

Salvaging Timber from the Volta Lake

A Project by CSR Developments

Developing the Required Operational Capability

Salvaging trees from the bottom of the Volta Lake is the **first industrial scale project of its kind in the world.**

In order to build the necessary operational capability, **extensive research and development efforts** have been undertaken since 2006, when the Government of Ghana first granted the concession.

Economic Impact

- Direct employment: close to 400
- Total jobs created: 1,400
- Yearly activity: several hundred million dollars



Fully operational salvaging convoy on the Volta Lake.

A **team of experts** from forestry, offshore petroleum, marine engineering and environmental science developed a conceptual design for salvaging equipment.

A **phased approach** was prepared for deploying it in an operating environment.

At the same time, a **trial salvage** was undertaken to collect valuable information on environmental impact and operational issues.

Processing and drying of the under-water timber, as well as **testing market acceptance**, were also studied.

Equipment has been shipped to Ghana for these operations, including a number of vessels.

Volta Lake Project Summary

- Company founded in 2005 with strong Ghanaian roots
- 25-year concession covering 350,000ha of the lake
\$15 million invested, \$100 million in next 4 years
- Employment, community development and lake transportation safety
- Creating financial, environmental and social returns
- Partnering with government, NGOs and local communities



Tree Salvage Operations

Startup Phase

The **first phase** of the salvage operation consists of pulling trees with the use of a barge and an excavator, transitioning to a combination pulling and cutting operation.

This initial phase will last about one year, by which time CSR Developments expects to be salvaging **several thousand cubic meters of timber per month**.

The company intends to use technology compatible with the wood products industry, which can be assembled and maintained in Ghana with **local expertise** whenever possible.

Such equipment would include barges, cranes and excavators.

CSR Developments will also continue developing its **own sonar technology** for production planning and for use on the salvaging barges.

Rollout Phase

The **subsequent phase** is designed to achieve higher volumes and efficiency and will utilize **multiple barges** for the salvage operations.

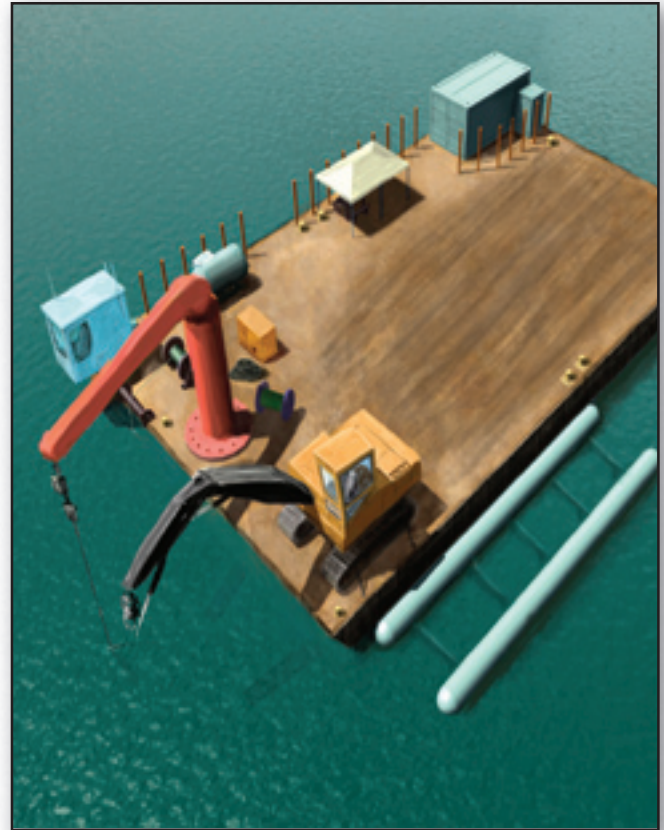
The vessel operator will locate the trees with **sonar scans** of the lake bottom.

A combination of **hydraulic chain saws** and remotely operated or boom mounted **cutting heads** will then be used to cut the trees.

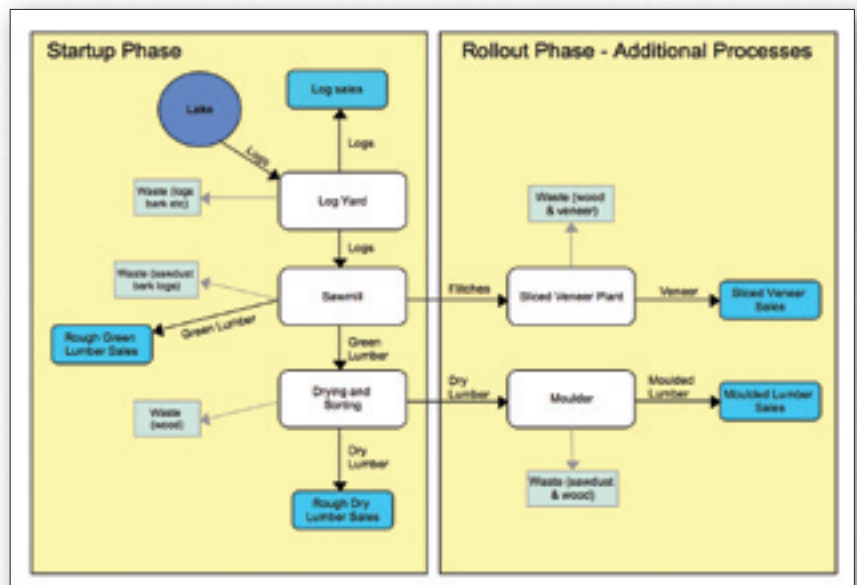
They will be lifted out of the water by a **crane or winch**, trimmed and loaded onto **pontoons** (equivalent to log trailers on land).

Some tree roots, buttresses and crowns will be returned to the lake for **fish habitat**.

When **multiple salvaging barges** are in operation at a significant distance from the shore, a **collection barge** will be deployed to gather the trees from the pontoons and tow them to the lakeshore facility.



Salvage barge with excavator, winch and log pontoon.



The two-phase implementation plan for operations at the Volta Lake.

Timber Processing

Startup Phase: the Small Mill

On-shore processing is also **implemented in two stages**. An initial small sawmill will be built on the shore of the **Afram Arm** of the lake near Akosombo.

This mill will allow the design team to incorporate what is learned from initial operations at the lake into the design of the larger mill.

Through this **phased process**, best solutions for operational, environmental and other related issues can be effectively implemented.

Key Figures

- Large mill with veneer slicing and co-generation
- Direct employment for close to 400 people
- Annual mill output of around 200,000 m³
- Comprehensive environmental and social development programmes
- Potential excess electricity for Ghana power grid

After salvage, the logs will be unloaded to shore at the mill site. Here they are sawn, sorted to grade specifications and readied for shipment from this **lake-side facility**.

Processing logs into sawn material creates a considerable amount of non-commercial grade product, which can constitute almost two thirds of salvaged timber.

For its use, a small energy system may be set up as well. Drying capacity may also be built to produce **kiln-dried lumber** and to test for optimal methods in kiln-drying wood that has been under water for decades.

Some non-commercial wood is expected to be available to **local residents** for uses such as **charcoal production, construction and carving**.

This first sawmill will have an output of 10,000 m³ annually, equivalent to about **3,500 trees**.

Capacity may be increased with the addition of a **second shift**.

A **second band mill** for re-sawing would allow for an additional increase in production in an effort to better utilize the salvaging output.

The mill yard will make a portion of its logs **available to the Ghana market**. Whatever timber is not processed by the mill will be sold to other companies.

Rollout Phase: Full-scale Mill Processing with Electricity Co-generation

The large sawmill will be a complex operation that will process around 200,000 m³ annually. It will have a re-manufacturing line for **value-added products**, such as flooring, trim, or window and door parts.

A **sliced veneer plant** will process high-end logs into decorative veneer for furniture, cabinetwork and mouldings, adding more capacity. An unloading facility will be the first priority in building this mill.

On-site kiln-drying capacity will be installed later to maximize the utilization of the wood inventory. In order to make good use of the mill's large volume of waste, a **co-generation plant** will be built. This plant will convert wood biomass into **power** for the lumber and veneer dryers, and the operation's generator.

Once this large facility is completed, most non-commercial wood will be utilized internally. Any **excess electricity** will be made **available to the Ghana power grid**.

The completed mill is anticipated to have about **300 employees**, with an **additional close to 100** salvaging the logs when the facility is fully operational.



Full Operations

By the completion date of its facilities, CSR Developments expects to have fully **integrated salvaging and processing operations**.

It will also have **value-added production** and activities for local and worldwide marketing and sales. The completely built-out facility will be **one of the largest single hardwood operations in the world**.

The **development and operational plans** will be designed to move from early trial to full functional capacity in a way that **optimizes economic, environmental and social interests**, as well as **safety**, throughout the project's life cycle.

Offering a Unique Resource

Supply & Demand Create Opportunity

Timber is Ghana's **third largest export** after gold and cocoa.

The industry makes a **significant contribution** to employment, infrastructure and revenue, particularly in rural areas.

More than two thirds of timber exports go to Europe with most of the remainder shipping to Asia and the United States.

While tropical log and rough-sawn lumber imports into Europe have declined in recent years, **African value-added hardwood imports have increased.**

In addition, with its high environmental standards and eco-conscious consumers, the European market presents **excellent opportunities** for environmentally-friendly, tropical hardwoods.

Furthermore, European Union **demand for legal and sustainable wood products** is outstripping supply, a situation that is not likely to abate anytime soon.

A successful CSR Developments project in Ghana will make it a **world leader in underwater salvage** and the supply of **eco-friendly, tropical hardwood.**

Moreover, by the time the company mill is fully operational, its output will significantly boost Ghana's total wood export volume.

This would make products from CSR Developments **Ghana's largest timber export.**

Certification and Marketing

CSR Developments is currently working on **global marketing strategies** that will allow it to successfully market the unique timber products from its Volta Lake operations on **Ghanaian and world markets.**

This process will leverage the company's triple bottom line approach into an **attractive market offering** across the globe.

By cutting dead, rather than living trees, the project will also help Ghana's efforts to reduce deforestation and illegal logging.

Relationships with potential marketing and sales partners are being explored to take full advantage of the **unique environmental attributes** of the wood.

CSR Developments is applying for certification of its products under the **SmartWood Rediscovered Wood** standard, which is run by **Rainforest Alliance**, an NGO that works to improve forest management in 60 countries.

The **certification system** would track every log the company salvages and processes into lumber products, from the lake to the port of Tema and beyond, linking responsible production to responsible consumption.

Such certification would provide third party audits of the environmental and social practices applied by CSR Developments and provide **access to worldwide green product markets.**



Salvaged timber from a trial on the loading barge deck.