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# A Study on the Use of Organic Fertilizers in Agriculture and Aquaculture

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Organic fertilizers are naturally derived substances used to enrich soil and aquatic environments. In agriculture, they support sustainable farming by improving soil fertility and microbial activity. In aquaculture, organic fertilizers help in boosting plankton growth, thus enhancing the natural food availability for cultured species. Their increasing adoption is driven by environmental awareness and the shift towards organic food production.

## Objectives

- To study various types of organic fertilizers used in agriculture and aquaculture.
- To evaluate the nutrient composition and effectiveness of organic fertilizers.
- To analyze their impact on plant growth and aquaculture productivity.
- To compare organic fertilizers with chemical fertilizers in terms of sustainability and output.
- To assess the economic viability of using organic fertilizers.

## Review of Literature

Several studies highlight the benefits of organic fertilizers in improving crop yields and sustaining aquatic ecosystems. Organic materials like vermicompost, cow dung, and green manure improve soil health. In aquaculture, fertilizers like poultry droppings and oil cakes increase pond productivity by supporting phytoplankton growth. Biofertilizers have also been recognized for their role in biological nitrogen fixation and nutrient recycling.

## Materials and Methods

### Study Area

The study was conducted at a designated aquaculture farm with earthen ponds and vegetable crop beds adjacent to the facility.

### Fertilizers Used

- Vermicompost
- Cow dung slurry
- Poultry droppings
- Mustard oil cake
- Rice bran and green manure

### Species Cultured

- Agriculture: Tomato (*Solanum lycopersicum*)
- Aquaculture: Nile Tilapia (*Oreochromis niloticus*)

### Experimental Design

Experimental units were divided into control (no fertilizer) and treatment groups with different organic fertilizers. Application was done weekly based on weight/volume. Observations were recorded over a period of 60 days.

**Parameters Studied**

- Soil pH, Organic Carbon, NPK content
- Water quality: pH, Dissolved Oxygen (DO), Total Ammonia
- Growth rate and biomass of crops and fishes
- Yield per unit area
- Cost–benefit analysis

## Expected Outcome

It is expected that organic fertilizers will improve growth and yield in both agriculture and aquaculture setups. Improved soil and water quality, reduced input costs, and enhanced sustainability are anticipated outcomes.

## Results and Discussion

Results will be presented after the experimental phase. Statistical tools will be used for comparison among treatments.

## Conclusion

Organic fertilizers are vital in reducing the dependency on chemical inputs. They enhance environmental sustainability and support better yield in integrated farming systems. Adoption of organic methods in aquaculture and agriculture is a step toward a greener future.