Successful stories in adapting to climate change

PRESENTED BY : MAYA MHANNA (HEAD OF RURAL ENGINEERING SERVICE- MINISTRY OF AGRICULTURE)

USCWA- BEIRUT 15-17 FEB 2016

Challenges Facing Water Resources

- Increasing Distress Facing Water Resources

Population Growth

Water Pollution

Climate Change

Water Consumption

- Difficult to determine actual breakdown of water consumption due to:

System leakage >50%
Losses & contamination

Unlicensed wells

Syrian Refugees

Water Consumption

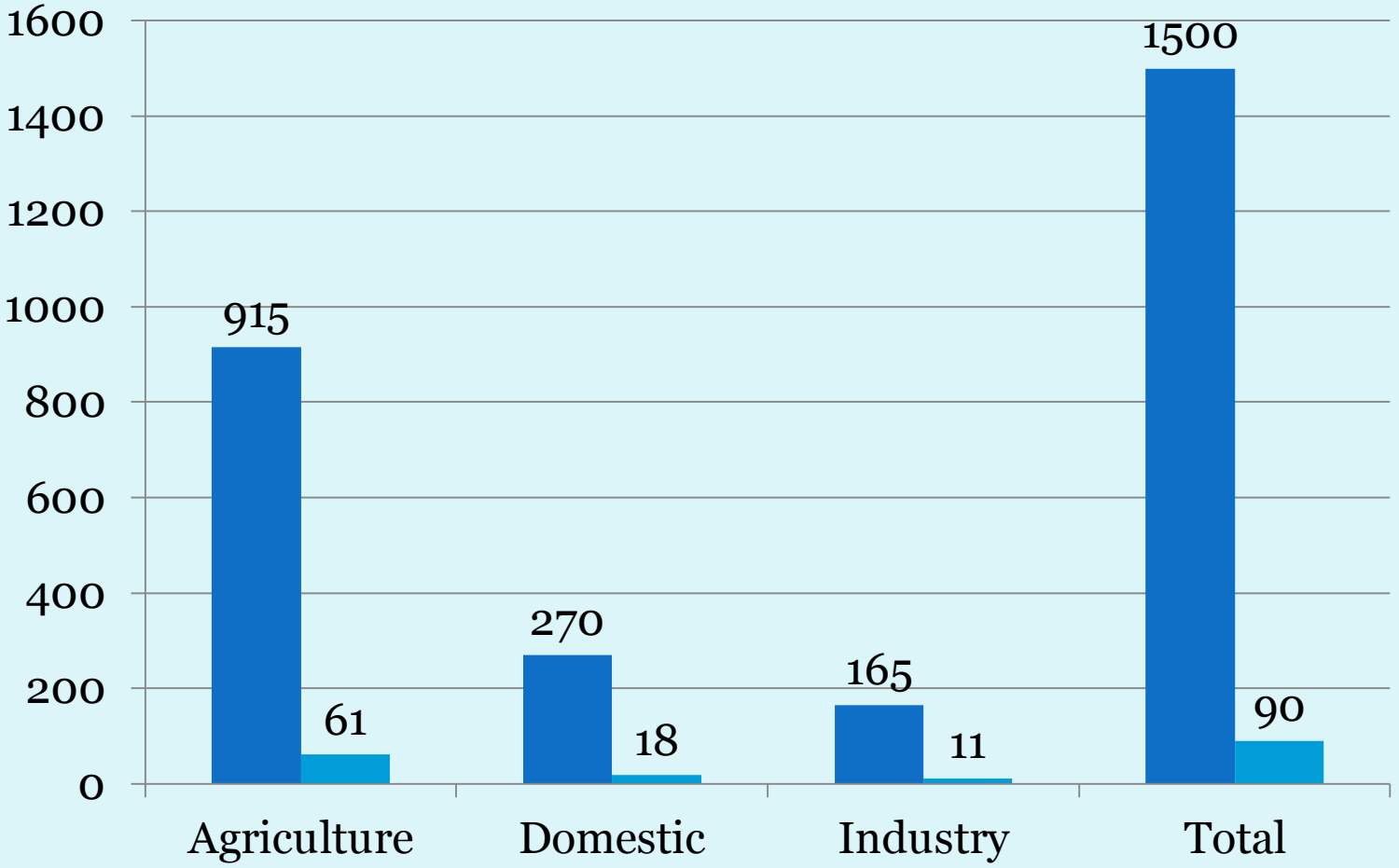
- Water withdrawal 1,473-1530 Mm^3/year (MoEW (2010)-WB (2009):)

Agriculture 61%

Domestic 18%

Industry 11%

Water Consumption by Sector



Irrigation Techniques

- Irrigated areas according to the irrigation technique used are as follow:

50% Surface

25% Drip

25% Sprinkler

Water Source for Irrigation

- Different sources of irrigation

Groundwater (49%)

Surface water/rivers (39%)

Hillakes and reservoirs

Agricultural challenges

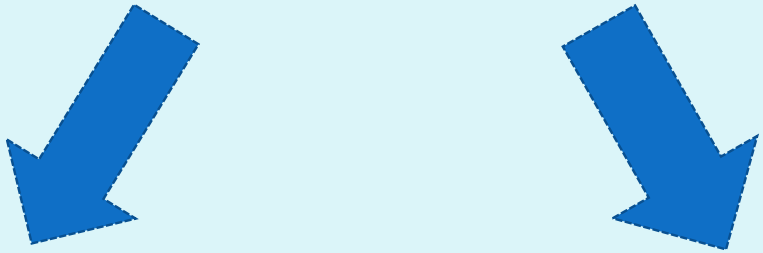
- Agriculture's contribution to Lebanon's GDP is small and has been dropping over the years from about 7% in 1994 to about 5.5% in 2013

- Climate change → decrease in water availability

- reduction in agricultural productivity especially for the crops that depend on irrigation.

Agricultural challenges

- Estimation : 20 days decrease in the time dense snow cover persistence (Shaaban 2009).



- ↓quality and ↑in salinity Less Water

Agricultural challenges

Demographic pressure and climate change are expected to cause a decrease in the production of exportable crops

- citrus crops
- Banana,
- Apple
- Potato

Challenges

- MoE(2001) by the year 2015, only 60% of water resources will be left to agricultural use (as compared to 74% in 1994). Water withdrawal figures for 2005 show that the share of agriculture had already dropped below 60% (FAO, 2010).

Challenges

- Surface irrigation still widely used mainly in small plots areas :
  - High investment cost irrigation systems
  - Lack of knowledge
- Waste Water is widely used in uncontrolled manner in irrigation.
- High running cost in irrigation due to fuel consumption especially that most agricultural areas are not connected to the grid

MoA actions

- Within the increasing challenges, MoA has undertaken several actions to improve irrigation sector and reduce pressure on fresh water.

MoA actions

- **Renewable energy projects**

3 solar systems were installed by MoA to pump water and use it for irrigation :

- ✓ Deir el Ahmar nursery (15 du, pumping depth 250 m)
- ✓ Hammana Nursery (8 du, centrifugal pump from reservoir)
- ✓ Kfardebian fruit trees plot (15 du, pumping depth 80 m)

Moreover, a study within (GRE.NE.CO) project was undertaken describing use of RE in agriculture sector in Lebanon

MoA actions

Treated Waste Water Projects

To reduce pressure on fresh water, 3 projects using treated wastewater are or have been implemented within MoA :

1. TCP with FAO

- ✓ At the end of this project, Guidelines for the use of Treated Waste Water in Lebanon were issued.

2. Coping with water scarcity (MoA/LARI/MoEW and FAO)

- ✓ Transmitting treated water from Iaat treatment plant
- ✓ Running capacity 600-700 m^3/day and full capacity 12 000 m^3/day
- ✓ Irrigating at 1st phase 220 du in Iaat (forage maize, Wheat, barley, forest trees (Populus), using drip irrigation on 30 du)

MoA actions

- 3. ACCBAT project (EU/MoA)
  - ✓ Transmitting treated water from Ablah treatment plant
  - ✓ Running capacity 800 m^3/day and full capacity 2 000 m^3/day
  - ✓ Irrigating at 1st phase 15 dun of vineyards in Ablah
  - ✓ A collection reservoir of a capacity of 15,000 m^3 is being constructed to collect water from the treatment plant.

MoA actions

- **Extension and trainings**

Within its program, MoA is regularly conducting trainings to:

- ✓ Farmers on:
  - New pressurized irrigation techniques
  - Irrigation schedule
  - Safe use of Waste Water in Agriculture
- ✓ Technicians and professionals (in collaboration with EU organizations):
  - Regulated deficit irrigation
  - non-conventional source of irrigation (treated waste water)

MoA actions

- **Subsidies to the farmers**

Within its objective to reduce the costs on farmers and encourage them to shift to water savings irrigation techniques:

- ✓ In 2013 MoA distributed irrigation equipment's for free to a number of fruit trees growers.
- ✓ As a first result at least 30% of the beneficiaries shifted from surface to pressurized irrigation networks.

MoA Strategy 2015-2019

Within the framework of MoA Strategy 2015-2019 different strategic axes were determined to promote the irrigation sector in Lebanon.

MoA Strategy 2015-2019

Shift the irrigation scheme of 1 000 ha/year :

From surface irrigation to pressurized irrigation, by subsidizing the irrigation materials by 50% of their initial cost.

MoA Strategy 2015-2019

Establish committee for Treated Waste Water use in Irrigation:

Includes all stakeholders to promote and legalize the use of TTWW in irrigation

Renewable Energy in Agriculture

- ✓ Economic study on the use of RE in Agriculture is undertaken
- ✓ 8 demopolts using RE in agriculture in (Bekaa, Nabatieh and Mount Lebanon) are under prepartion

Recommendations

- Promote the management of small scheme network through the establishment of WUA.
- Protect ground and surface water from pollution
- Choose planting varieties resistant to drought and high temperature
- Adjust planting dates
- Shift planting location

Thank you