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MSU-SEAFDEC/BFAR/NSDB COOPERATORS' PROGRAM

Mechanization & Devices for Environmental Improvements In Sugpo Ponds

by

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I. 1. Introduction and observation on the beginnings of shrimp pond culture in the Philippines and present innovations and improvements.

2. Definitions of mechanization (machines) and devices (tools) for scientific study to simulate the shrimp ecology and pond improvements and gadgets for study on sugpo ponds or instrument application.

II. Mechanical equipment used in pond layout construction and development.

1. (a) Bulldozers for general topographic leveling on land elevation, corrections for earth-moving like dike filling and pond bottom excavation. Practices on infrastructure on road building, drainage canal and other water pipe installations.

(b) Soil rotarvator, cultivators, leveling gadgets like the transit and dummy levels, CPG caterpillar scrapers, plow disc/ditch blades, tampers and the like.

(c) Shovel cranes, Fuco cranes with air compressors, pneumatic trans-excavator, and other earth movers.

(d) Tree stump pullers with tripod frames and block lift chains, and winch or pulley action for mechanical advantages.

(e) Flat bottom boat and barges, wooden dugouts, bamboo rafts or wooden conveyors for dike building devices.

2. Dike, crown, side slope protection, use of berms and W.S.C.

To control soil erosion, water turbidity or pollution and pond bottom sedimentation or siltation use:

(a) Boulder rock riprap; adobe, CHB, bamboo stakes and concrete slabs or poured concrete walls.

(b) Sodding with creeping grasses and other economic plants or vegetables on dike slopes, berms, and dike crown with sometimes coconuts, pineapple and "dampalit".

(c) Use of brick, tiles or plastic/rubber sheet covering to check borers, dike leaks and holding water in canvas or rubber pools, improvised marine plywood tanks, CHB holding tanks including the ferro cement structures and asbestos/ cement tubes. esp. plastic molded vats

3. Self-recording devices or automatic paraphernalia:

(a) Weighing techniques, thermograph with clockwork or transistorized testers; salinity-alkalinity meters, seawater oxygen recorders, pH meters, light and temperature meters; GE needles for turbidity and pond fertilizer indicator; portable air pumps used in plastic bag fry transports.

(b) Water supply pipes (PVC) and drainage asbestos/ cement or concrete pipes and culverts cast iron with gate valves and water concrete tanks of different sizes and designs with overhang lips (eel ponds), CHB and solid or semi-poured concrete formulations.

4. Mechanical agitators (oxygenators) using:

   (a) Water mill, paddle wheel or propellers; vertical flow pumps and sprayers; running waters in raceway tanks, waterfalls; horizontal and vertical water circulators; sprinkler type with compressed air like in feeding tubes; sandstone or false bottom arrangement for automatic feeding/waste control; gravity flow pond arrangement notably with tank culture.

      1. running water type-moving water where water is changed 7 to 10 times a day with continuous flow also in eel tank culture and shrimp culture tanks with pumps or water head pressure-flow.

      2. semi-running type-where water is changed once a day like in the shrimp hatchery procedure; conditioning ponds or rearing ponds.

      3. Stale or lotic condition- water is changed or water replacement is done to take care of water loss due to evaporation or water percolation in the pond bottom like in natural impoundments or fertilized rearing ponds or recycling tanks for water re-utilization or settling ponds.

5. Fry collecting devices/paraphernalia:

   (a) Grass "bon-bon" shelter collectors, sakag or mechanized push nets or floating fry trawl, blanket scope net; mechanized suction filter pumps or adopting yellow light attracting shrimps in sluice gates on night watering while the shrimps are feeding and floating with the currents.

6. Water control environmental modifications and adaptations:

   (a) Use of water sluice gate; drain pipes or valves; supply canals, polyethelene air tubings with air stones; roots blower; pond bottom sheltering or use of sand mounds and furrows pond gate

screening with v-trap baclad to lesson predators; metal sheet sluice gates with worm or windlass action or pulley action.

(b) Soil auger for soil depth sampling; core sampling for waterline stability or the use of a sand core to establish dike stability to break water moisture line.

(c) Use of water pumps and compressed air connections and tide water management with 1.0-1.5 M depth optimum or pond arrangement oriented to gravity-flow; water circulation both vertical and horizontal; use of different vertical flow pumps; agitators and false bottom arrangement to have automatic waste feed and water discharge example of Shigueno-airlift type culture method in circular concrete pools for culture of shrimps (marketable).

7. Harvesting gadgets for shrimp ponds:

a) trammel or gill net
b) filter net
c) baclad or lift set net called "tower"
d) shrimp trawl or pond draining
e) shrimp trawl net with electric or compressed air attachment

8. Algae control by mechanical sieve; pump or chemical action; fish pen or floating baskets/pens in cones like fish pens for freshwater shrimps or prawn; use of open/continuous flowing W.S.C. (part of bangos layout); box experiments and methods of transporting fry and marketable shrimp; embankment combination with fish nets/framed GI fine-mesh wire or plastics. Frozen shrimps, cured shrimps and live shrimp marketing techniques.