

## Design of microalgal biofuel supply chain network: GIS integrated approach

강성환, 허성민, 이재형<sup>†</sup>

한국과학기술원

(jayhlee@kaist.ac.kr<sup>†</sup>)

For the economic and sustainable production of microalgal biofuels, it is important to develop species with high lipid productivity, optimal processing technology, and supply chain network. Although there have been various literature published about the species and technologies, only a few studies on supply chain network of microalgal biofuel have been conducted. Therefore, in this study, the design of microalgal biofuel supply chain network is studied to investigate economically optimized biorefinery location, scale, and material flow between nodes. A major issue in microalgae supply chain design is finding potential locations where facilities may be sited since the location of biorefineries highly affects lipid productivities and economics of the system. Therefore, in this system, geographic information system (GIS) is considered in the selection of candidate locations of the biorefinery. The land data layers are used to obtain the suitable lands for the biorefinery, and weather data and growth model are utilized to calculate lipid productivity using the software ArcGIS and MATLAB. These potential locations will be utilized as an input for the mathematical optimization model.