

# إنفوسمك

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# EU Approved Fish Processing Plant in Egypt

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A detailed study have been prepared regarding a large integrated fishing project in Egypt, including establishing of EU approved fish processing plant, improved fishing operations and aquaculture of tilapia.

The Danish consulting company LarEll Associated Consultants represented by the two senior consultants Mr. Jens Ellegaard and Mr. Johnny Haupt Larsen has in 2004 prepared a comprehensive study for the new fishing company "GRAND LAKE" on the upgrading of an existing fish processing plant in Abu Simbel including the possibility for improving on the fishing operations and establishing of extensive fish farming – mainly of Tilapia.

"Grand Lake" licenses an existing processing plant in Abu Simbel and has access to fresh fish from Lake Nasser from local artisan fishermen, through up to 18 licenses for own fishing activities and from planned fish farming in four huge creeks at the Lake Nasser east bank opposite of Abu Simbel.

The assistance provided by LarEll Associated Consultants included description of raw material procurement, production technology, -optimisation and -monitoring, and plans for restructuring and renovating the existing production facilities to meet interna-

tional standards such as the EU demands for producing and placing of fish products on the market, as given in EU Directive 91/493/EEC (the hygiene directive) and the introduction of an own control system for quality assurance as given in EU Directive 94/356/EEC (the HACCP directive). Also recommendations for fishing and fish farming were part of the assistance given as is assistance in selecting a product range that will meet with the

Royal Danish Embassy in Cairo and carried through in September 2003.

The following assistance has also been partly funded by the "Private Sector Development Programme", DANIDA, through the Royal Danish Embassy in Cairo.

The results of the assistance are presented and described in detail in a very comprehensive business plan including a complete technical draft



Fish auction at fishing harbour in Abu Simbel

market and consumer expectations for high quality fish products and a market study for marketing and sales on the EU markets.

The assistance given was a follow-up on the initial study tour partly funded by the "Private Sector Development Programme", DANIDA, through the

project with layout, investment budget for the restructuring work to be carried out and for the processing equipment to be installed. The plan also includes the financial data and analysis for 3-years of operation after start-up of the renovated processing plant and includes a study of the economical viability of the planned activities.



Existing factory in Abu Simbel

The project is located in Abu Simbel City a small city of 2289 inhabitants (2002) at the southernmost part of Lake Nasser 100 km north of the boarder to Sudan.

Abu Simbel City is world renowned for the Abu Simbel temple with the huge Ramses statues and the tourism that has followed the rescue of the statues from flooding of the Nile valley during erection of the High Dam in Aswan has brought prosperity to the village, which now has an airport, 4 hotels and a number of banks.

However, Abu Simbel also has - apart from Aswan in the north - the only fishing harbour with a local fish auction to serve the fishery of Lake Nasser.

Fish auction at fishing harbour in Abu Simbel

The existing factory to be renovated and technologically updated (see photo) as part of the project activities is situated only about 1 km from the harbour, close to the lake as can be seen from the photo below and with good access roads for transports by trucks.

The existing building is planned to hold the upgraded fish processing plant, chill & cold stores and ice production with ice store. An extension of the facilities will finally include a new environmental friendly silage and feed production plant to utilise the offal from the filleting of the fish for saleable products.

Offices and staff facilities will be provided in the existing premises at the same location as today, but in addition to the facilities on the ground floor new staff facilities and laboratory will be provided on a new first floor over the existing offices and toilets. The laboratory is divided into two sections, one for chemical analyses and one for microbiological analyses.

Finally, technical areas such as compressor room and workshop in the factory building to the largest extent will be retained. The water treatment plant for production of drinking water for use in the factory will be installed in one of the separate buildings on the territory. The wastewater treatment plant will be placed on the territory based on further technical surveys. The territory has one entrance for trucks provided with a guard's house. The entrance is used for receiving of all goods from raw material to packaging materials and dispatch of all goods from disposable waste to final products. A new entrance for dispatch of final products should be considered in order to separate the incoming traffic with raw material and other materials from the outgoing traffic of final products. The entrance for visitors and staff to the territory should be through a third gate or together with the raw material entrance gate.

The visitors will go to the offices and administration area in existing premises next to the existing main gate. The staff will go around the offices and enter the building in the opposite end. From here stairs lead to the new first floor where the staff facilities are placed. The staff facilities comprise canteen, toilets, bath, changing and locker rooms.

The total built-up area of the

company is approx. 2300 m<sup>2</sup> in the ground floor and 475 m<sup>2</sup> on the first floor. To this should be added some existing smaller buildings on the territory.

The materials traffic entering the building includes supply of fresh fish and packaging materials.

The fresh raw material will be received at the ramp outside the building in front of the raw material reception and pre-processing department. The raw material is after reception control and weighing either brought directly to the pre-processing or to the new chill store for raw material.

The packaging materials enter the building in the opposite end through the gate for workers entrance and are brought to the new packaging materials store.

The final products leave the plant from the opposite end of the raw material reception on the covered platform next to the upgraded chill and cold stores.

All offal from the production is collected in the offal & silage department for further processing into silage and feed.



The factory seen from Lake Nasser

The employees for the fish processing plant go directly to the changing rooms on first floor after first having collected clean working clothes in the new laundry at the ground floor.

There are two changing departments, one for each sex. Each changing department consists of a changing room with lockers for the private clothes and after the bath section a changing room with lockers for the working clothes. The changing departments are also provided with hand washing facilities and a toilet. Access to the changing department is only allowed through the dedicated stair no. 1. This leads directly into the two changing rooms for private clothes in which the workers will undress and go to the bath area, take a shower and after drying go to the changing room with working clothes. In here they will get dressed in their clean working clothes and other personal gear – such as special footwear, hairnet, headgear, mouth protection (where necessary), aprons, sleeve protection, gloves etc.

From the changing room with working clothes the workers go down to the ground floor by the dedicated stair no. 2. Stair no. 2 is also used by the workers when coming from the production area and going to the first floor either for the canteen, the toilets or after the shift for re-dressing.

All the workers enter the processing areas through the sanitation corridor, except the workers in the silage and feed department. These workers have their own entrance, toilet, bath and changing facilities with lockers placed in the silage and feed production department. This is in order to separate the workers handling the offal and by-products from the other processing operators and also to fulfil the safety demands for workers handling chemicals and acids, demanding an emergency shower close to the processing area. In the sanitation corridor hands can be washed and disinfected before entering the production area. In here

aprons, overcoats, headgears and interior footwear can also be stored when leaving the production area either for breaks or for visits to the toilets.

visitors coming to inspect the plant will go to the administration entrance. From there they will be guided to the laundry, where they will be fitted-out with protective clothing and shoes before entering the processing areas through the sanitation corridor.

The processing area has in the layout been divided into separate departments. This has been done for hygienic reasons and with the purpose of minimising, as much as possible, noise and draught problems and thus improve on the work environment for the staff.

### Technologies and processing to be used after project implementation

All fish is landed in the harbour, both from fishing boats and from the fish farm. The sorting of fish according to species and size is done on the sheltered area in the harbour.

All whole fish for local market in Cairo is weighed, iced and packed into the trucks ready for immediate dispatch to Cairo by road.

The remaining fish for processing will be iced if needed and transported on a closed and insulated truck to the factory. The processing steps from unloading of raw material to dispatch of final products are described in the following.

In order for the processing plant to be approved for export to EU should not only the premises be of high standard complying with the demands as given in EU Directive 91/493, but also the

equipment have to fulfil strict demands.

### Line of production for consumer products:

In general, the production has been designed so that the raw material arrives at one end of the plant, and the finished products leave the plant from the opposite end. Between these two points, the processing takes place in different, separate departments.

The processing starts when unloading the trucks with raw material outside the plant on the covered unloading platform. The fresh raw material is transported from the truck in boxes on pallets by a hand lifting trolley.

Inside the processing plant, the general line of production takes the fish from "dirty" to more "clean" departments.

Processing starts with receiving of fresh raw material in the pre-treatment department. Removal of the heads and guts is done manually on the heading and gutting line. All offal is collected and transferred to the silage department.

in the processing and packing department the headed and gutted fish in boxes is filleted and cutted into specified pieces.

The fillets are packed on the packing line either in large polystyrene boxes with ice as fresh fish or in small packages for freezing. Fillets for single frozen products are brought directly to the belt freezer in the freezing department.

The packed fresh fillets with ice are transported directly to the chill store for final products. The fillets packed for freezing are placed in freezing frames at the end of the packing line before

being transported to the horizontal plate freezer in the freezing department.

The fillets are after the belt freezer collected and packed at the IQF packing table.

The frozen products from the plate freezer are transported in the freezing frames to the block ejector where the freezing frames are emptied. The frozen (block frozen and single frozen) products are following packed in master cartons, strapped and placed on pallets. The pallets can be wrapped on the pallet wrapper before being stored in the cold store for final products ready for dispatch.

The fresh or frozen products can upon order be collected from the final product chill and cold stores and brought to the covered loading platform. The products are here packed into trucks or containers for dispatch either by road to Cairo or to Aswan for further airfreight to Europe.

As it can be seen, the plant has been designed to enable a progressive line of production, where the products are constantly moving from more "dirty" to more "clean" departments, which are physically separated from each other. It is carried out in a continuous process flow with an on-line production, which respects the principle of "first in - first out". In this way the process flow is controlled, and all fish raw material is processed shortly after entering the production area.

A progressive line of production is maintained inside the individual departments. Apart from this, it has been avoided to cross the lines of production. Also, it has been attempted to minimise, as much as possible, the distance from one operation to the subsequent.



Fishing boat in Abu Simbel Harbour

To reduce the investment in expensive wastewater treatment systems, the benefits of clean low waste technology will be exploited by trying to increase yields of production, reduce water consumption and make offal saleable.

Project implementation will comply with the stipulations given in the EU Directive of 22 July 1991 "laying down the health conditions for the production and placing on the market of fishery products" (91/493/EEC) and the EU Commission Decision of 20 May 1994 "laying down detailed rules for the application of Council Directive 91/493/EEC as regards own health checks on fishery products" (94/356/EC).

Directive 91/493/EEC demands a flexible self-control system adapted to in-house requirements and based on certain HACCP principles - not the complete HACCP concept, which specifications are laid down in the Codex Alimentarius Standards of the Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO). Commission decision 94/356/EEC lays down detailed rules for the application of Directive

91/493/EEC as regards hygiene checks on fishery products to ensure that companies adhere to its requirements.

Naturally, companies are at liberty to implement the complete HACCP concept, which is often demanded by the customers, but from a legal point of view only some of the HACCP principles are binding requirements within EU. Implementation of the full HACCP concept is required in USA.

LarEll Associated Consultants is also - besides elaboration of Business Plans and Feasibility Studies - engaged with many other projects and tasks such as development of new efficient environmental and tailor-made processing equipment, developing and implementing HACCP systems, Environmental Management Systems, marketing studies, total technical draft projects with investment budgets and layouts.

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