AQUACULTURE AUTHORITY

Background, Powers, and Procedures

The Aquaculture Authority has been set up under the Environment (Protection) Act, 1986 as per the directives of the Hon'ble Supreme Court. The Authority is functioning under the administrative control of the Ministry of Agriculture with its Headquarters at Chennai. The Authority has been set up to deal with the situation created by shrimp culture in the coastal areas and it shall implement the "Precautionary Principle" and the "Polluter Pays Principle".

Shrimp farmers operating traditional and improved traditional systems of shrimp aquaculture may apply in the prescribed form **(Form I)** for adopting improved technology for increased production. Shrimp farmers who are already operating outside the Coastal Regulation Zone (CRZ) or those who want to set up new farms shall have to apply in the prescribed form **(Form III)** and obtain authorisation from the Authority within a specified period.

Coastal states/UTs have been asked to constitute State Level and District Level Committees to process the applications for the above purpose. The Authorization/Approval shall be for a period of three years from the date of approval in the first instance. Applications in this regard shall be sent to the Director/Commissioner of Fisheries of the respective states/UTs and to the District Level Committees set up by the Coastal States/UTs for this purpose.

The Authority shall have the powers to take all measures necessary for the purpose of protecting and improving the quality of the environment as well as preventing, controlling and abating adverse impact on the environment in relation to shrimp culture. The Authority shall have the maintenance of ecology as its prime guiding factor.

Hatcheries (Shrimp) that have already been set up in the Coastal areas as well as those that are to be set up in future need no approval of the Aquaculture Authority. The Supreme Court's interim order dated 19-08-1997on a review petition filed by the Ministry of Agriculture and other State Governments states that those farms which were to be demolished as per Supreme Court's judgement dated 11-12-1996 will not be demolished till further orders but no fresh seeds will be put in such farms. Shrimp farms situated outside the CRZ are not affected.

The forms prescribed by the Authority to obtain the approval of the Authority for the above purposes can be procured from the respective Directorates of Fisheries of the Coastal States/UTs, as well as from the District Level Committees set up for this purpose by the respective Coastal States/UTs. The prescribed forms, format of approvals etc., are enclosed for ready reference.

Forms/Appendix/Annexure	Purpose
Form **I**	Traditional/Improved traditional – to apply for prior approval for adopting improved technology
Form **II**	Form of Approval for adoption of improved technology for increased production, productivity and return in Traditional/Improved Traditional System of Aquaculture
Form **III**	(Existing/New farms – outside CRZ – Outside 1000 M from Chilka and Pullicat lakes – Authorisation/Approval): Form of application
Form **IV**	Authorisation/Approval for operating/setting up and construction of Shrimp Culture Farm/Shrimp culture Ponds outside the Coastal Regulation Zone
Appendix **I**	Directions 6,7 and 9 of Order of the Supreme Court of India in Judgement dated 11.12.96 on Writ petition (Civil) No.561 of 1994.
Annexure 6	Rules of Procedure

FORM **I**

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

TRADITIONAL / IMPROVED TRADITIONAL – PRIOR APPROVAL FOR ADOPTING IMPROVED TECHNOLOGY

Application for prior approval of Aquaculture Authority for adoption of Improved Technology for increased production, productivity and return by farmers who are operating traditional and improved traditional system of aquaculture (under Director 5* of the order of the Hon'ble Supreme Court of India in Judgement dated 11.12.1996 on Writ Petition (Civil) No.561 of 1994)

1. Name(s) of the Applicant(s)/
registered company/establishment
(furnish full name and details of permanent address) :

2. Address for Communication :

3. Details of location/land,
Details of the traditional/
Improved traditional shrimp farm in operation :

   a) State:

   b) Division/District :

   c) Revenue Village :

   d) Survey Numbers :

   e) Total extent of farm ** area (in hectares)
   for which approval is required and applied for :

4. Date of commencement of operations :
   a) Date of commencement of existing
   Traditional/improved traditional system:

   b) Date from which improved technology
   for increased production, productivity
   and return is proposed to be adopted for
   which approval is required and applied
   for :

5. Details of improved technology proposed to be adopted:
(Please furnish separately and enclose a Project Report giving details of)

(i) existing system :

(ii) improved technology proposed to be adopted and :

(iii) production, productivity and return proposed to be achieved:

6. Details of remittance of Processing Fee ***

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* Direction 5: "The farmers who are operating traditional and improved traditional systems of aquaculture may adopt improved technology for increased production, productivity and return with prior approval of the 'Authority' constituted by this order."

** Farm would denote total water spread area including bundhs and canals.

*** A processing fee of Rs.100/ha is to be remitted in favour of Secretary In-charge Fisheries, Government of……..along with the application form.

DECLARATION

I/We……son(s) / daughter (s) / wife of …… residing at ……. hereby declare that information furnished above is true to the best of my / our knowledge and belief. I/We am/are fully aware that if it is found at a later date that the information furnished by me/us is false and there is any kind of deviation/violation of the conditions on which approval may be granted by the Authority, the approval given may be either suspended or cancelled.

Date: Signature of applicant (s)

Place:

FORM **II**

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

Approval for adoption of Improved Technology for increased production, productivity and return in Traditional / Improved Traditional system of Aquaculture

F.No. Dated:

1. Approval is hereby granted to Shri/Smt/M/s……

son (s) / daughter (s) / wife of ……...

residing at ……

in the taluk of …….. of ……

District for adoption of improved technology for increased production, productivity and return in traditional / improved traditional system of aquaculture as specified for a period of three years from…….and is applicable to the farm mentioned below:

a) Improved technology:

b) Location of the farm:

Village	Survey No.	Extent (ha)
……..	……	…….
…….	……	…….
……	……	……...
	Total	_____

2. This approval in **Form II** shall be exhibited in the premises of the farm and produced for checking whenever demanded by an Inspecting Officer.

3. The approval is not transferable.

(By Order)

Date: (Seal of Office) Signature of the

Place: Approving Authority

FORM **III**

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

(EXISTING / NEW FARMS – OUTSIDE CRZ – OUTSIDE 1000 M FROM CHILKA AND PULICAT LAKES – AUTHORISATION/APPROVAL)

Application for Authorisation / approval of Shrimp Culture Farm / Shrimp Culture Pond: other than traditional and improved traditional which are already operating / proposed to be set up / constructed * outside the coastal regulation zone as defined by the CRZ notification and outside 1000 meter of Chilka and Pulicat lakes including bird sanctuaries namely Yadurapattu and Nelapattu (under Directions 6,7 and 9** of the orders of the Hon'ble Supreme Court of India in Judgement dated 11.12.1996 on Writ Petition (Civil) No.561 of 1994)

1	Name of the applicant (s) / registered company/establishment	:	
2	Address for communication	:	
3	Whether the application is for	:	
a)	authorisation of aquaculture establishment/shrimp farm/ shrimp culture ponds operating outside the Coastal Regulation Zone	:	YES/NO
b)	approval of aquaculture establishment/ shrimp farm/shrimp culture ponds proposed to be set up/constructed outside the Coastal Regulation Zone	:	YES/NO

Note : The reply YES or NO should be rounded of as applicable for (a) and (b)

* Shall include proposals where existing farms are also proposed to be expanded

** Directions 6,7,9: Enclosed as Appendix I

4) Details of land for which authorisation/ approval is applied for

State	Division/ District	Taluk	Revenue Village	Survey No.	Extent of farm area (ha)

5) If the whole or part of the above land falls under any one of the following categories, please furnish the details :

Categories	Village	S.No.	Extent (ha)
Agricultural lands			
Salt pan lands			
Mangroves			
Wet lands			
Forest lands			
Lands for village Common purpose			
Land meant for Public purposes			

6) If the whole or part of the land falls within the Coastal Regulation Zone as defined in the CRZ Notification, please furnish details :

7) If the whole or part of the land falls within 1000 meter from Chilka and Pulicat lake (including Bird Sanctuaries namely Yadurapattu and Nelapattu) please furnish details :

8) Furnish Project Report giving details with sketch (to scale) of design and layout of the farm in operation/proposed along with operational details, and water intake, supply, drainage and treatment facilities (Please furnish Report separately and attach to the application)

9) Based on the EIA/EMP where carried out or based on information on the environment of the shrimp farm with reference to other land uses in its neigh bourhood, and based on operational details of the farm as furnished in the Project Report, please state specifically whether :

a) the aquaculture activity has the effect of causing salinity of soil or the drinking water or wells :

b) the use of supplementary feeds will consequently increase sedimentation which on decomposition will be harmful to the environment :

c) such activity would cause siltation, turbidity of water course and estuaries with detrimental implication on local fauna and flora

10) If Environmental Impact Assessment (EIA) has been done, please attach the Report :

11) If Environmental Management Plan (EMP) has been drawn up, please furnish details :

12) If Effluent Treatment Plant (ETP) has been in operation / proposed, please furnish layout, design and technical details. Also indicate total water spread area (WSA) of ETP and WSA of the farm :

13) If licence/consent/approval for the farm in operation / proposed has been obtained / applied for from any of the Central/State authorities, detailed thereof should be furnished with copies of such documents. If licence / consent / approval has been applied for and rejected, the details may Be furnished with copies of documents

14) Details of remittance of Processing fee.*:

*A processing fee of Rs.200/ha is to be remitted in favour of Secretary In-charge Fisheries, Government of……..along with the application form.

DECLARATION

I / We ……..……

Son (s) / daughter (s) / wife of ……...……...

Residing at …...…….

hereby declare that information furnished above is true to the best of my / our knowledge and belief. I / We am / are fully aware that if it is found at a later date that the information furnished by me / us is false and there is any kind of deviation / violation of the conditions on which authorisation / approval may be granted by the Authority, the authorisation/approval given may be either suspended or cancelled.

Date :

Place: Signature of Applicant (s)

FORM **IV**

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

Authorisation / approval for operating / setting up and construction of Shrimp Culture Farm / Shrimp Culture Ponds outside the Coastal Regulation Zone as defined by the CRZ Notification and outside 1000 meter from Chilka and Pulicat lakes (including Bird Sanctuaries namely Yadurapattu and Nelapattu)

F.No……. Dated……

1. Authorisation / Approval is hereby granted to Shri / Smt / M/s……

……..son /

Daughter / Wife of ……

residing at…….

……

……. in the taluk of…….District.……..……for

a) Continuing the already operating shrimp culture farm/shrimp culture ponds

b) For setting up / constructing shrimp culture farm / shrimp culture ponds for a period of three years from ……...in the location of the farm mentioned below:

State	Division/ District	Taluk	Revenue Village	Survey No.	Extent (ha)

TOTAL

2. This Authorisation / Approval is granted to subject the following conditions :

a) the Shrimp culture farm / shrimp culture ponds shall restart operation / be set up / constructed only after obtaining Authorisation / Approval from the Aquaculture Authority,

b) The farm shall not deviate from the approved design and operation,

c) The farm shall not cause salinisation of soil or drinking water or wells,

d) The farm shall not cause increased sedimentation and health hazards,

e) The farm shall not cause siltation, turbidity of water course and estuaries with detrimental implication on local fauna and flora,

f) The farm shall establish and operate an Effluent Treatment Plant and shall ensure that the effluent quality at discharge point conforms to the specific standards prescribed by the Pollution Control Board of the concerned State / U.T.,

g) This Authorisation / Approval in Form IV be exhibited in the premises and produced for checking whenever demanded by an inspecting officer,

h) The Authorisation / Approval is not transferable.

(By order)

Date: Seal of Office Signature of Authorising

Place: / Approving Authority

Appendix – I

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

DIRECTIONS 6, 7 AND 9 OF ORDER OF THE SUPREME COURT OF INDIA IN JUDGEMENT DATED 11.12.1996 ON WRIT PETITION (CIVIL) NO.561 OF 1994

Direction 6	:	The Agricultural lands, salt pan lands, mangroves, wet lands, forest lands, land for village common purposes shall not be used / converted for construction of shrimp culture ponds.
Direction 7	:	No aquaculture industry / shrimp culture industry / shrimp culture ponds shall be Constructed / set up within 1000 meter of Chilka lake, Pulicat Lake (including Bird Sanctuaries namely Yadurapattu and Nelapattu)
Direction 9	:	Aquaculture industry / shrimp culture industry / shrimp culture ponds Other than traditional and improved traditional may be set up / constructed outside the coastal regulation zone as defined by the CRZ notification and outside 1000 meter of Chilka and Pulicat Lake with the prior approval of the "Authority" as constituted by this Court. Such industries which are already operating in the said areas shall obtain authorisation from the Authority" before April 30, 1997 failing which the industry concerned shall stop functioning with effect from the said date. We further direct that any aquaculture activity including intensive and semi-intensive which has the effect of causing salinity of soil, or the drinking water or wells and/or by the use of chemical feeds increases shrimp or prawn production with consequent increase in sedimentation which, on putrification is a potential health hazard, apart from causing siltation, turbidity of water course and estuaries with detrimental implication on local fauna and flora shall not be allowed by the aforesaid authority.

ANNEXURE 6

AQUACULTURE AUTHORITY
MINISTRY OF AGRICULTURE
GOVERNMENT OF INDIA

RULES OF PROCEDURE

1 The Authority shall function under the control of the Government of India in the Ministry of Agriculture and its Headquarters shall be located at Chennai, Tamil Nadu.

2 The Office of the Authority shall function from 9.00 AM to 5.30 P.M. on all days other than Saturdays, Sundays and Central Government holidays.

3 The Authority shall meet once in two months or as often as may be necessary.

4 The meetings of the Authority shall be presided over by the Chairperson and in his Absence by a Member chosen for that purpose by the Members present at that Meeting.

5 No business shall be transacted at any meeting, unless there is quorum of not less than four of the total Members of the Authority including the Chairperson; provided the said restriction shall not apply to any adjourned meeting and it shall be lawful to dispose off the business at such adjourned meeting irrespective of the number of Members present.

6 The proceedings of each meeting showing, inter-alia, the names of the Members Present there, shall be forwarded to each Member within 10 days and the minutes of the proceedings of the meeting shall be confirmed with such modification if any, as considered necessary. All questions shall be decided by the Authority by a majority of votes and in the event of equality of votes the Chairperson shall have a right to exercise a casting vote. The Proceedings shall be confirmed in the subsequent meeting of the Authority with such modification(s) as considered necessary.

7. The Member Secretary shall, in consultation with the Chairperson fix the date, time, place and also draw up agenda for every meeting. Notice of not less than ten clear days shall be given to every Member of such meeting. No matter other than that included in the agenda, shall be considered except with the permission of the Chairperson; provided that ten clear days notice shall not be necessary when in the opinion of the Chairperson business of an emergent nature has to be transacted.

8. For any business requiring urgent attention, the Chairperson can take action and get the same ratified in the next meeting of the Authority. If the Authority

disagrees with the Chairperson, the matter will be referred to the Government of India, in the Ministry of Agriculture for a final decision.

9 All communications to the Authority should be sent to the office of the Authority at Chennai and those shall be documented as per the standard Government procedure.

10 The Authority can make or order to make on its behalf any inspection, survey, measurement, valuation of any shrimp farm with a view to ascertaining their environmental impact at any time after issuing 24 hours notice to the occupier of the farm.

11 The Authority shall have the right to inspect any premises, such as plant, equipment, machinery, godowns, manufacturing or other processes, materials or substances in a shrimp farm and to give such directions as are necessary to prevent control and abatement of any adverse impact on environment.

12 The Authority shall have the power of removal or demolition of any shrimp farm and/or any structure therein which is causing any adverse impact on, after hearing the occupier of the farm and after giving a reasonable time for compliance of the order of removal or demolition

13 The applications for approval, from the farmers who are operating traditional and improved traditional systems of shrimp aquaculture, for adoption of improved technology for increased production and productivity shall be in **Form I** and the approval to be given shall be in **Form II.**

14 The application for authorisation/approval for a shrimp culture farm or shrimp culture pond(s), Other than traditional and improved traditional which are already operating/proposed to be set up/constructed outside Coastal Regulation Zone (CRZ) Notification, 1991 and outside 1000 mtrs of Chilka and Pulicat Lakes shall be made to the Authority in **Form III**. Approval shall be granted in **Form IV.**

15 The initial permission in respect of adoption of improved technology and for authorisation/approval of shrimp culture farm/shrimp culture ponds other than traditional and improved traditional which are operating/proposed to be set up/constructed outside the Coastal Regulation Zone as defined by the CRZ Notification and outside 1000 meters of Chilka and Pulicat lakes shall be in the first instance for a period of three years from the date of approval

16 The Authority shall have the powers to engage consultants or constitute committees and/or co-opt expert(s) under special circumstances such as to draft/prepare reports, assess/evaluate field environmental aspects and conduct field studies to assist the Aquaculture Authority

17 The Authority shall have the power to take all such measures as it deems necessary or expedient for the purpose protecting and improving the quality of the environment and preventing, controlling and abating adverse impact on the environment in relation to shrimp aquaculture.

18 The Authority shall take such measures as are necessary to plan and execute a nation-wide programme for the prevention, control and abatement of adverse

impact on the environment in relation to shrimp aquaculture

19 The Authority shall adopt the standards and norms as prescribed in the Guidelines issued by the Ministry of Agriculture in 1995 and those to be framed by the Government from time to time in respect of shrimp aquaculture

20 The Authority shall implement the 'Precautionary principle' and 'Polluter Pays Principle' as directed by the Supreme Court in its judgement dated 11th December 1996 in W.P. (Civil) No.561 of 1994

21 The Authority shall frame suitable schemes for reversing the damage caused by adverse environmental impact of shrimp aquaculture in the coastal States and Union Territories and such schemes shall be executed by the respective States under the supervision of the Union Govt.

22 The Authority shall have the maintenance of ecology as its prime guiding factor

23 The Directorate of Fisheries headed by the Secretary/Commissioner of Fisheries in the concerned coastal State/Union Territory shall be the nodal agency with whom the Authority shall interact for carrying out some of its functions. The nodal agencies shall also constitute District-level committees comprising representatives of concerned Departments/Boards/etc. to process the applications and other matters concerned with the functions assigned to the Authority

24 To ensure time-bound disposal of applications submitted for setting up/renewal/adoption of improved technology, the following time-frame shall be adhered to by the Nodal Agency/ District Level Committee/Aquaculture Authority, from the date of receipt of the application by the concerned Agency:-

Initial scrutiny and despatch of applications received by the Nodal agency:	One Week
Detailed examination of the application, site inspection, etc and return of the application with recommendations by the District Level Committee to the Nodal Agency:	Four Week
Entry of records and despatch of the application to the Aquaculture Authority with recommendations by the Nodal Agency:	Two Weeks
Grant of permission and its despatch to the Nodal Agency and the applicant by the Aquaculture Authority:	One Week

25 The Authority shall sue and be sued in the name of Member Secretary

GUIDELINES

Adopting Improved Technology for Increasing Production and Productivity in Traditional and Improved Traditional Systems of Shrimp Farming

Aquaculture Authority
Government of India
Ministry of Agriculture
Department of Animal Husbandry and Dairying
New Delhi – 110 001

GUIDELINES

Adopting Improved Technology for Increasing Production and Productivity in Traditional and Improved Traditional Systems of Shrimp Farming

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Ministry of Agriculture
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New Delhi – 110 001

Publication sponsored by the FAO's Bay of Bengal Programme for Fisheries Management,
91, St. Mary's Road, Abhiramapuram, Chennai 600 018
Tel 44-4936294 Fax: 44-4936000 e-Mail: bobpkcc@Amd2.vsnl.net.in

Justice G Ramanujam

Chairman

Aquaculture Authority

PREFACE

Coastal aquaculture has been recognised as an important tool for employment generation and as a vital source of supply for meeting the food security and nutritional requirements of our growing population.

The Supreme Court in its judgement dated 11th December, 1996 regarding shrimp aquaculture activities in coastal areas, directed the setting up of an Aquaculture Authority to regulate shrimp farming in the country. The intention behind the judgement is to develop shrimp aquaculture in a sustainable and eco-friendly manner. The Apex Court in its judgement also permitted farmers practising traditional and improved traditional systems of shrimp farming to adopt improved technology for increased production, productivity and returns with the prior approval of the Aquaculture Authority.

The Aquaculture Authority in pursuance of this direction constituted a Technical Committee which has formulated guidelines for adopting improved technology. These guidelines are comprehensive and lay down specific parameters for adopting improved technology by shrimp farmers practising traditional/improved traditional systems of shrimp aquaculture.

I believe that the practical guidelines evolved by the Technical Committee would be beneficial for shrimp growers, the scientific community and planners in achieving the objectives of sustainable and eco-friendly coastal aquaculture.

(G. Ramanujam)

New Delhi

1.5.1999

Dr. Yugraj Singh Yadava

Member Secretary

Aquaculture Authority

FOREWORD

The Guidelines for Adopting Improved Technology for Increasing Production and Productivity in Traditional and Improved Traditional Systems of Shrimp Farming have been formulated with the objective of optimising yield levels in such systems on sustainable basis. The Guidelines also aim at improving the management of shrimp aquaculture in traditional systems to ensure long-term sustainability of the farming practices and environmental security.

In preparation of the Guidelines, efforts have been made to incorporate data based on scientific experiments conducted in India and abroad. The Guidelines are, however, dynamic and would be subject to periodical revisions. Further, the Guidelines are illustrative and not exhaustive. Suitable modifications may have to be made by the farmers while adopting the improved technologies.

With great pleasure, I record my thanks to Dr. Kee-Chai Chong, Programme Coordinator, Bay of Bengal Programme, Chennai, and his staff for their valuable inputs towards publication of the Guidelines. Thanks are also due to Shri G.D. Chandrapal and other Officers and Staff of the Fisheries Division, Department of Animal Husbandry & Dairying, for their unstinted cooperation and support in preparation of the Guidelines.

New Delhi (Y.S. Yadava)

1.5.1999

BACKGROUND

The Honourable Supreme Court in its orders on the Writ Petition (Civil) No.561 of 1994 dated 11.12.1996, held that "The Shrimp culture industry/the shrimp ponds are covered by the prohibition contained in para 2(1) of the CRZ Notification. No shrimp culture pond can be constructed or set up within the coastal regulation zone as defined in the CRZ Notification. This shall be applicable to all seas, bays, estuaries, creeks, rivers and backwaters. This direction shall not apply to traditional and improved traditional types of technologies as defined in Alagarswami's Report which are practised in the coastal low lying areas."

The traditional and improved traditional systems as defined in Alagarswami's Reports are as follows.

> **TRADITIONAL**: Fully tidal-fed; salinity variations according to monsoon regime; seed resources of mixed species from the adjoining creeks and canals by auto-stocking; dependent on natural food; water intake and drainage managed through sluice gates depending on local tidal effect; no feeding; periodic harvesting during full and new moon periods; collection at sluice gates by traps and bagnets; seasonal fields alternating paddy (monsoon) crop with shrimp/fish crop (inter-monsoon)
>
> **IMPROVED TRADITIONAL:** System as above but with stock entry control, supplementary stocking with desired species of shrimps seed (Penaeus monodon and P.indicus); practised in ponds of smaller area 2-5 ha.

The Court in its Orders also permitted the farmers operating traditional and improved traditional systems of shrimp aquaculture to "adopt improved technology for increased production, productivity and return with prior approval of the Authority".

Accordingly, the Aquaculture Authority constituted a committee comprising the following members for preparing guidelines for enabling farmers to adopt improved technology:

1. Dr. G.R.M. Rao — Chairman
   Director, Central Institute of Brackishwater Aquaculture,
   Chennai

2. Dr. Satish Chandra — Member
   Member, Aquaculture Authority
   29, Doctor's Society
   4, Vasundhara Enclave
   New Delhi

3. Director of Fisheries — Member
   Government of West Bengal
   Calcutta

4. Shri V. Venkatesan — Member
   Director, Marine Products
   Export Development Authority
   Kochi

5. Shri G.D. Chandrapal — Member Secretary
   Deputy Commissioner of Fisheries
   Ministry of Agriculture,
   Department of Animal Husbandry & Dairying,
   New Delhi

The terms of reference of the Committee are:

i) To examine the relevant portion of the Supreme Court's judgement dated 11.12.1996 under which the suggestion has been made by the Apex Court for adoption of improved technology for increased production and productivity from traditional and improved farming systems.

ii) To define the specific parameters that are considered for improved traditional systems of shrimp aquaculture.

iii) To specify permissible activities that can be practised by the shrimp farmers within the CRZ area under the improved technology for increasing production and productivity from traditional and improved traditional farming systems.

iv) To suggest the measures that are to be taken by shrimp farmers while undertaking improved technology to protect the eco-system within the framework of the Supreme Court's Judgement dated 11.12.1996.

1. INTRODUCTION

1.0 Coastal shrimp aquaculture is an age-old practice in the States of West Bengal and Kerala. More than 50,000 ha is under traditional and improved traditional methods of shrimp farming. As per the classification mentioned in Alagarswami's Report and adopted by the Honourable Supreme Court, the traditional sytstem of culture is fully tide-fed; salinity variations according to monsoon regime; seed resource of mixed species from the adjoining creeks and canals by auto-stocking; dependence on natural food; water intake and drainage managed through sluice gates depending on local tidal effect; no feeding; periodic harvesting during full and new moon periods; collection at sluice gates by traps and bag nets; seasonal fields alternating paddy crop (monsoon) with shrimp/fish crop (inter-monsoon). The improved traditional system is different from the traditional system only in stock entry control and supplementary stocking with desired species of shrimp seed (*Penaeus monodon* and *P. indicus*) The average production levels in these types of systems range between 300 and 500 kg/ha/season. However, with the adoption of improved environment-friendly technology, the production and productivity of the system can be increased with the yield levels varying between 1000 and 1500 kg/ha/crop, resulting in optimum utilization of the resources available with the farmer. The Supreme Court, while permitting the traditional and improved traditional systems within the Coastal Regulation Zone (CRZ), has also permitted improvement in technology for these systems to increase production, productivity and returns.

2. EXISTING PRACTICES

2.0 Traditional coastal shrimp aquaculture followed in certain states of India is best described as the "trap and culture" method in large and shallow impoundments. This is largely dependent on the tidal flow for the water supply as well as for the seeding material. All the impounded organisms are allowed to grow, and periodical harvesting of the shrimps and fishes is carried out after an initial rearing for 2-3 months. Harvesting is generally through trapping during the spring tide period. Auto stocking results in the entry of unwanted predators and other aquatic organisms, which compete for food and space with the desirable species apart from preying on them. The organisms in the system depend on the natural productivity of the soil and water for the production of natural food materials. Hence the growth and survival of the target fin/shell fish is less and the profit very meager. Similarly, in the improved traditional method, though selective stocking is followed, preventing the entry of eggs/larvae of undesirable species is difficult which subsequently compete for food with the target species

SPACE FOR PHOTOGRAPH

Small-scale tidal-fed shrimp farms with feeder canals

2.1 Thus, for optimum utilization of the resources and increased production, productivity and returns to the farmer, improvement in the existing technology is necessary. Such improvements should aim at the following:

a) Improved farm design – for operational ease
b) Optimum soil and water condition
c) Removal of pests and predators
d) Qualitative and quantitative aspects for stocking shrimp larvae
e) Supplementary feeding
f) Soil and water quality management
g) Monitoring of growth and health
h) Improved methods of harvesting post-harvest management

SPACE FOR PHOTOGRAPH

Examining a shrimps's intestines to check and ensure correct feeding

3.TECHNOLOGY FOR IMPROVING PRODUCTION AND PRODUCTIVITY

The guidelines aim at increasing the production, productivity and returns from traditional and improved traditional systems of shrimp farming with sustainable and environment-friendly farming practices.

3.1 FARM DESIGN

3.1.1 Generally, the traditional and improved traditional farms are vast and the individual units range up to 100 – 200 ha. In such large water bodies, the adoption of improved culture technology may not be possible since management of such water bodies is very difficult. For better water management, individual culture units should be within 5 ha areas. Hence changes in farm design should be made wherever possible depending on the local conditions to reduce the unit culture area within manageable limits. The reduction in size should accompany formation of a suitable feeder channel system within the farm so that the water intake can be effectively managed in all the individual units. The water intake should be through sluices provided with net screens. The sluice gates should be watertight so as to retain the required amount of water in the ponds.

SPACE FOR PHOTOGRAPH1

Sluice gate to control flow of water from feeder channel

3.1.2 The water depth in traditional fields is low at 50-60 cm. For improving the growth and survival of the shrimps, at least a minimum depth of 80 – 100 cm should be maintained. Deepening of the farms is called for wherever necessary. The soil excavated after deepening should be used for the bunds etc.

3.1.3 The traditional/improved traditional systems of culture adopting improved technology may resort to the use of pumps whenever necessary

3.1.4 All farms above 5 ha should keep 10% of the area reserved as waste stabilization ponds.

3.2 OPTIMUM WATER AND SOIL CONDITIONS:

3.2.1 The low stocking and low feeding envisaged under the present system does not lead to accumulation of organic matter at the pond bottom. However, for better growth and survival of the shrimps, the soil needs to be conditioned. The best way to improve the pond bottom conditions is to dry the pond wherever possible and till the surface layer. This process shall enhance the mineralisation of organic load at the bottom.

3.2.2 Application of lime is useful in correcting the pH of the soil. It is a disinfectant; it also increases the mineralisation process. If the pH of the soil is not below 7.5, a basal dose of 300-500 kg/ha can be applied. However, in acid soils, where the soil pH is low, the quantity of lime is to be applied should be calculated on the basis of the pH and the type of lime used. The following dosages of quick lime/slaked lime are advocated for low pH soils.

Soil pH	Quick lime* (tonnes/ha)	Slaked lime** (tonnes/ha)
5.0	9.2	17.0
5.5	6.9	12.7
6.0	4.6	8.5
6.5	2.3	4.2

* During pond preparation

**During culture

3.2.3 The cultured species largely depend on the natural feed. To achieve sustained production, it is essential that supplementary additions of fertilizers should be resorted to. Both organic manures and inorganic fertilizers are generally used for the purpose. The dosage of organic manure to be applied is dependent on the organic carbon content of the soil. The following basal doses are prescribed

Dosage of manures in relation to organic carbon content of soil

Organic carbon in soil (%)	Prescribed basal dose Raw cow dung (kg/ha)	Dry chicken manure (kg/ha)
1	500	175
0.5	1000	350
0.25	2000	700

3.2.4 Similarly, application of inorganic fertilizers should be based on the nitrogen and phosphorous content of the soil which is detailed below

Application of urea in relation to available N

Available N in soil (mg/100g soil)	Urea to be applied (kg/ha)
12.5	100
25.0	50
50.0	25

Application of super phosphate in relation to available phosphorus

Available P in soil (mg/100 g soil)	Super phosphate to be applied (kg/ha)
1.5	100
3.0	50
6.0	25

3.2.5 While using inorganic fertilizers, care should be taken to avoid over-fertilization. The fertilization dosage given may not hold good for all the waters. The best way to regulate the fertilization schedule is through monitoring the algal bloom conditions based on the colour or transparency of the water.

3.3 REMOVAL OF PESTS AND PREDATORS

3.3.1 Pests and predators are the major problems encountered by the traditional farmers. Even when the selective stocking method is followed after screening the water intake, the entry of larvae/eggs of some of the unwanted species cannot be avoided. Before initiation of a new culture, it is essential that all unwanted organisms are removed from the pond. In drainable ponds, this is achieved by drying the pond bottom.

3.3.2 In cases where complete drying is not possible, organic, biodegradable piscicides such as Mahua oil cake and tea seed cake can be used. No chemical piscicide should be used. After the application of the pisscicide, at least a minimum period of 10 days should be given for its toxic effect to be degraded.

3.3.3 Piscides like Mahua oil cake (100-150 ppm) and tea seed cake (15-20 ppm) act as organic fertilizers after their toxicity is eliminated. The piscicides are applied with a minimum of water. The water dosage is calculated on the basis of the volume of water as given in the following table

Piscicide	Dose for 1000 m^3 of water (10 cm of water in 1 ha area) (kg)
Mahua oil cake	100-150
Tea seed cake	15-20

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3.4 QUALITATIVE AND QUANTITATIVE ASPECTS FOR STOCKING OF SHRIMP LARVAE

3.4.1 Stocking of healthy seed (post-larvae) solves most of the disease problems that are encountered by farmer. Only hatchery-reared and healthy seed should be used. The quality seed is characterized by active movement against the current in the container; absence of bright colouration; and adaptability to stress conditions of reduced salinity and formalin content. The presence of viral and bacterial pathogens/diseases should be identified by trained microbiologists.

3.4.2 The number of seed stocked has a strong bearing on its growth rate during culture. The stocking densities should be decided on the basis of the management practices followed. For improved traditional systems, the stocking densities should be in the range of 4-6 no./m^2

3.5 SUPPLEMENTARY FEEDING

3.5.1 With the above stocking densities, supplementary feeding becomes essential after 4 – 6 weeks of rearing, when the natural feed cannot sustain their growth. Only formulated feed (dry pellets) with a minimum 4-hour water stability should be used. The feeding rate prescribed by the manufacturer varies, depending on the quality of the feed. Generally, the feeding rates given in the following table are followed.

3.5.2 The feeding schedule should be regulated on the basis of the feeding check trays placed in the ponds. Feeding through trays placed in various parts of the pond is found to be more economical and beneficial. Excess feeding can be avoided by increasing the frequency of feeding. The daily feed requirement can be split into smaller rations, and given 4-6 times a day, with a major percentage during the evening and night feeding.

Size of the shrimp (gm)	Feeding rate (%)
2-5	4.0 – 3.0
5-10	3.0
10-15	3.0-2.5
15-20	2.5-2.0
20.35	2.0

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How shrimp in a small fond are fed

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3.6 MONITORING OF GROWTH AND HEALTH:

3.6.1 Disease manifestation in shrimps occur when the equilibrium between the host, the pathogen and the environment is altered. Most of the diseases occur only when the water quality conditions are stressful to the cultured shrimps. Water quality should therefore be maintained as suggested in para 3.7. The growth of the shrimps should be monitored continuously to adjust the feeding rate and to assess their well being. Shrimp with any one or more of the following conditions are diagnosed be disease-inactive and sluggish: empty gut, bluish/blackish colouration, with blisters or flared up gills, broken appendages, black/white spots, coloured gills and opaque muscles. In case of disease outbreak a trained pathologist should be consulted.

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The length of cultured shrimp is measured periodically

3.7 WATER QUALITY MANAGEMENT

3.7.1 Water quality management in shrimp culture ponds aims at maintaining optimal levels of certain important quality parameters as listed in the following table. In the present system of culture, periodical water exchange shall be necessary to maintain optimal water quality conditions. While exchanging water, care should be taken to avoid wide fluctuations in water quality conditions.

Optimal levels of water quality parameters

Water quality parameters	Levels
1. Temperature (°C)	28-33
2. Turbidity (cm)	25-45
3. Ph	7.5 – 8.5
4. Dissolved oxygen (mg/l)	5-7
5. Salinity (ppt)	15-35
6. Total alkalinity (ppm)	200
7. Dissolved inorganic phosphorus (ppm)	0.1 – 0.2

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Testing of water quality in shrimp pond

3.8 HARVESTING

3.8.1 Harvesting can be done by completely draining the pond, either by gravity or through pumping and hand-picking or trapping.

3.8.2 The water drained out for harvesting should be pumped into the waste stabilization ponds and kept for a few days for settlement before releasing into the open water.

3.8.3 Shrimps are generally harvested from the ponds over a period of 10-12 hours and the shrimps are liable to be spoiled during the period. The quality of the shrimps should be maintained so that it fetches a good price. Icing should be done immediately after harvest. Processors/buyers generally collect the harvest from the farm site and transport it in refrigerated vans. When such a facility is not available and the produce has to be transported over a long distance, the shrimps should be deheaded and stored in ice to prevent spoilage

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Shrimps should be iced immediately after the harvest to preserve shrimp quality

3.9 EXPECTED IMPROVEMENT IN PRODUCTION:

3.9.1 Adoption of improved technology shall enable the farmer to achieve production ranging between 1 and 1.5 tonnes/ha/crop. Two crops per year can be taken, leading to an annual production level of 2.0 to 3.0 tonne/ha

4. SECONDARY AQUACULTURE

Waste stabilization ponds which are mandatory in farms above 5 ha area, may be used for secondary aquaculture, depending on the available technology

5 CONCLUSION

The present guidelines for adoption of sustainable and environment-friendly technology by farmers practicing traditional and improved traditional shrimp farming are illustrative and not exhaustive. Suitable modifications may have to be made while adopting the improved technologies.

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Use of a cast net to harvest cultured shrimp

FARM DATA