Chapter 6

Conclusions

Sustainability Assessment of Biomass Utilisation in East Asia Working Group

February 2013

This chapter should be cited as
Sustainability Assessment of Biomass Utilisation in East Asia Working Group (2013), 'Conclusions' in *Extending the ERIA WG Methodology for Sustainability Assessment of Biomass Utilization in East Asian Countries*, ERIA Research Project Report 2011-19, Available at:
www.eria.org/publications/research_project_reports/FY2011/No.19/Chapter_6.pdf

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The ERIA WG has been working progressively on the development of indicators for assessing the sustainability of biomass utilization systems. First, suitable indicators were identified and quantification methods defined for the environmental, economic and social assessment of biomass utilization systems. These indicators were then field-tested and in the process, refined to suit the conditions and context of East Asia. During the period of the ERIA WG's activities, several international initiatives, such as GBEP and RSB also published their own sets of indicators. It was therefore imperative to check the methodology that had been developed and tested by the ERIA WG. This was one of the major tasks achieved by the WG in the current phase (2011-2012). In general, though the ERIA WG methodology used fewer indicators for the assessment of the environmental, economic and social aspects of biomass utilization than GBEP or RSB, the indicators used were nevertheless identified as being relevant and robust. Thus, for case of environmental assessment, life cycle GHG emissions was retained as the main indicator, noting also the importance of emissions from land use change (particularly direct land use change) as well as other impact categories including impacts on air, water and soil. Among other categories, soil quality was picked up to explore a possible indicator to be considered in the ERIA WG methodology. In the case of economic assessment, TVA, as selected earlier on, was considered adequate. The production and income approaches to estimating TVA have been outlined in this report. In the case of social assessment, the two indicators identified in the previous report (ERIA, 2011) – "Employment" and "Access to modern energy" – have been confirmed. These indicators have been further described and methods for their quantification presented.

The other important issue considered in this report is the development of a framework for a decision support tool for ex-ante assessments of biomass utilization projects and policies. The need for such a tool had been identified earlier on to facilitate evaluation of planned biomass utilization projects before they have actually

been implemented. To this end, the indicators for sustainability assessment were once again tested for relevance and applicability, first on a theoretical basis and then by means of a case study. Life cycle GHG emissions, TVA (using the production approach) and employment were identified as adequate indicators for ex-ante assessments. A case study on utilization of empty fruit bunches from palm oil mills in Malaysia for pellets (energy carrier) and biofiber composite profiles (biomaterial) was conducted. The decision support framework for ex-ante assessment was successfully tested in this case study. The study revealed that, using data from existing systems that were not necessarily identical to the proposed systems, reasonably accurate estimations could be made ex-ante. Uncertainty and sensitivity analyses would enhance the reliability of the study. It is also observed that the assessment result would give different information if the system boundary or the functions of products were set differently. This implies that boundary and functions should be clearly defined so that the assessment result could provide the target of the study with appropriate information.