



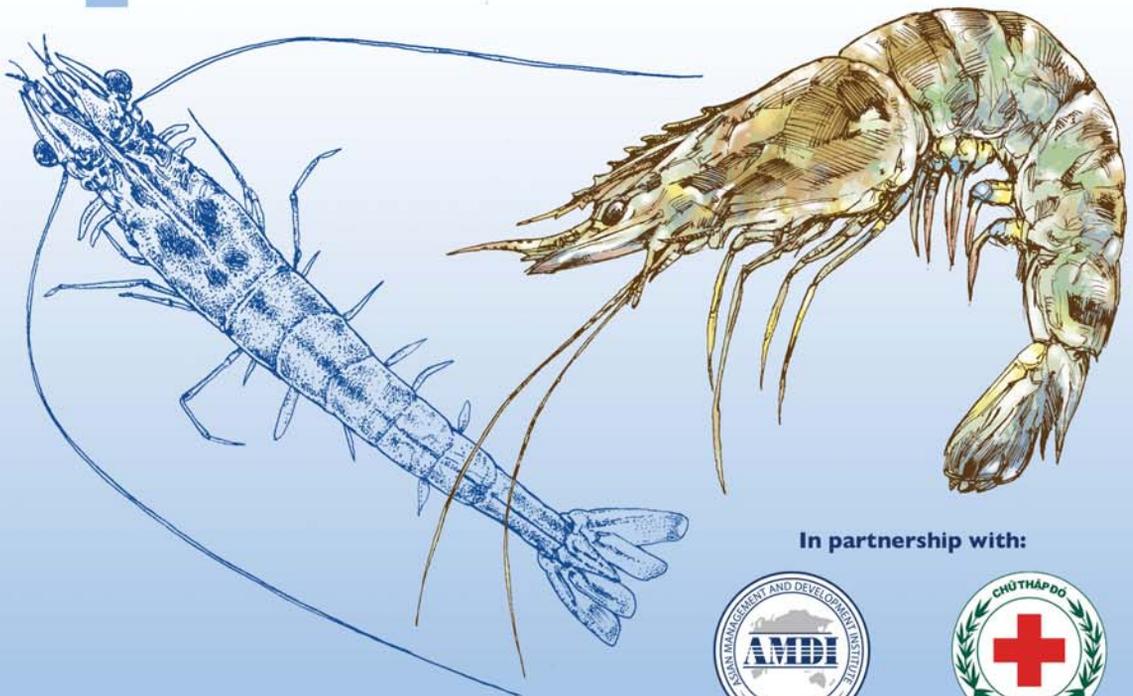
USAID
FROM THE AMERICAN PEOPLE



USAID Mekong Adaptation and Resilience to Climate Change

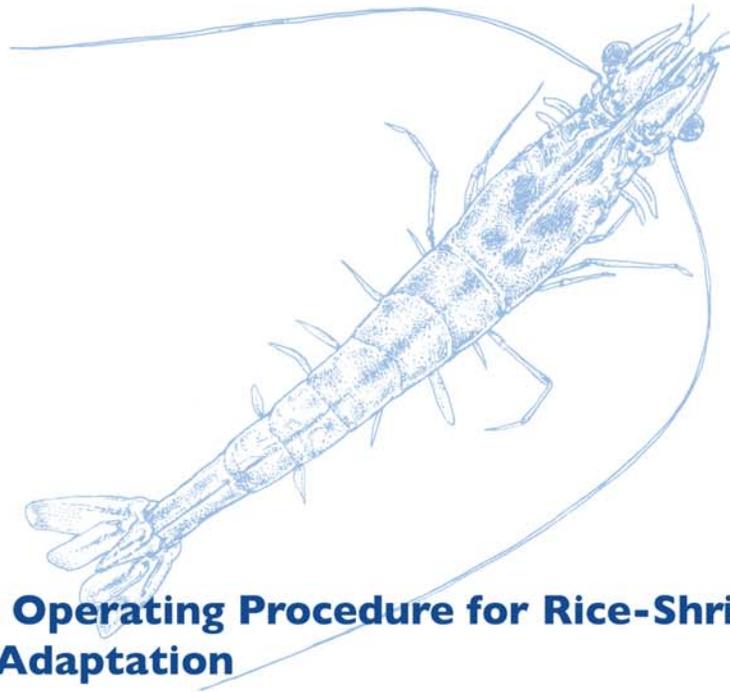
Standard Operating Procedure for Rice-Shrimp Nursery Adaptation

USAID Mekong Adaptation and Resilience to Climate Change (USAID Mekong ARCC)



In partnership with:





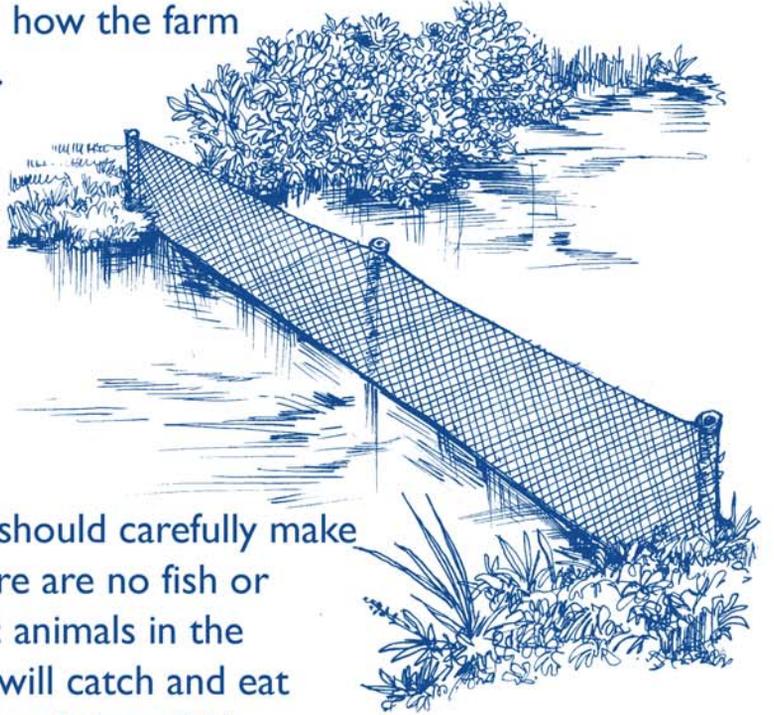
Standard Operating Procedure for Rice-Shrimp Nursery Adaptation

This publication has been made possible by the support of the American People through the United States Agency for International Development (USAID). It was prepared for the USAID-funded Mekong Adaptation and Resilience to Climate Change (Mekong ARCC), by DAI together with the local partners in Vietnam - Asian Management and Development Institute (AMDI), Vietnam Red Cross (VNRC), and local authorities in Thuan Hoa Commune, Kien Giang Province. The contents of this document are the sole responsibility of DAI and do not necessarily reflect the views of the US Government.

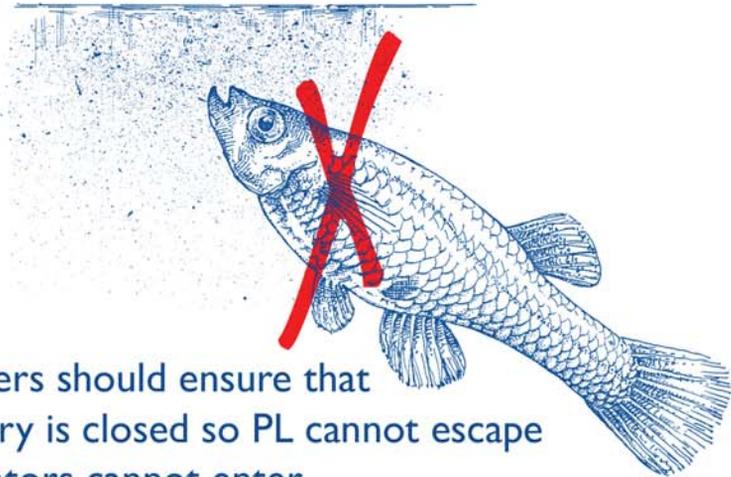
The USAID Mekong ARCC project is a five-year program (2011-2016) funded by the USAID Regional Development Mission for Asia (RDMA) in Bangkok and implemented by DAI in partnership with the International Centre for Environmental Management (ICEM), World Resources Institute (WRI), International Union for Conservation of Nature (IUCN), and Asian Management and Development Institute (AMDI). The project focuses on identifying the environmental, economic and social effects of climate change in the Lower Mekong Basin (LMB), and on assisting highly exposed and vulnerable rural populations in ecologically sensitive areas increase their ability to adapt to climate change impacts on water resources, agricultural and aquatic systems, livestock, and ecosystems.

Step I: Pond preparation

- The farmers should shield off one part of the pond for the nursery e.g., using a 10 x 10 m net inside the main pond or they can use a separate smaller pond, depending on how the farm is set up now.



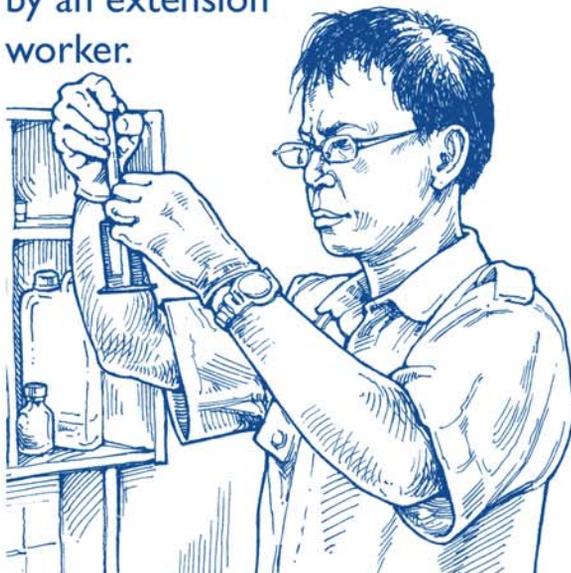
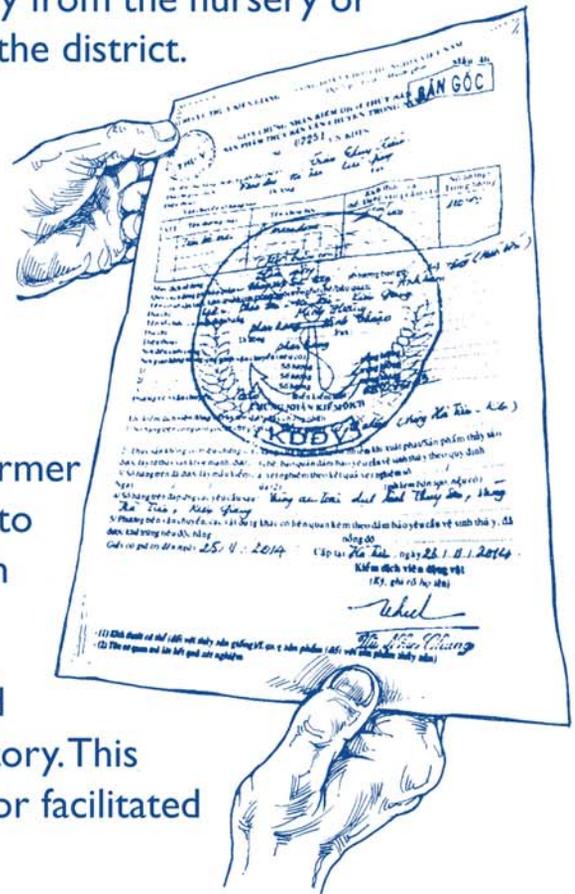
- The farmers should carefully make sure that there are no fish or other aquatic animals in the nursery that will catch and eat the post larvae shrimp (PL).



- The farmers should ensure that the nursery is closed so PL cannot escape and predators cannot enter.
- The nursery should be constructed 4-6 days before the PL are stocked.

Step 2: Selection of shrimp post larvae (PL)

- The farmers should get help to purchase PL by the extension service or through a farmer group/organization.
- The PL should be bought directly from the nursery or through the main distributor in the district.
- The farmer or the extension worker should demand to see certification from the nursery or distributor that state that brood stock is disease free and PL is a good quality.
- Buy the PL together (through farmer groups or an extension center) to get better quality and price from the nursery or distributor.
- The PL batch should be checked for disease by a qualified laboratory. This should be done by the nursery, or facilitated by an extension worker.



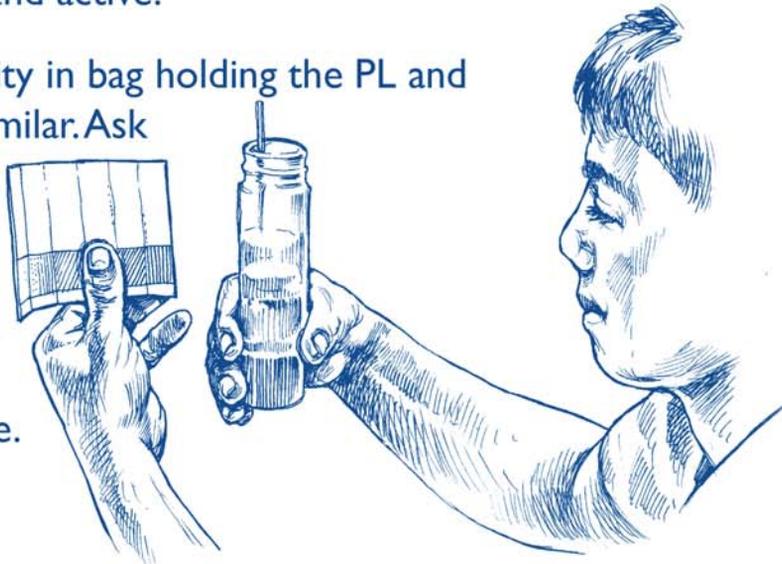
- Get big size PL between PL 12-15 if possible.



Step 3: Release of post larvae to nursery

- When PL are delivered to farm, the famers together with the extension worker should ensure the PL are healthy, moving around and active.

- Check that salinity in bag holding the PL and pond water is similar. Ask the extension worker before receiving the PL what the salinity in the bags will approximately be.



- When PL are released into nursery make sure to rest the closed bags in the pond water for about 40-60 min until temperature is similar in bag and pond water.

- When opening the plastic bag with PL and releasing the PL, be very careful! Don't stress the PL, but slowly let the water from pond and bag mix over a 10 minute period, and let the PL swim out of the bag into the nursery. Release the PL from a boat so not to suspend mud in the pond.



- Stocking rate should be 20-50 PL/m² in the nursery, and equivalent to 2-3 PL/m² in the grow-out pond.
- Stocking date to be advised by the extension worker.

Where possible, stocking the pond and feeding should be done from a boat to prevent suspending mud in the water.



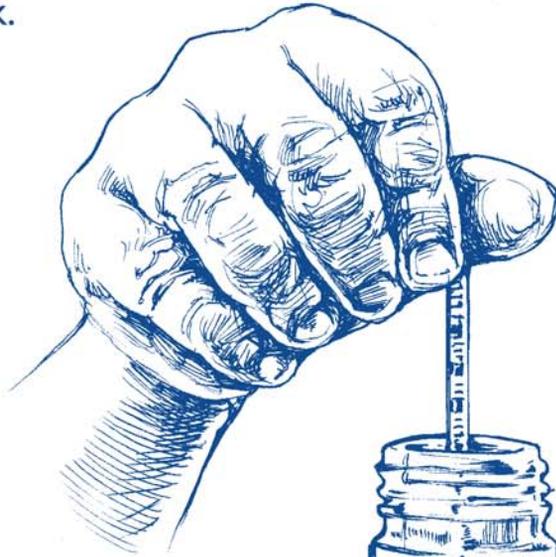
Step 4: Feeding of shrimp in nursery

- The farmers should use “crumble feed” a shrimp starter feed in the first 3 weeks of nursing.
- When purchased keep the feed in a dry, clean and cool place. Use it up as soon as possible once the bag is opened to avoid the feed getting damp and spoiled.
- Make sure the Date of Expiry is not passed.
- The right dissolved oxygen (DO) levels (4 mg/L) are essential for efficient feeding. Therefore the farmers together with extension workers should monitor the DO levels and feed accordingly.
- Feeding is best done in the morning when oxygen levels start to increase but for correct time, please use DO levels.
- Amount of feeding is about one handful of feed for the first week, two handfuls of feed in the second week and three handfuls (two in the morning and one in the afternoon) in the third week. Feeding once or twice per day is sufficient although the second feeding should be 8 hours after first feeding. You should adjust the quantity of feed based on observing the actual consumption. General rule: Normally the amount of feed provided should be about 10-20% of the total weight of the shrimp in the nursery.
- Make sure to spread the feed evenly around the nursery. This will help ensure even growth of the shrimp and minimize cannibalism among the shrimp. Do the feeding from a boat so not to suspend mud in the pond.



Step 5: Measuring of pond conditions

- Farmers should measure salinity of water and water temperature twice daily. This can be done at the same time as feeding, but can be done anytime, as long as it occurs consistently at the same time of the day. The measurements should be written down in the log book.



- Extension workers together with farmers should measure oxygen levels in ponds to construct a 24h oxygen profile with 1-hour measurement intervals before stocking. This is to determine the best time of feeding in the morning hours.
- The oxygen measurements should then be done weekly from 5 am – 10 am with one hour intervals during the rest of the shrimp growing season.



Note

- *Please don't stray from these guidelines as this is an experimental project that we want to measure*
- *Please tell the below support staff if you have any problems with your nursery and they can advise.*

Vo Minh Hai
Vietnam Red Cross Officer
Thuan Hoa Commune
Ph: 0166 925 9088

Nguyen Ngoc Cuong
Aquaculture Extension Officer
Thuan Hoa Commune
Ph: 097 496 0499

Logbook

Name: _____

Village: _____

Size of pond: _____

Notes:

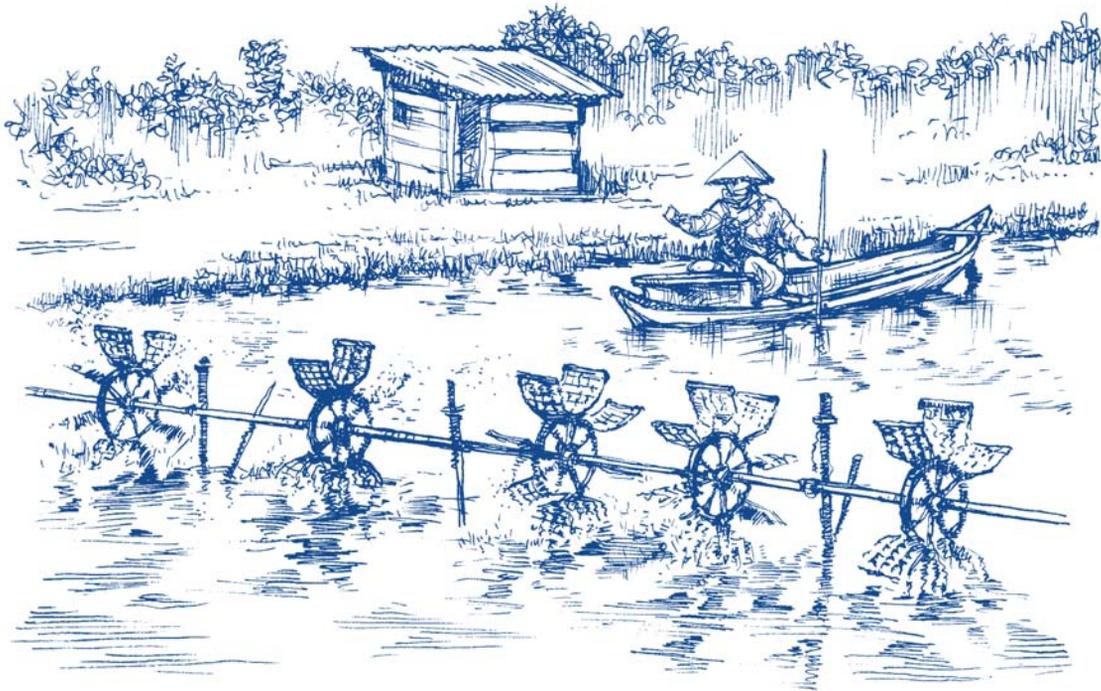
Day	Salinity (ppt)	Temp (°C)	O ₂ (mg/L)	Time of feeding	Harvest (size and total kg)	Price/kg
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

Day	Salinity (ppt)	Temp (°C)	O ₂ (mg/L)	Time of feeding	Harvest (size and total kg)	Price/kg
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Day	Salinity (ppt)	Temp (°C)	O ₂ (mg/L)	Time of feeding	Harvest (size and total kg)	Price/kg
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						

Day	Salinity (ppt)	Temp (°C)	O ₂ (mg/L)	Time of feeding	Harvest (size and total kg)	Price/kg
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						

Day	Salinity (ppt)	Temp (°C)	O ₂ (mg/L)	Time of feeding	Harvest (size and total kg)	Price/kg
73						
74						
75						
76						
77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						



USAID Mekong Adaptation and Resilience to Climate Change
(USAID Mekong ARCC)

11th Floor, Mahatun Plaza Building, 888/118 Phloenchit Road,
Lumpini, Pathumwan, Bangkok, 10330, Thailand

Tel: +66.2.650.9919 to 21 Fax: +66.2.650.9922 E-mail: info@mekongarcc.net

Web: <http://www.mekongarcc.net>

Follow us on:

<http://www.facebook.com/MekongARCC>

<http://www.twitter.com/MekongARCC>