SECTION -1
PROJECT CONTEXT

A. STATE OF ORISSA- A BRIEF PROFILE:

Orissa, bounded on the west by the thickly forested hills of the Eastern Ghats and on the east by nearly 500 km coastline of the Bay of Bengal, is a beautiful state covering an area of 156, 000 sq. kms. It is surrounded by Jharkhand on the north, West Bengal on the north-east Andhra Pradesh on the south and Chhattisgarh on the west.

Orissa is one of the prosperous states of India owing to its fertile land and rich mineral resources viz. coal, iron and bauxite. The state is booming towards a big industrial growth in the near future. Orissa is also emerging as a player in outsourcing IT and IT services.

Orissa, referred to as "The Soul of India", is a mystical land where the past and the modern today form a harmonious blend. The state is filled with awe inspiring monuments, thousands of master craftsmen and artists, numerous wildlife sanctuaries, stunning natural landscapes and many more.

B. PHYSIOGRAPHY OF THE STATE:

The coastal plains of Orissa stretch on the eastern coast of India from the Subarnarekha in the north-east to the Rushikulya in the south-west. This fertile region is known as the 'rice bowl' of Orissa. This coastal plain is narrow in the north, widest in the middle, narrowest in the Chilika coast and broad in the south.

The coastal plain is a gift of six major rivers. The formation of the coastal plains depends on the rivers and their catchment's area. The rivers are: From north to the south, the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi and the Rushikulya. Most of the rivers have failed to develop true deltaic

characteristics because of the strong off shore current which moves from Chennai to the Andhra coast and passes through Orissa coast.

According to the location, the coastal plain can be divided into three sub regions

a) The north coastal plains - the deltas of the Subarnarekha and the Budhabalanga up to the river Baitarani

b) The middle coastal plains - the combined deltas of the Baitarani, the Brahmani and Mahanadi

c) The southern coastal plains - the Rukshikulya plains, it can be divided into three zones parallel to the shoreline

i) The salt track along the coast.

ii) The arable tract or rice country in the middle

iii) The sub-montane tract to the west

B.1 The Salt tract:

The salt tract is a narrow belt which stretches just beyond the shore line for about 4.8 to 9.6 Km in land. In many places it is impregnated with salt and is completely deprived of agriculture. The innumerable sluggish and blackish streams make the area difficult to traverse. In the Mahanadi delta, this salt tract is covered with tidal forest known as the "Little Sunderbans", off Paradeep-Dhamra coast. In the Devi-Daya sector, Casuarina forests and plantations are found. The forest belt all along the coast merges with a narrow belt of pasture.

B.2 The Arable tract:

The grass belt merges into the vast plains. The endless stretch of rice lands is the fundamental characteristic. Most of these places are occupied by village sites so as to be free from the annual inundation. The rivers have formed levees and during high floods they inundate vast areas, causing grave danger to human lives, cattle population and agriculture parts of this arable tract are protected from floods and are irrigated by gravity.

This is the richest part of the whole of Orissa as far as agriculture is concerned.

B.3. The Sub montane tract:

This is the meeting zone of the arable tract and the spurs of the Eastern Ghats. It is termed as the 'zone of transition'. Soil erosion is rampant here. Under this predominating red soil, blocks of laterite are buried and at times they crop up to the surface, turning the area barren and desolate. In this zone low level laterites are formed. But patches of fertile area are not uncommon having rich vegetation. The natural vegetation varies from prickly thorns and stunted shrubs to Sal forests. The absence of a coastal forest belt is most striking. This is because of the lack of a marshy strip due to higher orography.

B.4. The Mahanadi Delta:

The Mahanadi delta has developed in seven different stages. The stages of development have occurred at 26, 18, 15, 9, 6 and 1.5 meter contours. After the seventh stage of delta development there is an upliftment as a result of which three sets of parallel sand dumes developed along the coast. These raised sand ridges brought changes in the drainage pattern and in deltaic morphology. These parallel sand dumes have the maximum development between the Chilika and the Devi mouth and from there up to north of Dhamra. Several lagoons of varied sizes have been formed. The best examples are the Sat Para and the Samagara Pata located to the north of Puri.

C. COASTAL RESOURCES/MARINE AREA OF THE STATE:

Orissa has a coastal line of 529 Km from the marshes of Ichhapuram in the south to the east of Subarnarekha in the north-east. The Orissa coast has bulged out in the middle portion from Brahmagiri on Chilika Lake in the south-west to Chandbali in the north-east where the Mahanadi, the Brahmani and the Baitarani have formed a combined delta.

Marine fishery of Orissa is mainly carried out by a means of mechanized boats, medium size trawlers, traditional crafts (catamarans), motorized canoes (FRP and Wooden) fitted with OBMs and Beach landing crafts fitted with IBM.

Maximum sustainable yield from Orissa coast has been estimated to be 1.61 MT. But since last four years the catch is almost at the same place increasing from 1.2 lakh to 1.3 lakh MT.

D. COASTAL ZONE MANAGEMENT-STATUS

D.1 Laws & Policies:

Government of Orissa has a clear cut policy towards marine fishing in the form of Orissa Marine Fishing Regulation Act(OMFRA).The Said Act regulates different fishing Zones along with the coast line. Further it aims at sustainable fishing activity through numerical restriction of mechanized fishing vessels in the landing centers and protecting the economical interest of traditional fisherman operating in the marine sector.

As regards protecting the coast, the coastal regulation zone (CRZ) notifications and the coastal aquaculture authority act (CAA, 2005) notified by Government of India has been in force. The act enables to regulate the coastal aquaculture to ensure sustain, increase in aquaculture products and protection coastal environment.

The Fisheries and ARD Department of Government of Orissa is responsible for implementation of OMFR Act and Rules and CAA Act 2005 in the state of Orissa.

1. Implementation of OMFRA:

   After promulgation of Orissa Marine Fisheries Regulation Act and Rules in the state, it was mandatory for all the fishing boats plying in territorial waters of the state to get them registered and obtain license from the competent authority. Mechanized fishing vessels are not allowed to carry out fishing activity within 5 km from the coast to protect the interest of traditional fisherman. Fishing Vessels of neighboring states without valid registration under OMFRA are not allowed to fish in the territorial waters of Orissa. To conserve fish stock and bio diversity, uniform ban on fishing from 15th April up to 31st May every year is meticulously followed in the state. Orissa Coast being famous for the nesting sites of rare olive Ridley, sea turtle, several conservative measures are being taken under the OMFRA. Fishing activities are also restricted for the purpose.

2. Key issues in Coastal Zone Management:

   In the last few decades, Chilika had been under tremendous threat from both natural and anthropogenic pressures

resulting in severe degradation of lagoon eco system. The degradation process involve excessive silt deposition, choking of outer channel, choking of in let, poor exchange of water, poor flushing out of sediment, reduction in tidal influx, reduction in salinity level, invasion of fresh water weeds, shrinkage of water spread area, etc. Such degradation of the lagoon environment had also adversely affected the growth of fishery resources.

The department of Fisheries, GOO has been looking after conservation of important marine resource and socio economic development of fishers by implementing different developmental schemes and executing the OMFR Act and Rules. Considering the chances of huge mortality of sea turtles on account of fishing related activities in the specified areas, the department of Fisheries, Department of Forest and environment and Coastguard have been working jointly for strict enforcement of OMFR Act and Rules. The central empowered committee constituted by Hon'ble Supreme Court visited the Orissa Coast on 12th and 13th Feb 2004.The mandate of the team was to suggest measures to provide favourable condition for mass nesting of the turtles. As such the suggestions of the empowered committee have been duly complied by the department of fisheries in connection to fishing gear and mechanization of fishing crafts along the nesting sites.

Nesting sites:

The large congregation of olive ridley, sea turtles in the coastal waters of Orissa is reported to start from mid October to end of April or May. The recent ban on fishing in the turtle congregation area is effective from 01st November to 31st May vide Government notification no.1895/FARD dated 04th Feb 2005.The existing ban on fishing and use of turtle excluder device(TED) in trawl net is mandatory as per OMFRA to prevent incidental mortality of sea turtles. Prohibition of fishing has also adversely affected the mobility of fishing vessels both mechanized and traditional. Thereby the livelihood for the poor marine fisherman of the area is at stake. Since they have no alternative key activities for their subsistence. The fisherman's of the coastal area are mostly landless or having partly quantum of land which is not sufficient for their subsistence throughout the year. Moreover due to high rate of illiteracy and non acceptance to any change process the fisherman/women are forced to leave their native to distance paces in neighboring states as

labourers. Out of 240 days of fishing, 180 days of fishing are affected by turtle conservation which causes decline of income of fisherman and resulted in regular conflict between fisherman and non fisherman community and migration to neighboring states for alternate employment.

3. Effect of OMFR Act and Rules on the livelihood of Fisherman:

   Due to the ban on fishing for the protection of olive riley turtles and the general ban imposed by Govt. of India, the fisherman's of the coast of Orissa loose almost 7 months in a year. The rough weather condition also prevails for more than 2 months in which the fisherman can not go for fishing. Thus the livelihoods of the fisherman are badly affected and alternate source of livelihood in coir sector may be considered. Since there is abundant availability of Coconut Husk due to existence of highest number of coconut production in the district of Puri and Ganjam.

D.2 **Institutions/Authorities(roles & responsibilities)**

Coastal zone management in the context of environment is integrally linked with the activities of industrial development, social and economic growth. The introduction of a requirement to prepare coastal zone management plans will mandate planning and coordination of development activities in the coastal zone. The preparation and effective implementation of coastal zone management plans is a long term measure. For this, integrated action of Departments like Industry, Housing and Urban Development and Pollution Control Boards is essential.

Public & Government:

(a) Department of Industries

For proper planning of industrialization for sustainable development of a coastal belt having potential for industrial growth, the Department of Industry has the major role and responsibilities to play.

Industries Department of the State pursues a multi pronged approach for industrial promotion in the State by providing infrastructure support, institutional support, and pre and post production incentives with a view to maximizing the triple objectives of value addition, employment generation and revenue augmentation. The department is entrusted with the responsibility to fully operationalise and strengthen the industrial facilitation mechanism under Orissa Industries(Facilitation) Act 2004 and Rules 2005.

(b) Housing & Urban Development Department

The Housing & Urban Development (H & UD) Department has a major role to play in providing basic amenity services in coastal areas having potential for economic growth in addition to projected population growth. The H & UD Department has been constituted with an objective to perform the statutory functions entrusted under Orissa Municipal Act, 1950 and Orissa Municipal Corporation Act, 2003.The Department has the major responsibility of providing basic city services like sanitation (both sewer and refuse), water, streets, schools, hospitals, etc.

E. JUSTIFICATION OF THE PROJECT:

E.1 Coconut Base Area:

In Orissa, coconut cultivation is done over an area of more than 50,000 hectares.

Orissa enjoys 450 kms. Of coastal belt most suitable for Coconut plantation. This traditional area is predominant of tall varieties of coconut which thrive for more than 100 years and start fruiting from 4^{th} to 8^{th} year depending on its maintenance. Under non-traditional areas, the basin of river Bainsadhara in Rayagada and some valleys in different inland districts are found to be suitable for the crops. The productivity of such plants are comparatively less

than the crops in traditional areas. At present the coverage under coconut is 42,143 hectares with average annual production of 33 nuts per palm. Coconut is considered as the cash crop of more than 10 lakh people residing in the coastal belt. The crop has multifarious uses and provides Oil, Copra, Drinks, Fuel, and raw materials for coir industry.

E.2 World coconut scenario

During independence, India ranked third in the world with a production of three billion nuts. By seventies, however, the position of India dropped to fifth. But the situation improved rapidly after formation of the Coconut Development Board (CDB) in 1981. India climbed to the third position again by mid eighties. And in 1995-96, it became the largest producer of coconut in the world. Although coconut is grown in more than 80 countries, the Philippines, Indonesia, India and Srilanka contribute about 78 per cent of the world production. In 2007-08, India contributed 27.86 per cent of world coconut production from only 15.82 per cent of world's share in area. The world production of coconut during the year 2006-07 was around 54,865 million nuts from an area of 11 million hectares. Nearly three fourth (73.3 per cent) of the world production is from India, Indonesia and the Philippines. Sri Lanka with about 4.97 per cent of the production occupies fourth position. Taking 1991 as the base year, growth rate over the period 1991-2006 has been 136.7 per cent in area and 108.7 per cent in production. Among major producing countries, Thailand and India have recorded excellent growth in production during the last few decades. In the early nineties, India ranked third in the world in area and production among 86 coconut growing countries.

E.3 Coconut production in India

Coconut industry provides sustainability to a million families and livelihood to about ten million people in India. It contributes over Rs.7000 crore annually to the national GDP and earns about Rs 250 crore of foreign exchange by exports of coir and coir products. Coconut is cultivated under varying soil and climatic conditions in seventeen states and three union territories. The coconut production, area under cultivation and productivity in India are shown in Table II. It is clear that the cultivation area under coconut has increased over the years. In 1995-96 it was 1830.9 thousand hectares, which increased to 1954.8 thousand hectares in 2007-08. The production of coconut increased from 12,952.3 million nuts to

15,920 million nuts. The productivity of coconut showed a fluctuating trend, but steadily increased from 6298 nuts per hectares in 2003-04 to 8265 nuts per hectares in 2007-08.

TABLE - 1

Area, Production and Productivity of Coconut in India During 1995-96 to 2007-08

Year	Area('000 Hectares)	Production(Million Nuts)	Productivity(Nuts per Hectare)
1995-96	1830.9	12952.3	7074
1996-97	1890.8	13061	6908
1997-98	1861	12717.3	6834
1998-99	1754.5	12535.9	7145
1999-00	1768.1	12129	6860
2000-01	1823.91	12678.4	6951
2001-02	1932.3	12962.9	6709
2002-03	1921.8	12535	6523
2003-04	1933.7	12178.2	6298
2004-05	1935	12832.9	6632
2005-06	1946.8	14811.1	7608
2006-07	1939.9	15840	8165
2007-08	1954.8	15920	8265

Source: Coconut Development Board, India

E.4 State-wise coconut production

Table 4.1 shows state-wise area, production and productivity of coconut in India. In 2006-07, Kerala occupied the first position with coconut production of 60,504 million nuts from an area of 870.9 thousand hectares. Tamilnadu, ranked second followed by Karnataka and Andhra Pradesh.

TABLE - 2

STATEWISE PRODUCTION AND PRODUCTIVITY OF COCONUT

Name of the States/	2005-06			2006-07			2000 2001		
Union Territories	Area (in '000 hectare)	Prodn. (nuts in million)	Prodvty. (nuts per hectare)	Area (in '000 hectare)	Prodn. (nuts in million)	Prodvty. (nuts per hectare)	Area (in '000 hectare)	Prodn. (nuts in million)	Prodvty. (nuts per hectare)
1	2	3	4	5	6	7	8	9	10
Andhra Pradesh	104.0	892.0	8577	105.0	1326.0	12629	102.5	1092.7	10660
Assam	19.1	204.9	10728	19.0	153.0	8053	20.9	135.9	6502
Goa	25.3	125.3	4953	25.5	126.7	4969	25.0	125.1	5004
Gujarat	16.4	138.3	8433	16.4	138.3	8433			
Karnataka	385.4	1209.8	3139	401.0	1625.0	4052	338.8	1754.1	5177
Kerala	897.8	6326.0	7046	870.9	6054.0	6951	936.3	5496.0	5870
Maharastra	18.0	273.4	15189	21.0	175.1	8338	16.8	244.4	14548
Nagaland	0.9	1.2	1333	0.9	0.2	222			
Orissa	50.8	274.6	5406	51.0	275.8	5408	42.1	163.9	3889
Tamilnadu	370.6	4867.1	13133	374.6	5429.9	14495	323.5	3158.4	9763
Tripura	3.3	7.0	2121	3.3	7.0	2121	9.1	7.0	769
West Bengal	24.9	323.5	12992	25.1	359.1	14307	24.5	330.5	13490
Andaman & Nicobar	25.5	87.1	3416	21.4	89.0	4159	22.7	87.2	3841
Lakshadeep	2.7	53.0	19630	2.7	53.0	19630	2.8	28.0	10000
Pondichery	2.1	27.9	13286	2.1	27.9	13286	2.2	28.0	12727

Source : Coconut Development Board

E.5 District-wise coconut production in Orissa

TABLE - 3

	2005-06			1999 2000			2000 2001		
District	Area(in hectares)	Prod (nuts in lakh).	Nuts per hectare	Area (in hectares)	Prod (nuts in lakh).	Nuts per hectare	Area (in hectares)	Prodn (nuts in lakh).	Nuts per hectare
1	2	3	4	5	6	7	8	**9**	**10**
Angul	837	38.00	4540	1059	40	3777	1344	41	3051
Balasore	1094	29.00	2651	3273	164	5011	4290	165	3846
Bargarh	1125	33.00	2933	257	10	3891	257	10	3891
Bhadrak	918	24.00	2614	1093	109	9973	1980	110	5555
Bolangir	898	17.00	1893	290	11	3793	296	11	3716
Boudh	180	8.00	4444	94	4	4255	151	4	2649
Cuttack	4885	249.00	5097	1407	91	6468	2828	92	3253
Deogarh	130	3.00	2308	80	3	3750	80	3	3750
Dhenkanal	1056	49.00	4640	364	14	3846	707	14	1980
Gajapati	1921	105.00	5466	1102	64	5808	1516	65	4288
Ganjam	7355	470.00	6390	4725	267	5651	5951	267	4487
Jagatsinghpur	2330	136.00	5837	289	25	8650	1456	25	1717
Jajpur	2340	144.00	6154	543	43	7919	1703	43	2525
Jharsuguda	180	9.00	5000	116	5	4310	145	5	3448
Kalahandi	380	12.00	3158	176	8	4545	184	8	4348
Kandhamal	349	16.00	4585	302	14	4636	393	14	3562
Kendrapara	2019	113.00	5597	231	12	5195	1238	12	969
Keonjhar	1232	47.00	3815	764	29	3796	854	30	3512
Khurda	3495	198.00	5665	1531	96	6270	2475	96	3878
Koraput	193	7.00	3627	280	14	5000	336	14	4167
Malkangiri	205	9.00	4390	196	10	5102	224	10	4464
Mayurbhanj	1055	48.00	4550	573	21	3665	736	21	2853
Nawarangpur	234	10.00	4274	184	4	2174	238	4	1681
Nayagarh	4743	311.00	6557	3378	201	5950	4083	201	4923
Nuapada	104	4.00	3846	67	4	5970	68	4	5882
Puri	9691	572.00	5902	5208	311	5972	6907	311	4503
Rayagada	415	20.00	4819	343	20	5831	457	20	4376
Sambalpur	322	15.00	4658	203	8	3941	260	8	3077
Sonepur	310	15.00	4839	197	8	4061	243	8	3292
Sundargarh	845	39.00	4615	661	23	3479	743	23	3095
TOTAL	50841	2750.00	5409	28986	1633	5634	42143	**1639**	**3889**

E.6 About Coir products:

Coir falls under the category of industrial hard fibres. there are various hard fibres such as jute, sisal, abaca, henequen hen, etc. among these coir fibres has its own position due to its unique properties such as rot proof & water resistant power etc. due to advantageous properties coir fibre has got international acceptance as an excellent raw material for the manufacture of floor furnishing articles of superb texture. The fibre has remarkable durability under humid condition due to which it is suitable for many applications.

Coir fibre are mainly used for the manufacture of coir materials like coir carpet, door mats, wall hanging, coir rope, coir mattresses, furniture cushion, cushion material in transport, bus seat, etc
The coir industries is an age old traditional cottage industry concentrated mainly in coastal belt of southern states Kerela, Karnataka, Tamil Nadu, Andhra Pradesh are main states where coir industry has grown well. Recently West Bengal, Orissa and Lakshadeep have also started coir production of improved variety.

At present 25-30% production of husk is estimated to be utilized for extraction of coir fibre in India. Production of coir fibre is around 2, 50,000 tons in India. The coir industry provides employment to good number of people belonging to the economically weaker section of society in rural sector. Women constitutes about more than 80% work force in the industry.

Among all the industrial fibres such as Jute, Sisal, Hemp, Cotton, Abaca, Aloe, Banana and Keora leaf used for making decorative and utility products, the natural celluloid coir fibre is the hardest one and owing to its unique characteristics of staple length, tensional rigidity, twisting property, tensile strength, resistance to friction, damp proof, echo-friendly and durability, coir has established its position in making various industrial and environmental friendly products. The fibrous husk surrounding the seed of coconut contains coco-fibre, the basic raw material for coir industry. Coir fibre extracted from coconut husk is used commercially for manufacture of a range of products with important end uses. The coir industry is a labour intensive industry. About half a million people are employed in this industry in India and 80% of workers engaged in spinning of coir yarn are rural women.

Kerala, Tamilnadu, Karnataka, Andhra Pradesh and West Bengal are the other major coconut producing states of India. The area under

coconut cultivation and production of coconut in different states of the country indicated in Table will show how such states are rich in availability of raw-material i.e. coir fibre. It is seen that Kerala state is the largest producer of coconut in the country, contributing as much as 44.7% of total production whereas coconut production in Orissa is only 8%.

The State of Orissa with coast line of about 480 Kms. is having abundant production of coconuts. This activity is generally concentrated in the coastal districts which are evident from **Table-2.** Considering the availability of husk, Orissa has huge potential for development of coir industry and for generating large scale employment for the coir artisans. Prior to 1978, coir industry in Orissa had not come to lime light. Limited coir fibre and coir products were produced by traditional methods in coconut concentrated areas. The husks were mostly used as fuel. Subsequently, on realizing the potentiality for development of coir industry in the state, the State Government took-up various developmental activities through training, research & extension services, financial assistance and awareness programme etc. Similarly Coir Board has also been extending its support for development of coir industry in the state. They had established a Regional Coir Training and Development Centre at Bhubaneswar during the year 1986 to provide skill training and other inputs for promotion of Coir Industry. Now, the centre has been closed in the year 2001 and their Regional 0ffice at Vishakhapatnam is looking after implementation of various schemes in the State.

It is estimated that 80 to 85 kg. of fibre, on an average, is extracted out of 1000 full matured husks. But due to the consumption habits and marketing pattern of coconut, most of the husks are used either as fuel or waste. About 80% of coconut with 60 to 70% coverage of husks is marketed in and outside the state, resulting in a situation of 30% availability of husk, for production of fibre. It is estimated that only 25% coconut husks are available for extraction of fibre in our state. On an average, 1837 MTs of coir fibre are produced in our State and the remaining requirement is met from neighboring states like Andhra Pradesh and Karnataka.

Kerala is the major producer of white coir fibre due to availability of natural retting facilities in the form of brackish water, canal water ways, lagoons and sea water flowing through hinters-land. In absence of such facilities and want of matured green husk our state is producing brown coir fibre by mechanical means.

The white fibre is generally used for manufacturing of coir yarn, rope, doormat, matting and carpets for internal and external marketing whereas the brown fibre is used specially for making

rubberized coir products, coir brushes, hard boards, geo-textiles and craft items in addition to yarn, rope, mat, matting and carpet production.

Coir, popularly known as the "Golden Fibre", is a natural fiber extracted from fibrous husk of the coconut shell and is used to make a wide range of products such as ropes, mats, mattresses, baskets, brushes, brooms, etc. A major portion of the coir in the form of coir pads is sprayed with rubber latex which bonds the fiber together to convert it in the form of rubberized coir. The preparation of coir is a lengthy process. The coconut husk is immersed in the water for about a month. The softened husk then is beaten to separate the fiber from the husk. This is then woven for making yarn, known as coir. While 50 per cent of coconut husk is used for making coir, the remaining share is used as a fuel in the rural areas. The State of Kerala also known as the "Land of Coconut" is the largest producer of coir in India. It accounts for more than 75 per cent of the total production. Coir industry in the state provides employment to around 4 lakhs persons of which 3.25 lakh are women. India accounts for more than two-thirds of the world production of coir and coir products. It is an important cottage industry contributing significantly to the economy of the major coconut growing states and union territories i.e. Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, Goa, Orissa, Assam, Andaman & Nicobar, Lakshadweep and Pondicherry.

India is the largest producer and consumer of coir and coir products followed by Sri Lanka. Both India and Sri Lanka account for more than 90 per cent of the global production. Philippines, Thailand, and Vietnam are the other important producers of coir and coir products.
In respect of international trade, India and Sri Lanka are the largest exporting countries of coir fiber and related products and the USA, the European countries; Japan and China, on the other are the major importing countries.

The Indian coir industry is now making a comeback, keeping pace with the change in technology and imbibing the latest developments in production techniques and designs.

The Indian coir industry has come a long way from manufacturing simple ropes to various high-end lifestyle products. The establishment of the first coir factory in Alleppey by James Darrah initiated the process of professionalism and modernization in an otherwise unorganized sector. Over one hundred and forty summers

ago, when James Darrah decided to establish a coir directory in Alleppey, he may not have visualized the revolution he was launching in a strange land. The Europeans had entrenched themselves in India and political revolutions of different hues were being enacted in various parts of India. But the one that Darrah launched by establishing India's first coir factory in 185960 in Alleppey, better known as the Venice of the East, was one that would change the face of Indian coastal belt. It would also emerge as the largest employment generator in the state.

Not that coir was something new to Alleppey. Coir had been in use in various forms and coir making was prevalent around the world from Belgian Congo to Guam and from Venezuela to Eritrea a long time before Darrah's factory came up in Alleppey. But the significance of Darrah's effort was that it raised coir-making in India from an unorganized cottage industry to a professional and modernized industrial activity that helped Indian coir to rule the world markets.

Up until then, coir making in India was largely a dissipated industry with households producing miniscule quantities products had already established an appeal of fiber by retting and then beating coconut for most Europeans as hygienic interior husks. Others would then make yarn out of decor products. Mechanization was unheard of the first coir factory was established, as and the family units that produced fibre and many as 1,402 of the 1,831 coir units in yarn hardly bothered about the advantages Kerala were in Alleppey, establishing the of professionally organizing their traditional coastal town as the unchallenged headquarter coir-making capabilities.. By this time, the factory was up, the unique quality of Indian domestic coir industry had spread its wings, coir did the rest.

Indian Golden Fibre

The golden textured Indian coir fiber, which Andhra Pradesh, Orissa and Goa, and there earned the unofficial brand name 'golden was no doubting the fact that Indian coir fiber', captured the European and world markets in no time. From then on, there was the principal reason for Indian coir's reign no turning back. The big corporate era soon established coir factories in fibre that in Alleppey, Kollam, Kozhikode, Kochi and other parts of Kerala. Industrial heavyweights of the time, including Volkart Brothers, William Goodacre, pierce Leslie and Aspinwall moved in to tap the potential offered by the golden fibre, and Alleppey was soon a household name all over Europe. By 1967 the "Golden Fibre" had captured the European and the world markets.

That was natural, considering the versatility of coir. The myriad utilities of coir took it to just about every area of human activity. For samples, consider this: The hop fields in England that provided raw material to the beer industry used coir ropes in large quantities on the farms. So did the olive oil presses in Turkey, bringing out the versatility of the coconut fibre.And coir products had already established an appeal for most Europeans as hygienic interior decor products.

Ruling World Market

By 1967, a little over a hundred years after the first coir factory was established, as many as 1,402 of the 1,831 coir units in Kerala were in Alleppey, establishing the coastal town as the un-challenged headquarter of the coir industry. By this time, the domestic coir factories coming up in several states including Karnataka, Tamil nadu, Andra Pradesh, Orissa and Goa, and there did no doubt the fact that Indian coir industry was on a broad footing. The principle reason for Indian coir reign in the world markets was the unique golden fibre that in turn was owed to the unique properties of the husk of Indian coconuts and the retting facilities available. As K.R. Lawrence Bandey, MBE who set up the William Goodacre operations in Alleppey reminisces, "Around the middle of the 20th century, there was not a house in Europe that did not use some coir article".

COIR GEO-TEXTILES

Coir Goe-Textiles, or coir Bhoovastra have shot into the lime light today thanks to its eco-friendly characteristics. They are being effectively used for improving soil bahaviours, preventing soil erosion, and in helping consolidation of soil. Coir as a 100% organic and bio-degradable fibre, with great water absorbency, has a definite edge over synthetic geo textiles, in the environmental aspect. The greatest advantage is that it provides an ecological niche for rapid establishment of vegetation. Coir geo-textiles come in a mind-boggling range of woven and non-woven varieties available for bio-engineering, including geo meshes,girds,geo-beds,anti-weed blankets, needled felts, erosion control blankets, geo-rolls,geo-webs, and fascines.

Popular Varieties

The Anjengo yam, which derived its name from Anchuthengu in the then Travancore kingdom, was easily the most premium brand, with a golden texture that earned it the golden fibre sobriquet. Coconut husks from Anchuthengu were retted in slightly moving waters of the lagoons in the area for about nine months, at the end of which the fibre was extracted by beating the softened husks. The pith and other materials would fall off, and the golden fibre would emerge, which established Indian coir's hegemony in the world markets.

There were also other well-known varieties like the Viacom yarn and the Artery yam, but the interesting part is that these varieties had their own niche markets even when branding was not prevalent in coir fiber and yam sectors.

Favourable Location
In fact, a key factor that helped the establishment of the coir spinning industry in Kerala is the presence of brackish backwaters and lagoons. Brackish waters had to be replenished by fresh water at frequent intervals to wash away the water contaminated in the process of retting of husks, and Kerala was naturally endowed with this facility also. This was perhaps what established the industry so firmly in India and particularly in kerala, even though coconut production was significantly high in several other countries like Indonesia, Philippines, SriLanka and Thailand.

Upheavals

After the heady days right from the time the first factory was established in the latter half of the 19th century to the middle of the 20th century, the industry went through some upheavals. The two world wars, the Independence movement, and later some opposition to European companies continuing in India, all left their consequences on the Indian coir industry. By the seventies, the wheel was turning full circle, and the foreign companies were leaving control to Indian business houses. The technology aspect was also overlooked and the Indian coir industry suffered as power looms in Europe muscled their way past the manually operated Indian looms. Also with the opening up of the economy, Indian coir products have been facing tough competition in the global market with products of other natural fibers and synthetics affecting exports. The battle-hardened Indian coir industry, however, had the resilience to live through those hard times.

Non-Conventional Coir

Coir ply boards developed by Coir Board are also an excellent building material, especially for interiors, instead of traditional heavier materials. Coir ply boards have gypsum core and the side are normally lined with paper. These boards are lightweight making it easier to dismantle should you want to re-do your interiors after a few years. The coir ply board is also an excellent low cost insulation material at residences and office buildings. Coir ply also offers a decor option and is an excellent wood substitute. It can be used in the place of conventional wood for all kinds of woodmark, like doors, windows, cupboards, wall panels, etc. It can be laminated or coated with melamine finish for a glossy or matte finish.

Modernization Process
Though slow in coming, in keeping with the international market trend the Indian coir industry has also woken up to the call for modernization. The ancient coir manufacturing techniques have been replaced by advanced technological processes, with the introduction of motorized rest, automatic spinning machines, mechanized de-husking processes and the technology for yarn based value added products. Semi-mechanized looms and power looms are now used for making mats, matting and carpets. The continued R&D efforts are bearing fruits with the innovative developments in the coir sector – non-woven items like coir mattresses, needled felt, PVC tufting etc.

Mats with unique designs and kaleidoscopic colours, carpets, bags and baskets, tablemats, throw rugs, mattresses, paneling materials, garden articles et al coir have now become favourite among home makers and interior designers worldwide." Great value for money, a substitute for synthetic fibbers, eco friendly, hygienic and versatile, light on the wallet as well as on environment, durable and weather resistant, chic and designer friendly the reasons for choosing coir by the environment protectionists and others find no limits

E.7 Market Potential of Coir products

Coir fibre is not a consumer product. It is an industrial input for coir based manufacture. Coir fibre is mainly used for making carpets, coir mats, wall hanging, toys, coir brushed, coir ropes, cushion material for bedding, sofa, automobile for transport. The fibres are generally taken by co-operative societies and associations formed by various unemployed women in rural areas. Due to its wide application the fibre industry is now having very good scope not only in domestic market but also in international market for its different products. As such there is very good prospects for setting such industry particularly in Puri district where plenty of raw materials and other infrastructure are available.

The coir waste is also being used for making coir fertiliser which has good future for green vegetable cultivation.

The government needs to take all possible steps in order to make coconut farming productive, remunerative and reliable supplier of raw materials to the processing sector assumes considerable significance in the national economy in view of rural employment and income generation. In India, coconut is consumed in the form

of tender nuts, raw kernel, copra, coconut oil and desiccated coconut. Since dishes made from coconuts are rich in fat, protein and some vitamins, they counterbalance some of the deficiencies inherent in the predominantly starchy foods consumed in the countries concerned. Some of the countries derive substantial revenue from the coconut industry. In India, export of coir products earns the much-needed foreign exchange. A large number of coconut products are manufactured in the country which have both domestic and export market. Vinegar and soft drink are manufactured from coconut water. Tender coconut water concentrate is another product which is manufactured and marketed successfully. Know-how for the preservation and packing of tender coconut water has been transferred to six firms in the country.

E.8 Coconut palm and its multiple uses

The coconut palm, with its tall, slender and uniformly thick stem and massive crown with a large number of leaves, bearing bunches of nuts in their axils, is one of the most beautiful and useful trees in the world. It perhaps yields more products of use to mankind than any other tree. Each and every part of the coconut palm is useful to man in one way or the other. The products of commercial importance are copra, oil, cake, desiccated coconut and fibre. The importance of the palm lies in the fact that not only does it supply food, drink and shelter but it also provides raw material for a number of important industries. The multi-product aspect of coconut is its biggest asset. Its products are eco-friendly. The health and nutritional benefits of coconut oil are being increasingly recognised. Recent studies show that coconut can also be used as an antiviral agent.

Leaves. Coconut leaves are plaited and used for thatching houses, covering retting pits, making baskets and partition walls in separating different lots of husks retted in linear trenches, etc. Plaited leaves are also made into several types of headgear and worn by poor men and women while out in the field. Unplanted coconut leaves are used for shading seedlings, mulching nursery beds and fencing, etc. The dry leaflets are tied into small bundles and used in villages as torch at night. ***Midribs of leaves.*** The midribs of leaves are utilised for making brooms, baskets, fish traps, petioles, bunch stalks, spathes, stipules, etc. These are mostly used as fuel. ***Trunk.*** The trunks of old coconut trees are utilised as timber for house-construction. The quality of the timber improves if it is soaked in saline water for some time.

Edible parts. The apple or cotyledon developed during germination and the tender bud are delicacies. The tender husks of some

varieties are edible and sometimes pickled. ***Coconuts and coconut products in medicine.*** Several coconut products and parts of the palm are used for medicinal purposes.

E.9 Stages in progress

The production of coconut was 3.28 billion nuts during 1950-51. In the last four-and-a-half decades, it has increased four times to reach the level of 13.09 billion nuts in 1997-98. Along with production, the productivity has also increased from 5238 nuts per ha to 6869 nuts per ha during the same period.
Up to year 1981, coconut development was looked after by Directorate of Coconut Development. Now CDB is responsible for the developmental activities. During eighties, the developmental programmes assumed a new dimension. The thrust areas included creation of permanent production potential, stepping up productivity, developing processing technologies for product diversification and improving market situation. Along with traditional southern
States, CDB has extended its activities to the semi-traditional (Orissa, Assam, Bhopal, Tripura, Andaman, Goa, etc) and eco-coconut (Manipur, Nagaland, Bihar, Gujarat, Madhya Pradesh, Rajasthan, etc) areas. Of the total coconut production in the country, approximately 48 per cent is used for edible purposes, 31 per cent for production of milling copra (which is crushed for extraction of oil), 8 per cent for conversion into ball copra, 11 per cent for tender coconut
and the remaining for manufacture of non-traditional products and cultural and social purposes.

E.10 Strengths of the Coir Sector

1. India is one of the leading producers of coconut in the world with production of about 13 billion nuts per annum.
2. Coconut area is distributed in 18 states and three union territories under different agro-climatic conditions.
3. 3000 years of tradition in coconut cultivation. Also, India is a premier coir manufacturing country in the world.
4. Hundreds of reputed and established private firms are engaged in manufacturing and marketing of various coconut products (including branded coconut oil) in small packs.
5. Wide range of coconut products, both edible and non-edible, is available for export to different countries.
6. Research support by reputed organisations such as CSIR, ICAR and DRDO.

7. Technical know-how and trained manpower available for manufacturing of various coconut based products. Good number of cultivars/varieties having specific nut characteristics

E.11 Problems of Coir Sector

With more than ten million people in India depending on coconut cultivation, processing, marketing and trade related activities for their livelihood, the sustainability of the coconut industry poses a big question. The dominant position held by coconut is falling on account of the following problems:

1. Low farm productivity due to mono-cropping practice, poor genetic makeup and nutrient deficiency of the soil
2. Post-harvest losses due to quality deterioration of copra in storage and transport, insect infestation, poor copra making practices and lower oil recovery due to harvesting of immature nuts
3. Price instability due to increasing competition from substitute oils, especially from palm and soybean, both in the domestic and international markets
4. Relative unremunrativeness of coconut farming as it is predominantly monocrop
5. Periodical arrangement is a hindrance to increased investment in coconut culture
6. Decline in coconut acreage due to land conversion for commercial and industrial purposes

E.12 Intervention of Gaps in Coir Sector

There is a huge potential both for raw coconut and coconut byproducts. The government should make all possible efforts to provide the farmers with high-yielding varieties and hybrids, manures, fertilizers, pest management intercultivation facilities and adequate irrigation. It should also focus on product diversification and market expansion. Area expansion as well as rehabilitation of existing plantations will have to go together to increase the production and productivity of coconut. Problems like low farm yields, unresolved disease conditions and inefficient marketing system need to be addressed on priority basis. The foundation of the coconut industry needs to be strengthened. The farmers and landowners will stay in coconut farming only if they find the enterprise truly profitable. It is high time for the government to act and support the perishing coconut industry by coming out with a

clear vision. The vision should aim at making coconut farming productive, remunerative and reliable supplier
of raw materials to the processing sector. With the government providing the lead and direction, all major stakeholders should act in concert to revitalise the coconut industry.

SECTION -II

PROJECT

A. STATE'S VISION AND STRATEGY FOR ICZM

The Coastal Zone Management Plan for the sustainable development of a coastal area will work through integration of sectoral programmes for development of settlement, agriculture, tourism, fishing, infrastructure, industry, mining, etc. in that area with environment as the top priority.

Puri District which covers about 155 Kms. of Coastal length is of prime concern on the basis of their existing and potential expansion. Part of the coastal sector of the district is coming under Gopalpur – Chilika stretch of ICZM project.

In view of the above Orissa Co-operative Coir Corporation Ltd.(A Govt. of Orissa undertaking) is appointed as the nodal agency for implementation of the Integrated Coastal Zone Management Project under Development of the coir sector of the State.

The need of the above in the present context speaks about providing best possible alternative livelihood support to the fisherman's family leading to reducing fishing pressure, migration of fisherman and other related socio economic problems along with adherence to enforcement made by Government through different acts and rules.

Due to the ban on fishing for the protection of Olive Ridley turtle and the general ban imposed by the Govt. of India, the fishermen of the coast of Orissa loose almost seven months in a year. The rough weather condition also prevails for more than two months, in which the fishermen can not go for fishing.

The ban imposed on fishing considering the natural calamities has restricted the mobility of the fishing vessels. Thus the livelihood for the poor marine fishermen of the areas is at stake since they have

no alternative key activity for their subsistence. These fishermen are mostly landless or having paltry quantum of land that is not sufficient for their subsistence through out the year. Moreover due to high rate of illiteracy and non acceptance to any change process these fishermen/women are forced to leave their native to distant places in neighboring states as labourers.

The project aims at providing best alternative livelihood support to fishermen villages on a pilot basis to be situated in Satapada in the periphery of Chilika of Puri district by promoting coir related activities such as Defibering (converting husk into fiber), Mat, Matting, Spinning of Coir fibre, Coir Toys, curled coir, Vermi-compost, Geo Textiles, etc.

At present the coconut is sold as it is and the husks derived out of those were utilized for fuel purposes or thrown away which otherwise causes pollution. The proposed project will literate the fishermen of the locality to use the husk commercially to provide them an alternative livelihood.

Sakhigopal known as coir hub of Orissa is situated quite nearer to the proposed location at Satapada.

B. **Project Objectives & Key Indicators**:

Integrated Coastal Zone Management (ICZM) under coir sector sets its goal in terms of progress towards most sustainable forms of development as mentioned hereunder:

1. Economic development and better use of the coastal region
2. Protection and preservation of coastal area
3. Minimization of losses of human life and property
4. Public access at the coastal zones

The objectives of the project are as follows:

1. To reduce fishing pressure
2. To improve the socio economic status of traditional fisher folk
3. To practice the fishermen/women about the commercial viability of the coir
4. To provide alternative employment to fishermen
5. To upgrade R&D for effective resource management
6. Evaluation of effectiveness of pollution control efforts
7. To have better utilization of coastal resources

Key Indicators:

1. Reduction in migration of fishermen as labourers to neighboring states and districts
2. Increase in per capita income of fishermen family
3. Better living condition of fishermen around the project area
4. Formation of self help groups and adoption of commercial activity
5. Reduction of husk dumping along side of the road

C. **Projects Guiding Principle and Key Design Features**:

Guiding Principles:

The projects guiding principle includes capacity building through organization of awareness camp, seminars and exposure visit for the fishermen to adopt coir activity as an alternative livelihood. Subsequently Self Help Groups (SHGs) will be formed to adopt various activities under coir sector. The members of the SHGs will be imparted training for preparation of different value added products which could be manufactured out of coconut husk which are at present under utilized. Further the members of the SHG will also be engaged in production activity in the proposed production center.

At present, the coconuts are sold to nearby Sakhigopal area and there is no concept of husk extraction in Satapara-Brahmagiri sectors. Even if people use coconuts for domestic purposes and for worship purposes, the husk is either used as a fuel or thrown away as a useless commodity. In order to make the training cum production center effective after its construction, i.e. after time frame of one and half years it is required to develop awareness on commercial utilization of husks and its commercial use. It is therefore, planned to come to organize the family of fisherman in groups under SHG mode and train them under coir activity. Initially they will be provided with fiber to be procured from nearby Sakhigopal area which will not only bring up a commercial activity and improve their livelihood but also bring up a sense to use husk commercially. During the construction phase, it is proposed to train 40 SHG groups with having average group strength of 10-15 .This will train at least 500 local women in the Satapara-Brahmagiri area and augment their family income by at least Rs.50/- per head per day. The local NGO will also be involved for formation & handholding the group & provide marketing support to the SHGs.

Key Designed Features:

i) Capacity building of fisherman in coir sector as their alternative livelihood

ii) Establishment of a training center of ITI Standard and an Institute of Centre of Excellence in coir sector in the State equipped with latest technology prevalent in the sector.

iii) Bringing awareness among the fisherman's about the commercial viability of the coconut husks

iv) To divert fishing folk to non fishing as well as easily assignable profession like production of value added coir products as fishing resources are decreasing in proportion to increasing population

v) Value addition in utilizing coconut husk, a waste product

D. **Project Area Description**:

The proposed project is targeted for the fisherman's of coastal regions of Chilika. The targeted area is divided into various sectors. The stakeholders of the sectors along with their population are detailed below:

Population of Fishing Villages in Chilika:

Table No.3

Sector	Block	Total		Fishers		Farmers		Employee	
		Pop	HH	Pop	HH	Pop	HH	Pop	HH
Northern Sector	Brahmagiri	6625	949	3357	480	2520	423	142	23
	Chilika	15139	1863	8540	1038	8191	1144	1461	207
	Kanas	23135	3194	9603	1437	12939	1609	604	148
	Tangi	55131	8189	21262	2913	27190	3996	7104	1065
	Sub-Total	100030	14195	42762	5868	50840	7172	9311	1443
Central Sector	Banpur	27232	4290	1011	167	23865	3752	2356	371
	Chilika	45547	7750	15794	2760	26197	4349	3556	616
	Krushnaprasad	14965	2386	6055	1098	4831	739	585	130
	Sub-Total	87744	14426	22860	4025	54893	8840	6497	1117
Southern Sector	Ganjam	11230	2148	7837	1494	2290	385	1273	270
	Khaliko	18735	3203	11762	2042	3992	599	1581	252

	te								
	Krushnaprasad	7425	1343	3995	734	2965	531	465	79
	Sub-Total	37390	6694	23594	4270	9247	1515	3319	601
Outer Chanel	Krushnaprasad	16318	2881	14238	2547	1300	232	361	61
	Sub-Total	16318	2881	14238	2547	1300	232	361	61
Total		241482	38196	103454	16710	116280	17759	19488	3222

Note :

PP: Population

HH: House Hold

The location for the proposed project for establishment of training cum production center will be situated at Satapara in Puri District. The selected location is quite nearer to Sakhigopal which is known as the Coir Hub of Orissa which will be an added advantage for marketing of the end products. The present status of the units engaged in coir activity in Puri District is as follows:

Table No.4

	No. of SSIs	**SHGs**	NGOs/Coop.	Total
Satyabadi	21	31	3	55
Pipili	16	9	0	25
Delanga	3	1	1	5
Puri Sadar/Town	2	8	0	10
Total:	42	49	4	95

Hence, considering the above factors and more no. of fisherman communities (target group) in and around Satapara it is suggested to locate the project at Satapara.

E. **Project Description and Scope**:

The proposed project envisages into three parts:

1. Awareness and capacity building of fishermen to take up coir based activity on commercial basis.

2. Adoption of coir as a commercial activity through Cluster Approach

3. Training Center for fishermen on production, uses and commercial viability of coir related products

4. Production Center for sustenance of training activity and to act as a model for commercial development of coir in the area

F. **Project Components and Component Description**:

The components of the project are divided into various parts as described below:

i) Capacity Building:

Capacity Building of the project will be made by conducting different awareness camps conducted by the Nodal Agency in Block wise as follows:

1. Conducting Seminars
2. Arranging workshops on coir activity
3. Exposure visit to different SSI units in coir sector within the State
4. Exposure visit to outside the State like Andhra Pradesh, Kerala, Tamilnadu & Karnataka

ii) **Establishment of Training Center**:

To impart training to the fisherman on following activities:

iii) Defibering & Spinning
iv) Weaving of door mats
v) Weaving of matting of different varieties
vi) Preparation of brush making
vii) Dying and shading matching
viii) Preparation of Vermi-Compost
ix) Manufacturing of Geo Textiles
x) Ratting of natural coconut farming fiber

The syllabus for training course on coir activity will be as follows:

1. **Defibering & Spinning**:

Theory:

a) Area under coconut cultivation in India in general with particular reference to Orissa State. Annual production of coconut, average yield of nuts/duration and general use

b) Fiber extraction- Process of Dehusking of the coconut,

Husk Rating – Selection of husk for rating, duration of rating, factors governing the quality of fiber during rating

c) Different Methods of De-fibering- by hand/machine/mechanical extraction of fiber from dry coconut/preparation of bristles/ spinnable fibers

d) Spinning of Yarn – Different methods of spinning by hand/ratt /machine

Description and function of Traditional Ratts

Types of Yarns and its specification for preparation

Production of Brown Yarn

Preparation of pith compost by using pith plus

Ratting of Green Coconut Husk – use of coir ret, Range of Coir and coir related products

e) Costing of each process & product

Practical

a) Production of bristle fiber/spinnable fiber

b) Cleaning of fiber for spinning
c) Practice of spinning by hand/ratt/machine in different quality of yarn
d) Preparation of yarn into Hank
e) Practice in rope/cordage making

2. **WEAVING OF DOOR MATS**:

THEORY:

Weaving of door mats by frame/loom

a) Description of different kind of mat
b) Weaving procedure of mat
c) Finishing Operation
d) Method of preparation of looms sketch on graph paper
e) Costing of process & product

PRACTICAL:

a) Practice for weaving by frame/loom
b) Practice in drawing of different sketch of design on graph paper
c) Finishing Operation

3. **WEAVING OF MATTING**:

THEORY:

a) The looms and its components
b) Description, Function, Care and Maintenance of looms
c) Preparatory process of different kinds of matting
d) Fundamentals of weaving by loom
e) Weaving of carpet and Geo-textiles
f) Costing of process & products

PRACTICAL:

a) Preparatory process
b) Selection of woven pattern/ design/ arrangement of loom
c) Practice in warping/ beaming/ drafting and weaving of different types of matting and carpet, etc.

d) Analysis of matting design

4. BRUSH MAKING:

THEORY:

a) Brush used commonly in India
b) Fiber used in brushes
c) Methods of extraction
d) Preparation of coir fiber for process
e) General procedure for manufacture of different kinds of brushes
f) Wood used for brushes
g) Varieties of process and its description
h) Introduction of tools, equipments and machineries and its maintenance, function, care and description
i) Costing of process & product

PRACTICAL:

a) Preparation of bristle fiber
b) Preparation of wood for brush handle
c) Tuft making and filling of different types of process
d) Preparation and practice of special types of brushes
e) Finishing operation of brushes

5. DYEING AND SHADE MATCHING

THEORY:

a) Introduction on different kinds of dye stuffs and chemicals
b) Dyes applicable to coir I.e.: acid, basic and direct dyes, Bleaching in different process and softening
c) Shade Matching in laboratory dyeing
d) Bulk dyeing and stenciling or printing
e) Costing of the process

PRACTICAL:

a) Practice in dyeing calculation
b) Dyeing of yarn and fibre in laboratory dyeing

c) Bulk Dyeing
d) Practice on bleaching and softening in different process
e) Stenciling of plain and mats

iii) Production Center:

The production center will be to utilize the husks for production of various value added products.

Manufacturing Process:

1. Procurement of good quality matured coconut husk
2. Feeding of husk to disintegrator for disintegrated husk
3. Water spraying for at least 10 days to disintegrated husk
4. Feeding of water sprayed disintegrated husk to decorticator
5. Sun drying of fiber received out of decorticator
6. Feeding of sun dried fiber pieces to shifter for separation of pith and fiber with nuts
7. Feeding of fiber with nuts to willowing machine for production of fiber of good quality
8. Feeding of good quality fiber for making bundles of different weights for sale
9. Feeding of good quality fiber to curling machine for preparation of curled coir rope for rubberized coir plants
10. Feeding of good quality fiber to spinning machines both of hand operated and motorized for production of yarn of different ply

iv) Marketing Support:

The products manufactured by the SHGs and Production Center will be marketed by the local NGOs/ the Nodal Agency by appointing marketing executives.

SECTION – III

PROJECT IMPLEMENTATION ARRANGEMENT

A. Institutional Arrangement

A.1 The Overall Institutional Model and Rationale:

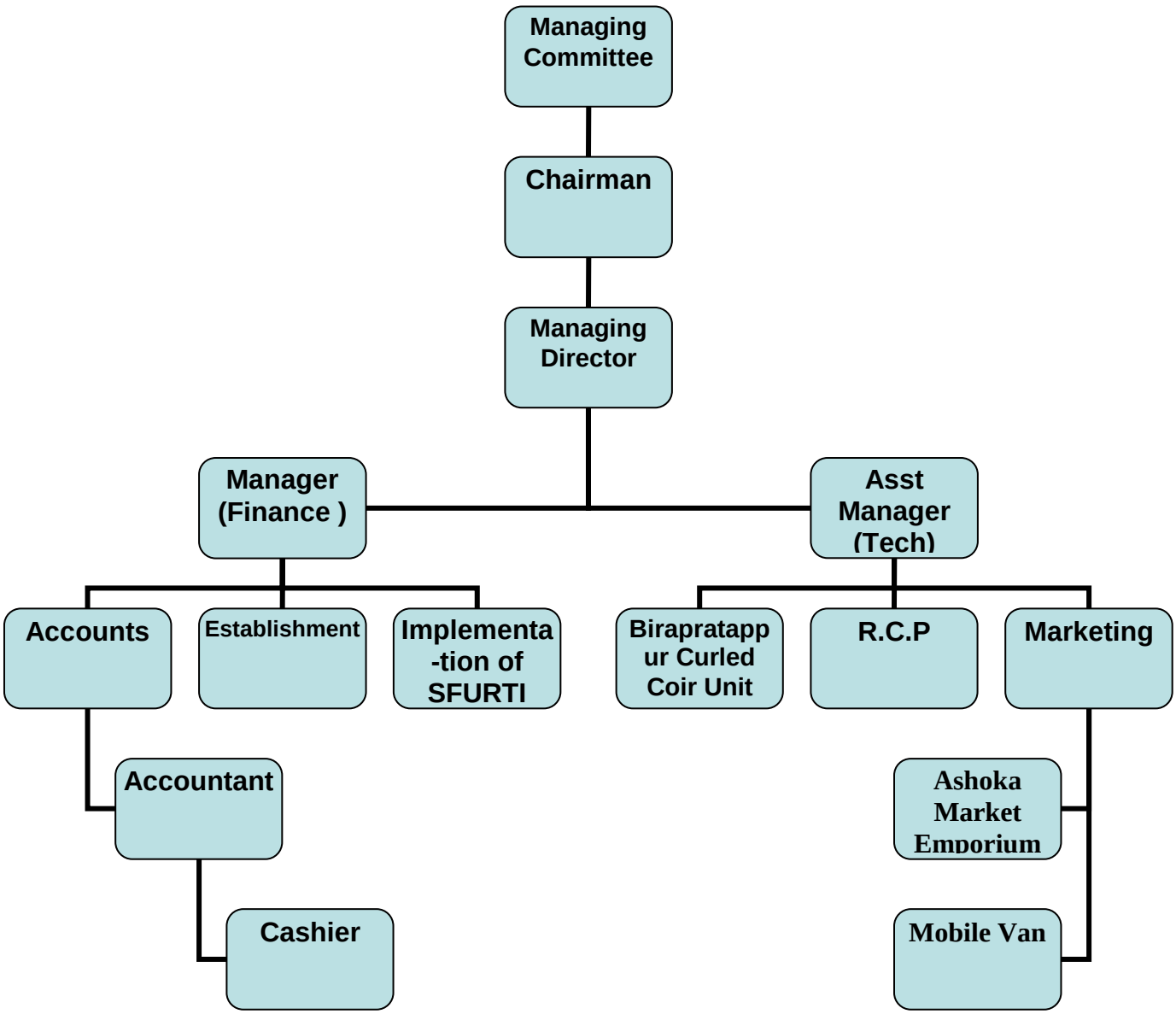
Orissa Cooperative Coir Corporation Ltd. is a State Level Apex Organization established in the year, 1980 with 35 primary cooperative societies as its member operating in the whole of Orissa .The basic objective of the Corporation is to develop coir industries in the State on commercial basis. The major activities pursued by the Corporation are to market the products of the coir artisans, cooperative societies SSI units, SHGs and Voluntary organizations. It has manufacturing activities like production of Rubberized Coir Products and coir fiber and curled coir at their existing plants.

A.2 Experience:

The Corporation has taken the responsibilities of implementation of SFURTI scheme introduced in the year, 2005 by the Nodal Agency, Coir Board. 2 coir clusters viz. Sakhigopal and Alanahat have been chosen for implementation of the scheme. The scheme includes operation like base line survey of coir artisans, capacity building and exposure visit of coir artisans, creation of SPV and management of CFC. Recently, introduced activity is Integrated Coastal Zone Management (ICZM) project in the coastal belt of Orissa for development of fishermen situated in the coastal Chilka.

As the nodal agency in Coir Sector its role is to implement the project on Coir Sector at the Coastal Zone's for providing alternate livelihood to Fishermen.

Organization Chart of Orissa Co-operative Coir Corporation Ltd.



A.3 Implementing Agencies – Roles & Responsibilities:

The project will be implemented by the Orissa Co-operative Coir Corporation Ltd. with the appointment of new staffs on contractual basis as well as supporting hands from existing staffs in the concerned locations of the proposed project. The SHG selected for the project will work for implementation of programme along with the staffs. The capacity building programmes for Coir Sector as an alternative method of livelihood will be organized in the blocks and through training, institutional visit and field exposure of target populations in phased manner.

B. **Financial Management Arrangement**:

B.1 **Financial Management Framework**:

All the financial management is governed by the prescribed Orissa General Financial Rules (OGFR) and Delegation of Financial Power Rules.

However for the project one project unit will be working under the supervision of the Director of Industries. The financial activities will be channelised through the project unit.

Sanctioning Power under the Project: The sanctioning power under the project will be vested upon the Managing Director of the Corporation. The annual budget is being approved by the Managing Committee.

B.2 **Funds Flow & Disbursement Arrangement**:

The funds received for the project from the World Bank will be kept in a separate interest bearing bank account to be opened as per the instructions of the State Governemnt.The books of account will be maintained separately in respect of the projects based on the sound accounting procedure in vogue and in consonance with the guidelines of the funding agency. The payments will be made in shape of Cheque/DD observing all financial formalities. The Accounts wing of the Corporation led by an Accounts Officer will manages budgeting and accounting.

B.3 **Accounting Policies and Procedures**:

The Corporation follows State Government financial rules in principle. But it maintains record as prescribed under the Companies Act, 1956 such as double entry system of cash book, ledger, bank reconciliation statement, receipt and payment account, balance sheet, etc.

B.4 **Staffing and Capacity Building**:

There are efficient manpower for smooth functioning of financial work of the office. In service training is being imparted to the personnel's for improving their performances. However, capacity building is needed for the financial department to efficiently and effectively manage the World Bank fund in a time bound manner.

B.5 **Financial Reporting**:

Monthly, quarterly and annual expenditure statements are prepared to put a control over the funds so invested. Further different periodical financial statement will be prepared such as Balance Sheet, Receipt & Payment Account, Income & Expenditure Account, Cash Flow statement, etc.

B.6 **Internal Control Mechanism**:

Internal control mechanism is by way of financial reviews at various levels at periodical intervals. Under the project, the Project Management cum Monitoring cell will control all the managerial as well as financial control of the project. Any problem will be looked after by the Project Head in the Project unit at Corporation for solution and it may be referred to Department of Industries for final decision if needed.

B.7 **Audit Arrangements**:

The proposed project will be audited by the independent agencies (Chartered Accountants/Cost Accountants) in regular interval to evaluate the utilization of funds in proper manner. The auditors appointed will have the liberty to verify each and every document as they may desire from the point of view of their reporting.

B.8 **Retroactive Financing**:

There is no arrangement of Retroactive financing in the Corporation. Only funds that are available at hand are being utilized for the purpose it is meant for, since diversion of funds is prima-facie not allowed.

B.9 **User Cost Sharing Principle**:

No user cost sharing principle exists in the Corporation. The SHG however will take up the execution work. Corporation will provide support to make them independent through

- Marketing &

- Capacity Building

C. **Procurement Arrangement**:

C.1 **Procurement Responsibility**:

The Project Management cum Monitoring Cell to be formed at Corporation Level will be responsible for the procurement of materials for the project. A committee will be formed headed by the Project Unit Head, will finalize the procurement of materials as well as civil works.

C.2 **Procurement Methods**:

The procurement procedure broadly consists of the following steps:

1. Assessment of requirement
2. Deciding procurement strategy including technical specifications
3. Mode of procurement
4. Preparation of tender document(Both Technical & Price bid document)
5. Advertisement of the tender
6. Issue of technical tender documents
7. Pre-bid conference
8. Opening of the technical bid
9. Evaluation of the technical bid document

10. Opening of price bid documents for those qualified in technical bid
11. Finalization of tender
12. Clearance of World Bank, wherever required
13. Award of contract
14. Notification of delivery to consignee
15. Pre delivery Inspection and testing
16. Receipt of consignment
17. Acceptance and storage of the consignment
18. Resolution of disputes if any

The method of procurement normally followed is:

As per OGFR, Rule-1 to Rule-4

Rule 1

All articles required to be purchased for the State Service shall be purchased on the condition that delivery shall be made in Orissa for payment in Rupees.

Rule 2

Except for the articles obtainable from firms on rate contract approved by the Director-General of Supplies and Disposals, Government of India or Director of Export Promotion Marketing, Government of Orissa, and from Co-operative agencies duly registered under Orissa Co-operative Societies Registration Act, sealed tenders should be invited, giving wide publicity for the purchase of articles, the value of which exceeds rupees fifty thousand unless it is in public interest to invite tenders, the concerned authority shall record the reasons therefore. In respect of purchase of articles, the value of which does not exceed rupees fifty thousand quotations shall be invited. In all cases, a comparative statement of rates should be prepared and placed before the authority competent to order purchase. When the sealed tenders are opened on the notified date, the concerned authority should initial all pages of the tender and corrections in the tenders so as to avoid any manipulation. The number of pages of the tender and the correction in each page attested by the competent authority should be broadly indicated at the bottom of the last page of the tender in red ink by him at the time of opening the tenders in the presence of the tenderers, if any.

Rule 3

All articles whether manufactured in India or abroad shall be subject to inspection before acceptance and articles for which specifications

and / or tests which may be carried out during manufacture or before or after dispatch from the suppliers premises.

Rule 4

Important plant machinery and iron and steel works shall ordinary be obtained from firms approved by the Director-General of Supplies and Disposals, New Delhi and specified in the lists mentioned by him.

Procurement may be made through

- Open advertised tender/National Competitive Bidding(NCB)
- Limited Tender (National/International)
- Shopping (National)
- Single tender/Direct Contracting

C.3 **Procurement Thresholds**

It will be as per the prescribed guidelines of World Bank.

C.4 **Overall Procurement Plan**

While resorting to procurement, specific budget provision should be available for meeting the expenditure in the financial year in which it is to be incurred. Preparation of a procurement plan is an essential requirement.

- Procurement plan covering civil works, equipment, goods, consultancy services and resource support shall be prepared on a firm basis for first year of the programme and on a tentative basis for the subsequent years.
- Procurement plan shall be prepared every year for proper monitoring and execution
- Method of purchase shall be based on the value of the contract, urgency of the demand, type of goods/services and availability of different sources of supply, etc.

- Limit of value per contract applicable to the particular procurement procedure shall be strictly adhered to.

- It shall be ensured that the procurement is based strictly on actual need

C.5 **Procurement Manual**

Procurement manual will be based on:

1. **Procurement Plan**

   - Flow of funds
   - Release and allocation of funds
   - Procurement Matrix (Responsibility)
   - Constitution of Empowered/purchase/executive Committee

2. **Procurement Procedures**

   - Forecasting/Assessment of the Requirement
   - Deciding on Procurement Strategy
   - Mode of Procurement
   - Preparation of Tender
   - Award of Contract
   - Disclosure
   - Quality Assurance through Inspection, Sampling and
   - Notification of Delivery of the Consignee and Receipt of Consignment

C.6. **Annual Procurement Plan**

Corporation will prepare the annual procurement plan after receiving the indents from the project sites. Priortisation of purchase of equipment, machinery, etc for a given financial year is made based on the available budget and priorities of the specific project need. The final list of annual procurement is

then made after verifying the non-availability of the stock. This list then becomes the basis for deciding how these items should be combined or divided into contract packages, what method of procurement should be used for each, and the scheduling of procurement activities. The choice of procurement method depends on:

- the nature of the goods and services to be procured
- the value of the procurement
- critical dates for delivery

C.7 **Procurement of Works**

Following are the stages in planning, sanctioning and execution of work which will be followed during ICZM Project.

(a) Inclusion in procurement plans
(b) Preparation of Preliminary Project Report(PPR)
(c) Acceptance of necessity and issue of 'Go ahead' sanction
(d) Preparation of Detailed Project Report(DPR) & Detailed Estimates
(e) Administrative Approval
(f) Technical Sanction
(g) Appropriation of funds
(h) Preparation of tender documents
(i) Call of tenders and Award of Work
(j) Execution of Works
(k) Monitoring of works and Quality Assurance

C.8 **Procurement at Community Level**

The procurement of husks are to be done by the SHG.

C.9 **Key Procurement Guidelines**

The "Guidelines for Procurement" provide the essential information and step by step procurement procedures in brief to achieve the following objectives

- Procurement plan and procedures

- Assessment of the Requirement
- Deciding on Procurement Strategy
- Mode of procurement
- Award of Contract
- Inspection, Sampling and Testing Procedure
- Notification of delivery to consignee
- Receipt of consignment
- Storage
- Resolution of disputes
- Laws governing the contract
- Arbitration
- Extension of Contract
- Complaint Redressal Mechanism

D. **Environmental and Social Safeguards**

For detail Refer Annexure – III.1

D.1 Current Regulatory Framework::

The regulatory mechanism is already in position like various environmental laws such as the Environment Protection Act, 1986, Air and water (Prevention & control of Pollution) Act 1974 1981, The coastal Regulation Zone (CRZ) Notification, 1991 and Amended 2002, Wildlife Protection Act and Rules made there under, Orissa Marine Fisheries Regulation (OMFR) Act, 1982 and Rules made there under. To implement these laws, specialized consultants in the respective field will be hired.

D.2 Baseline Environment Management Situation:

For the present project, the Orissa Co-operative Coir Corporation Ltd. will screen and prepare an environmental baseline report for the site chosen for implementation of the Biodiversity conservation at Satapara.

Besides, the field functionaries of the project implementing site will have to carry out public consultation with the local community during the initial implementation of the project. It is also necessary to carry a socio-economic study of the local people at the initial phase of the project implementation, as it will be helpful for monitoring and evaluation during the project operation as well as post- project evaluation.

D.3 Environment Management Framework:

The department of Forest and Environment, Government of Orissa and State Pollution Control Board have the overall responsibility for enforcement of the Environmental laws. However, the State project Management unit (SPMU) will be responsible for environmental screening of project site at Satapara during ICZM Project implementation.

The Operation Unit at Satapara will assess the impact on the ambient environment during project implementation and will formulate mitigation plan. The Environmental Experts from the State Project Preparation Unit (SPMU) will provide technical support during the project period. Whenever necessary, OSPCB and other competent agencies/organizations may be asked for necessary clarifications and technical support.

The field functionaries of project Site implementing the world Bank funded ICZM Project will provide regular reports in this regard to the Operation Unit of the Orissa Co-Operative Coir Corporation Ltd. located at

Bhubaneswar, which in turn will be responsible for preparing consolidated Environmental Monitoring report for the proposed project at Satapara as part of the regular project monitoring and will submit the same to the SPMU of ICZM Project. The head quarter of Orissa Co-Operative Coir Corporation Ltd will also undertake the annual Project Evaluation in collaboration with the SPMU.

D.4 Environmental Monitoring Plan:

With the progress of the Project, the field functionaries will communicate **monthly** environmental report to the Head Quarter of Orissa Co-Operative Coir Corporation Ltd at Bhubaneswar by updating checklist of environmental parameters.

The Operation Unit of the Orissa Co-Operative Coir Corporation Ltd will carry out **quarterly** environmental monitoring. The monitoring team will be comprised of Managing Director and Manager (Technical) of Orissa Co-Operative Coir Corporation Ltd along with representative of Director of Handicraft and cottage Industries, Orissa, Bhubaneswar. They may also include experts from other line departments in the monitoring team with hired specialized consultants. The Environment Specialists from the SPMU will provide technical support during the environmental monitoring. Whenever necessary, specialist experts may also be hired from outside. All quarterly environmental monitoring report will be submitted to the SPMU for preparation of the consolidated report of the ICZM Project.

At the end of the project, the operation Unit of the Orissa Co-Operative Coir Corporation Ltd will carry out **a post-project evaluation** of the project and will submit the detailed report by updating checklist of environmental parameters.

D.5 Institutional Arrangement for Environmental Management:

The Orissa Co-Operative Coir Corporation Ltd implementing the project shall arrange to have a Environmental Monitoring and Review Committee (EMRC). It will be comprised of Managing Director and Manager (Technical) of Orissa Co-Operative Coir Corporation Ltd along with representative of Director of Handicraft and cottage Industries, Orissa, Bhubaneswar..

This committee shall review the monthly field report along with quarterly monitoring reports, annual evaluation and post- project evaluation reports after its scrutinisation at the Head Quarter. The EMRC Committee will suggest remedial mitigation measures for the problems arising during the implementation process to the field functionaries as well as seek the help of the SPMU and Government.

D.6 Capacity Building:

Capacity building is required for all staff in order to execute the project successfully. This is because there are gaps between the capacity of the present staff and requirement of the project in environmental monitoring. The Staff are required to be given exposure of all new trends and methods of national/ international standard being followed within and outside the country along with success stories of different areas to provide successful solutions to issues relating to 'Integrated Coastal Zone

Management' in fragile and vibrant ecosystems of coastal Orissa.

Success of the project can not be assured without the involvement of the local community. Huge populations in and around the project implementation sites are directly or indirectly depending on the coastal resources, which are extending along Gopalpur-Chilika stretch of the ICZM Project. Therefore, it is necessary to bring these people to educate them regarding the sustainable management of the coastal ecosystem. This can be done through capacity building by exposure visit, meeting and training about environmental impacts.

D. 7 Budget

The estimated budget of the environmental monitoring and evaluation is INR Rs 12.00 lakhs during the Three years period of ICZM Project and its break up is as follows:

(a) The estimated budget for Mitigation plan per year Rs.7.00lakhs
The item wise break up of the above shall include the following:

(i) Cost of Insurance for personnel involved in the field work/
(ii) Monitoring and Evaluation
(iii) Cost of preparation of Mitigation Plan activities under the Environmental Management Plan EMP)

(b) The estimated budget for Environmental Monitoring per year Rs.5.00lakhs

The item wise break up of the above shall include the following:

(i) Transport of the Monitoring/ Evaluation Team;
(ii) Logistic support of the Monitoring/Evaluation Team;
(iii) Remuneration for outside experts
(iv) Cost of analysis of samples to be tested at recognized laboratories

SECTION – IV

PROGRAM AND IMPLEMENTATION SCHEDULE

Overall Program Phasing

The project will be operative for a period of three years. The over all phasing of the project period will be as follows:

Year	Proposed Activity	
1st Year	1. Capacity building among the fisherman's by undertaking various workshops, awareness camps in each block to make them aware about the activities proposed to be implemented for their alternate livelihood. 2. Commencement of Training Center to train the fishermen of the affected coastal zone .The duration of the course will be 4-6 months. 3. Commencement of Production Center to produce various coir products from the husks and also to make people self dependent to earn alternate earning to make them economically sound. 4) Formation of 10 model SHG (one from each block)	Phasing Schedule Annexed as IV.1

SUGGESTED IMPLEMENTATION:

Activity	Target Group
Common Facility Centre(CFC)	
Creation of Common Facility Centre (CFC)	SHGs
Establishment of Pith Block Processing Unit	Nodal agency
Class Room of 1000 Sq.ft	Fisherman
Opening of a product display cum marketing centre for SHGs	SHG
Production Center of 5000 Sq.ft	Fisherman
Product Development & Design Intervention	Fisherman
Marketing Assistance	
Participation in exhibitions	SHGs & Fisherman's
Buyer & Seller Meet in each quarter	SHGs & Fisherman
Media publication/broadcasting advertisements and coir based website.	SSIs, SHGs, NGOs. Marketers etc.
Capacity Building	
Exposure Visit	
Exposure visit of SHGs to sees available good marketable designs and good colour combination of products in Allepey	SHGs
Skill Up gradation	
Training programme to Fisherman/women to increase their capacity of production to earn more wages.	Fisherman
Awareness programme:	
Sensitization programme on different Govt. schemes introducing on coir activities	SHG
Impact Analysis study at the end of the programme	

SECTION – V

MONITORING & EVALUATION

The Orissa Co-operative Coir Corporation Ltd., a Government of Orissa undertaking will constitute an ICZM Project Monitoring and Evaluation Committee (PMEC) in the Project Management Cell (PMC) for monitoring and Evaluation of the project, which will be composed of officials, technical experts of the department. If necessary, experts from other allied departments will also be included in the Committee. Besides, technical experts may also be hired from external sources to meet the specific requirements as and when needed. The specialist experts from the SPMU will provide the technical support during monitoring and evaluation.

A. Objectives:

The objectives of monitoring and evaluation shall be as follows:

1. To ensure proper steps for conservation of ecosystem.
2. To ensure quality output in protection of endangered species and their habitats.
3. To detect problems and seek solution/ method for proper implementation of conservation strategy with proper involvement of local people.
4. To ensure timely completion of the project with proper utilization of resources and to ensure quality output.
5. Proper utilization of funds.

B. Components of Monitoring:

The following components will include the monitoring programme:

1. **Reporting:** - The implementing officials will report the progress of the work both physical and financial at regular interval (monthly basis) to the head quarters for the preparation of consolidated report by the Head quarter at Bhubaneswar to be submitted to the SPMU.

2**. Documentation**: - The progress and quality of work will be done through video and still photography at regular interval through experienced staff from the head quarter as well as by the project personnel appointed in the project. The ICZM Project Monitoring and Evaluation Committee (PMEC) in the Head Quarter at Bhubaneswar for monitoring and Evaluation of the project shall review the reports for acceptance.

3. **Monitoring through field visit**: - A team of competent and experienced staff from the head quarters along with others will visit the project site at regular intervals (Quarterly) and monitor the activity and provide the report in the specific format. The involvement and support of the SPMU experts may be sought for in this process.

4. Departmental Review: Basing on the data available through reporting, documentation and monitoring, the Head Quarter at Bhubaneswar of the Orissa Co-operative Coir Corporation Ltd. will prepare the consolidated report. Monitoring & Evaluation Committee of the Orissa Co-operative Coir Corporation Ltd. will review the consolidated report to be send to the SPMU. They will review the progress of the work and will suggest solutions for the problems. If necessary, experts from outside will also be called for the monitoring.

5. **Evaluation**: A team of experts from the Orissa Co-operative Coir Corporation Ltd. and specialists from SPMU of ICZMP, Orissa will evaluate the progress of the project annually. If necessary, experts from outside will also be called to carry out the evaluation. Feed back from the public consultations will also be considered during the process of evaluation.

All documents will be communicated to SPMU.

C. Results Framework:

It will be under following aspects:

vi) Capacity building of fisherman in coir sector as their alternative livelihood:

i. Area covered for Capacity Building.
ii. Number of Stakeholders and SHGs involved in the area
iii. Timely execution of awareness and training programme

b) Activities under taken for Construction works:

i) timely completion of construction works
ii) Quality out put

c) Activities under taken for Training & Production Centre:

i. Timely arrangement of Husks and training necessities

ii. Timely commissioning and quality activity of Coir products.

iii. Involvement of local fishermen and SHGs and their contribution.

D. Implementation Arrangements:

D.1 Arrangement for Results Monitoring:

The monitoring and evaluation schedule for training cum production centre of ICZM project will be as follows:

Monitoring:

i. The field functionaries will submit Monthly Monitoring report to the Head Quarter every month. It will include both physical and financial aspect of the project activities.

ii. The Project Monitoring Team will quarterly visit the site at Satapara and will prepare a detailed Monitoring result, which they will submit to the Head Quarter. A consolidated report prepared by the Head Quarter will be reviewed by the Committee constituted for the purpose at the Head quarters for onward transmission to the SPMU.

iii. The SPMU will provide the necessary checklist for the purpose

Evaluation:

i The Project Evaluation team formed at the Head Quarter will carry out annual evaluation of the project activity. The Monitoring and Evaluation Committee (PMEC) at the e Head Quarter will review the annual evaluation of the project activity for onward transmission to the SPMU.

Ii The SPMU will provide necessary matrix (criteria) for the evaluation of the project.

Iii The SPMU environment expert will provide technical support during the evaluation process.

All reports will be submitted to the SPMU. For the success of the project, necessary steps will be taken basing on the suggestions and recommendations of the SPMU.

To carry out the monitoring and evaluation, following is the break up of the budget:

For each quarterly Monitoring, the estimated cost in the budget is Rs. 0.50 lakh

The item wise break up of the cost for the above shall include the following:

(i) Transport of the Monitoring/ Evaluation Team;
(ii) Logistic support of the Monitoring/Evaluation Team;
(iii) Remuneration for outside experts
(iv) Cost of analysis of samples to be tested at recognized laboratories, if any.

The cost of monitoring per year will be Rs. .50 lakh x 4 quarters = Rs. 2 Lakhs.

There will be one time annual evaluation, the estimated cost = Rs. 1 lakh

The estimated total cost of Monitoring and Evaluation per year = Rs.3 lakhs

The estimated total cost of Monitoring and Evaluation for 3 years = Rs. 9 lakhs

D.2 Programme Management Reports:

Quarterly monitoring results submitted by Project Monitoring and Evaluation Team will be reviewed by the PMEC at Head Quarter. It shall be submitted quarterly to SPMU giving details of progress made in the project during preceding quarter. The suggestions given by the SPMU for execution, modifications, improvements, etc. shall be communicated to field functionaries by the Head Quarter and the compliances from field levels shall also be communicate to the SPMU.

D.3 Programme Operations Management Information System:

This facility will be provided in the offices of the Managing Director, Orissa Co-operative Coir Corporation Ltd.Bhubaneswar, Orissa.

The monitoring and evaluation data will be compiled by the Head Quarter operating at Bhubaneswar and after necessary review by the ICZM Project Monitoring and Evaluation Committee (PMEC) will be submitted to the

SPMU. It will then be ready for public consultation and reference.

D.4 Data Collection Tools:

All the data collected will be stored in digital form. For this purpose digital, still and video cameras will be used. Various data collection tools like field visit, report collection (physical and financial), photographic documentation, feedback from the stakeholders and public consultation etc will be used during monitoring. PCs and laptops and GIS Unit will be used for data collection, processing and demonstration.

ANNEXURE – V

EXECUTIVE SUMMARY:

The Coastal Zone Management Plan for the sustainable development of a coastal area will work through integration of sectoral programmes for development of settlement, agriculture, tourism, fishing, infrastructure, industry, mining, etc. in that area with environment as the top priority.

Puri District which covers about 155 Kms of Coastal length is of prime concern on the basis of their existing and potential expansion. Part of the coastal sector of the district is coming under Gopalpur – Chilika stretch of ICZM project.

In view of the above Orissa Co-operative Coir Corporation Ltd.(A Govt. of Orissa undertaking) is appointed as the nodal agency regarding implementation of the Integrated Coastal Zone Management Project under Development of the coir sector of the State.

The need of the above in the present context speaks about providing best possible alternative livelihood support to the fisherman's family leading to reducing fishing pressure, migration of fisherman and other related socio economic problems along with adherence to enforcement made by Government through different acts and rules.

Due to the ban on fishing for the protection of Olive Ridley turtle and the general ban imposed by the Govt. of India, the fishermen of the coast of Orissa lose almost seven months in a year. The rough weather condition also prevails for more than two months, in which the fishermen can not go for fishing.

The ban imposed on fishing considering the natural calamities has restricted the mobility of the fishing vessels. Thus, the livelihood for the poor marine fishermen of the areas at stake since they have no alternative key activity for their subsistence. These fishers are mostly landless or having paltry quantum of land that is not sufficient for their subsistence through out the year. Moreover due to high rate of illiteracy and non acceptance to any change process these fishermen/women are forced to leave their native to distant places in neighboring states as labourers.

The project aims at providing best alternative livelihood support to fishermen villages on a pilot basis to be situated in Satapara in the periphery of Chilika of Puri district by promoting coir related activities such as Defibreing (converting husk into fiber), Matting, Spinning of Coir Toys, Pitch Block Manufacturing, Zeo Textiles, etc.

At present the coconut is sold as it is and the husks derived out of those were utilized for fuel purposes or thrown away which otherwise cause's pollution. The proposed project will literate the fisherman's of the locality to use the husks commercially to provide them an alternative livelihood.

Sakhigopal known as coir hub of Orissa is situated quite nearer to the proposed location at Satapara.

The Objectives of the Project:

The objectives of the project are as follows:

1. To reduce fishing pressure
2. To improve the socio economic status of traditional fisher folk
3. To practice the fishermen/women about the commercial viability of the coir
4. To provide alternative employment to fishermen
5. To upgrade R&D for effective resource management
6. Evaluation of effectiveness of pollution control efforts

Project's Guiding Principles:

The projects guiding principle includes capacity building through organization of awareness camp, seminars and exposure visit for the fishers to adopt coir activity as an alternative livelihood. Subsequently Self Help Group (SHG) will be formed to adopt various allied activities under coir sector. The members of the SHGs will be imparted training for preparation of different value added products which could be manufactured out of coconut husk which are at present under utilized. Further the members of the SHG will also be engaged in production activity in the proposed production center.

Key Designed Features:

i) Capacity building of fisherman in coir sector as their alternative livelihood

ii) Establishment of a training center of ITI Standard and an Institute of Centre of Excellence in coir sector in the State equipped with latest technology prevalent in the sector.

iii) Bringing awareness among the fisherman's about the commercial viability of the coconut husks

iv) To divert fishing folk to non fishing as well as easily assignable profession like production of value added coir products as fishing resources are decreasing in proportion to increasing population

Project Area:

The location for the proposed project for establishment of training cum production center will be situated at Satapara in Puri District. The selected location is quite nearer to Sakhigopal which is known as the Coir Hub of Orissa which will be an added advantage for marketing of the end products.

PART – I - FEASIBILITY REPORT

A. Physical(Hydrological) Features

Orissa, bounded on the west by the thickly forested hills of the Eastern Ghats and on the east by nearly 500 km coastline of the Bay of Bengal, is a beautiful state covering an area of 156, 000 sq. km. It is surrounded by Jharkhand on the north, West Bengal on the north-east Andhra Pradesh on the south and Chhattisgarh on the west.

Orissa is one of the prosperous states of India owing to its fertile land and rich mineral resources viz. coal, iron and bauxite. The state is booming towards a big industrial growth in the near future. Orissa is also emerging as a player in outsourcing IT and IT services.

Orissa, referred to as "The Soul of India", is a mystical land where the past and the modern today form a harmonious blend. The state is filled with awe inspiring monuments, thousands of master craftsmen and artists, numerous wildlife sanctuaries, stunning natural landscapes and many more.

Physiography of the State:

The coastal plains of Orissa stretch on the eastern coast of India from the Subarnarekha in the north-east to the Rushikulya in the south-west. This fertile region is known as the 'rice bowl' of Orissa. This coastal plain is narrow in the north, widest in the middle, narrowest in the Chilika coast and broad in the south.

The coastal plain is a gift of six major rivers. The formation of the coastal plains depends on the rivers and their catchment's area. The rivers are: From north to the south, the Subarnarekha, the Burhabalanga, the Baitarani, the Brahmani, the Mahanadi and the Rushikulya. Most of the rivers have failed to develop true deltaic characteristics because of the strong off shore current which moves from Chennai to the Andhra coast and passes through Orissa coast.

According to the location, the coastal plain can be divided into three sub regions

a) The north coastal plains - the deltas of the Subarnarekha and the Burhabalanga up to the river Baitarani

b) The middle coastal plains - the combined deltas of the Baitarani, the Brahmani and Mahanadi

c) The southern coastal plains - the Rukshikulya plains, it can be divided into three zones parallel to the shoreline

i) The salt track along the coast.

ii) The arable tract or rice country in the middle

iii) The sub-montane tract to the west

The Salt tract:

The salt tract is a narrow belt which stretches just beyond the shore line for about 4.8 to 9.6 Km in land. In many places it is impregnated with salt and is completely deprived of agriculture. The innumerable sluggish and blackish streams make the area difficult to traverse. In the Mahanadi delta, this salt tract is covered with tidal forest known as the "Little Sunderbans", off Paradeep-Dhamra coast. In the Devi-Daya sector, Casuarina forests and plantations

are found. The forest belt all along the coast merges with a narrow belt of pasture.

The Arable tract:

The grass belt merges into the vast plains. The endless stretch of rice lands is the fundamental characteristic. Most of these places are occupied by village sites so as to be free from the annual inundation. The rivers have formed levees and during high floods they inundate vast areas, causing grave danger to human lives, cattle population and agriculture parts of this arable tract are protected from floods and are irrigated by gravity.

This is the richest part of the whole of Orissa as far as agriculture is concerned.

The Sub montane tract:

This is the meeting zone of the arable tract and the spurs of the Eastern Ghats. It is termed as the 'zone of transition'. Soil erosion is rampant here. Under this predominating red soil, blocks of laterite are buried and at times they crop up to the surface, turning the area barren and desolate. In this zone low level laterites are formed. But patches of fertile area are not uncommon having rich vegetation. The natural vegetation varies from prickly thorns and stunted shrubs to Sal forests. The absence of a coastal forest belt is most striking. This is because of the lack of a marshy strip due to higher orography.

The Mahanadi Delta:

The Mahanadi delta has developed in seven different stages. The stages of development have occurred at 26, 18, 15, 9, 6 and 1.5 metre contours. After the seventh stage of delta development there is an up-liftment as a result of which three sets of parallel sand dumes developed along the coast. These raised sand ridges brought changes in the drainage pattern and in deltaic morphology. These parallel sand dumes have the maximum development between the Chilika and the Devi mouth and from there up to north of Dhamra. Several lagoons of varied sizes have been formed. The best examples are the Sat Para and the Samagara Pata located to the north of Puri.

The Coastal Line:

Orissa has a coastal line of 529 Km from the marshes of Ichhapuram in the south to the east of Subarnarekha in the north-east. The Orissa coast has bulged out in the middle portion from Brahmagiri on Chilika Lake in the south-west to Chandbali in the north-east where the Mahanadi, the Brahmani and the Baitarani have formed a combined delta.

B. **Economic Features** :

In the last few decades, the fishermen of Chilika-Gopalpur Stretch had been under tremendous threat from both natural and anthropogenic pressures resulting in severe degradation of lagoon ecosystem.

The proposed project will be helpful to the fishermen of this stretch as an alternative source of increasing their family income . Hence the economic conditions of the stakeholders of the proposed area will be increased.

C. Existing Services Status

The fisher community in the affected area are poor and in a disadvantageous position in the society because of their illiteracy and social isolation.They remain indebted to private money lenders who advance money to meet their professional and other expenses.

Thus alternative livelihood support for their subsistence is essential.Under this background, it is suggested to establish a training cum production centre on Coir Sector at satapara to provide the local fishermen an alternative way of earning their livelihood.

D. Planning Aspects

Feasible Alternative Plans

Coir which was generally under used (a fraction used as fuel for cooking and the rest were dumped as solid waste causing pollution to environment), the present project providing opportunity to this under used coconut husk to get in to industrial raw material and simultaneously provide improved earninings to the local fishermen community. By making value

addition a large number of local fishermen will get the opportunity to improve their earnings. Alternatively husks can be converted in to fibres and sold away in the market without making any value addition. Similarly the total fibre can also be converted in to curled coir and a rubberized coir plant can also be envisaged keeping its overall feasibility in question but it is also capital intensive and the end benefits will accrue to only few workmen because of its high automation. Hence by establishing a well equipped training cum production centre to make the people aware about the commercial viability of coir which helps them to earn alternative livelihood.

Broad Economic Analysis and Financial Impact-Capital & O&M

Details discussed under "Economics of The Project"

Social Screening Outcome,R&R Requirements, Need for Land Acquisition

It is proposed to acquire about 1 acre of land from Government of Orissa(Revenue Department) for establishing the "Training cum Production Centre at Satapara.Hence there will be no obstacles.

Environmental Screening Outcome, Likely Environment Impacts, Need for Detailed Environmental Assessments

Insignificant impact on environment due to establishment of Training cum Production Centre at Satapara will occour.However on prediction of these impacts, adequate mitigation measures will be undertaken which are discussed in the related annexure in detail.

Overview of Institutional Issues and Capacity Building Required

As the Orissa Co-operative Coir Corporation Ltd. Is a specialized body in coir sector and in the proposed coastal areas the coconut production is very high it is suggested to aware the people about the commercial viability of Coir which were presently dumped on the road side as a waste or used as fuel for cooking. Hence the proposed training cum production centre will help the fishermen communities of the area to increase their per capita income.

PART – II – DETAILED PROJECT REPORT

A. DESIGNS

The details design is enclosed herewith as Annexure – V.1

DETERMINATION OF PRODUCTION CAPACITY

Weight of a piece of matured good quality husk		0.8	KG
Output of Husk			
Pith	60%	0.48	KG
Fiber	40%	0.32	KG
Capacity of Bailing Machine/Shift(4 Nos.)		4800	KG
Capacity of one Curling Machine/Shift(3 Nos.)		900	KG
Capacity of one Automatic Double Head Spinning Machine/Shift(4 Nos.)		160	KG
Capacity of one Automatic Single Head Spinning Machine/Shift(4 Nos.)		160	KG
Total Good Quality Fiber Production/Shift		6020	KG
Say		6000	KG
Good Quality Husk Requirement/Shift(in KG)		15000	KG
Total No.of Husk Required per shift		18750	Nos.
or Say		20000	Nos.
Total Good Quality Pith Production/Shift		9000	KG
Cost of Good quality Husk per Piece(Re.)		0.4	
Selling Price of Fiber per KG(Rs.)		9	
Selling Price of Curled Coir per KG(Rs.)		12	
Selling Price of Yarn of different quality per KG(Rs.)		25	
Production of Curled Coir/Shift		900	KG

Production of Yarn/Shift 210 KG

Total Purchase of Raw Material at 100% Capacity per Annum(Rs.) 2400000

SALES REALISATION	QUANTITY	UNIT	RATE/UNIT Rs.	TOTAL SALES Rs.
Good Quality Fibre	1800000	KG	9	16200000
Curled Coir	270000	KG	12	3240000
Yarn	63000	KG	25	1575000
Total Value of Production				**21015000**

POWER REQUIREMENT

Name of the Equipment	Qty	Connected Load in HP	Total Load
Disintegrator	1	20	20
Decorticator	1	30	30
Shifter	1	2	2
Willowing Machine	1	1	1
Belling Press Machine	1	2	2
Curling machine	2	7	14
Automatic double head coir yarn spinning machine	2	2	4
Automatic single head coir yarn spinning machine	2	1	2
Motorised Double Head Rope making machine of 4",6",8" perimeter size	1	2	2
Pith Block Manufacturing Machine	1	10	10

	Others	45	45	
		132.00		
	Power & Fuel Consumption			
1	**Energy Charge**			
	Installed load in KW			98
	No.of units			787.776
	Tariff Rs/KWH			3.50
	Annual Energy Charge Per annum in Rs			827165
		Total Power Per Annum		**827165**

D.ENVIRONMENTAL AND SOCIAL ASSESSMENTS

Details enclosed in Annexure-2

E. IMPLEMENTATION ARRANGEMENTS AND SCHEDULES

Proposed Implementation Management Process(responsibility in ULB,need for establishing additional capacities/systems)

The ICZMP project will be implemented by Orissa Co-operative Coir Corporation Ltd. At Satapara in Puri district. The Managing director of the Corporation will act as the Project Co-Ordinator.The Corporation will appoint on need basis the required consultants from outside for better monitoring and implementation of the project.

Quality Control Procedures, Third party checking Requirements, Need for hiring Consultants

The corporation will appoint consultants for various technical requirements like training to fishermens,procurement and installation of machineries and for Environmental monitoring and evaluation.

Procurement and Implementation Plans

While resorting to procurement, specific budget provision should be available for meeting the expenditure in the financial year in which it is to be incurred. Preparation of a procurement plan is an essential requirement.

- Procurement plan covering civil works, equipment, goods, consultancy services and resource support shall be prepared on a firm basis for first year of the programme and on a tentative basis for the subsequent years.

- Procurement plan shall be prepared every year for proper monitoring and execution

- Method of purchase shall be based on the value of the contract, urgency of the demand, type of goods/services and availability of different sources of supply, etc.

- Limit of value per contract applicable to the particular procurement procedure shall be strictly adhered to.

- It shall be ensured that the procurement is based strictly on actual need

F. **O&M PLANNING**

Operational Plans for Assets Design (How the system Operates), Maintenance Requirement, Estimates of O&M costs

The system will operate as per the norms prescribed by World Bank. The detail estimate of O & M cost is analyzed in Financial and Economic Analysis

Plans for O&M

The detail plans for O & M will be decided once the project gets approved.

Equipments, Tools & Plants, Logistics required for O&M

The detail requirement of the tools, plants and logistics are given under the head Financial and Economic Analysis.

Skills to be Built up, Manpower to be Hired, Outsourcing Contractors to be hired, Systems to be established(MIS,Accounting,Asset management,etc.)

The Corporation at the initial stage of the project will hire various contractors and consultants for setting up the project. However The Corporation will recruit their own staffs on contract basis for

day to day operation of the project .The detail manpower requirement is given under separate table.

Cost of O&M, Revenue recovery Plans, Proposed Tariffs, Subsidy Levels

The detail analysis has been made under the head Financial and Economic Analysis.

G. SERVICE LEVEL MONITORING

Projected Service level Achievements

The project aims at providing service to the fishermen's of the affected area by increasing their livelihood, family income and their standard of living .

Monitoring Requirements

The project will be monitored as per the norms prescribed by World bank.

ANNEXURE –III.1

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED TRAINING CUM PRODUCTION CENTRE AT SATAPARA

1. INTRODUCTION

1. Project description

Integrated Coastal Zone Management Programme (ICZMP) has been formulated by the Ministry of Environment and Forests, Government of India and funded by World Bank is concerned with sustainable long-term anthropocentric perspective area development plan in the coastal stretches of India. The project attempts to harmonize conservation and development with specific thrust on the welfare of local and indigenous

communities, the traditional custodian of the coastal resources.

The objective of the project is "protection and sustainable development of coastal stretches and the marine environment through sustainable coastal zone management practices based on sound scientific principles taking into account the vulnerability of the coast to natural hazards, sustainable livelihood security for local communities and conservation of ecologically and culturally significant coastal resources". The following environment management related activities are envisaged while implementing ICZMP:

- Contingency plan for degradation due to human activities
- Conservation and restoration of critical habitats through:

(i) Protection to important fragile ecosystem and keystone species.

(ii) Consolidation of degraded mangrove forest blocks and strategic estuarine river banks through mangrove plantation.

(iv) Conducive as well as protective environment to Olive Ridley Turtles for mass breeding and mass nesting.

(v) Eco-friendly sustainable condition to other aquatic wildlife such as dolphins, crocodiles as well as avifauna.

Puri District which covers about 155 Kms of Coastal length is of prime concern on the basis of their existing and potential expansion. Part of the coastal sector of the district is coming under Gopalpur – Chilika stretch of ICZM project.

In view of the above Orissa Co-operative Coir Corporation Ltd.(A Govt.of Orissa undertaking) is appointed as the nodal agency regarding implementation of the Integrated Coastal Zone Management Project under Development of the coir sector of the

State.

The need of the above in the present context speaks about providing best possible alternative livelihood support to the fisherman's family leading to reducing fishing pressure, migration of fisherman and other related socio economic problems along with adherence to enforcement made by Government through different acts and rules.

The state's vision and strategy for ICZM is perceived as:

(i) Long-term scientific management of the coastal zone and its resources in an integrated manner through multi-disciplinary approaches and adopting the success stories and standard procedures from other areas.

(ii) Protection of coastal and marine biodiversity of dynamic ecosystems.

(iii) Providing ecological security to the species and eco-systems.

Integrated Coastal Zone Management (ICZM) under coir sector sets its goal in terms of progress towards most sustainable forms of development as mentioned hereunder:

1. Economic development and better use of the coastal region
2. Protection and preservation of coastal area
3. Minimization of losses of human life and property
4. Public access at the coastal zones

The objectives of the project are as follows:

1. To reduce fishing pressure
2. To improve the socio economic status of traditional fisher folk
3. To practice the fishermen/women about the commercial viability of the coir
4. To provide alternative employment to fishermen
5. To upgrade R&D for effective resource management
6. Evaluation of effectiveness of pollution control efforts
7. To have better utilization of coastal resources

The major activities to be carried out by the Orissa Co-operative Coir Corporation Ltd, of the State of Orissa is to achieve these

objectives are as follows:

i) Capacity building of fisherman in coir sector as their alternative livelihood

ii) Establishment of a training center of ITI Standard and an Institute of Centre of Excellence in coir sector in the State equipped with latest technology prevalent in the sector.

iii) Bringing awareness among the fisherman's about the commercial viability of the coconut husks

iv) To divert fishing folk to non fishing as well as easily assignable profession like production of value added coir products as fishing resources are decreasing in proportion to increasing population

v) Value addition in utilizing coconut husk, a waste product

1. Baseline data:

The proposed project is targeted for the fisherman's of coastal regions of Chilika. The targeted area is divided into various sectors. The stakeholders of the sectors along with their population are detailed below:

Population of Fishing Villages in Chilika:

Sector	Block	Total		Fishers		Farmers	
		Pop	HH	Pop	HH	Pop	HH
Northern Sector	Brahmagiri	6625	949	3357	480	2520	423
	Chilika	15139	1863	8540	1038	8191	1144
	Kanas	23135	3194	9603	1437	12939	1609
	Tangi	55131	8189	21262	2913	27190	3996
	Sub-Total	100030	14195	42762	5868	50840	7172
Central Sector	Banpur	27232	4290	1011	167	23865	3752
	Chilika	45547	7750	15794	2760	26197	4349
	Krushnaprasad	14965	2386	6055	1098	4831	739
	Sub-Total	87744	14426	22860	4025	54893	8840

Southern Sector	Ganjam	11230	2148	7837	1494	2290	385	1273
	Khalikote	18735	3203	11762	2042	3992	599	1581
	Krushnaprasad	7425	1343	3995	734	2965	531	465
	Sub-Total	37390	6694	23594	4270	9247	1515	3319
Outer Chanel	Krushnaprasad	16318	2881	14238	2547	1300	232	361
	Sub-Total	16318	2881	14238	2547	1300	232	361
Total		241482	38196	103454	16710	116280	17759	1948

1. Physical settings :

The location for the proposed project for establishment of training cum production center will be situated at Satapara in Puri District. The selected location is quite nearer to Sakhigopal which is known as the Coir Hub of Orissa which will be an added advantage for marketing of the end products.

2. Biological settings

Puri District is situated near the Bay of Bengal. On account of saline climate coconut plantation is extensively undertaken in the district.

3. Socioeconomic Settings

(The socio–economic parameters viz. demography, population growth, density, sex ratio, health, work force participation, occupational structure, literacy etc, play an important role in determining the impacts of a proposed activity on the socio-economic status of the study area.)

4. Policy, legal, and administrative framework

The purpose of Environmental Assessment (EA) is to assist in the decision making process and to ensure that the project is environmentally sound and sustainable and necessary management plans are included wherever necessary to minimize/ mitigate the

environmentally adverse impacts. It is the responsibility of the project implementing agency i.e. the Orissa Co-operative Coir Corporation Ltd.(A Govt.of Orissa Undertaking), to ensure that the project activities are in consistent with the existing regulatory/ legal framework, whether national, state, municipal or local.

The environmental regulations, which have significance on the implementation of the Project, are highlighted below.

The Environment (Protection) Act, 1986

This act is an umbrella legislation that focuses on the protection of the environment, which includes water, air and lands the interrelationship among them.

The act provides power to the authority declared under the Act to take necessary measures for the purpose of protecting and improving the quality of environment life. Environmental Impact Assessment Notification, 2006 forms a part of the regulation under this legislation**.**

Relevance to the project:

(1) The conservation of coastal coir recourses and augmentation of conservation strategy for alternative employment opportunity to fishermen community causing reduction of fishing pressure on Chilika Lagoon..

(2) For regeneration of degraded coastal coir resources.

(3) To provide safeguard to the biotic community of the coastal ecosystem to sustain a rich fishing population.

Water (Prevention & Control of Pollution) Act, 1974

This Act has been enacted to implement measures devised for effective prevention and control of water pollution. It is essential for Orissa Co-operative Coir Corporation Ltd. to take necessary regulatory measures for disposal of sewage and trade effluents .

Air (Prevention & Control of Pollution) Act, 1981

This Act has been enacted to implement measures devised for effective

prevention and control of air pollution. It is the responsibility of the Orissa Co-operative Coir Corporation Ltd. to take necessary regulatory measures for discharge of emissions

Relevance to the project.

All construction contractors need to obtain the consent to establish and consent-to-operate for the various plants – concrete batching, stone crushing and other plants – that they may erect for the purpose of housing construction. This should be obtained from the nearest regional offices of the SPCB. If existing plants are to be used, then the units should have the valid consent orders.

The Hazardous Waste (Management, Handling & Trans boundary movement) Rules, 2008

This Act requires the owners to identify their wastes and manage them as per the prescribed guidelines. The assessment criteria under the Act are based on process involved and concentration.

The Coastal Regulation Zone (CRZ) Notification, 1991 (amended, 2002)

The Coastal Regulation Zone (CRZ) Notification, 1991 Issued under the Environment (Protection) Act, 1986, coastal stretches have been defined as Coastal Regulation Zone and restrictions have been imposed on industries, operations and processes within the CRZ. For regulating development activities, the coastal stretches within 500 metres of High Tide Line on the landward side are classified into four categories, namely:

- CRZ-I: (i) Areas that are ecologically sensitive and important, such as national parks/ marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, corals/ coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/ historically/ heritage areas, areas rich in genetic diversity, areas likely to be inundated due to rise in sea level consequent upon global warming and such

other areas, and (ii) Area between Low Tide Line and the high Tide Line.

- CRZ-II: The areas that have already been developed upto or close to the shoreline. For this purpose, "developed area" is referred to as that area within the municipal limits or in other legally designated urban areas which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains**.**
- CRZ-III: Areas that are relatively undisturbed and those, which do not belong to either CRZ-I or CRZ-II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas, which are not substantially built up.
- CRZ-IV: Coastal stretches in the Andaman & Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III.

The development or construction activities in different categories of CRZ area shall be regulated by the concerned authorities at the State/ Union Territory level, in accordance with norms stipulated in the CRZ regulation and in the state/ UT coastal zone management plan.

Relevance to the project.

- No new construction is permitted in CRZ-I areas that are ecologically sensitive.
- In CRZ-II areas, new buildings are permitted only on the landward side of the existing (or approved) road or authorized structures.
- In CRZ-III areas, no new construction shall permit within 200m from the High Tide Line.
- In CRZ-III areas, construction or reconstruction of dwelling units

between 200m and 500m is permitted only if it pertains to traditional/ customary rights.

- Construction of public rain shelters, community toilets, bridges, roads and jetties are permitted in CRZ-I areas that are not ecologically sensitive and fall between the high and low tide line. But clearance is required from the State/ UT Coastal Zone Management Authority.

Orissa Ground Water (Regulation and Control of Development and Management) Bill, 2006 (Draft)

This bill is to protect groundwater resources, to provide safeguards against hazards of its over-exploitation and to ensure its planned development and management in the state of Orissa and for matters connected therewith or incidental thereto. The bill shall empower government through the Orissa Groundwater Authority to develop, control, regulate and administer the groundwater in the state by ensuring its optimal and efficient utilisation. This also provides for conjunctive use of surface and groundwater. This bill provides for registration of new users of wells and also prohibition of sinking wells in notified areas without permit. It shall empower the authority to penalise the activities not in accordance with the act regarded as offences.

Relevance to the project.

Orissa Groundwater Authority shall regulate the abstraction of groundwater. Line department/ contractor should obtain clearances/ permissions, if required, from this Authority prior to any abstraction of groundwater**.**

Orissa Marine Fishing Regulation Act. XXXXXX (OMFRA):

The act regulates different fishing zones along coastline. It also aims at sustainable fishing through numerical restriction of mechanized fishing vessels in the landing centres and protecting the economic interests of traditional fisher operating in the marine sector. Under this act no mechanized fishing vessels are allowed to fish within 5 km from the coast to protect the interest of traditional fishermen. No outside

(neighbouring states) fishing vessels, not registered under OMFRA are allowed to fish in the territorial waters of Orissa. To conserve the fish stock and biodiversity, uniform ban fishing from 15th April up to 31st May every year is meticulously followed in the state. Orissa coast, being famous for the nesting sites of rare Olive Ridley sea turtle, several conservative measures are being taken under the OMFRA. Fishing have been prohibited in specified turtle congregation areas including Dhamara river mouth of this project site, all mechanized vessels within 20 km radius from the coast. Use of Turtle Excluder Devises (TED) has been made mandatory in all the operating trawlers. Several officers fisheries Department and other line departments such as Forest Dept. and Coast Guard have been declared as Authorised Officers for strict implementation of the Act.

2. ENVIRONMENTAL AND SOCIAL IMPACTS:-

Project Layout and Development Concept

- A training cum Production Centre (built-up area -------- sq.ft.) is proposed to be established at Satapara on a land measuring about 1 acre. This land will be allotted by the Government (Revenue Department) at Satapara in Puri District. The allotment of the land is under process.. The layout plan of the proposed civil construction (Annexure-iii) has been prepared**.**

Water Requirement and Supply

The requirement of water will be met from Deep Bore Well System.

Power Requirement and Supply

Power demand is estimated to be about 150 KVA. Electricity supply shall be provided from the nearest grid substation. All fire and safety measures will be taken as directed by the concerned authority. The construction of electric sub station and installation of transformers, LT and HT panels shall be as per the provision specified by the concerned authorities. The power requirement during construction will be met either through DG sets or supply through the nearest substation.

Back Up Power Supply System

It is proposed to install one DG. set of 150 KVA for power back up during the power failure period. in the proposed complex. The ventilating stacks of adequate height will be provided as per the norms. The DG set will also be equipped with state-of-the-art insulating and acoustic enclosures**.**

Fuel Requirements

HSD will be consumed for Diesel Generators in case of Power failure. The Diesel and Oil will be stored on the site as a reserved stock in a drum/ tin with proper identification mark/ labels in identified area. Fire and safety measures will be taken as per the guidelines from the concerned authority.

Environmental and Social Impacts

This section lists the potential environmental impacts, both positive and negative, during the construction as well as operational phase of the project. The environmental impacts identified in following pages are only preliminary in nature. Any further impact that may arise in due course of time will be assessed for its significance and necessary imitative measures will be included in the Environmental management Plan. Overall the project is expected to yield significant environmental benefits in terms of pollution abatement and improvement in public health, agricultural yield, fish yield.

Checklist for Environmental and Social Assessment of the project is given in Table-1.

Table-1 Environmental and Social Assessment Checklist

Features likely to be affected	Positive impact		Negative Impact		No Impact	Mitigation measures required or not
	Yes	Likely	Yes	Likely		
Forestry/ Vegetation					✔	
Birds					✔	
Fisheries	✔					
Other wildlife/animals					✔	
Air quality			✔			✔
Noise			✔			✔

environment							
Water quality				✔		✔	
Water availability					✔		
Soil quality				✔		✔	
Landuse and topography			✔			✔	
Drainage patterns					✔		
Sedimentation/erosion					✔		
Agriculture					✔		
Food production					✔		
Climate					✔		
Groundwater table					✔		
Industrialization	✔						
Housing (involuntary resettlement)					✔		
Employment/training	✔						
Income and livelihood	✔						
Other socio-economic activities					✔		
Health and safety				✔		✔	
Communications					✔		
Historical/cultural monuments					✔		
Scenic views and vistas					✔		
Tourism					✔		

Impact identification matrix for the construction phase as well as the operation phase of the proposed project is given in Table-2.

Table-2 Impact Identification Matrix

	Air	Noise	Surface Water	Ground water	Climate	Land & soil	Ecology	Health	Socio economic
Land Acquisition	Government Revenue Land without vegetation will be acquired. Hence no impact.								

Construction Phase									
Transportation of construction materials	✔	✔				✔		✔	✔
Construction	✔	✔	✔			✔		✔	✔
Operational Phase									
Generation of Liquid waste			✔	✔				✔	
Generation of Solid waste						✔		✔	
Emission from Coir Husking	✔							✔	
Operation of DG Set	✔	✔						✔	

Impact prediction matrix for various activities involved in the construction phase and operation phase and the impact characteristics are given in Table-3.

Table-3 Impact Prediction Matrix

Activity	**Environmental Attributes**	**Cause**	**Impact Characteristics**			
			Nature	**Duration**	**Reversibility**	**Significance**
Construction Phase						
Transportation of construction materials	Air	Transportation of construction materials in trucks & Exhaust emission from vehicles	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles	Direct Negative	Short term	Reversible	Low
	Land & soil	Dumping of materials & excavated earth	Direct Negative	Short term	Reversible	Low

	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct **Positive**	Short term	Irreversible	Medium
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Construction activity	Air	Operation of construction machinery	Direct Negative	Short term	Reversible	Low
	Noise	Noise generation from vehicles and machinery	Direct Negative	Short term	Reversible	Low
	Health	Inhalation	Direct Negative	Short term	Reversible	Low
	Socioeconomic	Employment	Direct **Positive**	Short term	Irreversible	Medium

	Environmental Attributes	**Cause**	**Impact Characteristics**			
			Nature	**Duration**	**Reversibility**	**Significance**
	Risk	Risk of accidents during transit	Direct Negative	Long term	Irreversible	Low, if safety measures are taken to prevent accidents
Operational Phase						
Training & Production	Water Quality	Generation of waste waters	Direct Negative	Short term	Reversible	Low, appropriate treatment methods will be implemented

	Air Quality	Dehusking,Decoticating,Defibreing,Shifting	Direct Negative	Short term	Reversible	Low, Appropriate methods will be followed during the process
		Operation of DG sets	Direct Negative	Short term	Reversible	Low, Operation of DG sets as scrubbers will be installed to control the emission of pollutants.
	Noise levels	Noise generation from instruments, operation of vehicles	Direct Negative	Short term	Reversible	Low, with installation of acoustic enclosures, periodic maintenance of vehicles,
	Soil Quality	Generation of Solid waste (Pith) from Husking & Defibreing	Direct Negative	Short term	Reversible	Low, with proper collection and safe disposal practice , composting and processing
	Socioeconomic	Employment generation	Direct **Positive**	Long term	Irreversible	High, new opportunities for income generation
	Overall Quality of Life	Impose of stringent standards	Direct **Positive**	Long term	Irreversible	High

Legal Framework

The legislative tools for coastal environmental management are outlined in the Coastal Regulation Zone Notification, 1991, Environment (Protection) Act, 1986, Water (PCP) Act, 1974 and Air (PCP) Act, 1981,

and Coastal Management Zone Notification, 2008 (Draft). Despite the obvious strengths of these regulations, there still exists a gap in the institutional coordination, which needs to be addressed**.**

Institutional Framework

The Project Coordinator (PC) will have overall responsibility for implementation of the Project in coordination with the Project Management Unit. PC will be assisted by adequate and qualified technical and managerial staffs and will be provided with necessary equipment/ instruments and other infrastructural facilities and vehicles. PC will be responsible for preparing consolidated environmental monitoring reports as part of the regular Project monitoring. For this purpose technical supports may be hired from other line departments, SPCB and SPMU of ICZM Project.

1. **Positive impacts due to the project activities –**

   Summarized in Table-2s & 3
2. **Negative impacts due to the project activities –**

   Summarized in Table-2 & 3
3. **Mitigation measures:**

   Discussed in Section 5

PUBLIC CONSULTATION

The above impact studies reveal that the implementation of the project is not expected to lead any adverse social concerns. As the activities will be involved in a Government (Revenue) land, there will be no loss of public land and therefore no rehabilitation programme is necessary. During construction phase, the activities are only small civil works which will have minor, localizes impacts and these can be readily managed. Necessary environment management programmes have been included in the project to mitigate/ minimize the adverse impacts of operation phase.

The local inhabitants of the Satpara have been consulted for their opinion on the establishment of the Training-cum-Production Centre at Satpara.

People from different categories were present in this consultation programme. They were briefed about the positive and adverse impact of the programme. Details is enclosed in Annexure-I.

4. ANALYSIS OF ALTERNATIVES

Coir which was generally under used (a fraction used as fuel for cooking and the rest were dumped as solid waste causing pollution to environment), the present project providing opportunity to this under used coconut husk to get in to industrial raw material and simultaneously provide improved earninings to the local fishermen community. By making value addition a large number of local fishermen will get the opportunity to improve their earnings. Alternatively husks can be converted in to fibres and sold away in the market without making any value addition. Similarly the total fibre can also be converted in to curled coir and a rubberized coir plant can also be envisaged keeping its overall feasibility in question but it is also capital intensive and the end benefits will accrue to only few workmen because of its high automation. Hence by establishing a well equipped training cum production centre to make the people aware about the commercial viability of coir which helps them to earn alternative livelihood.

5. ENVIRONMENTAL MANAGEMENT PLAN

5.1 Mitigation

The primary objective of this proposed Training cum Production Centre is to develop a basic infrastructure for installation of Equipments for production centre and to impart training to local fishermen community developing skills, semiskilled workmen for preparation of household coir products simultaneously increasing

the family income. To minimize possible impact on the community and the workforce of foreseeable risks during the construction and subsequent operation phases of the project, such environmental mitigation measures shall be used in conjunction with good management practices and good engineering design, construction and various operation practices.

Mitigation Measures during Construction

Activity	Impacts	Mitigative measures to be taken
Initiation of Construction activity	Legal non-compliance	All clearance/ approvals required for Environmental aspects during construction phases shall be ensured and made available before initiation of the work.
(a) Construction Phase The following section contains instructions to the Contractors/ Field implementing Officer, which should be adhered to while carrying out the construction activity. This section will be appended into the relevant bid document.		
Site development	Tree felling	• Any tree felling should be minimized. • Compensatory plantation through landscaping
Construction	• Top soil erosion	• In slopes and suitable places along the roadside, bush grass should be planted and retaining walls, water-intercepting ditches will be built to prevent soil erosion. • Deploy silt fences to avoid/ reduce soil erosion and run-off. • Temporary and permanent drainage systems will be designed to minimize soil erosion.
	• Air pollution	• Locally available materials should be used as much as

	due to Dust during Construction and transportation	possible so as to avoid long distance transportation, especially that of sand and stone. • Vehicles delivering loose and fine materials like sand and fine aggregates shall be covered to reduce spills on roads. • All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet. • Stockpiles of aggregate or spoil shall be covered and water applied. • The height from which excavated materials are dropped shall be controlled to a minimum practical height to limit fugitive dust generation from unloading. • All vehicles, equipment and machinery used for construction shall be regularly maintained to ensure that the pollution emission levels conform to the SPCB norms. • Mixing equipment should be well sealed, and vibrating equipment should be equipped with dust removal device. Residence should be 500 meters from downwind direction of asphalt mixing sites. • The random ambient air quality monitoring shall be done to ensure that the significant impacts are being mitigated adequately.
	• Noise pollution	• Noise emission level from all construction equipment shall strictly conform to the MoEF/

		SPCB noise standards. • On-site power gensets shall be covered with an acoustic enclosure and fitted with muffler and shall conform to the noise emission standards. • Ambient noise level monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards both during day and night time.
	• Water logging and creation of mosquito breeding site	• Avoid developing new quarries. Use existing quarries. • Careful attention to be given on design and maintenance of earthworks and drainage systems during construction to avoid creation of significant habitat areas for mosquito larvae. • Spray larvicide in silt traps to prevent the mosquito breeding.
	• Surface Water pollution	• Use water resources without conflict. • Solid/ liquid/ construction/ domestic wastes should not be disposed in surface water bodies. • Surface water quality monitoring shall be conducted at suitable locations at periodic intervals during construction phase to conform to the stipulated standards for Inland surface water bodies.
	• Ground water pollution	• Requirement of water for the whole construction period will be met from tanker supply/ ground water. • Necessary precautions will be

		taken to minimize the wastage of water in the construction process. • Ground water quality monitoring shall be done during construction phase, if large quantity of water is used. •
	• Land pollution	• The project will take prior permission from the competent authority for disposal of construction waste on landfill site in suitable area. It will be ensured that no construction spoils of any unsuitable material are disposed off on roadside or any other place in the project area. • Construction debris will be collected and suitably used on site as per construction waste management plan.
Labour camps	• Soil contamination • Pollution of drinking water sources • Surface water contamination due to washing, bathing and waste disposal • Tree felling for fire wood and tents • Unhygienic work	• All relevant provisions of the factories Act, 1948 and the Building and the other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996 shall be followed for construction and maintenance of labour camps. • Labour camps will be constructed within the project area • The Contractor/ Implementing agency shall also guarantee for the following. ➢ Availability of uncontaminated water for drinking, cooking and daily uses. ➢ Supply of potable water at easily accessible places. ➢ The sewage system for the

	environment • Air pollution form burning of tyres and plastic materials	camp will be designed, built and operated in such a way that no health hazard as well as no pollution to the air, ground water or adjacent surface water bodies should occur. ➢ Latrines and urinals shall be maintained in a clean sanitary condition at all times with adequate water supply. ➢ Toxic materials like tyres and plastic materials should not be burnt by the labours for any purpose. ➢ Trees will not be cut for firewood or tent.
Working Condition	• Impact on workers health • Impact on Public safety	• The Contractor/ Implementing Agency shall comply with all the precautions as required for ensuring the safety of the workmen as per the International labour Organisation (ILO) Convention No. 62 as far as those are applicable to this contract. • All machines to be used in the construction will conform to the relevant Indian Standards (IS) Codes, will be free from patent defect, will be kept in good working condition, will be regularly inspected and maintained. • Where loose soil is met with, shoring and strutting shall be provided to prevent the collapse of soil. • The project will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations and

		safe means of entry and exit. • The Contractor/ Implementing Agency shall arrange for ➢ A readily available first aid kit including adequate supply of sterilized dressing materials and appliances. Suitable transport to take injured or sick person to the nearest hospital will be immediately provided. ➢ Personal protective equipment such as safety goggles, helmets, safety belts, earplugs, mask etc. to workers and staff. • The project will take adequate precautions to prevent danger from electrical equipments. • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public. • Work spots will be maintained clean, and provided with optimum lighting. • Fire fighting arrangement: ➢ Demarcation of area susceptible to fires should be provided along with cautionary signage ➢ Portable fire extinguishers/ sand baskets shall be provided at easily accessible locations in the event of fire. ➢ The workers should be educated on the usage of

		the equipments in the need of emergency. • The contractor/ Implementing Agency shall not engage any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.
Operation Phase The following section contains activities to be undertaken by the respective persons entrusted with the operation and maintenance of the project activity to ensure long-term sustainability.		
Maintenance	• Poor drainage or Flooding	• Regular inspection and periodic maintenance for cleaning of drains to remove any debris or plant growth that may interrupt the flow.
	• Soil erosion	• Construct silt fences to avoid soil erosion.
Waste disposal and site restoration	• Soil contamination • Water contamination	• All the construction camps and facilities shall be dismantled and removed from the site. • Oil and fuel contaminated soil shall be removed, transported and buried in properly identified waste disposal areas. • Sapling of plants similar to that of cut trees, if any shall be planted. • Soak pits and septic tanks should be covered and effectively sealed off. • Construction debris shall be disposed separately and properly. • Follow safety measures while disposing wastes.

Environment	Air Quality	• Use of ultra low sulphur diesel in the DG sets. • Green belt development with specific species will reduce SPM levels. • Fumes will be generated during the acid digestion of samples in laboratory operations. To channelise the acid fumes, digestions will be carried out in Fume cupboards only. The fumes will then be scrubbed through an alkaline medium before being allowed to discharge to atmosphere.
	Noise	• All noise generating sources in the complex will be equipped with appropriate noise control measures. Noise levels will be consistent with prescribed standards for Industrial areas. • Ambient noise levels will be periodically monitored to determine compliance with the norms. • Noise levels will also be monitored at point sources for occupational noise exposure and ensuring health risk.
	Waste water	• Apply innovative method of Sprinkler in lieu of soaking tanks to reduce the release of waste water from Rating,Dyeing,etc.

	Ground Water Quality	• Production Centre waste water will be treated and the final effluent will be discharged to the main industrial drain of that area. • Ground water quality shall be periodically monitored. • The domestic sewage generated from the building will be linked to the soak pit within the project area.
	Solid waste	• Solid waste mainly comprises of pith, which can be treated using fungal treatment. Other recycling process which can be used to convert huge coir pith in to menures, coir pith blocks for agriculture purposes and preparation of artificial lawns.
	Traffic Pattern	• Vehicle movement will be regulated inside the site with adequate roads and parking lots.
	Landscaping and Green Belt Development	• Landscape and green area in approx. 20% of total plot area will be developed. • The species to be grown on the site will be fast growing native species having broad leaf base so that a permanent green belt is created in a short period. The effective plantation will also stabilize the soil and reduce any nuisance during windstorm.

5. Monitoring

2 The monitoring program will be a continuing program of data gathering and analysis to ensure the effectiveness of the mitigation measures for potentially adverse environmental impacts arising from construction and operation of Project facilities, and to suggest for any additional mitigation measures in case of significant deterioration of environmental quality. It is proposed to monitor essential parameters for ambient air quality, ambient noise quality, ground water quality, and waste water quality both during the construction and operation phases of the project including other social and important environmental parameters.

Monitoring Schedule:

The following components will include the monitoring programme:

1. **Reporting:** - The implementing officials will report the progress of the work both physical and financial at regular interval (monthly basis) to the head quarters for the preparation of consolidated report by the Head quarter at Bhubaneswar to be submitted to the SPMU.

2**. Documentation**: - The progress and quality of work will be done through video and still photography at regular interval through experienced staff from the head quarter as well as by the project personnel appointed in the project. The ICZM Project Monitoring and Evaluation Committee (PMEC) in the Head Quarter at Bhubaneswar for monitoring and Evaluation of the project shall review the reports for acceptance.

3. **Monitoring through field visit**: - A team of competent and experienced staff from the head quarters along with others will visit the project site at regular intervals (Quarterly) and monitor the activity and provide the report in the specific format. The involvement and support of the SPMU experts may be sought for in this process.

4. Departmental Review: Basing on the data available through reporting, documentation and monitoring, the Head Quarter at Bhubaneswar of the Orissa Co-operative Coir Corporation Ltd. will prepare the consolidated report. Monitoring & Evaluation Committee of the Orissa Co-operative Coir Corporation Ltd. will review the consolidated report to be send to the SPMU. They will review the progress of the work and will suggest solutions for the problems. If necessary, experts from outside will also be called for the monitoring.

5. **Evaluation**: A team of experts from the Orissa Co-operative Coir Corporation Ltd. and specialists from SPMU of ICZMP, Orissa will evaluate the progress of the project annually. If necessary, experts from outside will also be called to carry out the evaluation. Feed back from the public consultations will also be considered during the process of evaluation.

All documents will be communicated to SPMU.

5.3 Capacity Development and Training

The Managing Director of the Orissa Co-operative Coir Corporation Ltd. will act as the Project Director will be responsible for the implementation of Environmental Monitoring Plan.

As specialized environmentalist is not available with the implementing agency, capacity development in the line is necessary. Both official and field personnel's are to be trained in routine monitoring and monthly reporting of environmental monitoring.SPMU will be requested to impart necessary training and exposure visits for implementing the proposed project keeping environmental parameters under control.

5.4 Implementation Schedule and Cost Estimates

The Environmental Management Plan and Monitoring Plan shall be synchronized with the construction and operational phases of the project.

Various waste treatment practices shall be implemented both during construction and operation phase.

The total cost estimate for implementation of the Environmental Management Plan including mitigation measures and Monitoring Plan shall be Rs. 15 Lakhs. The detail cost break-up is as follows.