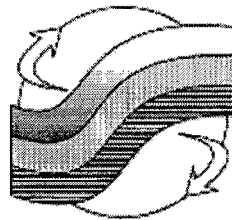


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**Petroleum Refineries and Heavy Metal Pollution in the  
Coastal Areas of Cameroon: A Case Study of SONARA and  
the Limbe Atlantic Coast**

**Master Thesis  
by  
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## ABSTRACT

Offshore oil was first discovered in Cameroon in 1976 and the refining of crude oil started in 1978, and since then its importance to the national economy has been increasing. By virtue of the fact that processing, storage, and transportation of petroleum products in Cameroon is concentrated in the coastal areas, marine ecosystems have become vulnerable. Besides the National Oil Refinery, SONARA, which is located at the coast of Limbe, the recent Chad-Cameroon pipeline project for the transportation of crude oil for export from Chad to the coast of Kribi in Cameroon left a lot of environmental destruction. Heavy metal bi-products resulting from refineries may enter marine environments, and eventually enter the aquatic or terrestrial food webs, with a multitude of deleterious effects to humans and the environment. These metals are of particular concern due to their high toxicity, and ability to bioaccumulate and biomagnify in the food chain.

An assessment of the effects of the National Oil Refinery (SONARA) on the concentration of cadmium and lead in the Limbe coastal area of Cameroon was conducted. The Graphite Furnace Atomic Absorption Spectrometry (GFAAS) was used to analyse marine sediments, molluscs (*Natica alderi*), fishes (*Epinephelus spec.*) and plants (*Aroid spec.*). Both cadmium and lead contents measured in all the samples were within the threshold concentration of the environment. However, a relatively high concentration of lead was observed in the sediment and mollusc near SONARA, compared to the control site. This increase in the concentration of lead is obviously due to the influence of SONARA, and this may be detrimental to the environment, and to humans through fish species that feed on mollusc. On the contrary, no obvious effect of SONARA was detected on the concentration of cadmium in the Limbe area. Never-the-less, the concentration of cadmium in the Limbe coastal area is influenced by other sources, which could be related to urbanization and agriculture. Similarly, there was no feasible link between the concentration of cadmium or lead in the Limbe coastal area and the terrestrial food web through the aroid plant.