5. PRESENTATION OF RESULTS

Presentation of results is very important as results of scientific calculations and deliberations need to be conveyed to decision makers (policy makers) in a way that is comprehensible and facilitates the process of decision-making. The working group has given much consideration to this issue. At first, "integration" of the results of sustainability assessment was considered and various existing integration methods reviewed (Sagisaka, 2009). However, it was recognized that combining the results from the three aspects of sustainability – social, economic and environmental – was not very meaningful and attempts to combine these into a single index would result in a loss of information as well as a serious implicit assumption that the three aspects are substitutable. This assumption, in fact, defeats the very purpose of moving towards sustainable development as it could be interpreted to mean for example, that social or environmental costs can be compensated by economic advantages.

When three indicators, one each for social, economic and environmental aspects, were identified as key indicators for sustainability assessment, an attempt was made to develop a methodology for normalizing each of the indicators to a dimensionless number, preferably between 0 and 1, and representing it on a radar diagram (triangular) (ERIA, 2010). The main idea was to present the three indicators in a single diagram and on a dimensionless scale so that the decision makers could see at a glance the impact of an activity on the three aspects of sustainability. As life cycle GHG emissions, human development index and total value added were used as the indicators for environmental,

social and economic aspects respectively, the normalization method was proposed as per the following equations (ERIA, 2010):

The Normalized Environmental Indicator (NEnI):

$$NEnI = \frac{GHG_{no-project} - GHG_{project}}{GHG_{no-project}} \quad (5\text{-}1)$$

The Normalized Social Indicator (NSoI):

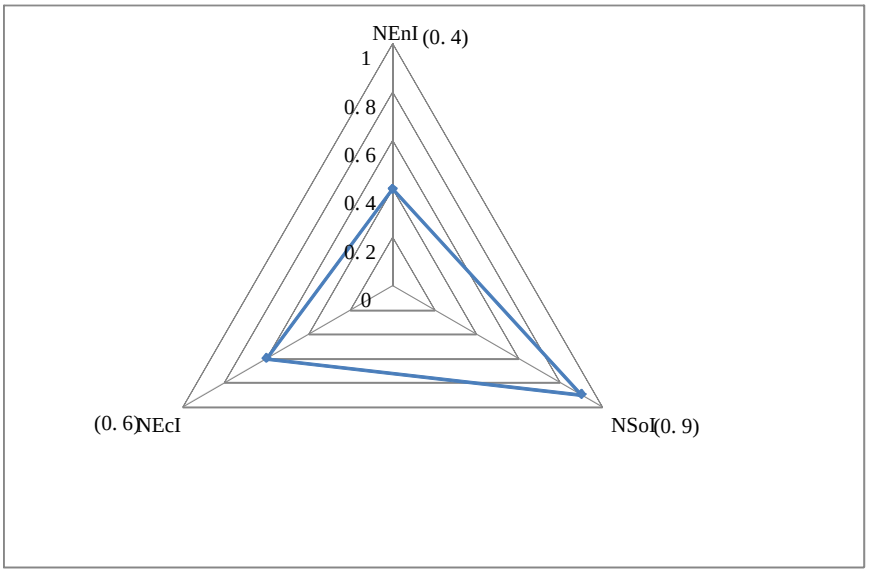
$$NSoI = \frac{HDI_{project} - HDI_{no-project}}{HDI_{\max} - HDI_{no-project}} \quad (5\text{-}2)$$

The Normalized Economic Indicator (NEcI):

$$NEcI = \frac{TVA_{project}}{Cost\ of\ the\ project} \quad (5\text{-}3)$$

These indicators could be presented in a triangular radar diagram format as shown in Figure 5-1.

Figure 5-1. Presentation of Integrated Results for a Hypothetical Example (NEnI = 0.4, NSoI = 0.9, NEcI = 0.6) (ERIA, 2010)



This method of presentation was then applied to the case studies that were conducted to test the sustainability indicators developed. The normalization part was found to be cumbersome particularly for the economic indicator.

Also, after the latest discussions in the working group, the sustainability indicators have been increased from a total of three indicators to one key master indicator for each aspect of sustainability along with sub-indicators. Presentation of several indicators on the radar diagram is even more complicated. Hence, it is felt that presenting all the indicators in a tabular format would be the most reasonable. This would give all the information available to the decision makers in a single table and relative priorities to various aspects can be assigned by the decision makers themselves based on the context and conditions of the study. However, it may be difficult for the decision makers to

assess the relative magnitude of the various indicators, for example, is a global warming potential of 10 t-CO_2eq large or small? For comparative studies this may not be an issue, but for individual studies, some kind of benchmark would facilitate an interpretation of the relative magnitude. This should be considered in further studies; it might eventually also facilitate the reconsideration of a visual presentation format with normalized values as proposed earlier on.