

PILOT PROJECT

ON

P E A R L C U L T U R E

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

COCHIN - 682018

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
KRISHI BHAVAN, NEW DELHI

APPLICATION FOR THE GRANT
FOR PILOT PROJECT FOR CONSIDERATION OF NRDC

1. TITLE OF THE SCHEME

'Pilot Project on Pearl Culture'

2. Location

- a) NAME AND ADDRESS OF THE INSTITUTE/UNIVERSITY
- Central Marine Fisheries
Research Institute
Post Bag No.1912, Ernakulam
COCHIN-682018
- b) NAME AND ADDRESS OF THE HEAD OF THE DEPARTMENT
- Dr.R.V. NAIR
Director
Central Marine Fisheries
Research Institute
COCHIN-682018
- c) ACTUAL LOCATION WHERE THE RESEARCH WORK WILL BE CARRIED OUT
- Tuticorin - (Tamil Nadu)

1. Name of the project: PILOT PROJECT ON PEARL CULTURE
2. a) Products: Cultured pearls
b) Co-products and by-products Seed pearls
Oyster meat and shells
3. Use of the products, by-products:
Cultured pearls Used as gems in jewellery of several kinds such as pearl strings, necklaces, brooches, rings, bangles etc.
Seed pearls Used in certain pharmaceutical preparations
Meat The meat, particularly the adductor muscle of pearl oyster, is edible.
Shells In poultry feed; source of lime; shell-crafts for decorative inlay and carving works.
4. a) Present consumption pattern:

Pearls are used in jewellery all over India. The pearl markets in Bombay, Hyderabad and Calcutta are well known and there is both an import and export trade for pearls (vide Appendix-1). India is importing on an average pearls worth about Rs.8.204 million every year as there is no production of pearls in the country after 1961. The last pearl fishery was held at Tuticorin in 1961 and along Jannagar coast in 1967, which are the two pearl-producing areas in the country.

The export trade in pearls is worth about Rs.10.253 million annually. The average export of natural pearls is about Rs.9.826 million as against an import of Rs.3.583 million. There is a significant pearl-processing industry in the country which converts most of the unworked natural pearls into processed natural pearls. Our export of pearls

reaches more than 35 countries, of which U.S.A., Hong Kong and the Persian Gulf countries are important.

The import of cultured pearls is worth Rs.4.621 million but the export of this commodity is valued at Rs.0.427 million only, indicating that 90.8 per cent of the cultured pearls imported are utilised within the country.

Cultured pearls worth a considerable sum are brought into the country by the Indian tourists and others as presentation articles.

b) How is the demand being met?

Indigenous production:-

Nil

Imports:-

i) By whom/from whom?

By approved agencies. Mainly from Japan which accounts for 91% of our import of pearls. The rest comes from several countries. Most of the cultured pearls that come to India from Japan are produced by the fresh-water mussel Hyriopsis schlegeli and are not of superior quality like the pearls produced by the marine pearl oyster Pinctada fucata.

ii) Quantity:

Figures given in Appendix 2.

c) Estimated future demand: The pearl trade has been showing an increasing trend as the figures indicate. The future demand may be in the order of Rs.25-30 million if indigenous pearls could be made available at competitive rates.

d) Present market price: No market survey has been undertaken so far.

5. Process:

a) Background information, existing technology and alternatives in India and abroad:

Pearls are produced by the pearl oysters and a few other molluscs by a natural process of biological defence against the accidental entry of foreign particles of organic or inorganic origin into their tissues. While the pearl oyster, which lives in the sea, is the main species that contributes to the pearl production in the World, a few others which live in the freshwater systems also produce pearls which are not of superior quality.

Japan developed in 1893 a technology to induce the pearl oysters to produce semi-spherical pearls by sticking nuclei on to the interior aspect of shells. The same country invented in 1907 a process for producing perfectly spherical pearls within the tissues of the oysters by implanting a spherical shell-bead nucleus and graft tissue. These pearls came to be called "cultured pearls". This technology enabled Japan to develop a pearl culture industry to produce pearls on a massive scale and to sell them at cheaper prices compared to natural pearls.

Australia had to go in for collaboration with Japan in 1956 to establish a pearl culture industry. Philippines, Burma, Indonesia and Hong Kong also have small-scale ~~pearl~~ production of pearls with the collaboration of Japan. The necessity for such collaboration has been essentially the lack of technical know-how.

India has pearl oyster resources mainly in two areas, the Gulf of Mannar and Gulf of Kutch. The exploitation of pearls, popularly called "pearl fishery", has been exclusively in the hands of the Governments of the two maritime States adjoining the above two areas namely, Tamil Nadu and Gujarat. The resources in both the areas are of a fluctuating nature and pearl fisheries have been a matter of chance depending on the density of populations of the pearl oyster in a given year. There has been no pearl fishery, and hence no production of pearls, in the Gulf of Mannar for the last 13 years and in the Gulf of Kutch for the last 7 years.

Several attempts were made in India both by the Government of Tamil Nadu and the Government of Gujarat since 1933, or even earlier, to develop a technology for cultured pearls independently. These efforts did not meet with success as the proper technical know-how was not available.

The technology has now been developed through the research efforts at the Central Marine Fisheries Research Institute. A research project on pearl culture was initiated in 1972 at Tuticorin with a Pearl Culture Laboratory at Veppalodai. Perfectly spherical cultured pearls were produced at this Laboratory in July 1973, marking the successful development of pearl culture technology entirely on indigenous efforts. The technology has been put to test repeatedly and has been found sound and viable.

- b) Detailed description of the process, its specific advantages and scope of its present and potential application:

The process of pearl culture could broadly be divided into two stages. The first is farming of mother-oysters and the second production of pearls.

For mother-oyster culture, oysters are collected from the natural pearl banks and by collection of the young stages of oysters on spat-collectors. The oysters are caged in special type of frame nets and suspended from floating rafts which are anchored in the open sea. The oysters are grown in this manner until they reach the size suitable for producing pearls in them.

In the second stage, the oysters are brought to the laboratory and conditioned for a surgical operation. Spherical shell-bead nuclei are implanted within the tissues of the oysters along with suitable graft pieces prepared from the mantle tissues. The oysters, after a brief period of convalescence in the laboratory, are arranged in frame nets and returned to the rafts in the farm. They are grown for a further period of about 3 months to 2 years at the end of which cultured pearls could be harvested.

The process described above is quite modern and as practised in Japan. This, at present, is the only process by which free spherical cultured pearls are produced for the market.

- c) In the light of trends of research in this line, does the proposal now made, has reasonable chance of standing test of time, say 10-15 years?

This is the first time in India that cultured pearls will be produced on a large scale. The process is sound and will stand the test of time.

6. Laboratory and/or preliminary work:

- a) Scale of investigations:

The preliminary work which has been carried out so far, though limited to the farming of about 2,000

oysters, has given successful results. A very high percentage of pearl yield has been obtained even in the preliminary work.

Six rafts have so far been floated in the sea for the culture of oysters. About 200 oysters have so far been operated and these have been partly examined for pearl production at different intervals, ranging from one to six months. The average success of pearl production could be expected to be about 70% of the operated oysters.

b) Quantity of product prepared:

The experiments conducted were for developing the technology and not production-oriented.

c) Are you able to supply adequate quantity of the product as samples to entrepreneurs?

It is possible to supply samples to the entrepreneurs. A demonstration of the entire process was given in January 1974 both to high ranking officers and other interested organisations.

d) Date of laboratory investigation with respect to operating conditions, approximate consumption of raw materials and utilities, yields, man power etc.

A pearl culture laboratory and farm were set up in December 1972 at Veppalodai near Tuticorin. The Laboratory is located in a very small building as the required facilities could not be mobilised at Veppalodai. Hence the experimental work had to be done with severe limitations of laboratory space. The operations which commenced in June 1973 could be carried out only by a single officer assisted by a very few supporting staff for the field and laboratory work.

About 2,000 pearl oysters formed the raw material for the farm work in the preliminary investigation. About 200 oysters have been operated so far and the work is being continued. Pearls were collected in batches during July, October and November 1973, January and February 1974.

7. Any work done on pilot project:

No work has so far been done on pilot project. The earlier investigations in 1972-73 were carried out under a research project of the Central Marine Fisheries Research Institute. Presently a scheme on pearl culture is in operation as an ad hoc collaborative research scheme between the Central Marine Fisheries Research Institute and the Department of Fisheries of the Government of Tamil Nadu.

a) Capacity of the plant:

About 2,000 oysters formed the stock in the farm. The scale of operations ~~is~~ being enlarged now for the purpose of research.

b) Duration of investigations:

From December 1972 - continuing

c) Designs data collected e.g. consumption of raw materials, utilities, operating condition, yields etc.

Design of rafts, buoying and anchoring devices, cages, nets, collection of oysters, farming procedure, surgical operations, nucleus preparation etc. have been worked out. These data have given us the required knowledge for expansion of the activities both for research purposes and for pilot-scale production of pearls.

- d) Whether the pilot/prototype plant is still in operation?
If so, could it be demonstrated to prospective entrepreneurs?

The scheme on Pearl Culture is in operation. The process could be demonstrated to prospective entrepreneurs.

8. Quality of products:

- a) Specifications of the products, I.S. or others:

There is no specification at present for the Indian cultured pearls.

- b) Have the products been tested to conform to the specifications?

Although no testing has been done so far the products are comparable to the imported pearls.

- c) Consumer acceptability report on the products:

The products have not been sent to market as yet and hence no consumer acceptability report on the products, is available.

9. Pilot plant:

- a) Suggested capacity:-

About 3,00,000 oysters are to be used for farming and production of pearls in a period of 5 years. The rate of stocking will be about 75,000 oysters a year for the first four years. There will not be any fresh stocking in the fifth year.

- b) Layout of the plant indicating:

- i) Land required for the plant
ii) Land required for raw material
and finished products storage.

About 0.5 hectare of land on lease basis at or near Veppalodai for the temporary establishment of

production laboratories stores, storage of by-products etc. The farm will be established in the sea for which a vast area is available.

10. Raw materials:

a) Specifications of raw materials:

The operations will be done on the pearl oysters of the species Pinctada fucata and other suitable species of pearl oysters. The shell-bead nuclei will be prepared out of suitable shell material.

b) Their availability:

i) Indigenous: Pearl oysters will be collected from the pearl banks of the Gulf of Mannar and Palk Bay. Besides this, attempts will be made to raise stocks by spat collection technology. It is hoped that intensive efforts would bring in the required raw material of about 3,00,000 oysters during the period of the pilot project. The success of this project would largely depend on this factor.

For the production of nuclei a simple process has been developed for preparing spherical shell beads and these have been used in the experimental production of pearls. Using this process, which is also under improvement, the required quantity of nuclei could be produced.

ii) Imported: It is suggested that about Rs.10,000 worth of beads may be imported from Japan for the work in the first year. The import will be only for the initial period of the project so that there need be no delay in the production of pearls during the time the large scale production of suitable nuclei indigenously is accomplished.

11. Equipment for pilot plant::

a) List of all equipments along with approximate specifications:

i) Indigenous equipment: The equipment will consist of operation tools, filtering units, holding tanks, motors etc. The operation tools are of special types and will be made locally.

ii) Imported equipment: At least 10 sets of operation tools are to be imported from Japan during initial stages of the project which will involve a foreign exchange of Rs.10,000/-

b) Likely suppliers: The equipment could be procured locally. The likely suppliers of operational tools both in India and in Japan will be found out after making preliminary enquiries.

c) Do you have any of this equipment already available:

Operational tools (personal sets with the scientist) are available. The fabrication of the tools could be done with these tools as prototypes and with suitable modifications. Other equipments will require to be procured.

d) Time required for procuring the equipment, erection, commissioning and trial production:

About one year from the commencement of the project for trial production.

12. Economics of the pilot plant/semi-commercial plant/prototype plant (As per proforma for predesign cost estimates).

Please see statements 1-6 for details. The

figures of receipts and cost of production are only approximate.

a) Fixed capital on building	Rs. 30,000/-
b) Fixed capital on plant	Rs. 1,99,000/-
c) Working capital	Rs. 12,97,200 (pay and allowance
d) Cost of production	About Rs. 9,000 per 1,000 pearls on an average.

13. Marketability prospects and distribution problem; addresses of firms interested in financial and technical collaboration from the beginning of the project:

Marketing of pearls could be taken up with the cooperation and help of "The Gem & Jewellery Export Promotion Council, D-15, Commerce Centre, 4th Floor, Tardeo, Bombay-400034".

The Department of Fisheries, Government of Tamil Nadu, Administrative Buildings, Madras-6" will be collaborating in the entire project on a 50:50 basis.

14. Safety considerations, if any:

It would be necessary to declare the farm area as "protected" for preventing fishing operations in the area. The Government of Tamil Nadu will be in a position to do this by issuing proper notification.

15. Anticipated effluents waste and pollution problems and suggestions for tackling the same:

There will not be any pollution problem arising out of the pilot project.

16. Copy of the complete patent specification, if process is patented.

The process has not been patented.

17. Any restrictions/difficulties anticipated in the implementation of the proposal.

Collection of the required quantity of pearl oysters from the natural pearl banks as well as through culture techniques would largely decide the full implementation of the proposal.

18. Detailed phased programme of work along with funds required, please indicate the total period required to complete the work.

Total period required: 5 Five years.

Phased programme of work:

First year: Collection of pearl oysters from the pearl banks, raft construction, sea farming at Veppalodai, conditioning of oysters, nucleus implantation, post-operative culture.

Construction of temporary laboratory accommodation; procurement of boats, jeep equipment etc.

Second year: Collection of pearl oysters from the pearl banks, collection of pearl oysters^{spat} from the farm and rearing; farming; conditioning of oysters; nucleus implantation; post-operative culture; pearl collection; collection of by-products; market survey; releasing the product to the market.

Third year: Programme same as in the previous year.

Fourth year: Programme same as in the previous year.

Fifth year: Programme same as in the previous year; completion of the project.

Funds required: Please see statements 1 to 4.

19. Processes which involve production of equipment, instrument etc:

- | | |
|---|---|
| a) Has any prototype been prepared? If so, number of prototypes already made: | The special equipment and instruments which are required in the project, apart from those readily available, in the market, are (1) the instruments for operation and (2) machinery for the production of nuclei. Regarding the instruments, we are now using foreign-made ones. These are proposed to be made indigenously with the help of suitable instrument manufacturers. A process for the production of nuclei has already been developed using an ordinary bench drill with suitable modifications. These developments are being made separately and will not involve funds from the proposed pilot project. |
| b) Have the prototypes been operated successfully? | |
| c) Have the prototypes been demonstrated satisfactorily to the entrepreneurs? | |
| d) How many more prototypes would be needed before production could be established? | |
| e) Have you a set of drawings for making prototypes? | |
| f) What is the suggested number of pieces for production of a commercial scale? | |
| g) Estimated requirement of Capital? | |
| h) What is the estimated cost of the item when produced on commercial scale? | |

20. Any other point not covered by the above which you wish to bring out.

Anticipated revenue. The total anticipated receipt is Rs.25,96,000/-. This is worked out on the following basis. Of the 75,000 oysters stocked in one year, at least 70% would survive to the next year; of these at least 70% (36,750 numbers) can be expected to produce pearls.

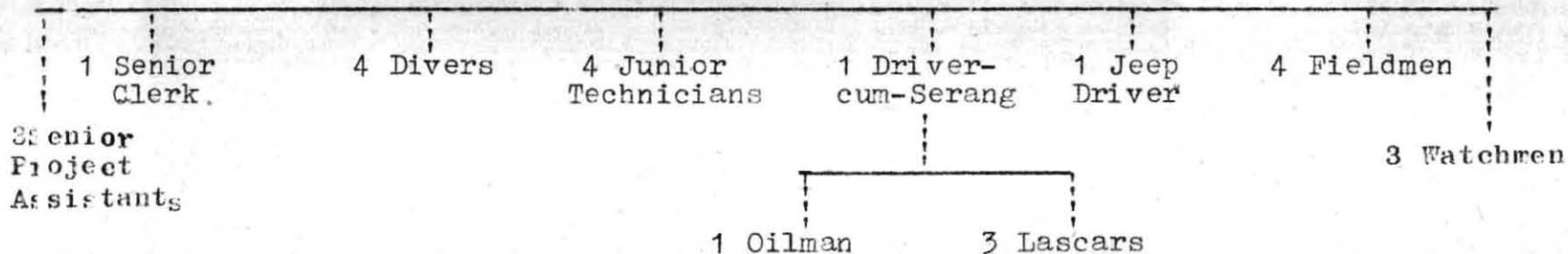
Fifty percent of the oysters would give at least one pearl each and the rest, two pearls each. In other words, from the second year onwards the annual production would be about 55,000 pearls; of these 30% may be expected to be of good quality (A grade), 40% of medium quality (B grade), and 30% poor quality (C grade). The value per pearl of A grade, B grade and C grade would be approximately Rs.25, Rs.10 and Re1/- respectively. Thus the annual income from the pearls would be Rs.6,49,000 from the second year onwards. The total revenue from the second to the fifth year would therefore be Rs.25,96,000. The estimated expenditure including the interest on capital is Rs.16,00,400. The estimated profit, excluding the value of assets after depreciation, for the period of 5 years is Rs.9,95,600.

ANNEXURE - I Organisation - staff pattern

Director, C.M.F.R. Institute, Cochin

Head of Division (Mollusca)

Project Officer (Pearl Culture)



ANNEXURE - IIStaff requirements

Sl. No.	Name of post	Scale of pay	No. of posts required	Essential qualifications	No. of posts already existing
1.	Project Officer	Rs.700-50-1250 (to be revised)	1	M.Sc. in Zoology/Fishery Biology/ Marine Biology with at least 10 years experience in Molluscan fisher- ies investigations; at least 2 years experience in the culture of molluscs.	No
2.	Senior Project Assistant	Rs.550-25-750-EB-30-900	3	M.Sc. in Zoology/Fishery Biology/Marine Biology with at least 2 years experience in molluscan fisheries investigations; experience in the culture of molluscs.	No
3.	Junior Technician	Rs.260-6-290-EB-6-326- 8-366-EB-8-390-10-400	4	Degree in Zoology/Fishery Science with experience of work in Marine Fisheries Research Institute.	No
4.	Diver	Rs.330-10-380-EB-12-500- EB-15-560	4	At least 5 years experience in diving in the sea for fishing molluscs (with special reference to chanks and pearl oyster)	1
5.	Senior Clerk	Rs.330-10-380-EB-12-500- EB-15-560	1	Qualifications as already prescribed.	
6.	Driver-cum-Serang	Rs.320-6-326-EB-8-390- 10-400	1		
7.	Jeep Driver	Rs.260-6-326-EB-8-350	1		
8.	Fieldman	Rs.210-4-250-EB-5-270	4		
9.	Oilman	Rs.196-3-220-EB-3-232	1		
10.	Lascars	Rs.196-3-220-EB-3-232	3		
11.	Watchman	Rs.196-3-220-EB-3-232	3		

APPENDIX - 1

IMPORT AND EXPORT OF PEARLS INTO AND FROM INDIA
(Values in 1000 Rupees)

Commodity	IMPORT				EXPORT			
	1968-69	1969-70	1970-71	1971-72	1968-69	1969-70	1970-71	1971-72
<u>Natural pearls</u>								
Unworked	1,973	5,312	3,679	3,080	5,992	7,483	5,158	6,293
Worked	214	74	nil	nil	884	1,560	4,535	7,398
<u>Cultured Pearls</u>								
Unworked	6,538	3,942	4,599	3,295	221	153	398	124
Worked	nil	7	68	36	34	62	173	543
Total	8,725	9,335	8,346	6,411	7,131	9,258	10,264	14,358

Source:- "Monthly Statistics of the Foreign Trade of India" published by the Directorate General of Commercial Intelligence and Statistics.

APPENDIX - 2

IMPORTS OF PEARLS INTO INDIA

(1968-69 to 1970-71)

Value in Rs.

Country of origin and articles	1970-71	1969-70	1968-69
PEARLS PRECIOUS AND SEMI-PRECIOUS STONES			
WORKED OR NOT			
<u>PEARLS NOT SET OR STRUNG NATURAL UNWORKED</u>			
Cong Brazil	--	13,876	--
Czechoslovakia	5,000	--	--
Dubai	5,260	--	--
Japan	36,68,835	51,08,084	15,94,923
Muscat	--	81,499	1,79,811
Qatar	--	1,08,165	1,71,528
Thailand	--	--	18,698
U.S.A.	--	--	1,913
Venezuela	--	--	5,775
Total	36,79,095	53,11,624	19,72,648

Contd.....

Appendix - 2 (continued)

NATURAL WORKED

Japan	--	74,020	--
S. Arab	--	--	2,14,436

CULTURED UNWORKED

Brazil	--	11,392	13,46,958
Australia	--	--	5,475
Czechoslovakia	33,651	19,317	3,684
Hong Kong	--	11,809	--
German F.R.P.	2,057	--	--
Japan	45,58,804	38,99,237	51,76,607
Poland	4,936	--	--
Switzerland	--	--	5,680

Total	45,99,448	39,41,755	65,38,404
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CULTURED WORKED

Belgium	5,580	--	--
German F.R.P.	950	--	--
Japan	5,123	6,641	--
Switzerland	31,985	--	--
U.K.	24,577	--	--

Total	68,215	6,641	--
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Grand Total	83,46,758	93,34,040	87,25,488
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Source:- "Monthly Statistics of the Foreign Trade of India" published by Directorate General of Commercial Intelligence and Statistics.

STATEMENT - 1 RECURRING EXPENDITURE - i) PAY OF OFFICERS AND ESTABLISHMENT

Sl. No.	Name of Post	Scale of pay	1st year (No. of posts)	2nd year (No. of posts)	3rd year (No. of posts)	4th year (No. of posts)	5th year (No. of posts)	Total
			Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1.	Project Officer	Rs.700-50-1250 (to be revised)	8,400 (1)	9,000 (1)	9,600 (1)	10,200 (1)	10,800 (1)	48,000 (1)
2.	Senior Project Assistant	Rs.550-25-750- EB-30-900	19,800 (3)	20,700 (3)	21,600 (3)	22,500 (3)	23,400 (3)	1,08,000 (3)
3.	Senior Clerk	Rs.330-10-380-EB- 12-500-EB-15-560	3,960 (1)	4,080 (1)	4,200 (1)	4,320 (1)	4,440 (1)	21,000 (1)
4.	Diver	-do-	15,840 (4)	16,320 (4)	16,800 (4)	17,280 (4)	17,760 (4)	84,000 (4)
5.	Driver-cum-Serang	Rs.320-6-326-EB- 3-390-10-400	3,840 (1)	3,912 (1)	4,008 (1)	4,104 (1)	4,200 (1)	20,064 (1)
6.	Junior Technician	Rs.260-6-290-EB-6- 326-8-366-EB-8- 390-10-400	12,480 (4)	12,768 (4)	13,056 (4)	13,344 (4)	13,632 (4)	65,280 (4)
7.	Jeep Driver	Rs.260-6-326-EB- 8-350	3,120 (1)	3,192 (1)	3,264 (1)	3,336 (1)	3,408 (1)	16,320 (1)
8.	Fieldman	Rs.210-4-250-EB- 5-270	10,080 (4)	10,280 (4)	10,480 (4)	10,680 (4)	10,840 (4)	52,360 (4)
9.	Oilman	Rs.196-3-220-EB- 3-232	2,350 (1)	2,390 (1)	2,420 (1)	2,460 (1)	2,490 (1)	12,110 (1)
10.	Lascar	-do-	7,050 (3)	7,170 (3)	7,260 (3)	7,380 (3)	7,470 (3)	36,330 (3)
11.	Watchman	-do-	7,050 (3)	7,170 (3)	7,260 (3)	7,380 (3)	7,470 (3)	36,330 (3)
			93,970	96,982	99,948	1,02,984	1,05,910	4,99,794
	Provision for additional pay of Project Officer consequent on the implementation of Third Pay Commission recommendations.		3,750	3,750	3,750	3,750	3,750	18,750
	Total		97,720	1,00,732	1,03,698	1,06,734	1,09,660	5,18,544

ii) DEARNNESS PAY OF PROJECT OFFICER

	1st year Rs.	2nd year Rs.	3rd year Rs.	4th year Rs.	5th year Rs.	Total Rs.
ii) Dearness pay of Project Officer	1,440	1,440	1,440	1,440	1,440	7,200



STATEMENT - 2 ALLOWANCES, HONORARIA, ETC.

Item	1st year	2nd year	3rd year	4th year	5th year	Total
Dearness allowance	16,560	16,920	17,220	17,400	17,820	85,920
Travelling allowance	3,000	3,000	3,000	3,000	3,000	15,000
Other allowances, Honoraria etc.	5,515	5,000	5,000	5,000	5,000	25,515
Total	25,075	24,920	25,220	25,400	25,820	1,26,435

STATEMENT - 3RECURRING EXPENDITURE - CONTINGENCIES

Item of expenditure	I Year	II Year	III Year	IV Year	V Year	Total
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Farming materials	1,00,000	1,00,000	25,000	25,000	10,000	2,60,000
Tools, nuclei etc.	25,000	25,000	25,000	25,000	5,000	1,05,000*
Chemicals, glassware etc.	10,000	10,000	10,000	10,000	5,000	45,000
Running charges for boats & Jeeps	10,000	10,000	10,000	10,000	10,000	50,000
Casual Labour	10,000	10,000	10,000	10,000	10,000	50,000
Rent for office building at Tuticorin	3,000	3,000	3,000	3,000	3,000	15,000
Other contingencies (including oyster collection charges)	20,000	20,000	20,000	20,000	10,000	90,000
Buoys	30,000	--	--	--	--	30,000
	2,08,000	1,78,000	1,03,000	1,03,000	53,000	6,45,000

* Includes Foreign exchange of Rs.20,000 for import of operation tools and nuclei during the first year of the project.

STATEMENT 4

TOTAL RECURRING EXPENDITURE

Items	1st year	2nd year	3rd year	4th year	5th year	Total
Pay of officers and establishment	93,970	96,982	99,948	1,02,984	1,05,910	4,99,794
Dearness pay of Project Officer	1,440	1,440	1,440	1,440	1,440	7,200
Additional provision for pay of Project Officer*	3,750	3,750	3,750	3,750	3,750	18,750
Dearness allowance	16,560	16,920	17,220	17,400	17,820	85,920
Travelling allowance	3,000	3,000	3,000	3,000	3,000	15,000
Other allowances, Honoraria etc.	5,515	5,000	5,000	5,000	5,000	25,515
Contingencies	2,08,000	1,78,000	1,03,000	1,03,000	53,000	6,45,000
Total	3,32,235	3,05,092	2,33,358	2,36,574	1,89,920	12,97,179
or	3,32,200	3,05,100	2,33,400	2,36,600	1,89,900	12,97,200

*On implementation of Third Pay Commission recommendations.

Nature of expenditure		I Year	II Year	III Year	IV Year	V Year	Total
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Cost of 32' boat	1 No.	1,20,000	--	--	--	--	1,20,000
2. Cost of 20' boat	1 No.	25,000	--	--	--	--	25,000
3. Cost of Jeep	1 No.	30,000	--	--	--	--	30,000
4. Cost of Traller	1 No.	4,000	--	--	--	--	4,000
5. Cost of Motor & Pump		10,000	--	--	--	--	10,000
6. Furniture		10,000	--	--	--	--	10,000
		1,99,000	--	--	--	--	1,99,000
		=====					=====
7. Petty works:							
Temporary Laboratory accommodation		30,000	--	--	--	--	30,000

STATEMENT 6 TOTAL RECURRING AND NON-RECURRING EXPENDITURE

	Recurring	Non-recurring	Total
Share of Indian Council of Agricultural Research	6,48,600	1,14,500	7,63,100
Share of Government of Tamil Nadu	6,48,600	1,14,500	7,63,100
Total	12,97,200	2,29,000	15,26,200

STATEMENT - 7 ANTICIPATED RECEIPTS FROM THE PILOT PROJECT

Nature of receipt	I Year	II Year	III Year	IV Year	V Year	Total
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Value of pearls produced	Nil	6,49,000	6,49,000	6,49,000	6,49,000	25,96,000

ASSETS after Depreciation at the end of the Project

Name of the asset	Depreciation @	Value Rs.
1. Boat 32'	10%	70,859
2. Boat 20'	10%	14,762
3. Jeep	10%	17,700
4. Trailer	10%	2,400
5. Motor & Pump		Nil
6. Furniture	10%	5,900
7. Laboratory shed		Nil
	Total	<u>1,11,621</u>

STATEMENT-8 CASH FLOW STATEMENT

<u>1st year</u>	Expenditure	5,61,200	
	Add: interest @ 8%	<u>44,896</u>	
		6,06,096	
<u>2nd year</u>	Expenditure	<u>3,05,100</u>	
		9,11,196	
	Deduct: Receipts	<u>6,49,000</u>	
		2,62,196	
	Add: interest @ 8%	<u>20,976</u>	
		2,83,172	
<u>3rd year</u>	Expenditure	<u>2,33,400</u>	
		5,16,572	
	Deduct: Receipts	<u>6,49,000</u>	
		1,32,428	PROFIT
<u>4th year</u>	Expenditure	<u>2,36,600</u>	Deduct profit
		1,04,172	of last year
	Add: interest @ 8%	<u>8,334</u>	
		1,12,506	
	Receipts	<u>6,49,000</u>	
		5,36,494	PROFIT
<u>5th year</u>	Expenditure	<u>1,89,900</u>	Deduct from
		3,46,594	previous year's
	Receipts	<u>6,49,000</u>	profit
		9,95,594	PROFIT
	Add: value of assets after depreciation at the end of fifth year	<u>1,11,621</u>	
	Net Profit	11,07,215	Total Profit
		-----	for 5 years