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UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of India

PROJECT DOCUMENT

Number and Title:	IND/88/052/A/01/37 Process cum Product Development Centre for Pumps, Motors and Diesel Engines, Coimbatore (Tamil Nadu)
Date:	August 1990
Duration:	Four Years
Project site:	Coimbatore (Tamil Nadu)
ACC/UNDP Sector and sub-sector:	Industry - 0510 Industrial Development Support Services
Government Sector and sub-sector:	Industry - Development of Small Scale Industries
Government Implementing agency:	Small Industries Development Organisation (SIDO) Ministry of Industry
Executing Agency:	United Nations Industrial Development Organisation (UNIDO)
Estimated starting date:	January 1991
Government inputs (local currency)	
(in kind):	Indian Rupees 38,000,000
(in cash):	N I L

UNDP and Cost Sharing Financing	
UNDP	$2,423,450
IPF	$
Other(specify)	$
Govt.or third party cost sharing(specify)	$
UNDP & cost sharing	$
T O T A L	$2.423.450

Brief description

Within the overall objective of bringing in improvement in the Indian exploitation by pumping of ground water for irrigation in the agricultural sector and also to accelerate industrial growth through improved equipment efficiency, productivity and users operating and maintenance knowledge, the project aimed to establish a Process and Product Research and Development Centre at Coimbatore (Tamil Nadu) to assist the small scale industry manufacturing implementing upgrading its product design,

for pump sets, motors and diesel engines used for lift irrigation purposes, to modernize and upgrade its technical status and implement technical training to Manufacturers & Users thereby helping the industry to produce a high quality energy efficient product and to become more competitive and help Users conserve scarce energy resources in exploiting ground water for irrigation in the agricultural sector. As a second effect such industrial modernization will accelerate the small scale industry growth through improved quality assurance, quality control and productivity leading to new product development for industrial and chemical pump units built to international standards so competitive to the export market.

On behalf of:	Signature	Date	Name/title
The Government			
Executing Agency			
UNDP			

United Nations official exchange rate at date of last signature of project document: $1.00 = Rs.16.37

A. CONTEXT

1. Description of sub-sector

Agricultural sector consumes nearly 20% of the available electricity in the country. The studies conducted on operational efficiency of electrical and diesel pump sets used in irrigation indicate that in general the pump sets operate at a much lower efficiency than the optimum level. Thus energy conservation in agricultural sector has become a matter of paramount importance. In pursuance of this objective as well as the policy of the Government to accelerate industrial growth through improved efficiency and productivity, a quick indepth study of pump industry was made by the Ministry of Industry in June 1987 with a view to examining the existing technology and suggest measures to upgrade the same. The Institute of Co-operative Management (ICM), Ahmedabad, had also conducted a study of agricultural pump sets operating in the country, and according to these reports about 80% of agricultural pump sets are working below the optimum levels of efficiency. The study by ICM further pointed out that energy worth about Rs. 1000 crores (Rs. 10,000 million) per year can be saved if all the existing faulty pumping systems are properly rectified. The major cause for energy drain in agricultural pump sets is the use of improper piping system and foot valve with high frictional losses, use of sub-standard and inefficient motor/diesel engine and of course inefficient pump and often mismatching of these components.

2. Host country strategy

The Government of India is concerned with this problem and proposes to take various measures for upgrading the quality and technology in agricultural pump sets. Prompting use of efficient pump sets in the field by way of sanctioning loans to farmers for efficient pumping systems, and educational and motivational campaigns to use quality pumps, are some of the measures being taken by the Government.

There are about 500 units in the small scale sector manufacturing agricultural and other pump sets. Small industry produces around 350,000 pump sets, nearly 50% of the country's total production. The main concentration of the industry is in Coimbatore, Rajkot and Ghaziabad. The small units continue to produce conventional types of pump and have not been able to modernise their manufacturing facilities.

The small scale industries in India on account of their inherent disadvantages have also a very weak R&D infrastructure available with them. They lack designing facilities, knowledge of improved techniques of manufacture and inspection and quality control. Through this project it is proposed to give them institutional support by establishing a Process and Product Development Centre for pumps, motors and diesel engines which will not only develop better products and technology but will also provide training and library facilities.

Prior to ongoing assistance

There has been no prior or ongoing assistance from any external source to cover the project sub-sector.

Institutional framework for development efforts in the sub-sector

As per Government's policy to promote development of the small scale industry (SSI), the manufacture of centrifugal pumps used for irrigation purposes, upto a diameter of 10 cm x 10 cm (4" x 4"), is reserved for the small scale sector. Out of the total production of pumps, about 95% are within the 10cm x 10 cm range and are thus manufactured by the small scale sector. The pump industry, which started in India is 1920's, is now a well established industry meeting most of the traditional demands for fluid handling in the country. The total investment in the pump industry is estimated at Rs. 350 million and it provides direct employment to about 25,000 persons. The Directorate General of Technical Development (DGTD) has estimated tha the pump industry registered an average growth rate of 15% per annum during the period 1978-79 to 1982-83 and is poised for a steady growth. Firm data regarding the number of units and the number of pump sets manufactured in the small scale sector is not available. It is estimated that in the country as a whole there are 500 small scale units and about 60 units are medium and large scale sector. The main concentration of the industry in the SSI sector is in Coimbatore. The small units continue to produce conventional type of pumps but most of these units have not been able to modernise their manufacturing techniques to improve their quality and reduce their costs. Some on-line improvements have however been made by a few units. Even though some units in the small scale sector are keen to keep abreast with the latest technology, facilities to undertake research and development to improve the design, manufacturing process, etc. are inadequate. In fact investment in R&D is beyond the capacity of the individual small scale units.

The electric motor industry which had only one units in the country at Coimbatore prior to 1939, gathered momentum during World War II. Its progress remained slow until after 1960 when the industry received a fresh impetus due to increase in demand of electric motors for industrial and agricultural purposes and a number of small scale units sprang up. The accelerated rural electrification programme was mainly instrumental in increasing the demand for motors in agricultural sector. There are at present more than 400 units in the small scale sector (in addition to 34 units in the organised sector with an installed capacity of 6.8 million H.P.). The figures of installed capacity and production of electric motors in small scale sector are not readily available but it is roughly estimated to be 40% of the country's total production of motors in the ranges manufactured by them (upto 15 HP). About 100 small scale units have obtained the ISI mark for their products.

The diesel engine industry had its origin in India in 1932. However, it was only during the first Five Year Plan (1952-1957) that the industry got a boost. It maintained a steady growth during the period 1960-73 due to "Grow More Food" Programme and irrigation plan. Thereafter particularly the SSI sector has been maintaining steady growth. In 1951 there were 800 units in the SSI sector. The range of diesel engines manufactured in the SSI sector mostly covers 5 HP to 20 HP engines. Out of the total production of diesel engine-operated pumps, 75 to 80% are in the range of 5 to 20 HP and these are being manufactured by the SSI sector. The production figures are 472,000 in 1985 and an estimated 529,000 in 1990. There are however only a few manufacturers making engines which give

consistent performance over a period of time. The present trend in innovation is for production of low weight to power ratio, use of alternative fuel, and high fuel efficiency. Besides, design changes for use of dual fuel are also being attempted. It is possible to improve the current performance of the SSI units manufacturing this item by R&D work on design, material and workmanship. However, if quantity is needed the best approach for versatile modern diesel engine, transfer of technology could be best.

It is in an effort to help the small scale sector in the above production areas, as a long term objective of the Government for upgradation of this industry, that the proposed PPDC for pumps, motors and diesel engines is being set up at Coimbatore. Suitable land and buildings will be provided by the State Government of Tamil Nadu while the other counterpart inputs will be the responsibility of the Government of India. The Small Industries Development Organisation (SIDO) within the Ministry of Industry will be the nodal agency for the implementation of the project on behalf of the Government from its very inception. The SIDO shall select from its own staff or from other origin the competent National Project Director and the experienced requisite staff in other disciplines for the successful implementation of the Project. To oversee the working of the Project, there will be a Project Advisory Committee (PAC) with DC SSI as its Chairman. This Committee shall include two representatives of DC SSI, a representative each of the Ministry of Industry and the State Government of Tamil Nadu, Director SISI, Madras and five representatives from the industry/industry associations in addition to representatives of UNDP and UNIDO. To ensure that the industry is adequately represented at the PAC, the number of its representatives will be increased if considered necessary after the commencement of the Project. The proposed institutional framework for the PPDC is given in Annex. VII-B. An organization chart for the PPDC is given in Annex VII-C. After the commencement of the Project, a Society is proposed to be formed to run the Centre.

B. PROJECT JUSTIFICATION

I. Problem to be addressed: the present situation

Nearly one third of land surface in India is semi-arid where rainfall is seasonal and erratic. Therefore, development of water resources for irrigation assumes great importance. Surface water was the mainstay of irrigation till almost the middle of this century, but in the last three decades the importance of grond water has been realised and now it constitutes an important source of irrigation accounting for about 45% of irrigation potential created in the country. Ground water is exploited by lift irrigation employing mostly centrifugal pumps powered either by diesel engines or electric motors.

At the end of the Sixth Plan, there were about 9,200,000 pump sets operating in the agricultural sector; 4,000,000 pump sets are expected to be added during the Seventh Plan Period. Recent field studies have indicated that most of the installed pump sets operate a low levels of efficiency, and that considerable saving in pump sets operate a low levels of efficiency, and that considerable saving in energy is feasible. Therefore, the need to evolve a highly efficient pumping system is

occasioned not merely by a desire for technological upgradation per se but also by the urgent need to conserve high cost and scarce energy resources.

More than 50% of the total production of pumps and prime movers is carried out in the small scale sector and roughly 40% of this production comes from Coimbatore (in Tamil Nadu) which has earned a name for the skills it has developed in electric motor and pump making. Coimbatore had been a Centre of this industrial activity for quite some time and in due course has not only developed an industrial base but also certain degree of specialisation in this area. As a result some of the most inexpensive pump sets produced in the country are from Coimbatore.

However, the pumps and prime movers manufactured in Coimbatore are still of solid, age old, design which consume large quantitiers of metal and occupy larger space. Not only the product is heavy and crude but it is also not so efficient. Developments and innovations in this field have since taken place the world over resulting in better designs, use of alternative and better material and modern manufacturing processes. This has not only brought about reduction in weight and size, and consequently the cost of the pump sets, but also improved efficiency and reliability of the product.

Improvement of design to achieve energy saving is by itself a large area offering immense potential. It has been estimated that by better design of agricultural pump sets and pumping systems, a total saving of Rs.1,000 crores per annum (Rs. 10,000 million) can be effected.

The manufacture of agricultural pumps and prime movers in the country, need to be guided and helped in design and manufacture of energy efficient pumping systems. The quality of agricultural pump sets is dependent on the quality of components such as castings etc. used therein. It may be pertinent to mention that India's export of engineering products has not kept pace with the growth in export in several other areas, even though there is an immense potential and advantages of cheap labour, space, etc. The main reason why this potential is not converted to good account is the lack of quality of products to meet international standards. In the case of pumps and prime movers, though the product is sturdy, its crude design, heavy weight, poor finish, and low fuel efficiency , are some of the factors inhibiting their exports. The small scale industries need considerable developmental inputs to improve their production methods, quality, finish, etc. to match the acceptable levels in the world market. Once this is achieved, profitability of many units which are often on the verge of sickness will greatly improve. Sickness among the units manufacturing these agricultural pump sets and prime movers is endemic because of creation of excess capacity and intense competition amongst the units. A process and product development centre can help their units redesign their products, adopt better techniques and reduce the cost of production so that the total demand for the products can increase.

2. Expected end of project situation

On successful completion of this project, about 10-12 redesigned or new designs of efficient standardized pump sets, 6 to 8 improved or new motors & 4 to 5 diesel engines would be redesigned or developed by the

Centre. After the field trials have been conducted & the products have been found to be of acceptable quality & also have been compared & tested against similar models from international world leaders. their designs together with manufacturing techniques will be passed on to the units willing to take up their manufacture. This will be the first step to bring out a culture different from reverse engineering in which the industries would be educated to adopt scientific methods which would ultimately bring in awareness for manufacturing quality products and better product designs. Some government agencies such as NABARD are expected to provide marketing support to the units manufacturing these improved pump sets by arranging supplies to the end-users.

3. Target beneficiaries

The target beneficiaries of this project would be the small scale units manufacturing pump sets and their components manufacturers. Ultimately the users, namely, the farmers would reap the benefits by using such pumps.

4. Project strategy and implementation arrangements:

As mentioned earlier there were 9.200.000 pumping sets operating in these country at the end of the Sixth Five Year Plan and 4.000.000 additional pumping sets are expected to be installed during the Seventh Five Year Plan. It has also been pointed out that about 80% of these pump sets are operating at a sub-optimal level of efficiency. Some action has already been taken to rectify the faulty pumping systems. The strategy underlying in sponsoring this project is to upgrade the technology and quality of agricultural pump sets so that the in-flow of sub-standard pump sets into the market is gradually reduced. This would also help save scarce energy resources.

The project will be located at Coimbatore. The imported machines, equipment and supplies, services of experts and fellowships will be provided by UNDP and the counterpart staff, services, indigenous equipment and running expenditure will be met by the Government of India. The Small Industries Development Organisation (SIDO) will be the nodal agency for the implementation of the project from the very inception. The project will be implemented through training of national staff abroad in related institutions and through international experts assigned to the Project. The Project Advisory Committee of the Centre which will include representatives of industry, will ensure that the industry is kept informed about the activities of the Centre so that the industry could make use of its sevices.

5. Reasons for assistance from UNDP/executing agency

It is the Government's decision to seek assistance from UNDP/UNIDO for implementation of this project. The required expertise in designing and developing energy efficient pumps is not readily available in the country. Other countries like Japan, European Community and North America have developed superior technology and design for manufacture of fresh water and industrial pump sets. It may be also possible to organise Transfer of Technology from such countries through the efforts of UNDP in which not

only technical knowhow is expected to be supplied but also deputation of experts to the project to train the counterpart staff and help in designing and improving the manufacturing technology of these pump sets. It is also expected that counterpart staff and others would be provided training in advanced countries so that they have an exposure to the state of art technology in this field, as prevailing in those countries.

6. Special considerations

None

7. Coordination arrangements

The entire activity of the project will be co-ordinated with other efforts in the sub-sector through the Project Advisory Committee with DC(SSI) as Chairman of the Committee. This Committee will have representatives from the industry and industry associations on it.

8. Counterpart support capacity

The Small Industries Development Organisation will be the implementing agency for this project. SIDO has a net work of SISIs, Branch SISIs, and Extension Centres throughout the country. In addition, a number of Tool Rooms and specialised projects/PPDCs with the assistance of UNDP and other foreign agencies are being run under its auspices. It has a cadre of technical and administrative staff and therefore, it possesses the requisite expertise to support such an activity. The counterpart budget contribution as envisaged will be provided by the Government of India from its own budget.

C. DEVELOPMENT OBJECTIVE

The development objective of the Project is to upgrade and modernise the technology and quality of pumping sets and prime movers manufactured by the small scale sector in the country and used for irrigation purposes with a view to achieving optimum level of their efficiency and conserving scarce energy resources in exploiting ground water for irrigation in the agricultural sector and to accelerate industrial growth through improved efficiency and productivity.

D. IMMEDIATE OBJECTIVES, OUTPUTS AND ACTIVITIES

1. Immediate objective one:

Establishment of a Process-cum-Product Development Centre (PPDC) for servicing and upgrading the technological and industrial status of industry manufacturing agricultural pumps, motors and diesel engines used in

irrigation, at Coimbatore in Tamil Nadu having the following functions:

a) To develop and/or improved new design and manufacturing technologies for the following pumps:

1) FIRST STAGE OF ACTIVITY;

i) Conventional horizontal centrifugal pump using electric motor or diesel engine as a prime mover
ii) Deep well vertical submersible pumps

2) SECOND PERIOD OF ACTIVITY

Elec o-monoblock pump for water pumping or industrial purpose.

i) Centrifugal pumps
ii) Regenerating pumps (rotary or centrifugal)
iii) Reciprocating pumps
iv) Jet Centrifugal pump combination
v) Submersible pump (deep well and sewage)
vi) Vertical turbine pump (top motor)
vii) Non-clog sewage pump (dry well or wet well)

3) FINAL STAGE OF ACTIVITY

Special pumps like those used for chemical industry, food industry, sewage pump, etc.

b) To develop and deliver to the industry improved package of technology which would include components, products, designs, inspection and quality control, quality assurance systems, standardised process operations and charts, and other systems engineering and technology.

c) Provide facilities for testing raw materials and non-metallic materials and components/products to meet national and international specifications/standards.

d) Provide facilities for proto-type manufacture of improved models of pumps, motors and diesel engines for testing, demonstration and development versus world leader products.

e) Render consultancy services to improve design, use of standard materials, energy efficiency, manufacturing methods and to provide modern technology.

f) Disseminate technological information, market survey results and trends and management inputs through seminars, workshops and technical information and documentation services.

g) Impart training in design and manufacturing process.

h) Conduct research and development programmes in relevant areas in close cooperation with other R&D institutions and the industry.

Outputs	Activities	Party responsible for the activity
	Pre-Project Activities	
1. PPDC for pumps, motors and diesel engines established and operational with the following departments/ divisions:	I.1.1. Acquisition of land for the building of the Centre *(see note)	State Govt. of Tamil Nadu (TN)
	I.1.2. Acquisition of temporary building and its modifications for housing the nucleus of PPDC.	State Govt. of Tamil Nadu, Small Industries Development Organisation(SIDO)
	I.1.3. Appointment of Project Director & core staff	SIDO
	Project Activities	
	I.1.4. Drawing up of building plans for PPDC *(see note)	Director,PPDC in consultation with T.N.Govt. & SIDO
	I.1.5. Requisition of equipment, both indigenous and to be imported (see Annex V)	Director PPDC in consultation with SIDO & UNIDO/UNDP
	I.1.6. Appointment of Staff (see Annex V)	SIDO/UNDP
Process Technology	I.1.7. Introduction & demonstration of new designs & technologies based on R&D; provision of facilities for prototype manufacture of improved models of pumps,motors & diesel engines for testing;demonstration & development;modernisation of existing industry units;improvement of techno-economics of production of existing products;about 10-12 designs of pumps, about 6-8 designs of efficient electric motors, and 4-5 designs of diesel engines will be developed; to render consultancy services to approx. 100 units per year on improved design; use of improved material, better manufacturing methods.	PPDC/UNIDO

*Note: The land and buildings are already available and could be refurbished rapidly to install the designated Director and some staff. (see Annex VII-D)

Outputs	Activities	Party responsible for the activity
Quality Control	I.I.8 Day to day quality analysis of raw materials & products received from the industry to meet national and international specifications/standards; quality certification;test facilities expected to be made available to 200 manufacturing units per annum; consultancy services to be rendered to about 100 units per annum.	PPDC/UNIDO
Information and Documentation	I.I.9 Consultancy services rendered and industrial enquiries answered; technological information dissemination and publication of newsletters, market survey results, preparation of reports on current status of industry and future national, and international trends; organisation of industry R&D collaborative get togethers; preparation of project/process design reports.	PPDC/UNIDO
	I.I.10 Providing calibration for measuring instruments used by manufacturers as well as providing adequate tooling.	PPDC/UNIDO
Training	I.I.11 To train personnel from industry in design and manufacturing process - training to be of 6 months' duration and to cover two batches per year of 20 trainees each (40 trainees per annum); and to conduct seminars and workshops for industry personnel.	PPDC/UNIDO

An illustrative work plan showing tentative activities during the first year of the Project is attached as Annex I. A detailed work plan will be prepared by the National Project Director in consultation with the CTA on the latter's arrival and attached to the Project Document as an annexure.

E. INPUTS

I. Government Inputs

(i) Inputs by Government of Tamil Nadu Land and Building

Land - Cost of developed land measuring 7.5 acres		Rs. 750,000
Buildings		
- Administrative block with design & development office, class room, etc. 1,500 sq. metres @ Rs.2,500/- per sq. mt.		Rs.3,750,000
- Workshop building - 1,500 sq. metres (including test area) @ Rs.2,000/- per sq. mt.		Rs.3,100,000
- Car parking,scooter and cycle parking space		Rs. 400,000
	Total	Rs.8,000,000

(ii) Inputs by the Government of India

a) Personnel - salaries and wages		Rs.6,920,000
b) Expendable equipment,cars furniture etc.		Rs.2,000,000
c) Non-expendable equipment		Rs.20,000,000
d) Technical Library		Rs. 580,000
e) Miscellaneous		Rs. 500,000
	Total	Rs. 30000,000

Total of (i) Government of Tamil Nadu inputs and (ii) Govt.of India inputs(Rs.8,000,000+Rs.30,000,000)	Rs38,000,000

Details of equipment and personnel are given in Annex V and Annex VI respectively.

II. UNDP Inputs

(i) Project personnel:

International experts/consultants

- Experts in product design and development	(1)	18 m/ms
	(1)	12 m/ms
	(1)	6 m/ms
- Consultants in production techniques (manufacturing)		8 m/ms
- Consultants in foundry/metallurgy/ pattern making		8 m/ms
- Consultants in quality assurance and quality control techniques		8 m/ms
		60 m/ms
- Duty travel (for 60 expert/consultant m/ms)		$ 12,000
- Mission costs (for mid-term and terminal evaluation)		$ 20,000

Brief job requirements of the experts/consultants' posts are given in Annexure VI

(ii) Training

Fellowships	Total	1990	1991	1992	1993
Product design and development(3x3 m/m)	9	-	3	3	3
Production Technniques(5x3 m/m)	15	-	6	6	6
Foundry/Metallurgy (2x3 m/m)	6	-	3	3	-
Quality Control Techniques	9	-	3	3	3
Study tours:					
Study tour by the Project Director and Jt.Director to observe working of similar centres	2	2	-	-	-

(iii)Equipment

- Expendable equipment	$ 188,000
- Non-expendable equipment	$1,300,000
Total	$1,488,000

Details of equipment items with their functions and justification for use of UNDP funds for procuring this equipment are given in Annexures V and V-A respectively.

(iv) Miscellaneous:

- Operation and maintenance cost of equipment	$ 15,000
- Reporting costs	$ 3,500
- Sundries	$ 11,500
Total	$ 30,000

F. RISKS

Description of Risk	Estimated likelihood
1. Factors which may at the outset cause major delays or prevent achievement of the Project's outputs and objectives.	
a) Delay in acquisition of land and/or hiring of temporary accommodation for the PPDC.	None - Land and building are already available. To start with, offices could be set up and redecorated within a few weeks.
b) Appointment of Director and other core staff	Low - After MLT visit on August 90 the availability of qualified Engineers to staff PPDC is confirmed
2. Factors which could over time cause major delays or prevent achievement of the Project's outputs and objectives.	
a) Design/plan and construction of the building for the PPDC.	Low - No construction is required to start PPDC. Only to set up partitions for offices
b) Delay in ordering and delivery of equipment	Low - Second hand equipment could be considered for some machine tools only.

G. PRIOR OBLIGATIONS AND PREREQUISITES

a) Prior obligations

The prior obligations of the Government are as follows:

1. Appointment of the Director and other core staff for the Project.
2. Refurbishing and redecorating existing building for the PPDC pending construction of the permanent building of the Centre.
3. Commitment for the construction of buildings for the PPDC.

The Project document will be signed by UNDP, and UNDP assistance to the Project will be provided only upon the Government's written assurance that the prior obligations stipulated above have been met to UNDP's satisfaction.

b) Pre-requisites:

The pre requisites of the Government are as follows:

1) Appointment of staff and provision of other services stipulated in the Project document (i.e. Part E "INPUTS" above) in a timely manner for the smooth implementation of the project activities.

2) Acquisition of land for the PPDC.

The Project document will be signed by UNDP, and UNDP assistance to the Project will be provided subject to UNDP receiving satisfaction that the pre-requisites listed above have been fulfilled or are likely to be fulfilled.

c) When anticipated fulfilment of one or more of the prior obligations is deemed unsatisfactory or a prerequisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

H. PROJECT REVIEWS,REPORTING AND EVALUATION

1.a) The Project will be subject to tripartite review (joint review by representatives of the Government, executing agency and UNDP), at least once every 12 months, the first such meeting to be held within the first 12 months of the start of the full implementation. The national Project Director and/or senior project Officer of the United Nations executing agency shall prepare and submit to each tripartite meeting a Project Performance Evaluation Report (PPER). Additional PPERs may be requested, if necessary, during the project.

b) A project terminal report will be prepared by the National Project Director for consideration at the terminal tripartite review meeting. It shall be prepared in draft sufficiently in advance to allow review and technical clearance by the executing agency at least four months prior to the terminal tripartite review.

2. The project shall be subject to evaluation 24 months after the start of full implementation, if considered necessary, one month prior to the scheduled termination, and 24 months following termination. The organization, terms of reference and timing will be decided after consultation between the parties to the project document, plus any associated United Nations Agency.

I. LEGAL CONTEXT

The following types of revisions may be made to this project document with the signature of the UNDP Resident Representative only, provided he or she is assured that the other signatories of the project document have no objections to the proposed changes:

(a) Revisions in, or addition of, any of the annexes of the project document with the exception of the Standard Legal Text for non-SBAA countries which may not be altered and the agreement to which is a pre-condition for UNDP assistance.

(b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of a project, but are caused by the rearrangement of inputs already agreed to or by cost increases due to inflation; and

(c) Mandatory annual revisions which rephase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility.

J. BUDGETS

Budget sheets covering Government contribution in kind and UNDP contribution follow:

Project Budget Covering Government Contribution in Kind

(in Indian Rupees)

Country: India
Project No: IND/88/050
Project title: Process and Product Development Centre for Pumps Motors and Diesel Engines, Coimbatore (Tamil Nadu)

		Total		1991		1992		1993		1994	
		m/m	Amount	m/m	Amount	m/m	Amount	m/m	Amount	m/m	Amount
10	PROJECT PERSONNEL										
11.01	National Project Director	48	280,000		70,000		70,000		70,000		70,000
11.02	Joint Director (2)	78	345,000		40,000		95,000		105,000		105,000
11.03	Dy.Directors/Documentation (5) Officer(1)	213	835,000		130,000		235,000		235,000		235,000
11.04	Asstt. Directors (9)	378	1,120,000		160,000		320,000		320,000		320,000
11.05	Other Supporting Staff										
	Tech: 38		2,290,000		100,000		730,000		730,000		730,000
	Others:48		2,050,000		100,000		650,000		650,000		650,000
19	Component total		6,920,000		600,000		2,100,000		2,110,000		2,110,000
30	TRAINING										
31	Maintenance of Trainees'salaries		Salaries of all the trainees, already covered under Personnel Component, will be maintained								
39	Component total										
40	EQUIPMENT&PREMISES										
41	Expendable equipment and consumables		2,000,000		500,000		1,000,000		300,000		200,000
42	Non-expendable equipment		20,000,000		4,000,000		8,000,000		7,500,000		500,000
43	Premises		8,000,000		5,100,000		2,000,000		700,000		200,000
			30,000,000		9,600,000		11,000,000		8,500,000		900,000
50	MISCELLANEOUS										
	Technical Library		580,000		140,000		240,000		100,000		100,000
51	Miscellaneous		500,000		100,000		200,000		100,000		100,000
59	Component total		1,080,000		240,000		440,000		200,000		200,000
99	GRAND TOTAL		38,000,000		10,440,000		13,540,000		10,810,000		3,210,000

Project Budget Covering UNDP Contribution

(in US Dollars)

Country: India
Project No: IND/88/052
Project title: Process and Product Development Centre for Pumps, Motors and Diesel Engines Coimbatore (Tamil Nadu)

		Total		1991		1992		1993		1994	
		m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
10	PROJECT PERSONNEL										
11	International Experts										
11.01	Product Design and Development Pumping sets - CTA	14	147,000	6	60,000	4	42,000	2	22,000	2	23,000
11.02	Product Design and Devp.Motors	11	117,500	3	30,000	3	31,000	3	33,000	2	23,000
11.03	Product Design and Devp. Diesel Engines	11	117,500	3	30,000	3	31,500	3	33,000	2	23,000
11.04	Production Techniques	8	87,000			4	42,000	2	22,000	2	23,000
11.05	Foundry/Metallurgy	8	87,000			4	42,000	2	22,000	2	23,000
11.06	Quality Control Techniques	8	87,000			4	42,000	2	22,000	2	23,000
11.99	Sub-total Experts/Consultants	60	643,000	12	120,000	22	231,000	14	154,000	12	138,000
15	Duty travel		12,000		2,400		4,400		2,800		2,400
16	Mission Costs(Evaluation Mission)		20,000		-		-		-		20,000
19	Component total	60	675,000	12	122,400	22	235,400	14	156,800	12	160,400
30	TRAINING										
31	Fellowships										
31.01	Product design and development (3x3 m/m)	9	51,150			3	16,500	3	17,250	3	17,400
31.02	Production Techniques(5x3 m/m)	15	84,900			6	33,000	6	34,500	3	17,400
31.03	Foundry/Metallurgy(2x3 m/m)	6	33,750			3	16,500	3	17,250		
31.04	Quality Control Techniques (3x3 m/m)	9	45,650			3	11,000	3	17,250	3	17,400
32	Study tour by the Project Director and Jt.Director to observe working of similar centres	2	15,000	2	15,000						
39	Component total	41	230,450	2	15,000	15	77,000	15	86,250	9	52,200

IND/88/052

		Total m/m	Total $	1991 m/m	1991 $	1992 m/m	1992 $	1993 m/m	1993 $	1994 m/m	1994 $
40	EQUIPMENT										
41	Expendable Equipment		188,000		50,000		60,000		40,000		38,000
42	Non-expendable equipment		1,300,000		500,000		500,000		150,000		150,000
49	Component total		1,488,000		550,000		560,000		190,000		188,000
50	MISCELLANEOUS										
51	Operation and maintenance cost of equipment		15,000		-		-		10,000		5,000
52	Reporting costs		3,500		-		-		-		3,500
53	Sundries		11,500		1,500		4,000		3,000		3,000
59	Component total		30,000		1,500		4,000		13,000		11,500
99	UNDP Total		2,423,450		551,500		564,000		203,000		199,500

IND/88/052

PPDC for Pumps, Motors and Diesel Engines
Coimbatore (Tamil Nadu)

Pre-project activities

1. Acquisition of land for the building of the Centre.
2. Acquisition of temporary building and its modifications for housing the nucleus of PPDC.
3. Appointment of Project Director and Core Staff.

Project activities	Starting Date	Duration	Party responsible for the activity
Phase I			
- Visit by CTA(Product design and Development) - Pumps	Month 1	2 Months	UNIDO/PPDC
- Visit by Consultant(Product Design & Development - Motors)	Month 2	3 months	"
- Visit by Consultant(Product Design & Development - Diesel Engine)	Month 2	3 months	"
- To carry out local analysis of the State of the Art of the industry	Month 2	3 Months	PPDC/SIDO
- Identification of areas of collaboration with the manufacturers, existing R&D institutions and universities.	Month 2	4 Months	PPDC/SIDO
- Study Tour within India and abroad of the Director and Joint Director for state of the art know how and/or for transfer of technology	Month 2	2 Months - 1 month in India 1 month in Abroad	PPDC/SIDO
- Finalization of building plans	Month 2	2 Months	PPDC/State Govt. of Tamil Nadu
- Finalization of specifications and requisition for equipment to be procured indigenous with UNDP funds	Month 2	2 Months	PPDC/CTA
- Construction of Building	Month 5	12 Months	PPDC/State of T.N
- Preparation of a local consultancy study involving aspects of quality control, price, exports, incentive on power tariff and other policy decisions at the national level.	Month 5	3 Months	PPDC/SIDO

Project activities	Starting Date	Duration	Party responsible for the activity
- Procurement & installation of indigenous equipment in temporary premises	Month 7	6 Months	PPDC
- Review of the progress in the above areas.	Month 8	1 Month	PPDC
- Organisation of a national technical seminar involving policy makers, manufacturer R&D institutions and end users to define the various aspects of the Project.	Month 9	1-2 days	PPDC/SIDO
- Preparation of first Project Performance Evaluation Report (PPER)	Month. 11	One week	NPD.
- Tripartitie Review of the Project	Month 12	One day	UNDP/PPDC/SIDO/ UNIDO
- Receipt of equipment from UNDP/UNIDO	Month 12		UNIDO/PPDC

Note: The above is a preliminary Phase-I work plan for the first 12 months of the Project activities. A detailed work plan will be prepared by the National Project Director in consultation with CTA and other Consultants at the beginning of the Project, and will become part of this Project Document.

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Annexure - II

SCHEDULE OF REVIEWS, REPORTS AND EVALUATIONS

Reviews

1.	Tripartite review	In the 12th, 24th and 36th months
2.	Mid-term review	24 months from commencement of the project
3.	Terminal review	One month before the scheduled termination of the Project.

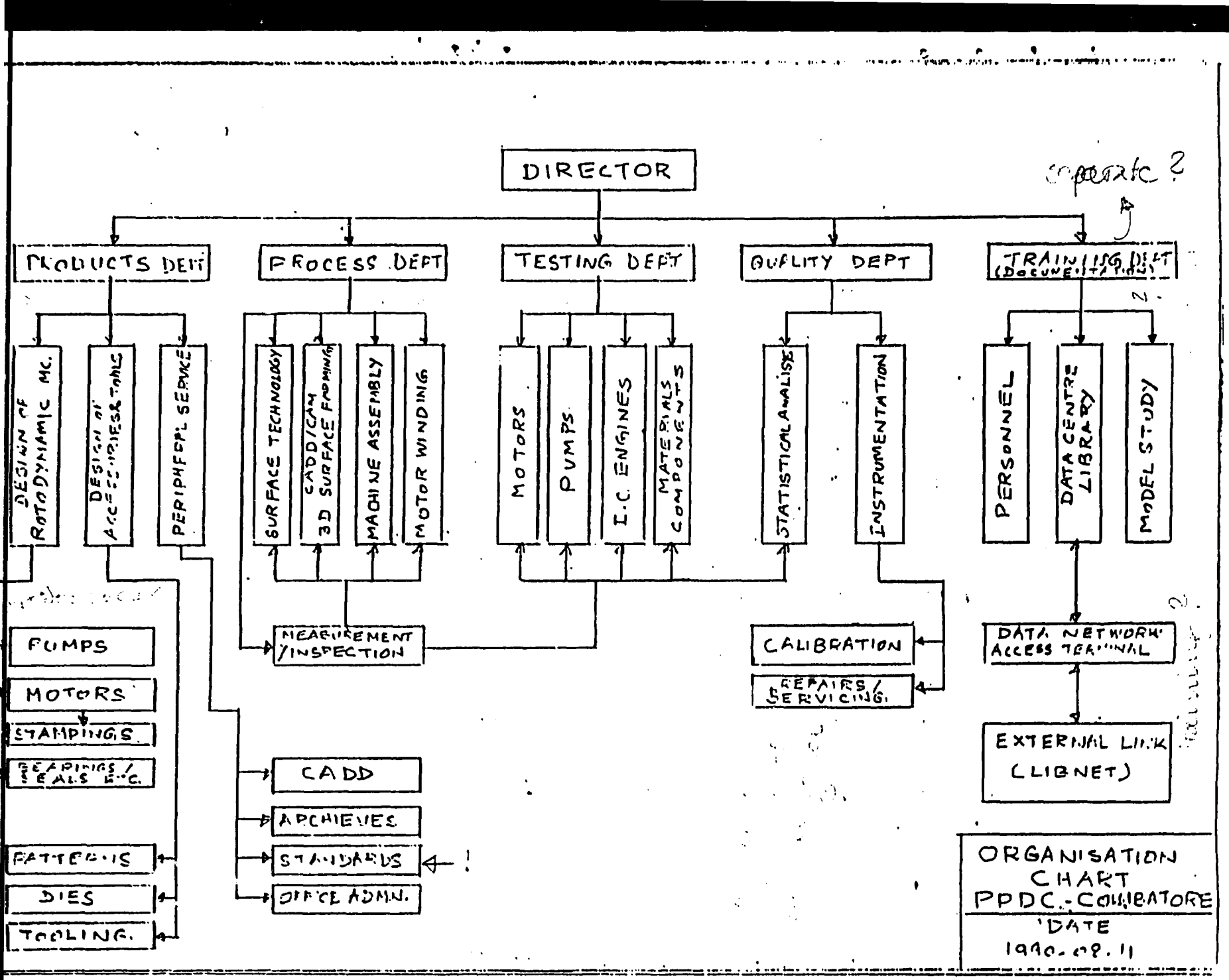
Reports

1.	Project performance Evaluation report (PPER)	In the 10th month and then 2 months before each Review.
2.	Project Terminal Report	Five months before the scheduled termination of the project.

Evaluations

1.	First Evaluation	24 months after commencement of the Project, if considered necessary.
2.	Terminal Evaluation	One month before the scheduled termination of the Project to coincide with the Terminal Review.
3.	Post Evaluation	24 months after the termination of the months.

Decision on type and timings of evaluation to be decided during project reviews.


DIRECTOR
PRODUCTS DEPT
PROCESS DEPT
TESTING DEPT
QUALITY DEPT
TRAINING DEPT
DESIGN OF ROTODYNAMIC MC.
DESIGN OF ACCESSORIES & TOOLS
PERIPHERAL SERVICE
SURFACE TECHNOLOGY
CADD/CAM 3D SURFACE FORMING
MACHINE ASSEMBLY
MOTOR WINDING
MOTORS
PUMPS
I.C. ENGINES
MATERIALS COMPONENTS
STATISTICAL ANALISIS
INSTRUMENTATION
PERSONNEL
DATA CENTRE LIBRARY
MODEL STUDY
PUMPS
MOTORS
STAMPINGS
BEARINGS / SEALS ETC.
PATTERNS
DIES
TOOLING
MEASUREMENT /INSPECTION
CADD
ARCHIEVES
STANDARDS
OFFICE ADMN.
CALIBRATION
REPAIRS / SERVICING
DATA NETWORK ACCESS TERMINAL
EXTERNAL LINK (LIBNET)
ORGANISATION CHART PPDC - COIMBATORE
DATE 1990.08.11

ANNEX VII C

ANNOTATED FORMAT

PROJECT FORMULATION FRAMEWORK

Country: INDIA

Date: AUGUST 1990

Project No.: IND/88/052

Proposed Title: Process cum Product Development Centre for Pumps, Motors and Diesel Engines at Coimbatore (Tamil Nadu)

Estimated duration: Four Years

Tentative UNDP + cost sharing contribution:	$2.423.450	Estimated counterpart costs:	Rs. 38.000.000

Sources of funds (IPF,SMF/LDCs, cost sharing, others): IPF

A. Development problem(s) intended to be addressed by proposed project

1. At sectoral or subsectoral level (the "macro" level):

Problem

Wastage of energy resources in exploiting ground water for irrigation purpo

Causes

Pumps presently used and manufactured in India are of poor efficiency and have a low level of reliability which both are attributed to poor hydraulic & mechanical design also to poor quality manufacture & as a final point lack of maintenance and experience by the users.

Lack of designing facilities and knowledge of improved techniques to design state of art hydraulics components.

Lack of improved techniques of modern machining.

Evidence

Excessive energy consumption programme of rectification of about 2500 pump sets carried out by the Rural Electrification Commission (REC) in 1985 in various parts of the country, showed an excess of energy consumption in the country ranging from 22.3% in the State of Tamil Nadu to 48.7% in Andhra Pradesh. The Institute of Cooperative Management(ICM), Ahmedabad which evaluated the results of the rectification programme estimates that energy worth about Rs.10.000 million (1.000 crores) per annum can be saved if all the existing faulty pumping systems are properly rectified. Higher costs of agricultural production. 80% of the existing agricultural pumping sets are working at sub-optimal level of efficiency; pumps and prime movers manufactured in Coimbatore where the industry is concentrated & which accounts for 40% of the total production in the country, are still of solid age-old design, of poor finish and consume large quantities of metal and occupy large space. As a result, not only is the product heavy and crude but it is also not so efficient and has low fuel efficiency.

2. At level subject to solution by the proposed project itself (the "micro" level):

Problem

Low efficiency of agricultural pumping sets used in lift irrigation manufactured by small scale industry in the country.

Causes

Inadequate or none R&D infrastructure and poor technology.
Lack of designing facilities and knowledge of improved techniques of management and manufacture of the pumping sets.
Lack of inspection and quality control facilities.
Lack of knowledge concerning new materials of construction for centrifugal Pumps, Motors and Diesel Engines.
Lack of quality components used for the manufacture of pumping sets.
Lack of training facilities for the manufacture of energy efficient pump sets, motors and diesel engines.

Evidence

Poorly designed low quality pumping sets and prime movers being produced. Wastage of raw materials in the production of the pumping sets. Higher costs of production of the pumping sets. Low efficiency and productivity causing an annual loss of energy to the tune of approximately Rs. 10,000 million (Rs. 1,000 crores). Higher costs of agricultural produce due to costly inputs. Low experience is found among users to adequately maintain or repair their units so, overall efficiency is going further down.

B. Concerned parties/target beneficiaries

1. Who has identified the development problem and how has it come to the attention of UNDP?

The problem has been identified by the Department of Industrial Development, in the Ministry of Industry through a team which was deputed to study the problem, and brought to UNDP's attention by the said Ministry through the Department of Economic Affairs, the coordinating agency for the UNDP programmes.

In August 1990 technical visits and meetings with Manufacturers and Associations have been conducted by Mr. M.L. Tartavel, UNIDO Expert. Cities as Madras, Coimbatore, Pune were visited for confronting opinions on a proposed Process Product Development Centre (PPDC) at Coimbatore for pumps and their drivers. (See Annexes I & IA) for list of Industrialists and Organization which have been contacted.

2. What particular group of groups are intended to benefit from the solution of the development problem identified above at item A.2 (i.e., the target beneficiaries)? If appropriate, indicate the breakdown of the group(s) of gender.

The target beneficiaries of this Project will be the small scale industrial units manufacturing pumping sets and prime movers, and their components. The ultimate beneficiaries will be the farmers who will benefit from the use of the improved pumping sets which are cheaper to buy and run than those presently available.

On the basis of interaction with the concerned organization/bodies it has been found that the appropriate means to improve pumps units for irrigation and other agricultural needs are not available to date. So, the urgency of a PPDC to be built at Coimbatore is very much felt to improve the end product of the small pump manufacturers.

Also, the second target to be achieved by PPDC is to develop new pumping units designed to be compatible to international standards and to be competitive being of the latest state of the art by comparison to the ones manufactured by world leaders, so, creating a new opening to Indian Pumps Manufacturers toward the export market.

C. Pre-project and end of project status

I. The present or pre-project situation:

Nearly one third of land surface in India is semi-arid where rainfall is seasonal and erratic. Therefore the development of water resources for irrigation has assumed great importance. Surface water was the mainstay of irrigation till almost the middle of this century, but during the last three decades the importance of ground water has been realised and now it constitutes an important source of irrigation accounting for about 45% of irrigation potential created in the country. Ground water is exploited by lift irrigation employing mostly centrifugal pumps powered either by diesel engines or electric motors. During 1986-87,the actual power availability user consumption was estimated at 148 billion units. The agricultural secto consumed about 29.5 billion units or 20% of the power available for

At the end of the Sixth National Development Plan, there were about 9.2 million (92 lakhs) pumping sets operating in the agricultural sector. About 4 million (40 lakhs) sets were expected to be added during the Seventh Plan Period. Thus a total of 13.2 million pumping sets are expected to be operating by the end of the Seventh Plan (March 1990). Recent field studies indicate that most of the installed pumping sets operate at low levels of efficiency and that considerable saving in energy is feasible. During 1985, the REC undertook rectification of 2500 pumping sets in different states which included replacement of suctional delivery pipes and bends made of RPVC/HDP and replacement of foot valves with more efficient ones. Evaluation of the results of rectification programme by independent agencies like the National Productivity Council (NPC) and ICM, Ahmedabad showed that the percentage of energy saved in lifting a given amount of water varied from 22.3 in Tamil Nadue to as high as 48.7 in Andhra Pradesh. The major cause for energy drain in agricultural pumps in the use of improper piping system & foot valve with high frictional losses, use of sub-standard/inefficient motor/diesel engine and of course an inefficient pump. Therefore, the need to evolve a highly efficient pumping system is felt not merely by a desire of technological upgradation per se also by the urgent need to conserve high and cost scarce energy resources.

More than 50% of the total production of pumps and prime movers is produced in the small scale sector and roughly 40% of it comes from Coimbatore in Tamil Nadu which has earned a name for the skills the industry there has developoed in the making of electric motors and pumping sets. Coimbatore has been a centre of this industrial activity for quite some time and in due-course has not only developed an industrial base but has also developed a certain degree of specialisation in this area. As a result, some of the most inexpensive pumping sets produced in the country are from Coimbatore. However, the pumps and prime movers manufactured in Coimbatore are still of solid, age old design and consume large quantities of metal and occupy larger space. Not only the product crude and heavy but it is also not so efficient. Developments and innovations have since taken place the world over in this field resulting in better designs, use of alternative and better materials and modern manufacturing processes. This has not only brought about a reduction in weight and size, and consequently the cost of the pump sets, but also improved efficiency and reliability of the product.

Information of design of the pumping set and the prime mover achieve energy saving is by itself an important area offering immense potential. It has been estimated that by better design of agricultural pumping sets and pumping systems, a total saving of approx. Rs. 10,000 million (Rs. 1,000 crores) per annum can be effected (Rs. 7,000 million in electricity and Rs. 3,000 million in diesel fuel). These savings are worth much more than the actual money saved - the former unblocks scarce electricity to operate more industries and pump sets and the latter saves precious foreign exchange. It is therefore imperative that the manufactures of agricultural pumps and prime movers in the country, a majority of whom as earlier indicated are concentrated in Coimbatore, should receive guidance and help in the design and manufacture of improved energy efficient pumping systems.

The quality of agricultural pumping sets and prime movers because of the poor quality of components such as castings, also does not meet the international standards. Though the product is sturdy, its crude design, heavy weight, poor finish and low fuel efficiency are some of the factors inhibiting their exports. The small scale industry needs considerable developmental inputs to improve its production methods, quality, finish, economics. etc. so as to match the acceptable levels in the world market. Once this is achieved, profitability of many units which are often on the verge of becoming sick, will greatly improve.

Sickness among the units manufacturing these products is endemic because of creation of excess capacity and intense competition amongst them. A process and product development centre would help the units redesign their products. adopt better techniques and materials and reduce costs of production so that the total demand for the production can increase for both the internal and the export markets.

2. The situation expected at the end of the proposed project:

At the end of the Project, it is expected that a full fledged process and product development centre will have been established, which would help the industry manufacture improved pumping sets and prime movers. It is expected that approx. 10 new designs of efficient pump sets and 4 to 5 designs each of electric motors and diesel engines will be developed during the life of the Project. After the field trials have been conducted and the products found to be of acceptable quality, these designs together with the manufacturing technology will be passed on to the units willing to take up their manufacture. This will be the first step to bring out new generation pump units replacing actual reverse engineering & for which the industry will be re-educated to adopt scientific methods which would ultimately bring in awareness of the benefits of manufacturing quality products and better product designs. The Centre will also assist the small scale industry by developing a delivery package of technology to include components, products, designs, inspection and quality control systems, standardised process operations, charts and other system engineering and technology. The centre will be knowledgeable of the international development of pumps for different fields of applications & be able to test & confirm such new products & be able to design equivalent or better product to permit Indian Manufacturers to approach successfuly the export market. The Government will be expected to provide marketing support to the units manufacturing improved pump sets and prime movers through agencies like NABARD (National Bank for Agricultural and Rural Development) by arranging supplies to the end users.

D. Special considerations:

1. The Project mainly concerns the small scale sector manufacturers of pumping sets and prime movers who will benefit from the settin g up of the proposed Centre. The improved designs of pumping sets and prime movers may attract investment by private sector in the manufacture of the improved products.

2. Identify any negative impact which the project may have on the environment or on particular groups, etc.

The Project is not likely to have any negative impact on the environment or on any particular groups.

E. Other donors, programmes active in the same subsector

There is no ongoing or earlier Project relating to the subject area of this Project.

There is no duplication with any existing Laboratory Institute or Research Centre which are either of limited means on either of a very high level of fluid mechanics;none of them is oriented to agricultural industrial pumps units developments or industrial pumps units.

F. Development objective and its relation to the country programme

To upgrade and modernise the technology and quality of pumping sets and prime movers manufactured by the small scale sector in the country and used for irrigation purposes with a view to achieving optimum level of their efficiency and conserving scarce energy resources in exploiting ground water for irrigation in the agricultural sector.

Apart from the fact that the development of agriculture is the priority number one of the Government of India, the Seventh Five Year Plan specifically states that as a large number of diesel & electrical pumpsets used in irrigation are found to be operating at low efficiency, resulting in over-consumption of fuel and electrical energy. efforts would be made to rectify the old installiations and at the same time to guard new installations of inefficient pumpsets.

The deveopment of modern manufacturing technology aimed at in this project is an important contribution towards achieving the larger national objective of modernising Indian engineering industries. The domestic and international competitiveness of Indian engineering goods will be enhanced through the application of this technology, which will enhance the quality and productivity of manufactured goods. These are in line with the objectives of the Country Programme.

G. Major elements

Immediate objective one:	Success Criteria
Establishment of a Process-cum-Product Development Centre (PPDC) to assist the small scale industry manufacturing agricultural pumps, motors and diesel engines used in irrigation and their components to upgrade the quality of their products and to make them more cost efficient.	When the PPDC has been actually established and rendering services to the industry as detailed herein & producing outputs as envisaged.

a) To develop improved designs and manufacturing technology for the folowing pumps (details in the Project document):

1) Conventional centrifugal pump using electric motor or diesel engine as prime mover:

2) Electro-monoblock pumps of different types.

3) Special pumps as pumps for chemical industry, food industry, sewage pump, submersible pumps etc. (during second stage of the project)

b) To delop and deliver to the industry improved package of technology which would include components, products, designs, inspection and quality control systems, standardised process operations and charts, and other systems engineering and technology.

c) To provide facilities for testing raw materials and components/products to meet national and international specifications/standards.

c!) To provide testing facilities for pumping sets up to 100 kW (approx.) with modern instrumentation for performance evaluations and analysis of results for new national and international pumping units.

d) To provide facilities for proto-type manufacture of improved models of pumps, motors and diesel engines for testing, demonstration and development.

e) To render consultancy services to improve design, use of standard materials, energy efficiency, manufacturing methods and to provide modern technology.

f) To disseminate technological information, market survey results and trends and management inputs through seminars, workshops and technical information and documentation services.

g) To impart training in design and manufacturing process.

h) To conduct research and development programmes in relevant areas in close cooperation with other R&D institutions and the industry concerning the latest state of the art for pumps of different fields built on the international market. On Annex. 4 are suggestions which were drafted by the pump manufacturers' Deputy. I have considered this listing very realistic and totally in alignment with my views after visiting and argumenting with Manufacturers, Users and Bankers. It is of the most importance for this document to be attached to the Project Formulation Framework.

Outputs	Activities	Party responsible for the activity
	Pre-project Activities	
I.1 A report consisting of local analysis of the state-of-the-art of the industry. information on identified areas of collaboration with manufacturers and existing R + D institutions, a study of related policy issues (quality control certification, standardization, incentives, prices, exports) and a work programme for the PPDC.	I.1.1. Acquisition of land for the building of the Centre.	SIDO/State Government of Tamil Nadu
	I.1.2 Acquisition of temporary building and its modifications for housing the nucleus of PPDC.	SIDO/State Government of Tamil Nadu
	I.1.3 Appointment of Project Director and core staff	S I D O
	Project Activities	
	I.1.4 Initial visits of CTA and two consultants(design and development of a) pumps, b) motors, c) diesel engines)	UNIDO/PPDC
	I.1.5 Carrying out analysis of State-of-the-art	PPDC/SIDO
	I.1.6 Identification of areas of collaboration with manufacturers and R + D institutions	PPDC/SIDO
	I.1.7 Study tour within India and abroad to preselected foreign countries by the Director & Joint Director	PPDC/SIDO
	I.1.8 Preparation of local consultancy study on related policy issues	PPDC/SIDO

Ouputs	Activities	Party responsible for the activity
	1.1.9 Organization of seminars for policy makers, manufacturers, R + D institutions and end users to define the functions of the PPDC	PPDC/SIDO
	1.1.10 Preparation of a report on the above activities	PPDC/SIDO
	1.1.11 Preparation of a detailed work plan for the project requirements, work procedures, space and equipment requirements of each of the organizational units of the PPDC	PPDC/SIDO
1.2 PPDC for pumps,motors and diesel engines established and operational with the following departments/ divisions.	1.2.1 Drawing up of building plans for PPDC	Director, PPDC in consultation with T.N. Government and SIDO.
	1.2.2 Requsition of equipment both indigenous and to be imported	Director, PPDC in consultation with SIDO and UNDP.
	1.2.3 Appointment of staff	SIDO/PPDC
	1.2.4 Training of staff abroad by international experts	UNIDO/PPDC

Outputs	Activities	Party responsible for the activity
	1.2.5 Development. introduction and demonstration of new designs and technologies based on R + D provision of facilities for prototype manufacture of improved models of pumps, motors and diesel engines and their components for testing, demonstration and development; modernization of existing industry units; improvement of techno-economics of production of existing proeucts; about 10-12 designs of pumps, about 6-8 designs of efficient electric motors, and 4-5 designs of diesel engines will be developoed; to render consultancy services to approx. 100 units per year on improved design, use of improved material, and better manufacturing methods.	PPDC/UNIDO
Quality Control & Quality Assurance	1.2.6 Day to day quality analysis of raw materials and products received from the industry to meet national and international specifications/standards; quality certification. test facilities expected to be made available to 200 manufacturing units per annum; consultancy services to be rendered to about 100 units per annum.	PPDC/UNIDO

Outputs	Activities	Party responsible for the activity
Information and Documentation	1.2.7 Consultancy services rendered and industrial enquiries answered; technological information dissemination and publication of newsletters, market survey results. preparation of reports on current status of industry and future national, and international trends; organization of industry R&D collaborative get togethers; preparation of Project/Process design reports.	PPDC/UNIDO
Training	1.2.8 To train personnel from industry in manufacturing process - training to be of 6 months' duration and to cover two batches per year of 20 trainees each (40 trainees per annum); and to conduct seminars and workshops for industry personnel.	PPDC/UNIDO

H. Project strategy

1. The direct recipients of the benefits of this project would be staff of the centre but this centre will only be an instrument of delivery to the target beneficiaries who will be the small scale sector manufacturers of pumps, motors and diesel engines, and ultimately the farmers reaping fruits from the improved quality of these products.

2. How the benefits are proposed to be delivered by the PPDC:

The PPDC will reach the target beneficiaries by:

a) Quality assessment of raw materials used in the manufacture of pumps, motors and diesel engines, and assessment and certification provided for the finished products.

b) Providing consultation to the industry for improvement of existing production technologies and techno-economics of the industry.

c) Information dissemination system to bring to the notice of industrialists the new developments in this field at national and international levels.

d) Demonstration of new production processes and technologies for smooth technology transfer and continuous incorporation of new developments into the fabric of the industry.

e) Project reports/proposals prepared which will help new entrepreneurs to establish new industries.

Describe the implementation arrangements proposed for the project

The project will be located at Coimbatore where adequate space will be made available for the project by the State Government of Tamil Nadu. Its implementation will be started with a programme consisting of local analysis of state-of-the-art study of possibilities to collaborate with manufacturers and existing R and D Institutions, study of some related policy issues, organization of seminars for policy-makers, manufacturers, R and D Institutions and end-users, and specialized study tours and of defining the work programme of the project and the PPDC. While the imported machinery and equipment, services of international experts/consultants and training fellowships will be made available by UNDP/Executing Agency, the counterpart staff, services, indigenous equipment and running expenditure for the smooth functioning of the project will be met by the Government of India.

The Small Industries Development Organisation (SIDO) in the Ministry of Industry will be the nodal agency for the implementation of the P roject from its very inception. The SIDO will select from its own staff, a Project Director and requisite staff in other disciplines for the successful implementation of the Project. To oversee the working of the Project there will be a Project Advisory Committee comprising

representatives of the Government. industry/industry associations, UNDP and UNIDO which will meet regularly to review the progress of the Project and critically examine the perspective plans of the Project, and provide guidance for its successful implementation. The Project will be implemented through training of national staff abroad in related institutions and locally by international experts. The Project Advisory Committee which will include representatives of the industry will ensure that industry is informed about the activities of the Centre and can make use of its services. Other institutions carrying out R and D work in related areas will be invited to co-operate with the PPDC.

Alternative project strategies and/or implementation arrangements

No other strategy/implementation arrangement was considered advisable for the present project other than to request UNDP/Executing Agency assistance for the setting up of this Centre. The required expertise in designing and developing efficient pumps is not readily available in the country. Other countries like Japan, Italy, France, Sweden, Denmark and West Germany have developed superior technology and designs for manufacture of fresh water pump sets. It is believed that it could be desirable later to organise Transfer of Technology from such countries through the efforts of UNDP/UNIDO by which not only technical knowhow is expected to be supplied but also deputation of experts to the Project to train the counterpart staff and help in designing and improving the manufacturing technology of these pump sets. It is also expected that counterpart staff and others selected would be provided training in advanced countries so that they have an exposure to the state-of-the-art technology in this field as prevailing in those countries.

I. Host country's commitment

1. The Small Industries Development Organisation (SIDO) in the Ministry of Industry, Government of India will be the implementing agency for the Project. While the land and buildings for the Project will be provided by the State Government of Tamil Nadu, the other counterpart inputs including staff, indigenous equipment, services and running expenditure for the Project will be the responsibility of SIDO on behalf of the Government. The Government will meet its counterpart obligations as envisaged in the Project document.

2. There exists a well established arrangement under which counterpart staff trained under the Project will remain in their posts for a fixed period of three years after their training.

J. Risks

Description of Risk	Estimated likelihood	
1. Factors which may at the outset cause major delays or prevent achievement of the Project's outputs and objectives.		
a) Delay in acquisition of land and/or hiring of temporary accommodation for the PPDC.	None (land is already available with existing building) see Annex 3.	
b) Appointment of Director and other core staff	Low - (this is confirmed after M.L.T. August visits to Coimbatore, Madras & Pune	
2. Factors which could over time cause major delays or prevent achievement of the Project's outputs and objectives.		
a) Design/plan and construction of the building for the Centre.	Low	(same as above)
b) Delay in ordering and delivery of equipment	Low	(same as above)
c) Delay in assigning international personnel to the project and training fellows as envisaged.	Low	

K. INPUTS

1. Skeleton Budget	National inputs (in Indian Rupees) US$1 = Rs. 16.37)	External inputs (in US Dollars)
Personnel	6.920.000	675.000
Sub-contracts	-	-
Training	-	230.450
Equipment	22.000.000	1.488.000
Premises including testing	8.000.000	-
Library	580.000	-
Miscellaneous	500,000	30.000
Totals	38.000.000	2.423.450

2. Comment on any proposed inputs which may raise policy issues on which headquarters guidance is sought (e.g. high equipment component, payment of local and recurrent costs, incentive payments).

None

Person(s) primarily responsible for this formulation framework _____
Signature

Name :

Title :

Project Budget Covering UNDP Contribution

(in US Dollars)

Country: India
Project No: IND/88/052
Project title: Process and Product Development Centre for Pumps, Motors and Diesel Engines Coimbatore (Tamil Nadu)

		Total		1991		1992		1993		1994	
		m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
10	PROJECT PERSONNEL										
11	International Experts										
11.01	Product Design and Development Pumping sets - CTA	14	147,000	6	60,000	4	42,000	2	22,000	2	23,000
11.02	Product Design and Devp.Motors	11	117,500	3	30,000	3	31,000	3	33,000	2	23,000
11.03	Product Design and Devp. Diesel Engines	11	117,500	3	30,000	3	31,500	3	33,000	2	23,000
11.04	Production Techniques	8	87,000			4	42,000	2	22,000	2	23,000
11.05	Foundry/Metallurgy	8	87,000			4	42,000	2	22,000	2	23,000
11.06	Quality Control Techniques	8	87,000			4	42,000	2	22,000	2	23,000
11.99	Sub-total Experts/Consultants	60	643,000	12	120,000	22	231,000	14	154,000	12	138,000
15	Duty travel		12,000		2,400		4,400		2,800		2,400
16	Mission Costs(Evaluation Mission)		20,000		-		-		-		20,000
19	Component total	60	675,000	12	122,400	22	235,400	14	156,800	12	160,400
30	TRAINING										
31	Fellowships										
31.01	Product design and development (3x3 m/m)	9	51,150			3	16,500	3	17,250	3	17,400
31.02	Production Techniques(5x3 m/m)	15	84,900			6	33,000	6	34,500	3	17,400
31.03	Foundry/Metallurgy(2x3 m/m)	6	33,750			3	16,500	3	17,250		
31.04	Quality Control Techniques (3x3 m/m)	9	45,650			3	11,000	3	17,250	3	17,400
32	Study tour by the Project Director and Jt.Director to observe working of similar centres	2	15,000	2	15,000						
39	Component total	41	230,450	2	15,000	15	77,000	15	86,250	9	52,200

IND/88/052

		Total m/m	Total $	1991 m/m	1991 $	1992 m/m	1992 $	1993 m/m	1993 $	1994 m/m	1994 $
40	EQUIPMENT										
41	Expendable Equipment		188,000		50,000		60,000		40,000		38,000
42	Non-expendable equipment		1,300,000		500,000		500,000		150,000		150,000
49	Component total		1,488,000		550,000		560,000		190,000		188,000
50	MISCELLANEOUS										
51	Operation and maintenance cost of equipment		15,000		-		-		10,000		5,000
52	Reporting costs		3,500		-		-		-		3,500
53	Sundries		11,500		1,500		4,000		3,000		3,000
59	Component total		30,000		1,500		4,000		13,000		11,500
99	UNDP Total		2,423,450		551,500		564,000		203,000		199,500

ANNEX V

LIST OF EQUIPMENT TO BE PROVIDED BY UNDP

I.	**EXPENDABLE EQUIPMENT**	
	Expendable equipment and supplies	$ 188,000

ANNEX V

LIST OF EQUIPMENT TO BE PROVIDED BY UNDP
NON-EXPENDABLE EQUIPMENT

1. 3D SURFACE MACHINING & INSPECTION SHOP

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	CAD/CAM 3D Surface Milling Machine	Set		100 000	
2.	XYZ & Angle measuring equipments	Set		80 000	
3.	Die Sinking tools	Set		3 000	
4.	Jig boring machine	Set		60 000	
5.	Copy milling machine	Set		10 000	
6.	Compressor & Pneumatic piping	Set		5 000	
7.	Spark Erosion machine	Set		55 000	
	Total			313 000	

II. MOTOR WINDING SHOP

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Auto winding machine	Set		30 000	
2.	Impregnation Equipment	Set		20 000	
3.	Baking Oven	Set		5 000	
4.	Mechanical Acceleration Streigth tester (G - tester)	Set		5 000	
5.	Wire gauge & roundness tester, Insulation thickness tester, Micro Ohm meter (Digital), Other tools & accessories	Set		5 000	
	Total			65 000	

III. INTERNAL COMBUSION ENGINE LAB

S.No.	Name of equipment.	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Computerised Testing facility to test IC Engines of speeds upto 3000 rpm and capacities from 1 to 11 kw. including accessories	Set		50 000	
	Total			50 000	

IV. PUMP TESTING FACILITIES

S.No.	Name of the equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Computerised performance testing facility for pumps of 10 to 100 kW	Set		80 000	
2.	NPSH Testing Facility with heating & cooling arrangements	Set		50 000	
3.	Noise Level measuring instruments, Palisade testing facility, Precision manometers and flowmeters of different ranges, Jet testing facility	Set		30 000	
	Total			160 000	

V. ELECTRICAL MOTOR/PUMP ASSEMBLY & TEST SHOP

S.No.	Name of the equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Computerised test bed(load test)(1 kw to 25 kw capacity)	Set		50 000	
2.	Computerised test bed (speed Torque)(1 kw to 25 kw capacity)	Set		30 000	
3.	Dynamic Balancing machine Computerised vibration signature analyser	Set		10 000	
4.	Hydraulic press/pulleys, Bearing Assembly Kits, Tachometer, stopwatch, temperature sensors etc.	Set		10 000	
5.	Memory Oscilloscope, Electrification & other facilities, Hot spot Inspection equipment(High current source + heat sensing papers)	Set		20 000	
6.	Anechoic chamber + noise level measurements	Set		5 000	
7.	Lathe, drilling, welding etc.	Set		5 000	
	Total			130 000	

VI. ROTODYNAMIC MACHINE DESIGN DEPARTMENT

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	CADD facilities - 3 to 4 station with LAN software - standard (FEM etc) & custom made	Set		75 000	
2.	Data Centre/ Library with lib-network access terminal facilities	Set		150 000	
	Total			225 000	

VII. MATERIAL & COMPONENT TEST LAB

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Stress analysis and testing facility for stationary & rotating elements	Set		100 000	
2.	Bearing testing facilities, Seal testing facilities, Testing equipment for materials against erosion, wear, corrosion & cavitation	Set		100 000	
	Total			200 000	

VIII. TRAINING OF PERSONNEL DEPARTMENT

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Auditorium for 100 persons, A/C, Video Projector, OPH, SP, Public address system etc, Class room for 40 persons with all above teaching aids.	Set		50 000	
2.	Different type of recent designed pumps of various capacities for study & assembly practice, Different type of recent designed ac single & 3 phase motors of capacities upto 11 kw for study and assembly practice	Set		50 000	
	Total			100 000	

IX ELECTRICAL MOTOR STAMPINGS SHOP

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	PRODUCTION				
	Sheet cutting machine Blanking Press Notching machine Deburring Processing Annealing Oxidising/Varnishing	Set		75 000	
2.	INSPECTION				
	Profile Projector Coating Thickness Gauge Electromagnetic Tester Epstines Frame Interlaminar Resistance Tester Stack Factor Tester	Set		50 000	
	Total			125 000	

X. SURFACE TECHNOLOGY DIVISION

S.No.	Name of equipment	Qty	Manufacturer	Approx. Estimate US $	Remarks
1.	Surface Roughness measurement and analysis				
2.	Surface grinding, honing, burnishing, lapping machines				
3.	Chemical processing of surfaces (electroplating equipment etc) (oxidising facilities)				
4.	Plasma Coating equipment	1 Set		120 000	
5.	Modern Painting processes			120 000	
	Total				

I.	3D SURFACE MACHINING & INSPECTION SHOP	313.000
II.	MOTOR WINDING SHOP	65 000
III.	INTERNAL COMBUSION ENGINE LAB	50 000
IV.	PUMP TESTING FACILITIES	160 000
V.	ELECTRICAL MOTOR/PUMP ASSEMBLY & TEST SHOP	130 000
VI.	ROTODYNAMIC MACHINE DESIGN DEPARTMENT	225 000
VII.	MATERIAL & COMPONENT TEST LAB	200 000
VIII.	TRAINING OF PERSONNEL DEPARTMENT	100 000
IX.	ELECTRICAL MOTOR STAMPINGS SHOP	125 000
X.	SURFACE TECHNOLOGY DIVISION	120 000
	TOTAL	1,488,000*

*Inclusive of approx. 10% towards the cost of insurance and freight.

NOTE : The list of equipment is subject to revision or modification if considered necessary.