Intelligent Solutions for Shrimp farming

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Real Time Water Quality Monitoring

- DO, pH, Temperature
- Analytics on diurnal data to check for deviations
Smartphone based Water Quality Monitoring

- Farmers had to carry water to a lab far away to check other water quality parameters

- Simplified test procedures to test Ammonia, Nitrite, Alkalinity, Potassium, Calcium, Magnesium

- Camera and Flash of Smartphone are used as colorimeter.

- Data is recorded digitally on the app.
Automatic Feeders

- Feeding the shrimp with Automatic Feeders has lot of benefits.
- But the adoption in India is less than 1%
- Assessing the feed trays and regulating the feed is a real pain
Autonomous Feeding of Shrimp

- On-demand feeding of the shrimp based on acoustics, water quality, growth models
- Only task of the farmer is to fill the hopper.
- No need to monitor the feed trays.
Autonomous Feeding of Shrimp

- Feeds the shrimp to its full growth potential
- Seed shifted from Nursery
- 24-Hour feeding
Feeding Patterns during White Feces

• High Feed Intake followed by sudden down fall
• 25% drop in survival in 2 weeks, no growth
Feeding Intake Co-relation to DO & Temp

Hourly Feed Vs DO Vs Temperature

- Feed (Kg)
- Dissolved Oxygen (ppm)
- Temperature (°C)
ShrimpSnap

- Automated feed tray to capture the images of shrimp
- Shrimp Size and distribution are analyzed from those images
- Disease symptoms are identified via computer vision.
Mobile App Monitoring

- B.Pond 1: 30.29°C, 8.59 mg/L, Days 8, 2.30 g
- Pond 2: 30.31°C, 12.38 mg/L, Days 40, 2.50 g

Location: Pedanandipadu
Devices – Data Transformation

- Pond Automation
  - PondMother
  - PondGuard

- Precision Feeding
  - ShrimpTalk

- Value Beyond Precision Feeding
  - Bio-Mass Estimation
  - Assessment of Growth Patterns
  - Pond Health Index
  - Early disease detection
  - Prediction of Yield and Profitability
Bio-Mass Estimate
Profitability Analysis

Profit Analysis

Week | Biomass (Kg) | Profit ($) | Dead Biomass | Survival (%)
--- | --- | --- | --- | ---
4 | 1362 | 0 | 0 | 0
5 | 1390 | 0 | 0 | 0
6 | 873 | 0 | 0 | 0
7 | 2833 | 0 | 0 | 0
8 | 7452 | 0 | 0 | 0
9 | 11078 | 0 | 0 | 0
10 | 10429 | 0 | 0 | 0
11 | 12922 | 0 | 0 | 0
12 | 12970 | 0 | 0 | 0
13 | 14101 | 0 | 0 | 0
14 | 13741 | 0 | 0 | 0
15 | 14652 | 0 | 0 | 0
16 | 11079 | 0 | 0 | 0
17 | 9575 | 0 | 0 | 0

Graph showing biomass, profit, dead biomass, and survival over weeks.
Data for all Stakeholders

- Healthcare
- Feed Companies
- Finance Institutions
- Hatcheries
- Insurance
- Exporters
Data for Brood Stock / Hatcheries

- Farm Performance data helps Brood Stock Centres and Hatcheries to choose ideal Genetic families.
Data for Feed Companies

• Real-time pond performance data helps feed companies to provide better extension services

• Relative Growth Index for each geography helps feed companies to formulate customized feeds

• Better feed demand forecast and production planning
Data for Shrimp Processing Companies

- Biomass availability data eases the sourcing operations
- Traceability reports
- Complete pond performance reports
- Images of Shrimp and Size Distribution
Insurance and Financial Institutions

- Data helps them to underwrite the risk
- Based on pond performance data financial institutions can increase the credit limits
- Insurance companies can settle the claims based on the pond data.
Driving the Digitalization of Aquaculture around the Globe