

**ENERGY POTENTIAL OF INVASIVE PLANTS
IN SRI LANKA**

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DECLARATION OF CANDIDATE AND SUPERVISOR

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Abstract

Invasive Alien Species (IAS) is a great threat to biodiversity in many of the natural ecosystems in Sri Lanka. Water hyacinth, Prosopis juliflora, Mimosa pigra, Lantana camara and Panicum maximum are found to be the most critical IAS plants which are threatening in lakes, Bundala, Mahaweli catchment, Udawalawa and island wide respectively. With the drawbacks of launched controlling mechanisms those of physical, chemical and biological, there is a much necessity for initiating more sophisticated program with the participation of public, especially rural community where there will be more benefits for them.

As far as the Sri Lankan energy balance is concerned about 45% comes from biomass while rest from imported petroleum (45%), hydro (8%) and unconventional renewables. About 25% of the imports expenditure is accounted for petroleum imports. On the other hand, the demand for fuel wood is increasing due to rapid industrialization and it will be always questionable whether the existing feed stocks are sufficient. Further, currently identified biomass species such as Gliricidia, Ipil, Eucalyptus and etc are not the best as far as the annual yield is concerned.

Learning from the nature, has been a key scenario in invention and development. IAS itself shows the characteristics which are suitable for dedicated energy crops those of high yield, low nutrition requirement and survival in mild environmental conditions. The two IASs; Guinea grass and Arundo donax, were analyzed to be used as energy feedstock. Their perennial nature along with high yield as high as 75 tons per hectare provide evidence their suitability as energy plants.

Guinea grass was further tested in an updraft gasifier and the flame was not stable for a long time but only for 6 to 7 minutes. The performances were different from batch to batch where gas analysis showed that it was composed with around 11% combustibles. In trial 2 sample, 50% of nitrogen suggests that the presence of oxygen is low and hence, the unaccounted 18% could be composed with tars which were not detectable by used column in GC analysis. Further, the heterogeneous nature of feedstock along with the uneven compaction caused uneven combustion throughout the cross section and height. Hence it was suggested again that the homogeneous nature of feed material is a crucial factor in gasification.

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