

Dr. David Obura, CORDIO East Africa<sup>1</sup>. 20 May 2017.

1. This summary presents my main concerns about the marine environmental impacts of the Amu Coal Plant in Lamu County. My comments are based on my reading of the Environmental and Social Impact Assessment (ESIA) and relevant scientific studies, my 25 years of experience on coral reefs and coastal marine ecosystems of the Kenya coast, East Africa and globally, and a site visit on the sea on 11 May 2017. The ESIA submitted by the project and accepted by the National Environment Management Authority (NEMA) has such gross omissions that the license based on it should be reversed immediately, and a more informed national debate on the proposed benefits and the risks of the project be held and concluded, prior to allowing a renewed ESIA.
2. I see four headline issues that I assess have been ignored by the ESIA and by NEMA, that are each make-or-break issues for the project, and that the National Environment Tribunal (NET) should rule on, in the case brought by Save Lamu against Amu Coal and NEMA. These four issues are:
  - a) toxic pollution from coal dust and ash,
  - b) climate change - carbon emissions from the coal plant,
  - c) climate change - sea level rise, and
  - d) the gross omissions, quality and credibility of the ESIA.
3. **Issue 1) Environmental concerns arising from coal dust and coal ash.** These concerns are elaborated on by two other witnesses for Save Lamu with greater experience in coal and biotoxicity issues than myself, Paul Winn and Mark Chernaik. Coal and its combustible products (ash, smoke, etc), contain many toxic substances such as polycyclic aromatic hydrocarbons (PAHs), trace metals such as mercury and arsenic, and various suspended particulate fractions (dust). How these are handled is essential, and there is grossly insufficient detail in the ESIA about both their release and dispersal into the atmosphere, rain and groundwater, and seawater, and of their toxic effects on biota and people.
4. In the air, the EIA doesn't assess maximum potential dispersal of dust and smoke that is possible based on the variable diurnal wind patterns at the site. In the sea, there is no discussion of any pollution issues affected by tidal and offshore currents. On land, and in the sea, the long term accumulation and impacts of toxins in sediments, biota and people are not addressed at all. The EIA even claims a positive health impact on people, whereas studies in South Africa estimate over 2,000 premature deaths annually attributable to coal burning for electricity generation. The relevant figure for Lamu Country must be estimated. See also paragraph 7 below.
5. The ash yard that will permanently store the residual ash from burnt coal will be a mountain on the site of the plant. Based on specifications in the ESIA it may eventually have a size of some 3.75 km long by 900 m wide and 25 m high. Comparing this to the shoreline of Lamu island, this would cover from Lamu town to Shela village, and equal the height of the Shela sand dunes and the highest buildings in Lamu town. No plan for disposing of this waste elsewhere is presented, so we must assume it is intended to remain in place, forever. The ESIA does not mention this at all, and presents no assessment of long term impacts, or how this mountain of toxic waste may weather or erode over time.
6. **Issue 2) climate change - carbon emissions from coal** - the ESIA report points out that the carbon dioxide emissions of the plant will equal the TOTAL current emissions of Kenya's entire energy sector. It claims this is insignificant as it is only 0.024% of global emissions. However, the obvious point is that this plant alone will DOUBLE Kenya's national carbon dioxide emissions from the energy sector. Another witness for Save Lamu, Ernie Niemi, details the social costs of carbon dioxide emissions, which should be assessed in the ESIA but are not. But more broadly, this is clearly an issue of national scale and it must be determined if there is any defensibility for Kenya to use coal for energy generation while portraying itself in a leadership role in climate mitigation and adaptation under the United Nations climate change framework, the UNFCCC. Kenya's energy sector is making game-changing investments in national-scale low-carbon alternatives such as wind and geothermal, and in local renewables such as wind and solar, so the Amu coal plant needs to be assessed against these. This is not just an issue for government to consider, but for civil society as well. The legal defense for the plant claims Kenya can do this on the basis of the United Nation's principle of "common but differentiated responsibilities", arguing that countries at low levels of development have free rein to pollute while they develop ... but this is a position that is narrow and hotly contested by significant portions of Kenyan society.
7. Given the dearth of reliable data nationally, the carbon emissions of the coal plant provide an analogy for the potential scale of pollution from the coal plant raised in issue 1. Kilogram for kilogram of coal burnt, if the Amu coal plant will be the biggest single polluter of carbon dioxide in the country (see paragraph 6), it is also very possible that it will be the single largest polluter of toxic chemicals, particularly given Kenya's low level of mining and heavy industry, and high dependence on agriculture and nature-based sectors such as tourism. The total magnitude of toxic emissions/pollutants is not estimated in the ESIA, and it is inconceivable that an industrial plant of this magnitude could or should be licensed without immense effort to assess its scale, and identify credible mitigation of its potential impacts.

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Further, siting this in a vulnerable location (see paragraph 8) raises further questions.

8. **Issue 3) climate change - sea level rise and long term pollution.** The mountain of toxic waste ash from the plant mentioned in point 1 is in a vulnerable location. A Digital Elevation Model of the Kenya coast shows the site to be between 3 and 6 m above sea level and it is within tens of meters of the shoreline. This means that whatever remains on the site after decommissioning (which is not discussed in the ESIA but should be by law), which we must assume includes the coal waste mountain, will be vulnerable to sea level rise of as little as 1-2 m (given wave action, extreme tides, storm surges and documented experience with the Indian Ocean Tsunami of 26 December 2004). The IPCC provides estimates of sea level rise for this century of up to 1 m, and the many uncertainties about the stability of the Greenland and Antarctic ice caps under global warming warn that much greater and faster sea level rise of several meters is very possible within the next few hundred years. What will happen when, not if, erosion by the sea of this toxic mountain starts? If LAPSSET proceeds the region will have an urban population of several millions of people (LAPSSET estimates over 1 million by 2050). The ESIA says nothing about this.

9. **Issue 4) the provision, acceptance and use of reliable and credible data** – the more scrutiny I apply to the ESIA report, the more the glaring lack of appropriate quantitative data shines through. Some brief examples:

- a) having done a field trip to the marine locations in the EIA – the thermal effluent outlet and survey transects in Manda Bay – the lack of coordinates for survey locations is glaring, and there are inconsistencies in the transect lengths compared to the actual width of the bay, and in different sections of the report.
- b) the habitat maps used are at an inappropriate scale for a detailed local study, and in fact show the presence of coral reefs that are non-existent. Notably, fieldwork purportedly done by the study authors does not appear to have enabled them to correct the errors in these maps. The ESIA also reports coral reefs at depths (10-20 m) and locations in the project area that is contrary to all advice and guidance I have been given from local experts during the 20 years I have worked in Lamu County. Due to exceedingly poor visibility (about 1 m) on my field trip due to port dredging/construction (see paragraph 10) I was unable to verify whether coral reefs were present at those depths.
- c) there are no quantitative measures of any habitat variables - seagrass or coral communities - that are required by the Act (EMCA) for baseline assessment and as a foundation for environmental monitoring.
- d) In relation to issue 1 on dust levels in the air, background levels of particulate matter reported in a table in the ESIA are implausibly low, and sampling was so inadequate as to be meaningless, suggesting a lack of understanding of the issues involved in monitoring standards.

10. Environmental impacts are cumulative, the prime justification for Strategic Environmental Assessments (SEA) and for ESIA's to assess concurrent projects. Yet, when discussing potential levels and mitigation for the coal plant, the ESIA does not take into account the SEA for the broader LAPPSET project, nor the Manda Port ESIA. It limits itself to 'concurrent construction' projects, rather than 'concurrent operational' projects, as required by the Act. Even a simple observation during my field visit of visibility levels of about 1 m at the coal plant site, and 3-4 m at sensitive coral reefs on Pate island showing evidence of heavy siltation, caused by ongoing dredging and berth construction for the Lamu port, indicate impacts from just one project are higher than suggested in the ESIA for that project. It is just not possible to assess the cumulative impacts from all the proposed LAPPSET projects without a full review of the individual ESIA's and of the SEA recently released.

11. To conclude - this is not just any project, this project WILL be Kenya's largest emitter of carbon dioxide, and MAY be Kenya's single largest emitter of toxic substances to the environment. Currently these impacts will be felt in a relatively un-impacted environment, but in the lifetime of the plant the population of the area will grow to over a million urban residents and be a major hub for trade and transport. The EIA is silent on the critical issues 1-3 (paragraphs 3-8), shows errors and omissions that undermine its credibility as an objective decision-support tool (paragraphs 9 and 10) and doesn't address the cumulative impacts of Kenya's largest set of development projects. Necessary steps for any further consideration of this project should include the following, after which scoping for a revised project description and ESIA could be developed:

- a) a credible national/international pollution study that includes marine, freshwater, air and terrestrial aspects, covering all pollutants released including carbon dioxide, convened under independent and credible oversight;
- b) reassessment of the LAPPSET Strategic Environment Assessment and the scoping of ESIA's for all its component parts, including for the Amu Coal Plant. Though not originally part of the LAPPSET plan, the coal plant is of such large significance, that it must be considered together with LAPPSET components;
- c) a full national debate on the pros and cons of the Amu Coal Plant for the considerations above, and similar ones raised in relation to terrestrial and human impacts not discussed here.