Ethiopia, Egypt and Sudan reach preliminary agreement on the operation of Grand Renaissance...

The Governments of Ethiopia, Sudan and Egypt have reached agreement on a declaration of principles governing the filling and operation of the 6000 MW Grand Ethiopian Renaissance dam on the Blue Nile. A preliminary agreement was reached on 6 March, after tripartite meetings between the three countries' foreign and water ministers. The US$ 4 billion project, which is being built by Salini Impregilo of Italy, will be Africa's largest dam and the continent's largest hydropower plant. Located in the western region of Benishangul-Gumuz, it will feature a 170 m-high, 1800 m-long RCC gravity dam, as well as two powerhouses equipped with a total of sixteen 375 MW generating units. Output is expected to be 15 000 GWh/year.

"The principles that were agreed to are concerned with the systems and mechanism for operating the Renaissance dam and the mechanism for cooperation on this dam," Egyptian Minister of Water Hossam Moghazi said after the talks in Khartoum. Sudanese Foreign Minister, Ali Ahmed Karti, said the countries had reached agreement on "principles that govern us on how to benefit from the Eastern Nile Basin and the Renaissance dam".

The deal will now be sent to the leaders of the three countries for final approval. It is reported to include principles governing the filling of the dam and its operation during times of drought, as well as measures to assess and monitor its downstream impacts better.

All parties agree that the deal signifies a major change in relations between the three countries. "The document represents the beginning of a new page in relations," Karti declared. Egyptian Foreign Minister Sameh Shoukry said that the agreement would "pave the way for further cooperation on the political and technical aspects" of the dam project. Ethiopian Foreign Minister Tadros Adhanom agreed that the principles represented a "new chapter" in trilateral relations.

Moghazi said that the tripartite dam committee, comprising representatives from the three countries, would sign a contract for assessing the likely impact of Grand Renaissance with a consultancy firm, following an economic summit in Sharm al-Sheikh.

Egypt has feared that the dam would negatively affect its traditional share of water from the Nile, which supplies 90 per cent of the country's water for farming, industry and drinking. The Blue Nile supplies 80 per cent of the Nile water that reaches Egypt. Ethiopia contends that the dam will increase water flows to Egypt by reducing evaporation on Lake Nasser. Other nations in the region have expressed support for the dam, including Sudan, the only other nation downstream of the Blue Nile.

The Egyptian Government has been particularly concerned about the speed with which Ethiopia will impound the reservoir. With a storage capacity of $74 \times 10^6 m^3$, it will be able to hold nearly the Nile's entire $84 \times 10^9 m^3$ of annual flow, meaning that rapid filling could substantially reduce Egypt's water supply in the short-to-medium term. Various studies have shown that filling the reservoir over a five to seven-year period could result in a 12 to 25 per cent decrease in the flow of the Nile into Egypt, depending on rainfall. Egypt has been requesting a longer impounding period of 15 to 25 years to reduce impacts.

Operating the dam during drought periods will also require careful coordination between the operators of the Grand Renaissance dam and the Aswan High dam in Egypt, according to a paper published last year in the World Water Council's journal *Water Policy,* [Whittington, Waterbury and Jeuland, 2014].

Sudan has much to gain from the Grand Renaissance project, according to Whittington, Waterbury and Jeuland. They point out that Sudan's Merowe, Roseires and Sennar seasonal storage dams should be able to increase their electricity output because of the improved regulation of the Blue Nile's flow. Regulation is expected to decrease flood damage in the country, which can be considerable, and Sudan is expected to be a significant importer of power from the project, which will have large surplus generation capacity, provided it produces anything close to its expected potential. This will improve the country's energy security. The dam will also trap sediment, saving Sudan the cost of controlling and removing it at its own dams and irrigation schemes.

The location of Ethiopia's Grand Renaissance dam on the Blue Nile.

... and the scheme achieves a record for RCC placement

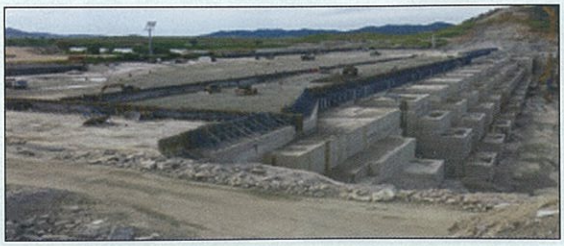
Meanwhile, a world record for placing roller compacted concrete has been set at the Grand Renaissance dam in Ethiopia. Between 27 and 28 December last year, a maximum continuous production of 23 200 m^3 in 24 hours was achieved. Of 10.2×10^6 m^3 (the total volume of the completed dam), 2.25×10^6 m^3 of RCC has already been placed, of which 1.985×10^6 m^3 was placed in 2014.

The hydro project is approximately 700 km northwest of Addis Ababa. The works entail the design and construction of a 170 m-high RCC dam, and a powerhouse with 16 Francis turbines, with a total installed capacity of 6000 MW and a nominal energy output of 15 000 GWh/year.

The project also includes a saddle dam (a CFRD), the volume of which is 16×10^6 m^3, an external spillway and also a 140 km-long transmission line.

Grand Renaissance is among the largest RCC dams in the world and will have the largest volume of RCC worldwide. Gibe III, another RCC dam currently under construction in Ethiopia, will be 246 m high.

These two projects represent the Government of Ethiopia's current commitment in terms of sustainable development for the country based on clean renewable energy.



Site of the Grand Renaissance dam in 2014.