

Week 12: environmental and socio-economic issues

[Science](#), [Social Science](#)



your s Week 12: Environmental and Socio-economic Issues In Week 12, Prof. Norris completed the environmental LCA subject and introduced the concepts of non-point impacts, ecological damage and resource depletion. He also discussed the socio-economic pathway to healthy impacts, the listed categories of impacts, and the concept of life cycle attribute assessment. Citing an example of non-point impacts, he explained that extracting clay from the earth has no environmental significance for the earth per se and hence will not figure in any of 18 impact categories. But clay extraction has multiple impacts on the environment if one considers the process involved. These impacts are captured in the supply chain for extracting clay and consist of fuel usage, equipment operation, land occupation and land transformation and water pollution. While the flow of natural clay into the economy is not considered as significant resource depletion, the unit process environmental impacts are significant.

Discussing resource depletion, Prof. Norris explained that the earlier methods of calculating depletions were inaccurate and resembled attempts to weigh frogs, literally. Just as frogs do not keep still while being weighed and keep jumping, it was very difficult to estimate existing resources, usage and left over balance since new discoveries of resources are also to be considered continuously. If one product life cycle uses one mega joule of coal and another

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product life cycle also uses one mega joule of oil, both have same consequence in terms of fossil fuel depletion, as per the methods used in the 1980s. However, since then the method has been improved. For instance, as

we use the established resources (proven reserves) of coal or oil and move to next one, they tend to be smaller, deeper, less assessable and more expensive to extract. The EcoIndicator-99 focuses on the fact that it takes more energy to extract usable resources (whether fuels or minerals) from lower quality deposits. In other words, he explained, the future generations have to pay a higher price to get lesser resources, if we deplete them now by reckless usage. The EcoIndicator-99 developed the scenario for quite far into the future for predicating the energy cost of extracting resources/substitutes in future.

The next aspect is the ecosystem damage and its measurement. The recipe developers focused on biodiversity as an indicator of ecological impact since it is extremely difficult to figure out the relationship between human consumption and loss of species. Therefore, instead of consumption-related studies, we take a more universal view of the ecological pressure from human activities on different ecosystems. All our activities put pressure on the species, both in the animal and vegetation worlds, leading to depletion and/or extinction. Even if they survive, we are making ecosystem less healthy, less diverse, less functional, and less productive. Ecoindicators help to inform us of such ecosystem damage.

Prof. Norris then discussed the social-economic interrelations. Consumption drives economic activity which causes pollution and resource depletion. Consumption also generates employment and incomes, providing livelihood for many. Businesses pay taxes, which are turned into public investments into infrastructure, human development, technology, etc., all of which

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can be beneficial. Thus, he explained that the traditional LCA methods of environmental impact assessment should be combined with the beneficial impact of economic activities. There is a risk of applying LCA methods only and avoiding an activity to save, for example, climate, but this decision may adversely impact other forms of pollution like water pollution. Therefore, the traditional LCA should be expanded through adding data on economic activity in each unit process and reducing the risk of shifting burden from environment to other impacts in supply chain. Citing the example of the burden of disease, among the 155 risk factors for human health and disease, unsafe drinking water, sanitation and hygiene account for 45%, indoor smoke from solid fuels for 32%, lead exposure for 11%, urban air pollution for 7% and climate change for 5%. These statistics clearly point out the limitations of LCA method. Hence, improved economic conditions can reduce the risks of exposure to risk factors, even though the related economic activities have other environmental impacts and solution lies in new pathways of socio-economic activities.

New pathways of socio-economic activities start from selection or redesign of products and processes, leading to reduced levels of activity in supply chains - from resource extraction through end-of-life cycles. These should reduce emissions without impacting employment, and economic growth. Improved economic activity in a sustainable manner can lead to improved health and reduced illnesses.