



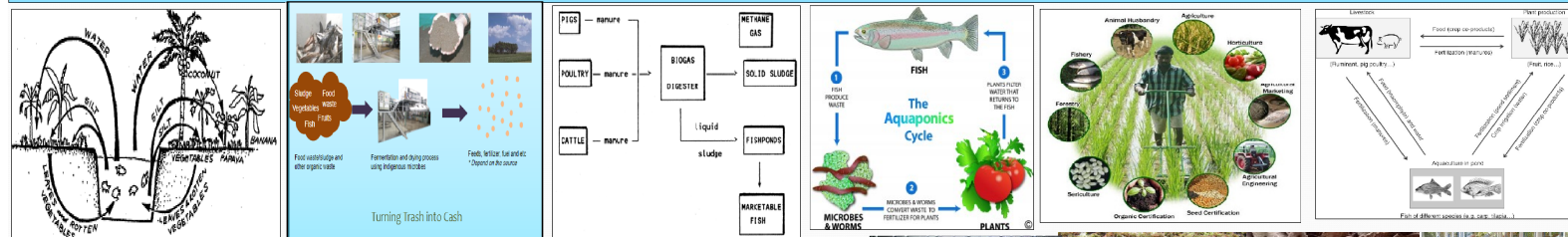
Environmental Sustainability through Integrated Aquaculture by waste utilization

Organised by: DESKU EIACP PC Resource Partner on Environmental Biotechnology

Hosted by: University of Kalyani, West Bengal

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- ✓ Increase in population along with development of industrialization and modern lifestyle lead to the huge generation of wastes.
- ✓ In integrated fish farming, many organic wastes are being reclaimed, recycled and re-used.
- ✓ This system of farming has been proposed as an environmental friendly way of recycling wastes, especially those produced through the cultivation of high trophic level fish species which require the supply of exogenous energy.
- ✓ In this system the various organic wastes (agriculture & household) is utilizing by means of reducing feed cost, obtaining faster growth and high yield of fish.
- ✓ Reclamation, recycling and re-use helps to solve the problems of wastes disposal and scarcity of resource materials.

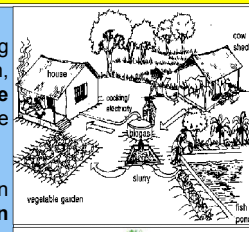


Integrated Fish Farming

- ✓ Integrated aquaculture system is the blending of various farming system in a sustainable way having good production with low cost, less energy consumption and no waste production.
- ✓ In this farming system all activities of cultivation various food crops (i.e corn or rice) and tree fodder which is used for animal feed, together with the raising of sheep, pigs, ducks and fish.
- ✓ Integrated fish farming however provides for recycling of organic wastes, both plant and animal based and could be a potential tool for waste recycling.

Types of integrated fish farming

- 1. Agriculture - based fish farming**
Agriculture based fish farming includes variety types of fish farming system like as mushroom - fish system, sericulture - fish system, fodder crop integration etc. **Pulses and oil seeds crop can also be grown on the pond bund.** Various kind of aquatic cash crops like as **Makhana** and **Singhara** may also be done with fishes.
- 2. Live - stock fish farming.**
Integration of fish farming with livestock and poultry birds in a design allowing **wastes from one system to be used as inputs in another system.**



Utilization of Agro-Wastes as fish feed

- ❑ **Biogas slurry**
- ❑ **Fish meal**
- ❑ **Soyabean meal**
- ❑ **Groundnut oil cake**
- ❑ **Mustard cake**
- ❑ **Sunflower cake**
- ❑ **Mango seed kernel**
- ❑ **Azolla**
- ❑ **Corn steep liquor**
- ❑ **Single cell protein**
- ❑ **Slaughter house by-products**
- ❑ **Poultry industry by products**

Fish Cultured in Waste Water

- Domestic sewage fish culture technique is widely used to meet the growing demand for fish in India.
- The technique is considered to be unique and is the largest operational system in the world to convert waste in to consumable products.
- Integrated resource recovery systems and waste recycling planning concepts suggested to maintain the good environment around urban areas.



Conclusion:

- It is high time attention is focused on turning these huge potential agricultural solid wastes to wealth.
- This farming system offers great efficiency in resource utilization, as waste or by-product from one system is effectively recycled.
- It is an efficient and economic means of environmental management as well as it increases the income of rural population.
- More attention should be given for efficient recycling of agricultural wastes, which makes our environment safer for life.



Acknowledgement

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