

**VALUE FOR MONEY AUDIT
OF PROJECTS**

FINAL REPORT

Submitted to

DANIDA



Environmental Quality International (EQI)

18 EL MANSOUR MOHAMED STREET, ZAMALEK, 11211, CAIRO, EGYPT

TEL: 202-27367879/27381328 FAX: 202- 27355489

EMAIL: INFO@EQI.COM.EG; WEBSITE: WWW.EQI.COM.EG

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Value for Money Audit
Obour Land Dairy Company
CLEANER PRODUCTION PROJECT

The Obour Land Dairy Company was randomly selected as a project representing the “Achieving Compliance in Industry” component of the “Environment Sector Program” provided by DANIDA to Egypt. . The company has received a loan from DANIDA in order to change its mode of operation to a cleaner less polluting production and therefore fulfill the objective of DANIDA. The main source of pollution was from the loss of product during the packaging process. By automating the packaging process the pollution was eliminated at the source. DANIDA has commissioned Environmental Quality International (EQI) to carry out a Value for Money Audit. The objective of the audit as given in the Terms of Reference document of the Royal Danish Embassy in Cairo, is to establish proof that the Danish tax payers’ money is spent for the purpose it was meant.

Site Visit:

A visit to the plant by Dr. Hamed Hamza, and Mrs. Mona Eldiwani from EQI took place on September 11, 2007. The team from EQI was accompanied by Engineer Emad Ali, Food Sector Coordinator of “Environmental Compliance Office” (ECO), and Mr. Mogens Dinesen, Technical Advisor to ECO. Mr. Ashraf Sherif, Executive director of Obour Land Food Industries, and Engineer Ahmed Hussein, Production manager of the plant welcomed the visitors. They discussed the operation of Obour Land Dairy Company and described the project financed by DANIDA. We were lead to a tour of the plant by Mr. Sherif and Engineer Hussein who explained the production process.

Process Description:

Obour-Land Dairy Company is specialized in the production of white cheese. The milk is first homogenized, pasteurised, and goes to ultra filtration. The concentrate from the filtration is pasteurised, homogenized and mixed with additives. After the incubation period, the cheese is refrigerated, cut, weighed, packaged and placed in cold storage.

Findings:

We first started by studying the reports published by the “Environmental Compliance office” (ECO) of the “Federation of Egyptian Industries”.

Screening Report:

This first report was written in November of 2002, and gave a brief description of the company, the production and consumption. The report listed observations about deviations from good environmental and industrial practices and recommended some options. The screening report is used in identifying and selecting the companies that could be part of the Environmental Sector Program

Pre-assessment Report:

This report dated January 2003 went into more details about the status of the company and the personnel. The report was preliminary identifying the items needed for “Clean Production”, and listed recommendations for improving the environmental aspect of the operation, and the efficiency of the production. What is very important in this report is that it quantified the efficiency of the production. The efficiency of the cheese production stood at about 65%, while the water consumption was more than 800% higher than the standard and the energy consumption was more than 500% higher than the standard. Improvement was badly needed.

Assessment Report:

The report was written in October 2003 and is more comprehensive than the previous ones. The report gave the final recommendations for cleaner and better production. It included the following recommendations:

- Establish an Environmental Management System
- Implement water conservation measures
- Reduce consumption of chemicals
- Implement Energy conservation measures
- Substitute Gas Oil (Solar) by natural gas as fuel in the boiler
- Upgrade the wastewater treatment system
- Introduce Good Manufacturing practices
- Install a lab for Quality Assurance

The main modifications recommended to the equipments were:

- Modify the wastewater treatment unit
- Install a new cooling water tower
- Provide a new laboratory to check the raw milk and products
- Provide a new continuous ultra filtration unit
- Provide a Tetra Pak machine for packaging the product in multilayer carton package. This is the best brand globally for this service
- Provide a Reverse Osmosis unit for reusing wasted permeate

It was reported that since the pre-assessment report some improvements have been implemented. The management and personnel of the company were trained in Good Manufacturing Practices, good “house keeping” was done, and the production personnel were given proper safety cloth.

Audit Visit Report:

The report dated July 2006 was the result of the audit conducted by DANIDA on the work progress of the “Environmental Compliance Office” in the “Achieving Compliance in Industry”. The report mentioned the environmental and economic benefits that resulted from the collaboration in this project, which included:

- Changing the factory floor tiling (for hygiene and safety)
- Insulating the steam pipes
- Installing a Tetra Pak cheese packaging machine
- Installing a continuous ultra-filtration unit
- Changing the fuel of the boiler from Gas Oil to natural gas
- Applying an Environmental Management System

A team led by DANIDA visited the plant and they noted the measures taken to guarantee hygiene and cleanliness and that all workers were wearing the personal protection equipment. They were shown the Tetra Pak packaging machine and its production line.

Environmental benefits:

The project has resulted in many environmental and production benefits. As stated in the assessment report, the advantages of the Tetra Pak machine are as follows:

- It eliminates the loss of material during production. All the milk fed to the machine is produced as cheese. No loss. Therefore it gives a cleaner and more efficient production.
- It decreases the resulting effluents to the sewer, making the production more environmentally friendly. The final discharge effluent was analyzed by an independent institute, and the effluent was found to be in compliance with the regulations. Both the BOD and COD were below the allowable limits.
- It doubled production capacity several times due to its speed and because it eliminates steps in the manual production of cheese. The milk is transformed into cheese in the Tetra Pak package within few minutes and eliminating the usual time needed to wait for the cheese to form in the manual packaging operation.
- Cheese produced using the Tetra Pak machine has a longer validity, up to six month, as compared to one month for cheese packaged by hand. The reason is that the machine-packaged product is tighter and therefore does not promote bacterial growth.
- Labour and production cost are decreased. What the machine can produce in an hour is more than what can be produced in a shift with many more labour.
- It helped expand the market reach. Because of the longer validity, the cheese can stay on the shelf for longer time and can travel to new markets.

Another Environmental benefit is the fuel used for the machine. Converting the fuel of the boiler from liquid fuel to natural gas has a positive effect on the emissions. The flue gas after the modification of the boiler were analyzed by an independent institute, however the emissions from the boiler before the modification were not available at ECO.

We have witnessed the Tetra Pak machine during production, and observed that the area around the machine is kept clean. The quality of the work done by the contractor that installed the Tetra Pak machine is good.

With the addition of the Tetra Pak machine, the Obour Land Dairy Company has increased its production capacity more than its local marketing capabilities. Therefore, the management is considering the possibilities of export. The Tetra Pak machine was bought at a very special discount. Mr. Hesham Morsy, Sales Manager of Tetra Pak confirmed that the machine bought was a demonstration unit that has been used in a training centre for only 200 hours; it was used for packaging olive oil. Mr. Hesham Morsy explained that the Tetra Pak machine was bought at a price of only about 25%.

Economic:

The Obour Land Dairy Company invested L.E. 3 million in order to upgrade its operation. Out of the L.E. 3 million DANIDA financed L.E. 1.7 million and L.E.1.3 million were self-financed. The major upgrade to the production was the addition of a Tetra Pak cheese packaging machine, having the capacity to produce from 5000 to 7000 packages of 500 gm white soft cheese items per hour. The finance by DANIDA was totally used for a partial payment of the Tetra Pak machine. However all the studies and reports were paid for by DANIDA.

Table 1 shows the breakdown of fees related to the project.

Line Item	Amount (L.E)
Invoice of the foreign supplier	1,830,370
Customs Fee	92,414
Managerial Fees	2,850
Sales tax paid	9,820
Saes tax instalments	183,526
Bank payment	5,435
Various Fees	2,877
Installation of Tetra Pak machine	207,000
Transportation Fees	400
Commission	300
Total Fees	2,334,992

Table 1 Obour Land Dairy Company Machine Purchase Project Cost

Procedures:

Obour Land Dairy followed procedures by advertising its need for packaging cheese machine, according to law 89 year 1998 for purchase regulations. The advertisement was published on 20 September 2004. Only one company, Tetra Pak, submitted an offer for packaging machine. A contract between Tetra Pak and Obour land was signed on 21st of May 2004.

Unfortunately, not all financial documents were available for the auditor’s review.

The following information was not available:

- Agreement between DANIDA and Obour Land Company.
- Obour Land Company Invoices and expenditures were not available for review.

Recommendations and comments:

It is evident that a great level of effort that was conducted during the preparation of this project. The assessment report has many valuable information, and is well organized. We recommend the following:

- Improvement of the filing system at ECO. Each project should have a separate file, where all the relevant documents of the project are kept. Retrieval of documents should be fast, without resorting to the owner of the project.
- Success should be measurable.. At the beginning of the project indicators of success must be defined to gauge the success of the project after implementation.
- ECO should have a data base that will include all the production and measured pollution figures at the beginning of any project.
- Any report financed by DANIDA, should at least be translated, if not written in English. This will make more people and consultant aware of what is going on.

The money spent by DANIDA was leveraged and well spent. All the studies and recommendations financed by DANIDA resulted in a big improvement to the plant environmentally and economically.

Value for Money Audit
Engineering Industries Company, Iron Foundry
CLEANER PRODUCTION PROJECT

The Engineering Industries Company was randomly selected as a project representing the “Achieving Compliance in Industry” component of the “Environment Sector Program” provided by DANIDA to Egypt. The company has received a loan from DANIDA in order to change its mode of operation to a cleaner less polluting production and therefore fulfill the objective of DANIDA. The main source of pollution was from the burning of coke in the cupola furnaces used to melt the metal. By replacing the cupolas by an electrical induction furnace, the pollution was eliminated at the source. DANIDA has commissioned Environmental Quality International (EQI) to carry out a “Value for Money Audit. The objective of the audit as given in the Terms of Reference document of the Royal Danish Embassy in Cairo, is to establish proof that the Danish tax payers’ money is spent for the purpose it was meant.

Site Visit:

Dr. Hamed Hamza from EQI, accompanied by Engineer Ahmed Kamal, the Metallurgical sector Coordinator of “Environmental Compliance Office” (ECO), visited the Iron Foundry facilities in Shubra El-Khema on September 17, 2007. Engineer Ahmed El Biali the Executive Director of the Engineering Industries Company led the visitors on a complete tour of the facilities, and explained the operation and all the modifications that took place as a result of the project. In a meeting after the tour, Engineer Ahmed El Biali answered the visitors’ questions.

Process Description:

The iron foundry is producing valves and pipe fittings, varying in size from 8 mm to 1000 mm, to be used in water and sanitary services.

The process starts in the laboratory, where the plant chemist analyses the scrap iron received as feed and determines the corresponding additives needed to be charged to the induction furnace to produce the required product. The scrap iron and additives are charged to the induction furnace, where they are melted together. A sample of the molten metal is analyzed by spectrometer to accurately determine any deviation of composition from the targeted product. Additives are then added to the induction furnace in order to adjust the composition of the batch. The molten metal is then casted into the shaped product, then machined. The bodies of the valves are casted in one piece. There is a separate department that produces associated components for the valves and machines the stem of the valves. The valves are then assembled, and pressure tested hydraulically to their design pressures. The valves or fitting are sand blasted for surface preparation, before they are spray-painted. Finally, the paint is left to dry under the sun.

Now the product is ready for selling.

Findings:

The EQI auditors first reviewed the reports published by the “Environmental Compliance office” (ECO) of the “Federation of Egyptian Industries”.

Screening Report:

This first report was published on February 2003, and gave a brief description of the company, the production and consumption. The report showed deviations from good environmental and industrial practices and listed three remedial options that the foundry was interested in. The screening report is used in identifying and selecting the companies that quality to be part of the Environmental Sector Program. The mode of operation of this foundry was very polluting and was emitting dangerous CO gas.

Pre-assessment Report:

This report dated February 2004 is mainly about policies and procedures. The report describes what needed to be done to install an Environmental Management System in the foundry. It recommended establishing an Environmental Policy, an Environmental Committee, an Environmental Register and a Self-Monitoring System.

The foundry management showed a keen interest in changing the mode of operation from using a cupola to using an induction furnace to melt the metal. The induction furnace is more efficient and environmentally much better. Based on the pre-assessment the main equipment needed were:

- Induction furnace and auxiliaries
- Analytical equipment for Quality Control

The total cost of the needed equipment was estimated at L.E 1.1 million, and the payback period was estimated at 4 month.

Based on the pre-assessment findings the project modifications were proposed.

Assessment Report:

The report was written in October 2004 and is basically the same report as the pre-assessment report with mainly two differences:

- The elimination of the section recommending the induction furnace
- The addition of a new section at the end of the report giving recommendations about the Cleaner Production using the existing cupolas

We tried to resolve the discrepancies that exist between the pre-assessment report and the assessment report with respect to the modification that took place at the foundry. We found out, that the assessment report was done when DANIDA was giving small grants to the plants, before the establishment of

the revolving fund. Therefore the scope of the project was only for “Clean Production” using the existing cupolas .

But after the revolving fund procedure was established, DANIDA agreed to give loans to the “Achieving Compliance in Industry” recipients. Therefore the scope of the project was expanded to include the addition of an induction furnace and the demolition of the cupolas.

Environmental Benefits:

The plant has been running now for over a year and the environmental and financial benefits of the new modification proved to be positive. The following are a list of the project’s impact:

- Elimination of emission that used to be generated from the cupola furnace (gases like SO_x, NO_x, and CO and particulate matters)
- Recycling of many scrap material that were impossible to recycle using cupola
- Reduction of rejected material
- Ease of operation and capability of operating around the clock
- Doubling of productivity
- Possibilities of producing different steel alloys that were not possible by cupola. Therefore was able to sell high quality alloys giving higher prices and profitability
- Variety of raw material that could be used and recycled
- Better quality of product and easier quality control
- Decrease of cost of production from 10 to 15% by using steel scrap instead of cast iron scrap
- Increase in sale in a year from L.E. 2.2 million to L.E. 4 million.

The reduction of emissions as a result of switching from using cupola furnace to the use of the induction furnace was estimated by ECO.

The Environmental Protection Agency of the USA provides factors to give a rough estimate of the yearly reduction in Particulate Matter having a size of 10 microns or less (PM 10) as a function of the net iron produced, when using induction rather than cupola furnace to melt the metal.

EPA gives a factor to roughly estimate the Heavy Metal reduction when switching to induction furnace from cupola. The reduction is estimated as a function of the molten metal, the Particulate Matter and the iron produced.

The reduction in CO₂ and SO₂ were calculated using standard emission figures for different fuels, as presented by the Association of Energy Engineers. The emissions from the induction furnace were assumed to be negligible, and the emission from the cupola is calculated from the amount of coke burned in the cupola and emitting CO₂ and SO₂.

For a net yearly iron production of 1500 tons, and for a yearly consumption of 180 tons of coke in the cupolas, ECO estimated that the emissions were reduced approximately as follows:

- Particulate Matter 10 = 10 tons/year
- Heavy Metals = 29 tons/year

- CO₂ (from Coke) = 660 tons/year
- SO₂ (from Coke) = 22 tons/year

The above rough figures show that the pollution has substantially decreased by switching to an induction furnace. To estimate the reduction of CO₂ emission, ECO assumed complete combustion of coke to CO₂ in the cupola. This is not the case, as there is some incomplete combustion of coke to CO as mentioned in the screening report.

We have asked ECO to provide us with the specification or the source of the coke used in the cupolas, but they did not have this information.



Figure 1 Dr. Hamed Hamza, EQI auditor, and Engineer Ahmed El-Biali at the charge of the induction furnace

EQI auditor witnessed the induction furnace during production, and observed that the area on top of the furnace was kept clean. The induction furnace is operating daily during one shift while the rest of the plant is operating two shifts. This means that the capacity of the furnace exceeds what the downstream equipment and labor can handle. The plant is becoming very crowded and the owner is planning to move to a new location where he can expand his facility.

The quality of the fieldwork done by the contractor that installed the induction furnace is good. The owner of the foundry in consultation with ECO procured the material for this project. The owner of the foundry being a mechanical engineer, self contracted all the civil, electrical, piping construction and installation of the equipment. The supplier of the induction furnace came for a week to check all the connections and commission the furnace. The induction furnace was under warranty for a year that already passed successfully with no problems.

Economic:

The Engineering Industries Company invested L.E. 1.1 million in order to upgrade its operation. Out of the L.E. 1.1 million, DANIDA financed L.E. 576,594 and the balance was self financed. Demolishing the cupolas used for melting the iron, and introducing the more efficient induction furnace drastically changed the operation of the foundry. Table 1 show the break down of cost for the project.

Line Item description	Cost (L.E.)
1 Induction furnace to melt the metal	354,198
2 Cooling water system used to for cooling the furnace. This is a closed loop cooling water system that has a small cooling water tower, cooling water pumps and four emergency tanks. A demineralizer unit is used to treat the water.	19,492
3 Cooling water compressor	28,670
4 Energy distribution board	65,011
5 Electrical substation to supply the power to the furnace. The substation is receiving 11,000 Volts.	20,720
6 Electricity transformers	56,000
7 Quality control equipment	33,371
8 Spectrometer for the analysis of the metal and the quality control of the product.	220,000
Total Line Items Cost	797,463
Electricity Cost	185,000
Sanitary Pipes (infrastructure)	60,000
Total Cost	1,042,463

Table 1 Engineering Industries Company project cost

Procedures:

The Engineering Industries Company followed law 89 year 1998 for purchase procedures. A steering committee was established that included representatives from Engineering Industries Company and National Bank (Ahly Bank), to evaluate the technical aspects of the project to insure they follow specifications agreed upon.

Three price quotes were submitted for the project, yet the majority of documents and agreements related to the purchase of equipment were not available.

Recommendations and comments:

- Nowhere could we find measurement of air pollution that was produced before or after the project was implemented. The assessment report failed to show any pollution figures and is basically a copy of the pre-assessment report. Air emissions should have been measured before and after the project, to clearly demonstrate the result. Any correlation used to estimate the reduction in the pollution figures have constraints, accuracy and a range of application that need to be understood.

- The objectives of the project should be clearly and quantitatively be defined at the beginning of the project.
- It is important to have any report financed by DANIDA, written in English or at least translated.
- Filing system in ECO needs improvement

This project is a very successful environmentally and otherwise, and EQI auditors are convinced that the DANIDA money was well spent. The results of this project are clearly evident when looking at the minimal environmental impact the plant in Shubra El-Khaima has on the environment surrounding it.

Value for Money Audit
El Redisya City Solid Waste Collection Project
SUPPORT FOR DECENTRALIZED ENVIRONMENTAL MANAGEMENT

DANIDA signed a contract with the Governorate of Aswan and Ministry of Environment to establish an Environmental Component at the Aswan Governorate within the framework of the Environmental Management in the Governorate in Support of the EMUs in Aswan. Subsequently, the Redeseya Local Unit (RLU), in association with the El Mostakbal Community Development Association (MCDA) requested and received funding from the Environmental Component at the Aswan Governorate to establish and operate an effective solid waste management system in the city of El Redisya, Aswan and its three satellite villages. Prior to the project, Redeseya and its villages had no formal solid waste management system. The request for funding was for a total of L.E 441,962; L.E 241,000 of which were provided as a grant through the Environmental Component of Aswan Governorate and LE 200,000 were provided by the government in kind in the form of paving the road to the dumpsite. El Redisya Local Unit then contracted MCDA to implement the project.

MCDA was established in El Redeseya, Aswan in 2003 (license number 673), with a founding membership of 100, including 20 women. MCDA's activities focus primarily on environmental and public health issues.

Environmental Quality International (EQI) was requested by DANIDA to perform a Value for Money Audit of the solid waste collection project. The audit was to determine if the funding given to the project by DANIDA equated the work performed in the project.

Site Visit:

A visit was conducted to Aswan governorate on September 10th and 11th, 2007 to undertake the Value for Money Audit of the Redeseya solid waste management project. The EMU office of Aswan governorate was also visited and the audit team met with the head of the office to discuss the project. She explained to the audit team the different project steps, and provided them with a number of relevant project reports and documents.

The audit team also visited El Redeseya and met first with the Head of the City Council, who expressed his great satisfaction with the with project implementation work carried out by MCDA.

The audit team then visited the project site and neighbourhoods serviced by the project to evaluate the quality of the service rendered to the community. The team also evaluated collection routes, and the distribution of metal containers and plastic bins.

During the field visit the team also followed the truck collection routing starting from waste collection to waste disposal at the dumpsite. At the dumpsite the city council loader covers dumped waste by sand on a regular basis. This prevents waste from being transported by wind to the surrounding areas

Findings:

Of a total project budget of LE 441,962, the Governorate of Aswan provided an in-kind contribution of L.E 200,000 in the form of paving the road to the dumpsite and some rehabilitation work of the dumpsite. Of the LE 241,962 grant from DANIDA, a total of LE 228,962 was used to purchase the following items:

1. One dump truck of 3.5 tones capacity (5.5 m³ domestic solid waste).
2. Fifty metal bins.
3. Twenty plastic bins of 140 litres capacity.
4. Ten wheeled handcarts.
5. Ten complete sets of uniforms and personal protective equipment (gloves, shoes, etc.).

All equipment were delivered to Aswan on November 2005, were put to use beginning January 2006.

The DANIDA grant also funded training and clean up campaigns (LE 13000), which were implemented by the EMU. Training was conducted for supervisors, and included office training and on site training. Training activities started on November 7th, 2005. Training volunteers (15 women and 2 supervisors) on filling out field survey data collection sheets was conducted on November 8th, 2005. Ten percent of the households (210 households) in addition to 25 commercial units were surveyed and data sheets filled out for them on November 12th, 2005.

A public awareness campaign was conducted for the project. Posters and flyers were handed out in schools. Training for volunteers, also included how to conduct household visits and how to communicate with households during awareness visits.

According to the solid waste management plan, the area is divided into three sectors, each serviced twice weekly. At the start of the project 320 households were serviced, currently 719 households are being served by the project. In addition, 190 shops and other commercial units also receive the waste collection service. Households and commercial facilities pay MCDA a small fee in return for the service. The project's paid work force consists of a supervisor, driver, and 4 labourers. Street cleanliness is out of the project scope and is the responsibility of the city council.

EMU and EMG consultants regularly visit the project site and serviced areas. They monitor and evaluate collection routes, and the distribution of metal containers and plastic bins with MCDA and RLU. According to the reports of 24/08/04 presented to the EMU at the Aswan governorate by the local consultant, the road leading from the city centre to the dump site was paved, which, in our opinion, will help achieve the goals of the new system, as the truck journeys are now easier, safer, and faster, and will keep the trucks from deteriorating prematurely. It had initially been agreed to pave the 1km-long road to the dumpsite, but following the revision of the urban plan, since the city was expected to grow rapidly, it was subsequently agreed to displace the dumpsite a further 500m out, so the road was extended. There is also a slaughterhouse along that road which produces large quantities of waste, and which is conveniently close to the new dumpsite, allowing for easier disposal of slaughter waste.

The city has been divided into 3 sectors which are serviced twice a week. The containers are located on the main axes, covering commercial areas as well. This system ensures the efficient and consistent control and transportation of the waste.

According to the available document, training was conducted for both the administrative and technical staff of the EMU, before project implementation. From our point of view, this training was very effective. There were two training sessions: the first, which was for the project managers, accountants, supervisors and fee collectors, was held between 23 and 25 May 2006; the second was for the drivers, waste collection team and maintenance technicians on 28 May 2006.

El Redisya city appeared clean, indicating the effectiveness of the project. From the field visit and assessment of project equipment, the condition of the equipment used and maintenance procedures are described below. Also, after discussions with key project participants and stakeholders strengths and weaknesses were determined.

Equipment Conditions:

From the site visit and the review of the available document, the dump trucks (Mitsubishi Canter, 3.5 ton load, 5.5m³ capacity), which are a very important feature of the project, as they are used on a daily basis, appeared to be well maintained. The following is the maintenance schedule:

1. Daily maintenance (check oil and water)
2. Bi-weekly maintenance (washing vehicle, check electric circuit, check battery, cleaning air filter, check tire pressure, greasing, and check hydraulic oil)
3. Monthly maintenance (replace air and oil filters, complete check).
4. Yearly maintenance (complete maintenance through local council mechanical workshop)

We concluded from the maintenance schedule described above, and the appearance of the trucks, that they were kept in excellent condition.

Environment:

The city has clearly benefited from the project. Its waste bins and containers are all emptied on a regular basis, and the streets are clean.

The paving of the road to the dump site has made the transportation of waste less damaging for the waste collection trucks; and the dump site is located conveniently close to the slaughterhouse, so any waste generated there is quickly and easily disposed of.

The following are both the environmental and social benefits of the project:

1. Eliminated waste accumulation and random dumping in public areas, which in turn reduced rodent and insects.
2. The project created a healthier environment for women and children who are often responsible for household waste collection and disposal.
3. The project provided employment opportunity. Six jobs were created from the project activities.
4. Indirect labour force by activation of workshops and gas stations.
5. Increase number of project participants meaning project success.

6. Increase awareness of proper solid waste disposal and environmental awareness.

Economic:

All line items listed in Table 1 were purchased directly by PROMPT/GTZ company on behalf of DANIDA.

Lines Items	Quantity	Total Cost (L.E.)	Funded by
Paving Road		200,000	Local Council
Cleaning Campaign		10,000	EMU
Dump Truck (3.5 tones)	1	159,000	EMU
Street metal containers	50	55,000	EMU
Wheel Hand Cart	10	4,000	EMU
Plastic Bins	20	9,460	EMU
Personal Protective Equipment (for the three cities not just El Redisya)	14	14,270.82	EMU

Table 1 Aswan project equipment and construction costs.

Procedure:

All procedures followed the Royal Danish regulations for purchasing equipment. Data on procedures and financial information were not available for review.

Project Weaknesses:

- MCDA has no authority on households who receive the service but refuse to pay the collection fee.
- MCDA has to pay L.E 100 per month to the Redeseya Local Unit.
- Distribution of bins and containers gives the chance for people to dispose their waste without paying a fee. Making it difficult for project to be economically sustainable.

Recommendations:

In order for the project to become sustainable we recommend that CDAs would be involved in the project to have a positive role in the protection of the environment. It is also recommended to launch programmes for capacity building and training for CDAs to encourage them to operate in environmental projects. Moreover, the project could be more successful and the local council should seek to recover full payment for the services it provides to households, as this would generate income and ensure project sustainability. The new law to collect fees through electric bills should be enforced to ensure the whole city is serviced.

Based on the field assessment and the interview conducted with key project personal the project is successful. It has positively impacted the community.

Value for money audit

Beni Suf integrated solid waste management project

SUPPORT FOR DECENTRALIZED ENVIRONMENTAL MANAGEMENT

DANIDA signed a contract with the Governorate of Beni Suf and Ministry of Environment to establish an Environmental Component at the Beni Suf Governorate within the framework of the Environmental Management in the Governorates in Support of the EMUs in Aswan and Beni Suf Project. Subsequently, the Governor of Beni Suf signed the Decree Number 48 of January 2003 “Beautification and cleansing of large cities,” which considers Beni Suf City as the starting, pilot, project, before implementation in other cities. The decree also included the creation, within the Governorate, the Beni Suf Cleansing Project (BSCP), which was entrusted with the task of developing and implementing a solid waste management program for the city of Beni Suf.

BSCP then requested and received funding from the Environmental Component at the Beni Suf Governorate to develop and implement an integrated solid waste management system for the city of Beni Suf. This included a DANIDA grant of DKK 3,280,000 and an in-kind contribution of LE 480000 from the Governorate in the form of cost of publications, training, training material and space, modification of workshop and garage, office space, etc. and a 10% contingency fund. Total project budget is DKK 3,760,000.

This project was randomly selected from all those funded by DANIDA under the “Environment Sector Programme”. Environmental Quality International (EQI) was commissioned by DANIDA to perform a Value for Money Audit of the solid waste collection project. The audit was to determine if the funding given to the project by DANIDA equated the work performed in the project.

Site Visit:

The EQI audit team visited Beni Suf on 17 September 2007, and met with the Director of Beni Suf’s EMU, and the Manager of BSCP. A tour of the city streets, the truck collection routes, and inspection of the street cleaning systems, was organized by the BSCP team. The tour included visits to the Mokbel area, where a household waste separation at source program has been implemented. A visit was also made to a composting plant, 18 km outside the city, and a sanitary landfill site in the Ghiadah area, which had previously been designed and equipped by the Finnish aid agency (FINNIDA). A visit was also made to the City Council garage where the tipper trucks are parked and which was upgraded. The team also visited the sanitary landfill at Ghiadah, another 18km south of the composting plant.

The Project:

The project covers all solid waste collection needs, street sweeping, landfill operations, composting, city beautification, and school children awareness raising and encouragement to participate in environmental activities in the city.

The project has the following main objectives:

- Increase public awareness and interest in a proper solid waste management system.
- Improve the solid waste management system and ensure that it is environmentally sound and cost effective.
- Capacity building through training programmes and workshop for project stakeholders in Beni Suf City.
- Review of the financial system and subsequent modification where required.
- Develop a complete master plan for the solid waste management system of Beni Suf City and the whole governorate.

The project consists of nine components, as follows:

1. Public awareness campaign on solid wastes management

A meeting was held on 23/8/2004 for the 2005-2006 work plan. Two workshops were conducted and documented. A total of 45,000 of flyers were produced and distributed. These flyers were written in colloquial Arabic, and also included photos for the illiterate members of the community. They are used to educate the local population on the value of household waste and how to deal with it, and to encourage the residents to keep their city streets clean.

2. Environmental Education concerning solid wastes

The first planning meeting was held on 2/11/2004 with project and Environmental Management Unit (EMU) managers. Implementation of the developed work plan has not been adequate. Several activities of this component, have not been completed. School visits have not been carried out, and printed material still was not been produced. There were some delays in the procurements of some equipment, as the project manager himself told us, although he did not show us any supporting documents. Given the importance of teachers and students in the future outcome of the project and its sustainability, and given that illiterate parents depend on their sons and daughters to some extent, we believe that this component needs to be more thoroughly addressed. On the other hand, for the training courses, which ended in March 2006, training materials appear to have been well prepared.

3. Training and awareness raising of the waste collection workforce and provision of safe equipment

The first training workshop ran from 20/8/2005 to 20/9/2005. It included the training of technicians. A complete set of training material covering all subject matter discussed was given to each employee for reference. The training programme ended in March 2006.

4. Improving the Beni Suf City solid waste collection system

The Solid Waste Management System (SWMS) was improved with the purchase of suitable equipment, including compactor trucks, dumping trucks, plastic containers and bins, and handcarts carrying 2 bins for street waste material.

5. Waste separation at source at a designated area

A waste separation at source programme was implemented in the City of Beni Suf. The training that was to be administered to the community leaders was

designed and evaluated by a consultant. The final working plan was established in February 2006. Problems in project implementation appeared as many residents failed to show sufficient interest in project implementation. The project has now been stopped.

Garbage separation at source projects are not always successful in developed nations and are even more difficult to implement in developing ones. It is not easy for people to separate household waste at home for several reasons. Most homes simply do not have enough space in their kitchens for two bins, and the cost of the extra bin and the collection bags is deemed too high. Finally, the most valuable recyclables will be taken by scavengers.

For these reasons, although it may be easy to start up, the project appears to be difficult to implement and sustain in the long term.

6. Improving the working conditions at a composting and separation plant

Training for the operation of the composting plants was carried out and the plant is now functioning properly, except for two components. First, the dry waste separation belt is not working, since the separation at source programme failed and was discontinued, and second, the agricultural waste shredder is too weak to process agricultural waste. The composting plant is running properly, except for the dry material separation belt, which is not completely operational due to improper separation at source. The plastic shredder was very useful in reducing the volume of plastic waste, but the agricultural waste shredder was not suitable for the type of waste produced in the area. It is too weak for the processing of all types of agricultural wastes. We tried to operate the machine, but some problems occurred and it did not function properly. It seems to have a very low capacity; moreover it can not handle heavy agricultural wastes. The machine needs to be serviced, and its power supply in particular needs to be repaired.

Manual instructions have been applied carefully. Even though the conveyer belt for separation related to the separation-at-source component is not working, the composting plant is still operating well.

7. Improving the day to day working conditions at the Ghiadah Sanitary Landfill

We observed the operating system of the sanitary landfill during the site visit at Ghiadah. The rate of operation depends on the amount of waste delivered at the site, which is at its peak between 9:00 and 14:00. All staff members had been trained by the national consultant to correctly operate the landfill.

A detailed working manual was written by a consultant for use by the workers of the sanitary landfill. The manuals and operation guides also provided to support local staff to run other project applications efficiently. The working conditions at the landfill are good and the landfill appears to be operating properly.

8. Logistic and administrative support for the solid waste project in the Beni Suef City

Several technicians working on the SWMS were offered a study tour to Denmark for Capacity Building.

9. Design a complete master plan for solid waste management within the City and throughout the Governorate

A complete master plan for the whole Governorate has been prepared and is currently being revised by Danish experts. The plan, which is based on extensive data collection surveys seven towns in Beni Suef Governorate, was presented to the public and discussed in a public meeting in the city of Beni Suef. The master plan was not available for inspection by the audit team.

In terms of equipment, the project has provided 140 plastic bins of 140 litre, and 160 of 340 litre capacity. The vehicles that have been provided include 1 compactor truck, 5 dumping trucks and 1 loader. The trucks are normally used on 2 daily shifts for street cleaning and household waste collection. The first shift is from 7:00 AM to 2:00 PM, and the other is from 3:00 PM to 9:00 PM. There are several designated waste collection plastic bins that have been provided and distributed to cover the whole City area, and these are emptied by loading trucks at regular times.

A visit to the City Council garage where the tipper trucks are parked and which was upgraded under the supervision of a local consultant, revealed that the garage is well organized. Log books for each vehicle are adequately kept up to date for consultation. An instruction manual was written by a local consultant for the appropriate maintenance of these vehicles.

The composting plant is running at full capacity (processing 10tons/hour), but work times change during the month of Ramadan, which was coincidentally at the same time as the field visit. A hired consultant added a separation belt, which is not being used due to the failure of the separation at source project. The shredder that was provided for agricultural waste is not used very regularly, since the amount of agriculture waste is limited. The shredder is also inefficient for shredding sugar cane agriculture waste. The loader is in good condition. A plastic shredder and air compressor that were also provided are working well. The sanitary landfill at Ghiadah is working well. The equipment is being used correctly, and the compacted waste layer is covered by sand. The landfill workers were trained by the local consultant, who also prepared a simple, clear and effective operating manual. The workers are following these instructions well. At the time of our visit, some street sweepers and a water sprayer truck were at work, and the city streets were clean. All equipment were being properly used and regularly checked for maintenance. The master plan for the whole governorate has been completed locally and has been sent to Denmark for review.

Environment:

Beni Suef city has benefited from the project, and it is clean. The waste collection and transportation system is operating efficiently and consistently.

Although the Separation at Source programme failed, the PMU tried to improve it. It should be noted that such a programme cannot easily be implemented in developing countries such as Egypt.

The public awareness campaign has successfully raised the Beni Suef residents' interest in environmental matters.

The composting plant is producing compost which is mostly used in city beautification for urban amenity areas.

Economic:

It is stated in the agreement conditions that transfer of allocated money from specific items in the project to another item is not allowed unless ENG approves the transfer. However the governorate was not committed to this condition as most of the project items were overcome without having the required approval.

Line Items	Cost (L.E.)
Equipment	1,571,266.40
Repair and maintenance	263,882.04
Licenses	600
Training and allowances	165,665.30
Printing	72,797.50
Clothes and protection means	330,085
Office equipment	8,227.80
Computer and photocopying machines	20,649.50
Stationary	4,078.75
Communication	822.90
Packing and plastic bags	50,297.93
Container and hand trucks	186,079.60
Others	35,220.80
Conference	2,882
Total Cost	2,712,961.67

Table 1 Amount Spent in the Project up until January 31st, 2006

As of September 16th, 2007, L.E 3,261,785 were transferred to the Beni Suef project from the Environmental Sector Program.

Copies of the expense documents, and not originals, were only available for review. Also the holding accounting registers for this purpose were not available. In addition documents about L.E 370,000 that were transferred were not attainable, the transfer has not yet been settled. Several financial documents that were not available for review.

Moreover, the project had only one bank account where all the money for the 2 governorate Beni-Suef and Aswan is being transferred, which makes it very difficult to follow up the transactions, in addition bank balance sheet to insure the amounts transferred and had not been disbursed were unattainable by the auditors.

Procedure:

The purchasing process was done according to the law 89 for the year 1998 and its executive rules. Three Financial offers were submitted. An awarding & inspection committees for examination and receipts of the storage reviewed the offers.

Recommendations:

- Local units usually require more training to improve their management skills rather than their technical skills.
- The filing system used to track purchasing operations needs to be improved, and extra stationary should be provided for the project offices. The importance of following up the bank account and obtaining balance sheet regularly and performing the required audits.

- The governorate should keep separate records for this grant in order to ease following up and preparing the reports. It is also recommended that each governorate have a separate bank account.
- The local consultants have to evaluate projects on a regular basis to prevent any problems.

The project has proven successful in cleaning the city of Beni Suef and establishing a solid waste management system.