

# Process Design for Sustainable Production of Value Chemicals from Agricultural Wastes Instead of Fossil Resources

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**Submission Category:** (A) Technical research proposal to solve concrete problems

## SDGs Targets/Indicators:

We are planning to try for “No. 8 Decent work and economic growth”, “No. 9 Industry, innovation and infrastructure”, “No. 12 Responsible consumption and production”, “No. 13 Climate action”, and “No. 17 Partnerships for the goals” with the process design for sustainable production of value chemicals from agricultural wastes instead of fossil resources.

## Abstract:

The problems that agricultural wastes increase and that required materials from fossil resources increase will arise with the expansion of world population. The materials from fossil resources should be replaced by those from renewable resources because the fossil resources are finite and regional distribution of them is very small. Here, we propose the process design for sustainable production of value chemicals from agricultural wastes instead of fossil resources. According to the discussion with four interviewees about process feasibility and SDGs, the value chemicals are determined to cosmetics, medicines and fertilizers, and the raw material is biomass from the agricultural wastes. Levulinic acid is chosen as an important material because that is one of the 12 most valuable platform chemicals determined by National Renewable Energy Laboratory. As a product, we select aminolevulinic acid (ALA), which is used as various chemicals such as medicines, cosmetics and fertilizers to maintain the balance of income and outcome. When chemical fertilizers using ALA are produced, recycling-based society based on sustainable agriculture would be achieved by reducing the fertilizer to farmlands (agricultural lands) and growing new plants. Environmental burden is small because the raw materials are obtained from agricultural wastes not from fossil resources. Also, it is possible to construct industrial bases appropriate for each region by selecting suitable target chemicals. Thus, the proposal enables to promote the economic growth of each region by developing the technique for producing the chemicals. The proposal in this present study can solve the problems that we are facing at present such as the problems regarding sustainable development goals (SDGs), for examples, “No. 3 Climate action” due to replacement of fossil resources by biomass, “No. 12 Responsible consumption and production” because of using agricultural wastes and making chemicals, and so on.

**Graphical Abstract:**

