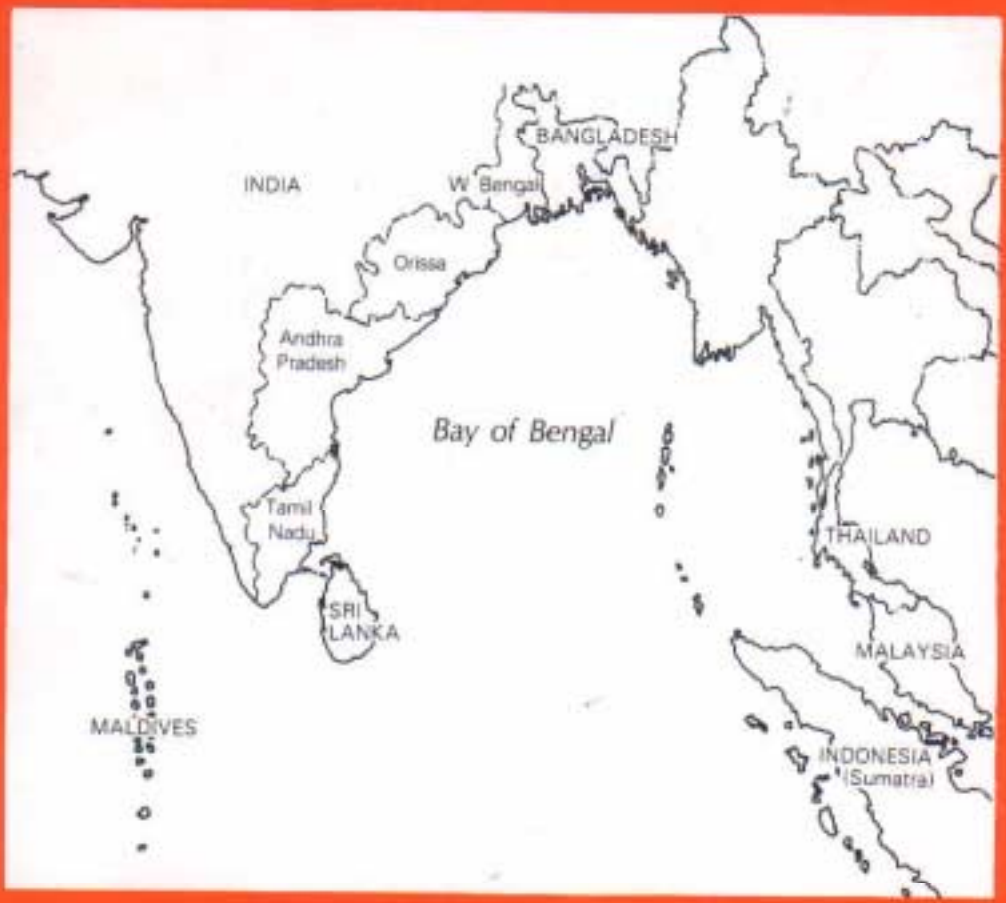
BAY OF BENGAL PROGRAMME
BOBP/REP/33
Development of Small-Scale Fisheries
GCP/RAS/040/SWE

Non-Formal Primary Education for Children of Marine Fisherfolk in Orissa, India



SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

BAY OF BENGAL PROGRAMME BOBP/REP/33

Development of Small-Scale Fisheries GCP/RAS/040/SWE

NON-FORMAL PRIMARY EDUCATION FOR CHILDREN OF MARINE FISHERFOLK IN ORISSA, INDIA

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CONTENTS

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SUMMARY

The pilot project on NFPE (Non—Formal Primary Education) for Orissa fisherfolk children grew out of an in service training scheme conducted by BOBP between March 1982 and July 1983 for 15 marine fisheries extension officers of Orissa. The scheme consisted of three modules, including one on community development. The work undertaken during the community development module led to the NFPE project.

The NFPE pilot project was carried out in Orissa's four coastal districts — Balasore, Cuttack, Pun and Ganjam — from 1983 to 1986. The project aimed at developing and demonstrating a non—formal primary education programme for fisherfolk children between the ages of 6 and 14. Children who satisfactorily complete the programme's curriculum are free to choose whether to join standard VI of a formal school or to remain in the non—formal stream, which is presently being established.

Under the project, a curriculum tailored to the needs and circumstances of Orissa's marine fisherfolk children was prepared and finalized in cooperation with various state and central authorities — the Department of Fisheries, the Department of Education, SCERT and NCERT. Several workshops with 50—60 participants were held to review the draft material and also to train teachers to use the material. More than 90 pictorial booklets were published in Oriya; UNICEF funded the printing of the booklets. The booklets are being used at 40 non—formal centres set up in the four districts – 19 in Balasore, 5 in Cuttack, 8 in Pun and 8 in Ganjam.

The response of the fisherfolk community to the project has been excellent. They have provided rooms or houses for running the centres, and sometimes food and accommodation for the teachers.

The curriculum consists of three packages especially developed for fisherfolk children by BOBP, comparable to Standards I, II, III, V of formal schools; plus four packages from general non—formal learning materials prepared earlier by SCERT, which are comparable to standards IV and V. Each package is divided into modules or subject areas, and every module consists of 4 to 12 "capsules". (Modules and capsules organize the learning process in an integrated way, based on the experience of the learner. They are different from traditional discipline-oriented methods.) There is a booklet for each capsule. The project consultant prepared 94 capsules or booklets, while some 60 capsules were used from the NFPE general materials prepared by SCERT. Together, the 150 odd booklets cover the entire primary stage of school, and are comparable to the learning

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materials used from Standard I to Standard V of formal schools.

The first package relates to the learners' social and physical environment. It teaches basic sciences and social science concepts; words, letters and numbers; and language skills. The second package, while further improving literacy, numeracy and linguisic competence, aims at developing the child's personality and deals in greater detail with socio—cultural and socio—economic aspects. It highlights blind beliefs, social evils and exploitation. The third package on oceanography is meant to develop the child's scientific perception of the marine environment, of marine products and of fishing techniques. Together, the NFPE curriculum integrates learning with life.

The NFPE project had some innovative features -- a special focus on a clearly defined occupational group; active community participation; a sound information base on the target group; a built—in evaluation mechanism; incorporation of modern principles of curriculum development, teaching and learning; and a special emphasis on teacher training and NFPE centre supervision.

For assessing the project's progress and the students' attainments, examinations were held in August 1985 in the 20 centres set up in 1984. They were conducted by the district inspectors of schools. A standardized test for Class I was used. The results were extremely encouraging: 94 per cent of the learners passed the language test, 98 per cent passed in environmental studies, 95 per cent passed in arithmetic. The average marks per subject were also satisfactory. Examinations conducted the following year for the first and second classes were equally satisfactory.

While the pilot project initiated by BOBP is now run by the authorities in Orissa, a proposal has been formulated to expand the project to cover fisherfolk children throughout the state. The project envisages the setting up of 60 more non—formal centres. A proposal for adapting the material developed for Orissa fisherfolk children to another state (Andhra Pradesh) has also been formulated.

1 PREAMBLE

Hardly anybody would object to the statement that literacy programmes are an integral part of development. It is also commonly accepted that education need not necessarily take place in schools and that it can mean different things to different people.

An informal vocational education arrangement exists among artisanal marine fisherfolk, by which boys and girls are initiated into the trade by fathers, mothers or other elders.

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Traditional mechanisms of education also operate in imparting religious or spiritual values and behavioural norms.

A common drawback of these traditional systems of transferring skills, knowledge and values from one generation to the next is that they are rather closed systems. They do not respond or react readily to changes which occur in the outside world. This is particularly so if they function in remote locations like fishing villages.

While traditional systems of education may have been suitable for a community living in a closed, subsistence – oriented economy, they are no longer suitable, since artisanal marine fishing has become a part of the coastal market economy, with its products even being exported to other continents.

Catches have risen sharply through more efficient fishing gear* and cash earnings have increased for marine products. But the living standards of fisherfolk — as reflected in their conditions of health, hygiene and housing, in their general appearance, in their clothing — have undergone hardly any change. This can be confirmed by regular travellers along the coastline. This is particularly true of the southern part of Orissa where Telugu—speaking fisherfolk are settled.

This state of affairs can partly be attributed to people other than fisherfolk themselves — such as middlemen and fish merchants who appropriate the benefits from new developments. Part of the responsibility, however, lies with the fisherfolk themselves; they do not comprehend the new developments and how they can benefit from them. Reason: lack of information and education about happenings outside their villages, and lack of literacy skills to acquire this knowledge.

Examples: Fishermen lack information about the prices paid for fish/prawns by the ultimate buyers and consumers, and the price which the fisherfolk themselves could rightfully demand. They lack information about their rights and priviJ.eges as citizens regarding infrastructure, health, education and credit facilities under various government schemes meant for the weaker sections of society.

Education and literacy can also help fisherfolk change their outlook – from one of day—to—day living, which is appropriate to a subsistence economy, to one of planned living, based on long—term aspirations, taking advantage of increased incomes.

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*Atil marine fisherfolk of Orissa. Ed. U.Tietze, Vidyapuri, 1985.

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The development of long—term aspirations is also necessary, if improved fishing technology presently developed by BOBP — such as motorized beachianding craft which require higher investment than artisanal fishing technology — is to be successfully adopted by traditional fisherfolk.

The effort to develop educational facilities for children of marine fisherfolk strengthens government effort at universalizing elementary education in India. Part—time education for children of the age—group 9—14 had been proposed as early as 1939 (Naik, 1966); and Article 45 of the Indian Constitution states that all children up to the age of 14 are to be enrolled in schools by 1960. These goals have remained elusive.

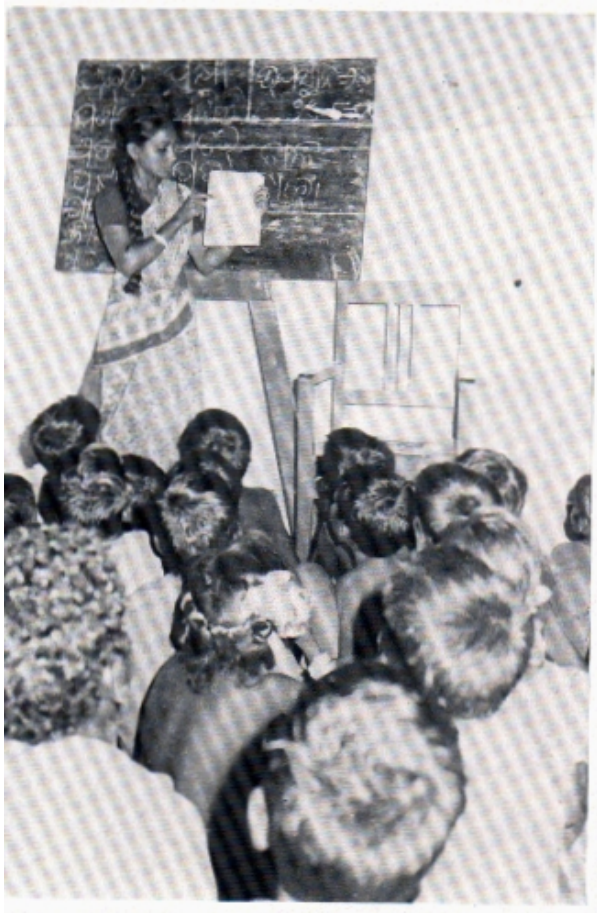
To prepare a plan to achieve universalization of elementary education, the Working Group on Universalization of Elementary Education was established in 1977. This recommended that every child in the age—group 6—14 should be a full—time learner in formal school, or a part—time learner in a to—be-developed non—formal stream. The non—formal stream was also meant to cater to the needs of drop—outs from the formal stream.

To implement the Working Group's recommendations, the CAPE (Comprehensive Access to Primary Education) project was launched in 1979. It aimed at out—of—school children between 9 and 14, who had either never been to school or had dropped out before completing primary education. NFPE is offered to this group of students on a part—time basis, which suits the working pattern/daily routine of the youth/children.

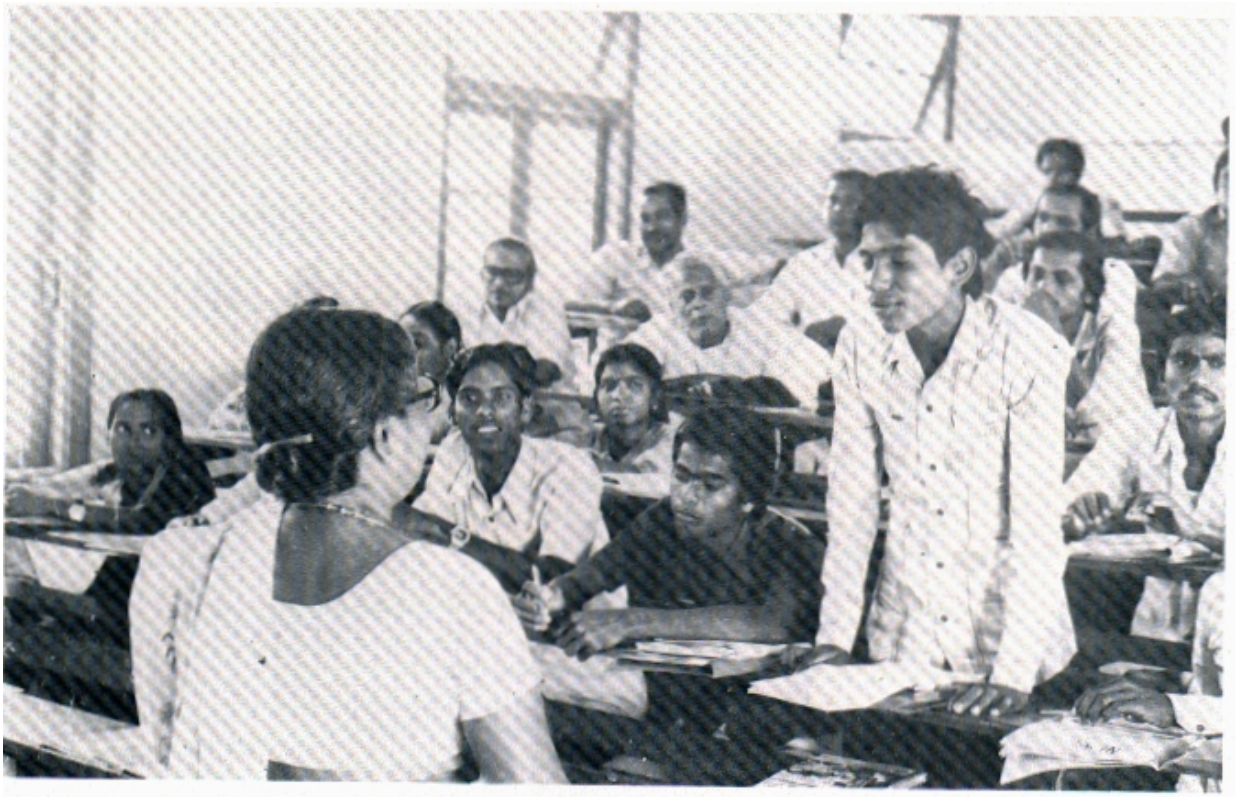
The CAPE project also took into account the criticism about the qualitative shortcomings of the formal school system (Naik, 1977), its over—emphasis on imparting information and on the student's memory power, its relative lack of success in building up skills and promoting values, in helping the personal growth of learners or in hastening social transformation.

In contrast, the non—formal approach recommended under CAPE aimed not merely at numeracy and literacy, but also at developing competence among the learners in solving various problems and tasks faced by individuals and the community.

Under CAPE, special curricula are being developed. These deviate from the discipline—oriented curricula of formal schools, and are based instead on everyday activities and problems, around which units of work are organized. These attempt to deal in an integrated way with literacy, numeracy, science, social studies, arts and aesthetics. For their content, non—formal curricula draw on real



Above left: One of the 40 NFE centres for fisherfolk children in Orissa. Right: Children await opening of a new centre. Below: Seminar for NFE teachers is on.



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A few of the booklets specially prepared for fisherfolk children and used at the 40 NFPE centres in Orissa.

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life—situations which are meaningful and significant to the learner.

Learning materials are designed for self—study, and allow learners to enter into the system at any of various points. This arrangement is particularly suitable for drop—outs and facilitates education in the learner"s own time.

The curriculum is developed in a decentralized way. It involves teacher—students and teacher—eductors of the Teachers" Training Institutes and the SCERT; it transfers skills required to develop curricula from centralized to decentralized levels of the educational set—up.

CAPE incorporates principles and concepts such as "project—based and experience—oriented learning", "integrated curriculum", "functional education", "moral and spiritual child development" etc. This indicates that part—time education of children from the 9-14 age group is something more than a crash programme to expand school enrolment; it is a complex and sophisticated part—time primary education system which seeks to overcome all the ills that afflict the traditional school sytem.

The low—cost character of the part—time non—formal school system however, remains. While having to meet ambitious standards and expectations, NFPE has to depend on less qualified, less trained and less paid teachers, as well as on poorer infrastructure and support[1] than the formal schools, a fact that makes the attainment of ambitious goals very difficult.

BOBP was aware of these constraints and tried to overcome them by introducing special conditions into the pilot project. These are described later in this report.

2. INTRODUCTION

The idea of educating marine fisherfolk children in Orissa originated from an in—service training programme[2] for marine fisheries extension officers of the state who had been posted in centres all along the coastline of the state.

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1 Teachers are usually matriculates with no training as teachers. Their remuneration of Rs.100 per month (US $ 8) is not sufficient to make a living. Physical school facilities are not provided, except for books and essential stationery.

2 The training programme is described in BOBP/REP/31, also in Bay of Bengal News, June 1985

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After being posted, the extension officers carried out a techno—demographic census [1] of the state's marine fishing villages. The census also covered infrastructure facilities. The study showed that lack of facilities for health, drinking water, communication, and schooling were the most serious problems in Orissa"s fishing villages. Primary schools were accessible to most fishing villages, but their capacity was limited in relation to the number of children of schoolgoing age.

The literacy rates in the coastal villages [2] of Orissa are below those for the respective districts and also below the national average. (According to the 1981 census, the literacy rates in the coastal sample villages are 35.7 per cent, 35.4 per cent, 33.9 per cent and 17.9 per cent in Balasore, Cuttack, Pun and Ganjam districts, respectively — being between 7 per cent and 13 per cent below the district figures.) Literacy rates among marine fisherfolk are probably even lower.

The perceptions of fisherfolk were investigated by fisheries extension officers during a field enquiry in September 1982. Fisherfolk were asked why they did not send their children to school. The reasons cited in southern Orissa.

- They themselves had not been to school. It was more or less customary for fisherfolk not to attend school.

- Their children would not be well—received by children from other communities.

- School timings were unsuitable. Children had to be at home to help sort fish or carry out other fisheries – related work.

- They did not know what practical use schooling would have.

When asked about their sons" future occupation, the vast majority of fisherfolk parents mentioned fishing. Only a small group of parents saw the future of their children in a salaried job. The children would follow the profession of their parents and grandparents.

Illiteracy is one of the main reasons that fisherfolk have not really benefited from the development of the fishing industry, the increase in prices of marine products, infusion of improved fishing technology etc. Further, illiteracy is an obstacle to implementing development activities.

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1 BOBP/WP/29 presents the results of the census in detail.

2 A coastal sample village is an entire gram panchayat. The village is an administrative unit, comprising in many cases hamlets of both peasants and fisherfolk.

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Orissa has the environmental and socio—cultural features of both the northern and southern pants of the east coast, and so seems an ideal place to develop and demonstrate a NFPE curriculum for fisherfolk children applicable to the entire east coast.

A seminar in October 1982 discussed the subject of NFPE. It was attended by fisheries extension officers, extension specialists and educationists as well as by members of voluntary agencies. They recommended an educational programme for fisherfolk children that could be later integrated with or become a part of similar national educational efforts.

This paper discusses the NFPE project that grew out of the seminar recommendation. The project turned out to be an excellent example of inter—institutional cooperation. Chapters that follow discuss the evolution and implementation of the project and the roles of various institutions that took part in the project. The curriculum packages developed by the project are discussed in detail in an Annexure. The performance of 40 NFPE centres set up under the project is discussed and evaluated. A proposal to expand the project throughout coastal Orissa by setting up 100 NFPE centres is also outlined.

3. PROJECT INPUTS

The objectives of the NFPE project were set out as follows:
- to integrate learning with fishermen's lives;
- to inculcate among the young in the community an awareness of and an aspiration for technological advancements and social changes for a democratic society;
- to help them develop a personality free from superstition and blind belief; and
- to equip them with the 3 R's for continuing education.

The NFPE project in Orissa was implemented as an experimental programme under CAPE. To overcome the constraints of the CAPE approach — lack of qualified teachers, low remuneration, inadequte infrastructural facilities and support — the following measures were adopted by the BOBP pilot project:

- Community support was mobilized by the fisheries extension service to house the school and provide food, shelter and additional remuneration to the teachers.

- Basic equipment for schools (NFPE centres) — such as a blackboard, an almirah, a chair, a table for the teacher and mats for students — were provided by BOBP.

- Teachers were paid an additional Rs 95 per month to evaluate the "capsules".

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- An in-service training programme was organized for teachers.

- Supervision and administration of schools was strengthened by involving the fisheries extension service, by providing a travel allowance for supervisory staff of teacher training institutes, and by conducting an evaluation exercise which was regularly reviewed at training courses/seminars for children.

The various organizations involved in the project played the following roles:

BOBP: Developed and distributed learning materials, carried out evaluation exercises, conducted review and training workshops and provided overall coordination.

SCERT, Orissa : Assisted in developing learning materials and training teachers, arranged to print them and to run experimental centres.

10 Coastal Teacher Training Institutes , TTIs (STS)* Supervised NFPE centres and participated in the training of facilitators through their teacher—educators.

Marine Fisheries Extension Service of the Department of Fisheries: Motivated villagers to construct and maintain buildings to house the centres, assisted in developing learning materials, participated in teaching the science aspects of the curriculum, and related education to other development alactivities.

Fisherfolk Community: Constructed or contributed buildings to house the centres, often provided the facilitators with accommodation and food, as well as extra remuneration; participated in review meetings, studies and investigations to prepare learning materials; took active part in the day—to—day running of the centres.

4. PHASING OF PROJECT

Work Programme

Jhe preparation and implementation of the project can be sub-divided into four phases. The first one was a preparatory phase and the other three, implementation phases .

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*STS - Secondary Training Schools.

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4.1 Preparatory phase (August l982-July 1983)

During the preparatory phase of the project, the data generated earlier by a fisheries census — about schools close to fishing villages, about levels of literacy in coastal areas in general and fishing villages in particular — were analyzed. Further, the fisheries extension officers probed the reasons for non—attendance in schools. These included the fisherfolk's perception of education, as discussed earlier (Introduction). Results of other studies conducted among Orissa fisherfolk were also referred to.

Discussions were held by BOBP with the Department of Fisheries, the Education Department, SCERT and UNICEF about their likely role in developing a curriculum and learning materials, and in establishing and running NFPE centres. A general curriculum frame was prepared, indicating the broad contents of learning packages and modules. A national consultant was recruited to write the materials (booklets).

SCERT agreed to cooperate in developing special learning materials for marine fisherfolk children and to set up experimental centres under its CAPE programme. UNICEF agreed to fund the printing of books to be published through the NCERT (National Council of Educational Research and Training).

The Department of Fisheries agreed to provide curriculum inputs about the occupation and environment of marine fisherfolk; to motivate fisherfolk to participate in the educational effort and to supervise the NFPE centres once they were established in the villages; and to help maintain these centres.*

Ten coastal TTIs were identified to supervise the NFPE centres and to appoint teachers.

The villages where centres were to be opened were identified by the fisheries extension officers in cooperation with the TTIs. The selection of IIIs and villages was then approved by the SCERT.

While discussing the curriculum framework, SCERT suggested that it be confined to two years in order to keep within the stipulations of the CAPE scheme. About the duration of the NFPE programme, BOBP pointed out that it might be difficult, if not impossible, to not merely achieve a level of literacy in reading, writing and mathematics compatible with formal primary schools but also to include in addition curriculum areas related to occupation, environment and culture of the

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* The fisheries extension centres, the NFPE centres supported by them and the teachers' training institutes supervising the education centres, are listed in Appendix 2.

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learner — and all this in less than half the time taken in formal school, viz, five years — considering that NFPE teachers were less qualified and less paid than formal school teachers. NEPE institutional arrangements were also less elaborate than those of the formal school.

It was ultimately agreed to aim at a two-year course while developing learning materials to keep within the stipulation of the CAPE programme, and to empirically observe the actual duration of the programme at the experimental centres.

At the end of the preparatory phase, a seminar was conducted. This was attended by headmasters and teacher—educators of secondary training schools, SCERT personnel, fisheries extension officers and representatives of the fisheries and education departments.

The seminar discussed and finalized the curriculum framework, as well as the first learning materials (12 booklets or “capsules” in the CAPE terminology) developed by BOBP. The curriculum framework indicated that three learning packages compatible with classes 1,2,3 and 5 of the formal stream were to be developed by BOBP with assistance from other agencies. These packages were to focus on the occupation, environment and culture of fisherfolk. General NFPE learning materials developed by SCERT for rural folk compatible with class IV and V of the formal stream were to complement the learning packages.

4.2 Implementation Phase I (August 1983-September 1984)

In December 1983, the first 20 NFPE centres were established. Teachers, called facilitators in the CAPE terminology, were appointed by the supervising TTIs.

Learning package 1 consisting of 36 capsules, compatible with Class I and partly with Class II of formal primary schools, was prepared, printed, and distributed to the NFPE centres.

An evaluation exercise described in greater detail in Chapter 7 commenced, in which the facilitators assessed each capsule separately. The evaluation exercise covered the following areas — students’ attendance, teaching time for each capsule, participation of learners in answering questions, discussion related to learning episodes; applicability of learning episodes, comprehension of literacy, numeracy, science, social science.

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Three one—week seminars were conducted in February, May and September 1984 to monitor the running of the centres and to impart training to the teachers. The seminars covered the following areas1

- February 1984 seminar: Principles of non—formal education; information about fisherfolk; briefing on structure of curriculum and learning materials; briefing on administration of centres and on cooperation with community and government agencies concerned; basic methods of teaching; teaching exercises; briefing on evaluation procedures and new capsules.
- May 1984 seminar: Review of psychology of learning; methodology of teaching languages, arithmetic, science, social science, sports/games; teaching demonstrations and exercises; briefing on new capsules.
- September 1984 seminar: Review of running of centres and review of capsules; student—teacher interaction/teaching skills; teaching aids; micro—teaching exercises; briefing on new capsules.

The draft of the learning package on marine environment and fishing technology was completed during the first implementation phase

4.3 Implementation Phase II (October 1984 – September 1985)

During Phase II, modules 1 and 2 (24 capsules) of learning package 2, which are compatible with Classes II and III of formal primary schools, were written, printed and distributed to the NFPE centres. The draft of the learning package on fishing technology and marine environment was translated into Oriya.

In December 1984, 20 more NFPE centres were opened Teaching aids for arithmetic, geometry, and science of learning packages 1 and 2 were developed and distributed to all centres3

Two more seminars were conducted in January and September 1985 to monitor the running of the centres and to impart training to “old” and “new” facilitators (facilitators of the centres opened in December 1983 and December 1984 respectively.

- January 1985 Seminar:
For “old” facilitators : Review of NFE centres and learning materials, microteaching exercises, briefing on newly developed learning materials.

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1 The location of the centres is shown in Appendices 3a to 3d.
2 The location of the centres is shown in Appendix 3.
3 The teaching aids are described in Appendix 4.

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For "new" facilitators: – Outline of SCERT/BOBP scheme of NFPE for fisherfolk chidren of Orissa; fisheries and fisherfolk of Orissa; principles of NFE; briefing on administration of centres and on cooperation with the community and the government agencies concerned; basic methods of teaching; teaching exercises; briefing on evaluation procedures and newly developed capsules.

– September 1985 seminars (district level): Review of running of NFPE centres and of learning materials; refresher lectures on teaching skills and teaching exercises; briefing on newly developed capsules; field inspection of centres.

Towards the end of the phase, class 1 examinations were conducted by the district inspectors of schools in the 20 centres which were opened in Deceriber 1983. The standard test used in formal schools was applied, supplemented by an additional test for the environmental aspects of the syllabus. The students' performance in the examination, described in detail in Chapter 7, was encouraging.

4.4 Implementation Phase III (October 1985—April 1986)

A workshop was conducted at which the contents of the learning package on fishing technology and marine environment were converted into capsular form with the help of SCERT consultants and fisheries extension officers. The learning package consists of five modules and 22 capsules.

Another seminar was held in April — which, besides reviewing the running of the centres and revising the learning materials, had refresher lectures on principles and methods of NFPE, and microteaching exercises. Teaching skills taught earlier were practised again mainly for the benefit of newly appointed teachers.

The third and last module of learning package 2 consisting of 12 capsules was printed and distributed. So were all 22 capsules of the last learning package on fishing technology and marine environment.

During this phase, a proposal for large-scale implementation of the NFPE programme was prepared (Appendix 10). It envisaged the setting up of 100 NFPE schools with permanent buildings over a period of five years, institutionalization of pre—service training for the teachers, improving the economic status of the teachers, etc. The proposal has been cleared by the Government of Orissa and is likely to be funded by a bilateral donor agency.

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5. CURRICULUM ORGANIZATION AND STRUCTURE OF LEARNING MATERIALS *

The NFPE curriculum has three learning packages prepared by BOBP. In addition, materials prepared by the SCERT and meant for NIPE in general, were also used by this project. A summary of the curriculum materials is found in the table.

Learning packages 1 and 2, compatible with classes 1 to 3, consist of three modules each. Every module in turn contains 12 capsules. A capsule is a unit of work and can be taught in 3–4 days at 2–3 hours a day, while the modules and packages refer to special functions or subject areas; they need 8 weeks and 24 weeks each respectively.

The third learning package especially designed for fisherfolk children consists of 5 modules with a total of 22 capsules. It deals with marine ecology and fishing technology and thus accounts for most of the fisheries science content of the curriculum.

Every capsule in the packages begins with a learning episode related to real life. There is continuity between the learning episodes of a module; they cover the science and social science aspects of the curriculum, and contain key words and key concepts, which are starting points for learning letters, syllables, etc.

The learning episodes are meant to be read out to the students by the teacher or by a student; they are also meant for self-study. Questions listed after the episode are to be answered and discussed orally. The episodes help reduce regional dialectical differences, and thus develop a standard Oriya tongue.

The questions to be answered and discussed after a learning episode are "closed" as well as "open"; they demand recall of facts contained in the episode; they also call for conclusions and explanations by the students, for expression of opinion.

For teaching reading and writing, a combination of synthetic and analytical methods is applied instead of letters being presented separately. To enable recognition of a letter through shape and sound, pictures illustrate words which are key concepts in the life of the fisherfolk and already figure prominently in the learning episodes. A new letter has a distinct colour, so that it can be easily identified by the learner. Thereafter, to gain familiarity with the letter and its use, the method of synthesis is applied; other words are presented for recognition as well as reading. Writing and reading exercises are carried out.

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*See Annexure 1 for a detailed description.

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NFPE CURRICULUM FOR ORISSA FISHERFOLK CHILDREN

Package No.	Package Title	Objectives or main emphasis	No.of modules	No. of capsules	Compatible with
Materials developed by BOBP especially for fisherfolk children					
1.	"The sea is our life"	Literacy, numeracy, linguistic competence (Teaches basic concepts, letters, words, numbers)	3	36	Standards I–Ill of formal school
2.	"Our families & communities"	Social Science; Also strengthens reading, writing & arithmetical skills	3	36	"
3.	"Marine ecology & fishing technology"	Functional knowledge & skills in science, arithmetic, modern fishing techniques	5	22	Standard V of formal school
General NFE materials developed by SCERT					
I	"We and our neighbours"	Social Science	2	12	Standards IV & V of formal school
II	"Science and scientific knowledge"	General Science	2	13	
III	"Let us read & write English"	English	2	19	
IV	"Learning calculations"	Mathematics	2	14	

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To maintain a proper logical structure in each unit of work, learning of the alphabet has been separated from learning of numerals. The latter are dealt with in separate capsules; these are, however, closely related to the content of the module.

A test at the end of each module covers both traditional and non—traditional curriculum areas.

Learning Package 1

Package 1, "The Sea is Our Life," is the introductory package. It centres on the environment and occupation of the target group. It is designed to teach basic concepts, basic letters, words and numbers and to integrate the teaching of reading, writing and arithmetic — and social science as well. Each "capsule" begins with a story, called an episode. It is drawn from real life and is set in the child's living environment — the trees, the sun, the sky, the ocean, the moon, the lunar effects, the fishing trips, the craft and the gear the fishermen use, etc. These episodes, together with the questions, both open and closed, help:

— in gearing the child towards a systematic NFPE approach;

— in making the children articulate their own experiences and express their ideas in the language we expect them to develop;

— in correcting regional dialectical variations; and

— in making the children understand regional characteristics and variations concerning fisheries and fishermen in Orissa.

To facilitate learning of the alphabet, methods of analysis and synthesis are applied and picture illustrations used. Reading and writing exercises follow.

The first module "We live by the sea shore" consisting of 12 capsules, deals with the environment of the learner, the second one, "We go to the sea for fishing"(12 capsules), with fishing as an occupation, while the third module, "Our boats and nets" (12 capsules), focuses on traditional fishing technology.

The titles of the capsules in Package 1 are as follows:

Package – 1 The sea is our life

Module 1 1

We live by the seashore

tapsules under Module 1.1

1—1 —1— Good news for village Pakhara.

1—1 —2— Learning in a new way

1—1 —3— Arithmetic teaching starts

1—1 -4- Seafish on the shore

1 1 —5— We learn to count fish

1 --1 -6— Shopping at the village market

1-1—7— Accounting for the shopping

1—1 —8— Seashore at dawn

1—1 —9- Fishing with a Mala jalo

1—1 - 10 - We reach Kangali’s place

1—1 – 11 – Counting of floats

1—1 – 12 – Discussion on girls’ education

Module 1 – 2 We go to the sea for fishing

Capsules under Module 1—2

1 - 2 - 1 Charan gets a new boat built

1 – 2 – 2 Facts about building a boat

1 – 2 – 3 Seasons and climate

-1-2-4- Preparing for a fishing trip

1 - 2 - 5 Going out to the sea for fishing

1 – 2 – 6 Reauhing the fishing ground

1 – 2 – 7 Bringing the catch ashore

1 - 2 – 8 Sharing the sale proceeds

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1—2—9 On fishing holidays

1 – 2 – 10 If there is a heavy catch

1 – 2 – 11 During leisure hours

1 – 2 – 12 Mutual understanding

Module: 1 – 3 Our boats and nets

Capsules under Module 1—3

1 – 3 – 1 Bipin learns about kattumarams

1 – 3 – 2 Bipin sees a kattumaram

1 – 3 – 4 Fishing with a Kabalanet

1 – 3 – 5 The kattumaram and the Irgali net

1 – 3 – 6 The kattumaram with a Marala net

1 – 3 – 7 Line fishing

1 – 3 – 8 About the Masula boat

1 – 3 – 9 Fishing with Bara jalo

1 – 3 – 10 Fishing with Jangal jalo

1 – 3 – 11 Salti boat and the Sarini jalo

1 – 3 – 12 Fishing with a Behundi net

Learning Package 2

Package 2, "Our families and communities", lays emphasis on social science, besides strengthening reading, writing and arithmetical skills. Module 1 (12 capsules) tries to question superstitions and unscientific attitudes, while supporting positive traditions. Module 2 (12 capsules) promotes a proper understanding of the role of the family and of various members, their duties and functions as well as democratic norms and values with regard to decision—making patterns, etc. Module 3 (12 capsules) deals with the various aspects of community life and the interaction between community and society.

The titles of modules and capsules of this package are as follows:

Package No.2 : Our Families and Communities

Module 2 – 1 : Our Festivals, Practices and Beliefs

Capsules under Module 2.1

2 – 1 – 1	The dola fair
2 – 1 – 2	Accounting during a congregation
2 – 1 – 3	Ganga Puja on Thursdays
2 - 1 – 4	Floor painting and calculations
2 – 1 – 5	Festivities on Chaitra Purnima
2 – 1 – 6	New Year's Day and learning of arithmetic
2 – 1 – 7	About Shamanism
2 – 1 – 8	Net inauguration and accounting
2 – 1 – 9	Does a talisman work?
2 – 1 – 10	Accounting on Kartika Purnima Day
2 – 1 – 11	Warding off the evil eye
2 - 1 – 12	Fishing camps and accounting

Module 2:2 Our Family Life

Capsules under Module 2.2

2—2—1	United we stand, divided we fall
2—2—2	Accounting of income and expenditure
2—2—3	The plight of Mother and Sister—in—law
2-2-4	Minoti overcomes her hardship
2—2—5	Udaya manages a new net
2—2—6	Prosperity in Uday's family
2—2—7	Counsel from the elderly
2—2—8	Profit from motorized boats
2-2—9	Life without work is meaningless

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2 – 2 – 10 Good natured Sadananda

2 – 2 – 11 Industry begets prosperity

2 – 2 – 12 Profit from economic enterprise

Module 2:3 Our Community and Society

Capsules under Module 2–3

2–3–1 Let us know our community

2–3–2 A glimpse into simple fractions

2–3–3 We for others, others for us

2-3-4 Learning about measuring liquids

2–3–5 Communication system and fish supply

2–3–6 Accounting and the postal system

2–3–7 Co–operation and co–operatives

2–3–8 A co–operative society's accounts

2-3-9 Why we should be educated

2 – 3 – 10 Reading the clock

2 – 3 – 11 Our village and the village panchayat

2 – 3 – 12 Basic ideas on geometrical figures

Learning Package 3

Package 3, "Marine Ecology and Fishing Technology", concentrates almost exclusively on functional knowledge and skills, including modern fishing techniques, as well as on science and arithmetic. The package consists of five modules with a total of 22 capsules. The modules cover the basic concepts of aquatic science such as ecology, environment, the eco–system of open beaches, river deltas, tidal areas, currents, winds and climatic conditions during the two monsoon seasons; primary production, food webs, energy balance; vertical zonation of the sea, life cycles of economically important fish species, and modern fishing technologies.

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The tities of Package 3 capsules are as follows:

Package No.3 – Marine Ecology & Fishing Technology

Module 3 – 1 – Environment

Capsules under Module 3–1

3 – 1 –1 Madhab learns about the land and the sea

3 – 1 – 2 Sanai learns about living and non–living creatures

3 – 1 – 3 Bishia acquaints himself with temperature, light and gases

3 – 1 – 4 Surama learns about salinity and pressure

3 – 1 – 5 The seabed

Module 3–2 Primary Production

Capsules under Module 3–2

3 – 2 – 1 Plants, the primary producer of food

3 – 2 – 2 Phytoplankton and zooplankton

3 – 2 – 3 Food chain

3 – 2 – 4 Food chains and food web

Module 3–3 Climate and Currents

Capsules under Module 3-3

3 – 3 – 1 Winds and their effects

3 – 3 – 2 Savitha gets to know about surf and tides

3 – 3 – 3 Summer and the summer monsoon

3 – 3 – 4 Winter monsoon and cyclones

3 – 3 – 5 Currents and upwelling

Module : 3-4 Life Cycle of Marine Animals

Capsules under Module 3-4

3 - 4 - 1 Jagu learns about prawns

3 - 4 - 2 Jaggayya learns about sharks

3 - 4 - 3 Bijaya learns about Hilsas

3 - 4 - 4 Raju learns about mackerels

Title of Module 3—5 Fishing Methods

3 - 5 - 1 Shore—based fishing

3 - 5 - 2 Boat—based fishing

3 - 5 - 3 Fishing with gibbets and purse seines

3 - 5 - 4 Fishing with liftnets and longlines

COMPLEMENTARY LEARNiNG MATERIALS OF SCERT

On completion of learning package 2, packages of general NFPE learning materials developed by SCERT for rural folk are used. The materials in these packages are compatible with standard 4 and 5 of formal school. These packages focus on geography, science, social science, mathematics, geometry and English.

The titles of the SCERT packages and capsules are as follows:

SCERT Package - I. SOCIAL SCIENCE

Package title : We and Our Neighbours

Module I—a : Let us know ourselves

Capsules under Module I-a

I - a - 1 Our country and its land

I - a - 2 Orissa, our state

I - a - 3 People in our service

I - a - 4 Shortening distance

I - a - 5 We and our past

Module I-b Many faces of Mother India

Capsules under Module I—b

I – b – 1 Our motherland and its soil

I – b – 2 Soils and their uses

I - b - 3 Let us move about

I - b - 4 We Indians are one

I – b – 5 How beautiful is life!

I - b – 6 Our pride and glory

I - b - 7 We gain freedom

SCERT Package II : GENERAL SCIENCE

Package title : Science and Scientific Knowledge

Module Il-a New Knowledge, New Life

Capsules under Module Il—a

II – a - 1 Heavenly bodies around us

II - a - 2 Animals and trees around us

II – a – 3 Effects of rain and wind

II - a - 4 Our body

II – a – 5 Our home

II - a – 6 Different states of matter

II - a - 7 Different types of forces

Module II—b Let Us Learn New Things

Capsules under Module Il—b

II - b - 1 Let us behold the heavens

II – b – 2 Preserve the soil

II – b - 3 Different phases of energy

II - b - 4 The minutest of matter

II – b – 5 Our apparel

II – b – 6 Story of a living machine

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SCERT Package III : ENGLISH

There are 19 capsules designed to teach the English language to Class IV. The titles are self– explanatory.

Title of Package III – Let us read and write English

Module III–a: "From words to letters and sentences"

Capsules under module ITT-a:

III – a – 1 Let us read and write English words

III – a – 2 Let us talk about persons and things

III – a – 3 Let us talk about colours

III – a – 4 More about persons and things

III – a – 5 My village

III – a – 6 My sweet home

III – a – 7 Our garden

III – a – 8 Our school

III – a – 9 My friends

III – a – 10 Our playground

III – a – 11 Our post office

Module Ill-b "Biju and Raju play a game"

Capsules under module III–b

III – b – 1 Biju and Raju play a game

III – b – 2 Biju at home

III – b – 3 Biju at the marketplace

III – b – 4 Biju in the classroom

III – b – 5 Biju and Raju set out for a picnic

III – b – 6 Biju and Raju visit a circus

III – b – 7 Biju and Raju meet a policeman

III – b – 8 Biju tells his story

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SCERT Package IV : MATHEMATICS

Package title:"Learning Calculations"

Module IV–a: "Calculations"

Capsulesunder Module IV–a:

IV - a - 1. Recalling past lessons

IV - a - 2. Let us learn bigger numbers

IV – a – 3. A monetary transaction

IV - a - 4. Our day-to–day calculations

IV – a – 5. Let us read time

IV – a – 6. Let us share

IV – a – 7. Unitary method of calculation

IV – a – 8. Let us measure our garden

Module TV-b: "Learning calculations further"

Capsules under Module TV–b

IV - b - 1. Let us count up to a crore

IV - b - 2. Four fundamental rules

IV – b - 3. Basic idea of fractions

IV – b - *4.* Odd and even numbers

IV – b – 5. Take note of time

IV – b - 6. Let us draw figures

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6 TRAINING OF TEACHERS

Training Requirements

The teachers appointed to the NFPE centres were all matriculates (except for one graduate), without either experience or training as teachers. To impart the necessary skills and knowledge, in-service teacher training, which consisted of 5 one-week and one-day courses was organized. The courses are briefly described in Chapter 3.

While most teachers posted at the NFPE centres endured during their own schooldays an "autocratic" or "teacher centred" style of teaching, the approach of CAPE in general and the BOBP curiculum in particular requires a democratic or "learner-centred" style of teaching. Consequently, the teachers not only had to learn how to teach, but also how to teach differently (from the way they themselves had been taught in school).

The "learner-centred" style of teaching aims at promoting reflective and analytical thinking, reasoning and problem-solving. It encourages open questions and comments from learners, and invites them to share their experiences and views. Teacher responses, illustrations and explanations are also different from the conventional.

An integrated curriculum which aims at unified learning, and in which experience, occupation and environment play an important role, requires teacher qualifications different from those of a discipline - oriented curriculum.

The teacher has to take care that in the context of unified learning — in this case centred on the learning episodes — continuity in the child's learning experience is maintained and the logical structure of the subject matter adequately presented. The units of learning should also be based on continuous cooperative discussion and work assignments which again require from the teacher considerable skills in managing group work.

The capsules as units of work have been designed in such a manner that local resources can be utilized and local characteristics and problems can be referred to. In order to utilize local resources and to facilitate the solution of tasks/problems, the teacher has to have sufficient knowledge about the fisherfolk, fishing and the environment.

Another essential skill is the teacher's ability to take care of individual differences among learners. This requires assessment of the learner's level of competence and the setting up and evaluation of separate goals for individual learners etc.

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Elements of Training

The training needs for teachers mentioned above * were met by the NFPE project in the following ways.

1. Through lectures, discussions and excursions, teachers were educated about the fisherfolk of Orissa, their fishing technology, marine resources and environment (1st training course).

2. The principles and general methodology of NFPE were taught along with the features of CAPE to highlight differences between the formal and non-formal systems of education and to familiarize the facilitators with the overall approach of the educational programme (1st training course).

3. Administration of centres and interaction with other concerned agencies/offices — such as teachers' training institutes, fisheries extension offices, district inspectors of schools etc — were taught, to equip the facilitators with basic managerial skills and know—how for running the centres (1st training course).

4. Telling facilitators about the findings of learning psychology, so that teacher can ensure continuity of learning experience (2nd course).

5. Methodology of language teaching, and the teaching of arithmetic/geometry, science and social science, to educate facilitators on how to consider the logical structure of subject—matter knowledge in teaching (2nd Training Course).

6. Teaching demonstrations, teaching exercises and role plays were conducted to demonstrate to the facilitators the general pattern of teacher-learner and learner—learner interaction and their major components — such as various types of non—verbal and verbal stimuli and responses, authority patterns, discipline, attention of learners, teacher—centered communication style versus learner centered communication style, expression of emotions and attitudes through gestures, looks etc. (3rd training course).

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* Only those teachers who were posted to the first 20 centres (opening in December 1983) participated in all training courses. Teachers at the centres which opened in December 1984 took part only in three courses. From 1985 on, the training courses had two separate course programmes, one for the old groups of facilitators, another for the new group. The two groups overlapped only for evaluation reports and micro—teaching exercises.

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7. The facilitators were briefed on the teaching of capsules and lesson planning, on how to organize "unified learning", group work and individual work assignments and tasks (all training courses).

8. Evaluation exercises were conducted to train facilitators in assessing learners' levels of attainment, and identifying problems (all training courses).

9. Lectures, teaching demonstrations and exercises in micro—teaching skills viz, stimulus variation and reinforcement (3rd training course), explanation and illustration (4th training course), and fluency in questioning and reorientation of learners (6th training course). Integration of teaching skills, even though practised in all training courses, was especially practised in the 5th training course.

In sum, the training proved to be very useful, particularly the emphasis on teaching skills, on practical teaching exercises and role plays. The NCERT's Regional College of Education, Bhubaneswar, helped conduct these parts of the training programme.

The integration of review/evaluation and training in the same seminar/training course proved to be useful too, because it helped to focus the training on the actual teaching requirements at the centres.

As for the drawbacks of teachers: these result from the distinctive style of NFPE, which calls for abilities and attitudes very different from what the teachers have encountered in their own schooldays. The drawbacks showed up even among teachers who attended all the the training courses.

These drawbacks relate mainly to analytical and transfer abilities, as well as to the teachers' perception of the teacher-learner interaction.

It is felt that the teachers need longer pre—service training before being posted to the centres, followed by in-service training. This suggestion has been made in the project expansion proposal, described in Appendix 10.

Pre-service training should basically instil a new teaching ethos among the non—formal teachers. It should focus particularly on skills and abilities which the teachers are supposed to develop in their students, but which they themselves did not acquire systematically during their schooldays. This is a matter of intellectual and behavioural analytical and transfer abilities, viz, to analyse problems and situations, to draw conclusions and to apply newly gained knowledge and skills to other problems and situations. These abilities can be used to analyse

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traditional structures critically and to contribute to their change. At the same time the old emphasis on "memorization" (with memory power being the main engine of student success), which the teachers were subjected to during their own schooldays, should be criticised and discouraged.

Once the teachers have acquired basic analytical and transfer abilities in various curriculum areas such as arithmetic, science, and social science, they can be trained on how to teach their students. The methodologies of science teaching, social science teaching etc can also be taught. Micro—teaching skills can be taken up briefly during the pre—service training and in depth during the in—service training

Another essential area to be included in the pre—service training is the teacher—learner relationship. Non—formal teachers have to adopt a democratic learner—centred approach and abandon the autocratic model of the past. Without such an approach, the capsules cannot be taught in the right way. Before going into details on how a "democratic" teacher should teach — in terms of stimulating and responding to the learner's activities, gestures etc. — a pre—service training session should be organized. This will give the teachers sufficient time to discuss their own views and experiences and express them in role plays to bring about a thorough change of attitude. Specific elements of a learner—centred teaching style need to be referred to only briefly during the pre—service training.

7. MONITORING AND EVALUATION

7.1 Tools of Monitoring and Evaluation

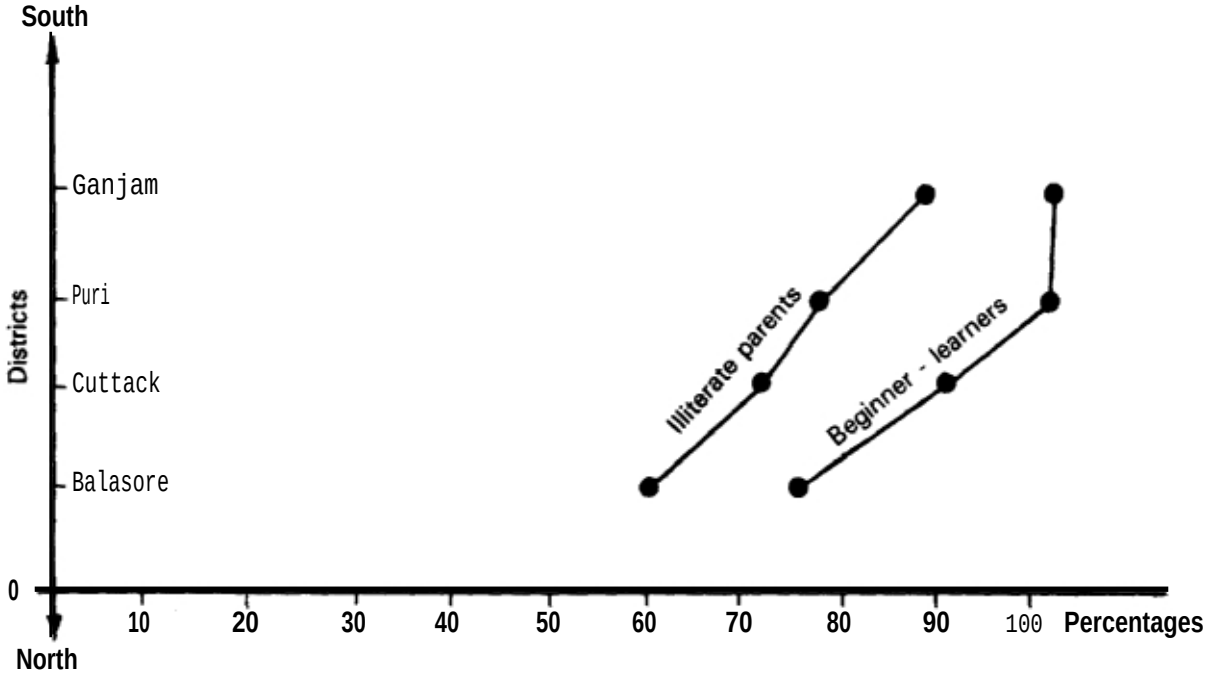
To assess the applicability of the learning material, the performance of teachers, the progress of learners and the response of the village communities, a self—evaluation exercise was carried out by the teachers. Besides this subjective instrument of monitoring, two objective tests were carried out by the district inspectors of schools: an examination in August 1985 (for 20 centres opened in December 1983) and another in August 1986 (for all the 40 centres).

The teacher's evaluation report discussed the relevance of the episodes to the learners' experience. It also discussed average attendance, the average time required for teaching the capsules, the percentage of students who participated in the discussion and who managed to do their work assignments in language/arithmetic easily. The evaluation sheet also contained the teachers" recommendations for modifying the capsules. The evaluation reports were compiled, analyzed and discussed at the periodic seminars.*

*The evaluation form and the instructions for analysis of the evaluation form are shown in Appendix 6.

Before being sent to B0BP, the evaluation report was seen by the NFPE center supervisors, the TTI educators and the fisheries extension officers, and thus served also as a monitoring tool with regard to attendance at the centres, duration of the capsules, participation of learners, applicability of learning episodes, and comprehension of literacy and numeracy. Some of the results of the evaluation exercise are discussed below.

First, however, we shall take a look at the educational level of students and their parents to find out how many students are beginners and how many are drop-outs from formal school. Appendix 7 shows that the vast majority of learners enrolled at the centres as on July 31, 1986, were beginners and at the same time. first generation learners.



Students without prior schooling (beginner - learners) and students with illiterate parents.

The graph above, based on Appendix 7, shows that as we proceed from the north to south the number of illiterate parents increases; the same is the case for learners who had no prior schooling before they were admitted to the NFPE centres.

Next we shall look at the sex ratio among learners and teachers and at the fluctuations in numbers of teachers and students. Appendix 8 shows the sex ratio among students and

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teachers as on July 31, 1986.

Of the 1137 learners there were 760 boys and 377 girls (a boy—girl ratio of 2:1); but if we look at the district figures we find, strangely enough, that the two districts at the extreme north and south (i.e. Babasore and Ganjam) have boy—girl ratios of 23:10 and 38:10 respectively while those for Cuttack and Pun are 12:10 and 11:10 respectively.

Ganjam district centres have had very few girls. In fact, one centre named Kuttur has not had a single girl student since its inception.

Fluctuations in number — or strength — among students and teachers are considerable (Appendix 9). The turn—over of students is explained by the fact that almost all of them are first-generation learners, who get little encouragement from their families for attending school regularly. The numbers fluctuate for teachers because of three factors.

The teachers are usually not from fisherfolk communities. They are outsiders to the NFPE centre villages, not residents. And since transport in coastal areas is usually a problem, it is difficult for them to come and go every day. Besides residence and transport problems, low remuneration is an important reason for the rapid turn—over of teachers. Most teachers who left their NFPE assignments either got better—paid jobs or got admitted as trainees at the TTI that supervised their centre (as a kind of reward for teaching at a NFPE centre).

The turn—over of teachers is greater in the southern districts of Cuttack, Puri and Ganjam than in Balasore in the north. The main reason is that the teachers of the south regard the NFPE centres largely as a stop-gap measure before they find a more lucrative job with better prospects elsewhere; whereas in Balasore, people own agricultural land and get some additional income from their duties as facilitators.

One very interesting trend in the southern districts is that most newly—appointed facilitators are girls, and they stick to their jobs for longer periods than their male counterparts. It is a very welcome change, it may bring about some stability. Besides, female facilitators attract more girl students — rural folk feel safer about sending their girls to schools with lady teachers.

Coming to the question of student drop—outs, we see from the table that it is more pronounced among girls than boys. But in Pun, it is the other way round, and in Cuttack the drop—out rate is about the same for both. In Ganjam, 54% of the girls and 40% of the boys dropped out. When a teacher leaves, it takes quite some time for a new one to take his place. In the meantime many students lose interest and drop

out. This phenomenon is striking in Ganjam where eight centres had a total turnover of 18 teachers. Besides, there is an interesting custom among the Telugu—speaking fishenfolk of Ganjam which aborts their studies. Girls' marriages are settled by their parents at a very young age, after which they are dissuaded from attending school. In many places, the parents are education-conscious but do not have enough faith in NFPE. They put their children in formal schools where they get admitted easily because of their good performace in NFPE tests. This is certainly an encouraging sign and as NFPE gains in popularity, stability in student strength will result automatically. But, before that can occur, teacher stability must be ensured.

Having discussed the prior schooling of learners and parents, the sex ratio among learners and the turn—over among learners and teachers, we shall now discuss the evaluation exercises and their findings.

7.3 Evaluation of Capsules

As mentioned above, an evaluation report was prepared by the facilitators for each capsule. After scrutiny by the teacher—educator and the fisheries extension officer it was forwarded to BOBP for compilation and analysis and discussed at periodic seminars.

The evaluation reports served mainly three purposes:

- They made the teacher focus and reflect on the most important criteria of teaching and learning. Did he or she teach, did the students learn, according to the criteria specified in the report?
- BOBP and the supervisors got to know about learners' progress and teachers' performance.
- How useful were the learning materials? How could they be improved? Some answers were obtained.

The evaluation exercise was carried out for learning packages 1 and 2. Learning package 3 was not covered; being the last package, compatible with class V of formal school, it could not be taught during the pilot project.

The following problems were discussed at the seminars consequent on evaluation exercise. Steps were taken to rectify them.

- Low at tendance of students
- Capsule teaching time — too short or too long
- Lack of learner participation in answering questions or in discussing the learning episode
- Learning episodes not relevant enough for the learners
- Unsatisfactory comprehension by learners of literacy or numeracy

Findings of NFPE curriculum evaluation reports:

It is not possible to go into the details of all the 72 capsules evaluated. Aggregated data for five modules of learning packages 1 and 2 are presented in the table below, separately for north and south Orissa, to reveal how the results vary with social and ecological conditions. The table brings out the following:

- The average attendance of learners per module, separately for north and south Orissa. This shows whether there was a progressive rise or fall in attendance, and whether this depended on the content of the module or on other circumstances.

- The duration or time taken for each module, so that one may estimate the time needed to complete the entire NFPE curriculum *

- The participation of learners, which is an index of the relevance of the learning materials and the quality of teaching.

- The degree of student comprehension of language or arithmetic.

When studying the table (opposite page) one should bear in mind that the information is based entirely on the teachers' perceptions which, apart from being subjective, might also be biased.

The table data are interpreted below, column by column.

Student attendance (see column 3)

Student attendance does not vary much between the north and the south since 25/26 students out of 30 attended each class. This is what emerges from the facilitators' individual reports. But practical observation reveals that students come in good number to a centre only when the teacher/facilitator is regular and punctual. Attendance becomes a problem when the facilitators are irregular, a fact which the batten do not highlight! On package 2, there was a high turnover of facilitators, hence attendance was erratic.

*Because of delays in printing and supply of the capsules to the centres, the time to "complete" a module at a centre usually far exceeds the teaching time.

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Module number	Area	Average attendance per day (no of students)	Duration in hours	How many questions answered	% of students participation	Comprehension of language or arithmetic		
						Easily %	With difficulty %	Not at all
1	2	3	4	5	6	7	8	9
Module 1 - 1	North	26	94	88.2%	88.1%	64.4%	33.8%	1.8%
	South	25	146	84.5%	78.4%	53.1%	42%	4.9%
Module 1 - 2	North	26	81	92%	87%	62%	31.2%	6.8%
	South	25	153	78.7%	77.6%	53.6%	44.1%	2.1%
Modu1e 1 - 3	North	25	94	91.3%	90.4%	63.8%	32.8%	3.4%
	South	24	154	92%	80.5%	61.3%	31.4%	7.3%
Modle 2 -	North	26	145	94%	91%	70.6%	34.2%	5.2%
	South	21	168	95%	84%	64.6%	19.4%	16.9%
Mod le 2 - 2	North	25	122	92%	92.6%	59.1%	38.1%	2.7%
	South	26	15.0	90%	81.9%	62.3%	26.8%	10.8%

<u>Time taken up by each module</u> (see column 4)

In this column we find great variations between the north and the south. As mentioned earlier in this report, most fisherfolk children from the southern part of Orissa belong to Telugu-speaking hamlets where people hardly speak Oriya; hence, any subject is covered slower in the south than in the north. But the time—gap between the north and south narrows progressively.

Another reason for the longer time taken in the soutti could be that almost all the southern students are first-generation learners. The northern students are second-generation or third-generation learners and grow up in a more conducive learning atmosphere.

A clarification is necessary on the time schedule for each module. The NFPE system raises students to Class VI level of formal school in 2 to 3 years. Each BOBP package can therefore be permitted a maximum period of 6 months. We see that in the south, package 1 has been covered within this specified period, since 146+153+154 hours at 18 hours per week adds up to 26 weeks. Hence we cannot say that children of the south are slow learners because of the constraint of language. The time schedule for covering the BOBP-supported NFPE curriculum in 2 to 3 years is as follows:

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(a) Maximum time required to cover package 1 — 6 months
(b) Maximum time to cover package 2 — 6 months
(c) Maximum time to cover package 3 — 6 months
(d) Complementary learning materials developed by SCERT — 12 months

The total time span to cover the whole curriculum is 30 months or 2 1/2 years – very reasonable indeed for a 5—year—course of formal school.

Questions answered and students' participation (columns 5 and 6 of Table)

In Module 1—1, under column 5, there is no significant variation between the north and the south on the percentage of questions answered, unlike in Module 1-2 where the figures for the north and south are 92% and 78.7%. This shows that topics familiar to students of the north, dealt with in Module 1—2, give them an advantage over students in the south. This is reflected by the figures on learner participation (77.6% for the south against 87% for the north - column 6). But in module 1—3, where topics familiar to the south are dealt with, the southern learners participate actively (80.5%) and answer more questions (92% against 91.3%) than the northern students.

As regards package 2, module 1, there is little variation in the questions answered (94% in the north,95% in the south) but there is a marked improvement in student participation in the south (84%). Reasons: Episodes in this module describe various festivals, practices and beliefs which the students themselves participate in or enjoy; hence, they find little difficulty in answering questions relating to those episodes and take pleasure in their discussion. But Module 2.2, "Our Family Life", is tougher: it deals mostly with the behaviour patterns of different members and their interaction in a family. This does not create as much interest among the young children as was generated in the previous module "Our Festivals, practices and beliefs". Student participation is relatively higher in the north for Module 2-2 than in the south.

Comprehension of languages and arithmetic (columns 7, 8 & 9 of table).

In column 7, the figures show the percentage of students who comprehended learning matter easily. In the north, there is no substantial variation fom module to module (except from 1.3 to 2.1) while in the south, the figures show an upward trend. But from module 2.1 to module 2.2, there is a sharp fall (from 70.6% to 59.1%) in the north; in the south too, the figure goes down, though not so steeply (from 64.6% to 62.3%). This can be attributed to the fact that difficulty inreased from module to module, calling for greater

intelligence, skill or application.

Column 8 shows the percentage of students who could pick up lessons after these were taught or explained more than once. The students here are mostly of average level in the age-group 6-8 years.

As far column 9, there is an almost continuous rise from module to module in the percentage of students who did not pick up what was taught even after repeated teaching. According to the facilitators, these are either new entrants, or those in the age—group below 6—8 for whom this course was never meant. Besides, some good students drop out from the non-formal schools at intervals, causing the percentage to vary from time to time. The trend of students seeking admission to formal schools is regarded as a healthy reflection of parents' or students' awareness of the need for education.

Fluctuation in the numbers of student NFPE schools is perhaps inevitable in the marine fisherfolk community — given the constraints of the fishing occupation.

7.4 Examinations

An objective indicator of the NFPE programme's impact is provided by the examinations conducted in August 1985 and August 1986.

The August 1985 examinations were at 20 centres opened in December 1983 on completion of learning package one. The August 1986 examinations were held at all the 40 centres on completion of Module 2 of package two. The standard test of formal schools was applied, and supplemented by a special section on the environment. (See Appendices 6, 6a and 6b).

The examination results have been very satisfactory. In 1985, of the 483 children who appeared for the language test, 94% secured marks above 29% with average marks of 68.2%, the highest individual marks being 99%; Of the 478 children who appeared for the environmental studies test, 98% secured marks above 29% with an average of 80.5%, the highest in every district being 100 per cent; finally, of the 485 children taking the arithmetic test, *96.3%* secured marks above 29% with an average of 76.6%, the highest being 100 per cent marks in both Balasore and Ganjam districts.

Surprisingly enough, in "Language", the top—ranker was the Telugu—speaking Ganjam district (average 74%, highest individual marks 99%)

In 1986, examinations were conducted for 40 NFPE centres for Class I and II, in a manner similar to 1985.

A special feature of the 1986 examinations was that all the

40 NFPE centres were given the option to allow as many students as they thought fit to appear for the Class-II standard test – even if the centres had been opened only towards the end of 1984. Reason: many of these new centres had completed module 2 of package 2, and the progress of these new centres were very encouraging. 451 students of these new centres wrote the Class I & II examinations. Of them, 176 (39%) appeared for the Class II. The result was very satisfactory — none of these students secured less than 30% in either environment studies or arithmetic. In "language", only 5 (3%) secured less than 29%. The relatively poor performance in the language test can perhaps be ascribed to one centre in Cuttack district — its functioning was not very satisfactory.

Thirty-nine of the 40 NFPE centres featured in the 1986 examinations; one centre in Ganjam was closed for a long time and was shifted to New Buxipalli, because of some difficulties at Nua Golabandha.

In the 1986 examinations, 414 students appeared for Class I, and 516 for class II, giving a total of 930 examinees in all.

The performance is summarized below:

Class I

Language

Appeared	412
Average marks	66.8%
Above 29% marks	95.4%
Highest marks recorded	100% in Puri

Environmental Studies

Appeared	409
Average marks	80%
Above 29% marks	98.3%
Highest marks recorded	100% (in every district)

Arithmetic

Appeared	412
Average marks	81.4%
Above 29% marks	98.3%
Highest marks recorded	100% (in Balasore & Ganjam)

Class II

Language

Appeared	514
Average marks	65.6-%
Above 29% marks	96.7%
Highest marks recorded	97% in Pun

Environmental Studies

Appeared	512
Average marks	B2.7%
Above 29% marks	99.8%
Highest marks recorded	100% (in every district)

Arithmetic

Appeared	516
Average marks	79.6%
Above 29% marks	99.8%
Highest marks recorded	100% (in Balasore)

<<

The results of the 1985 and 1986 examinations have enabled the designers of the programme to establish the following facts: –

– that the language constraint for Telugu–speaking children in the south will pose no serious problem in the long run;
– that the NFPE programme will enable students to enter-formal school at any stage they like;
– that the entire NFPE programme for a child starting as a fresh candidate can be completed in three years, making him or her fit for admission into Class VI of formal school.

8. NEPE FOR FISHERFOLK CHILDREN: THE FUTURE

The experience gained through the BOBP–supported NFP[project in Orissa can be utilized in two ways:

a) expansion and consolidation of the project in Onissa, to help all coastal fisherfolk children of the state
b) adaptation of the approach and the curriculum to other coastal states and other countries.

During the last year of the pilot project, the Orissa government and BOBP jointly prepared a proposal for expanding and consolidating the NFPE project (Appendix 10). The proposal is intended for bilateral external funding.

The expansion project will aim at consolidating the gains from the pilot project and at extending NFPE further in Orissa with bilateral external funding. The project envisages the establishment of 60 more NFPE centres (in addition to the existing 40) during the five-year period starting 1987–88. Initially, the 40 existing NFPE centres will be built up before starting work on the remaining 60. Some 6,300 chidren are expected to be enrolled in NFPE courses by 1991–92. Of these, 4,200 children will undergo a condensed 2–year programme of primary education which is expected to prepare them for secondary education, while the 2,100 children admitted in the last year of the project wili complete their primary education later. The special curriculum developed by the BOBP will be used in all the NFPE centres, and more capsules will be added progressively to the curriculum. A special system of examination/certification is also envisaged.

The infrastructure built up during this project can also eventually be used in adult literacy programmes aimed at marine fisherfolk. The total cost of the project is estimated at Rs 14.53 million, of which roughly Rs 13.70 million will constitute external bilateral assistance, the balance being borne by the Government of Orissa.

The Orissa experience can he adapted and extended to other coastal states in India. One such proposal is for the setting up of NFPE centres in Andhra Pradesh, India. There are 453 fishing villages in the eight coastal districts of

Andhra Pradesh. The literacy level of marine fisherfolk in these villages is a low 8% as against a national average of 36% and the state's average of around 30%. Low income, the nature of the fisheries, the use of children in fishing activities to raise family income and a passive attitude towards education ——all these factors militate against the enrolment of fisherfolk children in formal school. Most of the approximately 85,000 children in the age group 6—14 from coastal fishing villages are untouched by the formal system. Primary schools are few and far between. Parents are neither willing nor able to send their children to these schools. The dropout rate among children enrolled in formal school is very high. Given these circumstances, a NFPE system would seem to be the best bet for chidren from fisherfolk communities in coastal Andhra Pradesh.

The proposed five—year project envisages the setting up of 100 NFPE centres, starting with 30 during the second year of the project. The remaining 70 centres will be established during the third and fourth years of the project. Some 5,100 learners will be enrolled at these centres. Of these, 3,900 will complete their primary education during the project period. The curriculum developed for the Orissa pilot project will be modified to suit the needs of learners in Andhra Pradesh and will be translated into Telugu, the state language. The project is estimated to cost Rs 8.4 million.

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Appendix 1: LITERACY IN ORISSA STATE AND IN COASTAL VILLAGES OF THE STATE (1981 CENSUS

Orissa State

Total population	:	26.4 million
		- 13.3 million males - 13.1 million females
Average literacy		34.23%
		(for males 47.10% for females 21.10%)
Ratio		220 literate males for every 100 literate females.

The tables below give literacy information for 20 sample villages from each of Orissa's four coastal districts.

The tables show that the lowest literacy among the sampled villages is in Ganjam district (17.9%), the highest in Balasore (35.7%). The ratio of literate females to literate males is highest in Cuttack (56%) and lowest in Ganjam (37%)

<<

20 Sample Villages – Balasore District

Name of village	Population of the village	No of literates			Percentage of literates
		Males	Females	Total	
1. Udaypur	488	91	25	116	23.8%
2. Teluni	207	48	15	63	30.3%
3. Bolong	2841	687	228	915	32.2%
4. Nagaleswar	1736	442	142	584	33.6%
5. Saudi Chak	1121	355	126	481	42.9%
6. Machhadiha	422	125	41	166	39.4%
7. Sankarpur	271	39	9	48	17.7%
8. Sundarkoili	386	57	19	76	19.7%
9. Nuagaon	1007	281	79	360	35.7%
10.Chasakhand	523	62	38	100	19.1%
11.Balaramgadi	28	5	5	10	35.7%
12.Parikhi	6454	1575	569	2144	33.2%
13.Talapada	2300	561	182	743	32.3%
14.Anantapur	3256	1041	504	1545	47.4%
15.Barajdeuli	364	125	55	180	49.4%
16.Nuapur	2078	531	178	709	34%
17.Pakhara	3293	865	446	1311	39.8%
1B.Bishinupur	3114	987	488	1475	47.3%
19.Mulakaida	846	298	140	438	51.7%
20.Raghunathpur	821	226	131	397	48.3%

Average literacy percentage in the district 42.06%
Average literacy percentage in the sample villages 35.7%
Average ratio of literate females per 100 literate males 50

<<

20 Sample Villages – Cuttack District

Name of village	Population of the village	No of literates			Percentage of literates
		Males	Females	Total	
1. Rajnagar	2868	864	393	1257	43.8%
2. Satabhaya	903	180	65	247	27.3%
3. Talchua	515	177	72	249	48.3%
4. Jamboo	3327	678	257	935	28.1%
5. Mahakalpara	647	212	132	344	53.1%
6. Kharinasi	3460	741	250	991	28.6%
7. Harishpur Gara	2250	535	144	679	30.1%
8. Nuagan-Dhenkia	3405	1119	594	1713	*50.3%*
9. Nolia Sahi	362	100	27	127	35%
10. iatadhara Tanda	10	4	Nil	4	40%
11. Jatadhar	Uninhabited				
12. Barkuda	2	Nil	Nil	0	0%
13. Sahadabedi	789	278	67	345	43.7%
14. Kansanipatia	Uninhabited				
15. Abhay Chandpur	Uninhabited				
16. Godindapur	1744	448	241	689	39.5%
17. Bhuyanpal	6	2	Nil	2	33.3%
18. Kankana	837	263	93	356	42.5%
19. Kaudia	51	14	6	20	39.2%
20. Musadiha	85	13	*3*	16	18.8%

Average literacy percentage in the district 45.43%
Average literacy percentage in the sample villages 35.4%
Average ratio of literate females per 100 literate males 56

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20 Sample Villages – Pun District

Name of village	Population of the village	No of literates			Percentage of literates
		Males	Females	Total	
1. Sahana	570	164	56	220	38.6%
2. Konark	2425	632	318	950	39.1%
3. Gadabanger	9	6	Nil	6	66.6%
4. Noliapatna	77	8	2	10	13%
5. Udaygiri	380	120	36	156	41%
6. Baliapokhari	Uninhabited				
7. Biripadar	214	12	3	15	7%
8. Hunjan	57	2	Nil	2	3.5%
9. Morda	643	157	87	244	37.9%
10. Jamuna	339	84	20	104	30.7%
11. Brahmanandeo	585	163	37	200	34.22%
12. Godhanpara	37	12	5	17	45.9%
13. Sudhikishore	1015	269	117	386	38%
14. Chhuriana	1158	372	176	548	47.3%
15. Madhipur	517	196	126	322	62.3%
16. Khalakata	922	74	10	84	9.1%
17. Balukhanda	1852	450	153	603	32.5%
18. Mohinpur	80	23	3	26	32.6%
19. Batulibhuyan	19	5	5	10	52.6%
20. Kashi Haripur	372	37	6	43	11.6%

Average literacy percentage in the district 45.50%
Average literacy percentage in the sample villages 35.01%
Average ratio of literate females per 100 literate males 42

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20 Sample Villages – Ganjam District

Name of village	Population of the village	No of literates			Percentage of literates
		Males	Females	Total	
1. Venkat Raipur	2817	391	174	565	20%
2. Markandi	1708	124	39	163	9.5%
3. Sonapur	3367	700	178	878	26%
4. Patisonapur	1882	73	9	82	4.3%
5. Katturu	1619	190	27	217	13.4%
6. Gokkarkuda	673	157	67	224	33.2%
7. Kantiagara	1808	190	26	216	11.9%
8. Nua Golabandha	4821	671	322	993	20.6%
9. Hafipara	828	164	81	245	29.6%
10. Kirtipur	851	75	2	77	9%
11. Lodigam	426	62	14	76	17.8%
12. Baksipalli	2366	312	182	494	20.9%
13. Indrakshi	857	191	76	267	31.2%
14. Phasi Nuapur	276	27	1	28	10.1%
15. Dhepa Nuapur	400	30	2	32	8%
16. Ekasinghi	1498	142	25	167	11.1%
17. Chandanbara	986	34	6	40	4%
18. Kostapata	Uninhabited				
19. Basanaputti	447	79	31	110	24.6%
20. Upalaputi	1866	441	216	657	35.2%

Average literacy percentage in the district 31.3%
Average literacy percentage in the sample villages 17.9%
Average ratio of literate females per 100 literate males 37

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Appendix 2: LIST OF 20 NEPE CENTRES OPENED IN DECEMBER 1983 AND ASSOCIATED FISHERIES EXTENSION CENTRES AND TEACHER TRAINING INSTITUTES

S.No.	District	Name of the village where the centre is located	Name of the concerned Fisheries Extension Centre	Name of the concerned Teachers Training Institute
1.	Balasore	Teluni	Baliapal	Secondary Training School Nagaleswar
2.	"	Saudi	"	
3.	"	Sunderkoili	"	
4.	"	Saudi Chaka		
5.	"	Sankerpur		
6.	"	Purusottampur	Gopalpur	Secondary Training School Bagudi
7.	"	Talpada		
8.	"	Barajdeuli		
9.		Raghunathpur		
10.	"	Avana		
11	"	Nuapur		
12.	Cuttack	Sandhakud	Kujang	Secondary Training School Kujang
13.		Nolia Sahi		
14.	Pun	Chandrabhaga (Konarak)	Konarak	Secondary Training School Nimapara
15.	"	Penthakata	Pun	Secondary Training School (Women) Pun
16.		Balinulia Sahi		
17.	"	Gaurbara Sahi		
18.	Ganjam	Nulia Nuagaon	Ganjam	Secondary Training School (Women) Berhampur
19.	"	Nua Golabandha	Gopalpur on Sea	
20.	"	Bander Raikatur	"	"

-- - Distribution of FEOs, TTIs & TEs (District-Wise)

	CENTRES	FEDs	TTIs
BALASORE	11	2	2
CUTTACK	2	1	1
PURl	4	2	2
GANJAM	3	2	1
TOTAL	20	7	6

FED – Fisheries Extension Officer
III – Teachers' Training Institute
TE – Teacher – educator

<<

Appendix 2 (contd)

LIST OF 20 NFPE CENTRES OPENED IN DECEMBER 1984, AND ASSOCIATED FISHERIES EXTENSION CENTRES AND TEACHER TRAINING INSTITUTES

S.No.	Name of the District	Name of the Village where the Centre is located	Name of the concerned Fishery Extension Centre	Name of the concerned Teacher's Training Institute (S.T.S)
1	2	3	4	5
1.	Balasore	Udaypur	Chandaneswar	Secondary Training School, Langaleswar
2.	"	Krushnanagar	"	
3.	"	Chhanua	Chhanua	STS (W), Basta
4.	"	Kasafal	"	
5.	"	Jagannathpur	Adhuan	STS, Bagudi
6.	"	Nuagaon		
7.	"	Dhanakuta	Dharma	STS, Pahimohura
8.	"	Pradyutnagar		
9.	Cuttack	Keraragarh	Rajnagar	STS (8), Kendrapara
10.	"	Birabhanjapur		
11.	"	Kharanashi	Mahakalpara	
12.	Pun	Penthakata (N)	Pun	STS (8), Pun
13.	"	Sahana	Astarang	STS, Nimapara
14.	"	Anakana	"	
15.	"	Asijanga		
16.	Ganjam	Kantiagada	Ganjam	STS, Khallikote
17.	"	Gokhurkuda		
18.	"	Ramayapatna	Sonapur	STS, (8) Berhampur
19.	"	Katturu		
20.	"	Venkatraipur	Gopalpur on sea	

DISTRICT-WISE DISTRIBUTION OF NFPE CENTRES, FEDs AND IIIs

	CENTRES	FEOs	TTs
BALASORE	19	4	4
CUTTACK	5		1
PURI	8	2	2
GANJAM	8	3	2

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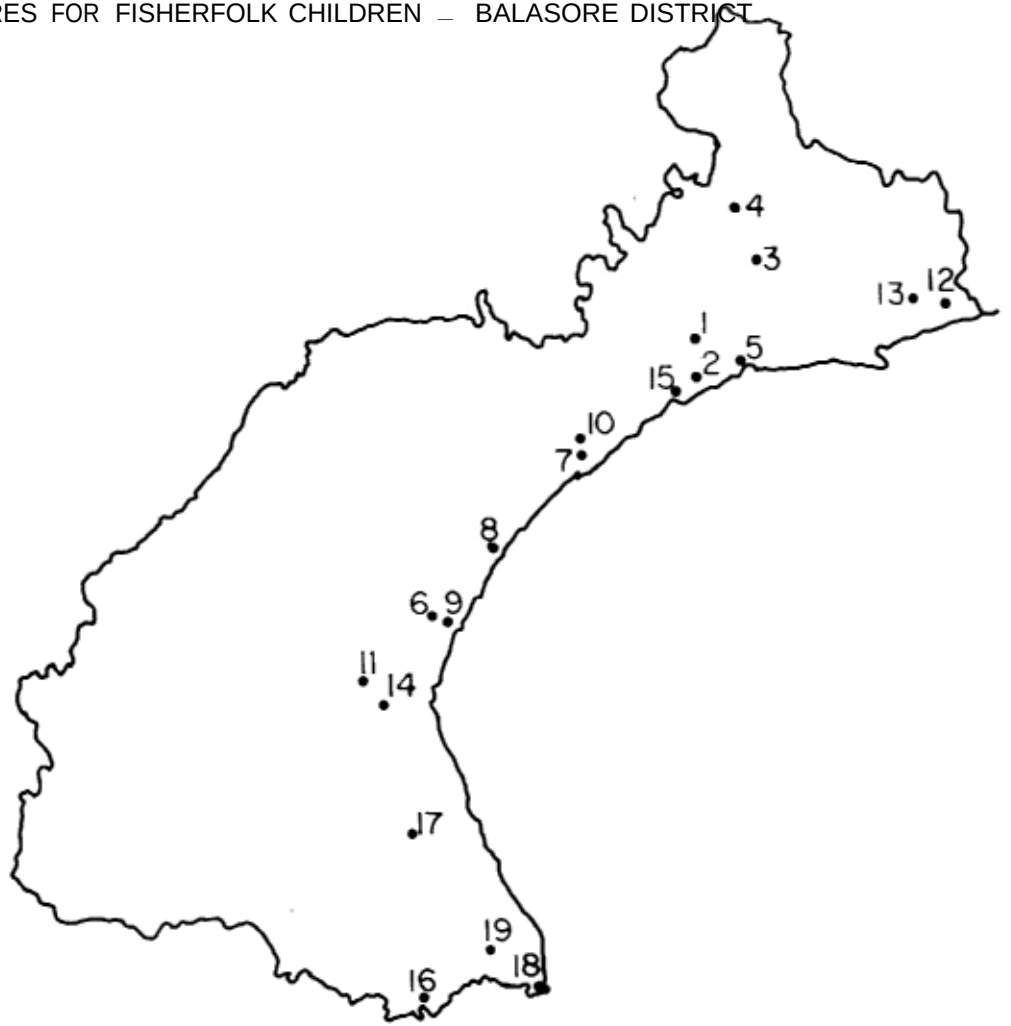
Appendix 3a

LOCATION OF NFPE CENTRES FOR FISHERFOLK CHILDREN – BALASORE DISTRICT



NFPE centres opened in December 1983

1. Teluni
2. Saudi
3. Saudi Chaka
4. Sankarpur
5. Sunderkoiti
6. Avana
7. Talapada
8. Nuapur
9. Barajdauli
10. Purusottampur
11. Raghunathpur

Centres opened in December 1984

12. Udaypur
13. Krushnanagar
14. Chhanua
15. Kasafal
16. Jagannathpur
17. Nuagaon
18. Dhanakuta
19. Pradyutnagar

Fisheries particulars: Balasore District

1. Coastline – 130 km
2. Total no of marine fishing villages = 150
3. Total no of marine fishermen's households = 9,260
4. No of active fishermen = 17,168

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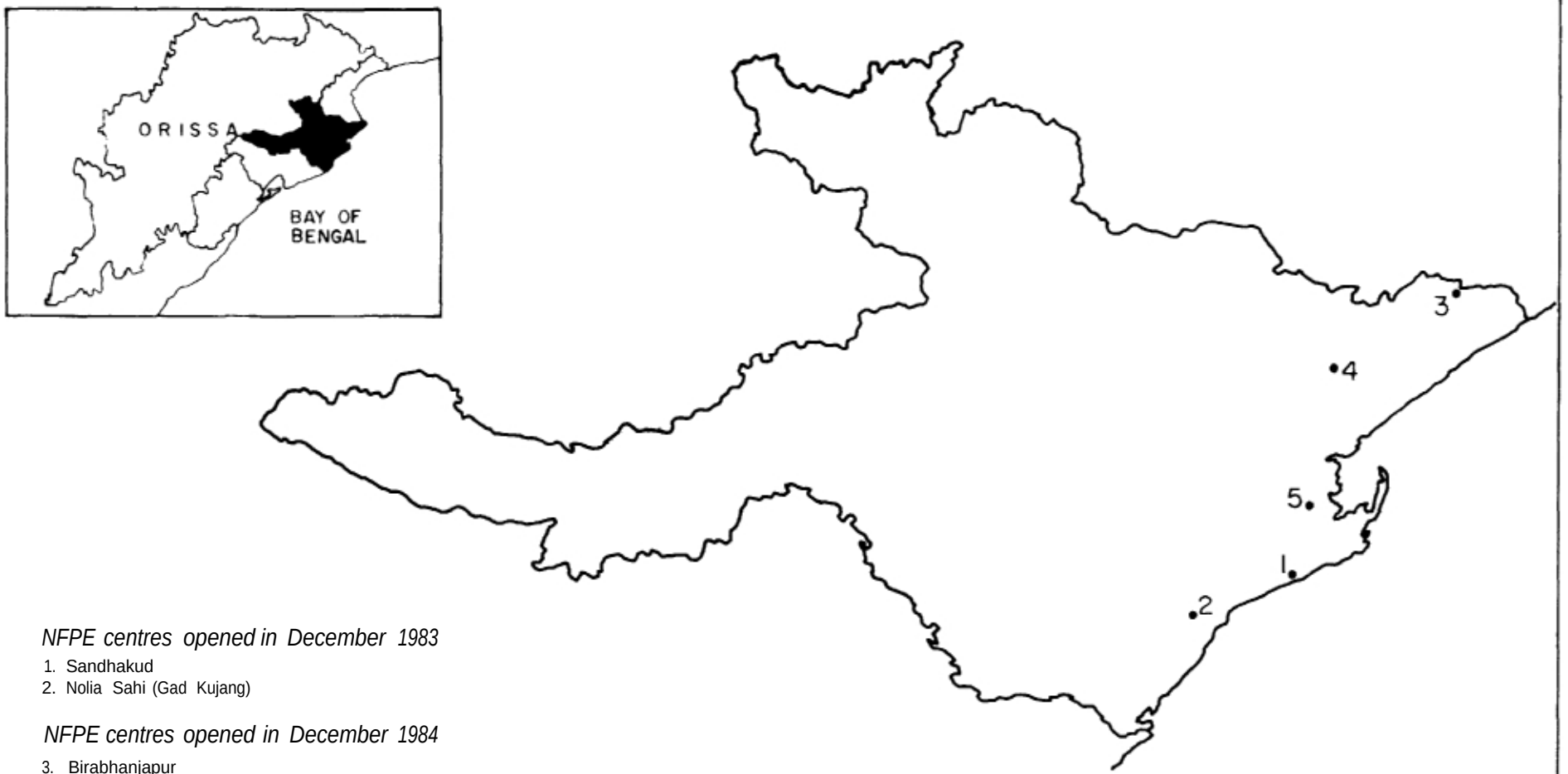
Appendix 3b **LOCATION OF NFPE CENTRES FOR FISHERFOLK CHILDREN – CUTTACK DISTRICT**



NFPE centres opened in December 1983

1. Sandhakud
2. Nolia Sahi (Gad Kujang)

NFPE centres opened in December 1984

3. Birabhanjapur
4. Keraragarh
5. Kharanashi

Fisheries particulars, Cuttack District

1. Coastline – 135 km.
2. Total no of marine fishing villages = 7
3. Total no. of marine fishermen's households = 1,686
4. No. of active fishermen = 3,202

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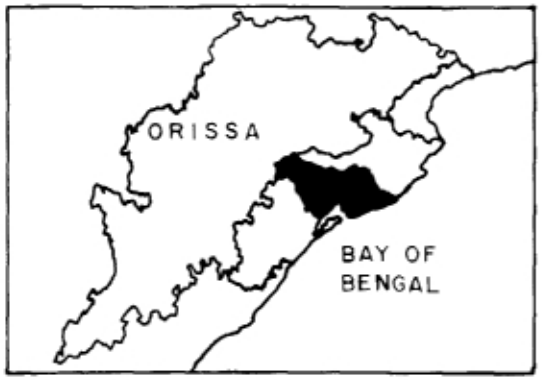
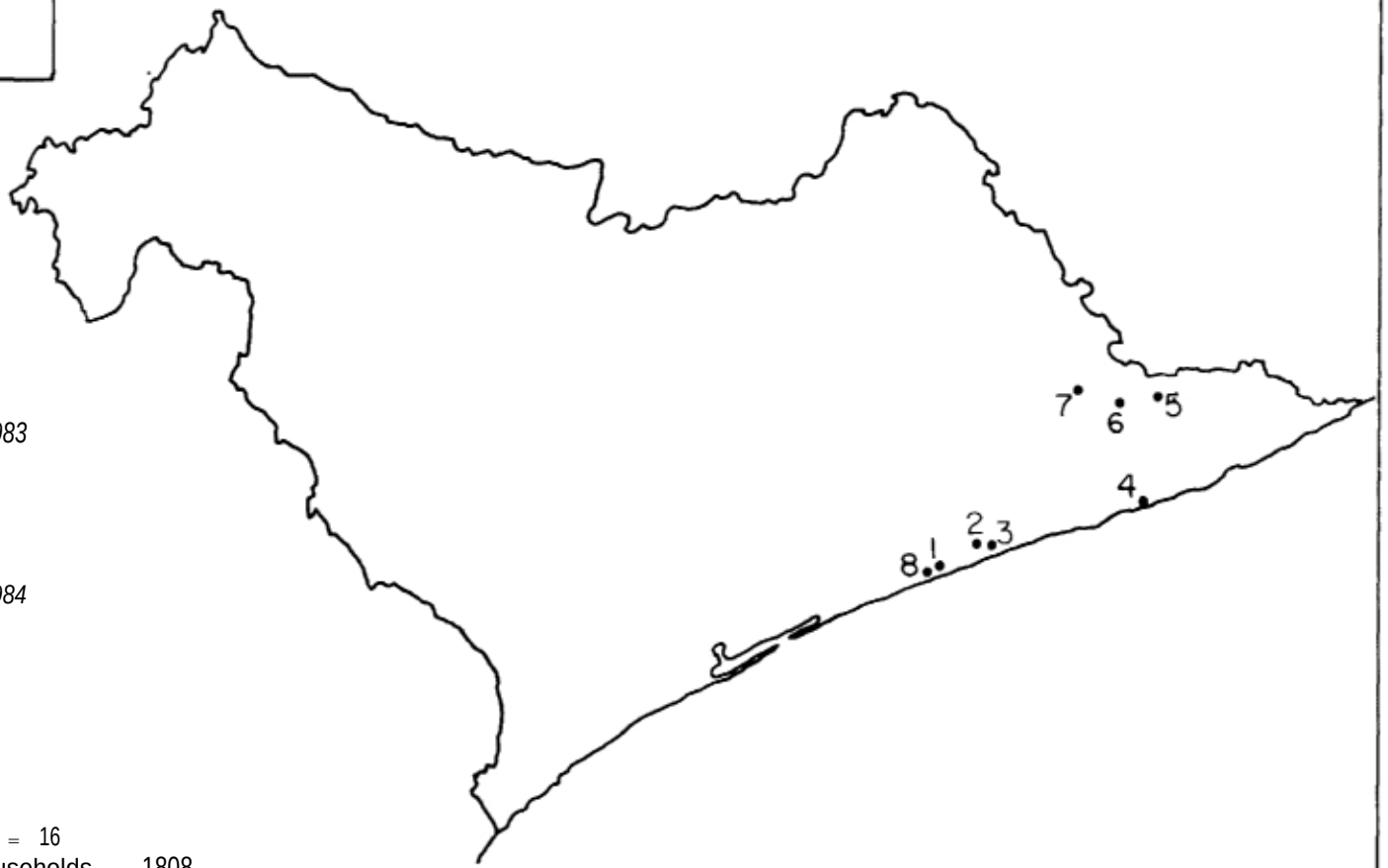
Appendix 3c **LOCATION OF NFPE CENTRES FOR FISHERFOLK CHILDREN – PURI DISTRICT**





NFPE centres opened in December 1983

1. Penthakata
2. Balinolia Sahi
3. Gaurbara Sahi
4. Chandrabhaga (Konarak)

NFPE centres opened in December 1984

5. Sahana
6. Anakana
7. Asijanga
8. Penthakata

Fisheries particulars – Puri District

1. Coastline = 155 km.
2. Total no. of marine fishing villages = 16
3. Total no. of marine fishermen's households = 1808
4. No. of active fishermen = 3800

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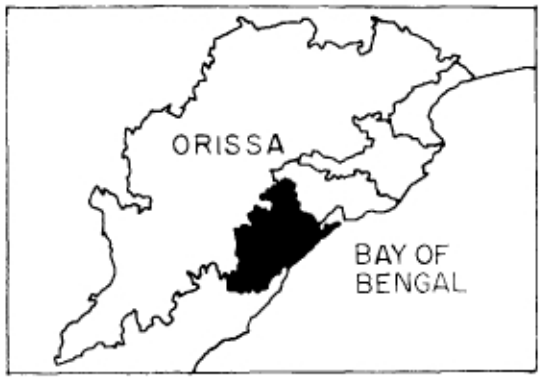

NFPE centres opened in December 1983

1. Nolia Nuagaon
2. Bander Raikatur (Near Gopalpur-on-Sea)
3. Nau Golbandha

NFPE centres opened in December 1984

4. Gokhurkuda
5. Kantiagada
6. Venkatraipur
7. Ramayapatna
8. Katturu

Fisheries particulars : Ganjam District

1. Coastline — 60 km
2. Total no. of marine fishing villages — 29
3. Total no. of marine fishermen's households = 4132
4. No. of active fishermen = 5880

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Appendix

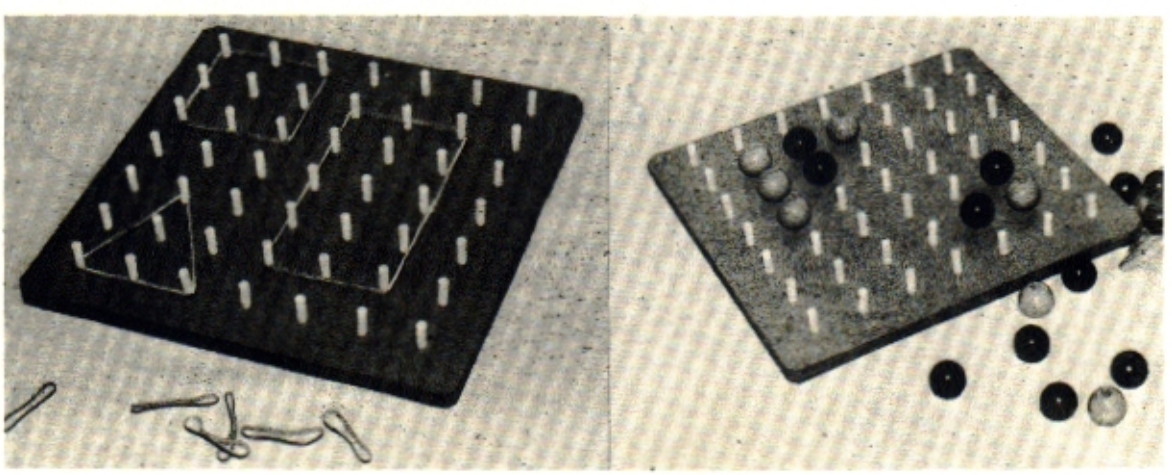
VISUAL TEACHING AIDS FOR PRIMARY SCHOOL CHILDREN

by E Amalore

Simple and effective teaching aids to help primary school children learn and assimilate mathematical concepts and ideas can be made quite easily from wood and other components available from hardware shops. The design concepts behind these aids are simple too if the mathematical principles underlying them are understood. The teaching aids are easily fabricated, even by a semi—skilled carpenter. Painting them in attractive colours is easily possible.

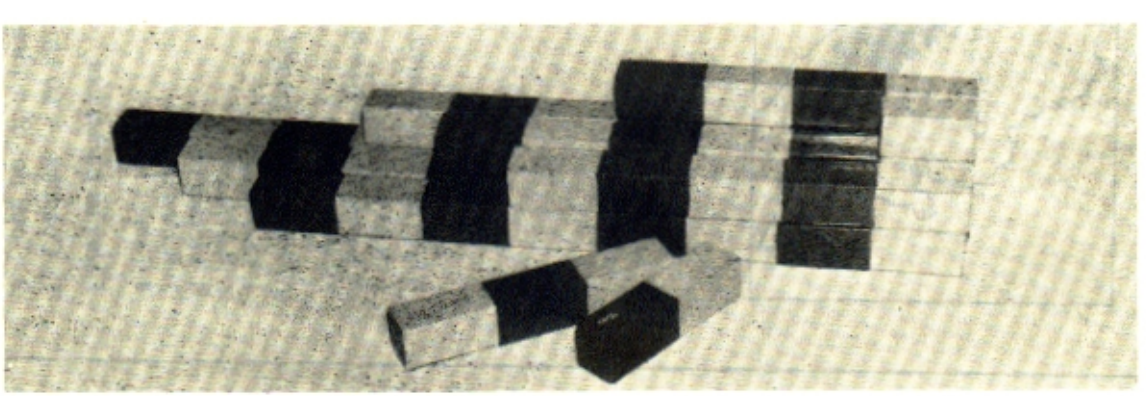
1. Ceo-board (to teach numbers)

This is a square wooden board on which plastic pegs are fixed at a constant pitch. The board can be used to teach numbers, digital values, simple geometrical shapes, the relationship between shapes and their areas, etc. Rubber bands and beads are used as teaching accessories along with the geo-board.



2. Number lines (To teach addition & subtraction):

Square wooden rods of varying lengths can be used to teach addition and subtraction. The rods are marked off into segments, each of them of unit length. Alternate segments are coloured.



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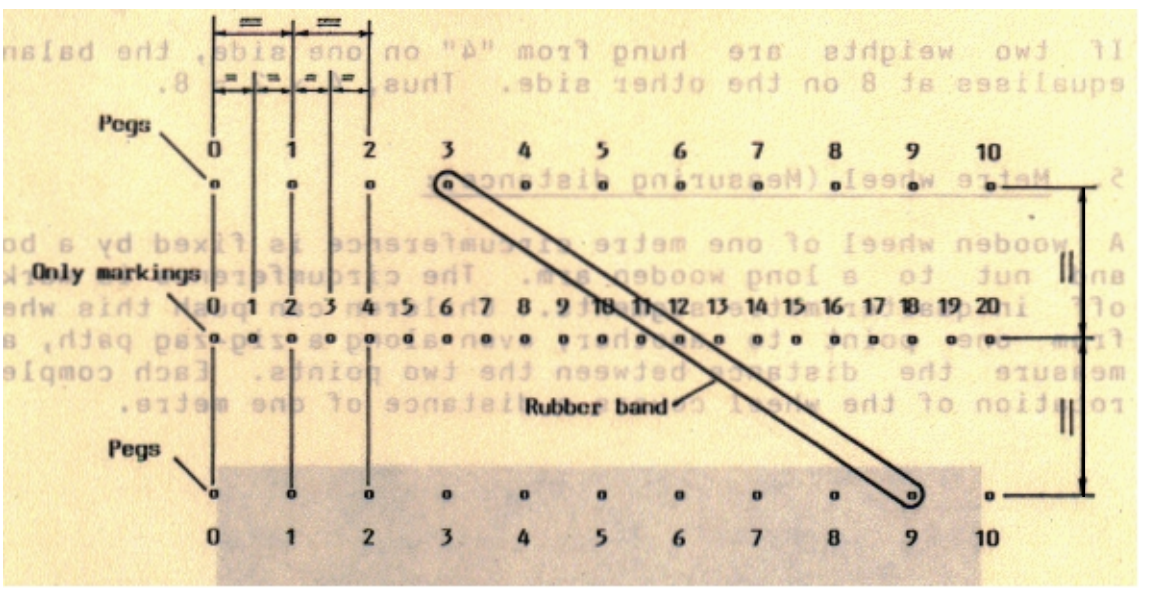
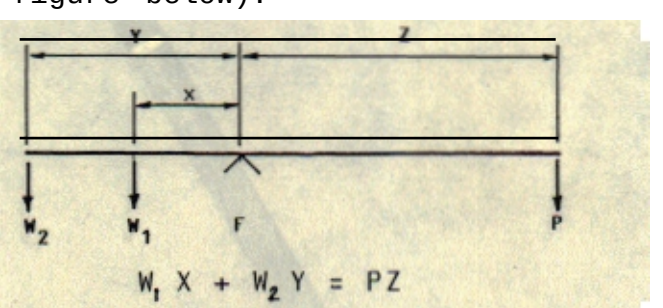
3. Addition board:

Plastic pegs are fixed on a rectangular board as shown in the figure. Numbers are marked below the pegs and also on a line between the two rows of pegs as shown in the illustration. If a rubber band is looped between one top and one bottom peg it crosses over a number in the middle row which is the sum of the top and bottom numbers in quesstion -

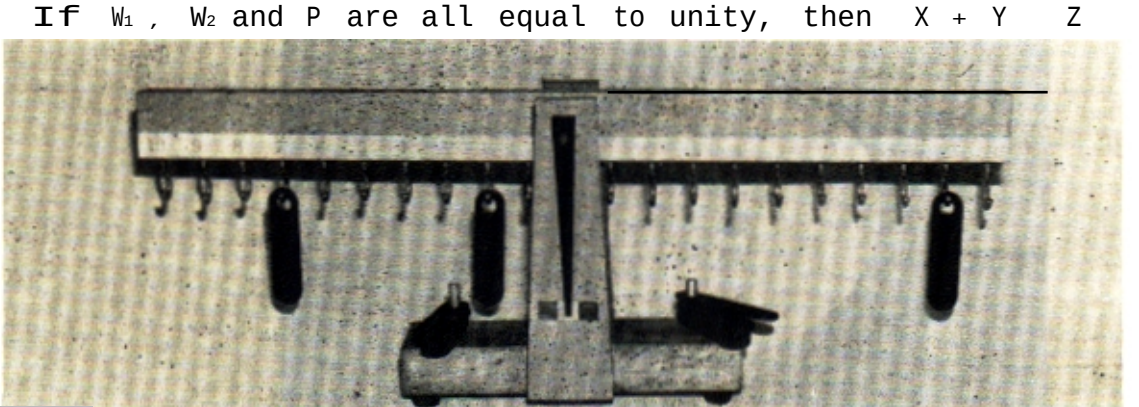


4. <u>Mathematical balance (To teach addition &</u>
multiplication:

This device is helpful in teaching addition and multiplication and is based on the first principle of leverage (see figure below).



If W_1 , W_2 and P are all equal to unity, then X + Y Z



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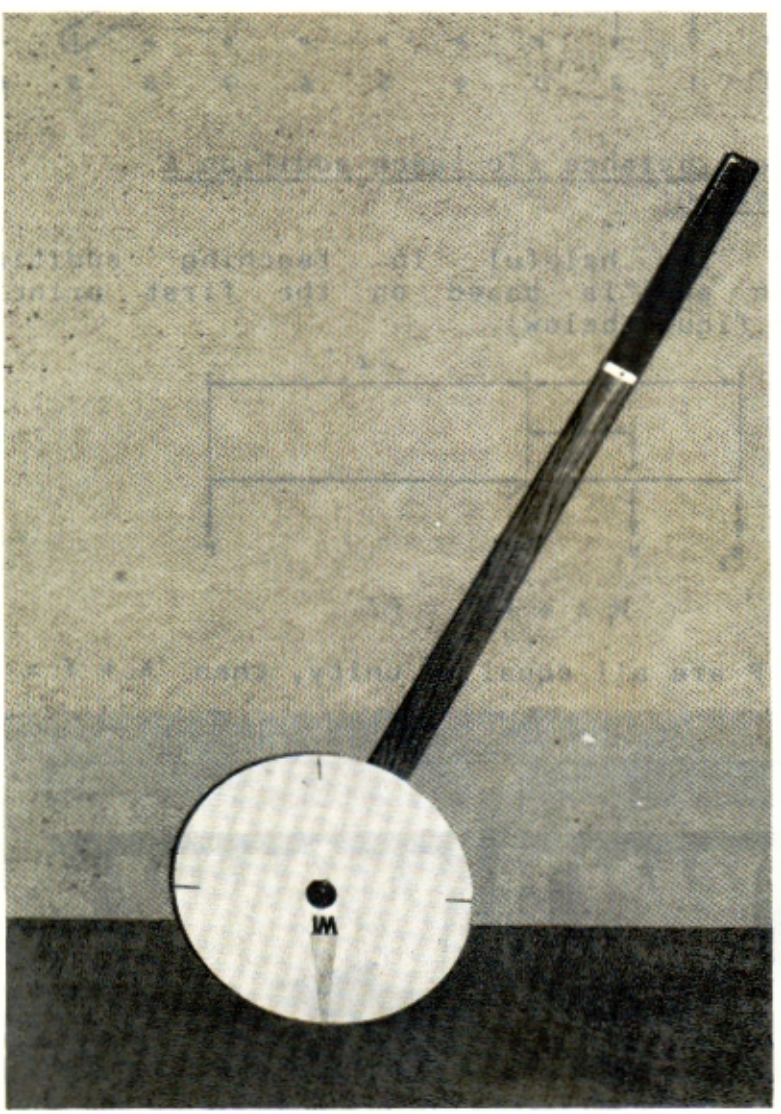
The balance is made of wood and curtain hooks. Weights are hung from the hooks and all of them must weigh the same. Any easily available component, for instance a washer, can be used as a weight. A wood or plastic pointer is fixed to a pivoting pin. The arm of the balance is marked from zero at the centre to 10, at a constant pitch, on either side. A curtain hook is fixed at each of these markings. The arm should be well—balanced when no weight is hung from any hook. The photograph here shows the addition 7 + 2 9.

If two weights are hung from "4" on one side, the balance equalises at 8 on the other side. Thus, 4 x 2 8.

5. Metre wheel (Measuring distance):

A wooden wheel of one metre circumference is fixed by a bolt and nut to a long wooden arm. The circumference is marked off in quarter metre segments. Children can push thIs wheel from one point to another, even along a zig-zag path, and measure the distance between the two points. Each complete rotation of the wheel covers a distance of one metre.



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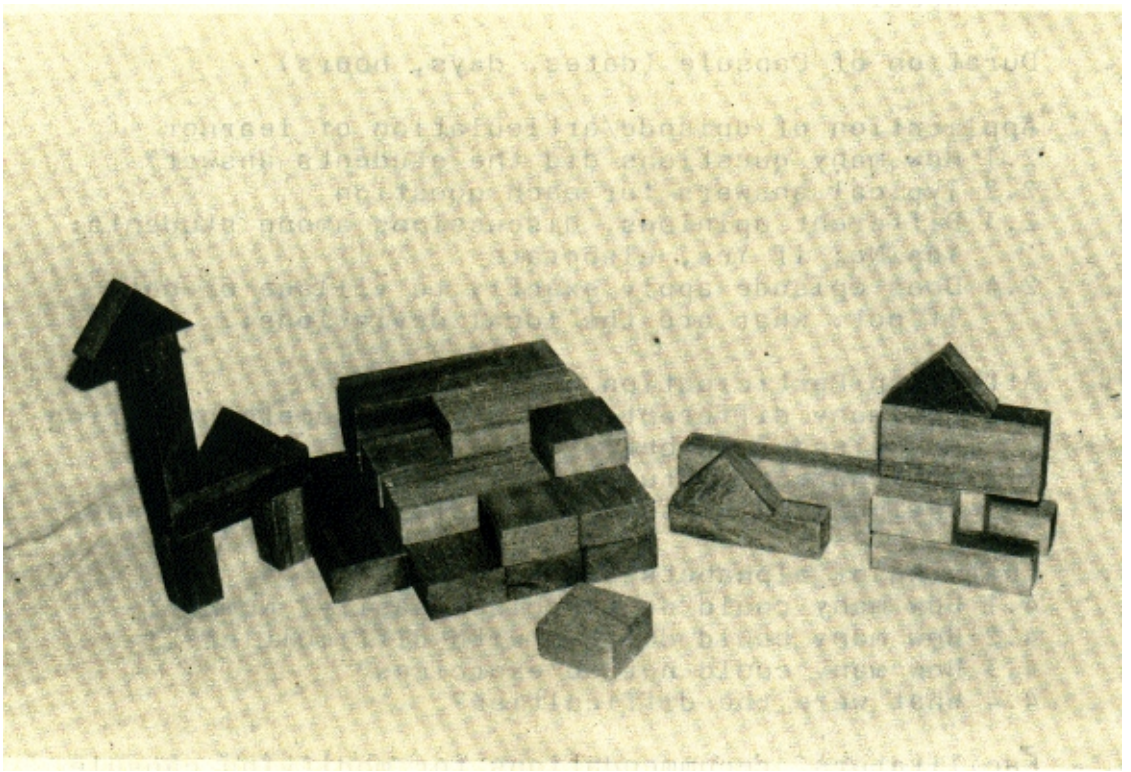
6. Building blocks:

These are small wooden blocks of different geometrical shapes. They can be used to create simple forms. – buildings, animals, patterns etc.



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Appendix 5 : CAPSULE EVALUATION FORMAT FOR TEACHERS

Evaluation Form

0. Attendance register (no. of students participating in capsule)

1. Duration of Capsule (dates, clays, hours)

2. Application of episode/articulation of learner
   2.1 How many questions did the students answer?
   2.2 Typical answers for each question
   2.3 Different opinions, discussions among students: Yes/No; if Yes, elaborate
   2.4 Does episode apply exactly to village or not? If not, what are the local deviations

3. Attention/Participation
   3.1 Flow many different students say something during an episode? Number:
   3.2 Are there any students disturbing the class, obviously disinterested, walking out? How many?

4. Learnfng of alphabets and arithmetic
   4.1 How many could do exercises easily? Number:
   4.2 How many could do them with difficulties? *
   4.3 How many could not do exercises?
   4.4 What were the difficulties?

5. Facilitators recommendations for modifying capsule, if any

Instructions for analysis of evaluation forms

Question No.	Analysis/Compilation
0	– Highest attendance, lowest attendance, average attendance (number of students) – names of 3 centres with highest and names of 3 centres with lowest attendance
1	- highest number of hours used for capsule, lowest number of hours used for capsule, average number of hours used for capsule – names of three centres with the highest number of hours, names of three centres with the lowest number of hours

* Only after more than three demonstrations or explanations by teacher

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Question No.	Analysis/Compilation
2.1	- highest, lowest and average number - names of centres with high and low numbers
2.2	- for each question, most common answer of all centres, on how many cases this is based, qualitative remark if necessary to describe degree of variation (similar, different, very different)
2.3	- In how many centres were different answers obtained? - In these centres, what was the average, the minimum, the maximum? – Qualitative remark: were these different answers based on different opinions, experiences, knowledge, understanding/intelligence or misleading questions?
2.4	– In how many centres does the story apply exactly, in how many does it not? – Describe deviations
3.1	– Convert in % then average, minimum, maximum, names of minimum centres, maximum centres
3.2	- Convert in % accordingly
4.1	– %, accordingly
4.2	– %, accordingly
4.3	– %, accordingly – Qualitative remark
5	– Summarize suggestions - names of centres which gave suggestions.

<<

APPENDIX 6

RESULTS OF EXAMINATIONS HELD **IN AUGUST 1985**

(Note: The exams were held for Class I, at the 20 NFPE centres opened in December 1983)

Subject	District	Frequency distribution under different marks-groups					Total no. appeared	Average marks (%)	Percentage above 29% marks	Highest marks recorded
		0-29	30-44	45-59	60-69	70 & above				
Language	Balasore	17	25	52	73	123	290	66%	94	88%
	Cuttack	4	3	2	11	27	47	70%	91	95%
	Pun	3	7	10	13	46	79	71%	91	98%
	Ganjam	4	3	2	9	43	61	74%	93	99%
Total		28	38	66	106	239	477	68.2%	94	99%
Environ–mental & Social Sc.)	Balasore	7	4	7	15	262	295	81%	98	100%
	Cuttack	1	1	3	0	42	47	80%	98	100%
	Pun	2	3	5.	9	59	78	77%	98	100%
	Ganjam	0	1	2	1	54	58	83%	100	100%
Total		10	9	17	25	417	478	80.5%	98	100%
Arithmetic & Geometry	Balasore	2	7	8	18	264	299	81%	99	100%
	Cuttack	7	6	7	9	18	47	60%	85	99%
	Pun	5	7	10	6	50	78	71%	94	99%
	Ganjam	4	3	1	8	45	61	75%	93	100%
Total		18	23	26	41	377	485	76.6%	95	100%

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APPENDIX 6a

RESULTS OF EXAMINATIONS AT NFPE CENTRES HELD IN AUGUST, 1986

CLASS—I (by district)

Subject	District	Frequency distribution under different marks—groups					Total no. appeared	Average marks (%)	Percentage above 29% marks	Highest marks recorded	No. of NFE centres participating in the examination
		0-29	30-44	45—59	60-69	70 & above					
Language	Balasore	10	6	34	42	88	180	66~2	94.4	98	14 out of 19
	Cuttack	4	4	5	7	24	44	63.8	90.0	97	4 out of 5
	Puri	2	5	14	10	63	94	749*	979*	100*	8 out of B
	Ganjam	3	5	17	19	50	94	68.8	96.9	96	7 out of B
Total		19	20	70	78	225	412	66.8	95.4	100	33 out of40
Environ—mental Studies (Science & Social Sc)	Balasore	—	2	2	6	170	180	78	100*	100*	14 out of 19
	Cuttack	2	1	2	1	37	43	82	95.4	100*	4 out of 5
	Pun	1	9	12	6	65	93	76.3	99	100*	8 out of 8
	Ganjam	4	1	1	4	83	93	86.6*	95.7	100*	7 out of 8
Total		7	13	17	17	355	409	80	98.3	100	33 out of 40
Arithmetic & Geometry	Balasore	2	2	3	6	169	182	84.2*	98.9	100*	14 out of 19
	Cuttack	1	—	1	5	36	43	79.7	97.7	99	4 out of 5
	Puri	—	3	11	7	73	94	78.7	100*	99	8 out of 8
	Ganjam	—	1	3	9	80	93	79.3	100*	100*	7 out of 8
Total		3	6	18	27	358	412	81.4	99.3	100*	33 out of 40

*Indicgte either highest marks or cent per cent

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APPENDIX 6b

RESULTS OF EXAMINATIONS AT NFPE CENTRES HELD IN AUGUST 1986

CLASS—Il (District—wise)

Subject	District	Frequency distribution under different mark groups					Total No. appeared	Average marks in %	Percentage above 29% marks	Highest marks recorded	No. of NFE centres participating in the examination
		0–29	30–44	45–59	60–69	70 & above					
Language	Balasore	11	35	68	61	160	335	64.3	96.8	94	19 Out of 19
	Cuttack	5	13	7	9	29	63	60.8	92.0	96	4 Out of 5
	Pun	1	6	16	7	41	71	70.5	98.6	97*	7 Out of 8
	Ganjam	–	1	7	9	28	45	73•9*	100*	96	5 out of 8
TOTAL		17	55	98	86	258	514	65.6	96.7	97	35 Out of 40
Environ–mental Studies	Balasore	1	5	21	18	289	334	83.8	99.7	100*	19 out of 19
	Cuttack	–	1	4	3	55	63	81.3	100*	96	4 out of 5
	Pun	–	2	10	10	49	71	73.9	100*	96	7 out of 8
	Ganjam	–	–	–	–	44	44	90.5*	100*	98	5 out of 8
TOTAL		1	8	35	31	437	512	82.7	99.8	100	35 out of 40
Arithmetic	Balasore	3	6	21	41	265	336	78.6	99.1	100*	19 out of 19
	Cuttack		1	5	2	55	63	84.8	100*	98	4 Out of 5
	Puri	–	2	10	12	48	72	75.9	100*	99	7 out of 8
	Ganjan	–	–	1	1	43	45	86.1*	100*	96	5 Out of 8
TOTAL		3	9	37	56	411	516	79.6	99.4	100	35 out of 40

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Appendix 7 PRIOR SCHOOLING OF STUDENTS AND THEIR PARENTS

S.No.	District	No. of NFPE centres	Total No. of students admitted	No. of students with prior school. ing	% of students with prior school back-ground	No. of learners whose parents completed primary school education	% of literate parents
1.	Balasore	19	**736**	**188**	**25.5**	**291**	**39.5**
2.	Cuttack	5	185	**18**	9.7	55	30
3.	Puri	8	234	Nil	Nil	60	25.6
4.	Ganjam	**8**	**404**	Nil	Nil	63	15.6

"Literates" are defined as those who have completed primary school education

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Appendix 8 : Enrolment of Learners at NIE Centres

Sl. No.	Name of village where the centre is located (Centres opened in Dec. 1984)	Name of district	Roll Strength (as on 1.1.1985) Boys	Girls	Total	Name of facilitators,' teacher as on 1.1.85
1.	Udaypur	Balasore	32	12	44	Mr Srimanta Kumar Das
2.	Krushnanagar		22	18	40	Ms Kalyani Panigrahi
3.	Chhanua		36	16	52	Mr Rabiridra Panigrahi
4.	Kasafal		14	17	31	Mr Premananda Patra
5.	Jagannathpur		16	9	25	Mr Sankarsan Pani
6.	Nuagaon		15	13	28	Mr Pradeep Kumar Sahu
7.	Dhanakuta		17	8	25	Mr Asish Kumar Sahu
8.	Pradyutnagar		16	9	25	Ms Menakalata Nayak
9.	Kerargarh	Cuttack	17	13	30	Mr Banamali Behera
10.	Birabhanjapur		14	15	29	Mr Ajay Kumar Sahu
11.	Kharanashi		14	13	27	Mrs Nibedita Bharatiya
12.	Sahana	Purl	22	7	29	Mr Daridra Narayan Senapati
13.	Penthakata (New)		12	13	25	Mr Biranchi Narayan Mishra
14.	Anakana		20	16	36	Ms Sanatan Behera
15.	Asijanga		16	20	36	Ms Prasanta Kumar Misra
16.	Kantiaqarh	Ganjam	25	12	37	Mr K Chintamani
17.	Gokhurkuda		22	5	27	Mr Asok Kumar Pradhan
18.	Ramayapatna		22	5	27	Mr Drupada Behera (on 1.6.85)
19.	Kuttur		37	—	37	Mr Krushna Chandra Behera
20.	Venkatraipur		24	15	39	Ms Vijayalaxmi Panigrahi
	Total		413	236	649	

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Appendix 8a : NUMBERS OF LEARNERS AND TEACHERS BY DISTRICT
(AS ON 31.7.86)

	Learners			Facilitators/teachers		
District	Boys	Girls	Total	Male	Female	Total
1. Balasore	401	175	576	18	1	19
2. Cuttack	79	64	143	4	1	5
3. Purl	100	90	190	4	4	8
4. Ganjam	180	48	228	4	4	8
Total	760	377	1137	30	10	40

APPENDIX 9 : TURN-OVER OF TEACHERS AND STUDENTS

	Turn—over of teachers						Turn—Over of students								
							Total admitted (No.)			Total dropouts (No.)			Dropouts (%)		Fluctu-ation (%)
District	Date of opening of centre	No. of centres opened	No. of facili–tators who worked upto 31.8.86	Ratio — teacher to centre (approx)	Time lapse (yrs)	Remarks	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	
Balasore	1983—84	11	20	2:1	2½	3 teachers in one centre in Barajdeuli	498	238	736	97	63	160	19.5	26.5	21.75
	1984–85		10	1:1	1½	2 teachers switched jobs for better prospects									
Cuttack	1983—84		4	2:1	2½	Job switch for better prospects	102	83	185	23	19	42	22.5	23	23.22
	1984–85	3	3	1:1	1½	No change									
Puri	1983-84			2:1	2½	Job switch for better prospects	125	109	234	25	19	44	20	17.4	18.8
	1984–85	4	8	2:1	1½	– do –									
Ganjam	1983–84	3	8	3:1	2½	In one centre 4 teachers worked and one centre had to be shifted	300	104	404	120	56	176	40	54	43.5
	1984–85	5	10	2:1	1½	Job switch for better prospects									
Total	1983–84	20	39	2:1	2½	Job switch for teachers training! better prospects	1025	534	1559	265	157	422	25.8	29.4	27
	1984–85	20	31	3:2	1½	Job switch for better prospects									

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APPENDIX 10

PROJECT PROPOSAL FOR ESTABLISHMENT OF

100 NON—FORMAL PRIMARY EDUCATION CENTRES

FOR MARINE FISHERFOLK CHILDREN IN ORISSA

Introduction

1. The literacy rate is lower in fishing communities of Orissa than in the neighbouring agricultural communities. There are approximately 30,000 children between the ages of 6 and 14 in coastal fishing communities of Orissa. Very few of them are touched by the formal school system as the formal curricula are not suited to the needs of the fisherfolk; timings are unsuitable; the number of formal schools are few and far off from the fisherfolk settlements.

2. Since 1983 the FAO under the Bay of Bengal Programme has been implementing in cooperation with the State Government a pilot project "Nonformal Primary Education for Children of Marine Fisherfolk" in the four coastal districts of Orissa. Under this project 40 experimental NFE Centres have been established, enrolling 1200 learners. 72 learning capsules equivalent to Class-I and II standards of formal school as well in-service materials for teachers have been developed. The existing facilitators and Marine Fishery Extension Officers have been trained. Examinations conducted at these centres have been found satisfactory.

The BOBP helped in developing the learning materials and their training out of the UNICEF grant. Besides, they have conducted required training courses and paid additional honorarium to teachers as well as contigencies for the NFE centres.

Objectives

3. The present proposal. aims at consolidating the programme and expanding it further with the help of a donor agency. It envisages the establishment of one hundred non-formal education centres (including the existing 40) during the five-year period commencing 1987—88. The 40 existing non—formal education centres would be built up in the first phase and the remaining 60 in the second phase. About 6300 children would be enrolled by 1981—82 of whom 4200 would complete the 2 years condensed programme of primary education, for qualifying themselves for the middle stage of

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education, while 2100 admitted in the last year will complete primary education later (Enrolment Scheme at Appendix - I). The special curriculum already developed by the BOBP would be utilised, besides developing more such capsules. A special system of examination/certification is also envisaged.

Subsequently the proposal may also encompass introduction of adult literacy to marine fisherfolk with the infrastructure thus established.

Financial implications

4. The total cost of the scheme is Rs 145.31 lakhs of which Rs. 136.99 lakhs is envisaged as the donor agency's participation, the remaining being the share of the State Government. A detailed abstract of the proposal has been shown as Appendix-II

Broadly speaking, the donor's participation is envisaged for construction of school building, cost of 10 Mopeds and other related expenditure for effective supervision of the scheme, honorarium to facilitators, cost of developing new learning materials and contingencies for non—formal education centres.

The scheme is proposed to be implemented as a special project under the State Fisheries Department with the required assistance being provided by the Education Department. The State Government will share operational expenses as well as contribute supervisory personnel from both the Fisheries and Education Departments. Besides, it would also ensure supervision of construction of buildings for the non—formal education centres and take responsibility for their maintenance.

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Appendix I

Enrolment Scheme. (No of students)

2 Year Course	40 Old Centres	30 New Centres to be Opened in 1989	30 New Centres to be Opened in 1990
1987–88	1200	—	--
1989–90	1200	900	
1990-91			900
1991-92	1200	900	
Total	3600	1800	900

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Appendix – II

Detailed cost of Establishment of 100 Non–formal Education Centres in Orissa

S1. No.	Particulars of Project Component	Agency that will bear the cost.	Unit Cost	1987–88 1st year Rs. im lakhs	1988–89 2nd year Rs. in lakhs	1989–90 3rd year Rs. in lakhs	1990–91 4th year Rs. in lakhs	1991–92 5th year Rs. In lakhs	Total for 5 years Rs. in lakhs
1	_2	3	4	5	6	7	8	9	10
1.	Cost of buildings	Donor Agency	Rs.80,000 per building	16.00	16.00	24.00	24.00		
2.	Supervisiom of School by extension wing of Fisheries Deptt. /TTI of Education Deptt.	–do–	Rs.150 per month per school	0.72	0.72	1.26	1.80	1.80	6.30
3.	Strengthening of SCERT Unit and Marine Exten-sion Wing of Fishery Deptt.	–do–	Details of staff salary as at Appendix–Ill	2.45	2.58	2.71	2.85	3,00	13.59
4.	Training of facilita-tors/Teachers.	–do–	Details at Appendix–IV	0.12	0.12	0.21	0.30	0.30	1.05
5.	Cost of 10 mopeds.	—do—	Rs. 7500	0.75					0.75
6,	Fuel and maintenance of mopeds	–do–	Details at Appendix–V	0.165	0.18	0.18	0.19	0.185	O.90
7.	Miscellaneous Expenditure including office contingencies both for SCERT and Fishery Deptt.	–do–	Rs.5000 each per year	0.10	0.10	0.10	0.10	0.10	0.50
8.	Honorarium to facilitators/ teachers.	–do–	Rs.400 per month per facilitator	1.92	1.92	3.36	4.80	4.80	16.80

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Appendix - II (contd.)

1	2	3	4	5	6	7	8	9	10
9.	Contingencies of N F P E centres	Donor Agency	Rs. 600/– per School per year.	0.24	0.24	0.42	0.60	0.60	2.10
10.	Printing of revised additional learning materials	–do–				7.50	7.50	–	15.00
		–do-	Total	22.465	21.86	39.74	42.14	10.785	136.99
11.	Cost of plots of land (in 10% cases @ Rs.10,000/— per acre).	State Fisheries Deptt.	@Rs.2500 per ¼ acre.	0.05	0.05	0.075	0.075		0.25
12.	Supervision of construction of school buildings,	–do	@Rs.1000 per building	0.20	0.20	0.30	0.30	–	1.00
13.	Incidental expenses of work sircars for school,	–do–	@Rs.1400 per school	0.28	0.28	0.42	0.42	–	1.40
14.	Maintenance of school buildings.	—do—	@1.5% of Capital cost.	0	0.24	0.48	0.84	1.20	2.76
		-do-	Total	0.53	0.77	1.275	1.635	1.20	5.41
15.	Establishment of furniture units and SCERT contingencies	State Education Deptt.		0.67 (for 40 schools)	0.67 (for 40 schools	0.68 (for 70 schools	0.89 (for 100 schools		2.91
			GRAND TOTAL	23.665	23.30	41.695	44.665	11.986	145.31

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Appendix – III

Strengthening of SCERT and Marine Fisheries Wing of the Fisheries Deptt.

1. SCERT

(i)	Consultants (two) in Class II OES Service @Rs 3,000 per month each	Rs 6,000.00
(ii)	Production Asst. (one) @Rs 1500/– per month	Rs 1,500.00
(iii)	Junior Stenographer (one) © Rs 1200/– per month	Rs 1,200.00
(iv)	Senior Assistant (one) © Rs 1200/– per month	Rs 1,200.00
(v)	Peon (one) © Rs 800/- per month	Rs 800.00
		Rs 10,700.00 x 12
		Rs 1,28,400.00

2. Fisheries Department

(i)	Asst. Director (Marine) Fisheries Extension (one) @ Rs 3000/– per month	Rs 3,000.00
(ii)	One Dy. Supdt. of Fisheries @ Rs.1500/– per mopnth	Rs. 1,500.00
(iii)	One Junior Stenographer @ Rs 1200/– per month	Rs. 1,200.00
(iv)	Senior Assistant (one) @ Rs 1200/- per month	Rs. 1,200.00
(v)	Peon (one) @ Rs 800/- per month	Rs. 800.00
		Rs 7,700.00 x 12
		Rs 92,400.00

Total (1) + (2)	Rs. 2,20,800
Add. D.A/ 11%	Rs. 24,288
	Rs 2,45,088
or say	Rs 2,45,000

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Appendix - IV

Training programme for facilitators/teachers

(a) Training programme for facilitators by SCERT - 10 days training once in a year and 5 days'evaluation programme – Total 15 days.

Facilitators will be paid extra honorarium © Rs 10/— per day for 15 days for 40 schools

Rs 10 x 15 x 40	Rs 6,000.00
(b) Training by Fisheries Extension Wing	Rs 6,000.00
Total for 40 centres	Rs 12,000.00
For 70 centres in 3rd year (40 existing + 30 new)	Rs 21,000.00
For 100 centres in the 4th year i.e (70 existing + 30 new)	Rs 30,000.00

Appendix V

Fuel and Maintenance of 10 Mopeds

	Fuel for 10 mopeds @ Rs 1500 each per annum	Maintenance charges of 10 mopeds per annum in Rs.	Total in Rs
1st year	15,000	1,500	16,500
2nd year	15,000	3,000	18,000
3rd year	15,000	3,000	18,000
4th year	15,000	4,000	19,000
5th year	15,000	3,500	18,500
Total.	75,000	15,000	90,000

ANNEXURE 1

THE ORISSA NFPE CURRICULUM: A DETAILED DESCRIPTION

Marine fisherfolk children in Orissa exposed to the BOBP's NFPE programme are expected to learn seven curriculum packages — three of them specially developed by B0BP for fisherfolk children, and four general NFPE packages developed by the SCERT. This Annexure describes the learning objectives of some of the modules and capsules.

Title of Package 1 – The Sea is Our Life

Title of Module 1.1 – We live by the seashore.

Learning objectives of Module 1.1

Language:

– To initiate children into systematic learning through meaningful. words preceded by familiar pictures and episodes that reflect real life situations.

– To introduce 18 of the 42 letters of the Oriya alphabet.

- To enable children to write 15 of these and read words made of all the 18 letters.

Arithmetic:

– To help students to learn counting, reading, writing and handling numbers upto 30; and

– To make students aware that the number ladder soars very high indeed, and is not limited to a hundred or a thousand.

General science – Children learn the Oriya names of some common birds, vegetables, fruits, trees, seafish, shells and animals;

– Oriya names of the waves, the sky, the sun, the moon, the sea and the stars;

- that the Sun rises in the east and sets in the west;

- that the earth is spherical; it gets light from the Sun; the Sun is much bigger than the earth and is situated far, far away from it; the earth being spherical, one half of it is lit by the Sun at a given point of time and hence day and night alternate as the earth revolves on its axis;

– some facts about the jute plants that grow in the courtyard of some homes in fishing villages and how the jute

fibre is made into threads and twine and used in fishing nets;

- the scientific reason for using floats and sinkers in gillnets.

Social Science

Children learn: - Some common relationships like father, mother, sister, brother, uncle (father's brother) and aunt (father's sister and uncle's wife);

- Household activities concerning what work their parents do, who cooks food, who handles money at home and outside; who helps mother in her work and who helps father in fishing;

- Some common customs at home and in the society;

- Problems of girls' education in the society;

- Helping neighbours in distress

Fishery Particulars:

They learn

- that boats and nets are used to catch fish in the sea;

- that Mala jalo is one of the fishing nets

- why fishermen use hats made of tender palm leaves;

- that barks of a particular tree are used for dyeing nets

(The module contains 12 capsules)

Title of Module 1.2 - Wego to the sea to fishing

Learning Objective of module 1.2

Language:

- to introduce all the 42 letters of the Oriya alphabet for recognition, reading and writing along with the matra AA (vowel "a" pronounced as vowel li or a)

Arithmetic:

- to enable children to count up to 100;

- to enable them to know what zero signifies;

- to enable them to master the skill of addition and

subtraction of two—digit numbers without carrying or bringing forward;

- to enable them to recognise all the Indian coins;

– to enable them to master the calculations involved in selling and buying fish; and

- to enable them to generate multiplication tables for 2 and 3 by the method of continuous addition.

General. Science:

- a year has twelve months and a month, thirty days;

– Oriya names of twelve months;

– wood logs are cut into planks with a saw for making a boat;

- planks are heated with fire from straw for bending them to the required size;

– oars are made of wood;

- coal—tar coating is applied to a boat to increase its durability;

– a heavy boat is easily moved to a distant place by rolling it over two logs of wood;

- names of different seasons in a year and their effects;

– 24 hours make a day and 60 minutes, an hour;

- Oriya names of the seven days in a week;

- a body heavier than water sinks and one lighter than water floats;

- a month has two lunar phases — a darker phase and a brighter one;

– the semidiurnal pattern of the tide and its connections with lunar phases;

– Oriya names of all the lunar days in a month;

– Oriya names of different parts of a day such as dawn, dusk etc.

Social Science: –

- the rites performed by a Brahmin and seven ladies before a new boat is launched;

– the importance of launching a new fishing boat on the auspicious day of 'Kartika Pournami' and its link with the famous "Balijatra" of Cuttack in Orissa;

– details relating to the festival of Balijatra;

– fishermens' belief that the sea and the fore part of a boat (stem) are the goddesses Ganga and Kali respectively;

– the need for recreation. The realisation of how leisure hours may be spent with the members of the family, friends and relatives;

– the need for visiting relatives and exchanging gifts;

– the need for confidence and understanding among crew members when a boat is out fishing.

Fishery particulars: They discuss the following with regard to fishing:—

– fishing boats, nets and their accessories;

– preparation for a fishing trip in the northern parts of Orissa;

– when to set out for fishing, and when to return ashore with the catch;

– the methods of fishing and hauling nets in the sea;

– the methodology of sharing sale—proceeds;

– the care taken to maintain boats, nets and accessories, after each catch and during fishing holidays;

– how to form a fishing team, collect money from each member and arrange for loans from banks; and

– importance of mutual understanding among the members of a fishing team.

(The module contains 12 capsules)

Title of Module 1.3 – Our Boats and Nets

Learning Objectives of Module 1.3

Language:

– to introduce four auxiliary letters and to enable children to read and write in Oriya with these auxiliary letters;

– to enable students to read and write words and sentences

using signs of all the ten vowels of the Oriya language;

– to enable students to recognise 13 compound letters and master the skill of reading and writing them;

Arithmetic:

– to enable students to learn methods of counting beyond 100 and up to 1000 and master the skill of writing three–digit numbers and handling them in adding and subtracting without carrying and bringing forward;

– to enable students to multiply and divide by a one–digit number;

– to enable them to solve problems involving weights such as kilogram and quintal, linear measures like metre and centimetre; monetary transactions; and

– to enable students to calculate the profit or loss in a transaction.

General Science: –

They learn the following:–

– a triangle has three sides while a rectangle has four sides;

– recognising the shape of a circle;

– about a silk–cotton tree;

– recognising the shape of a cylinder, a cone and a rectangular parallelopiped;

Social science: –

They get to know the following :–

– there are 13 districts in Orissa of which four — Balasore, Cuttack, Pun and Ganjam — are situated on the Bay of Bengal coast; for fishing purposes, the coast is divided into northern and southern parts;

– some important rivers of Orissa that flow into the sea;

– reading a map and making out directions from a map and from a place;

– Andhra Pradesh and West Bengal are Orissa’s neighbouring states;

– names of different vehicles for transportation and recognizing them from pictures;

– Pun is famous for the Jagannath temple;

– different industries at Choudwar in Cuttack——an.d some facts about Chilka lake in Orissa;

– the pearl, the precious stone, is collected from shells in the sea; artificial pearls can be obtained by culture;

– Paradip is a big port in the State of Orissa; and

– some general facts about the fishermen of Orissa and how different they are in the northern and southern parts of Orissa.

Fishery Particulars:

Students get scope to discuss the following:

– craft, gear and mode of operations of fishing with the Behundi net, Jangal Jalo and Sarini Jalo . and their accessories in the northern part of Orissa;

– craft and gear with mode of operations of fishing with Kilumala net, Kabala net, Irgali net, Marala net, Barajalo hand lines and longlines in the southern parts of Orissa;

– some special features of a kattumaram and a masula boat;

– distinguishing features of craft and gear of the southern and northern parts of the Orissa coast.

– the reasons for making kattumarams from light logs;

– why a fisherman going for fishing on a kattumaram puts a fisherman's hat on;

– why coal—tar coating is not applied to kattumarams;

– why sal wood is not used in a masula boat or in a kattumaram;
(The module contains 12 capsules)

Title of Package 2 – Our Family And Community

Title of Module 2.1 – Our Festivals, Practices and Beliefs.

Learning Objectives of Module 2.1

Language:

– to enable students to master better reading and writing skills with 26 additional compound letters of the Oriya lanugage;

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– to enable them to learn the traditional method of division and the method of dividing money into several shares up to 10; and

Arithmetic:

– to enable them to add, substract, multiply and divide using decimal points for rupee and paise, kilogram and gram, quintal and kilogram, metre and centimetre, etc.

General science:

They learn the following:

- a lamp needs air for burning;

- various harmful germs induce various types of ailments;

– these germs are tiny objects which can be seen only through a microscope;

- doctors examine the sputum, stools, blood and urine to identify the germs that cause ailments in the body and treat the patient accordingly;

– one should take care of one's personal cleanliness to keep diseases away;

– precautionary measures against diseases;

- animals too die if proper measures are not taken and diseases are not treated by veterinary doctors;

– how to use a common balance to weigh objects; and a litre container to measure liquids.

Social science:

- to make the children aware of the festivals and festivities in their communities;

– to make them aware of undesirable superstitions and beliefs that hinder their progress towards better living;

– in a crowd one should be cautious and behave in an orderly manner;

- during the Holi festival, one should behave in a decent way and should not harass people unnecessarily;

– Ganga puja, performed on Thursdays by fishermen, emboldens them to face the hazards of the sea. It cannot assure them a better catch or a better life if the worshipper stops fishing;

- cleaning of houses and their surroundings during festivals is a good thing but this should be done not just during festivals but regularly;

- there is no difference between a boy and girl as far as doing simple household jobs is concerned;

- during festivals and festivities one should be economical and should not spend beyond one's limit;

- like Hindus, Christians too pray in the churches on New Year's day for a happy and prosperous life;

- the English names of the months;

- those who cheat with a weighing balance are dishonest but they are not visited by instant punishment, such as a disease or an ailment.

- about health clinics and hospitals;

- diseases are not caused by the evil eye; illness cannot be cured by amulets;

- a married lady without children has no "evil eye" that spells danger for children in the pink of health;

- one should take care of one's money, whether one is poor or rich;

- a child should earn his or her pocket money, and should not depend wholly on the parents;

- how to earn pocket money by forming a team and carrying out small tasks

- ignorance of cause and effect and lack of information are responsible for the "evil eye" bogey, which makes one a prey to charlatans

- how fishermen live in fishing camps and lead an organized life; and

- the festivals of Dolajatra, Chaitra Purnima, New Year's Day, Kartika Purnima.
The religious rites performed to launch new nets, and to invoke divine blessings for good catches.

(The module contains 12 capsules)

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Title of Module 2.2 – Our Family Life

Learning Objectives of Module 2.2:

– to enable students to improve their reading and writing ability with 21 additional compound letters of the Oriya language, and to comprehend matters written in Oriya;

– to enable them to divide rupees and paise into parts not more than 10; to solve problems of weights like quintal, kilogram and gram with the four rules of arithmetic; to handle numbers up to 100,000; to calculate profit and loss and the area of a rectangular field.

General Science: -

They learn the following:

– food is the source of energy for the body;

- Arabic numerals and the method of writing dates according to English calendar;

- what causes Malaria;

– how rain is caused; and

– maintaining accounts of daily income and expenditure

– identifying 100-rupee and 50-rupee notes.

Social Science:

– to educate children about family life and its responsibilities ("family" sometimes includes their grandparents, uncles, aunts and cousins);

- to make them aware of hurdles in the way of a better and happier family life;

– co—operation of all members of a family is required for its economic welfare;

– when a female member does paid work in addition to doing household work, everybody in the family should be sympathetic and try to help her in household chores;

– younger children in the family imitate the older ones and so the elders should try to be a model in all respects;

- women in the fisherfobk community perform different types of work differently in the northern and the southern parts of Orissa, but all of them aim at improving the lot of their families;

– it is wise to hand over money for household management to the wife; there should be mutual understanding between husband and wife in all financial matters;

- women should have a say in all important family matters;

– happiness in a family depends largely on good relations between a husband and his wife;

- serious family problems should be solved through discussion among all members;

– it is safe to deposit money in a bank or post office; women should know how to open an account, deposit or withdraw money from a bank or post office;

- one should be systematic and regular about repaying bank or government loans;

– for a fisherman, fishing craft and gear are more valuable than ornaments;

– it is always advisable to consult elders in a family before embarking on new enterprises;

- one should take care of one's parents when they grow old;

– using mechanized boats for fishing is profitable;

– when one earns one avoids the embarrassment of depending on relatives;

– the distinctive features of a joint family and a nuclear family;

- a person determined to earn can find ways to do so; one can fight and overcome hardship;

– it is more dignified to earn money, even through manual labour, than to ask for charity;

– industry begets prosperity;

– it is better for parents to give their daughters a permanent source of income, than to waste money as dowry;

- how shrimp and prawn farming can be taken up as a profitable small–scale enterprise;

(The module contains 12 capsules)

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Title of Module 2.3 – Our Community and Society

Learning Objectives of module 2.3:

- to tell children about their community, which makes a valuable contribution to the society at large;

- to enable learners to get some idea about the extent of fishing done in India; to make them aware that there are marine fishermen all over the world; that many of them are richer than Indian fishermen because they have adopted modern fishing techniques;

- a bright and prosperous future beckons fisherfolk communities in India if they too accept modern methods;

- to impart knowledge on how improved communication and transport facilities in our country in recent times have increased aspirations for a better tomorrow; how education, co-operation and fishery co—operatives can help fulfil these aspirations and ensure better living conditions for the community;

- to demonstrate how a particular community cannot exist in society without the right kind of interaction with other communities, and how no community is either inferior or superior to any other in a sociey.

General Science and Mathematical Concepts:

The learners get to know the following:—

- the idea of simple fractions;

- 100 quintals make one metric ton;

- the method of adding and subtracting weights in metric tonnes;

- different liquids are measured in different litre containers;

- 1000 millilitres make one litre; and other measurements in the metric system;

- various postal transactions, and arithmetical calculations;

- calculations for sending parcels by rail;

- how accounts of a co—operative society are maintained;

- reading time from a clock; and

- to recognize different solid bodies from their shape.

Social Science: They get to know the following:-

- three-fourths of the earth's surface is covered with water;

- ten states in India are situated on the sea coast of which five are on the west and the remaining, including Orissa, on the east of India; the Bay of Bengal lies to the east, the Arabian Sea to the west and the Indian Ocean to the south of India;

- two—thirds of the total catch in the west coast comes from motorized fishing boats whereas in the east coast only one-third of the catch comes from motorized fishing; in Orissa, the figure is even lower;

- fishermen supply an important and nutritious item of food; food, clothing and shelter are the prime necessities of life;

- better communication and transport facilities in recent times have helped move fish quickly from the landing sites;

- the important roads and railway lines passing through Orissa and the mode of transporting fish to different places;

- the postal system, and how it helps in the quick disposal of goods and disbursement of dues to fishermen and traders;

- to derive the maximum profit from fishing, a fishery co-operative can be useful. If properly organized, it can ensure the highest returns on investment; also, that the major chunk of the profit is not swallowed by middlemen or traders;

- for better understanding the trade and business of fishing, one must be educated so that one is not exploited; and

- for a better life in society one should choose the right leaders who can ensure various amenities and privileges.

(The module contains 12 capsules)

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Package 3 : Marine Ecology and Fisheries

(Developed by BOBP)

Module 3.1 : Environment

Capsule 1 : Madhab learns about the land and the sea

Learning Objectives:

To enlighten students about the land and the aquatic environment and the differences between them.

They learn:

- about their own environment and the aquatic environment; and
- and about aquatic animals.

Capusle 2 : Sanai learns about living and non-living creatures

Learning Objectives:

- to enable students to recognize the differences between a living and a non-living object.
- to enable them to identify living and non—living objects in their environment and compare the two.
- to enable them to realise that living objects eat, move, reproduce, respire, protect themselves from danger and die.

Capsule 3 : Bishi acquaints himself with temperature and light

Learning objectives:

- to enable students to understand how light and temperature influence life in the sea, and to appreciate that the sun heats up the sea water which in turn causes changes in the weather.

They will learn

- how light is split into seven colours to form a rainbow when it passes through moisture in the atmosphere;
- only the blue and green components of white light penetrate through sea—water;
- this light does not reach beyond the upper layer of the sea and as a result plants can live only in this region and marine life is mostly found in this layer;

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- temperature affects fish production, survival of baby fish, their growth and fish migration as different animals require different temperature levels; and

- the reason different animals are seen in different seas and in different regions of the sea.

Capsule 4 : Surama learns about salinity and pressure

Learning objectives:

To make learners understand

* how marine animals live in the sea;

* how water columns exert pressure;

* how dissolved gases like oxygen and carbon dioxide play an important role in the lives of organisms inhabiting the sea.

They will learn the following:

- marine animals remain in the sea because they need saline water for surival;

- different species need different levels of salinity for survival;

- some marine species live at river mouths because they can withstand less salinity;

- the reasons why sea water is saline;

- the higher a water column, the greater the pressure exerted by it;

- fishes absorb oxygen from the water through gills;

- plants in water give out oxygen while producing food using carbon dioxide and sunlight, and this oxygen is utilised by the marine animals;

- plants consume the carbon dioxide released by animals during respiration.

Capsule 5 :The seabed

Learning Objectives:

- to make children understand that the seabed that is hidden under a large quantity of water has hills, mountains, volcanoes, plateaus, depressions and plains — just as on

land, the differences between these features on the seabed and on land.

They will learn the following

- different zones of the seabed and their names;
- the seabed does not come in contact with rain or wind and hence it remains unchanged;
- erosion in the seabed takes place mainly due to ocean currents;
- the portion from the shore upto 180 metres depth is known as continental shelf;
- off Orissa coast, the continental shelf is narrowest off Ganjam at about 40 km from the shore, whereas it is the widest off Balasore with a width of about 200 km;
- the depth from 180 metres to 1500 metres forms the continental slope;
- the materials carried from the land slip over the continental slope to reach the deep areas of the ocean, and those accumulated materials form a berm below the continental slope;
- the deep ocean bed starts after the continental slope; its depth ranges from 3500 metes to 5500 metres and is known as the abyss;
- in the deep ocean floor there are hills, mountains, basins, volcanoes, and deep trenches;
- the Marina trench in the Pacific Ocean is the deepest trench on earth and its depth is 10,500 metres;
- **sea** plants are normally seen over the continental shelf and on the hidden hills and mountains;
- the reasons for deep seabeds being rocky and barren;
- how corals grow and form coral islands or coral reefs in the continental shelf;
- there are coral islands and reefs in the Andaman, Nicobar and Lakshadeep areas of India;
- deep sea water is generally ‘cold but shallow waters are warm;
- most of the continental shelf areas contain mineral oils and they are extracted by digging deep wells in these areas, as is being done in the Bombay High region for petroleum;

- mineral oil extraction is being attempted in the Mahanadi basin;

Module No 3.2 :Primary Production

Capsule 1 :Plants, the primary producer of food

Learning Objectives:

To explain through experiments how plants prepare food in their leaves and, in the process, release oxygen into the atmosphere. Children will learn the following:

- plants are called primary producers; animals cannot prepare food for themselves unlike plants;

- carbon dioxide, water and nutrients are essential ingredients for preparing food in the leaves;

- plants prepare food from these ingredients with the help of energy from the sun; in the absence of sunlight plants cannot prepare food;

- while preparing food, plants release oxygen which we need for our life;

- plants store excess food in the leaves, stems, fruits and roots which we eat for our food;

- plants are our important friends and we should preserve trees and saplings.

Capsule 2 :Phytoplankton and Zooplankton

Learning objective:

- to enlighten learners on how tiny living organisms like phytoplankton and zooplankton support the lives of sea animals.

They will learn the following:

- there are tiny plants called phytoplankton and tiny animals called zooplankton;

- phytoplankton supply food to zooplankton and oxygen to the sea;

- phytoplankton are primary producers of food while zooplankton are primary consumers of food;

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– phytoplankton are the main plants of the sea (seaweeds grow only in the shallow regions of the seabed where sunlight reaches; such shallow regions are very few compared to the vast area of seabed);

– phytoplankton are so small that they are almost invisible to the naked eye

- nearly 20,000 phytoplankton can be found in just a drop of water; they have strange shapes which do not resemble any land plants;

- the colour of sea water changes from blue to either red or green because of the predominance of phytoplankton of that colour;

- phytoplankton absorb carbon dioxide and nutrients from the sea water through their body walls and prepare food with the help of sunlight and release oxygen into sea water;

– phytoplankton store food in their bodies as they do not have leaves like land plants;

– phytoplankton float on the surface in the sea where they get sunlight to prepare food;

– phytoplankton slowly sink down to layers where sunlight is no longer available; as a result they die for want of food;

– nearly all phytoplankton have a type of hard skeleton (unlike land plants) which sinks down to the seabed to form a layer of mud on the ocean floor; this layer is known as ooze.

– it has taken millions and millions of years for ooze to be formed; nutrients are released from this mud, a process that has continued since the beginning of life;

– zooplankton consist of early larval stages of molluscs, crabs, prawn, fishes and minute marine animals;

- zooplankton are slightly bigger in size than the phytoplankton

– all zooplankton can swim, and can go up and down in sea water; usually they remain at the surface during night and sink as the sun rises and the water b comes hot; they remain at the deepest zone at noon;

– zooplankton live on phytoplankton and other tiny animals of the sea.

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Capsule 3 :Food chain

Learning objectives:

To enable children understand that the food prepared by phytoplankton passes on from one organism to other, while the nutrients released from the dead and decayed animals are collected by the phytoplankton for food; this way, the cycle goes on.

They will learn the following:

- phytoplankton first prepare the food which then passes to different animals;
- animals are incapable of preparing food themselves; they meet their demands by feeding on plants and other smaller animals;
- zooplankton feed on phytoplankton;
- small fishes live on zooplankton and, in turn, become the food of big fishes like sharks, perches, croakers and seer fishes, and finally these big fishes become the food for whales or men;
- those who escape being eaten die and are subject to decay; they release nutrients for phytoplankton; and this process is known as the food cycle;
- the food cycle exists on land just as it does in the sea;
- on land, it begins with the grass that prepares food for itself; the grass is eaten by animals which in turn are eaten by other big animals, and the nutrients released by the dead animals again help feed the grass.

Capsule 4 : Food Chains and Food Web

Learning objectives:

To enlighten learners on how the life process is continued by the energy stored in food, and that energy is reduced during transmission of food through different steps.

They learn the following

- animals cannot synthesize food, and so they depend directly or indirectly on plants for food.
- without food, the life process ceases and animals die;
- animals live where food is available;

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– the sun being the source of all energy, plants utilize that energy for preparing food; animals can convert the food they eat into energy; hence sun's energy is transmitted to animals in some form or the other;

- the process of an organism eating and being eaten by another is known as the food chain — which we see on land as well as in the sea;

– the amount of energy consumed by phytoplankton is not passed on in its entirety to the shark in the sea; a similar reduction of energy is seen in land animals too;

- in the sea the quality of energy collected by big fishes is less than it could be if they collected energy directly from phytoplankton; they have to extract energy from those who consume phytoplankton or zooplankton;

- the food chain consists of a few links of organisms, whereas a food web describes how all organisms within a certain area obtain food or energy; within a food web many food chains are connected with each other and these interconnections look like a cobweb; this is seen both on land and sea.

Module 3.3 : Climate and Currents

Capsule 1 : Winds and their effects

Learning objectives:

To make children understand how wind and air affect weather on earth and sea.
They will learn the following:

– though we cannot see air, we can feel its movement; this movement is known as wind;

- when air gets heated it expands and becomes lighter; the surrounding air being cooler and heavier, pushes the lighter warm air upward; this process causes the wind to blow;

– the sun's rays heat the land, and as the air over it also gets heated, it rises up and causes the surrounding air to move in as wind;

– a slow wind is called a breeze and a stronger wind a cyclone or a gale;

- day times are warm while night times are cooler, but at different places and at different periods of time, temperatures vary causing the wind to blow from one place to another;

- in the afternoon, cool air from the sea moves towards the land – as the land gets heated more quickly than sea water; the wind blowing from the sea is known as sea-breeze.

- in the night, due to the absence of 'sunshine, wind from land blows usually after midnight towards the sea as land cools faster than sea water; the wind blowing from land is known as land breeze;

- the earth is spherical, and the imaginary horizontal line dividing the earth into two equal halves (north and south) is called the equator while the upper and the lower tips are called the poles;

- the equatorial region is hotter than the polar region and this causes wind to blow from the polar region towards the equatorial regions;

- the air never moves straight from the poles to the equator because the earth spins from west to east and this spin changes the direction of the wind to south-west or north—east;

- a wind is named after the direction from which it blows;

– air exerts pressure; the warmer the air, the lighter it becomes and less pressure it exerts, and vice—versa;

- wind blows from a high pressure to a low pressure zone.

Capsule 2 :Savitha gets to know about the surf and tides

Learning objective:—

To enable students understand what waves and tides are and how they are caused;

They will learn the following

– surface water, when it comes in contact with a moving current of air, crumples and forms a number of undulations; these undulations are known as waves;

- the highest point of a wave is known as the crest while the valley between two crests is known as a trough;

– during a strong wind or storm, waves become furious and attain great heights;

– the rise and fall of the water level is known as tide; tides have a semidiurnal pattern;

- how tides occur and how the gravitational pull of the moon on the sea water on earth's surface causes high tide and the

water swells up; how low tides occur;

- the duration between one high tide and one low tide is approximately six hours, and that between two high tides is approximately 12 hours; the tide does not occur everyday at the same time but is advanced by 52 minutes every day;

- spring tide and neap tide; why water rises to the maximum height during full moon and new moon days, and a minimum on the. eighth lunar day.

Capsule 3 :Summer and the summer monsoon

Learning objectives:

To enable students to understand how the summer monsoon occurs and how it affects life on earth and on sea

They will learn

- seasonal change in the wind is known as monsoon;

- how and why a summer monsoon blows;

- the movement of air from the sea towards the land in summer is known as summer monsoon;

- that summer starts from the month of April in India, and by the beginning of June the low pressure belt over the northern part of India causes the wind to move from the oceanic high pressure belt of the Arabian Sea, the Bay of Bengal and the Indian Ocean that surround India;

- the summer monsoon is also known as the south-west monsoon as it blows from that direction;

- the south—west monsoon carries water vapour that rises from the sea in summer and causes rain; that this brings summer rains to different parts of the country;

- greater rainfall occurs in the areas of high hills and mountains because they obstruct the summer monsoon;

- the summer monsoon hits the western ghats, the eastern ghat hills and the Himalayas and causes heavy rainfall in the adjoining areas; it rains more in the coastal areas.

Capsule 4 :Winter monsoon and cyclones

Learning objective:—

To make the learners understand how the winter monsoon sets in and how cyclones are caused

They will learn

– winter monsoon sets in by the month of November;

- it starts blowing in our country from north—west India towards the Bay of Bengal but it changes its direction to north-east because of the strength of other winds that blow over the Bay of Bengal; and hence the winter monsoon that causes rains is known as north east monsoon;

- this wind collects water vapour from Bay of Bengal and causes heavy rainfall over Tamil Nadu and Sri Lanka.

– cyclones develop due to an intense low pressure in a certain area;

- during a cyclone, wind blows very fast and changes direction;

– tropical cyclones originate over the sea, shift towards the land mass and break over there;

– fishermen and other people are warned before a cyclone comes as it is dangerous to go out for fishing during that time.

Capsule 5 :Ocean currents and upwelling

Learning objective:

To make children understand how currents and upwelling occur in the sea and what effect they have on the fish population.
They will learn the following:

– the flow of water within the ocean is known as current;

- currents are caused because of variation in density, temperature and salinity in the sea-water;

– currents develop due to the differences in the density of water; winds help in carrying the currrents;

– because of heat, there will be an excess of evaporation and salinity will increase;

- near the equator salinity does not vary much because of heavy rains in the area but that is not the case near the tropics; hence the salinity is high near the tropics; the upper sea water .which becomes very hot becomes less dense; this causes the upper warm sea water to float over the lower cool water of higher density and is carried by wind, causing warm sea currents;

- the warm current flows towards the cooler region and as it gradually comes in contact with cold water it gets cooled; but when the density of the surrounding water becomes high it cannot float; it sinks down and as a result the water below comes up;

- once the upwelled water comes up it is carried by wind and it flows as a cold current;

- the sinking dense water reaches the sea–bed and accumulates; the accumulated water flows near the bottom of the seabed, and this current is known as an undercurrent;

– the rising of sea water up from the lower level of the sea to the upper level is known as upwelling; due to the process of upwelling nutrients deposited on seabed are carried upward;

- currents normally move a little away from the coast, and so the shallow areas of the seabed do not get nutrients from currents but from the effects of upwelling;

- when wind moves parallel to the coast and gets diverted towards the sea, it drags the sea–water from the coast, causing water shortage near the coast; but water from the lower level comes up to fill the shortage and upwelling develops in the shallow region; this upwelled water is cool;

– in the areas of upwelling, as nutrients are available in plenty, there is luxuriant growth of phytoplankton and consequently a higher fish population;

- in India there are three upwelling areas, of which the most important and intense area is the Malabar coast in Kerala, the richest fishery area in India; the other two are off Orissa coast and off Andaman Island; these two areas too have rich fishery potential;

– there is great scope for developing marine fisheries off Orissa because of the existence of this upwelling area.

Module 3.4: Life cycles of marine species

Capsule 1 : Jagu learns about prawns

Learning objectives:

To describe the life cycle of prawn, a very important economic marine species, and to elucidate how prawn farming can be taken up for better profit by fisherfolk.

They will learn the following:

– prawns are not fish and belong to a group which does not

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have a backbone but only an external shell;

– the physical features of a prawn;

– in India prawns are caught in the three ways – by traditional fishing with kattumarams and gillnets, by small mechanised boats and by trawlers;

– prawns develop a new external skeleton at regular intervals and shed the old one; the process is called moulting; during moulting prawns remain buried in the mud to escape from enemies; moulting takes place during night time;

– prawns live on debris and the flesh of rotten animals, but during their younger stages they live on zooplankton;

– prawns are demersal species and remain hidden under the mud but keep their eyes over the ground level and as soon as food particles come into view they jump up and swallow them;

– the female prawn is slightly bigger than the male and the female prawns keep the eggs in their abdomen; mature prawns migrate to deeper regions and release eggs and the eggs, get fertilised;

– the different stages after fertilisation are known as nauplius, zoea and mysis; during mysis, the prawn gradually drifts towards the shore and enters estuarine waters as a 'larva'; the entire larval period is completed in about two weeks, after that it becomes a young prawn called the "juvenile" which has almost all the features of adult prawn.

– these juveniles enter estuaries, brackishwaters or a lake, swim freely and eat plenty of zooplankton;

– after 4 or 10 months they return to the sea and attain maturity;

– it takes 6 to 10 months for a prawn to attain maturity;

– each female prawn produces between 30,000 and 700,000 eggs.

– the full life span of a prawn is three years but a majority of them are caught before they reach that age;

– prawns in abundant quantities are found in the east coast from December to August but in Orissa from July to February;

– prawns are a delicacy and have become very costly as we earn money by exporting to foreign countries; from Orissa coast, prawns are exported to Japan and America;

– there are freezing plants at Balugaon, Puri, Bhubaneswar and Paradip;

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– prawns are deheaded and mixed with ice before they are sent to these freezing and processing plants; the headless prawns are divested of their shells, de–veined and thoroughly washed and then frozen in cartons; these deep—frozen prawns are exported;

– for increasing production we should take up prawn farming and there is good scope for both farming and culture of prawn;

– we have plenty of area for the culture of prawns in brackishwaters in the coastal sector; at present we are utilising only a sixtieth part of the available area for prawn culture;

– for scientific methods of prawn farming, we should learn the technology necessary -- preparation of pond, proportionate stocking of the pond with baby prawn, eradication of predators, sufficient time for growth, periodic monitoring and effective management;

– annually two harvests of prawns are possible to an extent of 800 kg per hectare, giving a net profit of about Rs 8,000 per year;

– commercial banks and other government financial institutions offer loans for encouraging prawn farming.

Capsule 2: Jaggayya learns about sharks

Learning objectives:

To enlighten learners about the life cycle of sharks, an important fish variety caught in large quantities off the Orissa coast.

They will learn the following:

– sharks and rays are different from other types of fishes and can be easily identified from among other fishes caught from the sea;

– the external and morphological features of sharks and rays;

- sharks are caught with large mesh gillnets and longlines; smaller sharks are caught close to the shoreline;

– about some important varieties of sharks;

– sharks eat small fishes, snails and molluscs;

- sharks have great olfactory powers and can smell food

from quite a distance;

- big sharks are dangerous since they attack human beings;

- sharks remain in warmer waters and do not lay eggs like other fishes – fertilization is internal; female sharks give birth to young ones; female sharks take 8 to 10 years to reach maturity and to breed; females release some 10 to 20 young ones at one time; young sharks look exactly like their parents;

– the mother shark does not take care of her young ones but eats her children; so soon after the young ones are born they go far away from their parents in search of food;

– young sharks eat plankton that float on the surface;

– sharks are very useful to mankind; their fins are a delicacy, their flesh is used as a nutritious food and the oil extracted from their livers, known as "shark liver oil", is used as a medicine which is rich in vitamins A and 0.

Capsule 3 :Bijaya learns about Hilsa

Learning Objectives:

To enlighten learners on the life cycle of hilsa, a very important fish caught abundantly off Orissa coast, and on how hilsa help us in our economy.

They will learn

- that hilsa is caught in large quantities in India from the rivers that flow into the Bay of Bengal because these fishes migrate from the sea to the river waters for laying eggs;

- that the hilsa is an important economic catch of fishermen in the northern part of Orissa;

– that hilsa move generally in schools of about 1000 to 1500 fishes together;

– about the external features of hilsa;

- that a hilsa does not have teeth, hence it does not take other fishes as food; but- it can strain microscopic food with the fine set of rakers on its gills; that it eats plankton and microscopic plants and animals that float in the water; that a hilsa is a fast growing fish;

– that hilsa migrate into freshwater or into less saline water for breeding; and that during this period, when they enter the rivers they are caught;

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- that the hilsa lays from 100,000 to 2,000,000 eggs; that all do not get fertilised; some eggs are destroyed and some are eaten by other animals;

- that after the eggs are hatched out the newborn fish remain in fresh water for 4 to 5 months; and that when they grow to about 6 inches long they again migrate to sea for further growth; that when they are about a year old and become about a foot long they come back to the rivers for breeding; that a hilsa has two spawning seasons, one during June - October and the other during December - March;

- that the young hilsa get food abundantly from the river mouth;

- that the young hilsa looks exactly like the adult but is smaller in size;

- that hilsa is considered a delicacy by all fish loving people in India and hence commands a high price;

- that hilsa is also caught from Chilka lake in Orissa though it is a different variety just as other riverine varieties of hilsa are different from each other.

Capsule 4 :Raju learns about Mackerels

Learning objectives:

To explain the life cycle of mackerel, an important economic catch off Orissa coast, and how mackerel catches help the fisherfolk

They will learn the following:

- the mackerel is considered an important catch in the southern part of Orissa as is hilsa in the northern part;

- the Indian mackerel is caught in large numbers off the southern coast of Orissa;

- the body features of mackerel;

- the mackerel starts its life from an egg laid by female mackerel and is subsequently fertilised; each female mackerel lays about 90,000 eggs in one season of which the majority are destroyed ; . the egg laying period is from October to April;

- a newly hatched larva is about 3 mm long, which during the course of next few days grows into a juvenile fish of about 5 cm length and resembles very much the adult fish;

- the juveniles form schools and feed on both phytoplankton

and zooplankton;

- mackerels attain maturity when they are about a year old and grow to about 22 cm length;

- mackerels are found in the upper and middle layers of the sea water;

- female mackerels go about 15 to 45 km away from the shore to lay eggs, and the male mackerels while swimming over the eggs release the sperm thus effecting fertilization——an example of external fertilization;

- mackerel fishery is one of the important fisheries of India and the catches have ranged from 16,000 to 200,000 tonnes per year in the last 30 years, the average catch being about 70,000 tonnes per year; the catches are more in the west coast than on the east;

- the catch in Orissa is about 1000 tonnes per year.

Module 3.5 - Fishing Methods

Capsule 1 - Shore—based fishing

Learning objectives:

To enlighten students about various shore-based fishing techniques adopted by fishermen;

They will learn

- that fishing methods can broadly be classified into two groups — shore—based fishing and boat—based fishing;

- that shore—based fishing can be classified into various types, such as beach seining, hand lining, scoop net fishing and cast net fishing;

- that hand lines are operated by fishermen of the southern coast of Orissa;

- that baits are used to attract fish to the hook of the hand line;

- that Sarini Jalo and Bara Jalo are used for beach seining;

- about the operational techniques of Sarini Jalo and Bara Jalo

- about the method of operating scoop nets of various types

- that cast nets are used in the sea shore or at the river

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mouth, or can be employed while catching surface fish in deep waters;

- that the cast net is large with heavy weights so that it sinks quickly and captures fish while they get scattered to the sides;

Capsule 2 :Boat—based fishing (trawls and boat seines)

Learning Objectives:

To introduce to the learner the two types of boat—based fishing — boat seining and trawling——prevalent on the Indian coast.

They will learn

– that boat seines are operated from non—mechanized traditional boats, while trawling is done by small or large mechanized boats;

– that in the southern part of Orissa, the Irgali net drageed by two kattumarams is an example of traditional boat seining;

- that trawling is the modern method of dragging the net by mechanical means where the boat has an engine to drive it;

– that the majority of the world's fishing craft used as trawlers engage in stern trawling; in this method fishing is done from the hind part of the boat;

- that the length of the boat used for stern trawling varies from 9 m to 170 m, but the mechanized small trawlers used on the Orissa coast are 9 to 10 metres in length;

– that the operational technique of stern trawling is somewhat similar to boat seining with Irgali net although in stern trawling only one mechanized boat (instead of two) is used to drag the net, and the mouth of the net is kept open with the help of two otter boards;

– that the trawl net consists of warp, otter board, head rope, foot rope and cod end;

– about the warp, otter boards, head rope, food rope and cod end;

– how fishing is done, how the net is paid out; how the lengths of the warps are maintained and how and when the net is hauled;

– that trawling is carried out in different layers of sea water;

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– that bottom trawling is done mainly for prawns that live at the bottom;

– that pair trawling is done with two identical mechanical boats and is comparable to Iragali net operations with two kattumarams;

– that in pair trawling, otter boards are not required as the two warps, one from each boat, keep the mouth of the net open;

– that pair trawling operations help fishermen catch more fish than stern trawling;

- that in India, off Gujarat and Maharastra coasts, pair trawling on a commercial basis is being done since 1981;

– that in outrigger trawling one boat drags two nets with the help of two booms placed at the middle of the boat and they look like two outstretched hands; the two booms overhang from either side of the boat and warps fastened to nets are paid out from the ends of these two booms; as a result, when the boat moves the two booms drag the trawl net from behind;

- that in India outrigger trawling is employed mainly for catching prawns with large trawlers of about 23 metres length;

– that this outrigger trawl fishing is carried on off Andhra Pradesh, Orissa and West Bengal coasts;

– that recently fishermen have started using two nets from each boom, and hence drag four nets from a single boat;

– about fish detecting devices like echo sounder and sonar which help identify fish concentration areas;

– that an echo sounder is used to detect the depth at which fish are available while sonar detects the distance;

– that both these devices are installed in fishing vessels.

Capsule 3 :Fishing with gillnets and purse seines

Learning objectives:

To explain how people go out to the sea to fish, and when they reach the fishing ground how they set the net and catch fish passively with gillnets and purse seines.

They will learn:

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– about the operation of gillnets;

- that gillnetting is the most widely used of all fishing methods in the traditional sector;

- that the gillnet is assembled with net webbing, head rope, foot rope, floats and sinkers;-

– about the uses of these parts;

– that the net for gillnetting should contrast as little as possible with the surroundings so that the fish do not recognise it; and hence the need for dyeing to merge with the colour of the sea water;

- that gilinets can be operated as bottom set gillnet, surface drift net and encircling gil.lnet;

– that bottom set gillnet can be used up to a depth of 150 metres;

- that bottom set gillnets such as jagawala and kulimala nets are used in the southern part of Orissa to catch prawn, croaker, pomfret, jew fish and ribbon fish;

- that the surface gillnet is widely used on the Orissa coast — it is known in the northern part as Basani Jalo Behundi Jalo, Ilisi Jalo and Nakuda Jalo and in the southern part as Katalala or Kabala, Jagawala nets — to catch hilsa, pomfret, seer fish, horse mackerel, cat fish, threadfin, croaker, sardines, anchovies and Indian mackerel;

– about the Jangal Jalo operations as a method of fishing with gillnets;

– that like the Jangal Jab operation there is one Sabado Jalo operation — where instead of five boats, seven boats operate. Of these five remain inside the encircled area to scare and drive fish, and the sinker line is pulled like a purse to trap fish. The trapped fish are harvested leisurely over three or four days;

– about the operations of Khia badia jalo and Gheri jalo as encircling gillnets;

– that purse seining can be taken up with one boat or two boats and that the fishing ground is encircled before the fishes are pursed;

– that one boat operation for purse seining is generally seen in India;

– about methods of setting and catching fish with purse seines.

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Capsule 4 :Fishing with liftnets and longlines

Learning Objective

To explain how line and lift fishing are done and what modern methods are used in other countries;

They will learn:

– that Burdu, a kind of hand line, is operated from a kattumaram for catching sharks in the southern part of Orissa;

– that the longline is the most popular of all line fishing gear;

– that in a longline, several short branch lines are connected at appropriate intervals to one long main line, and to each line hooks are attached and baits (live, real or artificial) are used before operating it;

– that fishes like tuna, shark and seer fish are caught in the longline;

– that the bongline can be set in mid—water and also at the bottom;

– that each branch line consists of a branch line proper, swivel, sekiyama, leader wire and hook; the function of each part;

– that each hook consists of eye, bend, barb, shank and point;

– that small sardines, cuttle fish and other small fishes are used as bait;

- that to catch tunas, a number of hooks are used on the surface of deep water, and the length of the line is about 160 km; that the fishermen of Japan use such a bongb.ine;

- that pole and line is another method of line fishing where a rod is used to which one end of the line is connected and a hook is attached to the other end of the line; that hooks (barbed or barbless) are used with or without bait; that barbbess hooks without bait are used for catching tunas;

– that poles are made of thin bamboo sticks of 1—3 metres length and 2-4 cm diameter, but in advanced countries like Japan people use poles made of different types of materials of different sizes.

- that nylon monofibament is used as bine;

– about the method of operating pole and line from a boat where a number of poles. are fixed on the deck of the boat;

– that organized pole and line fishing is carried out in India around Lakshadweep Islands;

– that fishing with Marala net in the Ganjam district in Orissa is a type of lift net fishing where four kattumarams are employed to set and lift the net;

– that the lift net is set at a particular place and lifted after a lapse of some 15/20 minutes;

– about modern lift nets that Japanese use from big vessebs; that the net is held by sticks on one side of the vessel and from the other side bights are switched on to attract fishes and squids; that when a large school is attracted, the lights are switched off and a single lamp on the side of the vessel is switched on; that when the fish move under the boat to the other side and enough fish gather over the lowered net, the net is lifted;

- that this modern boat lift net has proved very effective.

SCERT Package I (Social Science)

Title of Package I : We and our neighbours

Title of Module I–a : Let us know ourselves

Title of Capsule I–a–1 : Our country and its band

Contents : Students learn

- that the earth is spherical though it appears flat

– about a village, a panchayat, a block, a sub-division, a district, a province and the country and their relationship to each other;

- to realise that in India there is unity in diversity – people of different castes, creeds and languages live in India but they are all Indians;

– to realise that mutual understanding and co–operation among people makes rural life pleasant;

– how to be an ideal citizen;

Title of Capsule I–a–2: Orissa, our state

Learning objectives:

To enlighten learners on some important facts about Orissa.

- they get an idea of its location, climate, natural and mineral resources, its agriculture and industrial enterprises;

- they will realise the need for reclaiming wasteland and for irrigation facilities and how different parts of the state help and depend on each other for their essential commodities.

Title of Capsule I–a–3 : People in our service

Learning objectives

To enlighten learners about the functions of gram panchayats, municipalities, police, co-operative societies, banks, hospitals and veterinary hospitals. They learn what gram panchayats and municipalities mean; the functions and responsibilities of the police, how loans are obtained from co-operative societies and banks, and how medical treatment of men and animals is taken up in hospitals and veterinary hospitals

Title of Capsule I–a–4 : Shortening distance

Learning objectives:

To give an idea about different modes of communication. Learners will realise the need for transportation of essential goods and for communication:

- they will learn the working of the postal system and the telephone and telegraph systems.

Title of Capsule I–a–5 : We and our past

Learning objectives:

To track the evolution of mankind from the apeman and the nomad of the past to the present age. Children learn through a poem about different stages of man's progress and history.

Title of Module I.b: Many faces of Mother India

Title of Capsule I–b–1 : Our Motherland and its soil

Learning objective: To glorify the physical features of India through a poem. Learners are taught the different physical features of India, its rivers and their uses, its climate, and the effects of different climatic conditions at different places.

Title of Capsule I—b—2: Soils and their uses

Learning objective : To enlighten learners on how different soil types in India help produce different types of agricultural goods besides providing us with natural resources bike forests and minerals.

They learn about various types of soil, forests and their properties, types of agricultural goods produced and irrigation projects, facilities for improved methods of farming, the different minerals available in India;

Title of Capsule I—b—3 : Let us move about

Learning Objectives : To give an idea of the different types of transport facilities available in India: roadways, railways, waterways and airways. They learn about the postal system, and wireless and television services.

Title of Capsule I-b-4: We Indians are one

Learning objective: To encourage students to understand the concept of "Indianness" despite the diversity of religions, castes, creeds and occupations. The role of the constitution, the National Anthem and the National Flag as unifying forces to maintain the country's integrity and solidarity.

Title of Capsule I—b—5: How beautiful is life

Learning Objectives: To make students aware of India's rich cultural heritage. How its art, music, dance and sculpture attract people from all over the world.

They will learn that radio and television purvey news from far and near;

- about marvellous sculptures like to Taj Mahal in Agra, the Red Fort and the Juma Masjid in Delhi and Jagannath and the Lingaraj temples of Orissa, which draw tourists from everywhere;

- that the music and dance of different states in India promote national integration;

Title of Capsule I-b—6: Our pride and glory

Learning Objective: to recount in verse the services of great national leaders, past and present.

Students learn:

- how King Asoka, after the Kalinga war in Orissa, became a convert to Buddhism and the cause of peace;

– about the good deeds of King Kharabela as elucidated from the stone plate – carvings of the Elephant Caves in Orissa.

– about Akbar the Great, who was famous for his liberal and abbe administration and who united the Hindus and the Muslims of India

– about Tansen, the great musician; about Shivaji, the warrior hero of Maharashtra,

– about Raja Ram Mohun Roy, the great social reformer

– about Litkalmani Gopabandhu, leader, social reformer and journalist of repute in Orissa

– about Kalidas, Rabindranath, Sarojini Naidu, Jayadev, Aryabhatta, C V Raman, Kabir, Tulsidas, Mahatma Gandhi and their contributions to various fields of human endeavour.

Title Capsule I–b–7 : We gain freedom

Learning Objective: To recount how and when India came under toreign rule and how we regained freedom.

They learn how the English, who came to India as traders, took over the reins of the administration, and how great leaders starting from Nawab Siraj–ud–douba fought foreign rube in vain;

– about the Sepoy Mutiny, and the sacrifices of leaders bike Jayee Rajguru and Bakshi Jagabandhu Vidyadhar of Orissa, Nana Saheb of Kanpur, Tantia Tope of Central India and Rani Laxmibai of Jhansi before the united struggle for India's freedom began.

– about great freedom fighters like Bal Gangadhar Tilak, Bipin Chandra Pal, Laba Lajpat Rai, Mahatma Gandhi and Motibab Nehru; about great events in the freedom struggle, and important dates in Indian history.

SCERT Package II: (General Science

Title Package II : Science and Scientific Knowledge

Title Module Il–a: New Knowledge, New Life

Title of Capsule II–a–1 : Heavenly bodies around us

Learning Objectives: To impart knowledge about heavenly bodies and their effects on earth.

Children learn that a big object looks small when it is far away;

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– that light coming from a distant object appears looks dim;

– that beside a very bright light other lights look dim;

– how day and night occur;

– about the creation of the earth;

– that on full moon days the moon takes on a full round shape while on new moon days we do not see the moon at all.

Title of Capsule II–a–2 : Animals and trees around us

Learning objectives: To impart knowledge about the animals and trees around us and how they help us.
Students learn

– about living and non–living objects and their differences

– that animals and plants both have life;

– that living things need food for their life and for reproduction;

– about the different parts and functions of a plant

– how plants and animals help mankind in different ways.

Title of Capsule II–a-3 : Effects of rain and wind
Learning objective: To explain how climatic conditions and weather affect us.

They learn

– that we get light and heat from the sun; that they exist in different forms, such as water, steam and ice

– that the water from the sea takes different forms and eventually returns to the sea;

– about hot, cloudy, foggy, sultry, and cyclonic weather;

– that a vibrating body emits sound;

– that there are thermometers to measure temperature and weathercocks to ascertain the direction of wind;

– that weather forecasts help fatmers and fisherfolk.

Title of Capsule Il–a–4 – Our body

Learning Objective: To impart knowledge about different parts of our body and their functions.

Children learn

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– that we should take different types of food, as food supplies energy, helps growth and provides nutrition to our body; – about different types of fqod, which contain proteins, fats, carbohydrates and vitamins;

– how food is digested in the body;

- the need for proper dental care;

– the need for hole—type latrines and personal cleanliness.

Title of Capsule II—a-5 : Our home

Learning Objectives: To make learners aware of the need for a clean living environment and healthy habits.

They learn:

- how to keep cow sheds, latrines, drains and sewers clean and where these should be built;

- facts about health and hygiene and a clean home.

The matter is presented through a poem.

Title of Capsule II—a—6 : Different states of matter

Learning objectives: To impart knowledge about matter that exists in different forms:solid, liquid or gas; and the special features of these states of matter.

Students learn

– that matter exists in three forms i.e. solid, liquid and gas;

– that solids have a definite shape, but liquids take the shape of the container that holds them;

– that gaseous matter needs a closed container for its storage;

– that some solids dissolve in some liquids; and

– that water is the best solvent

Title of Capsule II—a—7: Forces of different types

Learning Objective: To impart knowledge as to how different kinds of forces help perform various types of work.

Students learn

– that force is required to perform work, and that more

force is needed for doing work quickly;

- that equal and opposite forces applied to a body make it static;
- that to make work easier, forces are applied at convenient points and tools are used for this purpose;
- that there are electrical and magnetic forces;
- that the earth exerts a gravitational force over objects, as a result of which these objects possess “weight”;
- that when two objects are rubbed together, a frictional force in generated; that constant friction on the parts of a machine causes wear and tear; and to reduce the effect of friction, oil or grease is applied to machines.

Title of Module II–b: Let us learn new things

Title of Capsule II–b–1: Let us behold the heavens

Learning Objectives: To impart knowledge about some important heavenly bodies and the solar system.

Students learn

- that the sun, the moon, the planets and the stars can be seen in the sky;
- the names of nine planets that move around the Sun;
- that the Sun and its planets together constitute the solar system;
- why day and night alternate and seasons change; and
- how with the change of seasons, changes occur in plants and animals.

Title of Capsule II–b–2 : Preserve the soil

Learning objectives: To impart knowledge about different kinds of soil, their properties and the need to preserve soil from erosion.

Students learn

- that stones when ground by various means turn into soil;
- that rains and winds erode the soil, and hence to preserve soil from erosion dams are erected and plants planted;
- about various types of soil and their properties.

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Title of Capsule II-b–3: Different phases of energy

Learning objectives: To impart knowledge on how forces are generated from energy, the primary source of which is the Sun; and how one form of energy is converted to another and used.

Students learn

– that to do work, force is required, and the ability to apply force comes from energy which we acquire from the food we eat;

– that the Sun is the primary source of energy;

- that one form of energy can be converted to other forms by several methods;

- that heat energy can be converted to light energy and mechanical energy, and electrical energy to magnetic energy.

Title of Capsule II–b–4 The minutest of matter

Learning Objectives: To impart knowledge about the smallest form of matter, the molecule; that when a molecule is further divided into atoms, the characteristic properties of the material we started with are lost.

Students learn

– that matter can be divided into its smallest part called a molecule, which retains the properties of the original material but loses these properties when it is further split up into atoms;

– that matter dissolves uniformly in a solvent;

– that the solute can be obtained in the crystalline form a solution;

– that physcial changes take place when water turns into ice or ice melts to water;

- that chemical changes take place when we burn paper, wood or sugar.

Title of Capsule II–b–5 Our apparel

Learning Objectives: To discuss the importance of apparel, how its suitability varies with the season.

Students learn

– the need for suitable apparel;

– what types of apparel are used in different seasons;

– that different types of apparel are made of different kinds of fibres;

– that one should take proper care of one's clothes.

Title of Capsule II–b–6: Story of a living machine

Learning Objectives: To teach the functions of different parts of our body, which work in harmony to make the body machine tick.
Students learn

– about the functions of different parts of our body; how they work systematically to keep the body healthy;

– about the functions of the five sensory organs;

– that air goes to the lungs through our nose and bronchi and that this process is known as respiration;

– that the heart pumps pure blood to all parts of the body;

– that we eat food for energy, and nutrition and for warding off illness;

– that food is digested in the mouth, the stomach and the intestines;

– that food should be kept covered in clean pots.

SCERT Package III (English)

Title of Package ITT: Let us read and white English

Title of Module ITT–a: From words to letters and sentences

Learning objectives : To enable students to learn letters, words and sentences in English through illustrations or pictures about people, friends, things, colours, the village, the home, the garden, the school, the playground, the post office.

(The module contains 11 capsules)

Title of Module III–b: Biju at different places

Learning objectives: To enable students to learn more words, and to express themselves through short and simple English sentences, about their home and school, about a marketplace, a circus, a policeman, a picnic that is to be arranged.

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Students learn

– to construct simple sentences in the present, past and future tenses, and in the affirmative, negative and interrogative mode;

– to use various environmental and classroom situations for expressing their ideas in English.

They will be able to read, understand and write sentences based on different simple structures of the English language, and answer questions put to them in these structures.

(This Module contains 8 capsules)

Package IV

Title of Module IV–a: Everyday calculations

Learning Objectives: To enable students to solve more problems and master skills required for monetary transactions, to read time, to understand the unitary method of calculation and to measure the area of a plot of land.

They learn the unitary method of calculation, and solve exercises through methods learnt earlier for monetary transactions and day–to–day calculations.

(This Module contains 8 capsules)

Title of Module IV–b: Learning further calculations

Learning Objectives: To allow learners to tackle further problems and solve them through different methods of calculation, dealing with numbers up to 10 million.

They learn to apply fundamental rules of calculations in mathematics for numbers up to 10 million; about simple fractions; about even and odd numbers. They learn to draw geometrical figures.

This Module contains 6 capsules).

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Publications of the Bay of Bengal Programme ***(BOBP)***

The BOBP brings out six types of publications.

Reports (BOBP/REP/....) describe and analyze completed activities such as seminars, annual meetings of BOBP's Advisory Committee, and projects in member-countries for which BOBP inputs have ended.

Working *Papers* (BOBP/WP/...) are progress reports that discuss the findings of ongoing BOBP work.

Manuals and Guides (BOBP/MAG/...) are instructional documents for specific audiences.

Miscellaneous Papers (BOBP/MIS/.. .) concern work not originated by BOBP — but which is relevant to the Programme's objectives.

Information *Documents* (BOBP/INF...) are bibliographies and descriptive documents on the fisheries of member-countries in the region.

Newsletters ***(Bay of Bengal*** *News),* issued quarterly, contain illustrated articles and features in non-technical style on BOBP work and related subjects.

A list of publications follows.

Reports ***(BOBP/REP/...)***

1. Report of the First Meeting of the Advisory Committee. Colombo, Sri Lanka, 28—29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
2. Report of the Second Meeting of the Advisory Committee. Madras, India, 29—30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.l, FAO, Rome, 1978)
3. Report of the Third Meeting of the Advisory Committee. Chittagong, Bangladesh, 1—10 November 1978 Colombo, Sri Lanka, 1978. (Reissued Madras, India, September 1980)
4. Role of Women in Small-Scale Fisheries of the Bay of Bengal. Madras, India, October 1980.
5. Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development. Madras, India, 3—8 September 1979. Madras, India, April 1980.
6. Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries, Colombo, Sri Lanka, 8—12 October 1979. Madras, India, June 1980.
7. Report of the Fourth Meeting of the Advisory Committee. Phuket, Thailand, 27—30 November 1979. Madras, India, February 1980.
8. Pre-Feasibility Study of a Floating Fish Receiving and Distribution Unit for Dubla Char, Bangladesh. G. Eddie, M. T. Nathan. Madras, India, April 1980.
9. Report of the Training Course for Fish Marketing Personnel of Tamil Nadu. Madras, India, 3—14 December 1979. Madras, India, September 1980.

10.1 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16—21 June 1980. Volume 1: Proceedings. Madras, India, September 1980.

10.2 Report of the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal. Chittagong, Bangladesh, 16—2 1 June 1980. Volume 2: Papers. Madras, India, October 1980.

11. Report of the Fifth Meeting of the Advisory Committee. Penang, Malaysia, 4—7 November 1980. Madras, India, January 1981.
12. Report of the Training Course for Fish Marketing Personnel of Andhra Pradesh. Hyderabad, India, 11—26 November 1980. Madras, India, September 1981.
13. Report of the Sixth Meeting of the Advisory Committee. Colombo, Sri Lanka, 1—5 December 1981. Madras, India, February 1982.
14. Report of the First Phase of the "Aquaculture Demonstration for Small-Scale Fisheries Development Project" in Phang Nga Province, Thailand. Madras, India, March 1982.
15. Report of the Consultation-cum-Workshop on Development of Activities for Improvement of Coastal Fishing Families. Dacca, Bangladesh, October 27—November 6, 1981. Madras, India, May 1982.
16. Report of the Seventh Meeting of the Advisory Committee. New Delhi, India, January 17—21, 1983. Madras, India, March 1983..
17. Report of Investigations to Improve the Kattumaram of India's East Coast. Madras, India, July 1984.
18. Motorization of Country Craft, Bangladesh. Madras, India, July 1984.
19. Report of the Eighth Meeting of the Advisory Committee. Dhaka, Bangladesh, January 16—19, 1984. Madras, India, May 1934.

20. **Coastal Aquaculture Project for** Shrimp **and Finfish in Ban Merbok, Kedah,** Malaysia. **Madras, India, December 1984.**

21. **Income-Earning Activities for Women from Fishing** Communities **in Sri Lanka. E. Drewes. Madras, India, September 1985.**

22. **Report of the Ninth Meeting of the Advisory Committee. Bangkok, Thailand, February 25—26, 1985. Madras, India, May 1985.**

23. **Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka. Madras, India, March 1986.**

24. **Fisherwomen's Activities in Bangladesh: A Participatory Approach to Development. P. Natpracha. Madras, India, May 1986.**

25. **Attempts to Stimulate Development Activities in Fishing Communities of Adirampattinam, India. P. Natprarha, V.L.C. Pietersz. Madras, India, May 1986.**

26. Report **of the Tenth Meeting of** the **Advisory Committee. Male, Maldives. 17—18 February** 1986. **Madras, India, April 1986.**

27. **Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu, India. E. Drewes. Madras, India, May** 1986.

28. **Small-Scale Aquaculture Development Project in South Thailand: Results** and **Impact. E. Drewes. Madras, India, May 1986.**

29. **Towards Shared Learning: An Approach to Non-formal Adult Education for Marine Fisherfolk of Tamil Nadu, India. L. S. Saraswathi and P. Natpracha. Madras, India, July** 1986.

30. **Summary Report of Fishing Trials with Large-Mesh Driftnets in Bangladesh.** Madras, **India, May** 1986.

31. **In-Service Training Programme for Marine Fisheries Extension Officers of Orissa, India. U. Tietze. Madras, India, August 1986.**

32. **Bank Credit for Artisanal Marine Fisherfolk of** Orissa, **India. U. Tietze. Madras, India, May 1987.**

33. Non-formal primary education for children of marine fisherfolk in Orissa, India. U. Tietze, Namita Ray. Madras, India, December 1987.

34. The Coastal Set Bagnet Fishery of Bangladesh—Fishing Trials and Investigations. SE. Akerman. **Madras, India, November 1986.**

35. **Brackishwater Shrimp Culture Demonstration in Bangladesh. M. Karim. Madras, India, January 1987.**

36. **Hilsa Investigations in Bangladesh. Colombo, Sri Lanka, June 1987.**

37. **High-opening Bottom Trawling in Tamil Nadu, Gujarat and Orissa, rndia: A Summary of Effort and lmpact. Madras, India, February 1987.**

38. **Report of the Eleventh Meeting of the Advisory Committee. Bangkok, Thailand, March 26—29,** 1987. **Madras, India, June 1987.**

Working Papers ***(BOBP/*** *WP/. ...)*

I. Investment Reduction and Increase in Service Life of Kattumaram Logs. **R. Balan. Madras, India, February** 1980.

2. **Inventory of Kattumarams and their Fishing Gear in Andhra Pradesh and Tamil Nadu. T. R. Menon. Madras, India, October 1980.**

3. **Improvement of Large-Mesh Driftnets for Small-Scale Fisheries in Sri Lanka. G. Pajot. Madras, India, June 1980.**

4. **Inboard Motorisation of Small G.R.P. Boats in Sri Lanka. Madras, India, September 1980.**

5. **Improvement of Large-Mesh Driftnets for Small-Scale Fisheries in Bangladesh. G. Pajot. Madras, India, September** 1980.

6. **Fishing Trials with Bottom-Set Longlines in Sri Lanka. G. Pajot, K. T. Weerasooriya. Madras, India, September 1980.**

7. **Technical Trials of Beachcraft Prototypes in India. 0. Gulbrandsen, G. P. Cowing, R. Ravikurnar. Madras, India, October 1980.**

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