



1,050MW Coal Fired Power Plant

Cultural Heritage Impact Assessment Study

Report Prepared for

Amu Power Company Limited

Report No. KT/4085/ESIA/V1/R1

10 July 2016



1,050MW Coal Fired Power Plant Cultural Heritage Impact Assessment Study

Prepared for:

Amu Power Company Limited

Geminia Insurance Plaza,
Kilimanjaro Ave. Upper hill,
PO Box 61872-00200,
Nairobi, Kenya

Prepared by:

Dr. Freda Nkirote
Ms. Angela Kabiru
Nairobi, Kenya

Contents

1	Executive Summary	11
2	Introduction.....	13
2.1	Project background	13
2.2	Project objectives and Justification	13
2.3	Project Description.....	13
2.4	Objectives of the HIA	14
3	Legislative Framework and Best Practices	15
3.1	National Laws on Land Tenure	15
3.1.1	Kenya National Land policy 2009.....	15
3.1.2	Land Tenure in the Kenyan Constitution 2010	15
3.2	National Laws on Culture	16
3.3	The National Museums and Heritage Act 2006.....	17
3.4	The Forest Act 2005	18
3.5	Fisheries Act.....	18
3.6	The Environmental Management and Co-ordination Act, 1999	19
3.7	International Laws and Treaties	19
3.7.1	The African Charter on Human and Peoples Rights	19
3.7.2	International Covenant on Economic, Social and Cultural rights, 1966 and international covenant on civil and political rights 1966.	19
3.7.3	Ramsar convention on Wetlands (1971, amended in 1982 and 1987)	19
3.7.4	UNESCO, World Heritage Convention.....	20
3.7.5	UNESCO Convention for safeguarding the intangible cultural heritage 2003.....	20
3.7.6	UNESCO Convention on the protection and promotion of Diversity of Cultural expressions 2005.....	20
3.7.7	UN Declaration on the Rights of Persons belonging to National or Ethnic, religious and Linguistic Minorities (1992).....	20
3.7.8	London Convention, 1972.....	21
3.8	Other Best Practices.....	21

3.8.1	World Bank Policy on Involuntary Resettlement (OD 4.30)	21
3.8.2	Performance Standard 7	21
3.8.3	Performance Standard 8.....	22
3.9	Limitations	22
4	Methodology for Cultural heritage assessment.....	23
4.1	Desk Review.....	23
4.2	Site Survey.....	23
4.3	Interviews	23
5	Description of Lamu County	24
5.1	Geography	24
5.2	Topography.....	25
5.3	Geology	25
5.4	Soils.....	26
5.5	Climate	26
5.6	Vegetation.....	27
5.7	Ethnic composition.....	28
6	Archaeological and Cultural Background of the Area	29
6.1	Archaeology and Prehistory of the Area	29
6.2	Historical and Cultural background	31
6.3	Significance of the area	33
7	Methodology for Assessing Heritage Impacts	35
7.1	Methodology.....	35
7.2	Identification of heritage aspects and impacts.....	35
7.3	Description of heritage aspects and impacts.....	36
7.3.1	Extent.....	36
7.3.2	Duration	37
7.3.3	Magnitude.....	37
7.3.4	Probability of impact	38
7.4	Method of assessing the significance of heritage impacts.....	38
7.5	Significance determination	38

7.6	Mitigation of heritage impacts	39
8	Potential Heritage impacts	40
8.1	Cultural Heritage Impacts of the Project Area	40
8.1.1	Livelihoods	41
8.2	Archaeology	67
9	Universal Outstanding Value of Lamu World Heritage Site	74
9.1	Potential impacts of developments on OUV	76
9.1.1	Assessment of Impacts associated with WHS OUV.....	77
10	Assessment of heritage impacts	80
10.1	Archaeological moveable and immovable finds.....	80
10.1.1	Impacts on moveable archaeological finds	81
10.1.2	Impacts on immovable archaeological finds.....	82
10.2	Cultural Heritage.....	83
10.2.1	Impacts on graves and shrines	83
10.2.2	Impacts on cultural landscape.....	84
10.2.3	Loss of grazing land	85
10.2.4	Loss of revenue from charcoal sales	86
10.2.5	Loss of building materials	87
10.2.6	Loss of plants of cultural value.....	87
10.2.7	Loss of mangroves.....	88
10.2.8	Loss of land	89
10.2.9	Impacts on boat operators	90
11	Conclusions and Recommendations	92
12	Bibliography.....	94

List of figures

Figure 5-1: Lamu administrative divisions	25
Figure 5-2: Ecosystems in Kenya	27
Figure 6-1: Gazzetted sites and monuments in Lamu County	30
Figure 8-1: Charcoal ready for sale.....	42
Figure 8-2: Mkwaju tree	43
Figure 8-3: Mwangati tree	44
Figure 8-4: Mkoma tree	44
Figure 8-5: Baobab tree.....	45
Figure 8-6: honey harvesting hole.....	45
Figure 8-7: Mpigo tree.....	46
Figure 8-8: Mpepeta tree.....	47
Figure 8-9: Mengo tree.....	47
Figure 8-10: Mwanga plant.....	48
Figure 8-11: Mjafali tree	49
Figure 8-12: Mshunduthi shrub	49
Figure 8-13: Mhenna plant.....	50
Figure 8-14: Mpichipichi shrubs.....	50
Figure 8-15: Mfukufuku tree	51
Figure 8-16: Mwongo tree	52
Figure 8-17: Somali pastoralists	54
Figure 8-18: Meeting with Somali pastoralist elders close to Kwasasi.....	55
Figure 8-19: Meeting with Boni elders in Bargoni.....	56
Figure 8-20: Mkamwa tree.....	57
Figure 8-21: Mbambakofi tree.....	58
Figure 8-22: Lamu County Fish abundance areas	61
Figure 8-23: Example of a ceiling made from Mangrove timber	65
Figure 8-24: Roof and thatch supported by Mangrove poles.....	66
Figure 8-25: Traditional boat partially constructed with mangrove.....	66
Figure 8-26: Buffalo skeleton on the project site	67
Figure 8-27: Map showing proximity of the identified archaeological sites and their proximity to the project area.....	69
Figure 8-28: Pottery scatter at Ngini site 1.....	70
Figure 8-29: Ngini pottery site 1- showing where the potsherds might be eroding from.....	70

Figure 8-30: Tana ware potsherds with punctuates	71
Figure 8-31: Crosshatched potsherds- typical of Tana ware	71
Figure 8-32: A jar and a bowl with carination- typical Tana ware.....	71
Figure 8-33: Chinese and Arabic Imported pottery	72
Figure 8-34: Whitish stratum where Tana ware pottery is eroding from	73
Figure 8-35: Pottery scatter at Ngini site 2.....	73
Figure 8-36: Remains of a collapsed well	73

List of tables

Table 7-5: Significance Assessment Matrix.....	39
Table 7-6: Mitigation Ratings Table	39
Table 10-1: Impact significance for destruction of archaeological movable materials- construction phase	81
Table 10-2: Impact significance for destruction of archaeological built in heritage- construction phase	82
Table 10-3: Impact significance for destruction of graves/shrines- construction phase.....	83
Table 10-4: Impact significance for loss of cultural landscape and sense of place- construction and operational phase	84
Table 10-5: Impact significance for loss of grazing land- construction and operational phase	85
Table 10-6: Impact significance for loss of revenue from charcoal sales- construction and operational phase.....	86
Table 10-7: Impact significance for loss of building materials- construction and operational phase	87
Table 10-8: Impact significance for loss of medicinal and wild foods plants- construction and operational phase.....	88
Table 10-9: Impact significance for loss of mangroves- construction and operational phase	89
Table 10-10: Impact significance for involuntary resettlement- construction and operational phase	89
Table 10-11: Impact significance for boat operators' loss of livelihood- construction and operational phase.....	90

Glossary

Term	Definition
Archaeology	The systematic study of past human life and cultures by the recovery and examination of remaining material evidence, such as graves, buildings, tools, and pottery
Palaeontology	The study of fossils to determine the structure and evolution of extinct animals and plants and the age and conditions of deposition of the rock strata in which they are found
Cultural heritage	This is the legacy of physical artefacts (tangible) and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations.
Holocene	This is a geological epoch which began at the end of the Pleistocene (at 11,700 calendar years BP) and continues to the present. The Holocene encompasses within it the growth and impact of the human species world wide including all its written history and overall significant transition towards urban living in the present
Neolithic	This pertains to or characteristic of the last phase of the Stone Age marked by the domestication of animals, the development of agriculture, and the manufacture of pottery and textiles commonly thought to have begun around 9000 – 8000 BC in the Middle East
Early Stone Age	This is the earliest stone tool making developed by the at least 2.6 million years ago. The Early Stone Age includes the most basic stone toolkits made by early humans.
Middle Stone Age	This is the period between 400,000 and 200,000 years ago, the pace of innovation in stone technology began to accelerate very slightly. The toolkits were established by at least 285,000 years in some parts of Africa, and 250-000 200000 years in Europe and parts of western Asia
Later Stone Age	These toolkits are very diverse and reflect stronger cultural diversity than in earlier times. The pace of innovations rose. Groups of Homo sapiens experimented with diverse raw materials (bone, ivory and antler as well as stone) the level of craftsmanship increased, and the different groups sought their own distinct cultural identity and adopted their own ways of making things.
Iron Age	The period in the history of humankind, following the Stone Age and the Bronze Age, marked by the use of implements and weapons made of iron.
Tangible Cultural Heritage	This includes buildings and historic places, monuments, artefacts, etc., which are considered worthy of preservation for the future.
Intangible Cultural Heritage	Intangible Cultural Heritage means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces that communities, groups and, in some cases, individuals recognize as part of their cultural heritage.

Term	Definition
Fossil	Mineralised bones of animals, shellfish, plants and marine animals.
Hominid	Any of the modern or extinct bipedal primates of the family Hominidae (great apes) including all species of the genera Homo and Australopithecus.

Acronyms

Acronym	Definiton
MOT	Ministry of Transport
MSA	Middle Stone Age
NEMA	Nation Environment Management Authority
NMK	National Museums of Kenya
OUV	Outstanding Universal Value
S&L	Sargent and Lundy
UN	United Nations
UNESCO	United Nations Educational Scientific and Cultural Organization
WHS	World Heritage Site
ACHPR	African Charter on Human Peoples Rights
APCL	Amu Power Company Ltd.
BMU	Beach Management Unit
EMCA	Environment Management and Coordination Act, 1999
ESA	Early Stone Age
ESIA	Environmental and Social Impact Assessment
FPIC	Free Prior Informed Consent
HIA	Heritage Impact Assessment
ICP	Informed Consultation and Participation
IFC	International Finance Corporation
KNBS	Kenya National Bureau of Statistics
KTL	Kurrent Technologies Limited
KWS	Kenya Wildlife Services
LAPPSSET	Lamu Port South Sudan Ethiopia Transport Corridor Project
LSA	Later Stone Age

1 Executive Summary

Amu Power Company Limited (APCL) is a project development company which is made up of Gulf Energy and Centum Investments and proposes to develop a coal-fired power plant with gross output of 1,050MW in Magogoni-Hindi area of Lamu County to meet the increasing demand for electricity power in Kenya. Kurrent Technologies Ltd. (KTL) was engaged to carry out as the Environmental and Social Impact Assessment (ESIA) of the project in order to fulfil the National Environmental Management Authority (NEMA) requirements. This Cultural Heritage Impact Assessment (CHIA) was conducted as part of the ESIA.

The implementation of the project is part of the Government's blueprint for producing 5000MW of electrical power in 40 months beginning September 2013. The Lamu coal power project is expected to contribute to the provision of reliable electricity to the national grid and will involve the construction of three steam turbine driven generator sets with total installed capacity of 1,050MW.

The main objective of this CHIA is to establish potential archaeological and cultural heritage impacts within the development area and the resulting cumulative effects to the Lamu World Heritage Site, and to review the probability and extent of the perceived impacts with a view to suggesting mitigation measures.

The history of the Lamu Archipelago dates back to the seventh century AD; Lamu Old Town which is the administrative capital of Lamu County, is recorded as the oldest and best preserved example of Swahili settlement in East Africa. In 2001, Lamu Town was named a UNESCO World Heritage Site because it has retained its traditional functions and culture to this day, and is also a focal point for Swahili language, culture and arts.

The methodology employed for this study includes a desktop study to review secondary literature such as databases and maps, scientific publications and unpublished reports relating to paleontological, archaeological and cultural heritage work undertaken on the Island; a physical site survey to record heritage that has not previously been recorded, to establish its integrity and state of conservation. Interviews were also conducted with various communities to collect data on tangible and intangible heritage.

The impacts identified in the study include those on archaeological artifacts, livelihoods and culture and probable impacts on the Outstanding Universal Value of the World Heritage Site. These are analyzed for probability of occurrence, magnitude, extent and the resulting overall significance. Mitigation measures are suggested and impacts upon mitigation are re-analyzed using a significance matrix.

The findings show that while there were no archaeological sites that were exposed on the surface, there may be a likelihood that these would be unearthed during the construction phase. As such, an archaeological watching brief is recommended during the construction phase.

The residents within the project site who are mostly farmers will be moved to pave way for the coal plant. As such, this report recommends that they are compensated for their land or its equivalent and resettled around the areas that have similar environment and suitable for farming and fishing in accordance with the African Development Bank's Operational Safeguard 2.

In addition, the findings show that due to the isolation of the Kwasasi residents from the urban centers as a result of inadequate road networks, indigenous knowledge of plants for medicines, food, building and furniture is key to their continued existence. This report identifies major plants of cultural value (which may be lost) as informed by the residents and suggests that APCL takes cognizance of such flora and plant the same outside their project area in a place accessible to the residents.

Other livelihood which are likely to be affected though not directly are those of mangrove cutters, fishermen and boat operators. Mitigation measures such as planting mangrove in the areas where they have been over harvested and areas that were affected by El Niño is suggested. Also providing fishermen with offshore fishing equipment and equity sharing of boating business with local boat operators during and after construction phase is proposed.

On the OUV of Lamu WHS, the findings are that, while Lamu population may benefit economically, its cultural values may get diluted or eroded due to population increase, and change in population character. As such, several mitigation measures have been suggested including: construction of buildings that are as close as possible to Swahili architecture to maintain the cultural landscape, provide support for Swahili institutions, construction of facilities away from the OUV, provision of prayer rooms/building of a mosque for the Muslim workers within the project area, allowing time for practice and attendance of employees to cultural festivals and *Maulidi*, induction of all external people who will come to work in the coal plant to Lamu culture and traditions, opening of a restaurant which serves exclusively Swahili dishes within the project site, introduction of a dress code in the project area which will be in line with Swahili values, come up with HIV and AIDS awareness program etc.

2 Introduction

2.1 Project background

Amu Power Company Limited (APCL) herein referred to as the Proponent composed of Gulf Energy (developer and lead-sponsor) and Centum Investments Ltd. (co-sponsor) intends to develop a coal-fired power plant with a gross output of 1,050MW in Magogoni-Hindi area of Lamu County to meet the increasing demand of electricity power in Kenya.

The project company has engaged the services of Sargent and Lundy (S&L) of the USA as the 'owner's Engineer and Kurrent Technologies Ltd. (KTL) as the National Environmental Management Authority (NEMA) registered "Firm of Experts."

2.2 Project objectives and Justification

The implementation of the project is part of the Government's blue print for producing 5000MW of electrical power in the 40 months commencing September 2013. The Lamu coal power project is expected to contribute to the provision of reliable electricity to the national grid and bring down the cost of power for both domestic and industrial use.

This is in line with Kenya's vision 2030, which recognizes reliable and cheap energy as one of the foundations for economic growth and essential for making Kenya a middle-income country by 2030.

2.3 Project Description

The project will involve construction of three steam turbine driven generators sets with total installed capacity of about 1,050MW with all auxiliaries and silencing equipment, a dedicated black start diesel generator, station canes and lifting equipment, three boilers and auxiliaries indoor switch gear at generator voltage, 400k switchgear and scabbling, neutral earthing switch gear, control metering and protection equipment, 20kv/ 400kv step up transformers, 400kv/6600v station transformers, 415v switchgear and motor control centres, 24v Dc and 110V Dc batteries, chargers, and distribution equipment, lighting and telephone system coal jetty, receipt, storage and transfer system, water storage and pumping system, Fire detection, protect system and SCADA system, sea water desalination and demineralization system, Ash handling plant and Ash Yard, and Waste water treatment plant.

2.4 Objectives of the HIA

The terms of reference for the HIA included the establishment of the potential archaeological and cultural heritage impacts within the development area and the resulting cumulative effects to the Lamu World Heritage site, and also to report on the probability and extent of the perceived impacts with a view to suggesting mitigation measures. Therefore the HIA team was tasked to do the following:

- a) To identify possible paleontological, archaeological, tangible and intangible cultural heritage and historic sites within the proposed development area
- b) To evaluate the potential impacts of construction, operation and maintenance of proposed development on archaeological, cultural and historical resources and to incorporate a risk assessment of the current and associated infrastructure.
- c) To evaluate the potential impacts on the Outstanding Universal Value of Lamu World Heritage site and to;
- d) Recommend appropriate mitigation measures that will need to be implemented through the life cycle of the project, to ameliorate any negative impacts on areas of paleontological archaeological, cultural and historical importance based on the site location within the existing project area.

3 Legislative Framework and Best Practices

The following are some of the laws and policies that are applicable in support of indigenous peoples and Heritage Impact assessment.

3.1 National Laws on Land Tenure

3.1.1 Kenya National Land policy 2009

The national land policy which was passed on 3rd of December 2009 provides a necessary and stronger framework for the governance of land and redress of historical injustices. It recognises the multiple roles of land including cultural heritage and the importance of protecting land which is definite for future generations. The national land policy acknowledges customary land rights and boldly recognises community land, and that ultimate ownership should vest in the community. The National Land Policy 2009 recognizes the multiple meanings and roles of land stating the following in section 29:

Land is not just a commodity that can be traded in the market. It represents the following multiple values which should be protected by both law and policy.

- a) Land is an economic resource that should be managed productively;
- b) Land is a significant resource to which members of society should have equitable access;
- c) Land is a finite resource that should be utilized sustainably; and
- d) Land is a cultural heritage which should therefore be conserved for future generations.

3.1.2 Land Tenure in the Kenyan Constitution 2010

This endorses a fundamental principle that all land in Kenya belongs to the people of Kenya collectively as a nation, as communities and as individuals'. The Constitution groups land into three categories: public, community and private. Community land is a new category of land ownership in the 2010 Constitution. Article 63 states that "community land shall vest in and be held by communities identified on the basis of ethnicity, culture or similar community interest" The Constitution recognizes community land as being inclusive of community forests, shrines and sacred natural sites.

Article 63 (2) goes on to say that community land comprises:

- a) Land lawfully registered in the name of group representatives under provision of any law;
- b) Land lawfully transferred to a specific community by any process of law;

- c) Any other land declared to be community land by an act of parliament; and
- d) Land that is-
 - Lawfully held, managed or used by specific communities as community forests, grazing areas or shrines;
 - Ancestral lands and lands traditionally occupied by hunter-gatherers communities or
 - Lawfully held as trust land by the county government but not including any public land held in trust by the county government under article 62(2)

Further article 63(4) states that community land shall not be disposed of or otherwise used except in terms of legislation specifying the nature and extent of the rights of members of each community individually and collectively.

The legislation will also ensure that the investments in property benefit local communities (article 66 (2) of the Constitution of Kenya 2010).

3.2 National Laws on Culture

Culture is a central pillar to the 2010 Constitution.

The constitution recognises culture as the foundation of the nation and as the cumulative civilisation of the Kenyan people and nation and promotes respect for ethnic diversity and equality. (Chapter 4 bill of rights, particularly article 27 of the Constitution of Kenya 2010.)

The new Constitution explicitly recognises minority and marginalised groups as being inclusive of indigenous peoples. Article 260 has four definitions of marginalised communities”

- a) A community that because of its relatively small population or for any other reason;
- b) A traditional community that, out of a need or desire to preserve its unique culture and identity from assimilation, has remained outside the integrated social and economic life of Kenya as a whole;
- c) An indigenous community that has retained and maintained a traditional life style and livelihood based on a hunter or gatherer economy; or pastoral persons and communities whether they are i) nomadic or ii) a settled community that because of its relative geographic isolation, has experienced only marginal participation in the integrated social and economic life of Kenya as a whole.

The Constitution recognises the right of communities to practice their culture and imposes duties on the state to protect and promote cultural rights of the peoples. Article 44 of the constitution states that:

- a) Every person has the right to use the language, and to participate in the cultural life of the person’s choice.

A person belonging to a cultural or linguistic community has the right, with other members of that community-

- a) To enjoy the person's culture and use the person's language, or
- b) To form, join and maintain cultural and linguistic associations and other organs of civil society

The Constitution in Article 11(1) recognizes culture as the foundation of the nation and as the cumulative civilization of the Kenyan people. According to Article 11 (2)(a) states that the state shall promote all forms of national and cultural expression through literature, the arts, traditional celebrations, science, communication, information, mass media, publications, libraries and other cultural heritage.

(2)(b) Continues to state that the state must recognise the role of science and indigenous technologies in the development of the nation and promote the intellectual property rights of the people of Kenya. (Parliament is empowered to enact legislation to ensure communities receive compensation or royalties for use of their cultures and cultural heritage and to recognise and protect the ownership of indigenous seeds and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya.

3.3 The National Museums and Heritage Act 2006

The National Museums and Heritage Act 2006 (revised in 2009) not only provides for the establishment, control, management and development of national museums but also provides for the identification, protection, conservation and transmission of natural and cultural heritage of Kenya.

The act defines "Cultural heritage" in section 2 as:

- a) Monuments
- b) Architectural works of monumental sculptures and paintings, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features which are of universal value from the point of view of history, art or science
- c) Groups of separate or connected building which because of their architecture, their homogeneity or their place in the landscape are of outstanding value from the point of view of history, art, or science.
- d) Works of humanity or the combined works of nature and humanity and areas including archaeological sites which are of outstanding value from historical, aesthetic, ethnological or anthropological point of view; and includes objects of archaeological or paleontological interest, objects of historical interest and protected objects

3.4 The Forest Act 2005

The Forest Act 2005 provides for the establishment, development and sustainable management including conservation and national utilisation of forest resources for the social economic development of the country. The act is applicable to all forests woodlands and state, local authority and private lands (section 2)

Section 33(4) recognises the need for the protection of sacred natural sites stating that

“ sacred groves found in any state forest, nature reserve, local authority forest or private forest shall not be interfered with and any person who, without lawful authority fells cuts damages or removes any such grove or tree or regeneration thereof, or biodiversity therein or abets in the commission of any such act commits an offence”

All indigenous forests and woodlands are also required to be sustainably managed including conservation of water, soil, biodiversity and a habitat for wildlife, and for “cultural use and heritage” (section 41(1))

The act recognises a forest community as a group of persons who-

- a) Have a traditional association with a forest for purpose of livelihood, culture and religion
- b) Are registered as an association or other organisation engaged in forest conservation.

3.5 Fisheries Act

The Fisheries Act Cap 378 of the Laws of Kenya provides a legal framework for the management, exploitation, utilization and conservation of fisheries and other connected purposes. It regulates the landing of fish and provides for the management of fish landing areas. Article 4 of the Act empowers the director fisheries in cooperation with other appropriate agencies and other departments of government to promote the development of traditional and industrial fisheries, fish culture and related industries. The act recognizes the contribution of fishing to local livelihoods and gives fishermen rights to fish in the Kenyan fishery waters.

3.6 The Environmental Management and Co-ordination Act, 1999

This Act aims at improving the legal and administrative coordination of the diverse initiatives in the field of environment so as to enhance the national capacity for its effective management. The Act's ultimate objective is to provide a framework for integrating environmental considerations into the country's overall economic and social development.

3.7 International Laws and Treaties

The Constitution of Kenya 2010 requires the implementation of international laws that Kenya is already party to. Article 2(6) states that "(a) any treaty or convention ratified by Kenya shall form part of the law of Kenya under this constitution

3.7.1 The African Charter on Human and Peoples Rights

The African Charter on Human and Peoples Rights (ACHPR) is the African continent human rights charter, which came into force on 21st October 1986 in Nairobi and was ratified by Kenya on 23rd January 1992.

The ACHPR recognises and protects the collective rights of people, including "the unquestionable and inalienable rights to self-determination (article 20(1) and "social and cultural development (article 22(1))

3.7.2 International Covenant on Economic, Social and Cultural rights, 1966 and international covenant on civil and political rights 1966.

These recognise the economic, social and cultural rights, including rights to self-determination, health and education, political and civil rights, including right to self-determination, to life freedom of religion speech and assembly.- Kenya acceded to these laws on the 1st of May 1972.

3.7.3 Ramsar convention on Wetlands (1971, amended in 1982 and 1987)

This convention came into force on 5th October 1990. It provides for conservation and wise use of wetlands and recognises the ecological and cultural importance of wetlands.

3.7.4 UNESCO, World Heritage Convention

This convention concerns the protection of world cultural and natural heritage 1972. The convention was ratified by Kenya on 5th of June 1991. It protects cultural and natural heritage of outstanding value, including natural sites and cultural landscapes formed through interaction between humans and nature

Duties of the State are to identify, protect, conserve, rehabilitate and transmit cultural and natural heritage to future generations, integrate heritage protection into regional planning, and refrain from activities that may damage heritage. States can nominate sites of importance for natural and cultural heritage on the world Heritage list, and threatened properties on the list of world heritage in danger. The convention establishes the world heritage fund for the protection of heritage and to provide technical assistance in developing management plans. States are encouraged to promote public participation through a participatory management scheme.

3.7.5 UNESCO Convention for safeguarding the intangible cultural heritage 2003

This was ratified by Kenya on 24th of October 2007. It recognises and protects intangible cultural heritage including intergenerational knowledge, oral traditions, practices, rituals and places relating with nature and the universe (Article 2). It promotes the widest possible participation and requires free prior and informed consent of communities in nominating intangible heritage and involvement in heritage protection (e.g. Articles 119b) and 15).

State parties can register sites of intangible cultural heritage on a representative list, and those in need of urgent safe guarding.

3.7.6 UNESCO Convention on the protection and promotion of Diversity of Cultural expressions 2005.

Kenya ratified this on the 24th of October 2007. This convention protects and promotes cultural expressions of minority and indigenous people to protect cultural diversity (e.g. Article 2).

3.7.7 UN Declaration on the Rights of Persons belonging to National or Ethnic, religious and Linguistic Minorities (1992).

The law recognises and protects cultural and religious identity of minority groups (e.g. Article 1)

3.7.8 London Convention, 1972

The convention is on the prevention of marine pollution by intentional dumping of waste and other matters to the sea.

3.8 Other Best Practices

3.8.1 World Bank Policy on Involuntary Resettlement (OD 4.30)

The document gives guidelines for compensation, disruption and displacement of population by a project

The International Finance Corporation (IFC) Sustainability Framework articulates the corporation's strategic commitment to sustainable development and is an integral part of IFC approach to risk management.

3.8.2 Performance Standard 7

Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases. The objectives of the performance standard 7 are as follows

- To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples.
- To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts.
- To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner.
- To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle.

- To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present.
- To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.

3.8.3 Performance Standard 8

This performance recognizes the importance of cultural heritage for current and future generations. Consistent with the convention concerning the protection of the world cultural and natural heritage, this performance standard aims to ensure that clients protect cultural heritage in the course of their project activities. For the purposes of this performance standard, cultural heritage refers to:-

- a) Tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric) paleontological, historical, cultural, artistic, and religious values;
- b) Unique natural features or tangible objects that embody cultural values, such as sacred graves, rocks, lakes, and waterfalls; and certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, practices of communities embodying traditional lifestyles.

3.9 Limitations

No records of previous archaeological or cultural heritage surveys exist for Kwasasi area, and therefore, it was assumed that such studies had not been done before. So we delineated the coastline as the area that we needed to concentrate on due to the farming that was taking place in the whole Kwasasi project area, and for cultural heritage we extended the area of study to include the environs where the Somali pastoralists are located and to Baragoni where the Boni hunter-gatherers currently live.

4 Methodology for Cultural heritage assessment

To conduct the archaeological cultural heritage impact assessment, three main approaches were adopted

4.1 Desk Review

This archaeological and cultural heritage study has been commissioned as the heritage component of the ESIA. It assesses the identified range of impacts in terms of accumulated knowledge of the area. The source of information that is used for this process is based on the available databases and maps; scientific publications and unpublished reports related to paleontological, archaeological and cultural heritage work undertaken in Lamu Island.

4.2 Site Survey

Physical survey of the proposed development area was done between the 20th and 29th of January 2015. Systematic surveys were done on foot within the project area, and selected sections outside the project area, except in areas where the ground was totally covered by vegetation and areas where farming was in progress. Therefore, most attention was paid to the open patches and the coastline.

Surveys were also guided by local informants who had immense knowledge of the area and were aware of areas where artefact i.e. archaeological pottery, and built in heritage, which did not belong to the current communities could be found.

4.3 Interviews

Further Cultural Heritage data was collected through interviews with the cultural heritage owners. About 40 members of communities living within the area of study were interviewed. Most of these were farmers.

While the people living around the site are the true recipients of any impacts, interviews were also conducted among other Lamu residents who earn a living from water and land resources which might be affected by the proposed development. These include the fishermen, pastoralists, hunter-gatherers, boat operators and mangrove cutters.

5 Description of Lamu County

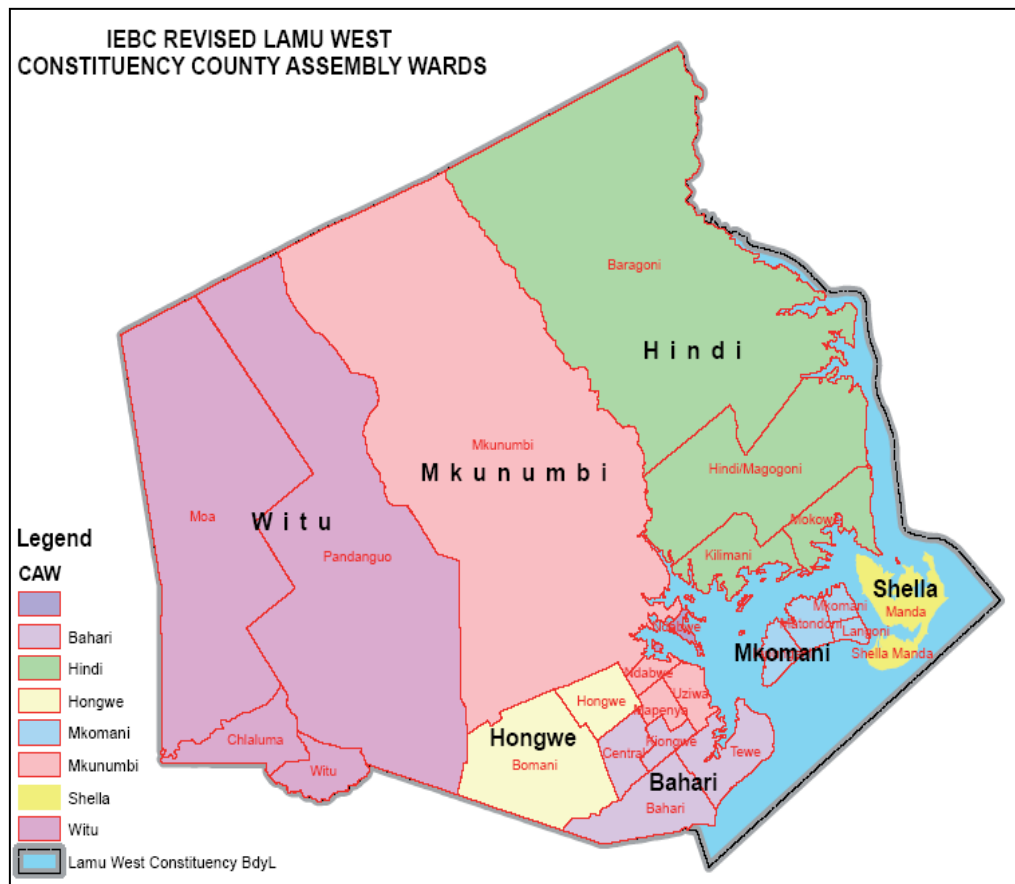
5.1 Geography

Lamu County occupies the northern-most part of the Kenyan coast. It is bordered by Garissa District to the north, Tana River District to the west and south-west, the Indian Ocean to the south and east, and the Republic of Somalia to the north-east. The Lamu coastline runs north-eastwards for approximately 130 kilometres. The district is characterised by a number of islands among which Lamu, Pate and Manda are the largest. Other prominent physical features are the many inlets of which Milhoi, Dodori, Mto Wange and Mongoni Creeks are a few.

The county includes historic settlements of Lamu, Matodoni, Kipungani, Shela, Pate and Manda. Lamu County has a population of about 101539 (2009 census). The Island area is 6,167km² with Lamu covering 311square kilometres. Among the surviving village towns that date to the first millennium ad are Pate, Siyu, Shanga, Faza, Chundwa, Mnyabogi, Mwajumwale and Kizingitini. Other important settlements along the northern Swahili coast include Kiunga, Ndau, Ishikani and She Jafari, Mwandoni and Mwambore.

The County is subdivided into Lamu West and Lamu East. The administrative divisions of Lamu West are Amu (Lamu), Hindi, Mpeketoni and Witu while Lamu East comprise Faza, Kizingitini and Kiunga divisions. The project area falls within Hindi Magogoni area (Figure 5-1)

Figure 5-1: Lamu administrative divisions



5.2 Topography

The district is characterised by low, almost level plain with the exception of the coastal sand dunes and the Mundane Sand Hills. The sand dunes and the sand hills hardly exceed 50 m above sea-level and few of their slopes exceed 5m in length. Due to the low level of the land, a large part of the district is susceptible to flooding.

5.3 Geology

The whole of Lamu District is covered by quaternary deposits which range from estuarine deposits to sands, clays and coral limestone. Nine different types of these quaternary deposits have been identified. These are: (a) Sand Dunes (b) Undifferentiated Quaternary Sands (c) Near Surface Coral Limestone (d) Beach Deposits (e) Alluvial Deposits (f) Contemporary Estuarine Deposits (g) Deltaic Deposits (h) Offshore Coral (i) Barrier Island Complex.

5.4 Soils

The parent material of the soils in the district originates from marine sediments. These soils are shallow and generally poor for agricultural purposes. They are also prone to waterlogging.

Soils in the bottomlands and in the plains to the west of the district have high fertility while those in coastal plains have low to moderate fertility. The soils formed on former coastal beach ridges and on sand dunes also have low to very low fertility.

5.5 Climate

With a climatic zone 10 miles wide, the coastal weather system is influenced by the Kaskazi and Kusi monsoons. The first of these, the Kaskazi blows in from the north-east during the months of November to March inclusive. These relatively dry winds, though warm, help mitigate the effects of an otherwise very humid atmosphere. The second monsoon, the Kusi, lasts from April through to September, and brings with it the long rains, which last from April through to June, with May being the year's wettest month. The short rains, though present, are less significant, and occur between October and November.

The district lies within the 600 to 1,000 mm isohyets and has three rainfall zones. The northern part of the district is semi-arid with an average annual rainfall of just over 500 mm. In the middle section, an annual rainfall of 750 mm is common. In the Southern coastal parts, rainfall in excess of 1,000 mm per year is common. The average annual rainfall thus decreases from south to north. Throughout most of the district, there is more than 30% chance of receiving less than 500 mm of rain in any one year, and in the more semi-arid north, there is more than 30% chance of receiving less than 380 mm in a year. While slightly drier in the north, rainfall all along the coast is reasonably constant, with Lamu experiencing an annual average of 800mm, Malindi - a third of the way down - around 1,050mm and Mombasa coming in at 1160mm.

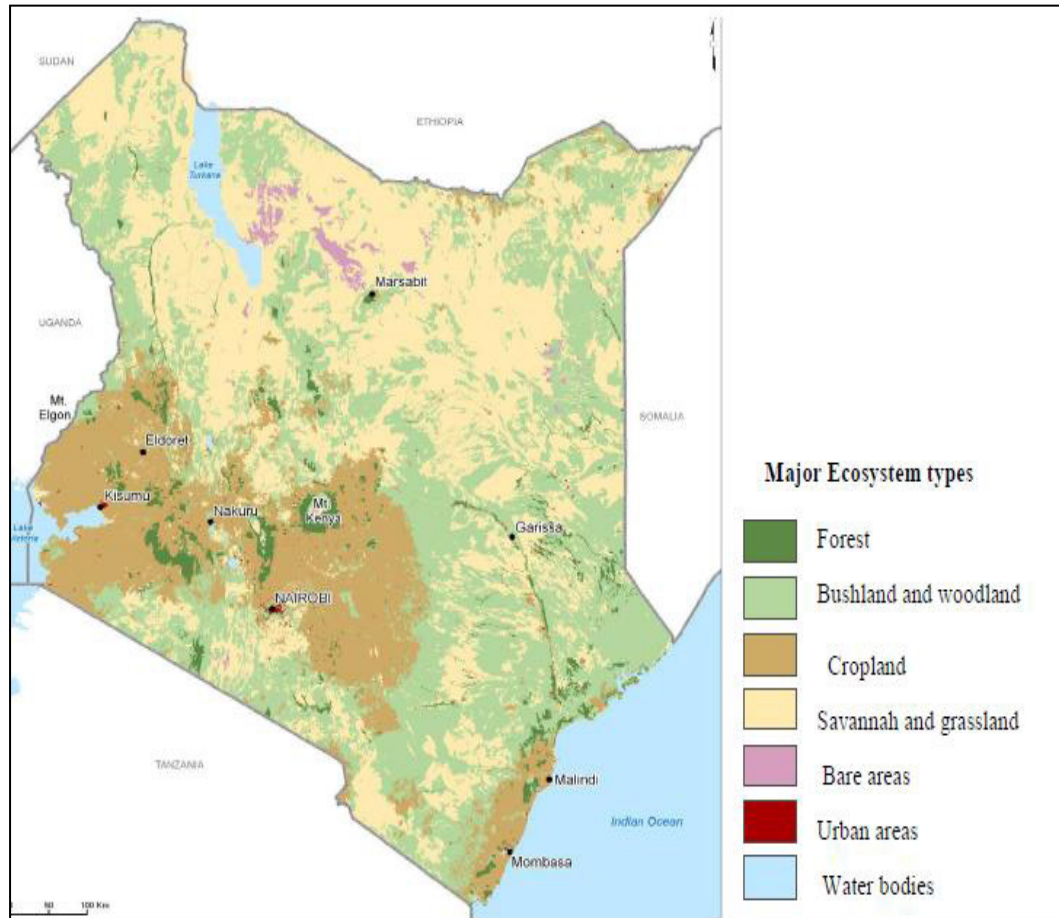
The highest average annual rainfall above 1000 mm occurs about 5-20 km inland. It is however, interrupted by Mkunumbi Bay. Generally, rains in the district are likely to be heavy every 3 or 4 years and relatively light in the intervening periods.

Temperatures throughout the district are usually high ranging from 23C to 30 C. The hottest months are December and April while the coolest months are May and July. Mean relative humidity in the district is 75%. The total amount of evapotranspiration is 2,230 mm per annum with the highest values occurring in March and September and the lowest in May. Comparison of evaporation and rainfall show that rainfall deficits occur in all months except for May. The largest deficit occurs from January to March.

5.6 Vegetation

The natural vegetation in Lamu County can be divided into six broad groups. These groups which are characterised by the dominant physiognomy include: Acacia-Euphorbia, low land dry forest, lowland rain forest, lowland moist savannah, and mangrove forest (figure 5-2).

Figure 5-2: Ecosystems in Kenya



5.7 Ethnic composition

The ethnic composition of the population in Lamu District has largely been influenced by the exposure of the district to maritime trade since the 14th Century, as well as the recent establishment of the Lake Kenyatta Settlement Scheme. This has resulted in an ethnic diversity comprising of the Bajuni, Kikuyu, Mijikenda, Arabs, Boni/Sanye, Pokomo/Riverine, Orma, Tharaka, Somali, Luo, Luhya, Swahili/Shirazi, Taita and many others. The main ethnic group is the Bajuni. They make up about 46% of the total population. The Bajuni live in villages in the archipelago, e.g. Faza, Pate and Kizingitini and along the coastal mainland. The Boni (5% of total population) on the other hand occupy the northern mainland while the Orma (2% of total population) are found in the southern part of the mainland. The Swahili/Shirazi and the Arabs, who constitute 1% and 6% of total population respectively, are mainly in the trading centres. The Kikuyu, Luo and Luhya together comprise about 24% of total of total population and the majority of them are in the Lake Kenyatta Settlement Scheme.

6 Archaeological and Cultural Background of the Area

6.1 Archaeology and Prehistory of the Area

The East African Coast has archaeological evidence dating back to the Stone Age and fossil evidence dating back to the Early Triassic period. The site of Mariakani produced a single extinct genus of basal neodiapsid named *Kenyasaurus Mariakanensis* (Harris and Carroll, 1977) while the site of Mtongwe produced handaxes that belong to the Oldowan and Acheulian traditions of the Paleolithic period. Later sites associated with the Middle and Later Stone Age occur in the hinterland while further inland Early Iron Age sites occur in abundance. These later sites are spread all the way into central Kenya and into Tanzania, and provide solid evidence of widespread and long lasting contacts between the people of the coast and those living in the hinterland.

The Swahili coast, running from Southern Somalia to Northern Mozambique is currently dotted with remains of settlements consisting of domestic houses, mosques, tombs and wells, built by Swahili speaking peoples of African descent who for hundreds of years traded and intermarried with Arabs, Chinese and Indians, creating a rich blend of Swahili culture with distinctive foreign influences.

The earliest written records of the East African coast appear in the Periplus of the Erythrean Sea dating to the 1st century AD, and Ptolemy's Geography in the 3rd century AD. Between the 9th and 14th centuries other Arab travelers wrote about the East African coast, its people and resources and the thriving trade with the Arabs. The Arab Ibn Battuta visited the coast in the 14th century and wrote about the places he visited such as Kilwa, Mombasa and Zanzibar. The Swahili communities along the coast developed permanent village towns that grew into city states dating back to the 7th and 8th century AD. The earliest settlements were built of mud while the later ones were of coral rug and mortar. The common feature on all settlements was a mosque and well. Most of the settlements have been abandoned, but retain a rich archaeological and historical context that provides evidence of a rich past.

Some of the largest city states included Shanga, Pate, Manda, Lamu, Ungwana, Shaka, Malindi, Gede, Mombasa, Kilwa, Mafia and Zanzibar. They had wide ranging influence far beyond their boundaries and had large trading networks with other parts of Africa and beyond. Smaller and moderately sized settlements also dot the coast all the way from Somalia to Mozambique, the oldest being found on the Northern Kenya coast and into Somalia. The Lamu archipelago has produced the oldest settlements ranging from the late 7th early 8th century AD in Shanga, 8th Century AD Pate, 10th century AD Manda and Lamu and numerous 11th and 12th centuries AD sites on the mainland/ hinterland of the Lamu archipelago (Horton 1986, Abungu 1989, Kusimba 1999). The oldest mosques in sub Sahara Africa is found in Shanga dating to the 8th Century. On the mainland of the archipelago are some of the most beautiful and detailed stone structures in East Africa, such

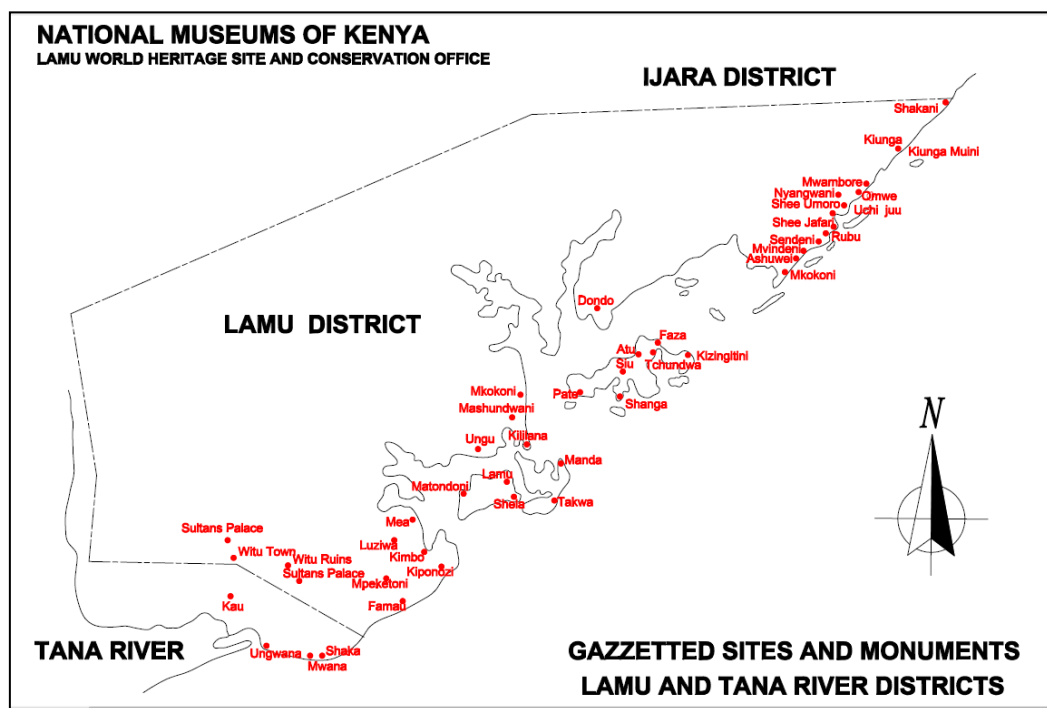
as the tombs of Ishakani, dated from around the 13th century. The northern Kenya coast has a collection of archaeological settlements whose density is found nowhere else in the whole of East Africa. These include She Jafari, Mwambore, Ishikani, Kiunga and Mwandoni among many others.

The archaeology of Lamu coast can be divided into three components:-

- a) Living historical towns- these include currently occupied settlements with an archaeological component. The current settlement may be built on top of the previous settlement or a short distance from it. These ruins usually consist of well-preserved remains of pillar mosques, tombs, wells and houses complete with public squares and courtyards. Examples of these include Lamu, Shela, Matondoni, Manda, Pate, Siyu, Buyi, Shanga, Faza and Kizingitini.
- b) Deserted ruins-these are settlements that have long since been abandoned and all that remains are the stone walls of mosques, houses, tombs and dry wells. These remains may be above ground or partially buried and overgrown by trees so their full extent is not easy to determine without an excavation. In many cases ruins may be discovered when foundations are dug for new buildings, or other activities that require massive earth movements such as roadworks. Such ruins include Takwa, Bui, Chundwa, Dondo, Ishakani, kimbo, Kiponozi, Kipungani and Kitau.
- c) Open archaeological sites that have buried artifacts without structures (Figure 3).

According to the Department of Archaeology records, this area lies within the Survey of Kenya topographical map sheet number 180/2. Several sites have been recorded in this area and some of them are gazetted as protected sites. (Figure 6-1).

Figure 6-1: Gazetted sites and monuments in Lamu County



6.2 Historical and Cultural background

The Island's history dates back to at least the seventh century AD- Lamu was one of a myriad Swahili city-states along the East African coast that were essential ports for trade networks extending to India, China, Persia, and the Arabian Peninsula. In 1506 it was invaded by the Portuguese, who monopolized shipping and suppressed coastal trade, causing the once prosperous city state to lose its position and gradually decline.

Lamu Old Town is the oldest and best preserved example of Swahili settlement in East Africa. It is also the administrative capital of Lamu County today. It flourished and remained a thriving *entrepot* with the rich immediate hinterland where wealthy slave owners possessed large plantation farms (*mashamba*) until the end of the 19th century. A combination of trade and agriculture contributed to Lamu's prosperity and defined its position as a regional powerhouse on the East African coast (Abungu and Abungu, 2009: 11-13; Allen, 1970). Lamu became an integral part of Zanzibar under Omani rule until the arrival of the British and German colonialists at the end of the 19th century. In 1890 the entire coastal strip north of Zanzibar was assigned to the Imperial British East Africa Company.

Hitherto Lamu was less powerful than its neighbor Pate until after the battle of Shela in 1813 where Pate, which had sought help from the Mazrui clan to completely suppress Lamu, lost. This resulted in Lamu becoming the regional powerhouse. Pate's loss of power is attributable to the abolition of slave trade, which deprived it of its workforce for the mainland plantations. This, in addition to the development of port of Mombasa, reduced Pate into a small sub regional port. The UNESCO CHIA report (2014) points out that this same reason caused the isolation of Lamu in the 20th century development in Kenya, leaving its cultural assets intact until the 21st century.

In 2001, Lamu Town was named a UNESCO World Heritage Site because it "is the oldest and best-preserved Swahili settlement in East Africa retaining its traditional functions" (UNESCO 2001: 44). A newspaper article about the UNESCO honor describes Lamu as "a focal point for Swahili and Arab art" (Oluoch 2002).

The "Swahiliness" of Lamu is often emphasized in such a way that it implies homogeneity and focuses on Islamic and Arabic identity. However, the groups of people living along the East African coast have never been isolated communities, and Swahili culture has always included an influx of traditions from the African interior as well as elsewhere in the Indian Ocean littoral. For hundreds of years the Swahili interacted with people from the African hinterland as well as mariners and traders from Arabia, Persia, India, Europe and China. In the process they often intermarried thus developing a distinct mixed culture as a result of this (Abungu and Abungu, 2009:15; Allen, 1993; Horton, 1986).

The ethnicity of Swahili-speaking peoples is a contested topic, and much scholarship has been devoted to the question of who constitutes the group known as the Waswahili (e.g. Allen 1993; Caplan 1997; Eastman 1971, 1994; Kusimba 1999; Le Guennec-Coppens and Caplan 1991; Mazrui and Shariff 1993; Middleton 1992; Spear 2000). As Spear (2000: 257) notes, in the last few decades "some 270 books, theses, and articles" have been written about the identity and history of Swahili-speaking people on the East African coast. Arguments revolve around exogenous versus indigenous origins of the ethnic group, and attempt to define what it means to be Swahili by considering factors such as ascribed social status, cultural traits, and linguistic practices.

Research has shown that the Swahili historically negotiated between African and Arab identities, upholding Islamic religious practices and settlement models while participating in marriage alliances within upcountry African lineages (Allen 1993; Kusimba 1999; Mazrui and Shariff 1993; Spear 2000). Therefore, it has been pointed out by the Swahili themselves that, they are African, Muslim communities who inhabit and have always inhabited the coast of East Africa. They speak an African (Bantu) language with loan words from Arabic due to long interactions. Archaeological evidence from Manda, Shanga and Ungwana sites within Lamu Island attests provides evidence for these interactions (Abungu 1989; Horton 1996; M'Mbogori 2011).

Although Swahili people can trace their lineage to both Arab and African ancestry, however, some prefer to emphasize exogenous sources of identity, which may be a residual effect from the British colonial policy of taxing "natives" in Kenya (Cooper 2000; Mazrui and Shariff 1993). Much of the current confusion and ambiguity about defining the Swahili as an ethnic group has roots in the colonial period, when the practice of separating and categorizing different groups of people was artificially imposed by the British (Cooper 2000).

Historians argue that the Swahili are the descendants of indigenous Bantu speakers (Sabaki) and either Cushitic speaking people or the Arabs known as the Shirazi who originated from Persia (Chittick 1968; Spear 1977; Pouwels 1984). Berg (1968) argues that since ruling families from the coast were from Shirazi, the claims seemed to have been adopted by the hypothetical descendants of their retainers and subjects. This view is not, however, readily acceptable since Pouwels (1984) claims that the Shirazi form the core of the Swahili people. On the other hand, Spear seems to hold a moderate opinion and claims that the Shirazi historically became a part of the coastal people and were more of a "historical phenomena" (Pouwels 1984, p. 251; citing Spear). The earliest Arabic settlement was around Brava and Mogadishu where Shirazi culture developed as a result of interaction with local people (Pouwels 1984; Spear 1977; Fedders and Salvadori 1988). The oral traditions of the Jomvu and the Kilindini sections of Swahili community asserts that they came from Shungwaya in the company of the Mijikenda and the Pokomo from where they had been expelled by the Oromo (Spear 1977; Pouwels 1984). These assertions are largely supported by the linguistic evidence using the principal of least moves (Pouwels 2001). The presence of a Bantu speaking community in the supposed locality of Shungwaya, according to Spear, offers further evidence although not enough is known about them to enable Bantu language classification, even though he also argues that a language (chi-miini) spoken in Barava is an archaic form of Swahili (Spear 1977).

Besides the Jomvu and the Kilindini Swahili, the other Swahili people claim to have come from Southern Somalia and they do not necessarily mention Shungwaya (Spear 1977; Pouwels 1984). When they arrived in Mombasa, they organized themselves into federations or tribes which are named according to their areas of residence (Berg 1968). In total, there are twelve federations namely; WaChangamwe, WaKilindini, WaTangani, WaMvita, WaJomvu, WaKilifi, WaMtwapa, Wapate, Wafaza, WaShaka, WaBajuni and WaKatwa. The distinctive feature of the tribes, besides language and culture, are the local independent governments that they subsequently formed with each town under Tamim, and a council of Wazee (Salim 1974).

Swahili is a name given to the coastal Swahili-speaking people over a thousand years ago by Arabic-speaking traders, who referred to them as "people of the coast." Their cultural unity is distinguished by Swahili as their common language. Currently the Lamu population comprises people of different ethnic affiliations with the Swahili forming the majority. Swahili became the national language of Kenya and Tanzania in the early 1960s, when the countries won their independence from Britain. Since then, immigrants from upcountry East Africa have further diversified the coast, making Swahili just one of the many African languages people speak there. Coastal people's ability to integrate newcomers and combine tradition with innovation has characterized the Swahili civilization for centuries.

The major traditional economic activities in Lamu include fishing, farming, mangrove harvesting, boat operating, trading in various items within the urban centers and skilled craftsmanship in leather, wood and metal. Most of the traditional stone houses and mosques that still stand today were built, in the 18th and 19th centuries, with coral stone and mangrove timber from the archipelago.

The people of Lamu have retained many of their traditional activities within a changing environment. The master craftsmen such as the boat builders of Matondoni and Kizingitini, masons, jewellers and woodcarvers of Lamu, leather workers of Siyu, all play dignified roles as custodians of heritage. Transfer of creative knowledge and skills to young people continues through the age-old practice of apprenticeship. Lamu youth learn traditional crafts, become masters themselves and ensure not only the survival of the heritage but also its appreciation and sustainability. It is this very heritage that the outside conceived and introduced development could be threat to.

6.3 Significance of the area

The project area is close (approximately 26km north of Lamu town) to the World Heritage Site of the Lamu Old Town, which is the oldest, continuously existing and best-preserved Swahili settlement on the East African coast, retaining its traditional functions, unlike other Swahili settlements which have been abandoned. Lamu has continuously been inhabited for over 700 years.

Built in coral stone and mangrove timber, the town is characterized by the simplicity of structural forms enriched by such features as inner courtyards, verandas, and elaborately carved wooden doors. Lamu has hosted major Muslim religious festivals such as *Maulidi* since the 19th century, and has become a significant centre for the study of Islamic and Swahili cultures.

Although the project site is outside the WHS, its cultural landscape is closely linked to the World Heritage property. The communities occupying the project area have close relationship with the communities living within the WHS and they have a common history and cultural values. As such, Kwasasi is not only linked geographically to the WHS but also archaeologically, historically and culturally.

7 Methodology for Assessing Heritage Impacts

The purpose of impact assessment is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The potentially significant environmental impacts were identified based on the nature of the receiving environment, a review of the proposed activities, and the issues raised in the public participation process.

Surveys were carried from the western to the eastern end of the development area. The soils are sandy silts and the vegetation is of low thorny bushes with acacia trees. The Eastern end of the development area seemed to have potential for archaeological materials based on the known occurrence of archaeological sites along the coastline and also due to the fact that most of the Western end of the project area is farmland and hence the soils are disturbed limiting any chances of finding anything *in situ*.

7.1 Methodology

The heritage variables discussed below have been assessed using International Finance Corporation (IFC) guidelines and standards, National Museums of Kenya requirements and National Environment Management Authority (NEMA) guidelines for Environmental Impact Assessment (EIA).

In the impact assessment stage of an EIA, identified issues are analysed and expected impacts are defined. This analysis identifies:

- The types of impact;
- Predicts the magnitude;
- Probability of occurrence;
- Extent of the impact; and
- Determines the overall significance of the impact.

7.2 Identification of heritage aspects and impacts

The outstanding heritage issues identified as having significance will be assessed using the methodology described below.

First, the issues raised will be described giving consideration to the associated activity and the aspect of that activity that is likely to result in an impact. The nature of the impact will also be described. Once this has been undertaken the significance of the impact can be determined. The following definitions will apply:

- An activity is a distinct process or task undertaken by an organization for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organization.
- A heritage aspect is an element of an organizations activities, products and services which can interact with the heritage. The interaction of an aspect with the heritage may result in an impact.
- Heritage impacts are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poor air quality. Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and paleontology. Impacts on the environment can lead to changes in existing conditions; the impacts can be direct, indirect or cumulative. Direct impacts refer to changes in environmental components that result from direct cause-effect consequences of interactions between the environment and project activities. Indirect impacts result from cause-effect consequences of interactions between the environment and direct impacts. Cumulative impacts refer to the accumulation of changes to the environment caused by human activities.

Aspects and impacts associated with the proposed development have been differentiated into construction and operation phases of the project.

7.3 Description of heritage aspects and impacts

The accumulated knowledge and the findings of the heritage investigations form the basis for the prediction of impacts. Once a potential impact has been determined during the scoping process, it is necessary to identify which project activity will cause the impact, the probability of occurrence of the impact, and its magnitude and extent (spatial and temporal). This information is important for evaluating the significance of the impact, and for defining mitigation and monitoring strategies. The aspects and impacts identified will therefore be described according to the definitions below.

7.3.1 Extent

The extent for each aspect, receptor and impact will be defined. The geographical coverage (spatial scope) description will take account of the following factors:

- The physical extent/distribution of the aspect, receptor and proposed impact; and
- The nature of the baseline environment within the area of impact.

For example, the impacts of noise are likely to be confined to a smaller geographical area than the impacts of atmospheric emissions, which may be experienced at some distance. The significance of impacts also varies spatially. Many will be significant only within the immediate vicinity of the site or within the surrounding community, whilst others may be significant at a local (project) or regional (county) level.

The extent of the impact will be rated on the following scale:

Localized (At localized scale and a few hectares in extent)	1
Study area (The proposed site and its immediate environs)	2
Regional (County level)	3
National (Country)	4
International (Beyond Kenya)	5

7.3.2 Duration

Duration refers to the length of time that the aspect may cause a change either positively or negatively on the environment.

The heritage assessment will distinguish between different time periods by assigning a rating to duration based on the following scale:

Very short (0 – 1 Years)	1
Short term (1 – 5 Years)	2
Medium term (5 – 15 years)	3
Long term (>15 years)	4
Permanent	5

7.3.3 Magnitude

The magnitude of a heritage aspect is determined by the degree of change to the baseline environment, and includes consideration of the following factors:

- The reversibility of the impact;
- The sensitivity of the receptor to the stressor;
- The impact duration, its permanency and whether it increases or decreases with time; Whether the aspect is controversial or would set a precedent; and
- The threat to environmental and health standards and objectives.

The magnitude of each of the impacts will be rated on the following scale:

Small and will have no effect on the environment	0
Minor and will not result in an impact on the processes	2
Low and will cause a slight impact on the processes	4

Moderate and will result in process continuing but in a modified way	6
High (processes are altered to the extent that they temporarily cease)	8
Very high and results in complete destruction of patterns and permanent cessation of the processes	10

7.3.4 Probability of impact

The probability or frequency of the impact occurring refers to how often the issue may impact either positively or negatively on the environment. After describing the frequency the findings will be indicated on the following scale:

Highly improbable (<20% chance of occurring)	1
Improbable (20 – 40% chance of occurring)	2
Probable (40% - 70% chance of occurring)	3
Highly probable (>70% - 90% chance of occurring)	4
Definite (>90% chance of occurring)	5

7.4 Method of assessing the significance of heritage impacts

The purpose of impact evaluation is to assign relative significance to predicted impacts associated with the project, and to determine the manner in which impacts are to be avoided, mitigated or managed. The information presented above in terms of identifying and describing the aspects and impacts will be summarized in a tabular form and significance will be assigned with supporting rationale. Significance will be determined before and after mitigation, taking into consideration all the factors described above.

A definition of a “significant impact” for the purposes of the study is: “An impact which, either in isolation or in combination with others, could in the opinion of the specialist, have a material influence on the decision-making process, including the specification of mitigating measures.”

7.5 Significance determination

The heritage significance rating is an attempt to evaluate the importance of a particular impact, the consequence and likelihood of which has already been assessed by the relevant specialist. The description and assessment of the aspects and impacts undertaken is presented in a consolidated table (Table 7-5) with the significance of the impact assigned using the process and matrix detailed below. The sum of the first three criteria (extent, duration and magnitude) provides a collective score for the CONSEQUENCE of each impact.

The last criteria determines the PROBABILITY of the impact occurring. The product of CONSEQUENCE and PROBABILITY leads to the assessment of the SIGNIFICANCE of the impact, shown in the significance matrix below.

Table 7-1: Significance Assessment Matrix

		CONSEQUENCE (Extent + Duration + Magnitude)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PROBABILITY	1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	3	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
	4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
	5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

In order to evaluate the mitigation threshold, the ratings table below is used.

Table 7-2: Mitigation Ratings Table

Low	<30	Where this impact would not have a direct influence on the decision to develop in the area
Medium	30-60	Where the impact could influence the decision to develop in the area unless it is effectively mitigated
High	>60	Where the impact must have an influence on the decision process to develop in the area

7.6 Mitigation of heritage impacts

Measures to avoid, reduce or manage impacts consistent with best practice will be proposed and the effectiveness of such measures assessed in terms of their ability to avoid, remove an impact entirely, render it insignificant or reduce its magnitude.

In assessing the significance of the impact, natural and existing mitigation will be taken into account. Natural and existing mitigation measures are defined as natural conditions, conditions inherent in the project design and existing management measures that alleviate (control, moderate or curb) impacts. In addition, the significance of impacts will be assessed taking into account any mitigation measures that are proposed.

8 Potential Heritage impacts

This section identifies the potential heritage related impacts of the proposed coal plant project.

8.1 Cultural Heritage Impacts of the Project Area

Meeting with Kwasasi residents on the 21st of January 2015

This meeting comprised 27 individuals who are mostly farmers from Kwasasi area. Among these, were members of the hunter-gatherer community-the Boni community who live among the farmers. The ethnic composition of the land owners comprises the Bajuni, Giriama, Kikuyu, Boni, Sanye, Somali and Borana. All these groups were present in the meeting. The main economic subsistence for all of them is farming although it is clearly known that the traditional ways of livelihoods for the Boni and Sanye is hunting and gathering, while for the Somali and Borana, it is pastoralism.

In between farming, the interviewed community members engage in fishing, hunting and charcoal burning as subsidiary livelihoods.

Deliberate efforts were made to get in touch with Boni and pastoralist families which currently live close to the development site. Interviews were carried out among 20 members of pastoral Somali group who live about 10 Kilometres away from the development site. Their opinions on land use and traditional ways of life which could be affected by the proposed development were sought. Similarly opinions of the Boni and Sanye who are the hunter-gatherers in Lamu and its environs were sought.

From the list of attendance, it was clear that the HIA team was dealing with a complex inter-ethnic composition which made it impractical to exhaustively speak of oral histories and cultural practises of each individual ethnic group as the residents were all newcomers in the area. They live together although not on a permanent basis. It was established that the farmers spend time in Kwasasi when they have to do farm work like preparing of the fields for planting, planting seasons and harvesting. These farmers originally came/ come from Pate, Witu, Hindi, Lamu and Kwasasi. Only two out of the 27 present claimed to have originated from Kwasasi. However, this notwithstanding, several cultural aspects and practices which cut across all these communities and could get affected by the proposed development were discussed. These included livelihoods, land use and indigenous knowledge.

8.1.1 Livelihoods

8.1.1.1 Farmers

Most of the people living close or within the development site are farmers who live away from the farms and only spend time in Kwasasi during land preparation, planting and harvesting. The land is managed in such a way that the farmer divides his land in patches and cultivates in these patches at different times. After one patch has been used for about 3 years, the farmer is usually aware that it is depleted of its nutrients and leaves it to rest for the following 5-6 years before it can be assumed to be ready for reuse. During this period, several wild plants are left to grow and this way, they provide both wild products and once cleared through slash and burn method, they provide manure for the next cultivation.

Further management is done through use of rotational cropping. The farmers plant the most demanding and profitable crop alone during one season, and practise intercropping for the next season. This helps in restoring the soils and also in utilizing the seasons in the most profitable way.

The types of crops planted in Kwasasi include but are not limited to sesame, cashew nuts, maize, peas, melons, peanuts, cassava, mangoes, lemon, coconuts, tomatoes, pepper, sweet potatoes and capsicums

Of all the above crops, sesame which is used as both cash and food crop is cultivated during its own season, while the rest are intercropped during a different season. The history of farming here is that the farmers used to plant cotton as the main cash crop because it was profitable, until the ginneries in Lamu stopped collecting it about 20 years ago due to political reasons. This caused the farmers to lose interest and to focus on cashew nuts. Similarly, the cashew nut business was thriving but the factories closed down in Lamu (again due to political reasons). As such, the farmers did not have a choice but to stop planting of cashew nuts since they did not have a ready market anymore. They also pointed out that the cashew nut trees occupy large spaces and also create shadows which make it difficult for the then to grow anything else in the farms. Following this, they started to focus on sesame and today they find it to be the most profitable crop. All the farms we visited had evidence of sesame farming. Either the sesame had just been harvested or it was thriving in the farm.

Once the crop has been harvested, traders come from Mokowe and other parts of Lamu to collect it for sale in both Lamu and other coastal towns like Malindi and Mombasa. Sesame is used for vegetable oil production and also as energy giving food usually put in pastries. The residents also mix it with sugar to make some form of high energy giving cake. They also bring small amounts of sesame to the factory to have it squeezed for production of oil for domestic use.

In addition to cultivating, the farmers also engage in fishing for domestic use. This is one of the ways for them to get animal proteins. As such fishing is not on a large scale and is only done here when the farmer feels the need.

Apart from fishing for proteins, the Kwasasi farmers also hunt small animals such as grass cutters, dikdiks, porcupine and larger animals like gazelles and impala. They also hunt buffalos (*nyati*) although they know it is illegal. The buffalos are prominent in Kwasasi and sometimes destroy the crop. This provokes the farmers into hunting them down.

The farmers also engage in charcoal burning as an economic activity. Among the trees that are found naturally within the operation area and are used for charcoal include; *mwanga*, *mchumbi*, *mpingo* and *mfukufuku*. Once the charcoal has been harvested, it is sold to the traders at 300ksh per sack and taken to the neighbouring towns of Hindi and Mokowe. Burning of charcoal is also done on small scale by a few individual farmers. During the field trip, evidence of charcoal burning was apparent in areas close to the project site (see figure 8-1).

Figure 8-1: Charcoal ready for sale



During dry seasons, the farmers also collect honey. Honey collection is mostly done from holes which occur naturally in baobab trees, which bees use for habitation. Besides the Baobab holes, the farmers make their own hives and place them in strategic places for honey harvesting. This also is not a mainstream economic activity but it is part of what forms their livelihoods.

8.1.1.2 Indigenous knowledge

During the meeting with the farmers at Kwasasi, several plants were mentioned and pointed out for their usefulness in either food, medicinal or woodworking (carvings). The useful parts of various trees included leaves, barks, roots and fruits. Below is the range of culturally important plants in Kwasasi. No scientific names are given for the plants. The names are given in local language and where possible in English as the team lacked reference materials while in the field.

a) *Mkwaju* also known as *Mzizi* (Tamarind tree)

The *Mkwaju* is specially used for making walking sticks, hence the name *Mkwaju* (which is also the Swahili name for a walking stick). And the tamarind fruits are used as essential ingredients in local soups because "*inaongeza damu kwa mwili*" ("it adds blood to the body")

Figure 8-2: Mkwaju tree



b) *Mwangati* (*Terminalia spinosa*)

This is a hard wood which the residents use for building boats and houses. The carved doors of Lamu town are made from this tree.

Figure 8-3: Mwangati tree



c) Mkoma

The leaves from this tree are used for thatching houses, basketry and bed and chair mats; its fruit is used for food; it also produces wine that is used as a refreshment in traditional ceremonies such as weddings.

Figure 8-4: Mkoma tree



d) Baobab (mbuyu)

This tree is prominent in the area and it is important for its food which is derived from the fruits, and honey which is harvested from the natural holes that occur in the trunk. Bees find home in these holes and they make honey here. This harvesting is most important during the dry seasons as it provides an alternative

livelihood for the residents. Once it is harvested, it is sold to individuals or to the traders in the nearest towns of Hindi and Mokowe.

Figure 8-5: Baobab tree



The baobab is also important to the residents for its bark which is used for medicinal purposes and for producing ropes which are used for building houses.

Figure 8-6: honey harvesting hole



The residents recognize the importance of baobab tree in the growth of mushrooms. Once part of the tree falls and rots, the mushrooms thrive there during the rainy season. These form additional sources of food to the residents. The residents also believe that it brings rain.

e) Mpingo

This tree is used for carving, making of knife and machete handles as well as firewood.

Figure 8-7: Mpingo tree



f) *Mpepeta* (*Caesalpinaceae* family) is used for its fruits

Figure 8-8: Mpepeta tree



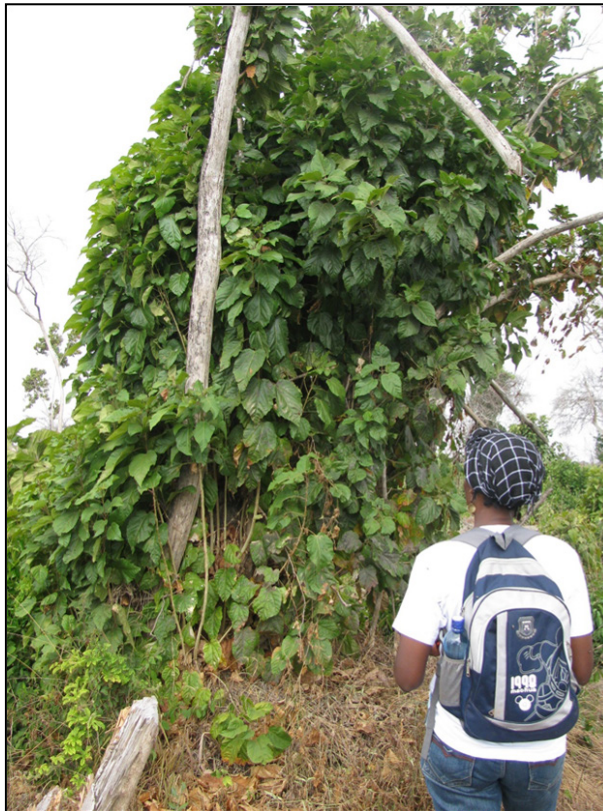
g) *Mengo* is used for curing constipation and for its fruits as food

Figure 8-9: Mengo tree



h) Mwanga is used for building wood as well as mwino

Figure 8-10: Mwanga plant



i) Mpeketo

This is named after the item that it is most valued for. It is used for making stirring sticks known as mpeketo in the local language. It is also used for building houses.

j) Matonga is used for fruits

k) Mangrove

These are used for reinforcing roofing slabs and lintels. This is the wood that forms the distinctive dark pattern in ceilings.

Several other trees, shrubs and grasses around the development site are used for medicinal purposes. These include

l) Mjafari

Both the leaves and roots are boiled and the resulting solution is used for curing stomach aches, malaria and headaches. It is also used for spicing tea.

Figure 8-11: Mjafali tree



m) Mvimbani

This is a brushwood used for curing stomach, headaches and blood pressure.

n) Mti Mweupe

The roots of this tree are used to make snake repellent while the leaves are used to treat colds (decongestant).

o) Mshunduthi

Leaves from this plant are used as cure for convulsions in children and it is also smeared on the boats (by those who know) to help them win boating competition.

Figure 8-12: Mshunduthi shrub



p) Mliwa

The products from the trunk are used as cosmetics for skin smoothing.

q) Mhenna

The leaves of this plant are used for producing colour which is used for body decoration. Its usage is widespread among the Swahili women especially during wedding ceremonies and other festivals.

The tree is also used as an indicator for water sources. In Kwasasi, fresh drinking water is one of their greatest problems. They therefore, must dig wells in order for them to reach ground water which is drawn using plastic containers. The mhenna plant is found only close to areas that contain fresh underground water. As such, rather than digging randomly, the residents use this plant as a guide to locate these wet points.

Figure 8-13: Mhenna plant



r) Mpichipichi

The leaves are used to make infusions which are used for curing excessive bleeding especially in women

Figure 8-14: Mpichipichi shrubs



s) Mfukufuku

This tree is used for making crab fishing sticks, and the bark is used for making and for healing and reducing excessive bleeding especially from cuts. The bark is also chewed and the infusion is used for neutralizing snake venom.

Figure 8-15: Mfukufuku tree



t) Mkaumwa

The roots of this tree are used for curing stomach problems.

It is important to note that these medicinal plants play a great role in the welfare of the residents since the nearest hospital is in Hindi which is about 18km from the development site. Until recently, the residents' means of transportation was only by foot and it took them 12 hours to get to Hindi and back. Today they have a choice of taking motorbikes which they consider to be very expensive. Therefore, these plants have been and are of great importance to them. Currently, with the introduction of motor bikes as the means of transport, the travelling has become easier but the fares are prohibitive. Therefore the medicinal plants are very handy for emergencies and for those who are unable to get to the hospital for various reasons.

Displacement of farmers, and cutting of cultural trees during the preconstruction and construction phases with result in land losses, crops, shelter and loss of livelihoods which are associated with its land use. Cutting of the cultural plants will not only deny them food but also plants that are key to their good health.

8.1.1.3 Built in Cultural Heritage

Based on the filed survey, it was established that the proposed coal power plant site does not have ritual sites, shrines, sacred grooves, sacred stones or sacred trees. It was also established that the burial grounds may have existed in the past, but none of the residents had a living memory of who might have been buried there. As noted above, until recently, most residents of Kwasasi have not been living within the project site. They have only been using the land for farming, collection of wild plants, fruits and medicinal plants. They therefore only use the land during certain periods of the year and move back to their permanent homes until the following season. As such, they did not have a recollection of where there might be graves but they pointed out that graves are likely to be found next to or below mwongo trees.

Figure 8-16: Mwongo tree



Graves

The behaviour of planting mwongo trees on graves is customary to Boni people. The tree therefore serves as a clear indicator of any graves in the project area and beyond. As seen in the preceding text, the Boni people who are hunter gatherers used this land long before the farming activities began. As such, they may have buried their dead here although they could not point to the graves since they currently live about 1 hour drive from the project area having been pushed by the farmers.

The current farmers are mostly of Islamic faith. They do not bury their dead in their farms. Instead, they have a communal cemetery where the dead must be

moved and buried according to Islamic law. The communal cemetery for this area is located in Pate Island and Hindi town, which is about 18km from the area of operation. Therefore, no graves of Muslims are expected in Kwasasi.

Shrines

Although several Boni shrines have been reported within Boni forest, the composition of population here is either Islamic or Christians. As such, they pointed out that they did not have any shrines as all the worshiping is done in areas away from their homes where there are mosques and churches. The closest areas of worship for Christians are in Hindi town, while Muslims can pray anywhere even where there is no mosque. They also did not have a recollection of any shrines within their living memories which might have been used by their ancestors who lived here before them.

However, in the recent past, the residents of Kwasasi have been using a shrine in Ngini, location 02. 05898S 40.88168 E to offer prayers and thanks giving after a birth of a child and other events. They bring food which may include rice and rice bread, make a sacrifice of a goat or chicken (depending on what one is able to afford) and share with their ancestors as they say their prayers. They believe that their ancestors used the area and they are buried here due to the presence of a large concentration of archaeological pottery which is scattered on the ground and presence of Mwongo tree which is an indication of a grave. Our guide Mzee Omari said that ceremonies are still held there, though not frequently. When the team visited the place, there was no trace of any recent activity which verified the information that was passed by the residents.

8.1.1.4 Pastoralists

Keeping of livestock is done mostly by the Somali and Orma pastoralists who migrate frequently depending on the severity of drought in Lamu, Tana River and Garissa districts. The pastoralists keep large numbers of cattle, goats and sheep. Other types of livestock include poultry and rabbits. With the rather harsh climatic conditions, it has become difficult to keep pure breeds of cattle, and the most common types of cattle found are crosses between Boran Semi-zebu Sahiwal, Ayrshires Friesians and Jerseys. Donkeys are kept mainly for transportation on the islands of Lamu and Faza. The Kenya Meat Commission buys animals from farmers and pastoralists and transports them either by ship or truck to their plant in Mombasa. There is no auction yard in which cattle bought from North are kept before they are sold to the Kenya Meat Commission. There was a proposal to start one at Mokowe but due to financial problems this was not realised.

Having spoken to the farmers who are the direct users of the affected area, it was found necessary to speak to the pastoralists who have also used this area for a long time although they do not reside in Kwasasi. The pastoralists bring their cattle in the area during dry seasons and build temporary manyattas (homesteads) as they are always in the move. They however keep returning to the same areas. As such, it was important to understand what cultural heritage issues they might have in terms of this form of livelihood and land use. The particular pastoralists that were spoken to point out that they have been in this areas since 1982. They graze their cattle within the grazing areas from Navy, Kwasasi, Magogoni up to Kiboko.

They mentioned that the grazing area from Pangoni to Jabiniani is owned by the ministry of livestock.

The team expected to encounter both the Somali and Orma pastoralist but it turned out that these two have their respective grazing areas and the Orma do not normally bring their cattle to this part of Lamu. The only few members of Orma community that were encountered were working in the farms for Somali land owners as hired labourers. As such, they were unable to contribute to any pastoral issues regarding the project and general area.

The team talked to about 20 pastoralists who have put their manyatta about 5km from the operation area coordinates S02.13104 E40.80655. They pointed out that they were from Ijara and Garissa. They were mostly of Somali origin and they graze their animals anywhere they can find grazing area. They are however restricted to the area east of Kwasasi due to tsetse flies which are endemic here.

In terms of their livelihoods, they were only concerned about the rapid loss of grazing lands. One old man pointed out that 'nowadays, land moves instead of cattle'. Meaning that they must keep chasing grazing lands since it is no longer available like before.

In terms of other land use like use of plants for food, medicine etc, they were not able to point at any wild trees that they use. However, they pointed at one plant *tinea albicans* whose fruits are used to treat stomach upsets and whose boiled roots cure sore throat.

Figure 8-17: Somali pastoralists



Figure 8-18: Meeting with Somali pastoralist elders close to Kwasasi



8.1.1.5 Hunter-Gatherers

While there is no universal definition of “indigeneity” or “indigenous peoples”, there is universal understanding of which communities constitute Indigenous Peoples.

The context within which the term ‘indigenous’ is issued in Lamu is rather contentious. Some civil society organizations identify all communities that have been found in the area for a long time as “indigenous”. This includes the Bajuni, Orma, Awer, Sanye, Swahili and Kore Maasai among many others. This context of “indigeneity” is in relation to migrant communities, including investors of both African and non-African descent, who have settled in the area in the recent past. Some civil society groups sometimes only identify the pastoralist and hunter gatherer communities as Indigenous Peoples. The communities that have lived in the area for a long time also have strong cultural traditions that they still practice for the last 300 – 400 years. Their livelihoods systems are also closely attached to the land and the coastal region has always been left out in national developments efforts.

Communities like the Awer (Boni) claim to have always been in the area and the pastoralist Orma are thought to have migrated into the area in the 17th or 18th century. The Bajuni are believed to be a result of Arab and Indian intermarriages with the local Bantu communities during the 14th century inter-continental trade. The Bajuni’s have generally dominated the economic, social and political landscape of Lamu.

After banning of hunting of wildlife by the Government of Kenya, the hunter-gatherer community turned to farming and charcoal burning in order to supplement their hunting of small animals, wild foods and honey harvesting.

Within the development area, a few families of Boni have completely abandoned hunting and gathering and could not recall when they last engaged in active hunting activities. They also did not seem to have any special land or plant uses within the project area. The only plants that they identified as being useful are the building material that is *sadasada* in Boni or *mwanga* in Kiswahili and thatching grass known as *asii* in boni.

This Boni family pointed out that they have lived in the area for about 30 years having migrated from Bargoni. They also pointed out that Bargoni is the current home of the Boni people who previously roamed the whole of the main land but have been pushed away by the farmers towards the Boni forest. Besides hunting of small animals, they also farm sesame, cassava, maize, peanuts and pumpkin.

Bargoni is located about one hour drive from the area of operation. The team found it necessary to locate them in order to establish their relationship with the affected area and what they would consider as acceptable mitigation strategies. At Bargoni, about 20 members of Boni community were interviewed in respect to their cultural values for the development area and its surroundings. The team sought to find out if they may have left behind graves, shrines, if they have special trees or plants that they consider culturally important either for their food value, medicinal value or any other purpose.

Figure 8-19: Meeting with Boni elders in Bargoni



The Boni from Bargoni area pointed out that they lived in the project area long before the other communities. According to them the Bajuni and the Somali could not use the land without their permission. With the Somali, they had a symbiotic relationship where they exchanged the products from the forest with other products which were not accessible to them including milk.

8.1.1.6 Plants of Cultural Value

The products from the following plants which are found around the project area and within their current residence were pointed out as being of cultural value.

a) *Mkamwa*

This tree is used by the boni in 2 ways

- i. Its fruits and seeds are used as food (*bure kikoch*)
- ii. They process the trunk to produce powders which is used for preparing porridge and chapatti

Figure 8-20: Mkamwa tree



b) *Mariga* or *digr* in Boni

The roots from this tree are boiled and immersed in water from morning to evening then put in the sun to dry before serving it with meat. It is believed to have very high nutrition value which helps in disease prevention

- c) Other trees for food include *Doo* and *Hurb (Mkapa)*. The fruits from these trees from an important source of food for the Boni.
- d) Ngambo: its fruits are used as food.

- e) *Mdule* and *Mfukufuku* / *mfupapo* on the other hand are used for construction houses and beds respectively. A bed made of *Mdule* sticks is especially important for newlyweds.
- f) *Mbambakofi* is used to carve mortars.

Figure 8-21: Mbambakofi tree



8.1.1.7 Medicinal plants and wild animal products

Just like it is the culture of the Bajuni, Giriama and the other communities living in Kwasasi to use the naturally occurring plants for health benefits, the Boni have several trees which are found in both their current environs and up to kwasasi that they use for curing various illness. Besides the plants they also pointed out that there are several cures that can be obtained from wild animal products which they have used over the centuries. However due to the government ban on hunting of wild animals, they no longer use these derive these benefits from hunting. As such, more emphasis is laid on the plants since the nearest hospital is found in Hindi town. The plants that have traditionally been used for medicines and are still available include

- a) *Mjafariri* or *Aril* in Boni language

The roots of this plant are used for curing malaria and also for curing sores.

- b) *Meki* in Boni language

The Boni make an infusion from the leaves and roots of this tree to cure tooth aches and colds.

- c) *Mwangajini*

The roots of this tree are crushed and applied on people who are possessed by evil spirits as a cure. The tree is found in two varieties black colour which is considered to be male and white colour which is considered to be female. For medicinal purposes, any of the two varieties is used first and if it does not work on the patient, the second one is used.

d) Sena (Boni) or Mtundukua

The leaves and roots of this plant are chewed and used for healing snake bites, while the fruits are used as food.

e) Akikarir

The leaves of this tree are squeezed to produce juice which is used for curing colds.

f) Kokonji (Mtutu)

The root of this tree is dug, cut into 3 pieces which are tied to the limbs of a pregnant woman during her last trimester. More of these roots are dug and buried in 5 spots within her house to facilitate safe and quick delivery of the baby.

g) Ndiki (boni) mengo (Swahili) and Marengo

Fruits from these trees are used as food.

h) Uruuru (Boni) Mvumbavu in (Swahili)

This tree is used for curing pleasure and gas in the stomach.

i) Tumar (Mawata)

This is used for its fruits and the roots are used as medicine for colds, general malaise and has aphrodisiac properties.

j) Halath (male and female) Mawacha ndovu

Fruits are used for food and other products of this tree are also used for incense.

k) Wahar (Boni) Mwongo (Swahili)

This tree is used to mark graves. It is also used as a shrine for by the Boni. Any time they have some form of difficulties which may include lack of rains or sicknesses, the conduct their prayers under these trees. They bring food and their hunting equipment with them during the prayers. Spells are also cast under this tree. Women and Men pray separately.

8.1.1.8 Wild animals

Although hunting of wild animals is banned, the Boni consider it a blessing when some stray into their farms because they kill them for food and where applicable for medicinal purposes for example, the following animals which are found in Boni forest and originally roamed the Boni hunting grounds are found useful for their health benefits besides food.

a) Giraffe

The soup from giraffe bones is used for healing diabetes and the fat for gonorrhoea (*kisonono*).

b) Zebra

Products from zebra are believed to have aphrodisiac properties.

c) Ostrich

Fat which is derived from this bird is used for curing hearing problems and asthma while its soup is used for curing joint pains.

The project's potential negative impacts on Indigenous Peoples include loss of land, territories and resources, increased conflicts, alteration of traditional livelihoods systems and the change in cultures and traditions among others.

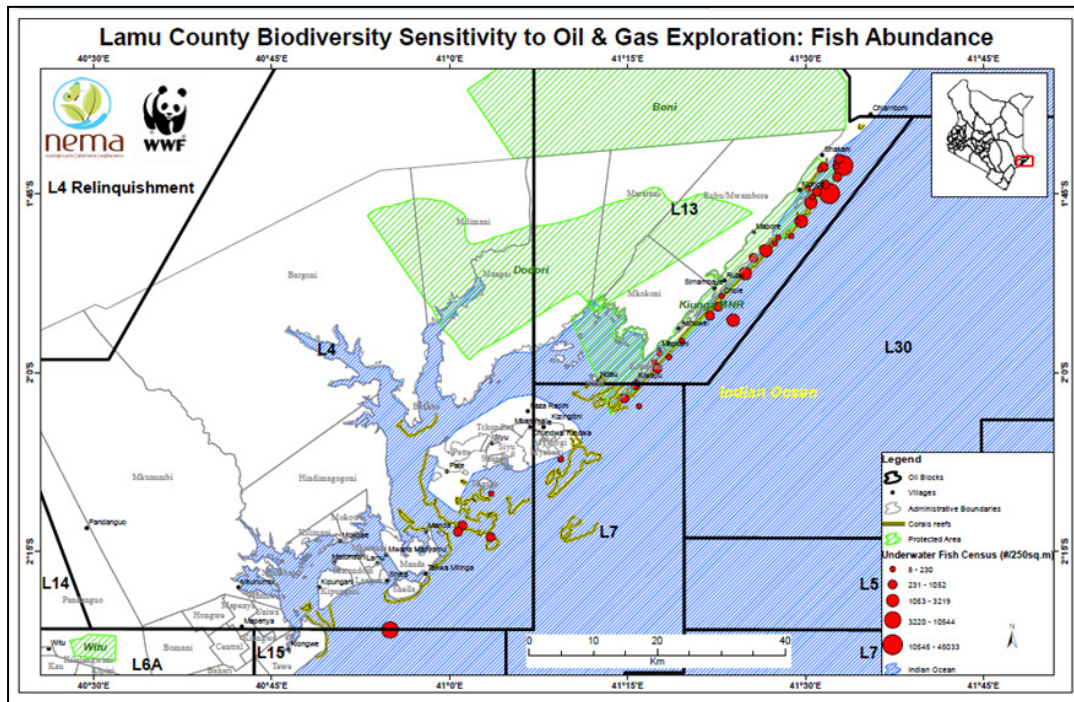
8.1.1.9 Fishermen

The main types of fish caught in Lamu include kingfish, barracuda, snappers, cavalla jacks, sharks, rays, groupers, scavengers, goatfishes, grunts, siganids, sardines, emperors, mackerels, sickle fish, crabs, lobsters, prawns and squids. Fishermen are licensed and their fishing craft registered. There are no restrictions however on the number of fishermen that can operate in the area. The fishermen have been organised into a fishing co-operative society with the aim of not only eliminating exploitation by middle men but also to help the fishermen acquire loans (so that they can improve their craft, gear, etc), to acquire storage facilities, and improve and control the marketing system. The Fisheries Department and Co-operative officials are continually helping this society achieve its goals. The Department operates through the society to pass on relevant information on several aspects of fishing to members. Due to lack of cold storage facilities, fishing activity is not carried out daily or as frequently as the fishermen would like. Active fishing is done when dealers put forward their order and send vehicles to collect the catch. Dealers supply ice blocks to preserve the catch which is mostly transported to Malindi, Mombasa, and Nairobi. Some of the catch, especially of prawns, is processed in Mombasa for export. A large portion of the catch is however, gutted, salted and sun-dried before sale. Data on fish from Lamu to other districts are not available. The collection of such data is difficult because some of the catches are not landed in the district.

The state of the fishing industry strongly depends on how efficiently the available resources are exploited. In that context the following can be said to be the main limitations affecting fishermen and hence fishing activities in the district. (a) Craft: Although the Bajuni and Swahili fishermen of Lamu District have the necessary experience to build larger boats (10-50 tons) than any other local Kenyan fishing community, their craft are not strong enough for deep sea fishing.

b) Hydrographic factors: The heavy wave action during the South-East Monsoon restricts fishing to the inshore waters. On the other hand during the calm North-East Monsoon, fishing can be done further in the offshore waters. (c) Untrawable bottoms: Most of the offshore areas have tough, spiky and stony bottoms which tear nets when trawling. (d) Cold storage facilities these are lacking in Lamu District. This lack is stifling the efforts of the local fishermen to improve their catches because they fear a bigger catch may get rotten.

Figure 8-22: Lamu County Fish abundance areas



The actors of Kenya’s fisheries are mostly artisanal fishermen who operate small, un-motorized vessels within 5 nautical miles of the shoreline. There are 4,800 registered vessels on the coast and cumulatively they produce 6,000-7,000 million tons of fish a year. The fruits of their labor are worth 500 million KES, or 5.76 million USD (Department of Fisheries, 2013). Given estimates that the marine fisheries in Kenya have the potential to generate 1-2 billion USD annually (Kabubu and Mwako 2014), Kenya’s marine fisheries are only reaching 5% of their potential. This isn’t too surprising considering the 195 nautical miles of marine resources currently being underutilized by the artisan fishing industry. While the fishing industry seems miniscule in national economic terms, it is much grander in terms of the coastal communities who are sustained by the industry.

In Lamu County, marine fisheries comprise 75% of the local economy (Mbungu 2014) and it has been the main livelihood strategy for generations. Fishing is the primary occupation for 89% of population, 101,539 people (KNBS 2010), in Lamu County, with mangrove harvesting, small scale farming, and tourism providing the additional income (MOT 2011, 133).

The seasonal weather patterns dictate when fishermen can work. The northeast monsoon and southeast monsoon seasons are influenced by trade winds that control the weather and ultimately fishing patterns (Maina 2012, 31). The Southeast Monsoon season usually lasts from May to August and is characterized by strong winds and rough seas. This is a risk to the fishing industry due to the lack of predictability concerning the length of time Monsoon season will persist and the inability for many fishing vessels to operate during this season (Maina 2012, 20). When fishermen are restricted by the seasonal weather patterns community energy is shifted to farming and other forms of income generation. However, several survey responses specifically stated, “fishermen are fishermen and farmers are farmers”.

Degraded fisheries are also due to corroded corals and destructed fish breeding ground as a result of Mangrove over exploitation for wood and non – wood products. This overbuilt pressure on the fisheries is due to lack of alternative livelihoods for the fishing communities and inability to harness offshore fisheries.

The fishermen cooperative though not concretely organized, has structures and representatives who channel their grievances and demands to authorities. They work closely with Beach Management Units (BMU) under the chairmanship of mzee Ali Suo Bakari.

Mr. Bakari pointed out several facts as discussed below:

- i) Firstly, he explained that most fishermen are taught the fishing skills by their parents. They are also taught how to use different fishing tools for different types of fish. For example the red snapper is caught using net, *malema* and *mishipi*. The fishermen however continue to learn different skills on the job.
- ii) Each fisherman works as an individual and sells his catch to the local restaurants within Lamu town and Lamu mainland. Sometimes fish is also bought by traders and transported to other towns away from Lamu. Some of the fish that are caught in Lamu include and are not limited to *Mkizi, chaa, vidara, chuku wa mikoko, tafi*, red snapper, prawns, crabs, shark, calamari, lobster, octopus, *nguva, kasa* (cod?) *Tewa, jodali, Kambisi*.
- iii) Some fish have their habitat around the mangroves. These include *mkizi, chaa, vidala, chuku wa mikoko, mgendi, dagaa/simu kishwa tafi* and red snapper while others use these areas as breeding grounds especially the crabs and prawns
- iv) Different types of fish are most abundant during different seasons of the year. For example the fishermen are able to catch *tafi, pono* (blue fish) during the months of May, June and July. These are mostly sold to the locals; therefore the market is not wide. During October to March, the fishermen are able to catch the larger fish including red snapper, *tewa, Kolele, Jeodali, and tangu*. These are more marketable especially for tourist market because they produce fillets. Octopus and *Majongoo* are exported also exported to China. Fins (*majongoo?*) of sharks are also exported to china.
- v) Fishermen will sometimes dry the fish for preservation. The dried fish is most popular in Mombasa and Kilifi where it is sold to the Giriama communities.
- vi) Besides the common health benefits that are known to result from fish meat, the following fish products were mentioned as being culturally important.

a) Shark liver

The shark liver is cut into small pieces put in a drum where it is allowed to melt into liquid. The resulting liquid is usually applied on the wooden boat as sealant and preservative. 20 litres of this liquid is sold for about 3,000 Kenya shillings. It is estimated that a shark is able to produce up to 200liters.

b) *Hambari* (whale faeces)

In addition to the meat, in the past, *Hambari* (whale faeces) were exported to Saudi Arabia, Yemen and Kuwait. One kilo of this may sell for 500,000 shillings.

c) *Nguva*

This fish bears human morphology it is said to have a human like body although it is clearly a fish. This fish is protected by Kenya Wildlife Services (KWS) and its fishing is prohibited. If it is caught by mistake in the shark traps, KWS must be notified quickly so that they can give a license for its removal and subsequent usage. If a fisherman catches a female version of the Nguva, he is traditionally required to go to the mosque for swearing that he did not have any sexual intercourse with it before it can be used by the rest of the community. Apart from its meat, oil from Nguva is used restoring white/grey hair into its original colour.

d) *Kasa* (cod)

Oil from Kasa is good for curing gonorrhea and tuberculosis (TB). One must mix half a cup of the oil with porridge and drink it at least for 2 days to cure TB and once for gonorrhoea.

e) Octopus

Its products are traditionally believed to have aphrodisiac effects

f) *Pomboo* (dolphin)

Not usually fished but its oil is used to treat asthma.

g) Brass

h) If the liver is smoked over the fire, the fumes that it emits can be used for healing eye problems. The patient is required to move close to the source of the fumes and to keep his/her eyes wide open.

8.1.1.10 Boat operators

Sea transport in the County dates back a long time and is important because it connects Lamu with other ports in Kenya and outside. As indicated above, there are no roads within the archipelago where majority of the people live. Movements between islands therefore, are by sea. Sea transport is also used extensively during the wet season when most roads are impassable. Both passengers and goods are carried by small ships, motor-boats and dhows. Navigation between Lamu harbour and the open sea is guided by several pillars, beacons and buoys. Small vessels usually anchor at the customs jetty but departure and arrival are sometimes affected by tides. However, large vessels anchor in the sea far from the town where the sea is deeper. Smaller vessels are then used to load or off-load them.

There are several jetties but the most important ones are the Customs jetty on Lamu Island and the Mokowe jetty on the mainland. Between these jetties operate the highest number of boats carrying both passengers and goods. The Manda Island jetty connects Lamu Island with the only tarmac airstrip in the district (located on Manda Island). Boats operate during arrival and departure of aeroplanes mostly for tourists. Other jetties in Lamu Island are the Fisheries Department jetty and the landing steps at Shela near Peponi Hotel. Jetties are also located at Kizuka, Magogoni, Mtangawanda and Siyu. Most of these jetties were built by prospecting oil companies a long time ago and are now collapsing. With extensive mangrove forests, swamps and mud due to tidal changes, access to and from the sea is difficult without jetties.

The boat operators in Lamu have formed an association known as Lamu boat operators' self-help currently under chairmanship of Mr. Awadh Hassan, where they have a membership of about 250 boat owners. The boats include speed boats of different engine capacities and as well as the wind driven dhows. Besides the main organization, they are in the process of registering a new association of "Lamu disaster rescue team" under the chairmanship of Luki Faruk.

Some of the operators have training in disaster planning and diving. The 50 people were trained by the US Marines on first aid and 40 of them attained first aid and swimming certificates. They have been involved in several lifesaving operations within Lamu.

Boat operating business has been in existence for many years and the Lamu boat operators have learnt the skills from their parents from whom they inherited their boats.

The boats are used either by individuals who may hire them at higher fee or by a collection of passengers who pay fares as a means of transportation from one end of the island to the other as well as to move around the islands of Lamu archipelago which include Manda, Pate, Shanga and Faza. Besides transportation, the boats are also used for fishing in both shallow and deep waters.

8.1.1.11 Mangrove Cutters

The total area of mangroves in Kenya has been estimated to be between 53,000 and 61,000 ha with 67% occurring in the northern Lamu area. The main forests are concentrated in the Lamu Archipelago and the permanent Tana and Sabaki river estuaries. The smaller mangrove areas are on the south coast in creeks around Shimoni and Vanga, in the bays of Funzi and Gazi, and also at Port Reitz and Tudor around Mombasa city, in Mtwapa, Kilifi and Mida creeks. The bulk of these forests occur in the intertidal areas where submarine ground water discharge or seepage occurs rather than in estuaries (Ruwa & Polk, 1986). The mangroves of the Lamu archipelago combined with the nutrient rich colder Somali current confer high productivity supporting some of the highest densities of finfish and crustaceans inshore in Kenya. Mangrove trees also provide valuable wood products for local communities.

Mangroves were declared a government reserved forest in 1932 and have been managed by District Officers who manage licenses, off-take and conservation. They fall under the Forest Act (2005) and are one of the ecosystems that 'fall between the cracks' because the forestry department is primarily concerned with terrestrial forests which are seen to be much more valuable in terms of timber (Samoilys et al 2011c). It is estimated that 10,300ha of mangrove forest has been lost in Kenya either to conversion pressures, overexploitation, or pollution (Ruwa 2003). Depending on the degree of alteration to the mangrove forest, recovery may take a long time or may never occur.

Many of Kenya's forests fortunately fall within national protected areas such as the Kiunga national Reserve north of Lamu, Mida creek in Watamu Marine Park and Reserve, and Shimoni/Tanga area within Kisite Mpunguti Marine Park and Reserve.

Two (Watamu and Kiunga) were declared as UNESCO Heritage Sites in 1979 and 1980, respectively. However, despite the national protection status of these mangrove forests, particularly the two largest formations in north Kenya, they remain under threat from developments. Mangrove Cutters are no longer organized as a group since the ban of mangrove harvesting. They however have a cooperative society “Mangrove Cutters –Cooperative Society” which is under the chairmanship of Mr. Abdurahman Aboud Lali. There are 6 mangrove traders within Lamu but only 3 are currently operating. Individual mangrove cutters bring their logs directly to the traders who sell them around Lamu for domestic use but they may also sell them outside Lamu each time the ban is lifted.

Although there has been a ban on mangrove harvesting, people are still issued licenses to carry low level harvesting under control since the architecture of Lamu depends heavily on the mangroves without which some houses would collapse.

Mangroves are used as house support beams and for ceiling and roofing (figure 8-23 and 8-24). This is because due to salty water from the sea, metals cannot survive. They easily corrode and if used for construction houses could collapse. It would also be difficult from the architectural point of view to replace them as opposed to the mangroves which are replaced after every 20 years.

Figure 8-23: Example of a ceiling made from Mangrove timber



Due to this need for mangrove trees and their important place in the Lamu architecture, the Mangrove cutters have traditionally used hand held saws to fell them in order to avoid over harvesting. The cutters are also guided by the traders who are also guide mangrove cutters on what sizes to cut and bring to the collection centre. Failure to bring the specified size results into waste of time and energy on the side of the cutter since the trader rejects them. This way, the cutter is forced to move around the forest searching for the correct sizes which ensures that the harvesting is distributed around all the areas and allows for them to grow. The desired size for house construction is 4 inches in diameter. It takes 8-9 years for a mangrove tree to attain this size.

Figure 8-24: Roof and thatch supported by Mangrove poles



Mangroves are heavy hardwood but some are light and are used for making dhow ribs (figure 8-25) which help them to float. This type of mangrove is known as *mililana*.

Figure 8-25: Traditional boat partially constructed with mangrove



Mangroves are also used by lime producers for firing or burning blocks of limestone in order to produce lime which is used as house construction mortar. In addition, the Mangroves help in countering soil erosion since they grow on the sea edge and they are also used as habitation and breeding grounds by various sea creatures.

8.2 Archaeology

The surface soil of Kwasasi and its environs is clay mixed with beach sands. The vegetation cover is thick bush land and woodland. The whole of this project area was searched for any archaeological remains which would include pottery, archaeological bones, graves, stone and iron objects.

A number of factors made it difficult to find any archaeological sites or materials on the surface.

Most of the land, as mentioned above, is cultivated and farmers claim to have cultivated their pieces of land for more than 30 years. There is a higher likelihood that these lands have been cultivated for longer periods than 30 years considering that members of Pate community pointed out that their ancestors used to cross over and cultivate at the main land although they lived in the island. Also as seen earlier in this report before and after the war of Shella, the residents of the islands used slaves to farm for the island's food supply from the mainland. This being the case there exists no chance of survival for in situ archaeological materials.

The vegetation around the project site is made up of bushes and tall grasses. Although there is little or no possibility of finding movable archaeological artefacts even if they existed in some areas (though highly unlikely), their visibility would not have been possible through the tall grasses and thorny bushes. In addition, there are buffalos in the parts of the project area which are covered by thick bush; a buffalo skeleton was observed at the project site (figure 8-28).

Figure 8-26: Buffalo skeleton on the project site



As discussed elsewhere in this report, Swahili settlements are found along the East African coast all the way from Somali to Mozambique. Some such as Mtwapa and Gede were built of stone and occupied over substantial period and so most of the original walls have been preserved. However, some ruins have been completely buried in the ground or are under water. A good example is ruins that were only discovered when the LAPSET building was under construction.

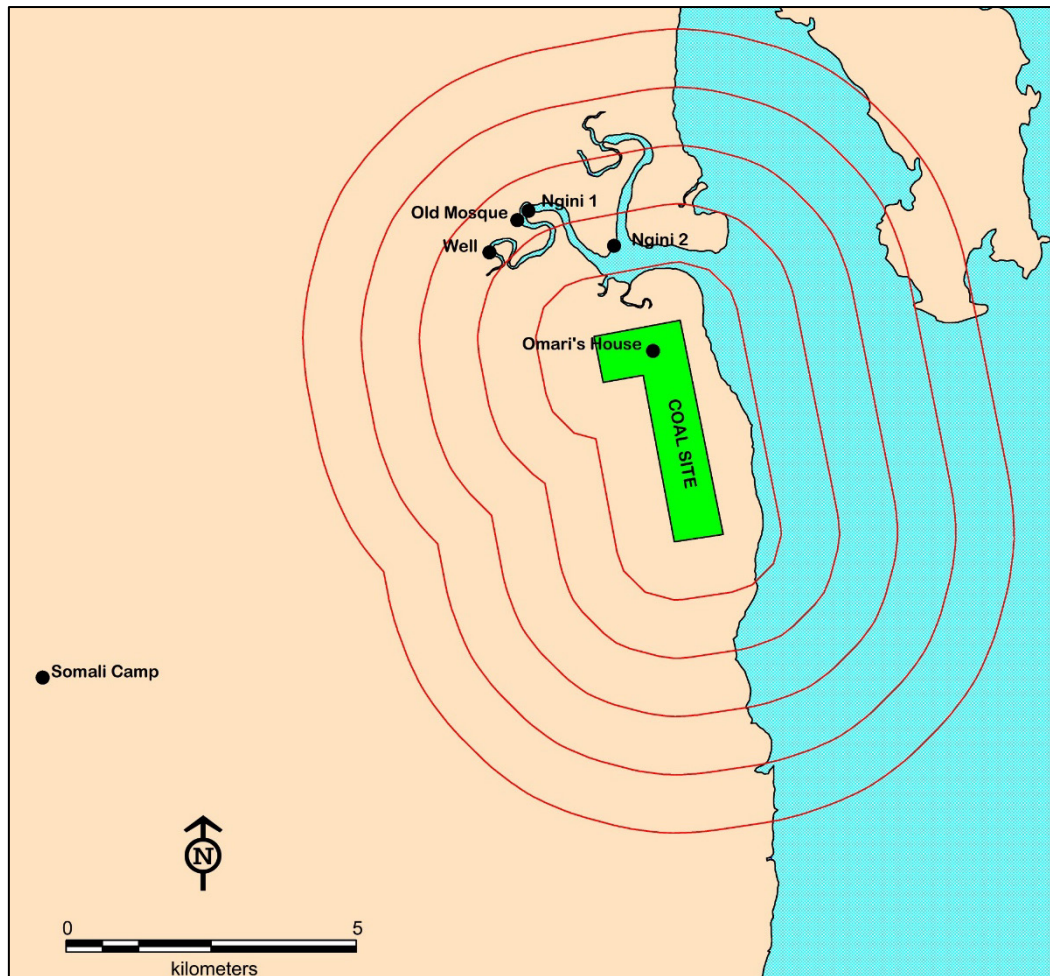
There are several ways of carrying out an archaeological survey: A pedestrian survey is carried out to physically cover all that area of interest by walking in transects or any other agreed method. However in cases where the land is too big to be covered adequately, or where some areas are impassable due to wild animals, thick forest or such other physical barrier, we rely on information from local residents to tell us where to find archaeological remains. Where remains are reported, we check that out, and in this case it's the only way to sample the entire area.

A part of Kwasasi is farmed land and there was no report of archaeological artifacts or features. Some parts of land were covered by thick mangrove which made it impossible to cover by foot, which in any case would have been covered by water. The sites that were visited are sites that were reported by locals, and were found to be rich in artifacts. As indicated in Figure 8-27, Ngini 1 and 2 have been exposed by erosion, with the deposits being as deep as 2m below the topsoil. The existence of these sites is an indication that there may be potential archaeological deposits in several areas although this is not apparent from the surface. A local resident called Omari has his house located within the project area and he reported uncovering potsherds when he built his house. This is why it was concluded that the area has high potential; if they are only artifacts they can be dug out but fixed ruins should be left in place.

In Figure 8-27, the contours are spaced 1km apart, so that gives an indication of how far the sites are from the location of the proposed coal fired plant. The Somali camp is further away because there is no suitable grazing land closer to the coast (farms, tsetse fly) and they have to move around in search of grazing lane for their cows.

It is worth noting that most ruins are usually within 2 km of the coastline while other open sites are further inland.

Figure 8-27: Map showing proximity of the identified archaeological sites and their proximity to the project area



A survey of the area showed minimal evidence of recent use of the site. The site contained a large collection of both local and imported pottery ware which had been dated elsewhere to between 7th and 16th Centuries AD (see figure 8-28 and 8-29).

Figure 8-28: Pottery scatter at Ngini site 1



Figure 8-29: Ngini pottery site 1- showing where the potsherds might be eroding from



The pottery includes archaeological Tana ware pottery which is known to occur all along the East African Coast. On the Kenyan coast, Tana ware is found along the Tana River up to Garissa area. The major Kenyan coastal sites, which have contributed Tana ware, are Shanga and Manda on the Lamu archipelago and Ungwana on the lower Tana River basin. Others include sites in the Mijikenda Kayas and Mombasa area. Besides Kenyan sites, Tana ware is found in both coastal and inland sites of Tanzania and also in Pemba, Zanzibar, Mozambique, Northern

Madagascar and Comoros islands (Chittick 1984; Horton 1984; Mutoro 1987; Abungu 1989; Chami 1994).

The morphological attributes of Tana pottery include bowls with slightly convergent rims, in-turned rims; bowls with open mouths; narrow mouthed globular vessels; large jars without-turned rims; and short necked vessels. Its decorative attributes include incised triangular designs, lines of punctate, zigzagging double incisions and oblique incisions (Chami 1994) as shown in figures 8-30 to 8-32.

Figure 8-30: Tana ware potsherds with punctuates



Figure 8-31: Crosshatched potsherds- typical of Tana ware



Figure 8-32: A jar and a bowl with carination- typical Tana ware



Besides Tana ware pottery, the imported ware includes pottery which has been identified elsewhere as glazed Islamic ware, Chinese ware, late sgraffiatos and 18th or 19th century spongeware from Holland. (Figure 8-33).

On the well site west of the development site, parts of a collapsed well were found still intact protruding from the edge of a cliff (figure 8-36). More than half of it had already collapsed. The residents claimed out that the well was inside a mosque whose remains were still visible on the sea shore after several years of erosion.

About 3 meters away from the collapsed mosque (well), pottery could be seen eroding from a nearby ashy level (figure 8-34). The composition of the pottery scatter included both local and imported wares just like from site1 and site2.

The first 6 sherds in the picture are Chinese ware probably from the 16th Century to recent times – while the bottom left is spongeware from Holland - 18th or 19th century and the two pieces next to it are Islamic glazed wares/ late sgraffiatos.

Figure 8-33: Chinese and Arabic Imported pottery



From all the three identified sites (figures 8-34, 8-35 and 8-36), the pottery seemed to be eroding from compact white soil just below a layer of black soils. At site 2 there was a foundation that the residents were digging for an underground water storage tank and pottery bearing soils could be distinguished clearly from the soil below and above it.

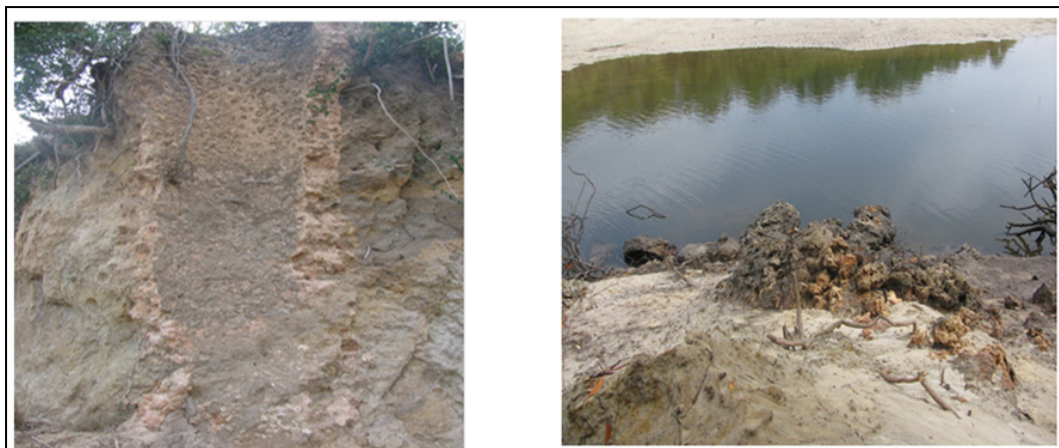
Figure 8-34: Whitish stratum where Tana ware pottery is eroding from



Figure 8-35: Pottery scatter at Ngini site 2



Figure 8-36: Remains of a collapsed well



9 Universal Outstanding Value of Lamu World Heritage Site

The following section is an extract from UNESCO website outlining the UOV of Lamu WHS and the criteria applied for its enlisting.

The growth and decline of the seaports on the East African coast and interaction between the Bantu, Arabs, Persians, Indians, and Europeans represents a significant cultural and economic phase in the history of the region which finds its most outstanding expression in Lamu Old Town, its architecture and town planning.

The town is characterized by narrow streets and magnificent stone buildings with impressive curved doors, influenced by unique fusion of Swahili, Arabic, Persian, Indian and European building styles. The buildings on the seafront with their arcades and open verandas provide a unified visual impression of the town when approaching it from the sea. While the vernacular buildings are internally decorated with painted ceilings, large niches (*madaka*), small niches (*zidaka*), and pieces of Chinese porcelain. The buildings are well preserved and carry a long history that represents the development of Swahili building technology, based on coral, lime and mangrove poles.

The architecture and urban structure of Lamu graphically demonstrate the cultural influences that have come together over 700 hundred years from Europe, Arabia, and India, utilizing traditional Swahili techniques that produced a distinct culture. The property is characterized by its unique Swahili architecture that is defined by spatial organization and narrow winding streets. This labyrinth street pattern has its origins in Arab traditions of land distribution and urban development. It is also defined by clusters of dwellings divided into a number of small wards (*mitaa*) each being a group of buildings where a number of closely related lineages live.

Attributed by eminent Swahili researchers as the cradle of Swahili civilization, Lamu became an important religious centre in East and Central Africa since the 19th century, attracting scholars of Islamic religion and Swahili culture. Today it is a major reservoir of Swahili culture whose inhabitants have managed to sustain their traditional values as depicted by a sense of social unity and cohesion.

Criterion (ii): *The architecture and urban structure of Lamu graphically demonstrate the cultural influences that have come together there over several hundred years from Europe, Arabia, and India, utilizing traditional Swahili techniques to produce a distinct culture.*

Criterion (iv): *The growth and decline of the seaports on the East African coast and interaction between the Bantu, Arabs, Persians, Indians, and Europeans represents a significant cultural and economic phase in the history of the region which finds its most outstanding expression in Lamu Old Town.*

Criterion (vi): *Its paramount trading role and its attraction for scholars and teachers gave Lamu an important religious function (such as the annual Maulidi and Lamu cultural festivals) in East and Central Africa. It continues to be a significant centre for education in Islamic and Swahili culture.*

Integrity (2010)

The property, covering 16 hectares, adequately incorporates all the tangible and intangible attributes that convey its outstanding universal value. A high percentage (65%) of the physical structures is in good condition with only 20 % being in need of minor refurbishment. The remaining 15 % may need total restoration. The majority of the town's buildings are still in use.

The town needs to maintain its relationship with the surrounding landscape. The setting of the Old Town is vulnerable to encroachment and illegal development on the Shela dunes that are a fundamental part of its setting. Development is a threat to its visual integrity as an island town closely connected to the sea and sand-dunes, and to its ultimate survival in terms of the fresh water that the dunes supply. The setting extends to the surrounding islands, all of which need to be protected from informal settlements, and to the mangroves that shelter the port.

Authenticity (2010)

The architecture of Lamu has employed locally available materials and techniques which are still applied to date. The people of Lamu have managed to maintain age-old traditions reinforcing a sense of belonging and social unity. This is expressed by the layout of the town which includes social spaces such as porches (*Daka*), town squares and sea front *barazas*. The town continues to be a significant centre for education in Islamic and Swahili culture.

The authenticity of the Old Town is vulnerable to development and to a lack of adequate infrastructure that could overwhelm the sensitive and comparatively fragile buildings and urban spaces that together make up the distinctive urban grain of the town.

Lamu Old Town is managed by the National Museums and Heritage Act 2006 (that replaced the 1983 National Museums Act CAP 216 and Antiquities and Monuments Act CAP 215) and the Local Governments Act (and the associated by laws). Physical construction is also subjected to the EMCA Act and the 2006 Planning Act, which recognize that archaeology is material for consideration. The Old Town has a gazetted buffer zone that includes the Manda and Ras Kitau mangrove skyline and the Shela sand dunes, also protected by the Forest Act and Water Act respectively (although the buffer zone has not been formally approved by the World Heritage Committee). All the components are legally protected.

Impact of development on OUV of Lamu WHS has been addressed in several reports including UNESCO HIA 2014 report, NEMA LAPSSSET report 2011 and other studies.

9.1 Potential impacts of developments on OUV

During the construction and operational phases of the LAPSSET projects including utilities, the population in Lamu may change in both numbers and character. The LAPSSET feasibility study undertaken by the Japanese Port Consultants in 2011 predicted that the population of Lamu would increase by over 1.25 million people over the period of the construction of the Lamu port. This will be about 12 times the current population of Lamu County. There may be a temporary increase in the working and living population resulting from the construction of the proposed Lamu coal power project.

The said population will be drawn from other parts of the country and world to offer skilled and unskilled labour for the proposed development. Besides the predictable number that will be working directly for the proposed coal power project, there may be an influx of people who will be attracted by new business opportunities due to the needs of the workforce.

The increased population will require among other facilities; housing, infrastructure and other amenities.

Construction of new houses in Lamu town would contribute to changes in the UOV of Lamu WHS in the following ways among others:

- By creating demand on the land through increased density of housing units;
- By using modern construction materials that are different from the traditional building materials;
- By altering the cultural landscape as a result of constructing high rise building(s).

People may opt to knock down the existing traditional buildings in order to respond to the new housing demands.

The increased population and development may put pressure on the existing infrastructure due to:

- Expansion of the existing roads on the main land;
- Creation of new roads on the main land;
- Increased traffic in both the old town and the mainland
- Pressure on the existing schools and hospitals;

The Authenticity of the intangible Cultural Heritage of the UOV of Lamu WHS may be affected due to population density and influx.

The cultural practices that have been preserved for centuries due to the closely knit population of Lamu may get diluted because of mass introduction of new cultures from the incoming people. The language, dress, religion, food, music, etc. of the indigenous communities may change as they may borrow from other communities hence slowly losing their traditional character.

With the new developments and populations associated with LAPSSET projects including the proposed coal power plant, the traditional livelihoods of the Lamu people will change. Pressure will be put on fishing grounds, mangrove cutting may increase with the new demands of housing and furniture hence depleting the mangrove reserves.

Increased population due to several projects will bring competition to the traditional livelihoods especially to the boat operators. For example, there is likely to be more motor boats which may eventually replace the dhows which are synonymous with Lamu Island.

The development will draw the youth to work as skilled and unskilled labour, which may not provide time for cultural practices like involvement in Maulidi and Lamu cultural festival activities which include donkey riding competitions, traditional dances, dhow competitions, etc. This could eventually lead to low activities during these festivals. Change of population character may also have influence on the traditional activities which take place during the festivals.

One of Lamu's UOV, is its position as a centre for Kiswahili language. This draws people from all over the world to come and learn the language from the owners. Change of population character and integration of other languages into the Swahili language may cause language dilution and development of 'sheng' (Nairobi version of Kiswahili which is a mixture of Kiswahili and other local and international languages).

High population density and better incomes may cause development of immoral behaviour hence increasing the prevalence of HIV and AIDS.

The increasing population will socially and culturally impact on the indigenous peoples of Lamu. Further, the developments and the accompanying land tenure subdivision may alter pastoralist, hunter gatherer and fishing community lifestyles without equipping the communities with skills to manage the change.

9.1.1 Assessment of Impacts associated with WHS OUV

Table 9-1: Impact significance for increased population density and pressure on the infrastructure at the World Heritage Site-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Short	Low	Highly probable
	2	2	4	4
Result: Medium negative (-32)				
Mitigation measures	Comments/Mitigation: <ul style="list-style-type: none"> Amu Power should support activities in Lamu County that promote cultural heritage such as the Maulidi festival, Lamu Cultural Festival, etc. 			

	<ul style="list-style-type: none"> • Amu Power should fund NMK led archaeological expeditions on Pate Island where potential archaeological and cultural heritage sites exist • Amu Power should sponsor competitions in calligraphy and exhibitions organized by the NMK and civil society groups 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Minor	Improbable
	2	2	2	2
Result: Low negative (-12)				

Table 9-2: Impact significance for changes in population character at the UNESCO world heritage site-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Short	Low	Probable
	2	2	4	3
Result: Low negative (-24)				
Mitigation measures	<p>Comments/Mitigation:</p> <ul style="list-style-type: none"> • Amu Power should build a flexible program that allows time for its workers to participate in the cultural festivals • Amu Power should allow time for Muslim faithful to attend prayers and other religious activities as required by Islamic faith in order to maintain the religious component of the UOV • Amu Power should encourage preparation and serving of local traditional dishes within its restaurants • Amu Power should have an induction program that introduces its workers to the traditional cultures of Lamu and where necessary promote the Swahili learning institutions within the Island • Amu power should impose a dress code to its workers (outside the PPE) and people doing businesses around the coal plant to maintain the cultural values and, which is not offensive to Lamu residents 			
Mitigation Status	Extent	Duration	Magnitude	Probability
	Study area	Short	Minor	Improbable

ESIA Study for 1,050MW Coal Fired Power Plant, Lamu County, Kenya
Cultural Heritage Impact Assessment (CHIA)



With mitigation	2	2	2	2
	Result: Low negative (-12)			

10 Assessment of heritage impacts

This section presents the significance of the heritage impacts identified for the proposed Lamu coal fired power plant. The assessment of heritage impacts has been undertaken using the methodology described in section 7 of this report. Therefore, both the potential impacts and the suggested mitigations are inclusive of the sentiments of the Lamu community.

The potential cultural heritage impacts which are assessed in this section include:

- a) Impacts on movable archaeological finds;
- b) Impacts on immovable archaeological and cultural heritage features;
- c) Impacts on graves/shrines;
- d) Cultural Landscape and Sense of Place impacts;
- e) Loss of grazing and browsing land;
- f) Loss of income from selling charcoal;
- g) Loss of building materials for homes;
- h) Impact on boat operators
- i) Impacts on mangrove cutters
- j) Impact on Hunter-gatherers
- k) Impact on pastoralists

10.1 Archaeological moveable and immovable finds

Cautionary

All archaeological material is protected under the National Museums and Heritage Act, 2006 and it is an offense to destroy such material. If archaeological or paleontological material (including graves/shrines) is uncovered at any point in time within the project area, all work must cease in that area while the relevant heritage authority (NMK) is notified. Rescue mitigation may be required at the cost of Amu Power. Human graves can occur anywhere on the landscape. It is best that these are not disturbed. In the event of an accidental disturbance, the find site must be left undisturbed and an archaeologist contacted immediately. The archaeologist will invoke the necessary procedure for exhumation if needed.

Although no artefacts or features were found on the surface during the field survey, the probability of finding them buried in the ground during the construction phase is possible. This conclusion is based on the fact that several archaeological sites are found around the proposed development area, some of which the team visited. There are also reports of archaeological objects being exposed when local residents in the Kwasasi area dig foundations to construct new houses, and it is expected

that such remains may be unearthed during excavation exercises. It is known that there are archaeological ruins all along this part of the Kenya coastline, though some of them have not been discovered/recorded because they are completely buried. A case in point is where the new LAPSET Ports Authority building now stands; it was reported that when the road was being constructed the crew unearthed ruins that were completely destroyed (Mwenje Mohammed, personal communication) because a heritage impact assessment was not done.

Due to the probability that archaeological objects might exist underground, it is recommended that a watching brief be set up to mitigate the damage. An archaeological watching brief is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. Its aim is to record archaeological remains (where present) during ground works within a specified area whose presence and nature could not be established in advance of development or other potentially disruptive works. A watching brief is therefore maintained whenever there is a possibility that archaeological deposits may be disturbed or destroyed. An archaeologist is employed by the developer to monitor the excavation of foundation, service trenches and any other intrusive works. The developer undertakes to give the archaeologist sufficient time to identify and record any archaeological finds and features that are unearthed in the process. This ensures that any objects buried in the soil are not destroyed.

If something is discovered in the course of excavation, the exercise must be stopped and the archaeologist on duty given time to examine the object and determine the course of action to be taken. This may include a rescue operation to remove the objects in question or a complete change of construction plans if the object cannot be moved. Only when the archaeologist on duty has given clearance should the construction continue.

In the case of isolated burials and other movable objects, it is recommended that a Chance Finds Procedure be used to report and record their occurrence. Any questionable objects should be shown to the archaeologist to determine their value and the next course of action.

10.1.1 Impacts on moveable archaeological finds

Table 10-1: Impact significance for destruction of archaeological movable materials-construction phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Very high	Probable
	2	5	10	3
Result: Medium-negative (-51)				
Mitigation measures	Comments/Mitigation:			
	<ul style="list-style-type: none"> Amu Power should develop and implement a chance finds procedure which must be complied with by all contractors engaged at the coal power plant site; 			

	<ul style="list-style-type: none"> • Amu Power must incorporate a chance finds procedure into their contract documents with their EPC contractor; • In the event of archaeological materials appearing during any construction related activities, work should stop immediately and a qualified NMK scientist engaged to advise on the way forward; • Due to the sensitivity of this region, Amu Power should engage an archaeologist and cultural heritage experts to offer watching brief throughout the construction phase. 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Permanent	Minor	Improbable
	2	5	2	2
	Result: Low negative (-18)			

10.1.2 Impacts on immoveable archaeological finds

Table 10-2: Impact significance for destruction of archaeological built in heritage-construction phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Very high	Definite
	2	5	10	3
	Result: Medium negative (-51)			
Mitigation measures	<p>Comments/Mitigation:</p> <ul style="list-style-type: none"> • A watching brief must be put in place to cover all excavation activities. An archaeologist should be present at all times since the probability of finding buried ruins is high. • Amu Power should develop and implement a chance finds procedure which must be complied with by all their contractors; • Amu Power's must incorporate the chance finds procedure into their contract documents with their nominated contractors who will undertake construction works in Kwasasi; • In the event of archaeological materials appearing during any construction related activities, work should stop immediately and a qualified NMK scientist engaged to advise on the way forward; 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Permanent	Low	Improbable
	2	5	4	2

	Result: Low negative (-22)
--	-----------------------------------

10.2 Cultural Heritage

The cultural heritage assessment identified both tangible and intangible cultural heritage which would be affected by the proposed project either directly or indirectly. While the tangible included physical materials, the intangible included the traditional knowledge which is passed through generations to enable cultural lifestyles and livelihoods. Therefore, all aspects of economy with a traditional base as well as indigenous plants for foods and medicines which depend on traditional knowledge were identified. The identified trees and plants as discussed in the previous sections are culturally protected due to their perceived value.

Various forms of livelihoods and cultural practices within Kwasasi and its environs which have been going on over the centuries were identified. The project area Kwasasi and its environs, is inhabited by farmers, pastoral and hunting and gathering communities. The activities of the latter, have now been curtailed by the government efforts to conserve wildlife. However, they still hunt small animals and collect wild plants for a living. The people who will be adversely affected by the project are the farmers as a result of loss of their farming lands. Several families live within the project area and they will have to be moved if the project is to take place as planned.

Transfer of traditional knowledge, which include indigenous knowledge on plants for foods and medicines, creative knowledge for boat building, fishing/fishing equipment, construction of houses and other skills to young people continues through the age-old practice of apprenticeship. Lamu youth learn traditional crafts, become masters themselves and ensure not only the survival of the heritage but also its appreciation and sustainability. It is this very heritage that the outside conceived and introduced development could be threat to.

10.2.1 Impacts on graves and shrines

Graves and shrines though not identified within the project area, as discussed in the archaeology section, there is a likelihood of coming across these because the area has been continuously occupied for more than a millennium now. As such, both recent and early graves might surface during the construction phase. Presence of *mwongo* tree will be a good indicator of a recent grave since all the communities living here identified this tree as symbolic for graves.

Table 10-3: Impact significance for destruction of graves/shrines-construction phase

Mitigation Status	Extent	Duration	Magnitude	Probability
	Study area	Permanent	Very high	Improbable

Without mitigation	2	5	10	2
Result: Medium negative (-34)				
Mitigation measures	<p>Comments/Mitigation:</p> <ul style="list-style-type: none"> • Amu Power and its contractors should undertake construction works carefully especially around the areas with <i>mwongo</i> trees for any visible signs of human bones. • Where bones appear in the course of any construction works on site, work should stop and a qualified scientist from the NMK should be engaged to identify and advise the contractor on the way forward • In the event of such an occurrence, the service contractor must engage the Kwasasi Elders to undertake the necessary rituals to relocate the human bones and accord a proper burial at a new location. 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Permanent	Low	Highly improbable
	2	5	4	1
Result: Low negative (-11)				

10.2.2 Impacts on cultural landscape

Currently, the Kwasasi area and its environs maintain an undisturbed cultural landscape where the houses are built from the local materials and there is a sense of uniformity in the style of construction. Plants, grass, bushes and food crops give the area a sense of place due to its cultural and natural feel. Construction of storied buildings, use of foreign building materials, and emergence of an urban center as a result of the proposed project will alter this landscape.

Table 10-4: Impact significance for loss of cultural landscape and sense of place-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	High	Probable
	2	5	8	3
Result: Medium negative (-45)				
Mitigation measures	Comments/Mitigation:			

	<ul style="list-style-type: none"> • Amu power and its service contractors should limit height and density of the planned buildings to harmonize the visual impact on cultural landscape • Amu power and its service contractors should ensure that buildings are designed in such a way that the architecture resembles Swahili houses and painted a similar colour in order to blend in with the surroundings • Amu Power and its service contractors should build vegetation buffer zones, including planting of trees within and in-between various service contractors work areas • Amu Power and its service contractors should only cut down vegetation and trees where their respective footprints are planned 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Low	Improbable
	2	5	4	2
Result: Low negative (-22)				

10.2.3 Loss of grazing land

Effects on pastoralist and the hunter-gatherer communities will not be as direct and advance as for the farmers, since they are neighbours to the proposed project area, but the continued encroachment limits their movements and occasional source of animal feed, wild plants and animals. Both national and international laws protect the rights of these people and therefore, forceful removal or destruction of the grazing lands or valuable cultural plants will not only be a crime against humanity but it is also prosecutable by law.

Table 10-5: Impact significance for loss of grazing land-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Low	Definite
	2	5	4	5
Result: Medium negative (-55)				
Mitigation measures	Comments/Mitigation:			
	<ul style="list-style-type: none"> • Amu Power should work within their footprint areas and avoid removal of excessive vegetation. 			

	<ul style="list-style-type: none"> As part of their CSR program, Amu Power should consider providing a buffer zone with grass for livestock 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	permanent	Minor	Improbable
	2	5	2	2
	Result: Low negative (-18)			

10.2.4 Loss of revenue from charcoal sales

Table 10-6: Impact significance for loss of revenue from charcoal sales- construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Short	Low	Probable
	2	2	4	3
	Result: Medium (-33)			
Mitigation measures	<p>Comments/Mitigation:</p> <ul style="list-style-type: none"> Wherever trees are to be cut down within the project area, Amu Power and its service contractors should plant indigenous trees outside the project area as an offset to prevent the effects of revenue loss through selling charcoal Amu Power should accelerate the development of the vocational training center for provision of skills to the Lamu and Kwasasi community to enable them generate alternative incomes from employment instead of selling charcoal 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Minor	Improbable
	2	2	2	2
	Result: Low negative (-12)			

10.2.5 Loss of building materials

All the dwelling places in Kwasasi are built from the local materials. The roofs are made of thatch, sticks and wood which are available from the project area and its environs. During the construction phase, these materials will be lost since they will need to be cleared to clear the way for the project operations and installations. Thus, the local community here will have to either find them elsewhere or change their style of building. Change of style will adversely tamper with the cultural heritage of the area

Table 10-7: Impact significance for loss of building materials-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Low	Probable
	2	5	4	3
Result: Medium negative (-33)				
Mitigation measures	Comments/Mitigation:			
	<ul style="list-style-type: none"> Amu Power and its service contractors should develop and implement a biodiversity offset program by planting indigenous trees outside of the project area; 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Permanent	Minor	Improbable
	2	5	2	2
Result: Low negative (-18)				

10.2.6 Loss of plants of cultural value

More than 20 trees were identified as significant for either medicinal, food, or other cultural values such as markers of graves and shrines. The people of Lamu have retained many of their traditional activities within a changing environment. These traditional activities are not only traditional ways of livelihoods and lifestyles but they also form an important part of their identity. The master craftsmen such as the boat builders, masons, jewellers and woodcarvers, leather workers, fishermen all play dignified roles as custodians of heritage. While most craftsmen are working in Lamu town and other neighbouring towns like Hindi, the raw materials (trees) which are suitable for different forms of crafts are sourced from Kwasasi and its environs.

Table 10-8: Impact significance for loss of medicinal and wild foods plants- construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Low	Probable
	2	5	4	3
Result: Medium negative (-33)				
Mitigation measures	Comments/Mitigation: <ul style="list-style-type: none"> Wherever medicinal trees and wild fruit plants are to be cut down within the project area, Amu Power and its service contractors should offset such trees and plants outside the project area. Amu Power should accelerate the development of the vocational training center for provision of skills to the Lamu and Kwasasi community to enable them generate alternative incomes which will enable them to seek conventional medical attention and to provide them with food security. Amu power should expand and support the existing health facilities and strive to empower the residents to visit for medical solutions 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Minor	Improbable
	2	2	2	1
Result: Low negative (-6)				

10.2.7 Loss of mangroves

The people from kwasasi and Lamu island in general use mangroves for various purposes as discussed in the previous section. Among these is building of houses, furniture and boats besides them creating a very good environment for particular fishes. Use of the mangrove is based on traditional knowledge and forms a major part of the Lamu's cultural heritage. Kwasasi area, is a home to mangroves, some of which will need to be cleared before and during the construction phase. Clearing of these will not only mean loss of heritage but also loss of traditional economy.

Table 10-9: Impact significance for loss of mangroves-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Permanent	Low	Definite
	2	5	4	5
Result: Medium negative (-55)				
Mitigation measures	Comments/Mitigation: <ul style="list-style-type: none"> Amu Power should compensate for the cleared mangroves by replanting them in alternative places Amu power should plant mangroves in areas which have been over harvested and areas which have experienced loss due to el nino 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Minor	Highly Improbable
	2	2	2	1
Result: Low (-6)				

10.2.8 Loss of land

Land in Kenya is mostly acquired through inheritance. Some of the people living in the project area have inherited family lands and they have no other lands to make a livelihood from. For the proposed project to take place, several families currently living in Kwasasi will need to be moved in order to pave way. Both National and international laws protect both private and communal lands thus making it a crime for anyone to make forceful eviction or to move people permanently from their lands without prior agreements and clear compensation procedures.

Table 10-10: Impact significance for involuntary resettlement-construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Long term	Moderate	Definite
	2	4	6	5
Result: High negative (-60)				

Mitigation measures	Comments/Mitigation: <ul style="list-style-type: none"> The Ministry of Energy and Petroleum (MoEP) should undertake a resettlement action plan (RAP) in accordance with the AfDB Operational Safeguard 2 and IFC Performance Standard 5. The MoEP should monitor the implementation of the RAP throughout the lifetime of the project 			
Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Long-term	Minor	Improbable
	2	4	2	2
Result: Low negative (-16)				

10.2.9 Impacts on boat operators

Boat operation is an inherited activity in Lamu. The knowledge of building boats as well as operating them is passed through kinship. Therefore, as much as the activity plays an important role as a traditional source of income, it also forms an important part of the identity for Lamu people. This activity will be lost if the traditional boating building materials are lost and also if foreign boats and boat operators are introduced in Lamu as a result of the proposed project.

Table 10-11: Impact significance for boat operators’ loss of livelihood- construction and operational phase

Mitigation Status	Extent	Duration	Magnitude	Probability
Without mitigation	Study area	Medium term	Moderate	Probable
	2	3	6	3
Result: Medium negative (-33)				
Mitigation measures	Comments/Mitigation: <ul style="list-style-type: none"> Amu Power should work with the beach management units (BMUs) on the needs of boat operators for employment and business opportunities Amu Power should provide employment and business opportunities to the local boat owners by offering boating jobs during the construction and operational phase. Amu Power should offer bursary to the already trained 20 rescuers (boat operator) to improve on their rescue skills with the increased number of boats and probable accidents 			

Mitigation Status	Extent	Duration	Magnitude	Probability
With mitigation	Study area	Short	Minor	Improbable
	2	2	2	2
	Result: Low negative (-12)			

11 Conclusions and Recommendations

Some of the issues highlighted in this report have been discussed elsewhere especially in the LAPSET report prepared by UNESCO, as well as the NEMA LAPSET report. This report took into consideration the findings by these reports, although the concerns which have been discussed in depth directly affect the Coal power plant blue print area.

The benefits associated with the Coal Power Plant are enormous and should positively affect the lives of Lamu people so that they can voluntarily transit from some of the less sustainable traditional sources of their livelihoods to new livelihoods accorded by this project; these would include, mangrove harvesting, offshore fishing and illegal hunting among others. The opportunities suggested in this report such as vocational training as should equip Lamu youth with skills that will not only be useful during the life time of the coal power plant project but even after so that they can use their competencies elsewhere in the country and beyond.

In general, this report acknowledges the likelihood of interference with OUV of Lamu World Heritage, but the effects are not envisaged to be direct since the project blueprint area is far from the Heritage site boundaries. It is however these indirect impacts that may occur from Amu Power project have been sufficiently addressed to reduce them to minimum or zero.

As it is evident from the current developments going on in Lamu town, several buildings and streets have changed from their cultural outlook to contemporary landscapes where buildings are no longer made with lime, mangrove and thatch but are made with stone, cement, concrete and aluminium roofing. This clearly suggests that although Lamu is a World Heritage site which is protected by 1972 UNESCO convention, change is inevitable with or without outside interference. This report therefore suggests that the authorities charged with the protection of Lamu World Heritage Site work closely with Amu Power to make sure that the suggested mitigation measures are implemented to avoid further erosion of the Lamu culture. They should also take stock of the rapid changes that are taking place and institute conservation measures in order to halt the ongoing destructions.

Also, Amu Power CSR program should include working with the county which is in the process of creating a conducive and enabling environment for socio-economic development by embracing modern livestock husbandry and creating livestock infrastructure such as auction yard, crushes, dips and disease free zone to support the livestock sub-sector.

In general, most of the residents and stakeholders that the team talked to did not seem to be opposed to the installation of the Coal power plant. They recognize the benefits that it could bring to the Lamu residents although they are apprehensive of all the side effects that could come with this development.

It is therefore recommended that Amu Power keeps in mind the needs of the residents and implements the provided mitigation measures so as to improve the lives of the Lamu people while helping to maintain their cultures through reducing the effects of cultural erosion and dilution.

12 Bibliography

Abungu G and Abungu L. D. Coulson, N. Pavitt, A. Fisher and C. Beckwith. 2009. *Lamu*.

Abungu, G.H.O (1989) *Communities on the River Tana, Kenya: An Archaeological Study of Relations between the Delta and River Basin 700-1800 AD*, Cambridge, University of Cambridge, PhD.

Adam, H.A. (2012) Recognizing Sacred natural sites and territories in Kenya. Institute of Culture and Ecology, Kenya

Allen, J. D. V. (1993) *Swahili Origins*. Nairobi, East African Educational Publishers.

Berg, F.J. (1968) The Swahili community of Mombasa, 1500-1900, *Journal of African History*, 9: 35-56.

Caplan, Pat. (1997). African Voices, African Lives: Personal Narratives from a Swahili Village. London & New York: Routledge.

Chami, F. A. (2001) Narosura pottery from the southern coast of Tanzania: first incontrovertible coastal Later Stone Age pottery, *Nyame Akuma*, 56:29-35.

Chami, F. A. (2006a) The Archaeology of pre-Islamic Kilwa Kisiwani (Island), *Studies in the African past*, 5: 119-150

Chami, F.A. (1994) *The Tanzanian Coast in the first Millennium AD*. Uppsala, Societas Archaeologica Upsaliensis

Chittick, N. (1965) Shirazi colonization of East Africa, *Journal of African History*, VI (3): 275-294.

Chittick, N. (1968) The Coast before the arrival of the Portuguese. In Ogot, B.A and Kieran, J.A. (eds.), *Zamani a Survey of East African History*, Nairobi, Longman Kenya Ltd. 100

Eastman, Carol. 1971. Who are the Waswahili? *Africa* 41, 3: 228-236.

Fedders, A. and Salvadori, C. (1988) *Peoples and Cultures of Kenya*. Nairobi, Transafrica Rex Collings in association with KTDC

Gearhart, R. "4 days for the prophet: Kenya's Maulidi Festival celebrates the birth of Muhammad." *World and I* Sept. 1998: 218+. *Academic OneFile*. Web. 10 Mar. 2015.

Horton, M, and Middleton, J. 2000. *The Swahili: The Social Landscape of a Mercantile*

Horton, M. (1996a). Shanga: *The archaeology of a Muslim Trading Community on the Coast of East Africa*. London, The British Institute in Eastern Africa.

Horton, M.C. and Middleton, J. (2000) *The Swahili: the Social Landscape of a Mercantile Society*, Oxford, Blackwell Publisher Ltd.

Kabukuru, W. (2012) Lamu - back to the future: Lamu, on Kenya's northern coastline, is now a tourist idyll and a UNESCO world heritage site, but five centuries ago, it was a crucial international commercial hub before it gradually lost its status. All this could be about to change as the island shakes off the dust of history and prepares to resume its old role once again. *African Business*. 383: p72

Kenya's Enchanted Island. Rizzoli International Publication, New York

Kusimba, C.M. (1999) *The Rise and Fall of Swahili States*. Walnut Creek, Altamira.

Le Guennec-Coppens, Françoise & Pat Caplan (eds.). 1991. *Les Swahili Entre Afrique et Arabie*. Paris: Karthala

Mazrui, Alamin M. & Ibrahim Noor Shariff. 1994. *The Swahili: Idiom and Identity of an African People*. Trenton New Jersey: Africa World Press.

M'Mbogori, F.N. (2015) Population and Ceramic Traditions: Revisiting the Tanaware of Coastal Kenya (7th-14th Century AD). *Cambridge Monographs in African Archaeology* 89, Bar International Series 2717

Pouwels, R. L. (1984) Eastern Africa and the Indian Ocean to 1800: Reviewing Relations in Historical Perspective, *International Journal of African Historical Studies*, 35(2/3): 385-425.

Pouwels, R. L. (2002) Eastern Africa and the Indian Ocean to 1800: reviewing relations in historical perspective. *International Journal of African Historical Studies*, 35(2/3): 385-425.

Pouwels, R.L. (2001) A reply to Spear on early Swahili history, *The International Journal of African History*, 34(3): 639-646.

Rodden, V. (2014) "Analyzing the Dynamics of the Artisan Fishing Industry and LAPSSET Port in Lamu, Kenya" Independent Study Project (ISP) Collection. Paper 1765.

Salim, A.I. (1974) Native or non-native? The problem of identity and the social stratification of the Arab-Swahili of Kenya. In Ogot, B.A. (ed.), *History and Social Change in East Africa, Hadith 6*, Proceedings of the 1974 conference of the historical association of Kenya, 65-85.

Spear, T. (1977) Traditional myths and linguistic analysis: Singwaya revisited, *History in Africa* 4: 229-246.

Stiles, D. (1981) Hunters of the Northern East African Coast: origins and historical processes, Africa, *Journal of the International African Institute*, 51(4) 848-462.

Wright, Kristina Dziedzic. "Cleverest of the clever: coconut craftsmen in Lamu, Kenya." *The Journal of Modern Craft* 1.3 (2008): 323+. *Academic OneFile*. Web. 10 Mar. 2015.

Other related reports

NEMA: Environmental Impact Assessment Project Report for Proposed Construction of the First Three Berths at the New Lamu Port and Associated Infrastructure by Hezekiah Adala (Reg. No 0094)

Abungu, G. (2014) Heritage Impact Assessment

for the proposed Lamu Port–South Sudan–Ethiopia Transport (LAPSSET) corridor and the new Lamu Port and Metropolis Development Project, as well as related development in the Lamu Archipelago, Kenya

<http://www.lamu.go.ke/ministries/ministry-of-fisheries-livestock>

World Heritage Advice Note: Environmental Assessment Operational Guidelines for the Implementation of the World Heritage Convention

United Nations Educational, Scientific and Cultural Organisation

Guidance on Heritage Impact Assessments for Cultural World Heritage Properties

A publication of the International Council on Monuments and Sites

January 2011 ICOMOS, 49-51 rue de la Fédération 75015 Paris, France

In collaboration with the World Heritage Centre

National Museums of Kenya. 2001. *Nomination Dossier: Lamu Old town application for*

NEMA, 2012. *National Guidelines for Strategic Environmental Assessment*. Nairobi: NEMA. *nomination to world heritage list*.
<http://whc.unesco.org/en/list/1055/documents/>

Kanyinke Sena Lamu Port-South Sudan-Ethiopia Transport Corridor (Lapsset)

And Indigenous Peoples In Kenya

Kegora, B. Et Al (2014) Environmental Impact Assessment Study Report For The Proposed Installation Of A 2t Liquefied Petroleum Gas Storage Tank And Filling Point On L.R. No. 209/7139, Off Likoni Road In Industrial Area, Nairobi

Abubakar Al-Amudy Chairman, Save Lamu (2013)

Environmental Impact Assessment Study Report for Construction of the First Three Berths of the Proposed Lamu Port and Associated Infrastructure

Website: www.savelamu.org

Performance Standards on Environmental and Social Sustainability January 1, 2012

Overview of Performance Standards on Environmental and Social Sustainability

Samoilys, M. et al (2013) Situation analysis for Mangroves for the Future:
Understanding the resilience of coastal systems

http://www.unep.org/NairobiConvention/docs/Situation_analysis_MFF_CORDIO

Society. Oxford: Blackwell Publishers.