PRESENT STATUS OF BACKYARD HATCHERY IN INDONESIA

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BACKYARD HATCHERY DEVELOPING IN INDONESIA

- Penaeid shrimp
  - Black tiger shrip (*Penaeus monodon*)
  - White shrimp (*Litopenaeus vannamei*)
- Grouper
  - Humpback grouper (*Cromileptes altivelis*)
  - Brown-marbled grouper (*Epinephelus fuscoguttatus*)
  - Leopard coral grouper (*Plectropormus leopardus*)
- Milkfish (*Chanos chanos*)
- Seabass (*Lates calcarifer*)
- Mud crab (*Scylla sp.*)
BACKYARD HATCHERY DEVELOPMENT

- 1980-1996: Fast development of tiger shrimp backyard hatcheries (starting in Jepara, and developing mainly in West Java, Central Java, East Java, Lampung, East Kalimantan and South Sulawesi)
- Since 1997: Number of tiger shrimp backyard hatcheries decreased dramatically due to the failures of shrimp culture caused by WSSV diseases
- 1995 to present: Development of milkfish backyard hatcheries in Gondol, Bali and Situbondo, East Java
- 1998 to present: Development of grouper backyard hatcheries in Gondol, Bali and Situbondo, East Java
- 2008 to present: Development of white shrimp backyard hatcheries in Situbondo and Tuban (East Java)
CHARACTERISTICS OF BACKYARD HATCHERY

- Simple rearing management:
  - Shrimp: Rearing nauplii to PL-10
  - Grouper: Rearing eggs to fry of 2.5 cm
  - Milkfish: Rearing eggs to a 14-16 day old fry
- Using simple tank and facilities with minimum standard
- Number of labour: 2-4 persons
- Number of larval rearing tank: 4-6 tanks
- Eggs or nauplii are purchased from big scale hatchery (nauplii center)
BACKYARD HATCHERY SEED PRODUCTION AND DISTRIBUTION

Fish/Shrimp Big Scale Hatchery (Nauplii Center) → Eggs/Nauplii → Backyard Hatchery → Fish Fry → Nursery → Grow-out

Provider of live feed (plankton, mysids)

Shrimp PL → Backyard Hatchery → Fish Fry → Nursery
IMPROVEMENT OF BACKYARD HATCHERY

- Using SPF-shrimp broodstock/nauplii
- Implementing biosecurity
- Implementing BMP’s for hatchery management
Improvement of backyard hatchery from outdoor to indoor

Shrimp backyard hatchery (SBH) outdoor

Indoor SBH with bamboo wall

Indoor SBH with cement wall
### Number of Shrimp Backyard Hatchery Farmers

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tiger shrimp</td>
</tr>
<tr>
<td>Central Java</td>
<td>23</td>
</tr>
<tr>
<td>East Java</td>
<td>15</td>
</tr>
<tr>
<td>Lampung</td>
<td>67</td>
</tr>
<tr>
<td>East Kalimantan</td>
<td>19</td>
</tr>
<tr>
<td>South Sulawesi</td>
<td>14</td>
</tr>
</tbody>
</table>
### Number of Fish Backyard Hatchery Farmers

<table>
<thead>
<tr>
<th>Fish</th>
<th>No. owner</th>
<th>Complete Hatchery</th>
<th>No. Broodstock tank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milkfish</td>
<td>324</td>
<td>44</td>
<td>130</td>
</tr>
<tr>
<td>Grouper</td>
<td>40</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>364</td>
<td>47</td>
<td>137</td>
</tr>
</tbody>
</table>
Development of Milkfish Hatchery

Number of tanks

Year


0 1000 2000 3000 4000 5000 6000

Milkfish fry market via Denpasar Airport

Average of 53 mill/mth (Jan 2006 to Feb 2008)
Grouper Backyard Hatchery Production

No. Seed (x 1000)

- Tiger Grouper
- Humpback grouper
- Coral trout

Year

2000 2001 2002 2003 2004 2005 2006 2007

Tiger Grouper production has shown a steady increase from 2000 to 2007, with a peak in 2007. Humpback grouper production has been relatively stable, while coral trout production has remained low.
Market of grouper seed via Denpasar Air Port

Average of 718.000/mth (Jan 2006 to Feb 2008)
## Number of Larval Tank

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milkfish</strong>*</td>
<td>5.015</td>
</tr>
<tr>
<td><strong>Grouper</strong>*</td>
<td>1.722</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6.737</td>
</tr>
</tbody>
</table>

Ratio of tank for LARVAE : ROTIFER : PHYTOPLANKTON: 1.5 : 1 : 3

Tank volume: 10 m³
Financial Analysis Tiger Shrimp

A. COST
   a) Investment (land, tanks, generator, pumps, etc. and 10% unrealized cost) IDR 126,800,00
   b) Operational cost per year (8 cycles, 4 larval rearing tanks):
      • Fixed cost (labours, electricity, maintenance) IDR 19,200,000
      • Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc) IDR 40,800,000
      • Total cost (fixed cost + variable cost) IDR 60,000,000

B. PRODUCTION
   a) Seed production per cycle : 30% x 4000,000 nauplii = 1,200,000 PLs
   b) Seed production per year : 8 x 1,200,000 PLs = 9,600,000 PLs
   c) Receivable per year : 9,600,000 x IDR 12 = IDR 115,200,000

C. ECONOMIC ANALYSIS
   a) Profit & Loss : Receivable/year – Total cost/year = IDR 55,200,000
   b) Return cost ratio (R/C) : Profit/Total cost = 1.92
   c) Payback period (PP) : Investment/Gain = 2.3
   d) Break even point (BEP) : Total cost/Seed production = IDR 6.25

Note : US $ 1 = ± IDR 10,000
# Financial Analysis of White Shrimp

## A. COST

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Investment (land, tanks, generator, pumps, etc., and 10% unrealized cost)</td>
<td>IDR 126,800,00</td>
</tr>
<tr>
<td>b) Operational cost per year (8 cycles, 4 larval rearing tanks):</td>
<td></td>
</tr>
<tr>
<td>- Fixed cost (labours, electricity, maintenance)</td>
<td>IDR 19,200,00</td>
</tr>
<tr>
<td>- Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc)</td>
<td>IDR 56,800,00</td>
</tr>
<tr>
<td>Total cost (fixed cost + variable cost)</td>
<td>IDR 76,000,000</td>
</tr>
</tbody>
</table>

## B. PRODUCTION

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Seed production per cycle</td>
<td>50% x 4,000,000 nauplii = 2,000,000 PLs</td>
</tr>
<tr>
<td>b) Seed production per year</td>
<td>8 x 2,000,000 PLs = 16,000,000 PLs</td>
</tr>
<tr>
<td>c) Receivable per year</td>
<td>16,000,000 x IDR 10 = IDR 160,000,000</td>
</tr>
</tbody>
</table>

## C. ECONOMIC ANALYSIS

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Profit &amp; Loss</td>
<td>Receivable/year − Total cost/year = IDR 84,000,000</td>
</tr>
<tr>
<td>b) Return cost ratio (R/C)</td>
<td>Profit/Total cost = 2.1</td>
</tr>
<tr>
<td>c) Payback period (PP)</td>
<td>Investment/Gain = 1.5</td>
</tr>
<tr>
<td>d) Break even point (BEP)</td>
<td>Total cost/Seed production = IDR 4.75</td>
</tr>
</tbody>
</table>

Note: US $ 1 = ± IDR 10,000
Financial Analysis of Milkfish

A. **COST**
   a) Investment (land, tanks, generator, pumps, etc. and 10% unrealized cost) IDR 209,000,000
   b) Operational cost per year (4 cycles, 4 larval rearing tanks):
      - Fixed cost (labours, electricity, maintenance) IDR 7,200,000
      - Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc) IDR 18,800,000
      - Total cost (fixed cost + variable cost) IDR 26,000,000

B. **PRODUCTION**
   a) Seed production per cycle : 80% x 400,000 eggs = 320,000 fish fries
   b) Seed production per year : 12 x 320,000 fish = 3,840,000 fish fries
   c) Receivable per year : 3,840,000 x IDR 10 = IDR 38,400,000

C. **ECONOMIC ANALYSIS**
   a) Profit & Loss : Receivable/year – Total cost/year = IDR 12,400,000
   b) Return cost ratio (R/C) : Profit/Total cost = 0.48
   c) Payback period (PP) : Investment/Gain = 5.44
   d) Break even point (BEP) : Total cost/Seed production = IDR 6.77

Note : US $ 1 = ± IDR 10,000
Financial Analysis of Humpback Grouper

A. COST
   a) Investment (land, tanks, generator, pumps, etc. and 10% unrealized cost) IDR 314,100,000
   b) Operational cost per year (4 cycles, 4 larval rearing tanks):
      • Fixed cost (labours, electricity, maintenance) IDR 19,700,000
      • Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc) IDR 93,300,000
      • Total cost (fixed cost + variable cost) IDR 113,000,000

B. PRODUCTION
   a) Seed production per cycle: 10% x 400,000 eggs = 40,000 fish of 3 cm
   b) Seed production per year: 4 x 40,000 fish = 160,000 fish
   c) Receivable per year: 160,000 x IDR 3,750 = IDR 600,000,000

C. ECONOMIC ANALYSIS
   a) Profit & Loss: Receivable/year – Total cost/year = IDR 487,000,000
   b) Return cost ratio (R/C): Profit/Total cost = 4.3
   c) Payback period (PP): Investment/Gain = 0.64
   d) Break even point (BEP): Total cost/Seed production = IDR 706.25

Note: US $ 1 = ± IDR 10,000
Financial Analysis of Brown-marbled Grouper

A. COST
   a) Investment (land, tanks, generator, pumps, etc. and 10% unrealized cost) IDR 314,100,000
   b) Operational cost per year (4 cycles, 5 larval rearing tanks):
      • Fixed cost (labours, electricity, maintenance) IDR 21,600,000
      • Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc) IDR 107,400,000
      • Total cost (fixed cost + variable cost) IDR 129,000,000

B. PRODUCTION
   a) Seed production per cycle: 10% x 400,000 eggs = 40,000 fish of 3 cm
   b) Seed production per year: 5 x 40,000 fish = 200,000 fish
   c) Receivable per year: 200,000 x IDR 1,000 = IDR 200,000,000

C. ECONOMIC ANALYSIS
   a) Profit & Loss: Receivable/year – Total cost/year = IDR 71,000,000
   b) Return cost ratio (R/C): Profit/Total cost = 0.55
   c) Payback period (PP): Investment/Gain = 4.42
   d) Break even point (BEP): Total cost/Seed production = IDR 645

Note: US $ 1 = ± IDR 10,000
Financial Analysis of Leopard Coral Grouper

A. COST
   a) Investment (land, tanks, generator, pumps, etc. and 10% unrealized cost) IDR 314,100,000
   b) Operational cost per year (4 cycles, 4 larval rearing tanks):
      • Fixed cost (labours, electricity, maintenance) IDR 19,700,000
      • Variable cost (shrimp nauplii, Artemia cysts, artificial feed, fertilizers, chemicals, etc) IDR 24,300,000
      • Total cost (fixed cost + variable cost) IDR 43,000,000

B. PRODUCTION
   a) Seed production per cycle: 2% x 400,000 eggs = 8,000 fish of 3 cm
   b) Seed production per year: 4 x 8,000 fish = 32,000 fish
   c) Receivable per year: 32,000 x IDR 4,500 = IDR 144,000,000

C. ECONOMIC ANALYSIS
   a) Profit & Loss: Receivable/year – Total cost/year = IDR 141,000,000
   b) Return cost ratio (R/C): Profit/Total cost = 3.28
   c) Payback period (PP): Investment/Gain = 2.18
   d) Break even point (BEP): Total cost/Seed production = IDR 1,343.75

Note: US $ 1 = ± IDR 10,000
Thank You

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