SMALL SEAWEED REFINERIES COULD MEET TRANSPORT NEEDS

Mid-size towns in developing countries could produce transport fuel from small bio refineries that use land-farmed marine algae, proposes a paper presented today (15 November) at the International Mechanical Engineering Congress in Houston, United States.

The authors illustrate their report with a design of an expandable biorefinery that uses the marine seaweed macroalgae, *Ulva spp*, for a town of 20,000 people in rural India.

Today the general approach is that the larger the biorefinery, the better it is. Our work shows this is not always true, lead author Alexander Golberg, of the Center for Engineering in Medicine, Harvard Medical School, United States, told *SciDev.Net.*

The researchers chose marine macroalgae as it is a promising feedstock (for biofuel) that does not compete with food crops for arable land or potable water. But the paper recognises that the technologies to cultivate and decompose the algae must be improved.

The biorefinery comprises a solar power system that generates the energy needed to cultivate macroalgae in about 30 hectares of ponds. The major growth in demand for liquid fuel in the next 20 years will take place in developing countries, the researchers say, and developing countries can manufacture this relatively low-tech and efficient system.

The next steps will be to build demonstration and pilot units. We have discussed possible projects in South Africa and India, Gregory Linshiz, co-author of the study and a researcher at the Joint BioEnergy Institute at the Lawrence Berkeley National Laboratory, United States, told *SciDev.Net.*

Ricardo Radulovich, coordinator of the Sea Gardens Project at the University of Costa Rica, points to key aspects that must be considered for a pilot.

These are the complicated process of producing fuel from algae, the cost and complexities of cultivating macroalgae in ponds on land which risk contaminating ground waters with salt and the need for a financial analysis of the biorefinery model.

Instead, he advocates macroalgae farming at sea. This is, he said, something that already produces 28 million tonnes of biomass per year in Asia, requires no freshwater at all, allows the use of other highly productive macroalgae species in a variety of marine environments and takes advantage of nutrients that pollute sea water.

Cristin Agurto Muoz, director of the algae biotechnology laboratory at the University of Concepcin, Chile, added that algae bio refineries can only be implemented once there are suitable technologies for decomposing seaweeds into fermentable sugars, and when liquid biofuels are competitive with fossil fuels.

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