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Annex I: Terms of Reference

A: BACKGROUND

The national electricity demand is projected to increase significantly in the near future as Kenya gears towards a middle-income economy. Kenya's development blueprint, The Vision 2030, has identified energy as a key driver for sustainable growth. The energy sector is expected to provide adequate, affordable and reliable supply of energy to meet the development needs of the country.

Kenya's Least Cost Power Development Plan projects a peak power demand of over 22,900MW in 2031 as a result of the rapidly increasing use of electricity for industrial, commercial and household use. This has called for the need to enhance and diversify national power generation and supply by identifying new generation and supply sources with a resultant challenge to produce energy that is affordable, reliable clean and sustainable. Nuclear energy provides such an option as it is most viable for base load operation, is efficient and most importantly, reliable. It is projected that as at 2031, nuclear energy shall be contributing a total of 4,000MW into the national grid.

Kenya Nuclear Electricity Board (KNEB) is established under the Kenya Nuclear Electricity Board Order 2012 pursuant to the provisions of the State Corporations Act, Cap 446 of the Laws of Kenya. KNEB's primary function is to promote and expedite the development of nuclear electricity in Kenya.

In order to comply with Environmental (Impact Assessment and Audit) Regulations of 2003, KNEB is subjecting the nuclear power programme to Strategic Environmental Assessment (SEA). The SEA will be conducted to present strategic recommendations for the nuclear power programme that are key in this initial decision making and planning stage in order to ensure people and environment are protected. The SEA will assist Kenya systematically and comprehensively address the unique environmental issues of nuclear power plant operation. This SEA will be based on the Strategic Plan for a Nuclear Power Programme in Kenya and any other relevant information available.

B: PROBLEM BACKGROUND

Nuclear power is seen as the technology of choice for satisfying future electricity demand since it ensures safe and reliable electricity production at a reasonable and competitive price, while providing independence from fossil fuel and associated price fluctuations. Uranium fuel represents relatively small fraction of the total cost of nuclear plants' electricity production. As a result, electricity production costs from nuclear plants are not as volatile compared to fossil-fuel based plants. Electricity generation from nuclear produces almost zero emissions. Meeting the increasing demand for electricity in the coming decades will require a mix of energy resources which emit low levels of CO2 or none at all, including nuclear power in an increasingly predominant role.

However nuclear power has unique characteristics that affect the environment such as accidental radiological releases; radioactive waste and spent fuel management; thermal and chemical releases of a higher level; complexity in the amount of land and time required for construction, the distance of cooling water intake, requirements for heavy haul roads, the international interest and quality assurance requirements; and decommissioning. These issues should be analyzed comprehensively in the context of Kenya's environment.

The International Atomic Energy Agency (IAEA) Safety Fundamentals, Principle 7 on protection of present and future generations states that *'People and the environment, present and future, must be protected against radiation risks*. This principle is in consideration that radiation risks may transcend national borders and may persist for long periods of time. Therefore, the possible consequences of current actions have to be taken into account and subsequent generations have to be adequately protected without any need for them to take

significant protective actions. By conducting the SEA this principle will be applied in this initial stage of nuclear power programme planning.

C: OBJECTIVES

The main objective of this consultancy will be to conduct strategic environmental assessment of Kenya's Nuclear Power Programme in order to determine the environmental impacts of this plan and the mitigation of these impacts. Other objectives are as follows:

1. To ensure sustainable use of natural resources in the implementation of the nuclear power programme.
2. To devise mechanisms to ensure enhanced protection and conservation of biodiversity, natural environment and built environment in the activities of the programme.
3. To ensure integration of socio-economic and environmental factors in the nuclear power programme.
4. To ensure public/stakeholder participation in the decision-making process for Kenya's nuclear power programme.

D: SCOPE OF SERVICES

The broad scope of the work is to carry out SEA for Kenya's Nuclear Power Programme. Specifically, the consultant will undertake the following activities through consultation and workshops with interested parties. All Reports will be submitted to NEMA.

1. Identify key economic, social and ecological issues regarding Kenya's Nuclear Power Programme.
2. Draft list of key environmental issues associated with Kenya's Nuclear Power Programme.
3. Assess the likely impact on the ecological systems resulting from constructing and operating a nuclear power plant.

Task 1: Prepare the Scoping Report

The specific tasks of the SEA Team would be to:

a. Define the level/tier at which the SEA will take place;
b. Define the boundaries of any required further assessment in terms of time, space, and subject matter;
c. Identify which sector(s) (& which other PPPs) to cover;
d. Further Identify PPP objectives;
e. Identify the possible effects of the PPP on the environment;
f. Identify the possible effects on people and property due to environmental changes;
g. Identify important issues/problems that will need to be studied in detail;
h. Screen out issues that are less important at this stage (and justify the scoping methodology and why some impacts are excluded)
i. Carry out stakeholder engagement - Inform potentially affected stakeholders about the PPP; Organize, focus, & communicate the potential impacts and concerns; Understand the values held by stakeholders about the quality of the environment that might be affected by the PPP; Evaluate concerns & determine how/whether to pursue them further; Determine who should be involved in the SEA (including agencies that have various decision-making mandates within the PPP's and the SEA study's

spatial boundaries); Determine consultation procedures and finalize the stakeholder engagement plan;

j. Analyze the policy and legal framework;

k. Identify SEA objectives with suitable indicators and criteria for the assessment;

l. Identify analytical methods & data needs;

m. Identify reasonable alternatives;

n. Provide the monitoring and evaluation plan and the methodology to be used.

Task 2: Submit the Scoping Report to NEMA

The SEA team will submit three (3) copies of the scoping report to NEMA and follow up the review process.

Task 3: Carry out detailed SEA study

Upon approval of the ToR, the SEA team will be required to undertake a detailed SEA study for the Nuclear Power Programme. This shall include the following:

I. Baseline data collection

The SEA team will collect additional baseline data which should reflect the objectives and indicators identified in the scoping report and it should cover the:

a. *Physical environment*, including PPP-relevant aspects of: climate, air quality, water resources and water quality, noise, topography, soils, geology, hydrology, and risks of natural disasters.

b. *Biological environment*, including PPP-relevant aspects of: biodiversity, ecology and nature conservation (including endangered species, protected ecosystems, habitats, species of commercial importance, and invasive species and their impacts).

c. *Socio-cultural and socio-economic conditions and human health*, including PPP-relevant aspects of: archeology, cultural heritage, landscape, recreational activities, human health, social-economic aspects, resource use (including land and water use), transportation, infrastructure, agricultural development, and tourism.

II. Carrying out situation analysis

The SEA team shall interpret the environmental baseline data collected to understand the status quo / existing environment and to identify the trends, and environmental opportunities and constraints in relation to the proposed PPP.

III. Identify and predict impacts and evaluate their significance

The SEA team will identify all the possible impacts associated with the proposed PPP and determine their level of significance.

IV. Compare alternatives

The alternatives will be compared to identify the preferred and to eliminate unacceptable alternatives. The comparative evaluation of alternatives will highlight potential irreversible effects or irreplaceable loss of natural capital, as well as risks to social and ecological systems. To achieve this, the SEA will be required to develop scenarios which will focus on:

a. Identification of the strategic issues associated with the PPP (i.e., identify the critical success factors and key concerns);

b. Representation of the current state of the environment (e.g., levels of environmental quality);

c. Description of the key driving forces and what is inevitable given the driving forces;

d. Identification of key uncertainties that could determine a different evolution of the future;

e. Outlining possible futures (given the key driving forces & uncertainties);

The *'worst case'* and the *'do-nothing'* scenarios should be identified to serve as benchmarks for the above evaluation. Options and alternatives that are illegal, ridiculous, not feasible, or unacceptable to society need to be eliminated. The SEA should focus on evaluating feasible, reasonable options and alternatives that work towards making the desired PPP a reality.

V. Identifying Measures to Enhance Opportunities and Mitigate Adverse Impacts

SEA aims to enhance the positive opportunities and to minimize any negative risks of the PPP. The positive opportunities will generally promote the achievement of the Millennium Development Goals and other positive development goals and objectives. The aim is to develop "win-win" situations where multiple, mutually reinforcing gains can strengthen the economic base, provide equitable conditions for all, and protect and enhance the environment. Where this is not possible, trade-offs must be clearly documented to guide decision makers. The SEA team will therefore be expected to Identify Measures to Enhance Opportunities and Mitigate Adverse Impacts.

Task 4: Quality Assurance of the Draft SEA Reports

Before submitting the Draft SEA reports to NEMA, the SEA team shall ensure quality assurance of the SEA using the same checklists as the internal and external reviewers will use.

Task 5: Submit Draft SEA Reports to NEMA

The SEA team will submit ten (10) hard copies and one (1) electronic copy for each of the Draft SEA Report (with non-technical summary) to NEMA, along with the SEA Submission Form 17 r42.

Task 6: Facilitate Public Review

Upon submission of the Draft SEA Reports to NEMA, the SEA team shall ensure that KNEB publishes two notices regarding the Draft SEA Report, each one week apart in both the Kenya Gazette and a newspaper with a nationwide circulation.

Task 7: Participate in the Final Review of the Draft SEA Reports

The SEA team will be expected to participate in the final review of the Draft SEA Report organized by NEMA in order to note down all the comments.

Task 8: Review the Draft SEA Reports

The SEA team will review the draft SEA Reports based on the stakeholder comments received during final review of the report.

Task 9: Facilitate a Validation Workshop

The SEA team will be expected to facilitate and hold a validation workshop (s) in coordination with NEMA and KNEB to engage key stakeholders in reviewing and validating the corrected SEA Reports.

Task 10: Prepare the Final SEA Reports

The SEA experts will prepare the Final SEA Report, incorporating all stakeholder comments from the validation workshop and ensure that it is endorsed by KNEB.

Task 11: Submit Final SEA Reports to NEMA

The SEA team shall submit, on behalf of KNEB five (5) hard copies and one (1) electronic copy of the Final SEA Report to NEMA along with the SEA Submission Form 17 r42.

Task 12: Obtain approval of the SEA Reports

The SEA team shall follow up decision making process by NEMA and obtain approval on behalf of KNEB.

METHODOLOGY

Standard SEA techniques will be used including site reconnaissance, use of checklists, matrices, map overlays, case comparisons, literature review, policy and legal framework review and stakeholder consultations in order to satisfy the Terms of Reference.

SEA STUDY TEAM

A multidisciplinary team under the leadership of a SEA Expert registered and licensed with NEMA will be required to conduct the SEA study. Detailed CVs and NEMA registration certificates for the team will be availed for scrutiny by KNEB.

EXPECTED OUTPUTS

The expected outputs will include the following:

i. Scoping Reports.

ii. A Draft SEA Report.

iii. Final SEA Report.

iv. NEMA approval

D: TIMING AND REPORTING REQUIREMENTS

The assignment up to the end of Validation workshops for the Strategic Assessment Reports is expected to take 24 weeks. The Consultant shall provide qualified staff with relevant experience of not less than 8 years in carrying out SEA for the Team Leader and at least 5 years for the additional core staff:

Consultant Personnel

Professional Specialization	**Minimum Years of Experience in Specialization**
Lead Assessor / SEA Specialist	10
Team members	8

The qualified firm must be registered by NEMA for carrying out such assignments and shall show proof of having carried out three (3) Strategic Environment Assessments. The Consultant shall be required to prepare and submit the following reports to NEMA and KNEB.

i. Scoping Report

The Consultant shall complete the final copy of the scoping report six (6) weeks after start of the assignment.

ii. NEMA Approval

The Consultant shall get NEMA approval for the scoping report two (2) week after submission and complete the field work/stakeholder consultation by the fourteenth (16) week after signing of the contract.

iii. Draft SEA reports

The Consultant shall provide Two (2) copies of the draft SEA reports for Kenya's Nuclear Power programme by end of Week sixteen (16) after signing of the contract

iv. Final SEA Report

The Consultant shall provide twelve copies (12) copies of the final SEA report by Week twenty (20) after commencement of works.

v. Validation Workshops

The Consultant shall facilitate the SEA validation works after NEMA gives the go ahead after review of the report.

E: FACILITIES AND COUNTERPART PERSONNEL TO BE PROVIDED BY THE CLIENT

The Client will provide the Consultant with counterpart and liaison staff.

F: IMPROVEMENT OF ToRs

The Consultant may offer suggestions and improvements in the Terms of Reference, which he considers would result in better implementation of the project. Such proposals when accepted will form part of the Terms of Reference of the proposals submitted by the consultant. The effect on the time and cost estimates given under the above clause shall be clearly identified.

ANNEX II: Environmental and Social Baseline Situation and Site Suitability Analysis

1.0 Lake Victoria Basin Counties

1.1. Hydrology

1.1.1. Siaya County

The major rivers that flow through Siaya County are River Nzoia and Yala. Yala Swamp, the third largest of Kenya's wetlands, is situated on the deltaic sediments of the Nzoia and Yala Rivers at the point drain to Lake Victoria. The swampy vegetation consists of papyrus; phragmites and typha. The wetland is a vital habitant for many birds and several fish species which are displaced from the main body of Lake Victoria upon the introduction of the predatory Nile Perch. The swamp also filters sediments, nutrients and pollutants from the waters entering Lake Victoria from the Nzoia and Yala River Catchments (Siaya County, 2013).

1.1.2 Kisumu County

The County has three major rivers flowing into the Winam Gulf namely: The Nyando, Kibos and Sondu. The rivers are heavily silted, resulting in the extensive formation of lakeside swamps. The Kano Plains, due to the structure on the floor of these escarpments, is vulnerable to flooding during heavy rains especially the lower Kano Plains and low-lying areas of Nyando. The county has a long shoreline along Lake Victoria. This shoreline is 90 km long and has more than 17 beaches all of which are fish landing bays (Kisumu County, 2013).

1.1.3 Homa Bay County

The county is dissected by a number of rivers namely Awach Kibuon, Awach Tende, Maugo, Kuja, Rangwe and Riana rivers, most of which originates from Kisii and Nyamira counties. There are also several seasonal rivers and streams which originate from highlands within the county. The county has 16 islands, some with unique fauna and flora and an impressive array of physiographic features. These have great aesthetic value as well as breath-taking scenery, especially the forested landscape around the islands and the coast of Lake Victoria and the peninsula like Sikri of Mbita sub-county (Homa Bay County, 2013).

1.1.4 Migori County

The main rivers in the county are Kuja, Migori and Riana all of which originate in the highland region of Kisii and Narok Counties. The other small rivers are Ongoche, Oyani and Sare. Migori and Ongoche rivers join Kuja River at different places within Nyatike Sub-county while river Oyani joins River Kuja around Gogo Market in Uriri Sub-county. River Sare also joins River Kuja around Pala Market in Ndhiwa Sub-county of Homa Bay County. Another spectacular feature found in the county is Gogo Falls found in River Kuja (Migori County, 2013).

1.2 Geology & topography

1.2.1 Siaya County

Siaya County has three major geomorphologic zones namely: dissected uplands, moderate lowlands and Yala Swamp. These have different relief, soils and land use patterns. It has an altitude of the rising from 1,140m on the shores of Lake Victoria to 1,400m above sea level on the North. There are few hills found in the County namely; Mbaga, Odiado, Akala, Regea, Nyambare, Usenge, Ramogi hills, Rambugu, Abiero, Sirafuongo and Naya hills. River Nzoia and Yala traverse the County and enter Lake Victoria through the Yala Swamp.

The geology of the area is composed of the old Nyanzian system forming exposed rocks in Siaya, Ugenya, Ugunja and Gem Sub-counties. These rocks include basalts, desites and rylites, that consist of coarse and fine aggregates used in the construction industry. The main soil type is ferrasols and its fertility ranges from moderate to low with most soils being unable to produce without the use of either organic, inorganic or in most cases both types of fertilizers. Most of the areas have underlying murram with poor moisture retention.

Bondo sub-county has various soil types ranging from black-cotton, sandy loams to laterite including red volcanic soils. West Sakwa, South Nyang'oma and Usigu locations have ferrasols, while North Sakwa, East and Central Yimbo have luvisols with low moderate fertility. The soil types in Rarieda ranges from black cotton soil in Madiany Division and sandy loams and red volcanic soils in Rarieda Division. The expansive Yala Swamp around Ramogi Hill has potential for large scale- irrigation using river Yala. Bondo Sub-County also has several islands including Mageta, Sirigombe, Magari and Yalombo (Siaya County, 2013).

1.2.2 Kisumu County

The county lies in a down warped part of large lowland surrounding the Winam Gulf, at the tip of which is Kisumu Town. East of Kisumu Town is the Kano Plains occasionally broken by low ridges and rivers. There are some notable physical features such as the scarps in the north, east and south. Others include the hill slopes and piedmont plains spreading across the vast Kano Plains. The county can be divided into 3 topographical zones namely: The Kano Plains, the upland area of Nyabondo Plateau and the midland areas of Maseno. The Kano Plains lie on the floor of the Rift Valley, which is a flat stretch bordered to the North and East by the escarpment, while the upland area comprises ridges which rise gently to an altitude of 1,835m above sea level.

The soils are dominated by lake sediments, commonly sand and clay soils. In Kano Plains, the soils are dark brown and grey, poorly drained and are generally very deep and firm. In the western part of Kano Plains are dark cotton soils commonly associated with the swamps. These types constitute more than 70 per cent of all soil types found in Kisumu County. The altitude in the county varies from 1,144 metres above the sea level on the plains to 1,525 metres above sea level in the Maseno and Lower Nyakach areas (Kisumu County, 2013).

1.2.3 Homa Bay County

The county is divided into two main relief regions namely the lakeshore lowlands and the upland plateau. The lakeshore lowlands lie between 1,163 – 1,219 m above the level and comprise a narrow stretch bordering the Lake Victoria especially in the northern parts of the county. The upland plateau starts at 1,219 m above the sea level and has an undulating surface which has resulted from erosion of an ancient plain. It is characterized by residual highlands such as Gwassi and Ngorome hills in Suba, Gembe and Ruri Hills in Mbita, Wire Hills in Kasipul as well as Homa hills in Karachuonyo. Kodera forest in Kasipul and the Kanyamwa escarpment that runs along the borders of Ndhiwa and Mbita also form part of the upland plateau. To the west of the county lies the Lambwe Valley where Ruma National park is located (Homa Bay County, 2013).

1.2.4 Migori County

The county has an altitude varying between 1140m at the shores of Lake Victoria in Nyatike Sub County to 4625m in Uriri Sub-county. Undulating hills covers most of the county with a few stretches of flat land. Some of the hills found in the county include Nyakune (4625m), Ogengo (4300m) and God Sibwoche (1475m) in Uriri sub-county, God Kwer (1420m), Mukuro (1454m) and Nyabisawa (1489m) in Migori Sub-county, God Kwach (1340m) in Nyatike Sub-county, Renjoka (1592m) in Kuria West Sub-county, and Maeta (1733m) in Kuria East Sub-county.

Most parts of the county are underlain by relatively acidic parent rock. Granite covers most parts of Kuria East, Kuria West, Nyatike, some parts of Rongo and Migori Sub-counties. The Nyanzian and Bukoban rocks cover the rest of the county. There is also presence of gold deposits in the county particularly in Macalder in Nyatike sub-county, Masara in Migori sub-county and some parts of Rongo, Kuria and Uriri sub-counties (Migori County, 2013).

1.3 Meteorology

1.3.1 Siaya County

The County experiences a bi-modal rainfall, with long rains falling between March and June and short rains between September and December. The relief and the altitude influence its distribution and amount. Siaya County is drier in the western part towards Bondo and Rarieda sub-counties and is wetter towards the higher altitudes in the eastern part particularly Gem, Ugunja and Ugenya sub-counties. On the highlands, the rainfall ranges between 800mm – 2,000mm while lower areas receive rainfall ranging between 800 – 1,600mm. Temperatures vary with altitude rising from 21° C in the North East to about 22.50° C along the shores of Lake Victoria while in the South, it ranges from mean minimum temperature of 16.3° C and mean maximum temperature of 29.1° C. Humidity is relatively high with mean evaporation being between 1,800mm to 2,200mm per annum within the County. The relative humidity ranges between 73 per cent in the morning and 52 per cent in the afternoon (Siaya County, 2013).

1.3.2 Kisumu County

The area has two rainy seasons, with the long rains occurring in March and May while the short rains occur in September to November. During the short rains the average annual rainfall ranges between 450mm and 600mm. Rainfall data indicates that the county largely receives substantial rainfall. Maseno has a mean annual rainfall of 1,630mm, Kisumu 1,280 mm, Ahero 1,260 mm, Kibos 1,290 mm, Muhoroni 1,525 mm, and Koru 1,103 mm. The lowland area which forms a trough of low rainfall receives a mean annual rainfall of between 1,000mm and 1,800mm. The mean annual maximum temperature ranges 25oC to 35oC and the mean annual minimum temperature ranges 9oC to 18oC (Kisumu County, 2013).

1.3.3 Homa Bay County

Homa Bay County has an inland equatorial type of climate. The climate is however modified by the effects of altitude and nearness to the lake which makes temperatures lower than in equatorial climate. There are two rainy seasons namely the long rainy season from March to June and the short rainy season from August to November. The rainfall received in the long rainy season is 60 per cent reliable and ranges from 250 – 1000 mm while 500 –700 mm is received in the short rainy season. The county receives an annual rainfall ranging from 700 to 800 mm.

Temperatures in the county ranges from 18.6°C to 17.1°C, with hot months being between December and March. February is usually the hottest month in the year. The temperatures are however lower in areas bordering Kisii and Nyamira highlands and higher in areas bordering the lake (Homa Bay County, 2013).

1.3.4 Migori County

The county has an inland equatorial climate modified by the effects of altitude, relief and the influence of the large body of water of Lake Victoria. Rainfall is generally continuous with little distinction between first and second rains. Annual rainfall averages between 700- and 1,800-mm. Long rains are between March and May while the short rains are between September and November. Dry seasons are between December, February, June, and September.

Nyatike, Karungu, Kegonga and Muhuru divisions have comparatively harsh climatic conditions than other divisions. The lakeshore divisions experience unreliable and poorly distributed rainfall. Temperatures show mean minimum of 240C and maximum of 310C, with high humidity and a potential evaporation of 1800 to 2000 mm per year (Migori County, 2013).

1.4 Biodiversity

1.4.1 Siaya County

The Yala Swamp is the richest ecosystem in biodiversity within the county swamp is home to the following fish species: Clarias gariepinus, Protopterus aethiopicus, Labeo victorianus and Barbus spp., but they occur in very low numbers. Protopterus is common only in the periphery of the swamp. Besides the fishes, the Swamp has a number of macrphytes, common rooted vegetation being Cyprus papyrus and Phragmites mauritianus. The shore is lined with a wide belt of C. papyrus and swamp grasses, while further inland the swamp becomes a dense mixture of Phragmites and papyrus reeds. A rich community of invertebrates and birds is found among the Yala River outlets into Lake Victoria. The aquatic nymphs of mayflies (Ephemeroptera), dragonflies (Odonata) and stoneflies (Plecoptera) are also common in the gravel substratum of the rivulets.

Other species of wild life found in the County include hippopotamus (Lake Victoria, River Yala), crocodiles (Yala Swamp, parts of the Lake Victoria), Sitatunga (Yala Swamp), monkeys, and leopards. The County has several species of fish, but the most popular ones are Nile perch, Rastrineobola argentea (Locally known as Omena), Hatlochromines (locally known as Fulu or Wiu) and Nile Tilapia. The first species have a very high commercial value and is responsible for the economic break through which has been experienced along the shore of Lake Victoria. Others are bushpig (mainly in Yala Swamp), Hyenas (Got Abiero, Utonga), various species of snakes e.g. pythons, cobras and various species of birds (Siaya County, 2013).

1.4.2 Kisumu County

The main wildlife in the county are silver backed jackals, leopards, baboons, ostriches, hyena, guinea fowls, duikers, lion, impalas, vervet monkeys, bird species, sitatungas, crocodiles, pythons, monitor lizards, hippos, among others. Dunga Beach is an IBA and home to threatened Papyrus Yellow Warbler (Chloropeta gracilirostris). Cyperus papyrus forms distinctive habitat type for papyrus specialist birds. The birds include the restricted range endemics like the globally threatened Papyrus Yellow Warbler (Chloropeta gracilirostris), the near threatened Papyrus Gonolek (Laniarius mufumbiri), White Winged Warbler (Bradypterus carpalis), Carruthers's Cisticola (Cisticola carruthersi) and Papyrus Canary (Serinus koliensis) (Kisumu County, 2013).

1.4.3 Homa Bay County

The main wildlife found in the county of Homa Bay include Topi antelope, hyenas, Roan antelopes, giraffes, buffaloes, hippopotamus, crocodiles and various species of snakes. Lately, zebra and rhinoceros have been introduced to Ruma National Park (Homa Bay County, 2013).

1.4.4 Migori County

Some common trees include Bondo (Euphorbiacandelabrum), Ochwoga (Carissa edulis), Mukinduri (Croton megalocarpus), Ngow (Ficus nataliensis), Onera (Terminalia brownii), Toona does well in the area but most trees are multi-branched, which may indicate bud borer trouble. Terminalia catappa, Cypress (a Cupressus lusitanica variant) does well in the area and some pine has been grown successfully (Migori County, 2013).

Various animals have been identified to be in the county such as the gazelles, monkeys, snakes, leopards and hyenas. This may be due to the proximity of the county to Ruma national Park in Homa-Bay County and Narok County where the famous Maasai Mara Game Park is found. In the Lake Victoria, there is presence of wild animals such as the hippopotamus and variety of birds. However, there has been frequent conflict between the human and hippos along the shores of Lake Victoria due to the encroachment of the lake area by human beings The birdlife in Migori is varied with many records of blue flycatcher, blue-spotted wood dove, harrier hawk, bat hawk, baglafecht weaver, tawny eagle, purple grenadier, beautiful sunbird,

yellow-billed stork, hadada ibis, African citril, cape turtle dove, paradise flycatcher, yellow white eye, white-browed robin chat, black-headed gonolek, black kite among others (Bidlife International Africa, 2019) (Migori County, 2013).

1.5 Environmental challenges and risks

1.5.1 Siaya County

Flooding and Droughts: Climate change has led to increased amount and intensity of rainfall resulting in frequent flooding as well as frequent dry spells leading to droughts. Moreover, continued loss of fertile soils and siltation of rivers and water ways leading to frequent flooding especially in the lowlands.

Invasive Species: Continued discharge of raw waste and industrial effluent into Lake Victoria has promoted the growth of water hyacinth that has engulfed it. In addition, climate change has led to increased temperature resulting in increased algal blooms in the lake which favour invasive species such as the water hyacinth. Other risks include overfishing, reclamation of the Yala swamp for agricultural purposes and impact of agrochemicals upon the aquatic ecosystem (Siaya County, 2013).

1.5.2 Kisumu County

Solid and liquid waste: - Kisumu City, being the third-largest city in Kenya, has been operating without an official garbage dumping site but are coming up with a County Waste Management Plan for garbage collection in the next financial years.
Use of plastic packing has resulted into major heaps of plastic scattered all over the towns or urban areas in the county. These areas include Kisumu, Ahero, Awasi, Maseno, and Muhoroni. Plastics are non-bio-degradable, and they pose a major environmental hazard in the county. They block sewage, drainage systems and livestock digestive systems and generally degrade the environment.
Sand harvesting: Sand acts as a safe aquifer for water flowing below and through it. Removal of sand results in destruction of underground aquifers and loss of safe water. Sand scooping adversely affects surface water quality and quantity and damages the aquatic ecosystem. Haulage of sand by heavy trucks causes environmental degradation by accelerating soil erosion and affecting soil stability. Storage of sand causes destruction of surface areas through clearing of vegetation and uses land that could be used for agriculture. Related social and health problems include prostitution and high school drop-out rate around sand harvesting areas leading to serious social and health problems.
Invasive species - water hyacinth: - has become a major invasive plant species in Lake Victoria and while it is native to the continent of South America, human activity has introduced the greenery to Lake Victoria, where it is claimed to have negatively affected local ecosystems, hindering economic activities and ecological services in the lake.

Other risks: - The ecological health of Lake Victoria had been affected profoundly as a result of a rapidly growing population, the clearing of vegetation along the shores and a booming fish-export industry, the disappearance of several native fish species, prolific growth of algae, and dumping of untreated effluent by several industries. Worst of all, much of the damage is irreversible. Traditional lifestyles of lakeshore communities have been disrupted and are crumbling. There is a consensus among scientists that if an accelerated push to save the lake is not made soon, this much-needed body of water will cease to sustain life (Kisumu County, 2013).

1.5.3 Homa Bay County

Deforestation: - The resultant reduction in vegetation cover has left the land bare and vulnerable to soil erosion, low rainfall and flash floods. This loss of vegetation has been largely attributed to human activities such as bush clearing for farming and settlement activities, firewood and charcoal production.

Solid waste Management: - materials such as plastics, nylon papers, packaging tins, food remains and faecal matter. These have increased the prevalence of water borne diseases, diseases vectors such as mosquitoes, and clogging of natural water ways and drainage facilities. Lake Victoria, which is the main source of water in the county, has suffered serious pollution as a result of environmental degradation what with flash floods and domestic uses which have led to huge deposits of pollutants in the lake.

Climate change: - Resulted to reduced fish stocks fish in Lake Victoria, drying up of water ways and worsening weather conditions, the local populations have not been able to sustain food production at a level commensurate with growth in the population (Homa Bay County, 2013).

1.5.4 Migori County

Desertification: Climatic change and human factors have led to desertification in the county. Poor farming methods and increased population pressure have led to clearing of forests and vegetation thereby leaving land which is exposed to the vagaries of erosion and overuse. With agriculture as the major source of income, more land is being exposed daily.

Flooding: This normally occurs periodically during heavy rains between October/Nov, March/April and affects mostly the lower parts of Nyatike sub-county along the river Kuja basin particularly Kadem and Lower Central Kadem locations.

The major effects of flooding in the county includes: displacement of people, destruction of shelter, disease outbreaks, disruption of learning centres, breakdown in transport systems, damage to water and sanitation systems, submergence of farms/ loss of crops, loss of livelihoods, human and animal deaths and human and wildlife conflict.

Mining-related accidents: These are prone in the gold prospecting areas of the county. They are caused by poor handling of explosives and leakages on the fluxing pumps used in the mining activities (Migori County, 2013).

1.6 Demographics

1.6.1 Siaya County

Settlement patterns follow agro-ecological zones and fish landing sites with high potential areas of South Alego, Ukwala, North Ugenya, Central Ugenya, Yala, Wagai, Central Sakwa, Mageta Island and Asembo Central locations having the highest population density that averages 350 persons/km2 (KNBS 2012 Population projections). Low potential areas include South West Alego, Usonga, West Sakwa, Usigu and East Uyoma locations. There are large nuclear settlements along major fish landing beaches of Misori, Luanda Kotieno, Kamariga WichLum, Usenge, Uhanya, Honge and Nango in Rarieda and Bondo sub counties.
The total population of the county as at 2012 was estimated to be 885,762 persons comprising of 419,227 males and 466,535 females (KNBS 2012 Population projections). This population is expected to grow at a rate of 1.7 per cent per year (Siaya County, 2013).

1.6.2 Kisumu County

The population of the county according to the 2009 Population and Housing Census was estimated at 968,909 persons with 474,687 males and 494,222 females (Kisumu County, 2013).

1.6.3 Homa Bay County

Based on projections from the 2009 Kenya Population and Housing Census, Homa Bay County has an estimated population of 1,038,858 persons consisting of 498,472 males and 540,386 females by the end of the year 2012. This population is projected to rise to 1,177,181persons in 2017. Of this total, 564,843 will be males while 612,338 will be females (Homa Bay County, 2013).

1.6.4 Migori County

The total population of Migori County according to the 2009 population census was 917,170 comprising of 444,357 males (48.6%) and 472,814 females (51.4%). This figure is expected to grow at a rate of 3.8 per cent per annum to approximately 1,028,028 persons in the year 2012, 1,152,165 persons in 2015 and 1,243,272 persons in the year 2017 (Migori County, 2013).

1.7 Electricity grid infrastructure

1.7.1 Siaya County

The county is connected to the grid and plans are underway to connect it establish two substations in Siaya county in Bondo and Ndigwa, Rarieda Sub County, as well as complete an upgrade for the Rang'ala substation in Ugunja constituency to increase the voltage (Siaya County, 2013).

1.7.2 Kisumu County

The County is currently connected to the grid, but a number of projects are underway to ensure power reliability for economic development. KETRACO is currently developing a 400kV Transmission Line from Olkaria to Kisumu through the Lessos, a 132kV Transmission Line from Mumias to Kisumu through Rang'ala. There is an existing substation in Mamboleo area while a new 400/220kV substation is also complete at Kibos area (Kisumu County, 2013).

1.7.3 Homa Bay County

All urban centres and most trading centres in the county have now been covered under the rural electrification programme. KETRACO is putting up lines through the county with substations to serve the populace within the county. One of the lines on construction is Sondu -Homa Bay -Ndhiwa -Awendo Line 132 kV transmission Line (Homa Bay County, 2013).

1.7.4 Migori County

The Urban centres in the County are all connected to the grid with a number of schools also connected via the rural electrification programme. KETRACO has built a 132kV Transmission Line from Awendo to Kisii with plans to build other lines (400kV) from Kehancha to Isebania and a 132 kV to connect Isebania from Awendo. The Gogo Hydropower plant (2 MW capacity) is the existing power generation plant while plans for the Sony Sugar Bagasse Power Plan with an 18 MW capacity are underway (Migori County, 2013).

1.8 Transport Support Infrastructure

1.8.1 Siaya County

The County had 283.2 Km of bitumen standard roads, 741.3Km of gravel and 1,161.8 Km of earth roads as at December 2012. The County has witnessed an improvement in the road network with several roads being tarmacked; these include the Rang'ala-Siaya-Bondo road which is 90% complete, Ndori-Owimbi- Luanda Kotieno, and Bondo -Misori –Mituri road, Kisian- Bondo and ngiya- Ndori road. Several roads in the County have also been gravelled. There are also three airstrips in the County namely: Gombe, Dominion and Sega (Siaya County, 2013).

1.8.2 Kisumu County

According to Kisumu County CIDP (2018-2022), Kisumu County is served with reliable road network, major players in the road sub-sector in the County include; Kenya National Highways Authority (KeNHA), Kenya Urban Roads Authority (KURA), Kenya Rural Roads Authority (KeRRA), Kenya Informal Settlement Improvement Projects (KISIP), Kenya Wildlife Services (KWS), Kenya Roads Board (KRB), Kisumu Urban Projects (KUP). It has 671 km of class A and B roads; and class C, D, E and R roads across the County. The County hosts the third busiest airport in Kenya and the Country's fourth International airport (Kisumu County, 2013).

1.8.3 Homabay County

Homa Bay County has one class A1 (Kisii-Kisumu) road which covers about 30 km; one class C20 (Homa Bay – Rongo) road covering about 30 Km; two class C19 (Homa Bay – Mbita and Homa Bay – Kendu Bay) roads covering about 71 Km and one class C18 (Rodi Kopany – Sori) road covering about 32 Km. All these class A and C roads are bitumen surfaced except for a 25 Km stretch of the Homa Bay – Mbita road which is yet to be tarmacked but work on which is in progress. In all about 168 Km of the road surface in the county is under bitumen, including a D221 road of about 5 Km linking Kadongo to the county boundary with Nyamira. The rest of the classified road network of about 1800 Km of is not bituminized with 25 per cent under gravel and earth 75 per cent under earth.

The County has five airstrips, namely: Kabunde, Mfangano, Rusinga, Otange and Otaro. Kabunde is the only one that has the bitumen-surfaced runway and can accommodate relatively large aircrafts.

Water is a favourable means of transport between Suba, Mbita, Homa Bay Town and Karachuonyo sub-counties of Homa Bay County. That is because the four sub-counties are on shores of and are served by Lake Victoria. This mode of transport is more prominent in Mbita where all the 12 islands are accessible to the majority only by boat (Homa Bay County, 2013).

1.8.4 Migori County

The County is traversed by 104.6 km of tarmacked road including Road A1 that links Kenya with Tanzania through Isebania. This is the only road that is bitumen. However, during this plan period, the following roads have been earmarked for construction to bitumen standard: Isebania – Kehancha – Kegonga – Ntimaru road (E166), Muhuru – Bay - Kehancha (C13), Rapogi – Ogwedhi (D202), Rongo- Riosiri (C20), Toku Bridge and approach roads (E205), and Homabay-Ranen. The rest of the road network in the county is made up of 1928 kilometers out of which 25% is gravel and 75% is earth.

The county has three airstrips, namely: Migori at Lichota, Macalder and Kehancha. None of the airstrips has bitumen surface implying that they can only accommodate relatively light aircrafts.
Water transport is still at its infancy stage despite the county being served by Lake Victoria at Nyatike sub-county. It still remains a favourable means of transport between Migori and the adjacent destinations such as Mwanza in Tanzania and Homa-Bay including major islands in the lake (Migingo island etc) (Migori County, 2013).

2. Lake Turkana Region

2.1 Hydrology

2.1.1 Turkana County

Rivers Tarach, Kerio, Kalapata, Malimalite and Turkwel are the major rivers in the county making them the most important with a potential of producing large amounts of food for the county, if properly utilized. Lake Turkana is situated on the eastern part of the county and has northern island.
The County is also endowed with underground water aquifers at Loitipis and Lodwar basin. This is the most significant resource for the county considering that there has been a drought challenge within this region for several years (Turkana County, 2013).

2.1.2 Marsabit County

The county has no permanent river, but has four drainage systems, covering an area of 948 sq. km. Chalbi Desert is the largest of these systems and it receives run-off from the surrounding lava and basement surfaces of Mt. Marsabit, Hurri Hills, Mt. Kulal and the Ethiopian plateau. In the south, the seasonal rivers of Milgis and Merille flow eastward and drain into the Sori Adio swamp. Other drainage systems include the Dida Galgallu plains which

receive run-off from the eastern slopes of Hurri Hills and Lake Turkana into which seasonal rivers from Kulal and Nyiru Mountains drain to (Marsabit County, 2013).

2.1.3 Samburu County

The physiography of the region influences the drainage pattern. The County falls in drainage areas number two (Kerio Valley) and number five (Ewaso Nyiro). Main water sources in the county constitute of surface and ground water. The Ewaso Ng'iro River flows northwards about 30 km, then changes the direction to flow eastwards.

After turning sharply east through the gap between the Mukogodo hills in the south and the Karissa hills in the north, the river flows through a 70m deep gorge for about 60 km in Barselinga. There are several seasonal riverbeds or "laggas" which during rainy seasons are filled with runoff water, making roads impassable and often leaving the area cut-off from the rest of the country (Samburu County, 2013).

2.2 Geology & topography

2.2.1 Turkana County

Lake Turkana is at an elevation of 360 m while the surrounding basin is anywhere from 375-914 m (. The main mountain ranges of the county are Loima, Lorengippi, Mogila, Songot, Kalapata, Loriu, Kailongol and Silale mountains. The mountain ranges, because of their high elevation, are normally green, covered with dense bushes and high woody cover.

The hills in the county consist of Tepes Hills in Kibish Division, Lokwanamor Hills and Lorionotom Hills in Kaikor Division, Pelekech Hills in Kakuma Division and Loima Hills in Loima Division which are characterized by large forests.

The open lying plains consist of the Kalapata and Lotikipi Plains. The plains form part of the arid area in the County and receive the lowest amount of rainfall of around 180 mm per annum. Soils in Turkana County are not well developed due to aridity and constant erosion by water and wind. Often stone mantles cap them. Colluvial soils tend to be reddish over the basement system and generally grey buff or white over the volcanoes. Aeolian soils are dune sands either active or fossil; Alluvial soils range from coarse sands to flash flood silts, while black or brown clays occur locally in areas of impended drainage (Turkana County, 2013).

2.2.2 Marsabit County

Most of the county constitutes an extensive plain lying between 300m and 900m above sea level which gently slopes towards the south east. The plain is bordered by hills and mountain ranges and is broken by volcanic cones and calderas to the west and north of the county. The prominent topographical features of the county are Ol Donyo Ranges in the south west (2,066m above sea level), Mt. Marsabit (1,865m above sea level) in the central part of the county, Hurri Hills in the north eastern part of the county (1,685m above sea level), Mt. Kulal in the north west (2,235m above sea level) and the Sololo-Moyale escarpment in the north east (up to 1,400m above sea level).

The Chalbi Desert, an area of 948 sq. km, lie between 435m and 500m elevation and is characterized by physical feature that forms a large depression. The depression seats within the Great Rift Valley and is only separated from Lake Turkana by a ridge that rises to 700m, far above 65m to 100m elevation in Turkana (Marsabit County, 2013).

2.2.3 Samburu County

The County falls on the northern interface between highlands and lowlands. To extreme west is Suguta Valley which is bounded on both sides by fault escarpments and floored by red clays, boulders and gravel fans. In the East of Suguta Valley, the County is characterized by repeated extensive high-level plateaus which have been built by repeated floods of lava from the Rift valley. The highest parts of these plateaus are the Kirisia Hill, rising to 2000m above

sea level. In the North of Baragoi - Tuum and South –Horr axis, the area rises to Mount Nyiro tapers northwards and falls steeply southwards. South and west of Mount Nyiro are peneplains which have been eroded to plains of lower levels ranging from 1000-1,350 m above sea level. These are noticeable at Kawap and the area between Lodungokwe and Wamba continuing eastwards and southwards. These plains are covered by red soils and sands derived from the adjacent slopes by sheet erosion. East of the central plains are the Mathew Ranges and the Ndoto mountains forming discontinuous ranges tending towards north-south of the eastern side of the county. Apart from the Lorroki plateau and the mountain ranges of Nyiro and Mathews, the rest of the County is a continuous basin which slopes northwards to Lake Turkana and east of Mathew Ranges.

In the western parts of the county, the soil is mostly Sandy loam soils. Kirisia area has sandy loam and sandy clay soils, which are lithosol (shallow stony soils) and cambisols. In the areas covered by lithosols water run-off is common and erosion quite prevalent. Just as Kiriasia, Lorroki has loam soils as the dominant one. These soils are mostly well-drained phaezems. However, some parts of it are covered by shallow lithosols, including the surrounding of Suguta Marmar where the risk of flooding is classified as medium. The lithic phase of the soils encourages run-off during periods of high precipitation.

In the northern part of the County consisting of Baragoi and Nyiro areas, the predominant soil covers are bouldery cambisols and lithosol. The soils are particularly more stoney and rocky on the southern slopes of Mt Nyiro and Ndoto mountains. These soils are shallow and have a lithic (stoney) phase, a characteristic that makes the soils prone to run off. On the eastern side that include Wamba and Waso areas, is significantly covered by weakly developed soils, mostly sandy and low in organic matter and in some places in Waso Division the soils are saline and sodic (mostly cambisols and solonetz) (Samburu County, 2013).

2.3 Meteorology

2.3.1 Turkana County

Turkana County is arid and semi-arid and is characterized by warm and hot climate. The temperatures range between 20ºC and 41ºC with a mean of 30.5ºC. The rainfall pattern and distribution is erratic and unreliable with both time and space. There are two rainfall seasons. The long rains usually occur between April and July and the short rains between October and November and ranges between 52 mm and 480 mm annually with a mean of 200 mm. The driest periods are January, February and September. The rainfall is distributed on an east-west gradient with more rainfall in the western parts and other areas of higher elevation. The rainfalls in brief, violent storms result in flush floods. The surface runoff and potential evaporation rates are extremely high. Due to the low rainfall and high temperatures, there is a lot of evapotranspiration resulting into deposition of salt in the soil and capping on the surface (Turkana County, 2013).

2.3.2 Marsabit County

The County has arid climatic condition with the exception of the areas around Mt. Marsabit, Mt. Kulal, Hurri Hills and the Moyale-Sololo escarpment which represent typical semi-arid condition. The temperature ranges from a low of 150C to a high of 26oC, with an annual average of 20.50C (World Weather and Climate Information, 2015). It has a bi-modal rainfall pattern.

The long rain season falls between April and May while the short rain season falls between November and December. Rainfall ranges between 200mm and 1,000mm per annum and its duration, amount and reliability increases with rise in altitude. North Horr (550m) has a mean annual rainfall of 150mm; Mt. Marsabit and Mt. Kulal experience 800mm while Moyale receives a mean annual rainfall of 700mm (Marsabit County, 2013).

2.3.3 Samburu County

The County has tropical climatic conditions. The driest months are January and February. The long rainy season falls in the months of March, April and May. The elevation and orientation of the major topographic features such as Mathew ranges and Ndoto hills influences rainfall distribution. Apart from South Horr and Wamba areas, short rains occur during the months of July and August, sometimes extending into September.

At Wamba and South Horr areas, the short rainy season is usually delayed and occurs in October and November and sometimes extends into December. The southwest plains and the Lorroki Plateau receive between 500 mm and 700 mm of rain annually. The Nyiro and Ndoto Mountains and Matthews range receive the highest amount of rainfall between 750 mm and 1250 mm per annum. The central basin and the plains east of the Matthews Range are the driest parts of the county with annual rainfall of between 250 mm and 500mm. Annually, the county has annual mean temperature of 290c with the maximum range being 330c and minimum of 240c (Samburu County, 2013).

2.4 Biodiversity

2.4.1 Turkana County

The county has three major national parks namely Sibiloi National Park which lies on the lake's eastern shore, while Central Island National Park and South Island National Park lie in the lake.

To the south especially within the South Turkana National Reserve, they county has, elephants, leopards, oryx antelopes, gazelles, warthogs as well as an exceptionally high number of Kori bustard roam. Along the border with South Sudan in the extreme northwest, the massive savannah grassland of the Lotikipi Plains forms another haven for wildlife which isn't marked as a nature reserve but still is worth visiting. In 1997, the Lake Turkana National Parks (161,485 ha) comprising of Sibiloi National Park, the South Island and the Central Island National Parks all within the Lake Turkana basin was designated as a UNESCO World Heritage Site (Turkana County, 2013).

2.4.2 Marsabit County

Zebras, buffaloes, black and white colobus, blue monkeys, bushbucks, sunis, and leopards populate the park. The County has more than 350 species of birds in total, of which 52 are birds of prey. Some of the birds are: Ruppell's griffon vultures, peregrine falcons, mountain buzzards, black kites and African fish eagles; sociable weaver birds, which can be identified by their neater, tidier nests; sparrow weavers, with their "scruffier" nests; and white-bellied turacos. The County is also home to elephants, reptiles and variety of butterflies. The common tree species are the acacia tress (Marsabit County, 2013).

2.4.3 Samburu County

The County is one of the counties with the largest number of wildlife outside protected area systems in Kenya. Some of the wild animals found in the County include; lions, cheetahs, leopards, giraffes, buffalos, waterbucks and various antelope species. The endangered species include Grevy's zebra, wild dog's, African elephants and black rhino, birds and different species of small wild game. Samburu County boasts of Samburu Special five species of wildlife which are endemic to Samburu and a few other areas north of the equator. These are: Reticulated giraffe, Beisa Oryx, Grevys Zebra, Gerenuk and Somali Ostrich. There are also rare and endangered species such as Debrazza monkeys in the Ndoto and Matthews forests. There also hundreds of bird species. The county also has 165 Km² Samburu National Reserve, the only game reserve in the County, Maralal National Sanctuary is another important conservation area within the County and 40 registered conservancies (Samburu County, 2013).

2.5 Environmental challenges and risks

2.5.1 Turkana County

Charcoal production is a major contributor to environmental degradation in the county.

Waste disposal in the county is a problem since the local authorities collects only 0.2% of the community waste. More so, 100,997 households use open defecation in the bush with only 20,214 households using latrines. This situation contributes to water, soil and air pollution and poses a health threat to the communities.

Riparian Farming: - Farming along river Turkwel and other rivers within the County is a major environmental. This weakens the river banks making them prone to flooding.

Climate Change: - The climate is still hot and dry although it has over the time worsened. There have also been cases of continued drought which was not the case in the past. The effects of climate change in the county are; cyclic spells of drought, high infant mortality rates due to poor nutrition and low sanitation, increased resource-based conflicts, increased morbidity, increased government expenditure on healthcare, increased school drop-out rates, shifts of investments to emergency relief hence compromises development, increased vulnerability to floods and loss of biodiversity. The effects of environmental degradation include; soil degradation and erosion, air pollution, garbage pollution, deforestation, desertification, climate change, wild fires, sand and dust storms and losses due to strong winds like blown roofs.

Faulting: The Great Rift Valley, in which Lake Turkana Basin is located, is characterized by geological faulting and the formation of sedimentary deposits.

Seismicity and Seismic Hazard: Approximately 4.2 million years ago (mya) the region experienced widespread and significant volcanism, associated with the Gombe basalts in the Koobi Fora formation to the east and with the Lothagam basalts further south; this event created a lake in the centre of the basin and apparently established the modern, continuous depositional system of the Turkana Basin. The oldest volcanic activity of the region occurred in the Nabwal Hills northeast of Turkana in the late Eocene. The Central Island within the lake is made up of three active volcanoes that belch sulphurous smoke and steam (Turkana County, 2013).

2.5.2 Marsabit County

Environmental degradation in the county is mainly as a result of deforestation and forest encroachment due to dependence on firewood and overgrazing. Inadequate solid waste collection and disposal coupled with lack of sewerage systems and unsustainable management practices are major contributors to environmental degradation in the county. Other drivers of environmental degradation include non-compliance with the law, weak enforcement of the environmental regulations, inadequate disposal of non-biodegradable materials like plastics and polythene, low levels of environmental awareness and low social responsibility on environmental matters at individual and community levels (Marsabit County, 2013).

2.5.3 Samburu County

Land degradation is caused by runoffs experienced during heavy rainfall and by wind erosion that is common in the drier parts of the county. The problem is influenced by exposure of the surface soils resulting from overgrazing and poor agriculture practices.

Destruction of forests due to charcoal production and illegal logging. Charcoal burning has been noted as the most severe cause of environmental degradation around major towns of

Maralal, Wamba, Archers and Baragoi, and has completely destroyed indigenous trees particularly acacia and Olea Africana; which usually take long to mature.

Invasive species such as Prosopis juliflora, Opuntia exaltata and acacia reficiens are a major threat to pasture and the local environment. They suppress grass and other undergrowth hence endangering availability of fodder for livestock.

Poor disposal of solid waste especially polythene bags has been a major menace in our towns and markets. This is attributed to lack of designated dumping sites and cleaners in the towns.

Climate Change: - Effects include unreliable, erratic and inadequate rainfall; recurring and more prolonged droughts; high and increasing temperatures; and declining of water levels in boreholes, wells and springs. Effects of which have resulted to human-wildlife conflicts (Samburu County, 2013).

2.6 Demographics

2.6.1 Turkana County

According to the results, the County population stood at 855,399 with projections of 1,036,586 in 2012 and 1,427,797 in 2017. 60 % of the population is young under the age of 19 years (GoK, 2009).

The population density in the county varies from 24 persons/km² in Turkana Central Constituency to 5 persons/km² in Turkana East Constituency. The average population density in the County is 12 persons/km2. This is based on the 2009 Kenya Population and Housing Census. Settlement patterns in Turkana County correspond with natural resource endowment. Low population densities in the rural areas and high population in towns and market centres exhibit this where economic opportunities prevail. Lake Turkana as a resource has influenced a high settlement patterns in the areas along it.

The low literacy levels estimated to be about 40% in the county can be attributed to many causes which include extreme poverty, understaffing in schools and cultural practices such as early marriages. Other calamities such as drought and inter boundary conflicts also inhibit the provision of proper education resulting in low literacy and education standards. This has impacted negatively on the quality of education and affected both enrolment and retention of the pupils especially in primary and Early Childhood Development (ECD) schools (Turkana County, 2013).

Notably, the county is largely occupied by the Turkana community which is identified as one of the vulnerable and marginized communities as identified in the Kenyan Constitution.

2.6.2 Marsabit County

The population of Marsabit County was 291,077 people in 2009 according to the Kenya Population and Housing census. This population is projected to rise to over 727,000 in 2050, 8 years before the year when the Demographic window of opportunity opens. The population is quite youthful with 46.7 % of the population below age 15 and has therefore a high dependency ratio (104). However, the proportion of population below 15 years is projected to decline to 39 % in 2030 and later to 32 % in 2050.

Marsabit County is home to a number of vulnerable and margilized groups such as: Gabra, Borana, Rendile, Samburu, Sakuye and Desenach

2.6.3 Samburu County

According to the 2009 Population and Housing Census, the population of Samburu County was 223,947. Given a population growth rate of 4.45 % per annum the County population is projected to increase to 399,378 by 2022 and 456,418 by 2025 (GoK, 2009).

Samburu County is home to the Samburu Community that is classified under the vulnerable and marginalized groups in Kenya.

2.7 Electricity grid infrastructure

2.7.1 Turkana County

The towns in Turkana County is connected to the grid though not entirely but relies also on thermal power productions. Plans are underway to connect the county through Turkwel- Loki char –Lodwar 220kV Electricity Transmission Line; Turkwel – Lodwar- Lokichogio 220kV Transmission Lines, with substations at Lokichar, Lodwar and Lokichogio to ensure power reliability (Turkana County, 2013).

2.7.2 Marsabit County

A few parts of the county are connected to the national grid. Moyale and Sololo are connected with electricity from Ethiopia. KETRACO plans to construct a 150km 400kV Electricity Transmission Line from Loiyang'alani to Marsabit to evacuate solar power from the Lake Turkana Wind Power, located entirely within Marsabit County. The Lake Turkana Wind Power project is entirely in the County as well as the Loiyangaleni substation that will connect to Suswa (Marsabit County, 2013).

2.7.3 Samburu County

The County is connected to the grid but also dependent on Thermal power production. Plans are underway by KETRACO to connect the County to Nyahururu, Rumuruti and Isiolo with a substation at Maralal. The County also has potential of geothermal energy at an estimate of 680 Megawatts at Emuruaenkokolak near Lake Lokipi to complement hydroelectric power (Samburu County, 2013).

2.8 Transport Support Infrastructure

2.8.1 Turkana County

The county has a total road network of 5,496.2 km of which 488.5 km are bitumen, and 5007.7 km earth surface. The challenges faced by this sub-sector include seasonal rivers that cut through roads and poor soils that increase the cost of road construction and maintenance. As a result, a number of roads are rendered impassable during the rainy seasons. Air transport in the county is not developed as well. There is only one airport in Lokichoggio and 22 airstrips across the county. Lodwar airstrip runway is tarmacked while the rest are just levelled grounds whose runways are not tarmacked (Turkana County, 2013).

2.8.2 Marsabit County

The current road network in the county is approximately 5,000 km. This comprises of 312 km tarmacked, 580 km gravel surface and 4,108 km earth surface. However, most of the roads are impassable during rainy seasons. The completion of the north-south highway linking Isiolo - Marsabit and Ethiopia has opened up the area to investments and greatly improve connectivity and lower the costs of transporting goods and services to the County, in addition to boosting cross-border trade between Kenya and Ethiopia. The highway construction also had a number of social responsibility projects such as construction of roads within the town which covered almost 11 km and improved drainage within the town, in addition to the improved aesthetic value of the town.

Marsabit County has eighteen airstrips located in all sub-counties. All the airstrips are in good condition and currently in use. There is no railway line, in the county. However, railway transport is expected to develop once the Lamu Port - South Sudan - Ethiopia Transport Corridor (LAPSSET) project is completed. The county has already benefited from the project through the tarmacking of the Isiolo - Moyale highway (Marsabit County, 2013).

2.8.3 Samburu County

The county's total road network length is 1,606.6 kilometers, out of which the Tarmac road (probase) covers a length of 10 kms, improved (graveled) road covers a length of 1,081 km and new roads cover 515. 6km. Most of these are rural access roads and those linking to major urban centers within the county. The Rumuruti – Maralal- Baragoi (Road A4) is the gate way to Samburu county. The road covers a length of 116 kms from Rumuruti to Maralal, and 108 kms from Maralal to Baragoi. 50 km of this road network is covered by Bitumen Surface the rest of the network is graveled and earth surface. The county expects 60 kms of bitumen surface as part of its road network from the planned LAPSSET corridor project that will connect Lamu Port- Southern Sudan and Ethiopia.

There are 11 airstrips in Samburu County. Wamba, Kisima and Baragoi airstrips are owned by the Kenya Civil Aviation Authority (KCAA). Those owned by the county government are Oryx, Kalama, Ngilai Wamba, Latakweny and kurungu. Sarara and Desert rose are privately owned airstrips. Maralal Nkuroto airstrip is not functional (Samburu County, 2013).

3. The Coast Region

3.1 Hydrology

3.1.1 Lamu County

The county has four major catchment areas categorized as Dodori coastal zone, Duldul, Lamu bay drainage and Tana River Delta (Lamu County, 2013).

3.1.2 Tana River County

The most striking feature is the river Tana that traverses the county from the Aberdares in the North to the Indian Ocean in the South covering a stretch of approximately 500km. Besides the river Tana, there are several seasonal rivers in the county popularly known as lagas, which flow in a west-east direction from Kitui and Makueni Counties draining into river Tana and eventually into the Indian Ocean.

The river beds support livestock as well as wildlife during the dry season since they have high ability to retain water. River beds are most appropriate sites for shallow wells, sub-surface dams as well as earth pans. However, they are also major bottlenecks to road transport as they cut off roads during rainy seasons making the county virtually land locked (Tana River County, 2013).

3.1.3 Kilifi County

The drainage pattern for the county is formed by a permanent river (Sabaki) and seasonal rivers, which drain into Indian Ocean through the various creeks along the coastline. The seasonal rivers are Nzovuni, Rare, Goshi and Kombeni. There are also streams which include Wimbi, Muhomkulu and Mleji (Kilifi County, 2013).

3.1.4 Mombasa County

Natural Drainage in the County is mainly formed by semi-perennial rivers and streams. These rivers are Kombeni and Tsalu that drain into the Indian Ocean. There are three permanent springs in rural parts of the County. Some parts have favourable geology therefore a high-water table (Mombasa County, 2013).

3.1.5 Kwale County

Kwale County is well drained by seven major rivers and numerous minor streams. Of the seven (7) rivers, three (3) are permanent. All these rivers drain into the Indian Ocean. The main rivers and streams are Ramisi, Marere, Pemba, Mkurumuji, Umba, Mwachema and the Mwachi River as shown in Table 3 3 below (Kwale County, 2013).

3.2 Geology & topography

3.2.1 Lamu County

The county generally flat and lies between altitude zero and 50m above sea level. The main topographical features include coastal Island and Dudol plains, sand dunes and the Indian Ocean (Lamu County, 2013).

3.2.2 Tana River County

The major physical features in Tana River County is an undulating plain that is interrupted in a few places by low hills at Bilibil (around Madogo) and Bura administrative sub-units which are also the highest points in the county. The land in Tana River generally slopes south eastwards with an altitude that ranges between 0m and 200m above sea level (Tana River County, 2013).

3.2.3 Kilifi County

The County has four major topographical features. The first one is the narrow belt, which forms the coastal plain and varies in width of 3km to 20km. The coastal plain lies below 30m above sea level with a few prominent peaks on the western boundary including hills such as Mwembetungu. Across this plain run several creeks resulting in excellent marine swamps that are endowed with mangrove forests and present potential for marine culture. This zone is composed of marine sediments, including coral, limestone, marble, clay stones and alluvial deposits that support agriculture (Kilifi County, 2013).

To the west of the coastal plain lies the foot plateau characterized by slightly undulating terrain. The plateau falls between 60m and 150m altitude and slopes towards the sea. A number of dry watercourses traverse the surface with underlying Jurassic sediments consisting of shells, sandstones and clays. In this zone, grassland and stunted vegetation prevail. The coastal range falls beyond the foot plateau and has distinct low range of sandstone hills and ranges between 150m to 450m high. These hills include Simba, Kiwava, Daka, Wacha, Gaabo, Jibana, Mazeras and Mwangea.

The Nyika plateau that rises from 100m to 340m above sea level and occupies about two thirds of the county area covers the lower lying ground along the western side of the county. The plateau is less populated with a thin vegetation cover, shallow depressions and gently undulating terrain. This is an arid and semiarid zone, which is suitable for ranching.

3.2.4 Mombasa County

The County lies within the Coastal lowland which rises gradually from the sea level in the East to about 132m above sea level in the mainland. The terrain is characterized by three distinct physiographic features, which include the coastal plain, which is found along the shoreline, covering parts of the South Coast, the Island, parts of Changamwe and the North Coast. The plain consists of an expansive flat land with raised beach terraces covered mainly by Coral limestone and back reef sand deposits that not only provide firm foundation for construction but also provide building materials.

The second category is the hilly areas mainly found within the Western part of the County that is underlain by shells and rises gently from 45m to 132m above sea level. This is characterized by poorly drained clay soils which restrict settlement and infrastructural development. The third category is the Indian Ocean and the shoreline covered with geologically sedimentary rocks of Jurassic to recent age. The topography has evolved as a result of the lowering of the sea level over time leading to severe erosion by the storm water draining into the sea. In addition, the subsequent rise in sea level led to the submergence of the valleys and the creation of Mombasa Island surrounded by deep natural creeks, ports and harbors such as Kilindini, Tudor, Makupa, and Old Port creeks. Other notable physiographic features include the fringing coral reefs, cliffs and tidal flats, sandy beaches, the coastal plain and a hilly severely dissected and eroded terrain (Mombasa County, 2013).

3.2.5 Kwale County

The County has four major topographic features namely the Coastal Plain, the Foot Plateau, the Coastal Uplands and the Nyika Plateau. The coastline in Kwale County is about 250 kilometres. This strip of land consists of corals, sands and alluvial deposits. The Foot Plateau, which is behind the Coastal Plain, lies at an altitude of between 60 and 135 meters above sea level. The plateau has a flat plain surface with high potential permeable sand hills and loamy soils. This zone is composed of Jurassic rocks and sandy hills consisting of Magarini sands ideal for sugar cane growing.

The county also is known for its white sand beaches and the land formations is a build-up of eroded reef material, i.e. coral sand when it is deposited on the inshore side of the reef. It forms a stretch of coastline covering approximately 250 km. Further, the area has one of the most productive coral reefs which occur as coral flats, lagoons, reef platforms and fringing reefs. They cover an estimated total area of 50,000 Ha. Stony coral cover averages between 30% and 40%.
The Coastal Uplands, commonly known as Shimba Hills rise steeply from the foot plateau at an altitude of between 135 to 462 meters above the sea level. This topographical zone is made up of many sand stones hills that include the Shimba Hills (420m), Tsimba (350m), Mrima (323m) and Dzombo (462m).

The Nyika Plateau, also referred to as the hinterland, rises gradually from about 180 meters on the western boundary of the county. The region is underlain by basement rocks system with exception of occasional patches of reddish sand soils. Occupying over a half of the county, the region is semi-arid, and the soils are generally poor. Geologically, the area is underlain by four groups of rocks. The basement rocks which occur as gneisses schists, quartzites and granitoids, and crystalline limestone found in the North West. The Karoo Sediments also called Duruma Sandstones (the Taru Formation, the Maji-ya-Chumvi Formation, the Mariakani Formation and the Mazeras Formation) which cover the middle strip of the county to the foot of Shimba Hills. Thirdly, the rock underlying the Coastal strip (the Jurassic –Cretaceous Rocks) which includes Kambe limestone found between the North East of Shimba Hills and on the Western shores of Mombasa Island. Lastly, there are recent sediments and deposits which consist of the Marafa and the Magarini formations (Kwale County, 2013).

3.3 Meteorology

3.3.1 Lamu County

The county enjoys two rainy seasons and temperatures ranging between 23^0 and 32^0C throughout the year (Lamu County, 2013).

3.3.2 Tana River County

The region has a hot and dry climate within ecological zones ranging from III (in the very high grounds) to VII (in the plains or lowlands). Average annual temperatures are about 30^0C with the highest being 410C around January-March and the lowest being 20.6^0C around June-July. Rainfall is low, bimodal, erratic and conventional in nature. The total annual rainfall ranges between 280 mm and 900 mm with long rains occurring in April and May, short rains in October and November with November being the wettest month. The Inter Tropical Conventional Zone (ITCZ), which influences the wind and non-seasonal air pattern for the river Tana, determines the amount of rainfall along the river line. The dry climate in the hinterland can only support nomadic pastoralism (Tana River County, 2013).

3.3.3 Kilifi County

The average annual rainfall ranges from 300mm in the hinterland to 1,300mm at the coastal belt. The coastal belt receives an average annual rainfall of about 900mm to 1,100mm with marked decrease in intensity to the hinterland. Areas with highest rainfall include Mtwapa and to the north of the coastal strip around the Arabuko Sokoke Forest. Evaporation ranges from 1800mm along the coastal strip to 2200mm in the Nyika plateau in the interior. The highest evaporation rate is experienced during the months of January to March in all parts of the county. The annual temperature ranges between 21^o C and 30^oC in the coastal belt and

between 30°C and 34°C in the hinterland. The county experiences relatively low wind speeds ranging between 4.8 km/hr and 12 Km/hr (Kilifi County, 2013).

3.3.4 Mombasa County

The County lies within the coastal strip in the hot tropical region where the climate is influenced by monsoon winds.

i. ***Rainfall: -*** The rainfall pattern is characterized by two distinct long and short seasons corresponding to changes in the monsoon winds. The long rains occur in April – June with an average of 1,040 mm and correspond to the South Eastern Monsoon winds. The short rains start towards the end of October lasting until December and correspond to the comparatively dry North Eastern Monsoons, averaging 240mm. The annual average rainfall for the county is 640mm

ii. ***Temperature: -*** The annual mean temperature in the county is 27.9^{0}C with a minimum of 22.7^{0}C and a maximum of 33.1^{0}C. The hottest month is February with a maximum average of 33.1^{0}C while the lowest temperature is in July with a minimum average of 22.7^{0}C. Average humidity at noon is about 65 per cent (Mombasa County, 2013).

3.3.5 Kwale County

The county has monsoon type of climate which is hot and dry from January to April/May, while the period from June to August is the coolest in the year. Rainfall is bi-modal with short rains being experienced from October to December, while the long rains are experienced from March/April to July. The total annual precipitation varies from 900mm– 1500mm per annum along the coast to 500mm to 600mm per annum in the hinterland. The average annual rainfall ranges from 600mm in the hinterland to 1200mm at the coastal belt. The coastal belt receives an average annual rainfall of a 1000mm with a marked decrease in intensity to the north and the hinterland. Average temperature ranges from 26.3^{0}C to 26.6^{0}C in the coastal lowlands, 25^{0}C to 26.6^{0}C in Shimba Hills, and 24.6^{0}C to 27.5^{0}C in the hinterland (Kwale County, 2013).

3.4 Biodiversity

3.4.1 Lamu County

Forests cover 11.5% of total county land surface area.428 km^2 of these forests or 64% of total forest cover is gazetted hence protected against commercial exploitation. These include 382 km^2 of mangrove forest and 46 km^2 of Witu forest. The non-commercial activities cover 280 km^2 comprising of Lingi forest, Boni forest and Lake Kenyatta buffer zone. More and more farmers and institutions are now participating in agro-forestry. The main forest products include the Mangrove poles used for construction, firewood, charcoal and casuarina poles. There are three 3 national reserves, two national parks and three private ranches which are home to several species of wild animals. They include Dodori National Reserve, Boni National Reserve, Kiunga Marine National Reserve and Witu Forest reserve (Lamu County, 2013) (Bidlife International Africa, 2019).

3.4.2 Tana River County

The county is dominated by complex ecosystem of high canopy coastal, riverine forests, wooded bush land and thickets as well as the grasslands and mangrove forests covering 355,688.65 ha. The species that are dominant in high canopy forest area include; *Chlorophora excelsa, Penicum spp, Manilkara zasibarensis, Brachilina brichantha, Terminalia spp.* Wooded bush is dominated by *Hyphaene coriacea, Terminalia spinosa, Digitaria milinjiana, Panicum infestum.* Grassland is dominated by *Echinochika spp, Sporobolus halvolus, Panicum spp, Cynodo dactylon.* Mangrove swamps forests include *Brugeira spp, Avecenia spp.* In the dry lands, dominant species include the *Acacia spp, Dobera glabla, Salvodora persica and the invasive Prosopis spp.*

The Tana Delta is listed as a Ramsar site; UNESCO tentative site of cultural and natural heritage (*https://whc.unesco.org/en/tentativelists/5514/);* and a listed International Bird Area (IBA). The Tana River delta contains a very wide variety of habitats, including riverine forest, grassland, woodland, bushland, lakes, mangroves, dunes, beaches, estuaries and coastal

waters. Small fragments of riverine forest, not nearly as extensive as the forests north of Garsen (see KE023), occur along the present or former river courses. Seasonally flooded flood-plain grasslands cover 67,000 ha of the delta. West of the flood-plain is a diverse bushland (Bidlife International Africa, 2019).

Tana Delta's key biodiversity

a) ***Birdlife: -***

The Tana River delta is a stronghold for two Near Threatened, restricted-range species, *Anthus melindae* and *Acrocephalus griseldis* (probably its main wintering ground). *Circaetus fasciolatus* is uncommon in riverine forest but has not been recorded in recent surveys. Internationally important populations have been recorded here for no fewer than 22 species, making the delta one of the key sites in the country for water bird conservation.

The Tana delta also supports one of the very few breeding sites for colonial water birds in Kenya. This heronry is near Idsowe, south of Garsen, on Ziwa la Matomba, a seasonally-flooded lagoon where the bird's nest in a thicket of *Terminalia brevipes*, usually between May and September but also at other times if the lagoon is flooded. Up to 5,000 colonial water birds of at least 13 species have been recorded nesting here, including *Anhinga rufa* (up to 100 pairs), *Ardea cinerea*, *A. purpurea*, *Egretta ardesiaca, Ardeola ralloides*, *Nycticorax*, *Casmerodius albus*, *Mesophoyx intermedia*, *Egretta garzetta*, *Anastomus lamelligerus*, *Threskiornis aethiopicus*, *Plegadis falcinellus*, and *Platalea alba*. Mwamba Ziwayuu, a small coral platform offshore from the Tana estuary, is a resting site for significant numbers of *Sterna saundersi* and *S. bengalensis* that feed in Ungwana Bay. Regionally threatened species include *Casmerodius albus*; *Ephippiorhynchus senegalensis* (a regular visitor in small numbers, May to September) and *Turdoides squamulatus* (local and uncommon) (Bidlife International Africa, 2019).

b) ***Other biodiversity: -***

The importance of the Tana River delta lies in the expanse, intactness, variety and productivity of its habitats. The flood-plain is grazed by a number of ungulates, including the restricted East African coast subspecies of the ungulate *Damaliscus lunatus topi*, with some 30,000 or so in the area. The rivers and channels support large numbers of *Hippopotamus amphibius* (estimated at 400–450) and *Crocodylus niloticus*. Ungwana Bay is one of the few places where *Dugong dugon* critically endangered in the region, has been recorded recently. The turtles *Chelonia mydas*, *Eretmochelys imbricata* and *Lepidochelys olivacea* nest on the sandy beaches. Twenty-two freshwater fish species are recorded from the lower Tana, including three eels *Anguilla* spp. and a distinct subspecies of *Petrocephalus catastoma*. The mangroves provide vitally important spawning and nursery grounds for many species of fish and crustaceans. The extensive mangrove forests include the only significant stands in Kenya of the plant *Heriteria littoralis*, and two other plant species that are considered threatened *Xylocarpus granatum* and *Bruguiera gymnorrhiza.* At least 280 plant taxa are recorded for the delta, and many more undoubtedly occur as there has been no thorough botanical survey; of these, 18 are considered rare in Kenya or globally (Tana River County, 2013).

3.4.3 Kilifi County

Wildlife in the county is mainly found in the Arabuko Sokoke Forest Reserve, Malindi Marine Park and Watamu Marini Reserve. In Arabuko Sokoke Forest Reserve, there are 240 birds‟ species, 261 butterflies, 79 amphibians, 52 mammals and 600 plants species. The Clarke's Weaver is completely endemic to the forest, while the Sokoke Scops Owl, Sokoke Pipit, and east coast akalat, Amani Sunbird and Spotted Ground Thrush are only found in the park and a few in Tanzania. These mammals are also endangered species: Aders Duiker, Sokoke Bush Tailed Mongoose, and Golden rumped elephant shrew. The Malindi Marine Park is endowed with magnificent resources such as fringing reefs, coral gardens in the lagoons, sea grass beds, mangroves, mudflats, and high fish diversity, marine mammals (e.g. dolphins), turtles and various species of shorebirds. In Watamu Marine Reserve, habitats include intertidal rock,

sand and mud, fringing reefs and coral gardens, coral cliffs, sandy beaches and the Mida Creek mangrove forest. Marine life attractions include fish, turtles, dugongs and crabs. The Mida Creek forest has a high diversity of mangrove species that provide refuge to a variety of both resident and migrant bird species (Kilifi County, 2013).

3.4.4 Mombasa County

The county has a natural forest of approximately 300 ha and 138 acres of agroforestry as 2013 as per the Mombasa County CIDP, 2013. It is home to mangrove forests, protected by KFS, and several indigenous trees. Wildlife in the county majorly found in the Marine ecosystem, natural terrestrial habitats and the in the private sanctuaries. Buffaloes, wildebeests, giraffes, hippopotamus, tortoise, birds and butterflies are some of the wildlife in the County. Marine parks are home to a colourful variety of marine species including crabs, starfish, stone fish, cucumbers sea urchins, corals, turtles, sea grasses and interesting migratory birds including crab plovers (Mombasa County, 2013).

3.4.5 Kwale County

The total area covered by forests in the region is about 7 per cent, 54,544 hectares (35,043 hectares gazetted, and 19,500 hectares not gazetted). The following categorization of the vegetation will support their sustainable management.

Terrestrial Wildlife: The remnant of the tropical forest in the region has been gazetted for conservation as the Shimba Hills National Reserve and the Mwaluganje Elephant Sanctuary. Among animal species found in the reserves are elephant, eland, sable antelope, giraffe, yellow baboon, Angolan columbus, sakes monkey, Grimm's bush buck, hyena, leopard, buffalo, and water back. In the ranches of Kinango and Samburu Division, the following animal species are found zebra, impala, Grants gazelles, eland oryx, gerenuk, lesser kudu and lion. Some of these ranches such as Kuranze have potential for tourist's attraction. The sable antelope has been gazetted as endemic. The County has also recorded 111 forests birds' species of which 20 are coastal birds.

Marine Wildlife: The mangrove forests and sea grass beds perform vital functions in protection and enrichment of the coast eco-system. They serve as habitat for many species of fish octopi and holothurians that are exploited commercially. Mangrove forests are habitat for a variety of terrestrial and aquatic plants and animals. The terrestrial fauna includes many species of birds, reptiles, mammals and insects. The aquatic fauna includes prawns, crabs and molluscs. Sea grass beds are also feeding ground for endangered species such as the green turtle, the hawksbill turtle and the dugong. The Kisite Mpunguti Marine Reserve has been established to protect and conserve some of the endangered species and their breeding grounds (Kwale County, 2013).

3.5 Environmental challenges and risks

All counties under study face similar environmental threats and risks as shown below: -

Flooding: - Flooding is the lower parts of the coastal area: the coastal plains, especially during the long heavy rains when it rains both on-shore and off-shore leading to surging of waters along the coastal strip.

Insecurity and Terrorism: - The coastal strip due to its inherent location to the highly polarized country of Somali it is at eminent risk of attacks from the insurgents. Additionally, the coastal area in the recent past has experienced militia operations especially in Mombasa and Kilifi and Tana River Counties. In the past 10 years isolated cases have been reported of Al Shabaab attacks in Mombasa and Lamu.In Tana River County, some residents are in possession of small arms for their protection and for retaliatory attacks.

Tsunami: - Tsunami hazard assessment has shown that the Kenyan coast is vulnerable to tsunamis that are generated in Indian or Pacific oceans (Amollo 2007). Simulations have

shown that the region can experience tsunami wave heights of up to 2m high and inundation extent is greatest in the unprotected areas reaching about 500m inland. However, Kenya has only recorded one tsunami in its history, that of the 2004 Indian Ocean tsunami.

The tsunami reached Kenya and is the first recorded tsunami in Kenya (Ngunjiri 2007). It came at low tide and was consequently less damaging than to other countries, especially those closer to the epicentre of the earthquake. One person was reported dead and there was property destruction of varying magnitudes along the entire coastline, especially to the fishing industry. Malindi Bay and Lamu. Assessing seismic risk in Kenya were most affected by destruction of fishing gear, boats and lost man-hours, which was due to these areas being wide, shallow and open (MSSP n.d.).

Kenya has a 600km long coastline, with Mombasa as the principal Kenyan seaport and a number of settled communities and establishments based on the coast. The coastal region is low-lying and is characterized by a fossil reef that lies a few meters above sea level. Kenyan mangrove forests, which have served as a defence against strong waves, have been over-exploited, and in some cases destroyed with the areas converted to other uses such as for salt ponds. This has left vast areas bare leading to coastal erosion and lack of protection against storm surges and tidal waves (MSSP n.d.).

3.5 Demographics

3.5.1 Lamu County

The county is made of cosmopolitan population composed of indigenous communities made of Swahilis, Arabs, Korei, Boni and Ormas and migrant communities from the rest of the country. The county population as projected in 2012stands at 112,551 persons composed of 58,641 males and 53,611 females (GoK, 2009) (Lamu County, 2013).

Lamu County is home to the following vulnerable and marginazlied groups in Kenya as per the constitution: Bajuni, Awer, Somali and Ilwani.

3.5.2 Tana River County

According to the KNBS population census of 2009, /the total population of Tana River County was 240,075, with 119,857 males and 120,218 females. The mean population density of the Tana River County was 6.25 persons/km$^{2.}$ The County comprises of the dominant Pokomo and Orma tribes, and Wardei Tribe. Other communities along the coastal areas of the county include the Mijikenda, Waata, Awer, Wailwana, Malakote and Bajuni (GoK, 2009) (Tana River County, 2013). These communities are identified as vulnerable and marginalized: Waata, Awer, Wailwana, Malakote and Bajuni.

3.5.3 Kilifi County

The population of the county was estimated to be 1,217,892 in 2012 as projected in the Kenya Population and Housing Census 2009, composed of 587,719 males and 630,172 females. The population is projected to rise to 1,336,590 and 1,466,856 in 2015 and 2017 first Kilifi County Integrated Development Plan (CIDP) 2013- 2017 respectively at growth rate of 3.05 % per annum (Kwale County, 2013). The county is home to the Waata and Swahili who are classified as vulnerable and marginalized.

3.5.4 Mombasa County

Population distribution and settlement patterns in the County are influenced by proximity to vital social and physical infrastructure networks such as roads, housing, water and electricity. Other factors that influence settlement patterns include accessibility to employment opportunities, and security. The total population of the county in 2009 was 939,370 persons of which 484,204 and 455,166 were male and female respectively. It was projected to be 1,051,825 in 2012 and will rise to 1,271,920 persons by 2017.

The County had a population density of 6,131 persons per Km^2 in 2009 which was projected to increase to 6,640.5 persons/ km^2 by 2015 owing to high population growth contributed to by the increased numbers of people seeking employment in the manufacturing, service and processing industries, the Port of Mombasa, Kenya Ferry Services, Container Freight Terminals, go downs and hotels. Highly populated areas are in Majengo, Bamburi, Bangladesh, Mikindani, Jomvu, Miritini, Migadini, Port Reitz, Mishomoroni and Bombolulu among others. The County has various settlement schemes namely Mwakirunge, Jomvu-Kuu, Bububu-A, Shika-adabu, Vyemani, Mwembelegeza and Majaoni (GoK, 2009) (Mombasa County, 2013). The County is home to the Swahili community grouped as vulnerable and marginalized.

3.5.5 Kwale County

The total population of Kwale County is projected to be 713,488 persons in 2012 comprising of 346,898 males and 366,589 females. This is a 9.8 per cent increase from 649,931 in 2009. The county population growth rate is 3.1%, and the sex ratio is 95 males per 100 females. Kwale County has three major towns namely Kwale, Ukunda/Diani and Msambweni with a population of 28,252, 62,529, and 11,985 persons respectively in 2009. The other major urban centres are Kinango, and Lunga-Lunga with a population of 7,958 and 3,670 persons respectively. Population density and distribution in Kwale County is strongly influenced by the topography and the agro-ecological set-up. Significant variations in density occur at the divisional level. The Kwale County population density was 86 persons/km^2 in 2012. The density varies from a minimum of 57 persons/km^2 in Kinango Constituency to 376 persons/km^2 in Msambweni Constituency (Kwale County, 2013) (GoK, 2009). The County is home to the Waata, Wakifundifundi, Washayu Watwaka/ Wachwaka and Duruma who are identified as vulnerable and marginalized groups in Kenya.

3.6 Electricity grid infrastructure

3.6.1 Lamu County

The County is currently connected to the National Grid through the Rabai- Malindi-Garsen – Lamu 220kV Transmission Line.

3.6.2 Tana River County

The county is connected to the grid through the Garsen – Hola - Garissa 220kv Transmission Line and Rabai- Malindi- Garsen- Lamu 220kV Transmission Lines with an operational 220/132/33kV substation at Garsen and a planned one at Hola.

3.6.3 Kilifi County

The County is connected to the National Grid with an operational 220/132/33kV substation located in Malindi. There are plans to set up a 400kV substation at Mariakani connected to Rabai Power Station (under the Rabal-Kilifi Electricity Transmission project is to enhance power supply to the cement plants and tourism complexes in the Mombasa-Kilifi area) and Isinya 400/220kV substation in Kajiado via the Mombasa- Nairobi 400 kV Electricity Transmission Project.

3.6.4 Mombasa County

The Kipevu power plant produces power which is fed into the national grid. There are plans to construct an 800MW LNG power plant in Dongo Kundu grid area. KETRACO in 2017 commissioned the Mombasa- Nairobi 400/220kV Transmission Line that connects Mombasa to Isinya 400/220kV substation. Plaans are underway to build more transmission lines in connecting the County such as: Mariakani Dongo – Kundu 400 kV Transmission Line, Rabai – Bamburi 132 kV Transmission Line.

3.6.5 Kwale County

As at 2013, the County had 10.6 per cent of households having electricity connections. The towns along the major road have access to electricity, which is unreliable due to frequent interruptions that affect investment and productivity in the county. Inadequate distribution of rural electrification stifles local development efforts and stagnates the economy. The county

relies on the national grid for its electricity need and has the potential for production of its own solar and small scale hydroelectric energy, which has not been exploited. KETRACO is however planning to put a line connecting Kwale at Lunga to Galu via a 132kV line with a 132/33kV substation at Lunga (Kwale County, 2013).

3.7 Transportation Infrastructure

3.7.1 Lamu County

The county has a total road network of 688.6km, and only 6km of this is tarmacked, thus, making travelling by road a nightmare and impassable during the rainy season. There are two main roads, Mokowe-Garsen road which connects the county to the rest of the coast counties and the county and Mokowe –Kiunga road which connects the county to Somalia border.

There are eight main jetties which inter link the main land to Islands and between Islands. These include Amu, Mokowe, Manda, Matondoni customs fisheries and hospital jetty, while Amu, Mokowe, Matondani and customs jetties are in fairly-serviced conditions, the rest are in deplorable state and need urgent rehabilitation The Lamu-Faza sea way is plyed by semi-motorized dhows and speedboats are the major transport route linking the far flang Island to the rest of the county. The challenges faced on this route include black spot near Manda, the lengthy time by dhows and huge fuel costs and limited capacity by the operating speedboats.

There are 13 airstrips, 11 public and 2 private. Manda is the main airstrip with 3 airline companies providing daily passenger flights. The rest of the airstrips are not very active. The county has no rail transport. The LAPSSET project is envisaged to transform the county transport infrastructure. The benefit from this project is far into the future, considering the myriad of challenges being faced. It is therefore prudent for the county to develop its transport infrastructure independent of LAPSSET project, if it has to attain its development objectives (Lamu County, 2013).

3.7.2 Tana River County

The total road network in the county is 3,377km with about 55% in motorable condition. The total road network is composed of 1,108km (class A – E) of classified roads and 2,269km (class U) of unclassified roads. Out of this only 449km is bitumen surfaced. The major roads in the county includes the Madogo – Hola – Malindi road which is dilapidated. The county boasts of seven airstrips with major ones located at Hola, Bura and Garsen, the county has a 76km sea front with Kipini operating as a fish landing site which can be potential sea port for fishing vessels. The LAPSSET project will potentially open up the county with road and rail network (Tana River County, 2013).

3.7.3 Kilifi County

The entire road network covers about 3000Kms. Of this 1,320 km is rural classified network, about 450kms is national classified network and the rest are unclassified. Approximate 30km of rural county roads are to bitumen standards, 220Km of rural county roads are gravelled and the rest are earth roads. The county has Malindi airport, Kilifi and Kijipwa airstrips to cater for the expected increase of visitors and residents in the county (Kilifi County, 2013).

3.7.4 Mombasa County

There is more than 300km of bitumen surface roads, 250 km of gravel roads and 91 km of earth surface roads in the county. The Likoni Ferry links the island to Likoni and subsequently to Kwale and Tanzania through Lunga-Lunga Boarder. The county has 10k of railway line and three railway stations. The port of Mombasa being a key resource and gate way to the East and Central African Regions. The county hosts an international airport and airstrips in Kisauni sub-county (Mombasa County, 2013)

3.7.5 Kwale County

Kwale County has a total of 1,483.1km of classified roads of which 187.7km are bitumen surface (paved surface), 425.2km is gravel surface and 871.2km of earth surface roads/rural access roads. An international trunk road traverses the county from Mombasa to Lunga on

the Kenya – Tanzania border. On the northern side the Mombasa – Nairobi Highway virtually forms the boundary of Kwale and Kilifi County. There are 4 kms of railway line and four (4) airstrips at Ukunda/Diani, Shimba Hills National Reserve, Msambweni and Kinango although only one is operational. Air transport has contributed to the growth of tourism sector, which significantly contributes to the economic growth of the county. There is a small port at Shimoni and Vanga which is mostly used for water transport by boats controlled by Kenya Wildlife Service. Water transport potential in the county remains largely unexploited (Kwale County, 2013).

Annex III: Consultation and Public Participation Minutes

The list below are all the regions that were consulted: -

1. Embu	**11. Homabay**
2. Meru	**12. Siaya**
3. Murang'a	**13. Kericho**
4. Nyeri	**14. Bomet**
5. Garissa	**15. Busia**
6. Kisumu	**16. Nandi**
7. Kitui	**17. Uasin Gishu**
8. Lamu	**18. Turkana**
9. Tana River	**19. Nairobi**
10. Migori	

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 4

Venue Lyco Hotel and Resort Regency, Nairobi

Date 19/07/2019

Present Annexed

This minute serve as the record of the meeting included the Proponent, Nuclear Power and Energy Agency (NuPEA), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of government agencies (Stakeholders) for the Strategic Environmental and Social Assessment for the Kenya nuclear Power Programme.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback from the participants.

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and NuPEA was given the opportunity to share a brief about the project. The NuPEA legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

NuPEA was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2037. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by NuPEA in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	Why did the government decide to go for Nuclear Power amidst other sources of energy like hydro, solar and wind energy?	1. National Position – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		different sources of energy to ensure a cheap reliable electricity.
	Which type of reactor technology will be considered for the Nuclear Plant? And what safety measures are put in place to ensure the same technology is up to date.	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	In the SEA has there been a consideration of alternative technologies? Where is the Uranium used for fuel fabrication been sourced from?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	How will electricity generated from the nuclear power plant be transmitted? Will the currently electricity grid holds the current?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	What is the volume of water used by a nuclear power plant for cooling? In the site selection, Tana River was identified as one of the sites in the coast region. Is this site to use the water from the Tana river or Indian Ocean? What are the advantages and disadvantages of using fresh and salty water? In NPP siting activities have the dynamics of land access been considered? In the NPP siting has there been consideration of water related treaties such as the Nile Treaty?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	What are the project economics? Nuclear is very expensive. This plant is at what cost to the country?	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
		7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel,

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	No issue Recorded	machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	This kind of power deal is good, but we must be sure that due diligence is done and consulted. Has the nuclear power programme considered the East Africa Community policies? What is the legal system in place? How does it interact with nuclear security during transport and during storage?	8. Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	Are there national regulations on radioactive waste management?	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	How is the nuclear power programme considering conflict resolution? Has the NuPEA considered liaising with the national authority in charge of water resources in order to familiarize with restrictions in water abstraction for power generation?	10. Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	How does the county of Embu participate in the process, if it hosts the plant? Who will be operating the nuclear plant? There is still a distinction between what we say and what we do? Our management culture may not be adequate for a nuclear plant?	11. Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	In human resource development for the nuclear power programme has the government considered exploiting the potential within the	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	country especially in the non-engineering areas?	nuclear facilities in different partner countries like S-Korea, China and US.
	How will the procumbent for the appropriate technology be conducted?	13. Procurement – local workforce competence is being developed to implement an NPP procurement, with legal, - contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	Do we have the capacity to manage the accidents? What studies and preparations are we undertaking?	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
	Nuclear is related a lot to "accidents". Risks related to nuclear are very high. The key word is "Safety". We need more detailed studies.	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	Has the nuclear power programme considered disaster management? What is the arrangement for the physical security of the plant? How do we manage the potential for terrorism?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	Do we have the capacity to manage the accidents? We need more detailed studies.	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		sustain resilience of vulnerable communities to hazards.
	In terms of sustainable development, does nuclear energy fall under the category of green energy? We need more detailed studies. How are we managing the environmental issue anticipated and arising with regards to the development of nuclear power?	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	Is there a risk of radioactive waste dumping from NPPs in Kenya?	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	Nuclear Waste storage issues are critical. We have heard of "storage" of nuclear in north eastern? What are the measures being put in place to ensure proper management of radioactive waste?	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Team Lead & NEMA Lead Expert Signature: **JT** Date:**20/07/2020**

Signature: **JK** Date: **21/07/2020**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue **Meru County Government Offices**

Date 21/06/2018

Present Annexed.

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Meru County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Mr. Kinoti Mwebia: Chief Officer Environment; Director Environment	Energy stakeholders in the country are critical players. In Kenya, politics of nuclear will require a lot of public awareness.	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
and Chief Officer Energy	Many people look at the negative issues and need to be educated. The cost of power is very high. Is Kenya Power part of this? Can we have another power company competing. Is the energy bill 2018 allow transmission & retail competition?	
	No recorded issue	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	A water-based reactor is being considered by the country and what are the key risks?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	KETRACO is like a Road where all the power generated passes on the way to distributers and consumers.	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	Meru is sited because of the Tana River and the potential for siting along the river of a PWR NPP facility.	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No recorded issue.	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	We have Iron in Meru and exploration needs more power. How can industries be involved in Nuclear Power generation?	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	We need industries that can create jobs for more people.	
	This requires legislation to guide the different key issues? Nuclear law? To effectively regulate concerns like waste and environment management.	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	Nuclear requires a good regulatory and institutions to regulate the different compartments of an NPP?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	Public participation is important and should be done through Meru Social Economic Commission and will help drive Meru's Vision 2040 Strategy: starts with the Elite – then platform with the governor; county assembly engagement and MP's meeting. The 13-county admin committee and the sub-county dev. Committee all participate	**10.Stakeholder Involvement:** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	Social Concerns should Meru host the NPP include: Job creation for the citizens; Livelihoods restoration and improvement; Land acquisition in a sustainable way; engagement with county using established structures	**11.Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	No issue recorded	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	No issue recorded	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, - contractual, physical construction, financing and

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards.
	No Issue Recorded	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	No issue Recorded	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	No Issue Recorded	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	No Issue Recorded	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.
	Key concern we have with nuclear power plant would be environmental impacts related to nuclear, pollution and waste disposal management	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	Protection from environmental radiation	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	Radioactive waste management is a key issue and the NPP must find clean ways of managing radioactive waste. The interventions must also benefit the locals	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert	Signature: **WO**	Date: **23/06/2018**
	Signature: **JT**	Date: **24/06/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Murang'a County Government Offices

Date 18/06/2018

Present Annexed.

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Murang'a County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	What is the motive behind the nuclear project? The information given here is not adequate. The package to sell nuclear to Kenya has to be watertight. Involve the Murang'a cabinet, political	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	players and informed public participation.	
	Let us have all disclosures through more dialogue before we can make choices. Many African countries will benchmark with Germany which is phasing out nuclear, why is Kenya proposing it for power generation now	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	We don't have disclosures about what exact designs are being proposed, how they work and how they could affect us.	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
		4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	If the siting is in Central Kenya there has to be more information, more sensitization and inclusion of other stakeholders.	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	Please do, complete disclosure of the project, how will we finance it? We must be very careful about international investors who only want to make money from projects that don't benefit us.	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue Recorded.	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	More disclosure on what legislative framework will nuclear operate under and how will host and surrounding	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	counties be protected, benefit and participate.	nuclear power plants to be established, operated and decommissioning.
	We had a landfill proposed in Murang'a and not all disclosures were given. We don't want another project with the same challenges. What is the regulatory framework with which institutions, under what supervisions?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	Country & county needs to be sensitized about nuclear. involve the political people in a project like this early. Involve the cabinet and provide full disclosure about the project so that we are operating from transparent space.	**10.Stakeholder Involvement:** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	What you have shared is insufficient to know if the management will be better that what we have seen in Kenya. What management plans are there for NPP proposed.	**11.Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	What you have shared is not sufficient. Do we have skilled manpower and personnel to operate, maintain and comply with international nuclear requirements?	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
		13. Procurement – local workforce competence is being developed to implement a NPP procurement, with legal, - contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
		14. Nuclear Safeguards: - Kenya has shown political goodwill and taken

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	I can only support it if the risks associated with nuclear are full disclosed	necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	What are the safety issues around nuclear that you have not disclosed? What should we be thinking about when dealing with nuclear safety issues?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	Are we being used by the international countries only interested in dumping investments to take care of their interests?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	No issue Recorded	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.
	I will support the project if the project is done according to procedure and fulfils all the fears of stakeholders in Murang'a.	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	No issue Recorded	**19. Radiation Protection:** The country is upgrading management systems for

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		exposure to nuclear radiation beyond acceptable legal limits.
	The issue of nuclear waste has to be clear disclosed if I will be able to support the project.	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert Signature: **WO** Date: **19/06/2018**

Signature: **JT** Date: **20/06/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Tana River County Government Offices

Date 12/07/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Tana River County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

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- Gather any comment and feedback

Introduction

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Issues/Concerns/Comments Raised by the Stakeholders

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Salim Bagana- C. Secretary G. Madubi- Deputy Dir Water Ali Barhe- Dep. Dir.	Nuclear is something nobody wants to touch. Nuclear is for developed countries not developing countries like Kenya.	1. National Position – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Abdulahi Omar-Dir. Environment	Marginalisation funds is a big issue to help us have infrastructure like others	
Salim Bagana- C. Secretary G. Madubi-Deputy Dir Water Ali Barhe-Dep. Dir. Abdulahi Omar-Dir. Environment	Do we have uranium in Kenya?	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	What Kind of reactor technology are we planning? What happens if there is water scarcity? What water impacts are we looking at on the river?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	How will the electric grid be upgraded to bring power to more people including in Tana River?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear.
	Have you sited Tana River? This should not be brought to this county? The receding rivers agriculture is displacing many along the Tana river! Livelihoods are disappearing!	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	Kenya's ability to mobilise finance is good, how sure are we that we are able to get the $500m for this kind of project? This will cost us our live times! We will pay it until we die.	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No Issue was Raised	7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	How is the legislative framework that will manage the nuclear power plant? Even if we are working with	8.Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Salim Bagana- C. Secretary G. Madubi- Deputy Dir Water Ali Barhe- Dep. Dir. Abdulahi Omar-Dir. Environment Salim Bagana- C. Secretary G. Madubi- Deputy Dir Water Ali Barhe- Dep. Dir. Abdulahi Omar-Dir. Environment	IAEA are, we sure we are going to keep the nuclear laws?	power plants to be established, operated and decommissioning.
	What is the regulatory framework that will manage the nuclear plant?	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	Tana River is very large, and we don't represent the whole county. How can we ensure these critical issues are discussed by the whole county stakeholders? We didn't benefit from the seven folks. How will we benefit from this project?	10.Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	Knowing this country, I am marginalised because of history. How will we allow this to go on marginalizing our communities and county? I am traumatised. Who will run the NPP for Kenya?	11.Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	What kind of Nuclear Human Resource does Kenya have? Are there representatives of the county in the decision-making system of the project?	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	No Issue Raised	13. Procurement – local workforce competence is being developed to implement a NPP procurement, with legal, - contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	Are you working with IAEA and how are they supervising the Kenya nuclear case?	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC)

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Salim Bagana- C. Secretary G. Madubi- Deputy Dir Water Ali Barhe- Dep. Dir. Abdulahi Omar-Dir. Environment		according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	What assurances for our safety do we have for having this nuclear facility in Kenya	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	What happens if there is a terrorist attack on such a facility?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	What happens in case of an Emergency? What happens in counties like ours where all systems are very basic and we cannot even manage flooding, we have no health facilities etc	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
	I am down-stream of the tana River, how sure are you that the environmental effects and the negative impacts will be managed to care for us the marginalised parts of this country? What Kind of reactor technology are we planning? What happens if there is water scarcity? What water impacts are we looking at on the river?	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Salim Bagana- C. Secretary G. Madubi- Deputy Dir Water Ali Barhe- Dep. Dir.	What about radiation effects?	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	This project should not be brought to Tana River, we fear Radio Active waste will	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Energy Dep. Abdulahi Omar-Dir. Environment	be an issue that is difficult to manage.	burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Expert Signature: **WO** Date: **13/07/2018**

Signature: **JT** Date: **14/07/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Nyeri County Government Offices

Date 22/06/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Nyeri County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	Of course, there are concerns about nuclear, which the project will have to deal with. New technologies are very bad. Take asbestos e.g. we have been using it in our hospitals & schools for years. Now they say it is poisonous and must be removed. As a county and country, we really need cheap power. We need a national campaign on nuclear like the one Kanu political party did in the early days of independence.	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.
	There is a big knowledge gap about nuclear in Kenya.	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	What better technology of nuclear is out there that makes it acceptable in Kenya removing the risks we know? There are smaller reactor models that can be used at the county level for small sustainable power needs like the ones used by submarines in the west. In the future we look to those areas.	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	How will the project make power more accessible to the of people of Nyeri?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	It is going to be sited in Nyeri? What are the issues being looked into in siting?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	The financing will require a lot of money, we must also get something for the people in the areas it is sited.	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	As a country we must industrialise, and our industries must be involved in projects like	**7. Industrial Involvement: -**

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	these both at the county and nationally. How will this project help Nyeri industries?	At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	The legislative process should be developed that enables the country to achieve its objectives of development but also to assure people of their safety and benefits.	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning
	The regulatory institutions should be able to ensure that the NPP runs according to agreed terms since it is a very sensitive project.	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	We need a nation information and awarenes campaign to sensitize the people on nucle power in Kenya. It should involve politicians, ar all citizens at their level. That is the only way ensure a buy in. The ordinary mwananchi mu understand. But for me, we need this project lik yesterday.	**10.Stakeholder Involvement:** involvement of key statutory & no statutory stakeholders is expected enable the development ar sustenance of a national position c nuclear. SESA provides an initi involvement opportunity that will b continues towards the nation position. Siting and ESIA will includ more specific involvement.
	Misinformation in Kenya will need to be manage	**11. Management:** Effective & standa KNPP Management requires proper established institutions, adequa resources, manpower and finance organized over all the phases of KNP activities. KNPP manageme standards entrust high level of safe culture to enhance safety.
	We need to train more people at county ar national level to be able to operate the NPP. It w take time and a lot of time, but we can do it in th long term. It's great to hear there are alread training and development of human resource f the Kenyan NPP.	**12. Human Resources: -** A strateg development of the knowledge ar skills necessary to purchase, operat maintain and comply within th regulatory requirements of a nucle power, is on-going, spreads acros most scientific and engineerir disciplines, includes exposure similar nuclear facilities in differe

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		partner countries like S-Korea, Chir and US.
	This is a big area of challenge for a country lik Kenya especially for the large projects, wh plans does the project have to manag procurement?	**13. Procurement** – local workforc competence is being developed implement a NPP procurement, wi legal, -contractual, physic construction, financing ar environmental issues that weigh in c the quality and context of th procurement of nuclear facilities. It ma include upgrading the procurement ac local content & standards
	Nuclear has many concerns that must be dea with to make people understand and appreciat through effective and continuous communicatio planning like the one KANU used during Moi er	**14. Nuclear Safeguards: -** Kenya ha shown political goodwill and take necessary measures to establish ar implementing a **State System Accounting and Control** of nucle materials (SSAC) according to IAE Secretariat set of Safeguards th verify the correctness & completenes of declarations.
	Safety concerns for the hosts county and for th country as a whole are key and should b managed and communicated well.	**15. Nuclear Safety:** Nuclear Safe standards at siting, desig construction, commissionin operations and dismantling of any NP must achieve proper operatir conditions, prevent or mitiga consequences of accidents, in manner that protects workers, th public and the environment. Kenya ha to ratify Convention on Nuclear Safe (CNS).
	Physical security is another concern many hav with nuclear plants given where as a country w are located. With a facility like that in Kenya aga even when there are effective plans ar strategies they need to be implemented well ar clearly communicated to all stakeholders.	**16. Nuclear Security & Physic Protection** – The States carry fu responsibility for nuclear security as fundamental in management of nucle technologies, in transportation and us of radioactive materials. Threats th can compromise national securit energy security, public safety ar national economy must be managed local & international level includir within international treaties.
	Emergency planning and response is a conce many including county governments will hav with NPP given where as a country we a located. With a nuclear again, even when the are effective plans and strategies they need to b	**17. Emergency Planning Preparedness:** Kenya is establishir **national radiation emergency plar** for response to nuclear and radiologic emergencies. It has an existir **disaster risk management policy**

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	implemented well and clearly communicated to a stakeholders.	increase and sustain resilience vulnerable communities to hazards.
	What are the environmental impacts how are the being dealt with and if something happens wh should do what? This requires stron environmental institutions including at the coun level.	**18. Environmental Protectio** Kenyan and both present and futu the environment, must be protecte against harmful radiation risks throug the IAEA International **Basic Safe Standards** (BSS) with requiremen for protection against risks associate with exposure to ionizing radiatio Kenya is party to several **Multilater Environmental Agreements** (MEA for environmental protection whic influence the development of KNP This SESA & an ESIA will also b carried out.
		19. Radiation Protection: The count is upgrading management systems f exposure to nuclear radiation beyor acceptable legal limits.
	Waste is an issue and a very big issue of conce to many also. How are we planning to deal wi nuclear waste? Are we protecting our peop sufficiently and are they well informed?	**20. Radioactive Waste Protectio** nuclear waste management is a critic policy that manages radioactive was handling, pre-treatment, treatmer conditioning, transport, storage ar disposal. We either burry it or th supplier collects it. It can also be r used.

Closing

Mr. Samuel Kimani, representing Directorate of Occupational Safety and Health and Services was invited to make closing remarks.

In closing also, the EIA Experts provided contacts (e-mail addresses- Juliana.Tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert	Signature: **WO**	Date: **23/06/2018**
	Signature: **JT**	Date: **24/06/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Kitui County Government Offices

Date 27/06/2018

Present Annexed.

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Kitui County Government led by the Ministry of Energy & Natural Resources.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting. Project Brief and NPP Introduction was done by Katua & Eng. Chesire.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
County Energy Minister	Why Nuclear Power? Why Not Coal? Is Nuclear replacing Kitui Coal? This is geopolitical,	1. National Position – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Benjamin Mukholo, Energy & Natural Resources Officer, Kitui County Deputy Director Rachel	If Kitui is developing coal I don't think it can support nuclear. We need power for industrialisation & to develop Iron Ore & Steel in the County Are We ready for Nuclear Power? Can we manage the global nuclear politics?	different sources of energy to ensure a cheap reliable electricity.
Benjamin Mukholo, Energy & Natural Resources Officer, Kitui County County Energy Minister	I wasn't there during Hiroshima but was there during Chernobyl. The whole world was anxious? Between nuclear & coal which kills faster? We know about clean coal; do we have clean nuclear?	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Benjamin Mukholo, Energy & Natural Resources Officer, Kitui County	We are still struggling with water to drink, how will we share Athi water with nuclear?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Benjamin Mukholo, Energy & Natural Resources Officer, Kitui County	Kitui has been doing energy reticulation for a while and we are working very closely with Kenya Power and others to take power to all parts of Kitui. How will this help us?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
Deputy Director Rachel	Is the plant going to be in Kitui? If coal is developed, I will sleep well if nuclear in Kitui no! where will it be sited within the county?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors.
	No issues raised	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issues raised	7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel,

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Deputy Director Rachel	Have they ratified the Kyoto Protocol? Are we sure we are following and will be able to follow all the laws on Nuclear?	8.Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	No issues raised	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Energy Minister Mukholo, Energy & Natural Resources Officer, Kitui County	Are we consulting with the same national government? The discussion we have with NGOK is that Kitui Coal will be developed. You want to make us feel coal is bad so that you bring Nuclear? are we involved or has the decision been made already?	10.Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Deputy director Rachel	I think people in Kenya take SESA and ESIA for granted. Do proponents follow these issues?	11.Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Deputy director Rachel Mukholo, Energy & Natural Resources Officer, Kitui County	In terms of HR are we ready to manage nuclear facilities? I don't think there is capacity in Kenya to manage Nuclear	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
Deputy director Rachel	Are we ready to procure Nuclear given our corruption	13. Procurement – local workforce competence is being developed to implement an NPP procurement, with

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	and poor adherance to standards?	legal, - contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Deputy Director Rachel	How can we protect our people? There will be cancer and the Kenyan Cancer treatment is in shambles? The national referral hospital is what we all know? Are we prepared for the health impacts?	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Deputy Director Rachel	Does Kenya have ways to keep people & environment Safe from Nuclear radiation? How can we protect our people? Nuclear accidents & incidents are more than for coal	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Deputy director Rachel	Are we ready to be supervised and bossed around by international agencies and governments about nuclear power? Given the terrorism threats in the region are we not opening ourselves to more threats? Katua mbona wewe unatuletea shida?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Deputy director Rachel	Is Kenya Ready to handle nuclear radiation and ionizing impacts?	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
Deputy Director Rachel	Is Kenya Ready to handle nuclear radiation and radioactive waste impacts?	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Are we serious? Between Coal & Nuclear Which has less impacts?	International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Deputy director Rachel	Is Kenya Ready to handle nuclear radiation and ionizing impacts?	19. Radiation Protection: The country is upgrading management systems for exposure to radiation beyond acceptable legal limits.
Deputy Director Rachel	Can Kenya Manage Nuclear Waste? What about disposal of nuclear waste? Where will we dispose and them and how will we be protected from its effects?	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- Philip.abuor@sgs.com or juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert Signature: **WO** Date: **28/06/2018**

Signature: **JT** Date: **29/06/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Garissa County Government Offices

Date 12/07/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Garissa County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy director Energy and	Power is too costly and unreliable in this country? How can we bring it down using nuclear?	1. National Position – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
DD environment	Talk of Nuclear everybody gets scared. "Uranium deposits were done in Turkana" and clear feedback wasn't given. How will we manage nuclear? What about renewable energy?	different sources of energy to ensure a cheap reliable electricity.
	No issue Raised	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Deputy director Energy and DD environment	What is the amount of water used? What is the proximity to the water body? How safe is the end water? How safe is the dam water?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Deputy director energy	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. should the county where the site is be included?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No issue raised	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue raised	7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		planning process to achieve this is on-going.
Deputy director environment; Energy Minister	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	8.Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Deputy director environment; Energy Minister	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Energy Minister Deputy director Environment Deputy Director Energy	How do we as a county benefit and what are we getting from a nuclear plant in our area? We must Educate our people about engaging with Uranium? Employment benefits? Public participation? Land compensation?	10.Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Deputy Director Energy Deputy Director Environment	We must Educate our people about engaging with Uranium to manage it well	11.Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Deputy director environment	We must Educate our people about engaging with Uranium to ensure that we as a county are able to manage all nuclear facilities	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
		13. Procurement – local workforce competence is being developed to implement a NPP procurement, with legal, - contractual, physical construction,

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	No issue raised	financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Deputy Director Energy Deputy Director Environment	What measures do we have to ensure we are safe from all risks associated with handling uranium?	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Deputy Director Energy Deputy Director Environment Energy Minister	How safe will it be for Uranium to be used to produce electricity? Water is our right and we need to ensure we use it safely? What assurances?	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Deputy director environment	How safe are we? How safe are our people and animals if it located in Garissa?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Deputy Director Energy Deputy Director Environment Energy Minister	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
Deputy Director Energy	“Uranium was deposited in Turkana. Fear was seen when a well was dug and people got cancer”.	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy Director Environment Energy Minister	What would be the impact on pastoralists and their animals? What about wild animals? Will you share the NEMA SESA report with us as a county?	ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Deputy director environment Director environment	The fear of ionizing effects is very real. The NTV story on Kargi in Marsabit was very fearful. Was there no framework for managing nuclear?	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
Deputy Director Energy Deputy Director Environment Energy Minister	We all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal"	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail addresses- Philip.abuor@sgs.com or juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert — Signature: **WO** — Date: **13/07/2018**

Signature: **JT** — Date: **14/07/2018**

Subject/Ref: Nuclear SESA Stakeholder Consultation Programme Meeting – Phase 3

Venue Lamu County Government Offices

Date 10/07/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Lamu County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Siad M. -Chief Officer Health & Environment	- Please define the type nuclear- this needs to be demystified to the stakeholders in the simplest form?	**1.** National Position – This is a participatory and inclusive process and will not compete with coal or any other

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	- Why nuclear energy, while we have coal and other renewable sources of energy? - Has a proper energy needs assessment been done? - Does nuclear energy support sustainable development? Lamu is a recipient of too many projects.	energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	No Issue Recorded.	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	The coal plant project is controversial – the beneficiaries need to support the PAPs by compensating them especially in improving their livelihood like offering solutions for deep sea fishing	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO		4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	Where is the intended proposed site?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
Siad M. -Chief Officer Health & Environment	The cost of nuclear is high, will it be the tax payer's role to pay? That will affect the taxpayer if the cost is transferred to the	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	taxpayer then it will affect the citizens	Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO		7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	However, at the grassroot level, the community believes that their opinions are fulfilling a certain requirement in the project approval process. All in all, the Government is the final decision-maker.	8.Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	The titanium mining project has exploited the poor people in Kwale compromising the health of the community especially for the workers. How will nuclear be any better?	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	-It's important to send some people for benchmarking for a better understanding? - Compensation of the displaced communities including livelihoods like fishing. -The community is divided into two those for the projects (especially those receiving compensation) and those against the projects. However, at the grassroot level, the community believes that their opinions are fulfilling a certain	10.Stakeholder Involvement:- involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	requirement in the project approval process. All in all, the Government is the final decision-maker.	
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	Will nuclear be managed effectively and efficiently to manage the inherent risks associated with it? Do we have the governance ability?	11.Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	Capacity building for the Lamu community to get better understanding. However, is human resource development being done at County level?	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	No issue Recorded	13. Procurement – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	No issue Recorded	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Siad M. -Chief Officer Health & Environment		15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning,

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	How safe will be a Nuclear facility in the country	operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	No issue recorded	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	No issue Recorded	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	-Adoption of Environmental safeguards for mitigation of the adverse impacts. -Thermal Impacts will affect our fisheries – the fish eggs can go to the water abstraction and an ecosystem will be lost, hence compensation of the fishermen's livelihoods is recommended. -Marine and terrestrial life in Lamu is sensitive, factor this into your site selection process. Lamu is also a UN cultural heritage site, will this project take this into consideration?	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	Can we quantify the cost of ionizing pollution?	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
Siad M. -Chief Officer Health & Environment Mohamed Athman-Director Abdulsalam Omar Mohamed A.M -PHO	Handling of radioactive waste is a concern due to the lack of preparedness in our nation – from experience, are we ready? Invest in preparedness rather than emergency Can we quantify the cost of disposal?	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi Stakeholder Involvement Expert Signature: **WO** Date:**11/07/2020**

Signature: **JT** Date: **12/07/2020**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Kisumu County Government Offices

Date 12/02/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Kisumu County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of an NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	Kenya needs cheaper reliable electricity. We need to improve generation and distribution;	1. National Position – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	There are concerns about "costs of power"; how would 4,000MW NPP help alleviate these concerns? This needs a lot of civic education and awareness of energy & nuclear to gain support. Green energy is a major concern in Kisumu.	includes different sources of energy to ensure a cheap reliable electricity.
	Does Kenya have uranium, or will it be imported?	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	What kind of nuclear technology will the facility use and what are its main impacts? Why Kisumu?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered. The need water masses.
	Will Nuclear electricity power be distributed countrywide?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	What are the hosting requirements?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No Issues Recorded	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	What are the modes of industrial partnerships for the NPP?	7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		industries and services companies. A planning process to achieve this is on-going.
	What legal framework has Kenya developed?	8.Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
		9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	What are the modes of stakeholder partnerships with an NPP?	10.Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	Have we developed the management required to run nuclear institutions and facilities?	11.Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	No Issues Recorded	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
		13. Procurement – local workforce competence is being developed to implement an NPP procurement, with

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	No Issues Recorded	legal, - contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	What safeguards have been put in place to manage potential risks around handling nuclear facilities?	14. Nuclear Safeguards: - Kenya has shown political goodwill and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
	What safety measures are in place to manage risks at different stages of the NPP? Especially if located in a town like Kisumu? How much distance from the facility are people allowed to live comfortably? Does Kisumu have such land?	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	What security measures will be put in place to protect the facility from external threats?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	What emergency measures are in place to deal with emergencies and how prepared should the county and the communities around the facility be? Are we having plans to build such capacities?	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
		18. Environmental Protection: Kenyan and both present and future the environment, must be protected

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	What environmental impacts are associated with having a nuclear plant in a town like Kisumu? What are the impacts on water? What are the impacts on biodiversity? Do we have local and international capacity to deal with those impacts?	against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	How should we protect ourselves from radiation? How do we protect the people? What institutional mechanism are there and its capacity?	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	How do we deal with radioactive waste? What frameworks are there? Who is responsible should radioactive waste contaminate water? People or biodiversity?	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Expert Signature: **WO** Date: **13/02/2018**

Signature: **PA** Date: **14/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Homa bay County Government Offices (Governors Board Room)

Date 19/02/2018

Participants Annexe 1 (Insert Picture).

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Homa Bay County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
H.E Cyprina Awiti -Governor	Power is too costly and unreliable in this country? How can we bring it down using nuclear? Talk of Nuclear everybody gets scared. "Uranium deposits were done in Turkana" and clear feedback wasn't given. How will we manage nuclear? What about renewable energy?	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes different sources of energy to ensure a cheap reliable electricity.
Eliud Otieno Ochieng. Chief of Staff	Where will Kenya be acquiring the Uranium fuel for the nuclear power plant? I am well aware that there are Uranium deposits in Kenya, Will the country consider mining and processing of the mineral here in the Country or will it be imported?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Dickson O. Nyawinda CEC water and Environment	What is the amount of water used? What is the proximity to the water body? For example, Homa Bay county is bordering Lake Victoria. How safe is the end water? How safe is the dam water?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered. The final reactor technology is yet to be considered based on research outcome.
Hesbon Omwa Energy for Impact	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear.
Daniel Asher CUTS - Nairobi	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. should the county where the site is be included?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
Caren Okombo		**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Dream EP Global (ltd)	How will the government finance the project? Will is call for another loan from other national or it will be financed purely from by the Kenyan government?	for 1000MW NPP. This will require the country to outsource for fund to finance part of the project.
	Where will the country acquire the materials for construction of the nuclear power plant? And is there any factory in Kenya that meet the quality standards for the required contraction materials/	**7. <u>Industrial Involvement: -</u>** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Getrude Misango -Business development	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	**<u>8.Legislative Framework:</u>** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Maryline Agwa Hoama bay county	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	**<u>9. Regulatory Framework:</u>** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Dennis Keya -Dream EP Global Energy	How do we as a county benefit and what are we getting from a nuclear plant in our area? We must Educate our people about engaging with Uranium? Employment benefits? Public participation? Land compensation?	**<u>10.Stakeholder Involvement:</u>** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Arnold Ayoma -Dream EP Global Energy	We must Educate our people about engaging with Uranium to manage it well	**<u>11.Management:</u>** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
David Ajumbo -P. A. to the Governor.	We must Educate our people about engaging with Uranium to ensure that we as a county are able to manage all nuclear facilities	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
	How safe will it be for Uranium to be used to produce electricity? Water is our right and we need to ensure we use it safely? What assurances?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	How safe are we? How safe are our people and animals if it located in Garissa?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Pam Onyango Renevia Energy	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	What about wild animals, both the aquatic and terrestrial animals as well as the natural vegetation? Will you share the final NEMA SESA report with us as a county?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	How well will the organisation ensure that in case of radiation emission, the population as well as the environment is well protected, and the effect will not be catastrophic?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	Considering the past accidents related to nuclear power plants, we all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal" as the safest waste disposal and management. Are there alternative ways of managing the radioactive waste?	**20. Radioactive Waste Protection:** Nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Lead Expert Signature: **WO** Date: **20/02/2018**

Signature: **PA** Date: **21/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Busia County Government Offices

Date 16/02/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Busia County Government led by the Ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Why has Kenya taken long to go Nuclear power way? Power is too costly and unreliable in this country? How can we bring it down using nuclear? Talk of Nuclear everybody gets scared. "Uranium deposits were done in	**1.** National Position – This is a participatory and inclusive process and will not compete with other energy source. The energy mix includes different sources of energy to ensure cheap and reliable electricity.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Turkana" and clear feedback wasn't given. How will we manage nuclear? What about renewable energy?	For Kenya to decide to go nuclear, it has taken the energy sector a study that has projected increased demand of energy in the near future.
	No issue Raised	2. Nuclear Fuel Cycle: - NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	What is the amount of water used? What is the proximity to the water body? How safe is the end water?	3. Reactor Technology Assessment (RTA): is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	4. Electric Grid System – the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. should the county where the site is be included?	5. Siting: water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No issue raised	6. Funding & Finance: The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue raised	7. Industrial Involvement: - At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	8. Legislative Framework: - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	9. Regulatory Framework: - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	How will the county government of Busia benefit from the nuclear power programme? We must Educate our people about engaging with Uranium?	10. Stakeholder Involvement: - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. The county will have the benefit of connecting to a national grid that provide cheap and reliable electricity.
	How is the organisation enduring that the locals are well informed about emergency response and other forms of management that are required while operating a nuclear power plant?	11. Management: Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	We must Educate our people about engaging with Uranium to ensure that we as a county are able to manage all nuclear facilities	12. Human Resources: - A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	No issue raised	13. Procurement – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	Are there measures that will be taken to ensure the country is safe from all risks associated with handling uranium?	14. Nuclear Safeguards: - Kenya has shown political willingness and taken necessary measures to establish and implementing a State System of Accounting and Control of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	How safe will it be for Uranium handling to ensure total control of radioactive waste? Water is our right and we need to ensure we use it safely? What assurances?	15. Nuclear Safety: Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	What measures is KNEB putting in place to ensure safety pf the people and animals with regards to sitting and location of the nuclear power plant? Can you give a brief the nuclear security framework?	16. Nuclear Security & Physical Protection – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How safe will be the water?	17. Emergency Planning & Preparedness: Kenya is establishing national radiation emergency plans for response to nuclear and radiological emergencies. It has an existing disaster risk management policy to increase and sustain resilience of vulnerable communities to hazards.
	What would be the impact on pastoralists and their animals? What about wild animals?	18. Environmental Protection: Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International Basic Safety Standards (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several Multilateral Environmental Agreements (MEAs) for environmental

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Will you share the NEMA SESA report with us as a county?	protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	The real issue is the radioactive waste management. Where will the waste generated be stored? The board should not leave any stone unturned with regards to waste management.	19. Radiation Protection: The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	We all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal" what is the long-term effect to the future generation?	20. Radioactive Waste Protection: nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail addresses juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Lead Expert Signature: **WO** Date: **17/02/2018**

Signature: **JT** Date: **18/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 2

Venue County Assembly of Bomet

Date 04/04/2018

Participants Annexe 1 (Insert Picture).

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Bomet County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback from the participants.

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2037. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Power is too costly and unreliable in this country? How can we bring it down using nuclear?	**National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Talk of Nuclear everybody gets scared. "Uranium deposits were done in Turkana" and clear feedback wasn't given. How will we manage nuclear? What about renewable energy?	The energy mix includes different sources of energy to ensure a cheap reliable electricity.
	No issue Raised	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Isaac Kitur Clerk to the county Assembly	What is the amount of water used? What is the proximity to the water body? How safe is the end water? How safe is the dam water?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. Has sitting of an area to build the plant been completed?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No issue raised	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue raised	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		planning process to achieve this is on-going.
Hon. D. S Rotich Speaker	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Hon. Kirui K. Josphat Leader of Majority	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	Have the council of governors involved in the NPP? The county government cannot involve the counties if the council of governors is not engaged? How do we as a county benefit and what are we getting from a nuclear plant in our area? We must Educate our people about engaging with Uranium? Employment benefits? Public participation? Land compensation?	**10. Stakeholder Involvement: -** Involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	We must Educate our people about engaging with Uranium to manage it well	**11. Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	We must Educate our people about engaging with Uranium to ensure that we as a county are able to manage all nuclear facilities	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		different partner countries like S-Korea, China and US.
	No issue raised	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
	How safe will it be for Uranium to be used to produce electricity? Water is our right and we need to ensure we use it safely? What assurances?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	How safe are we? How safe are our people and animals if its located in Garissa?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	In case of an accident, what safety measures are put in place and well as emergency response mechanism that will be ensured? ow do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	"Uranium was deposited in Turkana. Fear was seen when a well was dug and people got cancer". What would be the impact on pastoralists and their animals? What about wild animals? Will you share the NEMA SESA report with us as a county?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	With regards to processing of radioactive waste, the waste disposal and management, is there adequate measures and capacity to manage the waste?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	We all have the fear of nuclear waste? How effective will the nuclear waste be managed?	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (Philip Abuor e .mail: Philip.Abuor@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Lead Expert Signature: **WO** Date: **05/04/2018**

Signature: **PA** Date: **06/04/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Embu County Government Offices

Date 19/06/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Embu County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Engineer Micheal Engineer Waganagwa	All the seven folks are located in Embu. Embu is the light of Kenya. The country needs more energy. There are more opportunities in Embu; 'Nuclear' Perception.	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Chief Officer Energy & housing; Chief Officer Water & Natural resources.	Chenorbyl comes to mind. They are 'feared' Power Plant. Embu investors said Kenya needs more power; critical number of people not employed. Nuclear is the way to go. Is this time for nuclear or is it time for food security? Do we need it?	includes different sources of energy to ensure a cheap reliable electricity.
	"When we hear nuclear, we only think of a bomb"	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
	Access to water issues and disposal of that water should be clear.	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	No issue Recorded.	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	Is Embu a considered site for the NPP? Embu was visited by the siting team. Land will be free if you site in Embu. "What is our Cut" if its sited in Embu? How do we benefit?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	What are the project economics? Nuclear is very expensive. This plant is at what cost to the country?	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue Recorded	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	This kind of power deal is good, but we must be sure that due diligence is done and consulted. What legal due diligence are we undertaking in the project? What is the legal system in place? How does it interact with nuclear security during transport and during storage?	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	What regulatory or institutional due diligence is Kenya undertaking in the nuclear project?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	Community consultations should be done enough times. We provide free land to investments. We consult a lot on investment projects. Nuclear is a very top down approach. Do the neighbouring countries support?	**10.Stakeholder Involvement:**- involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	How does the county of Embu participate in the process, if it hosts the plant? Let's call a spade a spade, who will be managing the nuclear plant? There is still a distinction between what we say and what we do? Our management culture may not be adequate for a nuclear plant?	**11.Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	Do we have the capacity of the staff to work in the nuclear plant? Do we have the expertise?	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
		exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	How do we manage the issue of procurement with the corruption culture in Kenya?	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	Do we have the capacity to manage the accidents? What studies and preparations are we undertaking?	**14. Nuclear Safeguards : -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	Nuclear is related a lot to "accidents". Risks related to nuclear are very high. The key word is "Safety". We need more detailed studies.	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	Nuclear plants take a very top down approach. Due to security issues. What are the plans? What is the arrangement for the physical security of the plant? How do we manage the potential for terrorism?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
		17. Emergency Planning & Preparedness: Kenya is establishing **national radiation**

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	Do we have the capacity to manage the accidents? We need more detailed studies.	**emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.
	Nuclear emissions are a are a concern. When you bring nuclear to Mt. Kenya Region, what potential biodiversity impacts to the region? We need more detailed studies. How are we managing the environmental issue anticipated and arising?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	We need more detailed studies of potential radiation impacts in the region.	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	Nuclear Waste storage issues are critical. We have heard of "storage" of nuclear in north eastern? If you site in Embu are you also going to store waste in Embu?	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the EIA Experts provided contacts (e-mail addresses- juliana.tek@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Lead Expert Signature: **WO** Date: **20/06/2018**

Signature: **JT** Date: **21/06/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Migori County Government Offices

Date 22/02/2018

Present Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Migori County Government led by the County Ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Gov. Obado, Deputy Gov, Energy Min, Energy Committee	The least I have dealt with nuclear is in school while teaching. As a source of electricity, it something that if done well we should	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Chair, Environment Min Deputy Dir. etc	welcome it. We are tired of expensive power. Kenya power should improve its local partnerships to improve power access.	different sources of energy to ensure a cheap reliable electricity.
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	What areas are we looking to engage in within the fuel cycle and does Kenya have Uranium to use?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract
	What technology assessment has been done so far and how has it improved nuclear as a source of power?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
	We want to be more power to different parts of Migori county, probably another sub-station and more distribution lines. What partnerships can be expected from Kenya power?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear.
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	Is Migori a potential site and what are the issues to look out for to determine a site? We will give you land and would be ready to host Nuclear facility in Migori. We want to understand and be involved more in the process.	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	GoK should be able to access financing for the NPP. What would be the cost and what would be invested in the host county?	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	Power is what bring in more industrial activities in the counties? We need power to help provide work	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	for the youths they stop throwing words as I pass. What county involvement would be hosting an NPP help improve in the county? What are the industrial benefits of hosting an NPP?	supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
	Is there a new law to manage nuclear in Kenya? We have not seen the bill, and will it be brought for our input? Does it include roles for hosting counties?	**8.Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	What regulatory and institutional arrangement are required for the NPP to run? What would be required at the county level?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	How do we involve all stakeholders? What public information should be shared? What is the role of the county? What partnerships are there with the national GOK? What skills capacity building opportunities are there for the county representatives?	**10.Stakeholder Involvement:**- involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	If Management of the NPP is to international standards the project should be able to supply cheap power to all counties. What plans do we have to improve our standards?	**11.Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	What human resources are existing? What is being developed? Which partnerships are being opened to host counties? What benchmarking opportunities are available to learn about how nuclear works for say our MCA's to	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
	help inform the public and communities?	
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min Deputy Dir. Etc	No issue recorded	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards.
	What safeguards are there to ensure the facility handles materials to international standards	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	What are the key Nuclear safety areas and has Kenya ratified international safety standards?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	No issue recorded	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Gov. Obado, Deputy Gov, Energy Min, Energy Committee Chair, Environment Min	In case of emergencies like we have seen in Ukraine and US are we prepared to deal with them? If so, what are we doing and how can the county be involved?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SGS Kenya Involvement Expert & KNEB Proponent
Deputy Dir. etc	It important that the environment is protected. What environmental impacts are potential for the design proposed to our people, water, and other biodiversity? How are they going to be managed? This is very important to ensure the NPP succeeds	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	Radiation from an NPP is something Kenya may have to learn to manage at the level of an NPP? What policies and institutional framework are we building?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	Is safe long-term Radioactive Waste disposal possible within the Kenya? How are we planning for it?	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

Reference & Communications

In closing also, the Experts provided contacts (e-mail addresses-Philip.Abuor@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Expert Signature: **WO** Date: **23/02/2018**

Signature: **PA** Date: **24/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Uasin Gishu County Government Offices

Date 27/03/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Garissa County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

roject Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy director Energy and	Power is too costly and unreliable in this country?	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
DD environment	How can we bring it down using nuclear? Talk of Nuclear everybody gets scared. "Uranium deposits were done in Turkana" and clear feedback wasn't given. How will we manage nuclear? What about renewable energy?	different sources of energy to ensure a cheap reliable electricity.
	No issue Raised	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Deputy director Energy and DD environment	What is the amount of water used? What is the proximity to the water body? How safe is the end water? How safe is the dam water?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Deputy director energy	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. should the county where the site is be included?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No issue raised	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
		7. Industrial Involvement: -

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	No issue raised	At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Deputy director environment; Energy Minister	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	**8.Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Deputy director environment; Energy Minister	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Energy Minister Deputy director Environment Deputy Director Energy	How do we as a county benefit and what are we getting from a nuclear plant in our area? We must Educate our people about engaging with Uranium? Employment benefits? Public participation? Land compensation?	**10.Stakeholder Involvement:** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Deputy Director Energy Deputy Director Environment	We must Educate our people about engaging with Uranium to manage it well	**11. Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Deputy director environment	We must Educate our people about engaging with Uranium to ensure that we as a county are able to manage all nuclear facilities	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		different partner countries like S-Korea, China and US.
	No issue raised	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Deputy Director Energy Deputy Director Environment	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Deputy Director Energy Deputy Director Environment Energy Minister	How safe will it be for Uranium to be used to produce electricity? Water is our right and we need to ensure we use it safely? What assurances?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Deputy director environment	How safe are we? How safe are our people and animals if it located in Garissa?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Deputy Director Energy Deputy Director Environment Energy Minister	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy Director Energy Deputy Director Environment Energy Minister	What would be the impact on pastoralists and their animals? What about wild animals? Will you share the NEMA SESA report with us as a county?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Deputy director environment Director environment	The fear of ionizing effects is very real. The NTV story on Kargi in Marsabit was very fearful. Was there no framework for managing nuclear?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
Deputy Director Energy Deputy Director Environment Energy Minister	We all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal"	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail Philip.Abuor@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:

Winstone Omondi, Stakeholder Involvement Expert

Lead Expert Signature: **WO** Date: **28/03/2018**

Signature: **PA** Date: **29/03/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Turkana County Government Offices

Date 26/03/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Garissa County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision international Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy director Energy and DD	Why has the government opted for nuclear power instead of investing more on solar power that is in plenty in	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. The energy mix includes

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
environment	the Northern Kenya, as an alternative source of energy? Who will be the distributer of electricity generated from the nuclear power? Will it be sold and distributed by the monopolistic KPLC?	different sources of energy to ensure a cheap reliable electricity.
	Geologists have discovered plenty of Uranium deposit in Turkana and in some places around the country, is it sufficient enough to operate the nuclear power plant?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya will either purchase finished fuel elements within a long-term supplier contract.
Deputy director Energy and DD environment	Turkana County is bordering lake Turkana and the people here depend on the lake for domestic use, will the amount of water required for the plant affect the water quality and quantity in the lake? What is the plant proximity to the water body?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Deputy director energy	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	You said the siting team includes KNEB, NEMA, geological depart, KENGEN & disaster dept. should the county where the site is be included.	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	No issue raised	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
	No issue raised	**7. Industrial Involvement: -** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
		planning process to achieve this is on-going.
Deputy director environment; Energy Minister	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	**8.Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Deputy director environment; Energy Minister	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Energy Minister Deputy director Environment Deputy Director Energy	We see the need to go for nuclear for industrialization and further debate on the NPP We must Educate our people about engaging with Uranium? Employment benefits? Public participation? Land compensation?	**10.Stakeholder Involvement:** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
Deputy Director Energy Deputy Director Environment	We must Educate our people about engaging with Uranium to manage it well	**11.Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Deputy director environment	How is the NPP going to benefit 'wanjiku' interms of employment, training and community benefits?	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	What about the monopoly of Kenya Power and lighting	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction,

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	company (KPLC), will there be a parallel seller of the nuclear electricity? Will it affect the pricing of electricity?	financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Deputy Director Energy Deputy Director Environment	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Deputy Director Energy Deputy Director Environment Energy Minister	How safe will it be for Uranium to be used to produce electricity? Water is our right and we need to ensure we use it safely? What assurances?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Deputy director environment	How safe are we? How safe are our people and animals if it located in Turkana?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Deputy Director Energy Deputy Director Environment Energy Minister	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.
Deputy Director Energy	"Uranium was deposited in Turkana. Fear was seen when	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy Director Environment Energy Minister	a well was dug and people got cancer". What would be the impact on pastoralists and their animals?	International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Deputy director environment Director environment	How will affected population, in case of radiation emission be protected? With regards to processing of radioactive waste, the waste disposal and management, is there adequate measures and capacity to manage the waste?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
Deputy Director Energy Deputy Director Environment Energy Minister	In terms of best practices, where has the best practices in radioactive waste management worked?	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail addresses) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:
Winstone Omondi, Stakeholder Involvement Expert

Lead Expert Signature: **WO** Date: **27/03/2018**

Signature: **PA** Date: **28/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Siaya County Government Offices

Date 14/02/2018

Participants Annexe 1 (Insert Picture).

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Garissa County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy director Energy and	What made Kenya to have an interest in going nuclear?	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source. Solar power is in plenty yes but cannot provide the base load power for industrial operations.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
DD Environment	Why has Kenya taken long to go Nuclear power way? There is plenty of renewable energy, for example Solar power, why not exploit the solar power first before having nuclear power?	The energy mix includes different sources of energy to ensure a cheap reliable electricity.
	Is there Uranium deposits in the country that will require as fuel for the nuclear power plant? Will there be a separate entity that will be tasked with mining and processing of uranium?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Deputy director Energy and DD environment	What is the amount of water required for operating the nuclear power plant? Siaya county is bordering Lake Victoria and I presume it can be a good candidate site for constructing the plant, what is the proximity to the water body?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Deputy director energy	Once the plant is set up, the number of watts produced will be almost equivalent to what is carried by the current grid. Will the country develop new power grid for the nuclear power plant?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
	Is Siaya county considered as one of the potential sites to host the plant? What are some of the criteria that a county like Siaya must have to be one of the preferred counties to host the power plant?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	Who will finance the construction of the nuclear power plant? Will there be compensation for people who might be displaced by	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	the construction of the power plant? Will the counties contribute towards the construction of the nuclear power plant?	
	No issue raised	**7. <u>Industrial Involvement: -</u>** At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Deputy director environment; Energy Minister	Is there already existing legislative framework with policies that guide the development of the nuclear power plant?	**<u>8. Legislative Framework:</u>** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Deputy director environment; Energy Minister	What do we have in place for institutions to work together towards realization of the nuclear power? What strict regulations are there to ensure proper security and liability in case of a nuclear power accident?	**<u>9. Regulatory Framework:</u>**- an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Energy Minister Deputy director Environment Deputy Director Energy	What are some of the benefits the county will get from the construction of the nuclear power plant? What programmes are put in place by KNEB to ensure that the locals are well informed of the nuclear power programme? Will the county engagement be done to all the 47 counties or only few counties with potential of hosting the plant are engaged?	**<u>10. Stakeholder Involvement:</u>** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	Opinion: There is need for an aggressive campaign on the pro and cons for the Nuclear Power Programme.	
Deputy Director Energy Deputy Director Environment	With regards to processing of radioactive waste, the waste disposal and management, is there adequate measures and capacity to manage the waste?	**11. Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
Deputy director environment	There is a gap in nuclear knowledge in the Country that need to be addressed, how is the organization working to close gap in order to close the gap?	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.
	Who will be contracted for the construction of the nuclear power plant? How will the tendering process be conducted?	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
Deputy Director Energy Deputy Director Environment	What measures do we have to ensure we are safe from all risks associated with handling uranium? In case of leakages in the systems, how will it be managed and the confidence in the systems? How will affected population, in case of radiation emission be protected?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
Deputy Director Energy	How safe will it be for Uranium to be used to produce electricity?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy Director Environment Energy Minister	Water is our right and we need to ensure we use it safely? What assurances?	protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Deputy director environment	How safe are we? How safe are our people and animals if it's located in Siaya County?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
Deputy Director Energy Deputy Director Environment Energy Minister	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.
Deputy Director Energy Deputy Director Environment Energy Minister	Biodiversity: has the issues that may affect the biodiversity clearly debated on and amicable solution proposed so that no environment is affected by the programme? Will you share the NEMA SESA report with us as a county?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
Deputy director environment Director environment	Do you think Kenya as a country is ready to handle the nuclear radioactive waste?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
Deputy Director Energy	With regards to processing of radioactive waste, the waste disposal and management, is there adequate measures and	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Deputy Director Environment Energy Minister	capacity to manage the waste? How will the radioactive waste be transported from the source to the storage or disposal site?	the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail Phuilip.Abuor@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:
Winstone Omondi, Stakeholder Involvement Expert

Lead Expert Signature: **WO** Date: **15/02/2018**

Signature: **PA** Date: **16/02/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Nandi County Government Offices

Date 29/03/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Nandi County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Solomon Kipkoskei	What benefits will the nuclear power programme come with towards addressing the costly and unreliable power in Kenya? Because the high	**1. National Position** – This is a participatory and inclusive process and will not compete with other energy source in terms of reliability and affordability. The energy mix includes different sources of

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Chief Officer land, Environment and Natural Resources	cost is affecting even the country operations. Most people are scared of nuclear power considering the historical accidents, why did the country decide to embrace nuclear technology for electricity generation? Is the country in a position to manage nuclear materials?	energy to ensure a cheap reliable electricity. Kenya is embracing nuclear power technology because it is the sure way of generating power that will drive the economic growth of the country and, for sure nuclear electricity is safe considering the current technological developments.
	There are Uranium deposits in the country, will the processing of the uranium fuel be done in Kenya? If so, will it require additional investment in the uranium plant?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Risper C. Tanus Ass. Director Environment and Natural Resources	What is the amount of water used? What is the proximity to the water body? How safe is the end water? How safe is the dam water?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered.
Julius K. Korir Admin. Land Environment and Natural Resources	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
Mutai C. Joyce	Nandi county is rich in natural habitat and we do not suggest a destruction of such habitat to pave way for the development of nuclear power plant. What is your alternative sitting for the plant?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified, the communication will be made public for public opinion.
	Will the construction contract be awarded to Chinese, has been case of major development projects in the country/	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP.
		7. Industrial Involvement: -

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	No issues raised	At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
James K. Meli -Dir. Environment and Natural Resources	Are there existing legislation to manage nuclear materials in Kenya and will we follow that law effectively to protect people?	**8.Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
Elphas K. Moek Adm. LENK	What do we have in place for institutions to work together towards realisation of the nuclear power programme? Are there strict regulations that are already in existance?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
Pamella Rono -Chief of Staff	How will Nandi county benefit from the nuclear power programme in our area? How many training programmes offerd by KNEB seen people from Nandi county take part? Public participation? Land compensation?	**10. Stakeholder Involvement:** - involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	What measure is the organisation putting in place, in terms of capacity building towards management of radioactive waste materials?	**11. Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	How many Kenyan citizens have been trained in terms of managing and operating the nuclear power plant? What academic areas should the students focus on to be	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	able to work in a nuclear power plant?	
	No issue raised	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations
James K. Meli -Dir. Environment and Natural Resources	What safety consideration is being put in place to ensure proper handling and managing of uranium materials? What assurity is being guaranteed to the people that the entire programme and project will not have a damaging impact to the people and the environment?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
Elphas K. Moek Adm. LENK	How safe are we? How safe are our people and animals if it located in Garissa?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	How do we deal with an emergency? How safe will be the water?	sustain resilience of vulnerable communities to hazards.
Elphas K. Moek Adm. LENK	What environmental consideration are being put in place to ensure sustainable development? How will the aquatic life be managed once the water from either the lake or Ocean is used to cool the plant is released? When decommissioning the reactor, how well will the space and environment be protected?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	We all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal"	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail Philip.Abuor@sgs.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:
Winstone Omondi, Stakeholder Involvement Expert

Lead Expert Signature: **WO** Date: **30/03/2018**

Signature: **PA** Date: **31/03/2018**

Subject/Ref: Stakeholder Consultation Programme Meeting – Phase 3

Venue Kericho County Government Offices (Governor's Board Room)

Date 03/04/2018

Participants Annexed

This minute serve as the record of the meeting included the Proponent (KNEB), SGS Kenya Limited (Social Involvement Consultant) and the relevant representatives of Kericho County Government led by the ministry of Energy.

Agenda

The agenda of the meeting was:

- Present information on the proposed KNPP, SESA methodology, and collect views and opinions about possible impacts of Kenya Nuclear Policies Plans and programmes;
- Gather any comment and feedback

Introduction

After introductions the meeting participants shared their names and which organisation they represent. The chair welcomed the participants and KNEB was given the opportunity to share a brief about the project. The KNEB legal policy background, the objects of KNPP and the purpose of carrying out the nuclear SESA. The SGS Kenya representative provided the methodology of the process and legal framework and scoped issues identified in the draft SESA, NEMA comments and seeks opinions and comments on the scoped issues in the Draft SESA.

Project Description

KNEB was established by the government to develop the KNPP for the purposes of introducing Nuclear electricity into the national energy mix. Nuclear electricity is cheaper, more stable and efficient source of electricity. The KNPP proposes to develop 1,000MW of NPP into the grid by 2027. The meeting today is part of developing the national position. We identified SGS Kenya as consultants for the Strategic Environment & Social Assessment (SESA). Counties are critical stakeholders of a NPP and involving counties is the part object of this high-level meeting.

Among the nuclear technology alternatives Light water or Boiling water or pressurised water reactors have been identified as the best proven nuclear technology alternative for Kenya. This milestone approach process seeks stakeholders' opinions about the proposed KNPP based on 23 infrastructure issues (as described by engineer) and domesticated by KNEB in policies, plans and programmes developed under the supervision International Nuclear Atomic agency.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
Hellen Chepkwony	Will the nuclear power plant, once completed help bring down the cost of electricity in the country?	**1. National Position** – This is a participatory and inclusive process and will not compete with coal or any other energy source.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
CEC PSM	How will we manage nuclear power generation while the country is still struggling with exploitation of renewable energy?	The energy mix includes different sources of energy to ensure a cheap reliable electricity.
Joel K. Bett CS/Hcps	Will the mining of Uranium fuel be done in Kenya? How will the uranium fuel be transported?	**2. Nuclear Fuel Cycle: -** NFC includes front-end, reactor services and Back end. Kenya will be involved in reactor services, either once-through or closed NFC. The choice is yet to be made. To acquire Nuclear fuel Kenya with either purchase finished fuel elements within a long-term supplier contract.
Charles Kirvi -Chief of staff	What is the amount of water used? What is the proximity to the water body? Apart from water, what else is being considered for the programme?	**3. Reactor Technology Assessment (RTA):** is the methodology of evaluation, selection & deployment of the best nuclear reactor technology to meet the design objectives suitable for Kenya. Design options for PWR and BWR are being considered. Other consideration is the construction space and public support for the programme, among other legal and legislative requirements.
Eng. W. Langat C.O – WEEPdd. Natural Resources	The age of the power line? The distribution of power in the county? The cost of power to the retailers? How can it be brought down is the county is involved in distribution and reticulation?	**4. Electric Grid System –** the nuclear unit is the largest operating in a power system there is a process on-going to analyse and upgrade Kenya's grid system to suit nuclear power plant proposed. Coal could be the stepping stone of Nuclear
Geoffrey Rutto -CEC, Development and Natural Resources	Has sitting of an area to build the plant been completed? The issue of sitting a nuclear power plant need to be clear and communicated on time. Has the organization settled on a specific site for the construction of the nuclear power plant?	**5. Siting:** water source is a key siting consideration for BWR/ PWR designs. A team is in place to study siting options based on exclusion, avoidance and suitability factors. When a candidate sites are identified.
	Who is funding KNEB? Who will the fanciers of the nuclear power plant?	**6. Funding & Finance:** The NPP has a high capital cost. The GOK is funding current activities. A financing option like Build Operate Transfer (BOT) is being considered to cater for $500M estimate for 1000MW NPP. Constriction of the power plant will definitely be funded through loans and the Kenyan government.
		7. Industrial Involvement: -

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	No issue raised	At the construction & operations phase specific areas like cement, steel, machinery equipment and chemical supply, will be allocated to Kenya industries and services companies. A planning process to achieve this is on-going.
Samuel Ondeng County department of Environment	While petroleum exploration as you say may have caused the geological well to be affected, do we have legislation to manage nuclear and will we follow that law effectively to protect people?	**8. Legislative Framework:** - A Bill to legislate nuclear is on covering areas as nuclear safety, security, safeguards and civil liability for nuclear damage for all the nuclear power plants to be established, operated and decommissioning.
	What do we have in place for institutions to work together if this thing is to come? There has to be strict regulations?	**9. Regulatory Framework:** - an Institutional & organisational framework with competences measures & procedures. An independent national regulatory body will be in place to manage NPP.
	How well is the process of public participation and information about the nuclear power programmed cascaded to common 'Mwanch'? Are there employment benefits to the county? Public participation? Land compensation?	**10. Stakeholder Involvement: -** involvement of key statutory & non-statutory stakeholders is expected to enable the development and sustenance of a national position on nuclear. SESA provides an initial involvement opportunity that will be continues towards the national position. Siting and ESIA will include more specific involvement.
	We must Educate our people about engaging with Uranium to manage it well	**11. Management:** Effective & standard KNPP Management requires properly established institutions, adequate resources, manpower and finances organized over all the phases of KNPP activities. KNPP management standards entrust high level of safety culture to enhance safety.
	How is KNEB ensuring that the citizens are well informed of the nuclear power programme? Is there adequate human capacity that will be able to operate the nuclear power plant? Is the board offering training programmes for the people	**12. Human Resources: -** A strategic development of the knowledge and skills necessary to purchase, operate, maintain and comply within the regulatory requirements of a nuclear power, is on-going, spreads across most scientific and engineering disciplines, includes exposure to similar nuclear facilities in different partner countries like S-Korea, China and US.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	expected to operate the power plant?	
	Who will be contracted to build the nuclear power plant?	**13. Procurement** – local workforce competence is being developed to implement a NPP procurement, with legal, -contractual, physical construction, financing and environmental issues that weigh in on the quality and context of the procurement of nuclear facilities. It may include upgrading the procurement act, local content & standards
	What measures do we have to ensure we are safe from all risks associated with handling uranium?	**14. Nuclear Safeguards: -** Kenya has shown political goodwill and taken necessary measures to establish and implementing a **State System of Accounting and Control** of nuclear materials (SSAC) according to IAEA Secretariat set of Safeguards that verify the correctness & completeness of declarations.
	Uranium to be used to produce electricity, what are the safety measures put in place to ensure the people are not affected by radiation? Water is our right and we need to ensure we use it safely? What assurances?	**15. Nuclear Safety:** Nuclear Safety standards at siting, design, construction, commissioning, operations and dismantling of any NPP must achieve proper operating conditions, prevent or mitigate consequences of accidents, in a manner that protects workers, the public and the environment. Kenya has to ratify Convention on Nuclear Safety (CNS).
	How safe are we? How safe are our people and animals if it located in Garissa?	**16. Nuclear Security & Physical Protection** – The States carry full responsibility for nuclear security as a fundamental in management of nuclear technologies, in transportation and use of radioactive materials. Threats that can compromise national security, energy security, public safety and national economy must be managed at local & international level including within international treaties.
	What happens in case of an emergency in a place like Garissa where the county is very large, and communities are pastoralists? How do we deal with an emergency? How safe will be the water?	**17. Emergency Planning & Preparedness:** Kenya is establishing **national radiation emergency plans** for response to nuclear and radiological emergencies. It has an existing **disaster risk management policy** to increase and sustain resilience of vulnerable communities to hazards.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team (SGS Kenya & KNEB Proponent)
	What would be the impact on pastoralists and their animals? What about wild animals? Will you share the NEMA SESA report with us as a county?	**18. Environmental Protection:** Kenyan and both present and future the environment, must be protected against harmful radiation risks through the IAEA International **Basic Safety Standards** (BSS) with requirements for protection against risks associated with exposure to ionizing radiation. Kenya is party to several **Multilateral Environmental Agreements** (MEAs) for environmental protection which influence the development of KNPP. This SESA & an ESIA will also be carried out.
	How will affected population, in case of radiation emission be protected?	**19. Radiation Protection:** The country is upgrading management systems for exposure to nuclear radiation beyond acceptable legal limits.
	We all have the fear of nuclear waste? Even if you say it will use in "deep geological disposal"	**20. Radioactive Waste Protection:** nuclear waste management is a critical policy that manages radioactive waste handling, pre-treatment, treatment, conditioning, transport, storage and disposal. We either burry it or the supplier collects it. It can also be re-used.

In closing also, the EIA Experts provided contacts (e-mail addresses) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

Prepared on behalf of SGS Kenya Limited by:
Winstone Omondi, Stakeholder Involvement Expert

Lead Expert Signature: **WO** Date: **04/04/2018**

Signature: **PA** Date: **05/04/2018**

Stakeholder Engagement Forum **SESA Nuclear Power Program Report**

Kenya Nuclear Electricity Board

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Subject/Ref: Stakeholder Consultation Meeting – SESA Project Report for the Proposed Nuclear Electricity Power Program

Venue **Kilifi County Office - Boardroom**

Date 19/01/2018

Present Refer to Appended list

These minutes serve as the record of the meeting between the Proponent (KNEB), SGS Kenya Limited (SESA/ Social Experts) as consultants and the representatives of Kilifi County executive office (refer to attendance list for the institutions represented). The objective of the meeting was to provide information on Kenya Nuclear Electricity Power Program and SESA process and the as well as obtain feedback from the stakeholders.

Agenda

The agenda of the meeting was:

- Present detailed information on the proposed Kenya Nuclear Electricity Power Program, the SESA process and the stakeholder engagement process;
- Gather any valued comments and gather any ideas, opinions, views and concerns as feedback for the SESA report

Introduction

The meeting opened with a prayer led by Ms. Zena Achieng – Kilifi County Government. Thereafter, the meeting Chairman, Mr.Wilfred Baya, County Director of Environment welcomed the stakeholders to the meeting. He presented apologies from the Governor and Chief Executive as they were out on official duty. He informed the participants that the purpose of the meeting was to give KNEB and their consultants SGS an opportunity to present the content on KNEPP and SESA process and seek their views and concerns regarding the proposed program.
Mr Baya then invited Mr. Philip Mutai, Director Legal Affairs KNEB and team leader KENPP technical team to make presentation on the proposed KENPP, SESA Project Manager Mr. Philip Abuor from SGS and Mr. Joel Omondi SESA social expert SGS consultant to present on the SESA Project Report preparation process.

Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Stakeholder Engagement Forum — SESA Nuclear Power Program Report

Kenya Nuclear Electricity Board

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
Zena Achieng, EIA Expert, Kilifi County	**Potential Site -** Do you have specific plant sites already identified?	KNEB stated that siting is a process of analysing various factors that determine the safety of operation of a nuclear power plant on a particular location based on a set of criteria. potential project regions have to go through 3 process 1. Exclusion criteria 2. Avoidance criteria 3. Suitability criteria This process is carried out in phases, Phase 1 involves regional analysis and selection of potential sites, Phase 2 involves screening of potential sites and selection of candidate sites Phase 3 involves comparison of the candidates sites to come up with proposed sites The proponent has completed phase 1 of the process and has identified potential sites. Regions with water bodies, among them. They are currently conducting screening exercise for the potential sites identified to come up with candidate sites.
	Scoping Report – a copy of SESA scoping report to be shared with county **SESA Timeframe -** What is the specific project timeline for the SESA study	SESA Consultants agreed to send a final copy that was approved by NEMA to be SESA informed the stakeholders that SESA study was guided by other agencies, NEMA as a regulatory body had to approve the scoping report before moving to the stakeholder engagement phase. Election period also contributed to the delay. SESA study should be done by July 2018.

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
	Water Polution: If Nuclear Power Plant is built along river sabaki, will the population living downstream be in a position to consume the same water with risk of radiation effects?	The proponent assured stakeholders that there are several nuclear reactors. Pressurized reactor technology uses a lot of water as coolant. But that water has not exposed to radiation, water does not interact with nuclear reactor environment. Water from river, lake or ocean is used as a coolant in the cooling tower of a nuclear plant. So it is safe to be used after drained back to the river
	Alternative Fuel - Kilfi county residents currently use charcoal for fuel hence destroying alot of trees. How will nuclear energy solve this issue	Proponent confirmed that Nuclear power will act as the best alternative cheaper option. Especially in generating electricity so people can move away from the conventional sources of energy.
Mr. Wilfred Baya, Director for Environment, Kilifi County	**Security –** Coastal region is not safe with regards to Terrorism connected to Alshababab Attacks. Nuclear plant will be a disaster if Terrorist target it	Proponent confirmed that safety and security in nuclear power plant is very critical considerations before commissioning, there are global regulations, terms and conditions. Kenya has identified the global safety and security requirements for the set up of a nuclear plant
	Economic benefit- Fishing is the main source of income for kilifi people. When heated water from the cooling tower is released back to the river or ocean it will kill fish and marine life forcing the fishermen to go into deep seas for fish. What are the measures in place for such scenario?	Proponent enlightens stakeholders that when designing water used for cooling the turbines is in millions of volumes so it cannot be heated. The outlet of +-3 degrees standard requirement will be warm acting as good breeding environment for fish hence there's alot of fish instead, boosting that economy Economically Nuclear power program will create alternative jobs locally. Human resource planning shows that over 5000 workers will be directly and indirectly will be directly involved in design, siting, bidding and construction of the

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
		nuclear power plant majority drawn from local labour pool. Proponent has signed MoU's with polytechnics for specialised knowledge on nuclear power in the counties; KNEB communication department has a plan on public forums. County forums at the coastal county to discuss nuclear technology. Career talks in schools and mentorship programs for students are part of the career development plan. • Pwani University – Public baraza • Career open day in UoN • Career talk in Malindi Schools If people want to study nuclear the plan is clear in 5-10 years for employment Proponent confirmed aspect of employment will be within the framework for the county. We will partner with county, the objective is to inspire the population to join this field of nuclear
	Building capacity – How are the locals informed of the program with regards to preparation of this employment opportunity?	The Proponent will use existing land policies and legal frameworks to ensure no one is aggrieved. And any displaced person will be compensated. Distance from the plant is 10 miles = 16kms KNEB also confirmed that, Governor Kilifi county has benefited from trip to Korea Nuclear Power plant. In South Korea University for example the plant is in between university Engineer will come with diff designs for approval, on emergency preparedness zones, there is a limit of how many people500,000 but the construction will be guided by international requirements

Stakeholder Engagement Forum — SESA Nuclear Power Program Report

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
		standards
	Land issue – Nuclear Power plant will need a lot of land to commission. Alot of people will be displaced, how will you manage this?	KNEB stated that its proven somebody living close to NPP is safer than someone flying in an aeroplane in the amount of radioactive exposure and that compared to Solar energy needs large amount of space/vis nuclear plant and energy generated. Land and compensation policies will be a guiding tool in managing any land or displacement and resettlement of people
	Nuclear Energy – We have other sources of energy including renewable energy, is nuclear necessary? Demand for energy in Kenya is low; last year consumption was 1400megawatts, so meaning we are producing more that we can consume. On the ground so many people cannot access electricity	As a technical experts and responsible agemcy, Kenya cannot achieve industrial economy with the current energy production. With vision 2030 development agenda, Kenya requires 17,00MWof electricity produced. Currently the country is generating a total of 2300 MW from all the other sources of energy including hydro, geothermal, wind and solar. Meaning the country still has deficit hence need for alternative source of energy to realize vision 2030. Nuclear energy has been identified as stable efficient and reliable source of electricity that will produce base load power to steer industrial development and stimulate economic growth. KNEB confirmed that no country globally has industrialised using wind or solar energy. Those can be used for domestic purposes.
Mr. Otieno Environment officer, Kilifi County	**Creating Awareness –** If you carrying any meetings around the county, SESA and KNEB team should involve county executive and assembly	Proponent stated that they had communicated for the MCA's to be invited for the meeting earlier but seems there was confusion at the county office. They

Stakeholder Engagement Forum SESA Nuclear Power Program Report

Kenya Nuclear Electricity Board

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
	to boost the image on the ground. Include the MCA'S in the baraza's to caution the proponent from public resistance. Also meet the committees as rep, on behalf of entire team	promised to plan early for next meetings and even one KNEB officer to be sent on the ground early to secure appointment for the top county leadership executive and relevant assembly department committee so that we can have fruitful engagements SESA team requested that another stakeholder meeting be organised and all relevant people in the county executive and assembly be invited for meaningful engagement. KNEB also mentioned that the communication department was organising for a county forum and open day in Kilifi County in February (put up a tent at the market and address people randomly) they will involve the county office to plan and execute this program Proponent confirmed of ongoing career talks in schools and baraza forums to educate the public on nuclear power as part of creating awareness. In future they will invite the members of county assembly to spear heard such forums to gain community confidence and educate the public as much as possible as a continuous process
	Nuclear Waste Management – How will you manage the radioactive waste? So that our people are safe even as we embrace the project?	Proponent informed the stakeholders present that Kilifi hospital disposes radioactive components currently. Proponent assured that the nuclear waste is so minimal and manageable. Other countries like Belgium are turning waste into energy, and storage facilities can be a revenue stream for the county. Depending on policies nuclear waste is stored for up to 15 years. Kenya will adhere to

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
		internationally accepted waste management. Kenya based on existing conventions and signed treaties will adhere to proper management of radioactive wastes in support of safety of people and environment from ionizing radiation. The radiation protection board is the regulator in addition there are existing draft polices and strategies geared towards radiation safety on radioactive wastes Has been established

Closing

Mr. Baya chairing the meeting made closing remarks. Communication to the county regarding this should be addressed to Governor or Chief of staff for it to be acted on faster, he also started that Kilifi executive office embraces the project and wishes it is a success soonest so that the community can benefit and reduce burning charcoal for fuel hence saving our forests. Philip Mutai from KNEB confirmed that Governor is already a champion of this project and asked the chair to convey our meeting notes to his. He reiterated that KNEB sent the letter earlier but seems there was confusion at the office. Next time we'll plan early and even one officer to be sent on the ground early to secure appointment for the top county leadership and relevant assembly dept so that we have fruitful engagements. Immediate one KNEB is planning is a county forum and open day where they put up a tent at the market and engage people randomly. They will do this in conjunction with kilifi county government.

In closing also, the SESA Experts provided contacts (e-mail addresses- Philip.abuor@sgs.com or joelomondi@gmail.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

There being no other business, the convener thanked all who attended and the meeting closed with prayer lead by Ms. Jackline Lang'at, Consultant - SESA stakeholder engagement Coordinator.

Prepared on behalf of SGS Kenya Limited by:

Mr. Philip Abour, SESA Project Manager Signature: Date: 29.01.2018

Jackline Lang'at, SESA Stakeholder Engagement Coordinator Signature Date: 29/01/2018

Stakeholder Engagement Forum **SESA Nuclear Program**

Project Report

Kenya Nuclear Electricity Board

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Subject/Ref: Stakeholder Consultation Meeting – SESA Project Report for the Proposed Nuclear Electricity Power Program

Venue **Kwale County Office - Boardroom**

Date 15/01/2018

Present Refer to Appended list

This minute serve as the record of the meeting between the Proponent (KNEB), SGS Kenya Limited (SESA/ Social Experts) and the representatives of Kwale County executive office and the county assembly (refer to attendance list for the institutions represented). The objective of the meeting was to provide information on Kenya Nuclear Electricity Program and SESA process and the as well as obtain feedback from the stakeholders.

Agenda

The agenda of the meeting was:

- Present detailed information on the proposed Kenya Nuclear Electricity Program, the SESA process and the stakeholder engagement process;
- Gather any valued comments and gather any ideas, opinions, views and concerns as feedback for the SESA report

Introduction

The meeting opened with a prayer led by Mrs. Feddis Mbura - MCA. Thereafter, the meeting Chairman, Mr.Godfrey Nato, County Chief Excutive Ministry of Environment Manager welcomed the stakeholders to the meeting. He informed the participants that the purpose of the meeting was to give KNEB and their consultants SGS an opportunity to present the content on KNEP and SESA process and seek their views and concerns regarding the proposed program.

Mr Nato then invited Mr. Philip Mutai, Director Legal Affairs KNEB and team leader KENP technical team to make presentation on the proposed KENP and Mr. Joel Omondi SESA social expert SGS consultant to present on the SESA Project Report preparation process.

Stakeholder Engagement Forum | Project Report | SESA Nuclear Program

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Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
Binti Omar, Advisor Climate Change and Water Sanitation Office of the Governor, Mombasa County	**Capacity building**- How many people from the coast are part of the scholarship program sent to Korea?	KNEB confirmed that among the students who received scholarship to study Masters program in Nuclear in Korea, one was from the coast region, and many more will be absorbed in future for degree and diploma courses as part of capacity building process.
	Safety – Is Kenya ready to manage nuclear plant. being a developing country now that some accidents have been reported to occur in the nuclear plants in developed countries i.e Fukushima and Chernobyl Disaster s	KNEB states that Nuclear is highly regulated. Kenya has to meet international standards before the plant can be commissioned. The vendors will not sell Kenya if we don't meet the international Standards. International Atomic Energy Authority will come and do independent study and approve Kenya's ability and readiness for the Nuclear power. Based on Safety on design engineering and safety culture
	Nuclear vs Clean renewable energy – Why invest in Nuclear rather than clean renewable energy	Alot of industries opt out of Kenya and fear of investing in Kenya because of the cost of electricity. Nuclear is the cheapest option compared to other sources of energy The cost is Nuclear will attract a lot of investment in industries Kenya will likely use Public Private Partnership to fund the program. Following other countries i.e Turkey Nuclear program Rasia are building for them the plant
	Financing – Nuclear Power Program is expensive to put up. How will funding happen?	KNEB will ensure that the identified site will benefit as stipulated though the existing

Stakeholder Engagement Forum SESA Nuclear Program

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
	funded by Russia Does the project have **Corporate Social Responsibility Component** in line with community benefits	frameworks. The Country has existing localization policy. Local content act to cover the community. Best practices for any project where the plant is put, will undergo environmental protection, induction program for the community. Project site region will ensure that development of schools, colleges to train the technical people (3000 – 7000) employed in the nuclear power plant is potential ripple to the community. The county can also benefit through tax of the income generated is shared to the county government by the proponent.
Mr. Godfrey Nato, CEC for Environment and Water Sanitation, Mombasa County	**Waste management -** is Mombasa County going to be recipient of waste or possible project site	KNEB confirmed that Mombasa is the heart of coastal region. Being densely populated island will automatically not be a potential site for the power plant. KNEB assured that no county will be a dumping site for the waste. Nuclear equipment will pass through the port of Mombasa. Hence the county being an entry point will benefit through custom tax and infrastructure. There will be a lot of offshore benefits from the plant as well such as water desalination for the county residents use.
Mr. Shebe Mukomo MCA & Chair Environment Committee, Mombasa County	**Land related concerns** -what plans have been put in place to mitigate impacts ownership dispute including Resettlement or Land Acquisition? **Creating Awareness** – Nuclear power known to be risky. You need a very aggressive awareness of people. Proponent need to involve the people immediately	The Proponent will use existing land policies and legal frameworks to ensure no one is aggrieved. And any displaced person will be compensated Proponent confirmed of ongoing career talks in schools and baraza forums to educate the public on nuclear power as part of creating awareness. In future

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Stakeholder Engagement Forum SESA Nuclear Program

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
		they will invite the members of county assembly to spear head such forums to gain community confidence and educate the public as much as possible as a continuous process
Ms. Feddis Mbura, MCA Deputy Chair Environment Committee, Mombasa County	**Project support -** As people representative my proposal to the proponent KNEB. For the community to embrace the project at the coast region. The local people should be involved in all stages including bench marking trips to see the real project out there.	KNEB confirmed that Governor Kilifi county has benefited from trip to Korea Nuclear Power plant. Proponent confirmed of possible future engagement for other coastal County leadership to be parts of 'seeing is believing' tours to the existing nuclear power projects.
Chief Officer, Trade & Tourism Mombasa County	**Engagement with SESA experts -** Proposed that the team at the county to partner with SGS now is developing and conducting SESA?	KNEB consultants stated that at the 1st stage of SESA was developing scoping report. That was submitted to NEMA for approval. Current stage is for stakeholder engagement, to gather views and opinions to be integrated to the report. When the site is identified the host county will lead the stakeholder and public participation together with the consultants. All agencies within the county will have a direct engagement with the consultants.

Closing

Mr. Nato chairing the meeting made closing remarks. He acknowledged the presentation and the importance of having nuclear power plant in the coastal region. Mombasa County will benefit in terms of improved infrastructure at the entry port and water desalination for the Mombasa population. He appreciated the effort already made and mentioned that he will deliver the meeting content to both the Governor and deputy governor of Mombasa county. He suggested that next bench making travel, the county government executive and county assembly will be interested to participate so that they can be patriots in engaging the public participation awareness in the Mombasa County. He further observed that the SESA Project Report should capture all the concerns raised by the Stakeholders the meeting. Philip Mutai from KNEB confirmed that political class are the main champions at the national level and the county level. They will be considered in future bench marking trips to existing nuclear plants so that they can champion the public engagement forums in their counties to Schools and baraza's to create awareness also town hall county forums.

Stakeholder Engagement Forum **SESA Nuclear Program**

Project Report

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In closing also, the SESA Experts provided contacts (e-mail addresses- Philip.abuor@sgs.com or joelomondi@gmail.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

There being no other business, the convener thanked all who attended and the meeting closed with Islamic prayer lead by Mr.Fawz Rahid, CEC Tourism & Trade, Mombasa County.

Prepared on behalf of SGS Kenya Limited by:

Mr. Philip Abour, SESA Project Manager Signature: Date: 29.01.2018

Jackline Lang'at, SESA Coordinator Signature Date: 29/1/2018

Stakeholder Engagement Forum **SESA Nuclear Program**

Project Report

Kenya Nuclear Electricity Board

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Subject/Ref: Stakeholder Consultation Meeting – SESA Project Report for the Proposed Nuclear Electricity Power Program

Venue **Mombasa County Office - Boardroom**

Date 17/01/2018

Present Refer to Appended list

This minute serve as the record of the meeting between the Proponent (KNEB), SGS Kenya Limited (SESA/ Social Experts) and the representatives of Mombasa County executive office and the county assembly (refer to attendance list for the institutions represented). The objective of the meeting was to provide information on Kenya Nuclear Electricity Program and SESA process and the as well as obtain feedback from the stakeholders.

Agenda

The agenda of the meeting was:

- Present detailed information on the proposed Kenya Nuclear Electricity Program, the SESA process and the stakeholder engagement process;
- Gather any valued comments and gather any ideas, opinions, views and concerns as feedback for the SESA report

Introduction

The meeting opened with a prayer led by Mrs. Feddis Mbura - MCA. Thereafter, the meeting Chairman, Mr.Godfrey Nato, County Chief Excutive Ministry of Environment Manager welcomed the stakeholders to the meeting. He informed the participants that the purpose of the meeting was to give KNEB and their consultants SGS an opportunity to present the content on KNEP and SESA process and seek their views and concerns regarding the proposed program.

Mr Nato then invited Mr. Philip Mutai, Director Legal Affairs KNEB and team leader KENP technical team to make presentation on the proposed KENP and Mr. Joel Omondi SESA social expert SGS consultant to present on the SESA Project Report preparation process.

Stakeholder Engagement Forum SESA Nuclear Program

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Issues/Concerns/Comments Raised by the Stakeholders

The table below presents issues/concerns/comments raised by the stakeholders during the meeting.

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
Binti Omar, Advisor Climate Change and Water Sanitation Office of the Governor, Mombasa County	**Capacity building**- How many people from the coast are part of the scholarship program sent to Korea?	KNEB confirmed that among the students who received scholarship to study Masters program in Nuclear in Korea, one was from the coast region, and many more will be absorbed in future for degree and diploma courses as part of capacity building process.
	Safety – Is Kenya ready to manage nuclear plant. being a developing country now that some accidents have been reported to occur in the nuclear plants in developed countries i.e Fukushima and Chernobyl Disaster s	KNEB states that Nuclear is highly regulated. Kenya has to meet international standards before the plant can be commissioned. The vendors will not sell Kenya if we don't meet the international Standards. International Atomic Energy Authority will come and do independent study and approve Kenya's ability and readiness for the Nuclear power. Based on Safety on design engineering and safety culture
	Nuclear vs Clean renewable energy – Why invest in Nuclear rather than clean renewable energy	Alot of industries opt out of Kenya and fear of investing in Kenya because of the cost of electricity. Nuclear is the cheapest option compared to other sources of energy The cost is Nuclear will attract a lot of investment in industries Kenya will likely use Public Private Partnership to fund the program. Following other countries i.e Turkey Nuclear program Rasia are building for them the plant
	Financing – Nuclear Power Program is expensive to put up. How will funding happen?	KNEB will ensure that the identified site will benefit as stipulated trough the existing

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Stakeholder Engagement Forum SESA Nuclear Program

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Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
	funded by Russia Does the project have **Corporate Social Responsibility Component** in line with community benefits	frameworks. The Country has existing localization policy. Local content act to cover the community. Best practices for any project where the plant is put, will undergo environmental protection, induction program for the community. Project site region will ensure that development of schools, colleges to train the technical people (3000 – 7000) employed in the nuclear power plant is potential ripple to the community. The county can also benefit through tax of the income generated is shared to the county government by the proponent.
Mr. Godfrey Nato, CEC for Environment and Water Sanitation, Mombasa County	**Waste management** - is Mombasa County going to be recipient of waste or possible project site	KNEB confirmed that Mombasa is the heart of coastal region. Being densely populated island will automatically not be a potential site for the power plant. KNEB assured that no county will be a dumping site for the waste. Nuclear equipment will pass through the port of Mombasa. Hence the county being an entry point will benefit through custom tax and infrastructure. There will be a lot of offshore benefits from the plant as well such as water desalination for the county residents use.
Mr. Shebe Mukomo MCA & Chair Environment Committee, Mombasa County	**Land related concerns** -what plans have been put in place to mitigate impacts ownership dispute including Resettlement or Land Acquisition?	The Proponent will use existing land policies and legal frameworks to ensure no one is aggrieved. And any displaced person will be compensated
	Creating Awareness – Nuclear power known to be risky. You need a very aggressive awareness of people. Proponent need to involve the people immediately	Proponent confirmed of ongoing career talks in schools and baraza forums to educate the public on nuclear power as part of creating awareness. In future

Name and Designation of Stakeholder	Issue/Concern/Comment raised	Responses from SESA Team & Proponent
		they will invite the members of county assembly to spear heard such forums to gain community confidence and educate the public as much as possible as a continuous process
Ms. Feddis Mbura, MCA Deputy Chair Environment Committee, Mombasa County	**Project support -** As people representative my proposal to the proponent KNEB. For the community to embrace the project at the coast region. The local people should be involved in all stages including bench marking trips to see the real project out there.	KNEB confirmed that Governor Kilifi county has benefited from trip to Korea Nuclear Power plant. Proponent confirmed of possible future engagement for other coastal County leadership to be parts of 'seeing is believing' tours to the existing nuclear power projects.
Chief Officer, Trade & Tourism Mombasa County	**Engagement with SESA experts -** Proposed that the team at the county to partner with SGS now is developing and conducting SESA?	KNEB consultants stated that at the 1st stage of SESA was developing scoping report. That was submitted to NEMA for approval. Current stage is for stakeholder engagement, to gather views and opinions to be integrated to the report. When the site is identified the host county will lead the stakeholder and public participation together with the consultants. All agencies within the county will have a direct engagement with the consultants.

Closing

Mr. Nato chairing the meeting made closing remarks. He acknowledged the presentation and the importance of having nuclear power plant in the coastal region. Mombasa County will benefit in terms of improved infrastructure at the entry port and water desalination for the Mombasa population. He appreciated the effort already made and mentioned that he will deliver the meeting content to both the Governor and deputy governor of Mombasa county. He suggested that next bench making travel, the county government executive and county assembly will be interested to participate so that they can be patriots in engaging the public participation awareness in the Mombasa County. He further observed that the SESA Project Report should capture all the concerns raised by the Stakeholders the meeting. Philip Mutai from KNEB confirmed that political class are the main champions at the national level and the county level. They will be considered in future bench marking trips to existing nuclear plants so that they can champion the public engagement forums in their counties to Schools and baraza's to create awareness also town hall county forums.

Stakeholder Engagement Forum **SESA Nuclear Program**

Project Report

Kenya Nuclear Electricity Board

In closing also, the SESA Experts provided contacts (e-mail addresses- Philip.abuor@sgs.com or joelomondi@gmail.com) through which the stakeholders can further channel additional comments or concerns not raised in the meeting.

There being no other business, the convener thanked all who attended and the meeting closed with Islamic prayer lead by Mr.Fawz Rahid, CEC Tourism & Trade, Mombasa County.

Prepared on behalf of SGS Kenya Limited by:

Mr. Philip Abour, SESA Project Manager Signature:  Date: 29.01.2018

Jackline Lang'at, SESA Coordinator Signature  Date: 29/01/2018

Annex III: Consultation and Public Participation Attendance Sheets

KNEB SGS SCK•CEN EHS

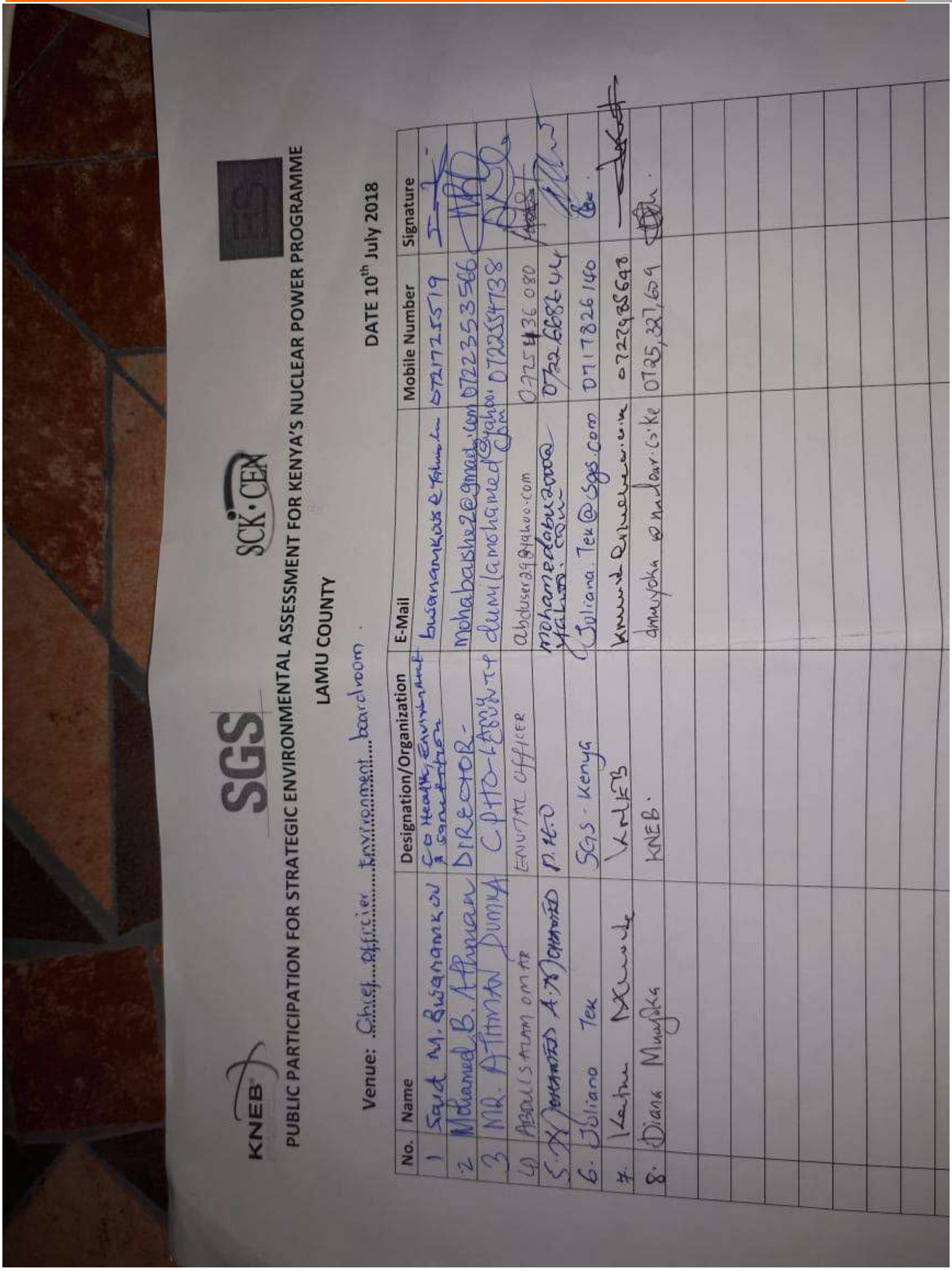
PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

NYERI COUNTY

Venue: GOVERNOR'S BOARDROOM – NYERI

DATE 19th June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	HE MUTAHI KAHIGA	GOVERNOR	mutahi8@gmail.com	0722383047	
2.	NAHASHON MUNGORA	PA – GOVERNOR	mungoranahashon1@gmail.com	0727964348	
3	Diana Muyoka	KNEB	dmuyoka@nuclear.co.ke	0725327609	
4.	Njeri W. Kamiaru	KNEB	nkamiaru@nuclear.co.ke	0728293667	
5.	Juliana Tek	SGS – Kenya	Juliana.Tek@sgs.com	717826140	
6.	Omondi Winstone	SGS – Kenya	Joel.omondi@gmail.com	0722938806	
7	Juster Mwendwa	SGS – Kenya	Justermbaio@gmail.com	0726071715	
8.	Chesire K. Edwin	KNEB	Cedwin@nuclear.co.ke	0723696146	
9.	Kapis Goga	KNEB	Kondigi@nuclear.co.ke	0727601994	
10	Kathu Kimuhe	KNEB	[illegible]@nuclear.co.ke	[illegible]	



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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

LAMU COUNTY

Venue: Chief Officer Environment boardroom.

DATE 10th July 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1	Said M. Bwanamkou	CO Health, Environment & Sanitation	bwanamkous@yahoo...	0721725519	[signature]
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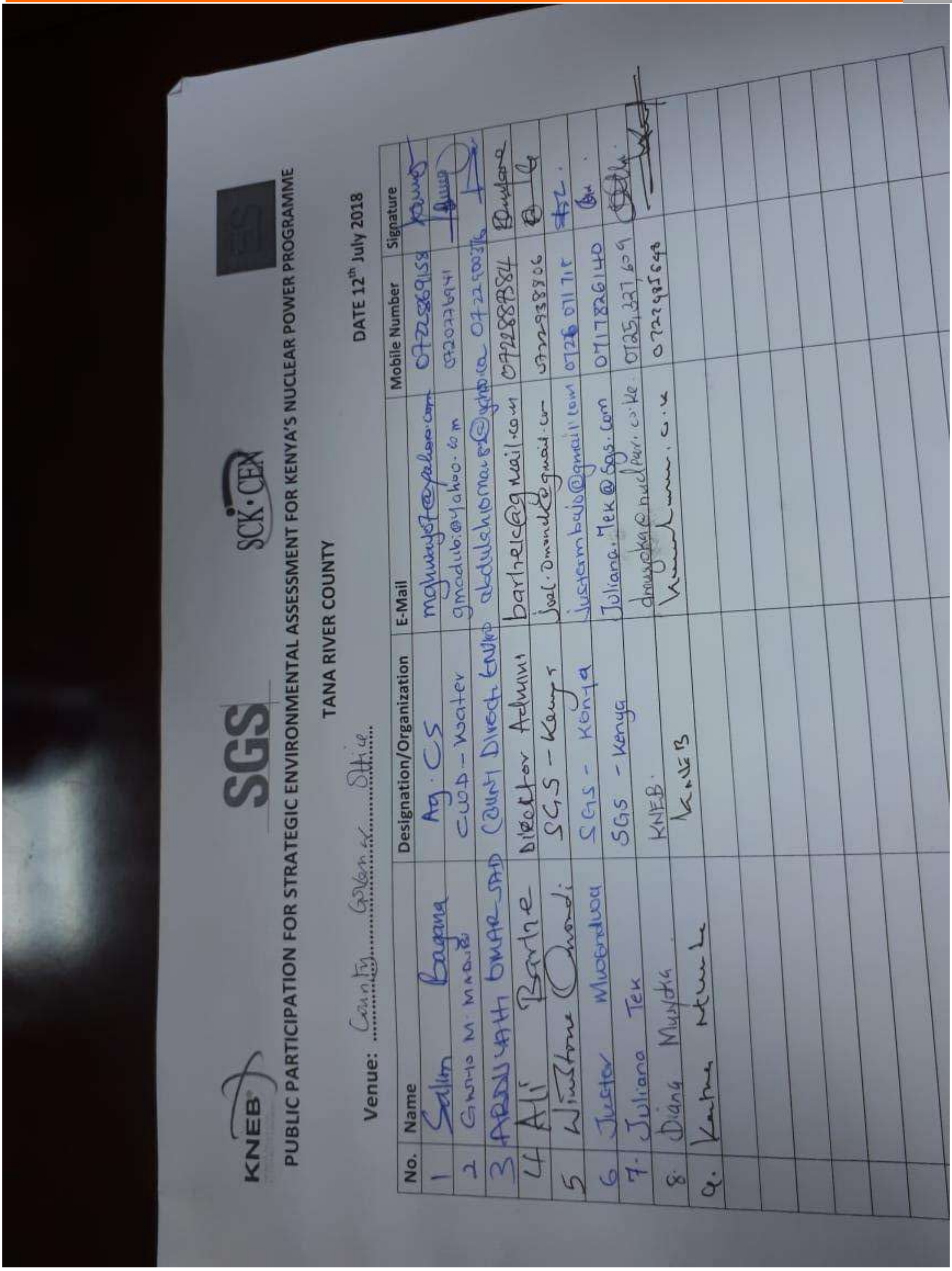
3	MR. ATHMAN DUMILA	CPHO-LAMU CNTY	dumilamohamed@yahoo.com	0722554738	[signature]
4	ABDULSALAM OMAR	ENVTAL OFFICER	abduser29@yahoo.com	0725436080	[signature]
5	MOHAMED A. MOHAMED	D.H.O	mohamedabu2000@yahoo.com	0722668644	[signature]
6	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	0717826140	[signature]
7	Katha Mxxxx	KNEB	[illegible]	0727985648	[signature]
8	Diana Muyoka	KNEB	dmuyoka@nuclear.co.ke	0725,327,609	[signature]



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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

TANA RIVER COUNTY

Venue: County Governor Office

DATE 12th July 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1	Salim Bagana	Ag. CS	mghuayo57@yahoo.com	0722869158	[signature]
2	Gwiyo M. Madubi	CWD – Water	gmadubi@yahoo.com	0720276941	[signature]
3	Abdullahi Omar Sadi	County Direct. Enviro	abdulahiomar82@yahoo.co	0722900376	[signature]
4	Ali Barhe	Director Admin	barheic@gmail.com	0722887384	[signature]
5	Winstone Omondi	SGS – Kenya	joel.omondi@gmail.com	0722938806	[signature]
6	Juster Mwendwa	SGS – Kenya	justermbajo@gmail.com	0726 071 718	[signature]
7	Juliana Tek	SGS – Kenya	Juliana.Tek@sgs.com	0725,327,609	[signature]
8	Diana Munyoka	KNEB	dmunyoka@nuclear.co.ke	0722985648	[signature]
9	Kathurima [illegible]	KNEB	[illegible].co.ke		

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

KWALE COUNTY

Venue: Kwale County Board Room.

DATE 25 / 01 / 2018

No.	Name	Designation/Organisation	E-Mail	Mobile Number	Signature
1	MARTIN M. MWARO	CS - Clerk	mwaromart@yahoo.co.uk	0721883464	
2	Dr. Mohamed Pakia	CO - Env. & NR	pakiamohamed@yahoo.co.uk	0721...	
3	DYOO GEORGE P.	CDE - NEMA	oyoogp@gmail.com	0725006604	
3	ALI A. BUDZUMA	County Planner - Kwale	aabdallah44@gmail.com	0724935832	
4	Abdulaziz H. Bakari	GIS Analyst - Kwale	abdulaziz470@gmail.com	0712763340	
5	Shoks Ali Omar	Physical Planner - Kwale	omarshox@gmail.com	0702 060 563	
6	KAPIS GOGA	KNEB	kapisgoga@gmail.com	0727 601 994	
7	CATHERINE KIANJI	KNEB	ckianji@nuclear.co.ke	0724712571	
8	Dennis Nkonge	KNEB	dnkonge@nuclear.co.ke	0723350544	
9	Kathure Kimunde	KNEB	kimunde@nuclear.co.ke	0727985698	
10	Jackie Lagat	SGS	chepchel@gmail.com	0722877413	
11	WINSTONE J. OMONDI	SGS	Joel.Omondi@gmail.com	0722938806	
12	Chesire K. Edwin	KNEB	Cedwin@nuclear.co.ke	0723 696 146	

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

MOMBASA COUNTY

Venue: Executive Board Room

DATE 17 / 01 / 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	DR. GODFFREY NATO	CECM ENVIRONMENT	natogodffrey@gmail.com	0732325974	
2	FAWZ RASHID	CECM TRADE, TOURISM + INV	fawz@alfawzern.com	0724-111-117	
3	Philip Mvati	Director Legal & Reg	pmvati@nuclear.co.ke	0722649921	
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5	Omondi WINSTONE	SGS Social & Environment	joel.omondi@gmail.com	0722938806	
6.	JACKLINE LANGAT	SGS	Chepchul@gmail.com	0722877413	
7.	Kathia Maundu	KNEB	Kmaundu@nuclear.co.ke	0727985698	
8.	Kepis . Goga	KNEB	Kepisgoga@gmail.com	0727601994	
9.	Catherine Kinyua	KNEB	CKinyua@nuclear.co.ke	0724712571	
10	Dennis Nkonge	KNEB	dnkonge@nuclear.co.ke	0723850644	
11	FEDDIS MBURA	M.C.A	feddismbura@gmail.com	0724569475	
12	SHEBE A. Mukondo	M.C.A Chair Environment	Abdallashebe60@gmail.com	0712574998	
13	BINTI OMAR	ADVISOR OFFICE OF THE GOV	bintyali79@gmail.com	0718885428	
14	Abdulwahab mbarak	chief officer	abdulwahab.mbarak@gmail.com	0722677416	

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

KILIFI COUNTY

Venue: Governor's Board Room

DATE 19 / 01 / 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	Jackline Langat	SGS	chepdel@gmail.com	0722877413	
2.	Winstone Omondi	SGS	joel.omondi@gmail.com	0722938806	
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4	Philip Abuor	SGS/ESIA Consultants	Philip.Abuor@sgs.com	0722410369	
5	PHILIP K. MUTIH	KNEB	Pmutai@nuclear.co.ke	0722648335	
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7.	Kapis Goga	KNEB	K.Ondiegi@nuclear.co.ke	0727601994	
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9.	Catherine Kiragi	KNEB	ckiragi@nuclear.co.ke	0724712571	
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11	WILFRED BAYA	County Energy Officer	baya.kenga@yahoo.com	0713619022	
12	Marcel Otieno	County Gov of Kilifi	marcelotieno@gmail.com	0727177482	

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

KIRINYAGA COUNTY

Venue: ..... **DATE 20th June 2018**

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
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2	Kapii Gregory	KNEB	Kondiegi@nuclear.co.ke	0727601994	
3	Diana Musyoka	KNEB	dmusyoka@nuclear.co.ke	0725,327,609	
4	Omondi Hinchone	SGS – Kenya	joel.omondi@gmail.com	0722938806	
5	Juster Muondoo	SGS. Kenya	justermbaja@gmail.com	0726071715	
6.	Njeri Kamiam	KNEB	nkamiam@nuclear.co.ke	0728293669	
7	Juliana Tek	SGS -Kenya	Juliana.Tek@sgs.com	0717826140	
8	Ikaowa Muinde	KNEB	kmuinde@nuclear.co.ke	0727985648	

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

EMBU COUNTY

Venue: GOVERNOR'S BOARDROOM

DATE 28th June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	Eng. Waganagwa	CECM – WATER	Ranjiwa2012@gmail.com	0725237142	
2	SULEIMAN FARHAN	CECM ENERGY	carintsuleiman@gmail.com	0722359603	
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5.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	0717826140	
6.	Njeri Kamiaru	KNEB	nkamiaru@nuclear.co.ke	0728293667	
7	Eng. Richard C.N. Mbogo	C.O. Water & Irrigation	rcoradon@yahoo.co.uk	0724164162	
8.	Omondi Wilistine	SGS - Kenya	Joel.omondi@gmail.com	0722938816	
9.	Juster Mwenduwa	SGS – Kenya	justermbajo@gmail.com	0726071715	
10.	Dima Musyoka	KNEB	dmusyoka@nuclear.co.ke	0725,327609	
11	Kapis Gogo	KNEB.	Kondigi@nuclear.co.ke	0727609194	
12.	Chesire K. Edwin	KNEB	Cedwin@nuclear.co.ke	0723 696 146	
13.	Eng. Albert Gatuta	Director - Water Services	agatuta@gmail.com	0720746515	

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

NYERI COUNTY

Venue: GOVERNOR'S BOARDROOM – NYERI

DATE 19th June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	HE MUTAHI KAHIGA	GOVERNOR	mutahi8@gmail.com	0722383047	
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4.	Njeri W. Kamiaru	KNEB	nkamiaru@nuclear.co.ke	0728293667	
5.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	717826140	
6.	Omondi Winstone	SGS - Kenya	Joel.omondi@gmail.com	0722938806	
7	Juster Mwendwa	SGS - Kenya	justermbaio@gmail.com	0726071715	
8.	Chesire K. Edwin	KNEB	Cedwin@nuclear.co.ke	0723696146	
9.	Kupis Goga	KNEB	Kondiegi@nuclear.co.ke	0727601994.	
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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

KITUI COUNTY

Venue: BOARD ROOM

DATE 27th June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	JOHN M. MAKAU	CEZM - ENVIRONMENT & NATURAL RESOURCES	makaujohn69@gmail.com	0722704039	
2.	BENJAMIN MUKUTO	D-D- MENR	bmmusili@yahoo.com	0725819005	
3.	Everlyne Kitavi	SFO - MENR	ekitv@gmail.com	0723324505	
4.	Rachel Mwangangi	A.D - Energy - MENR	Kalumuhm@gmail.com	0720538186	
5.	Marian John	E.O, MENR	mariannduku@yahoo.com	0719707999	
6.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	0717826140	
7.	John M. Munyalo	Caritas - Catholic Diocese Kitui	Jmunyalo@gmail.com	0728247005	
8.	Nahashon K. Wew	Min of Energy	nkwew@yahoo.com	0720349327	
9.	Jupiter Mwendwa	SGS - Kenya	[illegible]@gmail.com	0726071715	
10.	Diana Musyoka	KNEB	dmusyoka@nuclear.co.ke	0725,327,609	
11.	Omondi Winstone	SGS - Kenya	[illegible].omondi@gmail.com	0722938806	
12.	Kapis Goga	KNEB	Kondiegi@nuclear.co.ke	0727601994	
13.	Kahura [illegible]	KNEB	[illegible]@nuclear.co.ke	0722985648	

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

GARISSA COUNTY

Venue: CECM Environment & Energy office

DATE 29th June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1	Habon A. Maalim	CECM. Energy	habonmaalim@yahoo	0721246026	
2.	Dekow Khalif Maalim	Asst. D. Energy	Khalif9990@yahoo.com	0720460012	
2.	Kuhu Mwenye	KNEB	kmwenye@nuclear.co.ke	0722 985690	
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3	Justor Mbaso	SGS - Kenya	justormbaso@gmail.com	0726,071,715	
6.	Mulki Mohamed Dekow	Director Environment	Mulkimohamed@yahoo.com	0714418710	
7.	Hajir A. Ali	Director - Energy	hajirshenj@yahoo.com	0720737302	
8	Kapis Goga	KNEB	Kondiegi@nuclear.co.ke	0727601994	
9.	Omondi Winstone	SGS - Kenya	joel.omondi@gmail.com	0722938886	
10.	Chesire K. Edwin	KNEB	Cedwin@nuclear.co.ke	0723696146	
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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

MURANG'A COUNTY

Venue: CEC Environment & Climate change Office **DATE 18th June, 2018**

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
	CECILIA KIBO	CEC - ENVIRONMENT	ceeawakite@gmail.com	0721814137	
	JOSPHAT RUKENYA	CO WATER & IRRIGATION	cdimuranga@gmail.com	0722924411	
	Kapis Goya	KNEB	Kondiegi@nuclear.co.ke	0727601994	
	[illegible]	KNEB	[illegible]	0729985498	
	Njeri Kamiaru	KNEB	nkamiaru@nuclear.co.ke	0728293667	
	Chesire K Elvis	KNEB	Cadvin@nuclear.co.ke	0723 696 146	
	Diana Muoyoka	KNEB	dmuoyoka@nuclear.co.ke	0725,327,609	
	Juster M. Mbaio	SGS K	Justombaio@gmail.com	0726071715	
	Winstone Joel Omondi	SGS K	Joel.omondi@gmail.com	0722938882	

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

LAMU COUNTY

Venue: Chief officer Environment boardroom.

DATE 10th July 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1	Said M. Busanamkou	CO Health, Environment & Sanitation	busanamkous@yahoo.com	0721725519	
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6.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	0717826140	
7.	[illegible]	KNEB	[illegible]	0727985648	
8.	Diana Munyoka	KNEB.	dmunyoka@nuclear.co.ke	0725,327,609	

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

MERU COUNTY

Venue: CECM EWNR Office

DATE 22nd 21st June, 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
1.	KINOTI MWEBIA LAWRENCE	CO - EWNR	kinotilawrence@gmail.com	0721744755	
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3	Elijah Kobia	Div Natural Resources	elikabai@ymail.com	0727663486	
4.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com		
5.	Njeri Kamiaru	KNEB	nkamiaru@nuclear.co.ke	0728293667	
6.	Omondi Kingstone	SGS - Kenya	joel.omondi@gmail.com	0722938866	
7.	KAPIS GOSA	KNEB	Kondiegi@nuclear.co.ke	0727601994	
8.	JUSTUS MWENDWA	SGS - Kenya	justusmbajo@gmail.com	0726071715	
9.	Diana Mugyoka	KNEB - Technical Officer	dmugyoka@nuclear.co.ke	0725327,609	

KNEB SGS SCK•CEN

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

TANA RIVER COUNTY

Venue: County Governor Office

DATE 12th July 2018

No.	Name	Designation/Organization	E-Mail	Mobile Number	Signature
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4	Ali Barhe	Director Admini	barhe[illegible]@gmail.com	0722887884	
5	Winstone Onondi	SGS - Kenya	Joel.Omondi@gmail.com	0722938806	
6	Juster Mwendwa	SGS - Kenya	justermbajo@gmail.com	0726 071 718	
7.	Juliana Tek	SGS - Kenya	Juliana.Tek@sgs.com	0717826140	
8.	Diana Musyoka	KNEB.	dmusyoka@nuclear.co.ke.	0725,327,609	
9.	Katana Ntunde	KNEB	[illegible].co.ke	0722985648	

KNEB SGS SCK•CEN EHS

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

HOMABAY COUNTY

Venue: ....

DATE 19th February 2018

No.	Name	Designation/Organisation	E-Mail	Mobile Number	Signature
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	PAM ONYANGO	RENEWIA ENERGY	Pam@Renewia.com	0795058674	
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KNEB SGS SCK·CEN EHS

PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

MIGORI COUNTY

Venue: ..... **DATE 21st February 2018**

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

NAKURU COUNTY

Venue: Elsamere Conservation Centre, Naivasha. DATE 6 / 4 / 2018

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

BOMET COUNTY

Venue: COUNTY ASSEMBLY OF BOMET.

DATE 4 / 04 / 2018

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

KERICHO COUNTY

Venue: Governor Board Room **DATE** 03 / 04 / 2015

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

TURKANA COUNTY

Venue: CO Office

DATE 26/03/2018

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

NANDI COUNTY

Venue: OFFICE OF LANDS ENVIRONMENT & NATURAL RESOURCES

DATE 29/03/2018

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PUBLIC PARTICIPATION FOR STRATEGIC ENVIRONMENTAL ASSESSMENT FOR KENYA'S NUCLEAR POWER PROGRAMME

UASIN GISHU COUNTY

Venue: DG Office

DATE 27 / 03 / 2018

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NUCLEAR POWER AND ENERGY AGENCY (NuPEA) formerly KNEB

STRATEGIC ENVIRONMENTAL ASSESSMENT- NATIONAL STAKEHOLDER MEETING FOR THE KENYA NUCLEAR POWER PROGRAMME.

VENUE: LAICO REGENCY HOTEL

DATE: 19th JULY 2019

ATTENDANCE LIST

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STAKEHOLDER MEETING FOR THE NUCLEAR POWER PROGRAMME

NUCLEAR POWER AND ENERGY AGENCY (NuPEA) formerly KNEB

STRATEGIC ENVIRONMENTAL ASSESSMENT- NATIONAL STAKEHOLDER MEETING FOR THE KENYA NUCLEAR POWER PROGRAMME.

VENUE: LAICO REGENCY HOTEL

DATE: 19th JULY 2019

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STAKEHOLDER MEETING FOR THE NUCLEAR POWER PROGRAMME

NUCLEAR POWER AND ENERGY AGENCY (NuPEA) formerly KNEB

STRATEGIC ENVIRONMENTAL ASSESSMENT- NATIONAL STAKEHOLDER MEETING FOR THE KENYA NUCLEAR POWER PROGRAMME.

SGS

VENUE: LAICO REGENCY HOTEL

DATE: 19th JULY 2019

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STAKEHOLDER MEETING FOR THE NUCLEAR POWER PROGRAMME

NUCLEAR POWER AND ENERGY AGENCY (NuPEA) formerly KNEB

STRATEGIC ENVIRONMENTAL ASSESSMENT- NATIONAL STAKEHOLDER MEETING FOR THE KENYA NUCLEAR POWER PROGRAMME.

VENUE: LAICO REGENCY HOTEL

DATE: 19th JULY 2019

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STAKEHOLDER MEETING FOR THE NUCLEAR POWER PROGRAMME

NUCLEAR POWER AND ENERGY AGENCY
(NuPEA) formerly KNEB

STRATEGIC ENVIRONMENTAL ASSESSMENT- NATIONAL STAKEHOLDER MEETING FOR THE KENYA NUCLEAR POWER PROGRAMME.

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50					

STAKEHOLDER MEETING FOR THE NUCLEAR POWER PROGRAMME

Annex IV: Consultation and Public Participation Images

Embu

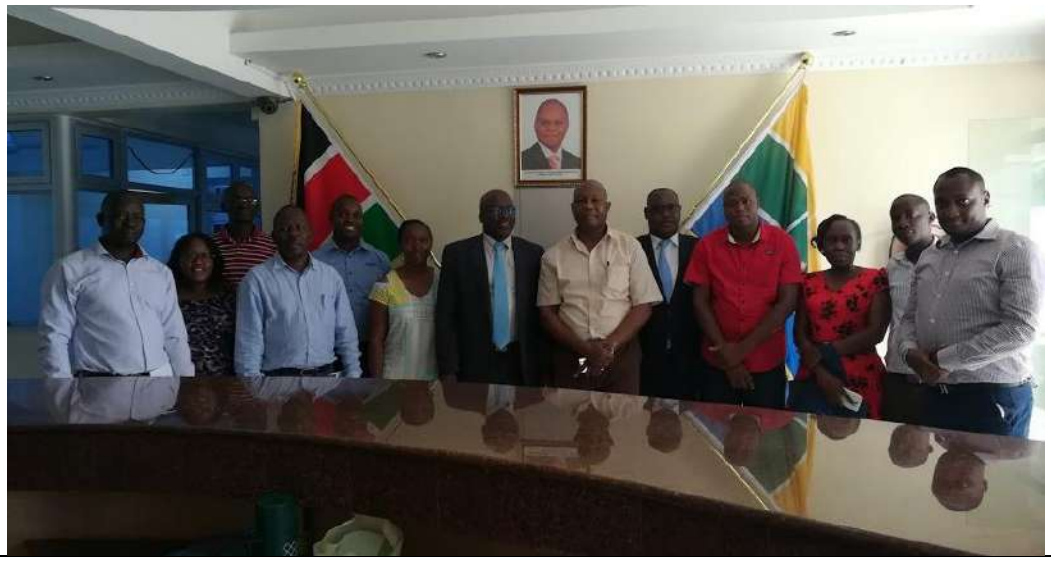
Meru

Nyeri

Bomet

Migori

Kilifi



Mombasa

Kwale

Annex V: National Milestones and Key Achievements

Several key milestones and achievements were realized by the Agency during the implementation of the strategic plan. These include: -

1. Conducted a Pre-Feasibility study for the introduction of the Nuclear Power Programme.
2. Adoption and implementation of the Quality Management System (QMS) and gained ISO 9001:2009 certification.
3. Enhanced cooperation and collaboration with stakeholders locally, regionally and internationally.
4. Initiation of the process of the ratification of various conventions on the peaceful application of nuclear technologies in the Country.
5. Enactment of the Nuclear Regulatory Act, 2019 which ensures safe, secure and peaceful utilization of atomic energy and nuclear technology.
6. Conducting IAEA Integrated Nuclear Infrastructure Review (INIR) and Site and External Events Design (SEED) review mission to assess the progress the country has made towards realization of the programme.
7. Development of policies and strategies for the various infrastructure issues in regard to the nuclear power programme.
8. Conducting technical studies for the development and deployment of the nuclear power programme.
9. Enter into Memorandum of Understanding (MoUs) with countries and organizations on capacity building and human resource development for the nuclear power programme.
10. Facilitation of several staff management and leadership skill improvement initiatives.

Based on the 22 infrastructure issues the following were the key achievements/milestone;

No.	Infrastructure Issue	Key Achievement(s)/milestone
1.	National Position	Safety, security and non-proliferation needs have been recognized and plans to ratify several conventions related to the future nuclear power programme has been initiated through formation of a Technical Working Group to spearhead the ratification of necessary treaties & conventions. The Cabinet has shown commitment on the ratification of the Convention on Nuclear Safety through Kenya's statement during the 60th IAEA General Conference in 2016. Draft Cabinet Memorandum on Accession to the following conventions has been prepared: ● Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, ● Convention on early notification of a nuclear accident ● Convention on Assistance in case of a nuclear accident or radiological emergency. Nuclear security has also been recognized through ratification of the relevant conventions and treaties, namely: The Convention on the Physical Protection of Nuclear Material and its Amendment;

		and the International Convention for the Suppression of Acts of Nuclear Terrorism. A draft Nuclear Regulatory Bill has been developed and is currently under parliament legislation process. The Nuclear Power and Energy Agency (N*u*PEA) has been established under Energy Act 2019, it assumes the roles of a NEPIO. The National Energy Policy that formally introduces nuclear into the energy mix was adopted by the National Cabinet in September 2015.
2.	Internal and External Issues	Draft Risk Assessment for Kenya's Nuclear Power Programme.
3.	Security and Physical Protection	Development of nuclear security and physical protection policy and strategy Initiation of preliminary national threat assessment for nuclear related threats. Enforcing Nuclear Regulatory Act, 2019 which acknowledges and addresses the importance of security and physical protection for nuclear facilities/radioactive sources in storage or during transport Review of nuclear security infrastructure through the IRRS Mission Adoption of relevant legal instruments in the area of nuclear security namely: ● The Convention on the Physical Protection of Nuclear Material ● The Amendment to the Convention on the Physical Protection of Nuclear Material ● The Int'l Convention for the Suppression of Terrorist Bombings (● The Int'l convention for the Suppression of Acts of Nuclear Terrorism ● The Int'l Convention for the Suppression of the Financing of Terrorism ● UN Security Council Resolutions 1373 and 1540.
4.	Nuclear Safety	A process of ascension to the Conventions on nuclear safety" and convention on early notification of nuclear accident, convention on assistance in the case of a nuclear accident or radiological emergency and joint convention on the safety of spent fuel management and on the safety of radioactive waste management has been initiated.

		Signing of bilateral agreements with the Republic of Korea, China, Russian Federation, Slovakia and Ghana to support the development of a robust nuclear safety infrastructure. Development of a draft National Policy and Strategy for Safety for Kenya to ensure that facilities are operated, and activities conducted to achieve the highest standards of safety.
5.	Management	Leadership and Management for Introducing and Expanding Nuclear Power Programmes has been conducted through the International Nuclear Leadership Education Program. A quality management system based on ISO 9001:2015 requirements and international guidelines for nuclear power development has been established and implemented Ken Gen has been identified as an owner/operator organization for the management of the nuclear power plant
6.	Funding and Financing	Estimation of the Cost of the Programme The Government has been identified as the initial provider of funds for various activities of the nuclear power programme. Technical working group developed to carry the activities of the funding and financing infrastructure with an estimation of the magnitude of the cost of the preliminary activities before the actual project is commissioned
7.	Legislative Framework	Adherence to all relevant international legal instruments has been demonstrated through ratification of the relevant international legal instruments dealing with nuclear security, and the presence of a Comprehensive Safeguards Agreement and Additional Protocol. The Nuclear Regulatory Act, 2019 which is a comprehensive nuclear law covering nuclear safety, security, safeguards, and civil liability for nuclear damage, and provides for the establishment of the Kenya Nuclear Regulatory Commission.
8.	Safeguards	Cabinet has shown commitment on the ratification of the Convention on Nuclear Safety in the Kenya's statement during the 60th IAEA General Conference held in 2016. A review of safeguards approaches of other countries was undertaken and recommendations were made to identify and incorporate good practices of these countries in Kenya's planned nuclear power programme in the area of safeguards.
9.	Radiation Protection	The Nuclear Regulatory Act, 2019 addresses measures to enhance current radiation protection measures to meet requirements related to nuclear power plants
10.	Regulatory Framework	The Nuclear Regulatory Act, 2019 provides for the establishment of a Kenya Nuclear Regulatory Body. Preliminary efforts to

		identify the resources and competencies for the regulatory body has been initiated. An Integrated Regulatory Review (IRRS) mission was conducted to strengthen the effectiveness of the national regulatory infrastructure
11.	Electric Grid	Conducted grid study to support NPP Completion to electric grid study for interconnections scheme for potential nuclear power plant sites for enhancement of grid capability to accommodate power from nuclear power plant.
12.	Human Resource Development	Development of HRD draft strategy. Development of NPHRD concept model Studies have been conducted to identify the knowledge and skills necessary to purchase, operate, maintain and regulate a nuclear power plant. A draft human resource development strategy that seeks to ensure Kenya has the requisite manpower to successfully establish and maintain the nuclear power programme has been developed More than 50 individuals have undergone trainings on nuclear power plant technology at both local and international learning institutions.
13.	Stakeholder Involvement	Development of a comprehensive Communication Strategy, which identifies different stakeholder categories, their different information needs and strategic communication approaches. Roll out of a strong public education programme that includes a list of the different Stakeholder Involvement activities conducted over the previous years, including a National Stakeholder Conference and a visit by parliamentarians to operating countries and the IAEA. Development of a variety of informational, educational and communication materials that address the risks and benefits for introducing nuclear power in Kenya. Continuous undertaking of public and stakeholder education activities to create awareness and increase knowledge among the public and stakeholders on Kenya's nuclear power development.
14.	Site and Supporting Facilities	Establishment of a national Site Selection Team (SST) to finalize site selection activities for nuclear installations. Completion of ***Criteria for Siting of nuclear installations in Kenya*** (based on the IAEA SSG-35). General survey of potential regions carried out and potential sites identified through screening and comparison.

		Screening and ranking of the potential sites undertaken and Preferred and Alternate candidate sites identified. Completion of an IAEA Site & External Events Design (SEED) Review Mission on site survey and site selection for NPPs in Kenya. Preparatory activities for site assessment initiated through engagement of a Consultant for the development of ***Terms of Reference for characterization of sites for nuclear power plants in Kenya.***
15.	Environmental Protection	Conducted a Strategic Environmental Assessment (SEA). Consideration of nuclear reactors and nuclear plants as one of the projects to undergo environmental impact assessment in the second schedule of the Environmental Management and Coordination (Amendment) Act 2015 Capacity building in the areas of Environmental Impact Assessment including Strategic Environmental Assessment through training by the IAEA Initial baseline environmental information has been collected and analysed in connection with site selection
16.	Emergency Planning	Assessment of national emergency preparedness and response capability through the IAEA emergency preparedness and review Mission assessment of the emergency preparedness and response requirements and resources necessary for nuclear power through the IAEA EPREV Mission implementation of the EPREV mission action plan with stakeholders.
17.	Nuclear Fuel Cycle	Assessment of suitable fuel cycle options for the Kenya nuclear power programme Development of draft Nuclear Fuel Cycle policy and strategy Development of user requirements and reactor technology assessment for both Large NPP and Small Reactor Technologies. Evaluation of Nuclear Energy System Options using INPRO tools and methodologies for assessment on reactor technology and consultancy.
18.	Procurement	
19.	Radioactive Waste	Assessment of suitable radioactive waste management options for processing, handling, storing and disposal of different radioactive waste types Development of a draft National Policy and Strategy for Radioactive Waste Management

20.	Industrial Involvement	Industrial survey to assess the capability of the local industries in Kenya in regard to the Nuclear Power Programme. Development of a database to assess the capability for local industries as potential suppliers for the nuclear power programme
21.	Procurement	Identification of requirements for purchasing nuclear power plant equipment and services Draft position paper on procurement needs for nuclear power plant components
22.	Nuclear Knowledge Management	