

**EVALUATION OF THE IMPLEMENTATION OF THE GHANA TRADE & INVESTMENT
PROGRAM ENVIRONMENTAL MONITORING, EVALUATION AND MITIGATION PLAN
(EMEMP)**

FIRST EVALUATION, MARCH 1994

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1 - SUMMARY EMEMP

Environmental monitoring of AID development activities is required by Regulation 22-CFR-216 usually called REG 16. This involves measurement of any changes in environmental quality, positive or negative during the implementation of the USAID Trade and Investment Program in Ghana.

The Ministry of Trade and Industry is the implementing agency of the Trade and Investment Program (TIP). Environmental Protection Council (EPC) technically takes the lead in implementing the Environmental Monitoring, Evaluation and Mitigation Plan (EMEMP). Environmental Protection Council is under the newly created Ministry of Environment.

The Environmental Monitoring, Evaluation and Mitigation Plan (EMEMP) focuses on the most significant environmental issues identified during project design, environmental assessment, and special studies undertaken prior to the implementation of the TIP program. NTE environmental issues to be monitored under the EMEMP are related to NTE project activities: Salt mining industry, shrimp and prawn industry, forestry and furniture industry, and non-traditional agricultural export/pineapple.

The document identifies GOG institutions with potentials for participating in the NTE Environmental Monitoring, Evaluation and Mitigation program.

2 - THE EVALUATION PROGRAM

Two TDYs were made to prepare this evaluation of the TIP/EMEMP and assist the Environmental Protection Council (EPC) prepare their term report on the Environmental Conditionality for the disbursement of the second tranche of the TIP. The first TDY was on 01/08/94 to 01/14/94, and the second one on 02/22/94 to 03/04/94. With the first TDY it appeared that the Ministry of Trade and Industry and the EPC needed immediate assistance to finalize their term report for the release of the second tranche of the TIP Cash Grant.

The first TDY was mainly dedicated to the evaluation of the EMEMP. Work sessions and meetings with key people and institutions involved in the implementation of the EMEMP were held. These include work sessions with the Deputy Minister of the Environment, EPC officers, officers of the institutions involved in field monitoring (Institute of Aquatic Biology, and Fisheries Research Unit), and the Director of Trade and Investment Management Unit (TIMU) at the Ministry of Trade and Industry (MOTI). The Ministry of Trade and Industry is the implementing agency of the TIP.

The second visit focussed mainly to work with the EPC EMEMP implementation coordinators to write up the report to assess the level of implementation of the EMEMP that is one of the conditions precedent for the disbursement of the second tranche of the Cash Grant.

3 - RELATION OF EMEMP TO USAID MISSION M&E OR NRM IMPACT MONITORING

The TIP/EMEMP is part and parcel of the overall USAID/Ghana mission monitoring and evaluation system that includes monitoring for performance, achievement, people level impact (economic and social impact), and environmental impact. The system performs annual Assessment of Program Impact (API) reported to Washington. It is fed by division level monitoring systems, that is in turn fed by project monitoring plans. Project monitoring plans include also assessment of performance, achievement, people level impact (economic and social impact), and environmental impact. In the Trade, Agriculture & Private Sector Office, an FSN Agricultural Economist, Mr. William Akiwumi, is fully responsible for all monitoring and evaluation activities, including the supervision of the TIP/EMEMP.

4 - RELATION OF EMEMP TO HOST COUNTRY ENVIRONMENTAL M&E.

The Environmental Protection Council is implementing a project Ghana Environmental Resource Management Project (GERMP), which is part of the implementation of the Ghana/NEAP¹ and funded by World Bank and dedicated to country wide monitoring of natural resources use and management. Under the GERMP, a National Environmental Information System (NEIS) will be developed as a central source of environmental information. All other environmental monitoring activities initiated in the country, such as the TIP/EMEMP, the Forest Resource Management Project, the GEMS²/Water Monitoring, and Minerals Commission environmental study and monitoring program of the Songor lagoon are to be integrated into the GERMP/NEIS.

As an inference from various discussions, it appears that the link between the TIP/EMEMP and GERMP/NEIS³ is not very clear to most implementing agencies. The GERMP is being implemented with assistance from the World Bank.

¹ National Environmental Action Plan

² Global Environmental Monitoring System

³ GERMP = Ghana Environmental Resources Management Project;
NEIS = National Environmental Information System.

5 - THE EMEMP WORK PROGRAM

- Stage of preparation.

The Environmental Monitoring, Evaluation and Mitigation Plan (EMEMP) was recommended as one of the conclusions of the program environmental assessment and the four supplementary environmental reviews, and was prepared with assistance from REDSO/WCA Environmental Unit⁴ and has been available since June 1992. However, many institutions involved in the monitoring activities do not have it. It is time that all the institutions have it and study it.

- Stage of implementation.

Most institutions to be involved in the implementation of the EMEMP are not prepared yet for their specific tasks. EPC should take a stronger lead of these institutions in the implementation of the EMEMP.

The first stage of the implementation of the EMEMP should have started with an Implementation Workshop intended to allow all participants to analyze and prepare for the different activities to be undertaken for the implementation of the EMEMP. The workshop had not taken place yet. A one day workshop on the Implementation of the TIP/EMEMP is planned to be held soon. The program and list of participants have been proposed (see annex).

- Problems encountered related to the implementation of the program.

Delays in budgeting and funding are retarding the programming. On one hand, participant institutions are waiting for EPC to make necessary funds available to them; and on the other hand, EPC is waiting for the Ministry of Trade, the TIP implementing agency, to make the funds available to them. It has been suggested that EPC is not legally allowed to add this activity in their budget list. The Ministry of Trade should be responsible for listing the funds necessary for the EMEMP in their budget and have it approved, then make it available to the other participant institutions.

Note that the financing and implementation of the EMEMP is the Government's responsibility, is a conditionality for further disbursements for the TIP from USAID and is regarded as the contribution of the Government to the TIP.

⁴ The Environmental Monitoring, Evaluation and Mitigation Plan (EMEMP) was prepared by Idrissa Samba, USAID/REDSO/WCA Environmental Advisor, and Clement Dorn-Adzobu then Head of the Ghana Environmental Protection Council (EPC).

The EMEMP Implementation Workshop should be made a priority. It would clarify various aspects of the EMEMP especially the budgeting and financing aspect. Source of funds for various activities of the TIP project including the EMEMP should be explained also⁵.

6 - YEARLY MONITORING PROGRAM OF THE EMEMP

The TIP/EMEMP identified a number of Ghanaian institutions to participate in the implementation of the monitoring plan. Each participating institution should have prepared a yearly workplan. As of now, only the workplan for "Water Quality & Pollution monitoring" has been jointly prepared by the Institute of Aquatic Biology (IAB) and Water Resources Research Institute (WRI). Other institutions are not yet fully involved in the implementation of the EMEMP. They are: 1) The Soils Research Institute (located at Kumasi) which will perform soils monitoring; 2) The Hydro Division Architectural and Engineering Services Corporation (AES) which will undertake water gaging; 3) Mineral Commission; and 4) the Forestry Department which will monitor vegetation cover and forestry resources. All of them, those directly involved and those that are not, are waiting for the Environmental Protection Council (EPC) to make the first move by making available the necessary funds and logistics. ←

Even though geographical locations have been selected for monitoring, no sampling site has been identified to date by any of participating institutions. All the institutions involved in the implementation of the EMEMP for the various components of the TIP project (Salt winning, Fisheries development, Furniture production, and Non traditional agricultural exports) are waiting for EPC to provide the funds necessary for field monitoring activities. Apart from ~~few~~ historical data made available to EPC by monitoring agencies, the following basic preliminary works are yet to be carried out: i) baseline data collection and analysis; ii) preparation of field sheets; iii) preparation of a database (customizing an appropriate computer software); and iv) assembling of field teams. A "wait and see" attitude seems to have been adopted by line institutions. ←

7 - GRANT AGREEMENT CONDITIONALITIES OR OTHER PROVISIONS RELATED TO ENVIRONMENTAL MONITORING AND MITIGATION

The Program Grant Agreement (number 641-0125) dated September 30, 1992 between the Republic of Ghana (Grantee) and the United States of America, acting through the Agency for International Development (AID) defined a number of Conditions precedent to

⁵ The EMEMP is entirely part of the TIP project and should be treated as such. USAID is providing the funds for the implementation of the TIP project, except for the EMEMP local currency component which is the responsibility and contribution of the Government.

each of the five (5) disbursements of the program.

The condition precedent (CP) related to environmental monitoring and mitigation is listed in the conditions precedent for tranches 2 through 5 in the following order: CP5 for tranche 2; CP7 for tranche 3; CP8 for tranche 4; and CP7 for tranche 5. The EMEMP condition precedent for all tranches is stated as follows: "Evidence that the environmental monitoring plan is being implemented".

The way this condition precedent is stated seems to be too broad to allow abuses. The evidence required is not clearly stated in regard of its nature, level, degree, quality and importance in the EMEMP implementation. In each term report for tranche disbursement, achievements to be made towards the satisfaction of the environmental conditionality should be defined and clearly stated.

8 - FUNDING SUPPORT TO THE EMEMP, BUDGETING AND FINANCING

The meeting with Mr. Kwasi Hazel of the Ministry of Trade and Industry shed some light on the budgeting and financing issues. EPC has yet to submit the operation budget for 1994 to the Ministry of Finance through the Ministry of Trade and Investment.

In 1993 fifteen (15) million Cedis were released for the implementation of the EMEMP out of the amount. 12.05 million Cedis were used for the purchase of a computer adequate for data management⁶. Remaining funds will be used for allowances and other expenses.

When EPC provides a budget for 1994, a cheque will be issued to cover all the activities for this year. The money will be made available to EPC then channelled to the institutions involved in the implementation of the monitoring plan. This procedure will be used throughout the implementation of the EMEMP.

The USAID mission has a limited dollar funds for limited purchase in the US. This can be used for the purchase of software and other small equipment not available in Ghana.

DETAILS FOR 1993 BUDGET DISBURSEMENTS

⁶ The computer purchased has the following specifications: 80486 DX2/66 Intel Processor, 8mb RAM and 300mb hard disk.

1993 BUDGET DISBURSEMENT		
ITEM	ESTIMATE COST	AMOUNT DISBURSED
1. Data Processing System (PC)	12,000,000.00	12,054,000.00
2. Accessories to PC + Maintenance Cost (20% cost)	2,400,000.00	-
3. Compilation of Historical/Baseline Data	200,000.00	-
4. Vehicle (One 4WD diesel)	22,500,000.00	-
5. Spare Parts (15 % cost)	3,375,000.00	-
6. Running and Maintenance Cost (20%)	4,500.00	-
TOTAL	44,975,000.00	12,054,000.00

The 1993 budget estimate presented to the Ministry of Trade and Industry totalled 44,979,000.00 Cedis covering the items listed in the table. Only 26.8% of the budgeted funds, a little more than 1/4, were disbursed by the GOG. This seems to be a limited performance that would not allow for a proper implementation of the EMEMP. This also makes sustainability of the EMEMP beyond project life very questionable.

However, in December, the Ministry informed EPC of the approval of 15 millions Cedis from the Ministry of Finance. Since this was not enough for the purchase of the vehicle for field monitoring (the priority activity), it was decided to use it for the purchase of a computer for processing of the available historical data collected from various implementing agencies. Hence 12,054,000.00 Cedis was paid out for the purchase of the computer. Figure amounts to an increase of 54,000.00 Cedis or 0.45% increase over the budgeted figure due to cost since the estimates were proposed in January 1993.

1994 BUDGET ESTIMATES

	ITEM	TARGET DATE	ESTIMATED COST (c)
1a	Supply of One 4WD Diesel Vehicle	March	22,500,000.00
1b	Spare parts for (1a) @ 15% cost	March	3,375,000.00
1c	Running & Maintenance cost @ 20% cost	March	4,500,000.00
2	Supply of accessories to Computer & Maintenance @ 20% cost	Jan	2,400,000.00
3	Compilation of Historical/Baseline Data	Feb-March	200,000.00
4	Computer processing of available raw data	Jan -May	500,000.00
5	Field reconnaissance/Sampling site selection	April	1,000,000.00
6	Field Measurements (Sampling & Laboratory analysis)	June	1,652,800.00

	ITEM	TARGET DATE	ESTIMATED COST (c)
7	Field Data Processing and analysis	Mar. July, Sept., Dec	500,000.00
8	Quarterly Meetings of working Groups	Feb, May, Aug, Nov.	400,000.00
NOTES: Were funded from remaining 1993 funds: (i) Items 3 & 4; (ii) 100,000.00 cedis out of item 8; (iii) 2,146,000.00 cedis of item 2			

NOTE 1: On 24th January 1994, an amount of 2,946,000.00 Cedis, remaining from the 15 millions approved in 1993⁷, was received from the Ministry of Trade and Industry as balance of 1993 budget approved for payment and this covered the following activities:

	CEDIS
a) Compilation of Historical/Baseline data	200,000.00
b) Computer processing of available raw data	500,000.00
c) Quarterly meeting of working groups	100,000.00
d) Supply of accessories to computer and maintenance cost at 20% cost of computer	<u>2,146,000.00</u>
TOTAL	2,946,000.00

NOTE 2: The original budget for item (d) is 2,400,000.00 Cedis; hence an amount of 254,000.00 Cedis is yet to be received.

NOTE 3: Items for which funds are yet to be provided are:

	CEDIS
a) Supply of 4WD Diesel vehicle, spare parts, running & maintenance costs	29,375,000.00
b) Quarterly meetings of working groups	300,000.00
c) Sample sites selection	1,000,000.00
d) Field measurements, Sampling & laboratory analyses	<u>1,652,800.00</u>
TOTAL	32,327,800.00

9 - COMPOSITION OF COORDINATING TEAM

It appears that the Environmental Protection Council, the coordinating agency of the implementation of the TIP/EMEMP, has the capacity to coordinate the implementation of the EMEMP. However there are some budgetary, logistical, programming and

⁷ This was transferred into the 1994 budget.

planning problems to be solved subsist.

EPC seems to have sufficient and qualified personnel to coordinate the implementation of the EMEMP. However, because of recent personnel movements, the creation of the new Ministry of Environment, the transfer of the institution in new head quarters and attendance of staff to workshops out of the country, activities were slowed down. The retirement of the former Head of the EPC, Dr. Dorm-Adzobu, has also something to do with the delay in the implementation of the EMEMP. The Coordinator of the EMEMP at the EPC should get implementing institutions more involved with the EMEMP and set up appropriate coordination. Personnel of the EPC involved in the implementation and coordination of the EMEMP are as follows:

OFFICER	POSITION	RESPONSIBILITY IN THE EMEMP
1. Dr. G. A. MANFUL	Acting Deputy Director/Operations.	Data Analysis
2. E. M. K. AMEKOR	OIC Environmental Quality; Monitoring Unit	Coordinator of TIP/EMEMP; Data Management and Analysis
3. Mr. J. A. ALLOTEY	Assistant Director; Head Environmental Assessment/Information Unit	GIS Specialist; Data Management
4. Mr. AMOYAW OSEI	Program Officer	GIS Specialist; Data Management
5. VALERY ASMAH	Program Officer	Member of Monitoring team
7. HELEN KYEI	Computer Programmer	Development of Program for data management.
8. HELEN ATTIPOE	Computer typist	Report preparation for submission to TIMU.

10 - INVOLVEMENT OF INSTITUTIONS

After a series of meetings, various government/non-governmental organization were identified for the implementation of various components of the TIP/EMEMP with the core institutes being; Institute of Aquatic Biology (IAB), Water Resource Research Institute (WRRI), Fisheries Research Unit of the Ministry of Agriculture (FRU), Forestry Department (FD), AESC Hydro Division, and Minerals Commission among others.

- Role and responsibilities of various implementing agencies:

IMPLEMENTING AGENCY	RESPONSIBILITIES
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1.	Institute of Aquatic Biology; Chemistry department	Measurement of water quality (physical, chemical and biological parameters) in salt, shrimp/prawn & NTAE impact areas. Limnological data in coastal ecosystems.
2.	AESC Hydro-Division	Determination of water levels and flow data in salt and NTAE industry impact areas.
3.	Ministry of Agriculture; Fisheries Research Unit (FRU) Tema	Monitoring of marine fishery data over project life time. Measurement of salinity and beach water temperature along the coast of Ghana. Supply of data on fishing vessels involved in shrimp and prawn industry.
4.	Forestry Department; Accra, Kumasi & Takoradi offices.	Monitoring of volume of yearly timber harvest over the project period; Species composition of timber harvested. Survey of primary tropical forest remaining in Ghana.
5.	EPC (Environmental Quality Unit)	Overall coordination of environmental monitoring, data processing and analysis and reporting the same to TIMU. Determination of atmospheric pollution due to wood processing into furniture, excessive noise levels during furniture production. Registration of licenses of pesticides imported into the country. Monitoring of the use of counterfeit, restricted & prohibited agro-chemicals in NTAE production.
6.	Save the Seashore Birds Project/Ghana	Monitoring of water birds species/population in salt mining project areas through random counts, and the impact of project activities on their population.
7.	Remote Sensing Application Unit; University of Ghana; Geography Department.	Determination of percentage of marginal land put into agriculture because of high pressure on land resources (planned under GERMP).
8.	Survey Department	Production of maps to determine new land use patterns, deforestation, changes in vegetation, etc. (planned under GERMP)
9.	Soil Research Institute	Determination of soil fertility, erosion sites, soil capability analysis (planned under GERMP), and impact of development of NTAE on soils

Note that activities listed for #7, #8 and #9 have been planned under GERMP, hence to avoid duplication of efforts, the information for these activities will be accessed for TIP/EMEMP.

Institute of Aquatic Biology (IAB) and Water Resources Research Institute (WRRI) jointly presented a yearly workplan covering the period from 1993 to 1997 for water quality and pollution monitoring. However, since the workplan had been designed no further work, such as sample site selection, identification of field team, or any other preparatory tasks, has been done towards the implementation of the EMEMP because of budgeting and financial issues to be settled with EPC. It was explained that delays were caused by the fact that IAB feels its responsibilities in the EMEMP as a consultant job ordered by EPC. As such, EPC has to make funds and necessary resources available to them to do the work.

Also IAB has not yet selected the personnel assigned to the EMEMP, this can be done and the work program easily included into their annual work load. IAB has sufficient and qualified personnel to undertake field and laboratory work related to the EMEMP. In addition, IAB benefit from the services of student performing their research in the institution.

Fisheries Research Unit (FRU) like other participating institutions, is waiting for EPC to put in place the funds necessary to perform the field work. No site selection has been made.

FRU has the qualified personnel to perform field and laboratory work and has a performing sampling system. However, since the field vehicle being used is rather old, the unit may need some logistical assistance.

FRU has computer facilities that can be used for EMEMP data management. The unit is currently using Lotus and DBase for data storage, management and storage.

FRU might need some more personnel and complementary training for its personnel, especially for field personnel. Training is mainly needed for "Stock management" and "ecosystems management".

11 - AREAS, INDICATORS AND PARAMETERS FOR MEASURING ENVIRONMENTAL CHANGES

11.1 - IMPORTANCE AND SIGNIFICANCE OF DESIGNATED MONITORING AREAS

It has to be noted that sampling stations are not selected yet for any of the sectors involved in the monitoring. Only broad areas have been identified. Sampling stations will be identified by EPC in relation with line institutions. Also final selection of all field indicators and parameters to be monitored is yet to be made.

- SALT INDUSTRY

There are about six (6) salt industries listed in the document TIP EMEMP INDICATORS/KEY DETERMINANTS as recommended areas for monitoring. The working group however selected: 1) the Songor Lagoon at Ada; 2) the Panbros Salt Ltd at Accra; and 3) the Benya Lagoon at Elmina; and 4) Apaman Salt Industries at Apam.

Factors taken into consideration in the selection of the areas to be monitored are:

a) An extensive and in-depth environmental impact assessment has been conducted on the Songor Lagoon and the results can serve as

baseline data for monitoring any change under TIP.

b) The Panbros Salt Ltd:

(i) is one of the largest and hence one which will have great environmental effects.

(ii) it lies in the Densu delta which is a Ramsar site;

(iii) it also serves as habitat for many migratory birds.

c) The Benya Lagoon in Elmina is also one of the main salt producing areas and not much is known about the environmental effects of this activity on the adjoining area.

d) The Apaman Council Salt Industry located in Apam in the Central Region is one of the viable salt industries likely to attract TIP funding hence the need to monitor environmental change that might result from increased salt production there.

- SHRIMP & PRAWN INDUSTRY

The selected towns, Accra, Tema, Elmina and Takoradi are major fishing towns and are locations at which the Fisheries Research Unit of the Ministry of Agriculture is already carrying out monitoring of fish catch as well as beach temperature and salinity measurements on a regular basis. Final selection of indicators and exact sampling sites have to be done by the Fisheries Research Unit and EPC.

- FOREST/FURNITURE

The listed towns (Kumasi, Akim Oda, and Takoradi) for monitoring environmental impact of improved furniture production have large communities in which furniture producers are congregated. Hence, the production and disposal of waste (sawdust) can be easily monitored. Secondly, the effect of their activities so far as dust and noise levels are concerned can be assessed.

It is also proposed that the village of Enyiresi, located a few kilometers from Anyinam on the Accra/Kumasi trunk road which is very popular for cane baskets and wood carvings be included in the sites for monitoring.

The Western and Ashanti regions have large forest cover from which wood is extracted for furniture production hence the deforestation rate and consequent effect of improved furniture production is to be monitored by the Forestry Department. Final selection of indicators and exact sampling sites have to be done by the Forestry Department and EPC.

- NTAE INDUSTRY

The main area of focus is the Densu basin which is a major area for pineapple production. Other large farms can be found in Kasoa and Kuntunse in the Greater Accra Region. An intensive and in depth monitoring of the effects of pineapple farming on the Densu river which is a source of drinking water for many communities and the western part of Accra will serve as the principal monitoring activity.

Monitoring of soil capability, erosion, fertility and contamination should be included in the monitoring program as early as possible for a proper conservation of the production potential of the area.

Specific areas of concentration for the production of plantain and yam will be selected for monitoring as the program evolves.

11.2 - IMPORTANCE AND SIGNIFICANCE OF DESIGNATED INDICATORS AND PARAMETERS FOR MEASURING ENVIRONMENTAL CHANGES.

Changes in the flow rates and water levels in lagoonal and riverine systems are due to several factors one of which is the environment at the headwaters. Any change in these could lead to reduction or otherwise in aquatic life and serves as a good indicator of the state of the environment.

While increased temperature and high salinity values are suitable for increased salt production, the reverse situation holds for freshwater environments that would be monitored in the NTAE project impact areas. Changes in these parameters affect the type of flora and fauna that exists in the area and are good indicators for monitoring the spawning grounds for shrimps which should also not exceed certain levels of salinity.

Dissolved oxygen levels are indicators for determining the suitability of aquatic environment for supporting life. BOD⁸ levels are determined to a large extent by organic pollution of the aquatic system. Change in BOD results in the imbalance of species population and this is a good indicator of environmental quality.

The presence and diversity of algae in the lagoon is a good indicator of the state of the environment because certain algae thrive only under specific conditions. Any change in the environmental conditions leads to dramatic changes in both density and diversity of algae. During the project life therefore a change in the algae population and diversity will give a good indication of environmental change. The possibility

⁸ Biological Oxygen Demand

of algal poisoning from the use of contaminated salt necessitates algal monitoring.

Chemical residues from agriculture, industrial effluent, and leaching from solid waste dump sites flowing into lagoons and the ocean are some of the sources of heavy metals in the aquatic environment. The possibility of ingestion by shrimp and other aquatic life makes it imperative for the determination of some of these metals in lagoon and ocean shrimp in the impact areas.

The monitoring of fecal coliform in the salt, shrimp/prawn and NTAE industries will reveal the state of the environment vis-a-vis the spread of bacterial and viral diseases which might be transmitted through the use of contaminated water in the production process in the project impact area.

Levels of turbidity and suspended solids which are water quality determinants depend on the season and flow rates and affect the bacterial counts, hardness and salt content in the aquatic system in the salt industry. Changes in turbidity and suspended solids levels therefore affect the environment and hence the production level of salt in the lagoons. In the NTAE industry, increased turbidity and suspended solid levels could be attributed to soil erosion due to bad agricultural practices and surface runoff which degrade the environment.

Measurements of suspended particulate matter and noise in the environment of wood/furniture processing industries gives an indication of the extent of atmospheric and noise pollution⁹.

Monitoring of volume of wood extraction for furniture and the area of forest cover destroyed, etc. would help determine the extent of environmental change due to project impact on forest resources.

12 - BASELINE DATA

EPC has collected some historical/baseline data on water quality, salt, fisheries and forestry. However, neither collection of baseline data is complete yet, nor data analysis for use as baseline reference for the EMEMP has been performed.

Note: It has been reported that IAB had performed a comprehensive study of the entire Densu River catchment covering an entire year that can be used as a baseline reference for the EMEMP.

13 - EMEMP DATA COLLECTION

Following is the status of field data collection:

⁹ The EPC has the appropriate equipment for atmospheric and noise pollution monitoring.

- No data sampling station has been selected to date, and no data has been collected.

- Data collection methods, personnel in charge, schedule and timing have to be defined in the form of a field guidebook.

14 - DATA MANAGEMENT, TREATMENT AND DISSEMINATION

Arrangements for data management are still to be made and a software selected and customized. As stated in the EMEMP document, the system used for data management should be compatible with standard GIS used or proposed to be used in the country. Data/Information dissemination and accessibility has to be defined.

IAB has a computerized data management facilities, currently used for fisheries data management, that can accommodate data collected for the EMEMP, and used for data processing and reporting. It has to be pointed out however that IAB's computer equipment has limited capacity, and is project equipment. There may be the need for IAB to acquire a central server for institute wide data management and retrieval.

It is advisable that computer facilities of various institutions involved in the EMEMP be linked by modem to facilitate data sharing, management and retrieval. One major limiting factor of this proposed networking would be the mediocre condition of the Accra telephone system.

15 - REPORTING ON PARAMETER ANALYSES

Since field sampling and monitoring is yet to be done, there are no analyses performed and no results to report.

16 - USE OF RESULTS OF THE EMEMP

The results of EMEMP will be used by:

- i) Government of Ghana for future policy formulation on environment;
- ii) EPC and allied institutions in the country responsible for policy implementation and mitigation of environmental degradation;
- iii) Individuals and research institutions for academic work.

EPC should put in place a mechanism for presenting this information in a manner that is easily accessible to users, as well as effective information dissemination process. Major questions are:

- Planned use and the use effectively made of the data and information collected;
- Effectiveness of data collected on conservation and protection of environment and natural resources;
- Complementary and further data and information needed;

17 - EVIDENCE OF FULFILLING ENVIRONMENTAL MONITORING CONDITIONALITY

There are evidences that EPC and Ministry of Trade are active towards implementing the TIP/EMEMP. However this evidence need } to be pushed forward and confirmed. Evidence of activities undertaken towards the implementation of environmental monitoring in TIP/EMEMP is presented below for all the four major areas:

17.1. NTAE POLICY & LEGISLATIVE DEVELOPMENT

Most likely, if NTAE Policy and Legislative Development results in increase in production and efficient marketing, the new policy may have an impact on the environment and natural resources with an increase in land put into agriculture, possible exploitation of marginal land, increased use of pesticides and fertilizers, and possible social tensions related to limited land resources.

Plans have not been made by EPC to monitor this critical aspect of the impacts of the program.

17.2. SALT MINING INDUSTRY

- Major producing areas have been identified: (i) Ada (Songor Lagoon); (ii) Accra (Panbros Salt Ltd.); (iii) Elmina (Benya Lagoon); (iv) Apam.

- Historical Data Assembled: (i) Environmental Impact Study Report (Water Characteristics & Aquatic Biology) of the Songor Lagoon, Ada.

- A field form for reporting chemical examination of water has been designed.

- Parameters to be analyzed have been selected; however, monitoring of ground water and sediment transport have been left out because the necessary facilities do not exist. Analysis of salt contamination, by pollutants for example, should be analyzed on a regular basis by individual salt firms, and report made to EPC, to insure that high quality products are injected into the market.

17.3. SHRIMP AND PRAWN INDUSTRY

- Major production areas have been identified: (i) Accra; (ii) Tema; (iii) Elmina; (iv) Takoradi

- Historical Data Assembled: (i) Reports: Ghana canoe Frame Survey 1989 (FRU, Tema); (ii) Number of Operational Motor Fishing Vessels & Canoes 1991-92; (iii) Marine Invertebrate Production figures 1991-92; (iv) Regional marine Fish Production 1991-92; (v) Summary of Marine Fish production in Ghana 1991-92; (vi) Daily Beach Water temperatures for 8 stations along Ghana's coastline 1991-92; (vii) Daily Beach Salinity measurement for Tema 1991-92;

- Lead agencies for monitoring identified.

- Monitoring sites, indicators and parameters for monitoring this component of the program have yet to be defined. One of the first steps towards the implementation of this aspect is to find out if shrimp/prawn breeding and nursery sites exist in the program/project activity zones for possible impacts, and assess the capacity of the shrimp/prawn population to support increased harvesting. Also individual firms should be involved in the quality control of the product for possible contamination and pollution. Some significant work has still to be done for the implementation of the shrimp/prawn component of the program.

17.4. FOREST/FURNITURE INDUSTRY

- Major Regions of wood and cane extraction identified: (i) Ashanti Region; (ii) Western Region

- Major Processing Points identified: (i) Kumasi: Wood Furniture; (ii) Akim-Oda: Wood Furniture; (iii) Takoradi: Wood Furniture; (iv) Accra: Cane Furniture

- Some historical Data Assembled: (i) Major regions of timber extraction & processing; (ii) Major regions of cane extraction; (iii) Volume of orders for 7 popular timber species 1992; (iv) Yearly Timber harvest (as % of allowable cut) 1990-1992; (v) Number of new Timber concessions issued; (vi) Volume & Value of moving Timber species; Lumber (33 species) and Log(18 species) - 1992; (vii) Volume and Value of Timber exported - 1992; (viii) Volume and Value of Logs exported - 1992.

- In relation with the forest service and referring to the EMEMP document, arrangements are still to be made to monitor the impact of NTAE activities on forest resources (volume harvested, volume left, timber selection, degradation related to harvesting activities, how regeneration and species composition are affected, etc).

17.5. NTAE INDUSTRY

- Major areas of production identified: 1) Pineapple: i) Densu Basin (Nsawam, Akwadum, Weiija); ii) Kasoa; iii) Kuntunse; 2) Plantain: Eastern Region; 3) Yam; i) Eastern, ii) Brong Ahafo, iii) Northern Regions.

- Historical Data Assembled: (i) Production Estimates of some major crops in Ghana - 1992; (ii) Estimates of cropped area for some major crops in Ghana - 1992; (iii) Data on location, acreage and access roads to some pineapple Farms.

- For this program/project component there is also a significant amount of work still to be done to put together monitoring arrangements. Arrangements have to be made with the department of agriculture, crop protection service, and the forest service to implement the monitoring of indicators identified in the EMEMP document.

17.6 - GENERAL ARRANGEMENTS FOR STARTING THE IMPLEMENTATION OF THE EMEMP

Arrangements have been made for: 1) the procurement of a PC for data processing; 2) design of a field form for chemical examination of water (complementary field form for forestry, soils, etc, have to be prepared); 3) identification and collaboration with lead agencies for environmental change monitoring; 4) four general meetings, two consultancy visits and special meetings with various agencies have been held.

18 - SUMMARY ISSUES, SOLUTIONS AND RECOMMENDATIONS

ISSUES	PROPOSED SOLUTIONS/RECOMMENDATIONS
THE EMEMP WORK PROGRAM	
1. Sustainability of EMEMP activities beyond life of project is highly doubtful for the time being. The EMEMP is still perceived as an extra burden super-imposed to the institutions routine programs.	The first stage of the implementation of the EMEMP should have started with an Implementation Workshop. The EMEMP Implementation Workshop should be made a priority. The workshop will explain the reasoning behind the structure of the EMEMP document which incorporates ongoing activities of governmental institutions and NGOs.
2. Line institutions are not yet fully involved in the implementation of the EMEMP, and are not prepared yet for their specific tasks.	The workshop should show the linkage between the TIP/EMEMP and other monitoring programs as well as the link with ongoing activities of line agencies.
3. No implementation workshop yet.	
4. Even though sampling areas have been defined, sampling stations are not selected yet for any of the sectors involved in the monitoring.	Field activity will start when vehicles are in place. Note that the Fisheries Research Unit and the Institute of Aquatic Biology have sampling sites along the coast and at the Songor lagoon; they can be used but may not fall in the TIP monitoring areas, however where necessary, complementary sites will be selected.
5. Final selection of all field indicators and parameters to be monitored is yet to be made.	Complementary indicators should be identified, eg. for soils fertility, shrimp & prawn biology, and impacts on forest resources.
6. Plans have not been made by EPC to monitor the impacts of the program policy and legislative component.	EPC should liaise with the new Ministry of Environment to carry out this monitoring activity.
7. Arrangements are still to be made to monitor the impact of NTE activities on forest resources.	Field reconnaissance visits should be made to wood/cane extraction areas to assess environmental impacts and identify parameters for monitoring.
YEARLY MONITORING PROGRAM	
8. Each participating institution should have prepared a yearly workplan.	Each institution should furnish EPC with workplans indicating target dates for implementation of specific activities for incorporation into general workplan by the TIP/EMEMP coordinator.
9. Institutions are waiting for the Environmental Protection Council (EPC) to make the first move by making available the necessary funds and logistics. A "wait and see" attitude is adopted in all institutions.	This issue should find a solution through the workshop and availability of field logistics.
10. Baseline data collection and analysis not complete yet.	This activity can be performed before availability of funds and logistics. EPC should urgently work on this.
11. Preparation of field sheets not complete yet.	This also should have been done already. EPC should liaise with line agencies to put required field forms together.
12. Preparation of a database (customizing an appropriate computer software) not done yet	The Ministry of Trade & Industry and EPC should expedite action on the supply of PC/Computer and accessories to enable the customizing take off.

ISSUES	PROPOSED SOLUTIONS/RECOMMENDATIONS
13. Besides IAB, assembling of field teams by each institution involved is not yet done. For example FRU have not selected yet the personnel assigned to the EMEMP, this should have been done and the work program easily included into their annual work load.	Each line institution should assemble the field team responsible for TIP/EMEMP, and inform EPC accordingly.
INTEGRATION IN COUNTRY'S OTHER EN&E	
14. The link between the TIP/EMEMP and GERMP/NEIS is not very clear to most implementing agencies.	The workshop should address this issue.
GRANT AGREEMENT	
15. The environmental condition precedent for the TIP project is the implementation of the Environmental monitoring Plan. It is stated as follows: " <u>Evidence that the environmental monitoring plan is being implemented</u> ". However, the way this condition precedent is stated seems to be too broad to allow abuses. The evidence required is not clearly stated in regard of its nature, level, degree, quality and importance in the EMEMP implementation.	In each term report for tranche disbursement, achievements to be made towards the satisfaction of the environmental conditionality should be defined and clearly stated.
FUNDING	
16. Delays in the release of funds by the Ministry of Trade and Industry to EPC is part of the problem for the slow start of the implementation of the TIP/EMEMP. For example, the release of 15 millions Cedis to EPC for the 1993 activities was done only in December 1993.	Annual budgetary requirements for the TIP/EMEMP should be submitted to the Ministry of Trade & Industry in the last quarter of the year to enable easy release of funds for the next year's activities. Revisions due to increased cost should be done in early January.
17. Delays in budgeting and funding are retarding the monitoring program.	EPC and the Ministry of Trade & Industry should discuss and determine the best approach to resolve the delay issues.
COORDINATING AGENCY	
18. Some coordinating problems have been noted.	The Environmental Protection council has the capacity to coordinate the implementation of the EMEMP. However there are some budgetary, logistical, programming and planning problems to be solved subsist. The Coordinator of the EMEMP at the EPC should get implementing institutions more involved with the EMEMP and set up appropriate coordination.
PERSONNEL & TRAINING	
19. Training and staffing needs related to the implementation of the TIP/EMEMP should be assessed by EPC and line agencies.	FRU might need some more personnel and local complementary training for its personnel, especially for field personnel. Training is mainly needed for "Stock assessment" and "ecosystems management". The EPC TIP/EMEMP coordinator to facilitate local training by provision of funds and logistics to FRU. FRU to explore the use of resources and expertise in Côte d'Ivoire Fisheries Unit?

ISSUES	PROPOSED SOLUTIONS/RECOMMENDATIONS
BASELINE DATA	
<p>20. Collection of historical data is not yet complete, and data analysis for use as baseline reference for the EMEMP has only been partially performed.</p>	<p>The Coordinator should liaise with other institutions such as AESC/Hydro, Forestry Department, etc.. for existing data and complete analysis of data for use as baseline reference for the TIP/EMEMP.</p>
USE OF RESULTS OF EMEMP	
<p>21. Arrangements are to be made for the dissemination of the findings of the TIP/EMEMP.</p>	<p>EPC should put in place a mechanism for presenting this information in a manner that is easily accessible to users, as well as effective information dissemination process.</p>

19 - PERSONS MET AND INSTITUTIONS VISITED DURING EMEMP EVALUATION

1. Dr. Farouk Ibrahim, Deputy Minister of the Environment;
2. Dr. Ahorttor W. Y., EPC staff member
3. Mr. Emmanuel M. K. Amekor, Officer in charge of the Environmental Quality Unit of the EPC, TIP/EMEMP Coordinator.
4. Dr. G. A. Manful, Acting Deputy Director/Operations, EPC.
5. Mrs. Valerie Asmah, Program Officer, EPC
6. Mr. C. A. Biney, Acting director of IAB
7. Miss. Emelia Annang, Acting deputy Director of Fisheries, Fisheries Research Unit.
8. Mr. J. E. B. Haizel, Director of Trade and Investment Unit. Ministry of Trade and Industries.

ANNEX

**ONE DAY WORKSHOP ON
TIP/EMEMP IMPLEMENTATION**

1 - PROPOSED PROGRAM

TIME	TOPICS
09:30	Arrival of participants
10:00	Introduction of chairman
10:05	Opening address by Dr. P. C. Acquah, Executive Director, EPC
10:15	Overview of TIP by Mr. Cleveland Thomas, USAID/Accra
10:30	Break/Snacks
11:00	TIP/EMEMP Objectives by Idrissa Samba, USAID, REDSO/MCA, Abidjan
11:30	Financial Operations in TIP/EMEMP by J. E. B. Haizel and Mr. William Akiwumi
11:40	Roles & responsibilities of EPC and other monitoring institutions in the implementation of the TIP/EMEMP by Mr. E. M. K. Amekor, coordinator, EPC
12:10	Break/Lunch
13:10	General Discussions
14:15	Closing address

2. PROPOSED LIST OF PARTICIPANTS

#	INSTITUTIONS INVITED	# Participants
1	Institute of Aquatic Biology	1
2	Water Resources Research Institute	1
3	Fisheries Research Unit, Tema	1
4	Forestry Department	1
5	Ministry of Agriculture (Statistics & Census Division)	1
6	Plant Protection and Regulatory Services	1
7	Industrial Research Institute	1
8	Remote Sensing Applications Unit (UG)	1
9	AESC/Hydro Division	1
10	Save the Seashore Birds Project, Ghana	1
11	Ghana Water and Sewerage Corporation	1
12	Oceanography Department (UG)	1
13	Soil Research Institute	1
14	Minerals Commission	1
15	National Board for Small Scale Industries	1
16	USAID/Accra	2

#	INSTITUTIONS INVITED	# Participants
17	Ministry of Trade and Industry	2
18	Environmental Protection Council	3
19	Rapporteur (from EPC)	1
20	TIP/EMEMP consultant from USAID/REDSO/WCA, Abidjan	1
	TOTAL	24