Measures to facilitate Low-Carbon and Energy-Saving water use in semiarid areas

5th Oct. 2011

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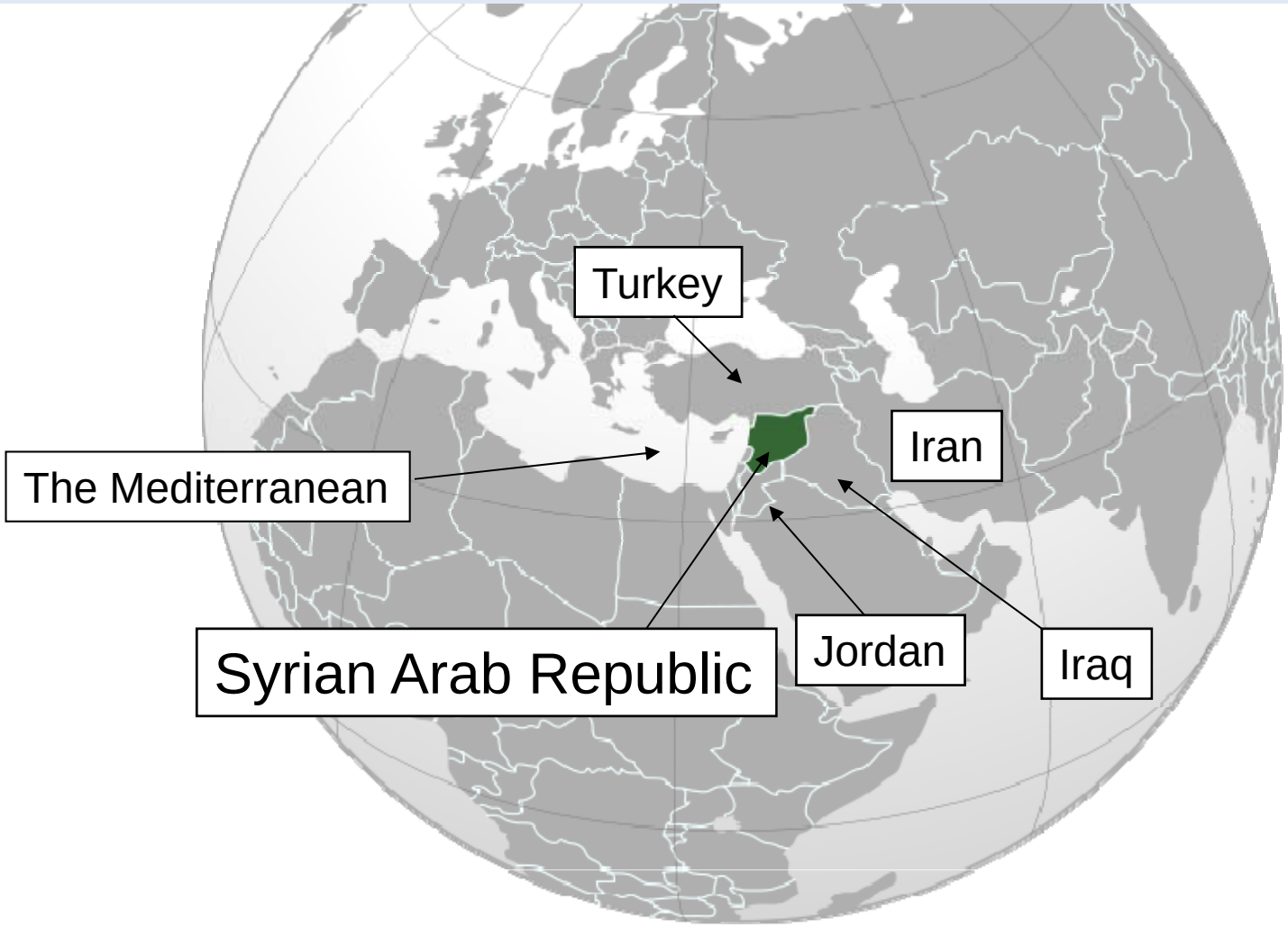
Location of Syria



* Base map (Syria (orthographic projection).svg) is downloaded from Creative Commons.

Outlines of Syria (1)*

- Capital city: Damascus
- Area: 185 thousand km^2（about a half of Japan）
- Population: 22.5 million（2010）
- Gross National Income per capita:
  2,160 dollars（2008）
- Official language: Arabic
- Religion: Islam（86%), Christian（8%）

* Data book of the world (2011)（Ninomiya Shoten publishers Co., Ltd.）

Rural Damascus

Outlines of Syria (2)*

Exports from Japan to Syria（2009）

26.1 billion yen (Motorcars 41.6%, Tyres 17.6%, Machinery 12.7%, Electric devices 6.7%, Buses and trucks 6.1%)

Imports from Syria to Japan (2009)

3.4 billion yen (Processed petroleum 78.3%, Raw cotton 10.1%, Soap 1.8%）

* Data book of the world (2011)（Ninomiya Shoten publishers Co., Ltd.）

Rural Damascus

Outlines of hydrology and water use in Syria (1)

- About a half of the land is in semiarid (Al Badiah) basin.
- We can see rainfall from the autumn to the spring. The annual average rainfall around the center of Damascus is about 200–250 mm, and there is snowfall in the winter.
- There are some international rivers flowing in Syria. e.g. Euphrates, Tigris, Orontes.
- A large part of water is used for agriculture.

Rural Damascus

Outlines of hydrology and water use in Syria (2)

- Under water shortage, farmers tend to use water as much as possible.
- Most of the water use depends on the ground water etc. drawn by pumps.
- When the rate of fuel for pumps had risen dramatically, the tendency to decrease the operation time of pumps became stronger. Also, interest in the efficient irrigation techniques became stronger among the farmers.
- Disposed sewage water is reused in agriculture.

Memories of water service in Syria (1)

As a resident at fourth floor of an apartment near the center of Damascus.

1. We basically received the tap water before noon. Each house has the tank on the rooftop of the building for reserving water before noon, and we use the water reserved in the tank in the afternoon. The source of the tap water in my district was springs in the suburbs of Damascus. If the basin had received much rainfall and the ground water level near the spring was high, the pressure of the tap water would be higher, and the duration of water service would be longer, sometimes 24 hours a day.

Memories of water service in Syria (2)

2. We reserved drinking water in a portable tank in the kitchen before noon, or purchased bottled water (spring water in Syria).
3. When the water service was limited (e.g. in late summer), it was difficult to reserve water in the tank on the rooftop of the building because of the lack of the tap water pressure. Every house had a small pump near the divergence of the water pipe to increase the tap water pressure.
4. The rate of water was very cheap compared with that of electricity etc..

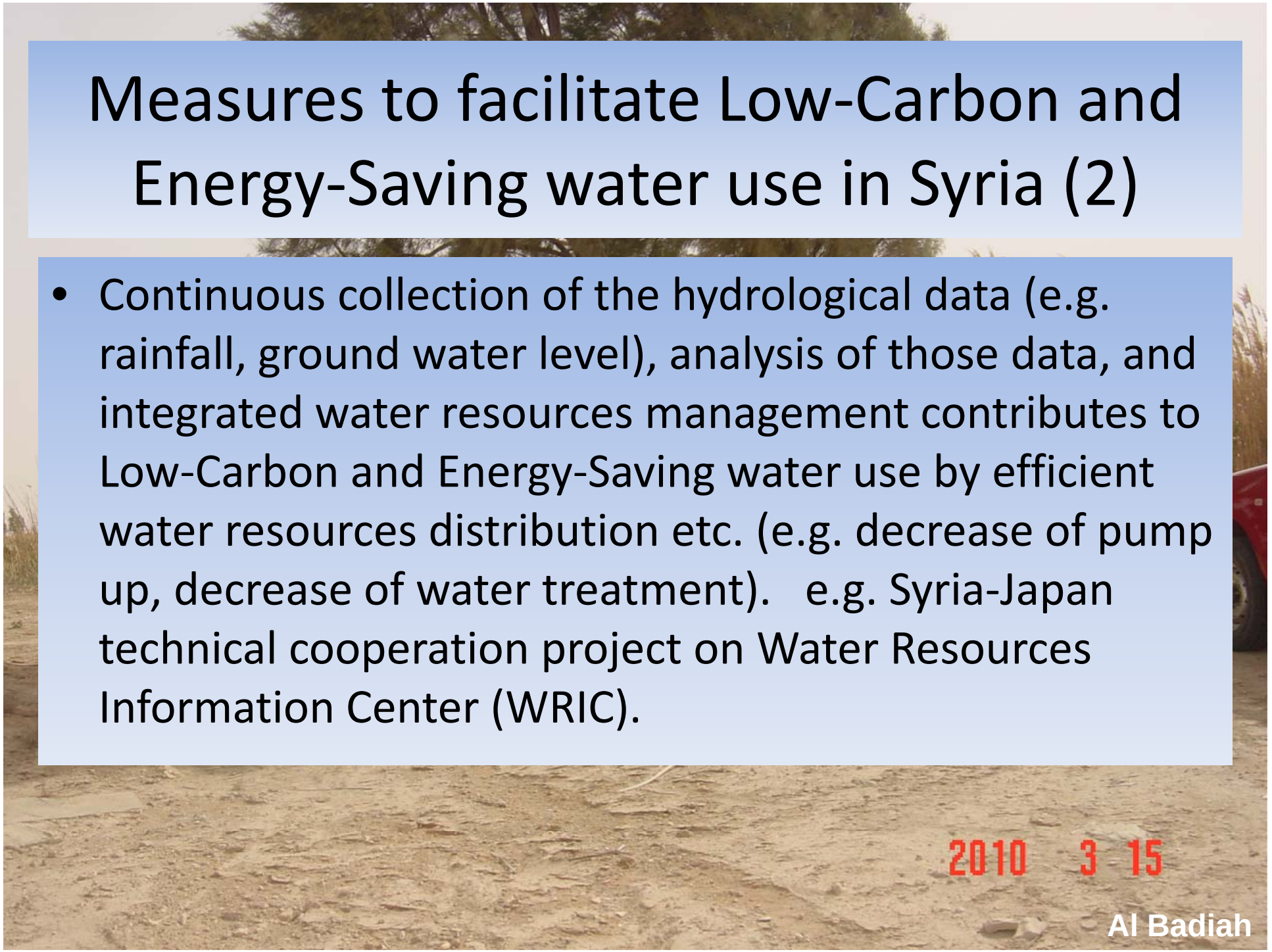
Measures to facilitate Low-Carbon and Energy-Saving water use in Syria (1)

- Since there are wide semiarid areas under water shortage, water saving and conservation is more emphasized than Low-Carbon and Energy-Saving water use. e.g. Syria-Japan technical cooperation project on Development of Efficient Irrigation Techniques and Extension in Syria (DEITEX).
- Since most of the water use is depending on the ground water etc. drawn by pumps, water saving directly connects with Low-Carbon and Energy-Saving by saving the fuel.

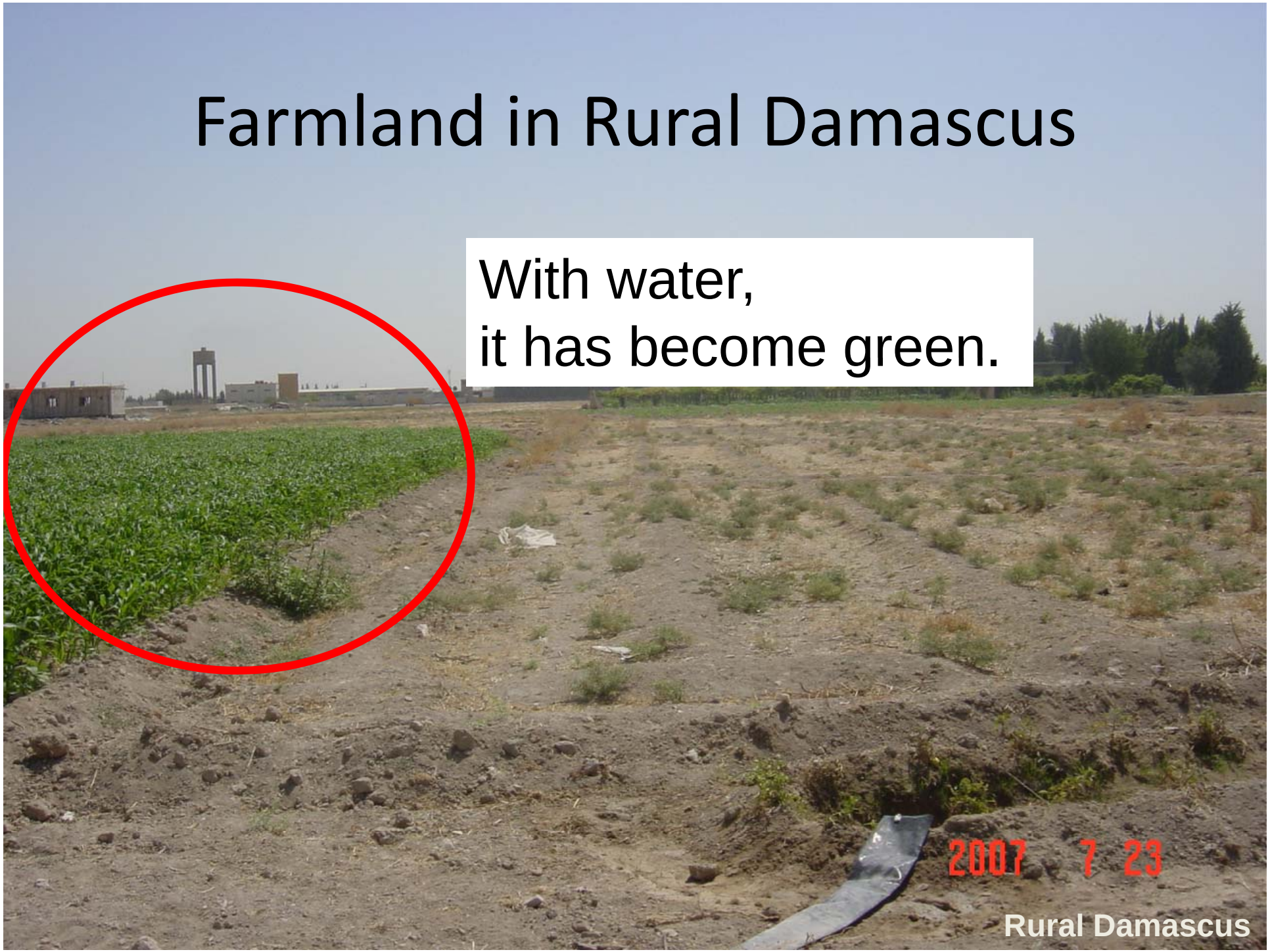
Al Badiah

Measures to facilitate Low-Carbon and Energy-Saving water use in Syria (2)

- Continuous collection of the hydrological data (e.g. rainfall, ground water level), analysis of those data, and integrated water resources management contributes to Low-Carbon and Energy-Saving water use by efficient water resources distribution etc. (e.g. decrease of pump up, decrease of water treatment). e.g. Syria-Japan technical cooperation project on Water Resources Information Center (WRIC).



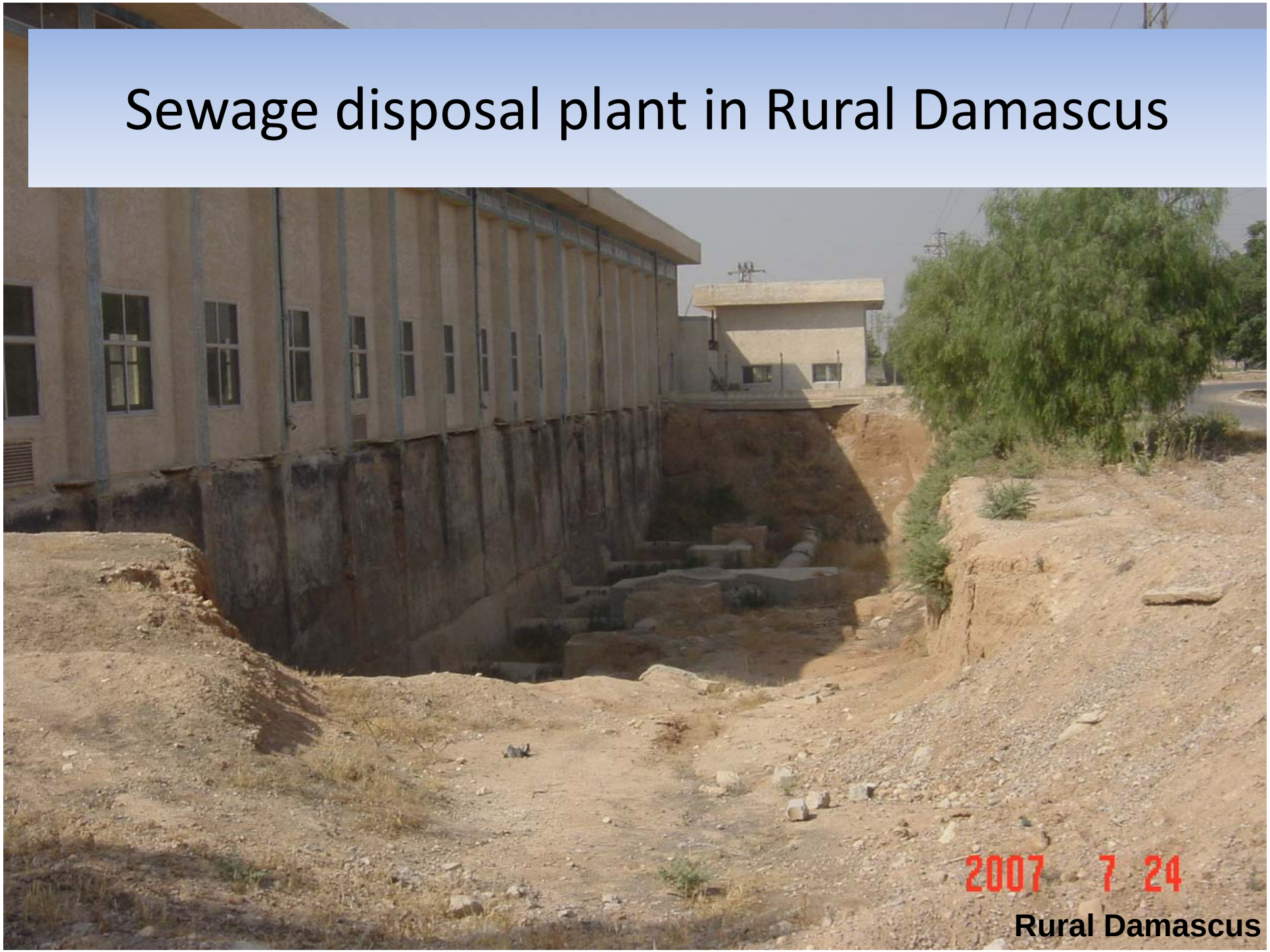
Farmland in Rural Damascus



A well at a water service station in semiarid areas

Agricultural portable pumps along a river

Sewage disposal plant in Rural Damascus



Irrigation canal from the sewage disposal plant (1)

Irrigation canal from the sewage disposal plant (2)

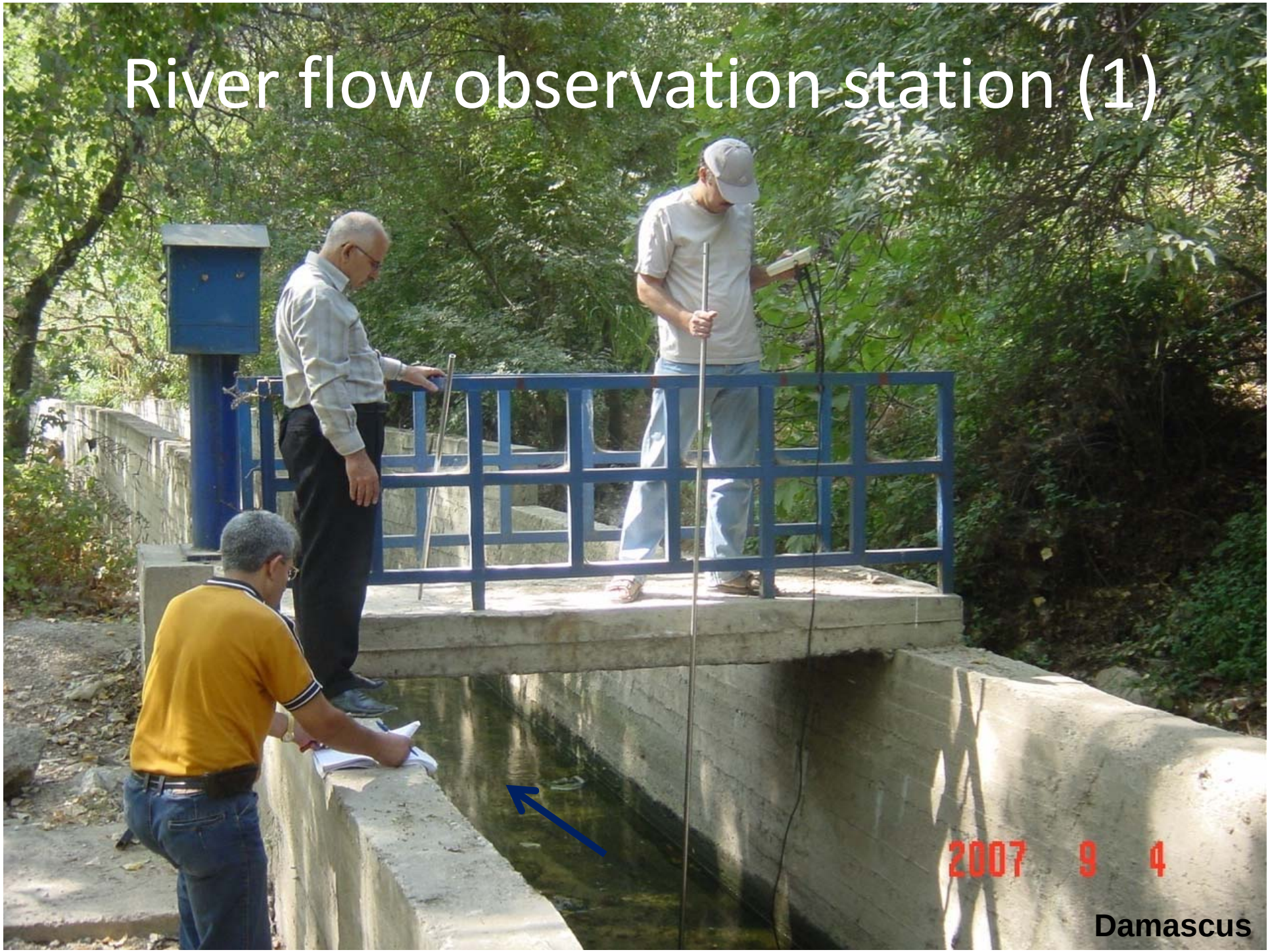
An intake pit of the irrigation canal


Irrigation by the water
from the sewage disposal plant
2007 7 24
Rural Damascus

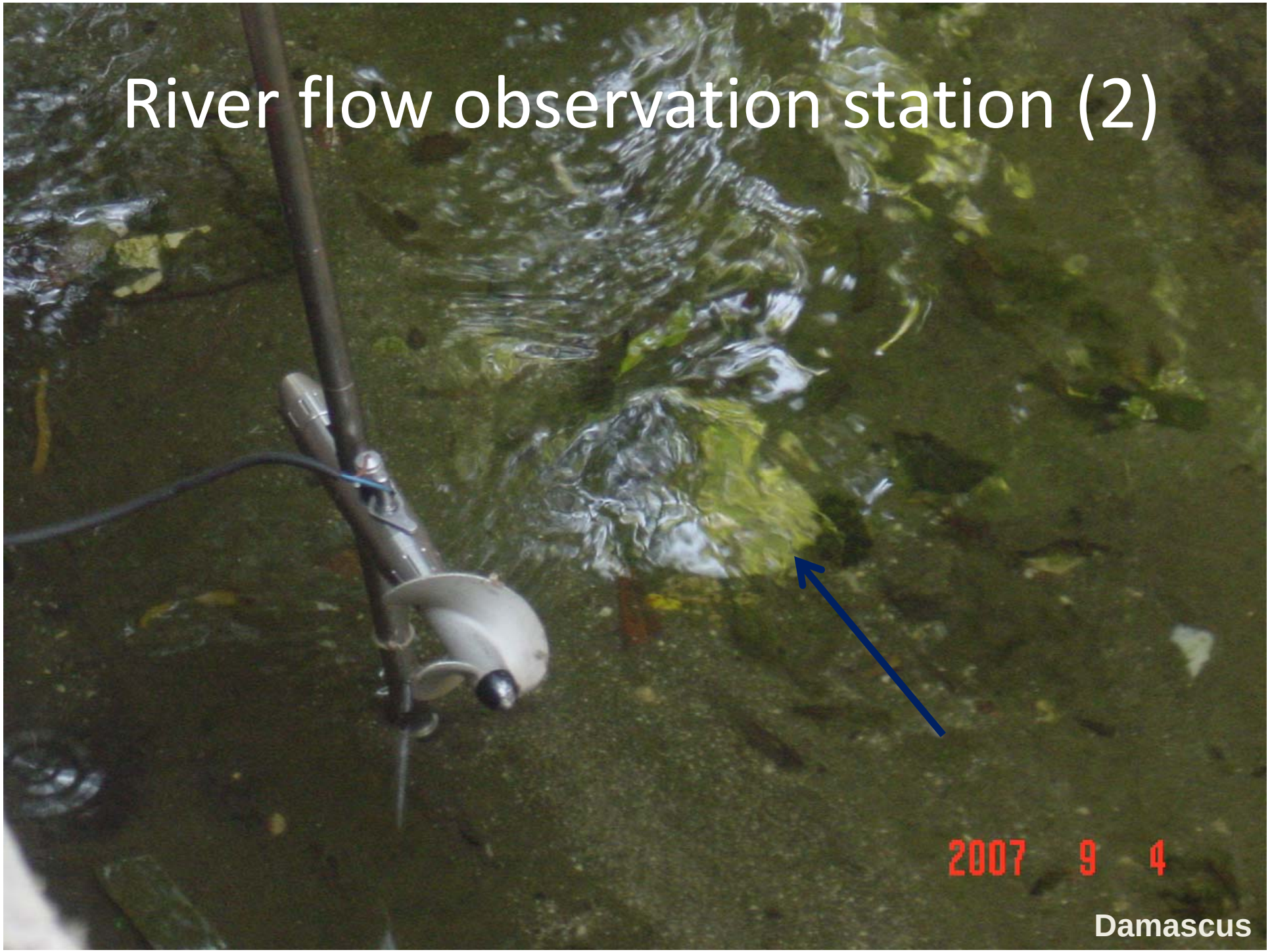
Ground water observation station (1)

Ground water observation station (2)

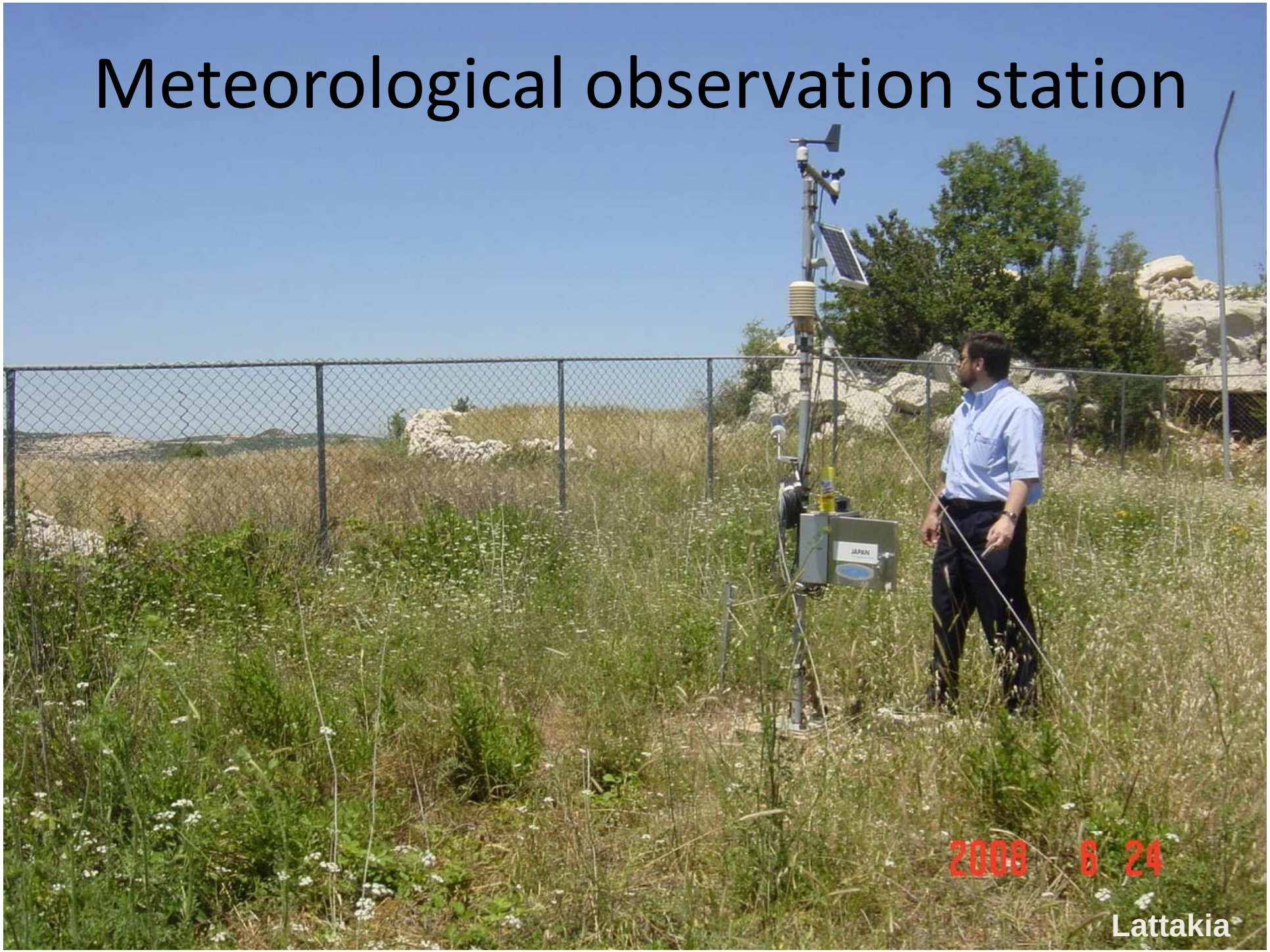
River flow observation station (1)



River flow observation station (2)



Meteorological observation station



Rainfall observation station

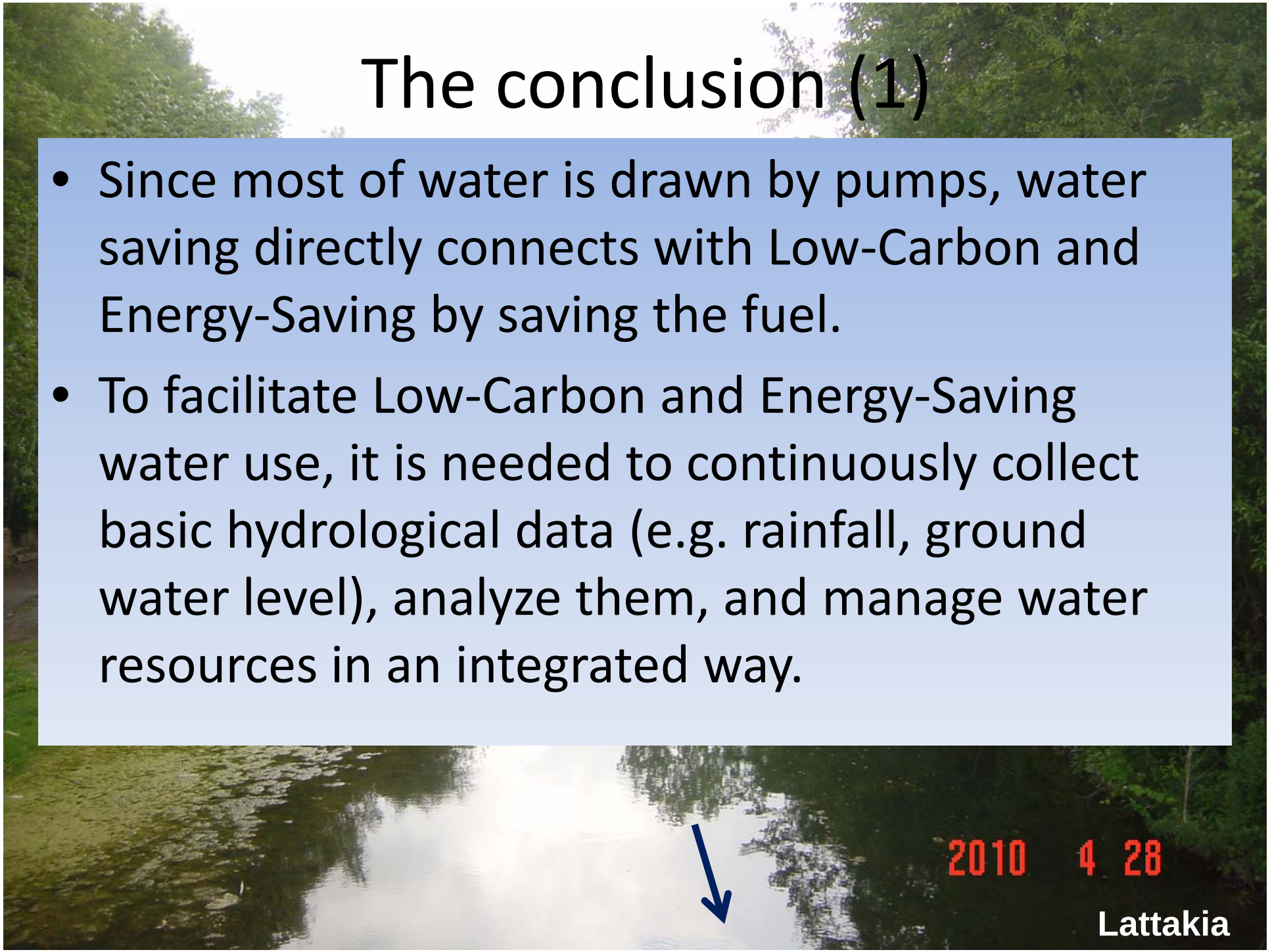
Evaporation observation station

A windmill near a dam in semiarid areas

Solar cells at a water service station in the semiarid areas

The conclusion (1)

- Since most of water is drawn by pumps, water saving directly connects with Low-Carbon and Energy-Saving by saving the fuel.
- To facilitate Low-Carbon and Energy-Saving water use, it is needed to continuously collect basic hydrological data (e.g. rainfall, ground water level), analyze them, and manage water resources in an integrated way.



The conclusion (2)

- Reuse of disposed sewage water in agriculture may contribute to Low-Carbon and Energy-Saving water use with careful management.
- Generating facilities by windmill, or by solar cells have been partially introduced. It may contributes to Low-Carbon and Energy-Saving if the maintenance system of the facilities is available.