Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
Fifty-third session
Vienna, 15-26 February 2016

Nile River and sustainable development in Egypt

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My presentation will include :

1- Water budget and sustainable development in Egypt.

2- Conveying the fear and worry of the Egyptian people towards the expected negative impacts of the GERD construction on Egypt

3- Conveying Egypt high desire to settle the matters belonging to its water share through negotiations under “Principles declaration “ that was signed among Egypt ,Sudan and Ethiopia.

Historical rights

Role in the founding of Egyptian civilization

The Greek historian Herodotus wrote that "Egypt was the gift of the Nile".

The Nile was an important part of ancient Egyptian spiritual life.

Hapy was the god of the annual floods, and both he and the Pharaoh were thought to control the flooding.

The Nile was considered to be a causeway from life to death and the afterlife.

Nowadays Nile represents soul of the Egyptian people “No water No life”

Water supply & demands in Egypt

water supplies and demands in Egypt

According to an agreement between Egypt and Sudan (1959) the Nile water budget is 18.5 ´ bn m^3 to Sudan and 55.5 ´ bn m^3 to Egypt .

Nile water comprises about 97% of the renewable water supplies in Egypt.
The sources of Egyptian Nile water supplies are in the Ethiopian Plateau (83%) and Equatorial Plateau (17%).

Water demands in Egypt exceeds 90 bn m^3

Water Resources and Extraction	
Type of Water Resources	**Quantity /billion m^3/year**
Nile River	**55.5**
Precipitation	**1.8**
Fossil Ground Water Extraction	**1**
Sea Water Desalinization	**0.1**
Sum	**58.4**
Reuse of Spilled Water Resources	
Renewable Ground Water Extraction	**2.3**
Waste Water Reuse	**2.9**
Agricultural Drainage Reuse	**7.5**
Sum	**12.7**
G.Sum	**68.2**

Water deficit = 90 bn - 68.2 bn = 21.8 bn m^3

Sustainable Development & Strategies

Sustainable Development relies on the River Nile

- Water is the fundamental element for sustainable and integrated development in Egypt. Horizontal expansion in agriculture is connected to the country's ability to provide the water required for that expansion. Moreover, with shortage of water, the economics of water use and its future on the long run require searching for alternatives and determining the water resources available at present and additional resources we can obtain in the future.
- In Egypt ,searching for alternatives has began early four decades ago to compensate water balance deficit.

From seventies , Egypt setout strategy to develop irrigation programs to face over population as follows:

- 1- Water resources development program.
- 2-Preservation of water resources and River Nile protection program.
- 3- Replacement and renovation of lifting stations program.
- 4- Preservation of the integrity and efficiency of the High Dam program.
- 5- Agricultural land drainage program.
- 6- Studies and research program.
- 7- Protection of Egyptian coastal areas program.
- 8- Updating cadastral maps program.
- 9- Supporting and developing human potentials and water media.

With all the above-mentioned efforts, Egypt is categorized under the water poverty limit

The world Figure of water poverty line is 1000 m^3 / capita /year
Meanwile in Egypt it is 616 m^3 / capita /year of pure water.

Egyptian people are asking “is construction of the Grand Ethiopian Renaissance Dam (GERD) will affect our resources of water ?

Ethiopian officials answered No…… we hope that….. So it was important to study the possible impacts . Scientists of Egypt studied the specification of the dam to identify if there are negative impacts on socio-economic conditions or not

Location of the GERD

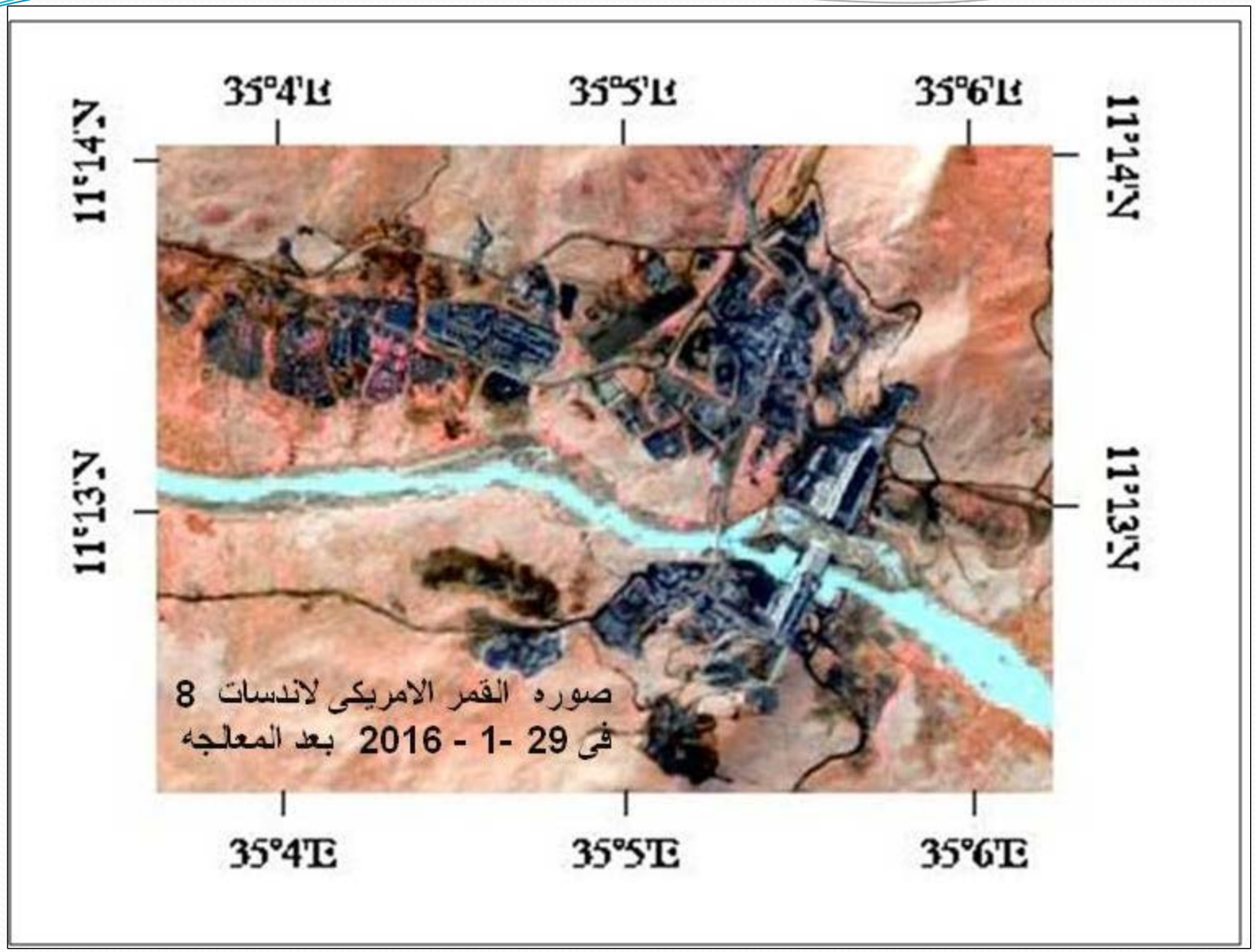
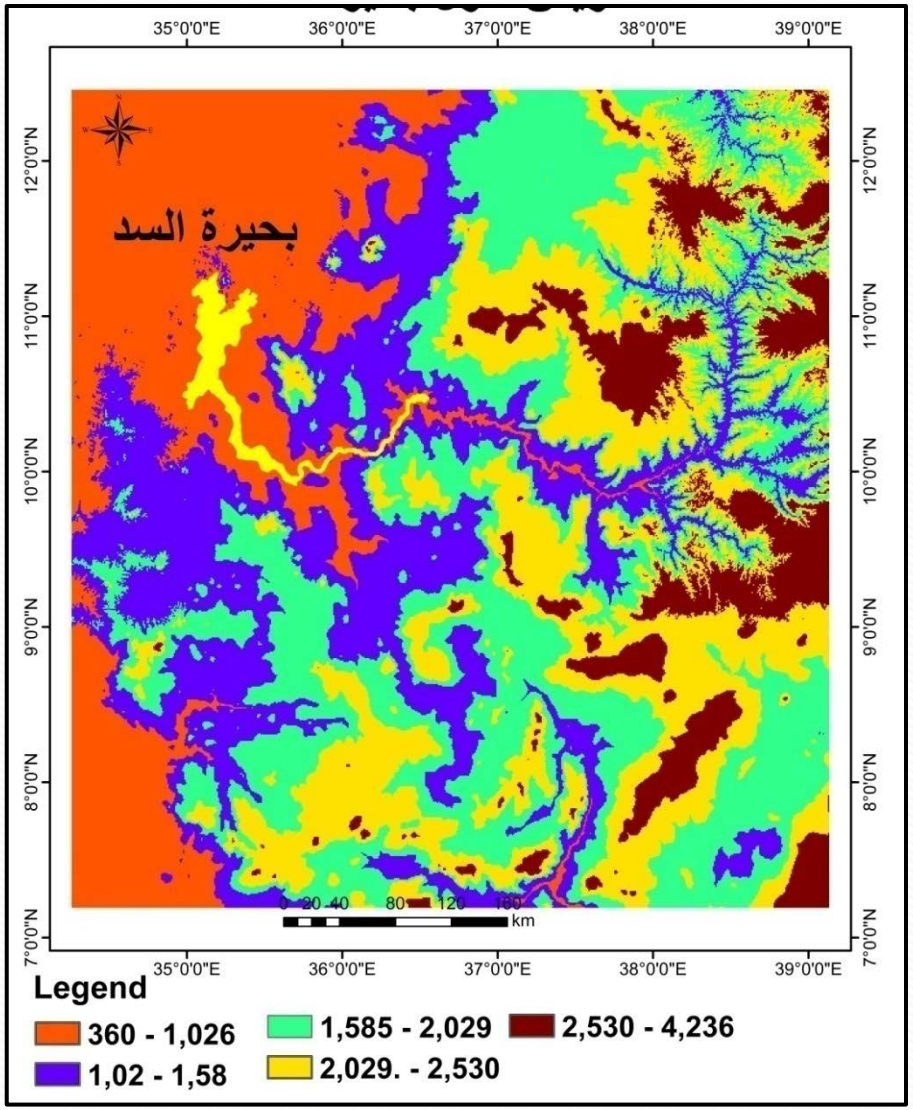


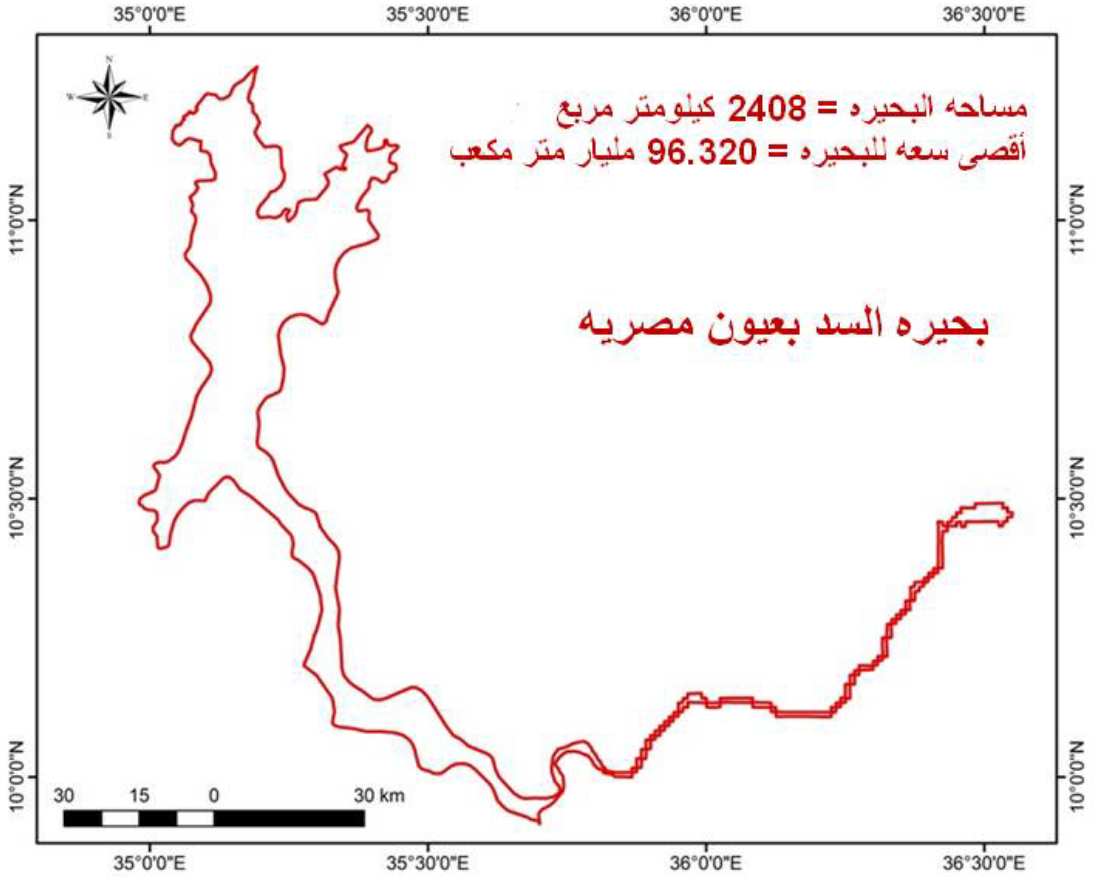
Image of Landsat 8.0 acquired in 29-01 -2016

Recent Satellite Image with High Spatial Resolution (1 meter)

GERD dam Specifications

Dam and spillways	
Type of dam	Gravity, roller-compacted concrete
Impounds	Blue Nile River
Height	175 m (574 ft)[2]
Length	1,800 m (5,900 ft)
Elevation at crest	645 m (2,116 ft)
Dam volume	10,000,000 m^3 (13,000,000 cu yd)
Spillways	Six sector gates
Spillway type	Controlled overflow
Spillway capacity	15,000 m^3/s (530,000 cu ft/s)
Reservoir	
Creates	Millennium Reservoir
Total capacity	79×10^9 m^3 (64,000,000 acre·ft)
Surface area	1,561 km^2 (603 sq mi)
Power station	
Commission date	2017 (planned)
Type	Conventional
Turbines	16 x 375 MW Francis turbines
Installed capacity	6,000 MW (max. planned)
Annual generation	15,692 GWh est





Reservoir specifications

The negative impact of GERD on Egypt as Egyptian scientists see

A- Water shortage in reservoir filling period

-If the filling of the reservoir happened in one year (the worst scenario) all Egyptian water share of 48 bn cubic meters (from the blue Nile) could be lost, No body accept that,

-If the filling happened in two year, 24 bn cubic meters of water per year could be lost, etc.

- If the filling of the reservoir occur in ten years, Egypt will lose 4.8 bn equivalent to 1 million feddan lost. But we can deal with this shortage.

Severe harm could be occurred with the short periods of filling .At this case we will lose all our fertile lands .We are negotiating to be the filling period not less than seven years to secure our water share

B-Socio economic impacts

- At least two million farmers will lose their income during the period of filling the reservoir .

-Agricultural land will be degraded ,where salinity level will increase to unacceptable limits.

Crop production will decrease from 30 – 50 % concurrent with water shortage

The GERD could also lead to a permanent lowering of the water level in Naser lake, if floods are stored in Ethiopia. This will reduce the ability of the Aswan High Dam to produce hydropower to the tune of a 100 MW loss of generating capacity for a 3 m reduction of the water level.

Egyptian Scientists point of view was considered by the Egyptian government so principles declaration was signed for keeping Nile water share of Egypt.

Declaration introduction

"Valuing the increasing need of the Arab Republic of Egypt, the Federal Democratic Republic of Ethiopia and the Republic of the Sudan for their over-border water sources, and realizing the importance of the Nile River as a source of life and a vital source for the development of the people of Egypt, Ethiopia and Sudan, the three countries have committed themselves to the following principles concerning the Grand Ethiopian Renaissance Dam:

Ten principles were considered

1. Principle of cooperation:
2. Principle of development, regional integration and sustainability:
3. Principle of not causing significant damage:
4. Principle of fair and appropriate use:
5. The principle of the dam's storage reservoir first filling, and dam operation policies:
6. The principle of building trust:
7. The principle of exchange of information and data:
8. The principle of dam security:
9. The principle of the sovereignty, unity and territorial integrity of the State:
10. The principle of the peaceful settlement of disputes:

Finally ,it is worthy to say

• Egypt and its scientists appreciate peaceful settlement of disputes and

•Egyptians wish the progress , prosperity and luxury for their brothers in Ethiopia, at the same time, Egypt is very keen to keep its national water security.

•The Egyptian president Mr. El-Sisy has signed "Declaration of principles" with both the presidents of Sudan and of Ethiopia for building trust among the three countries. Now we are waiting for Ethiopia response through the forthcoming negotiations.

•Egypt top priority is to strengthen friendly mutual relations with all African countries and insists to achieve the formula of ….WIN .. WIN ….No winner …and no loser

Thank you