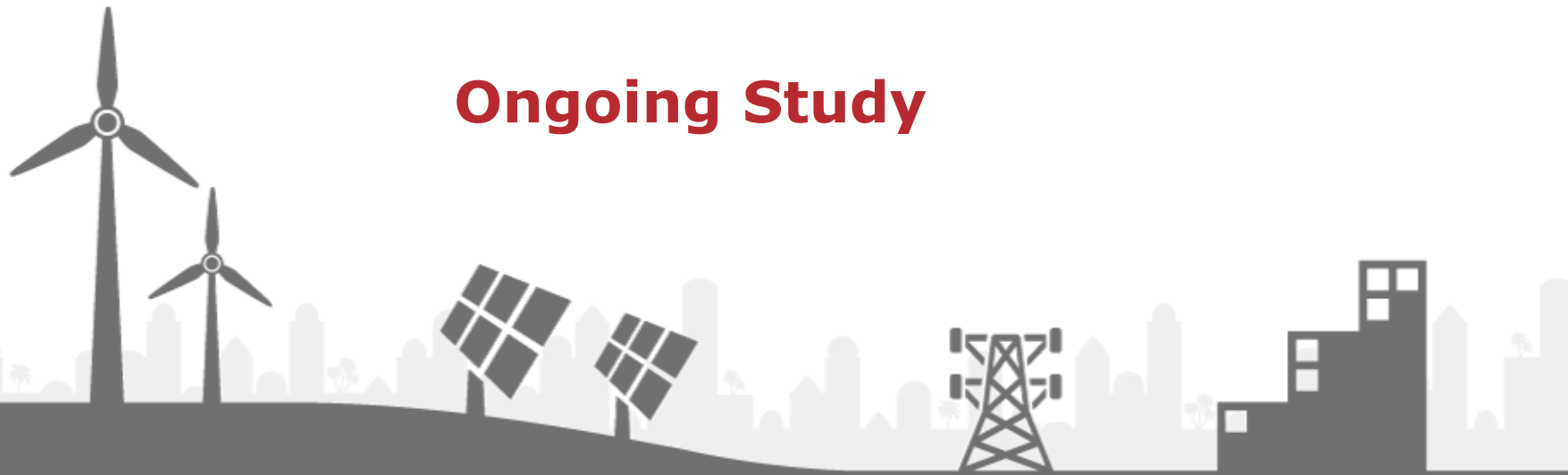


# RE-ACTIVATE

## Tentative Assessment of the Solar Pumping Market in Egypt

**Ongoing Study**



**RCREEE**   
Regional Center for Renewable Energy and Energy Efficiency  
المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة

  
german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT

Implemented by :  
**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

# Overview

- General overview and status quo
- Breakdown of agricultural landholdings
- Applied irrigation systems for landholdings
- Potential market for Solar Water Pumping
- Local Value Chain for Solar Water Pumping
- Preliminary socio-economic impacts
- Main market opportunities
- Main challenges and barriers
- Important issues and relevant questions

# Status Quo of Agriculture and Irrigation

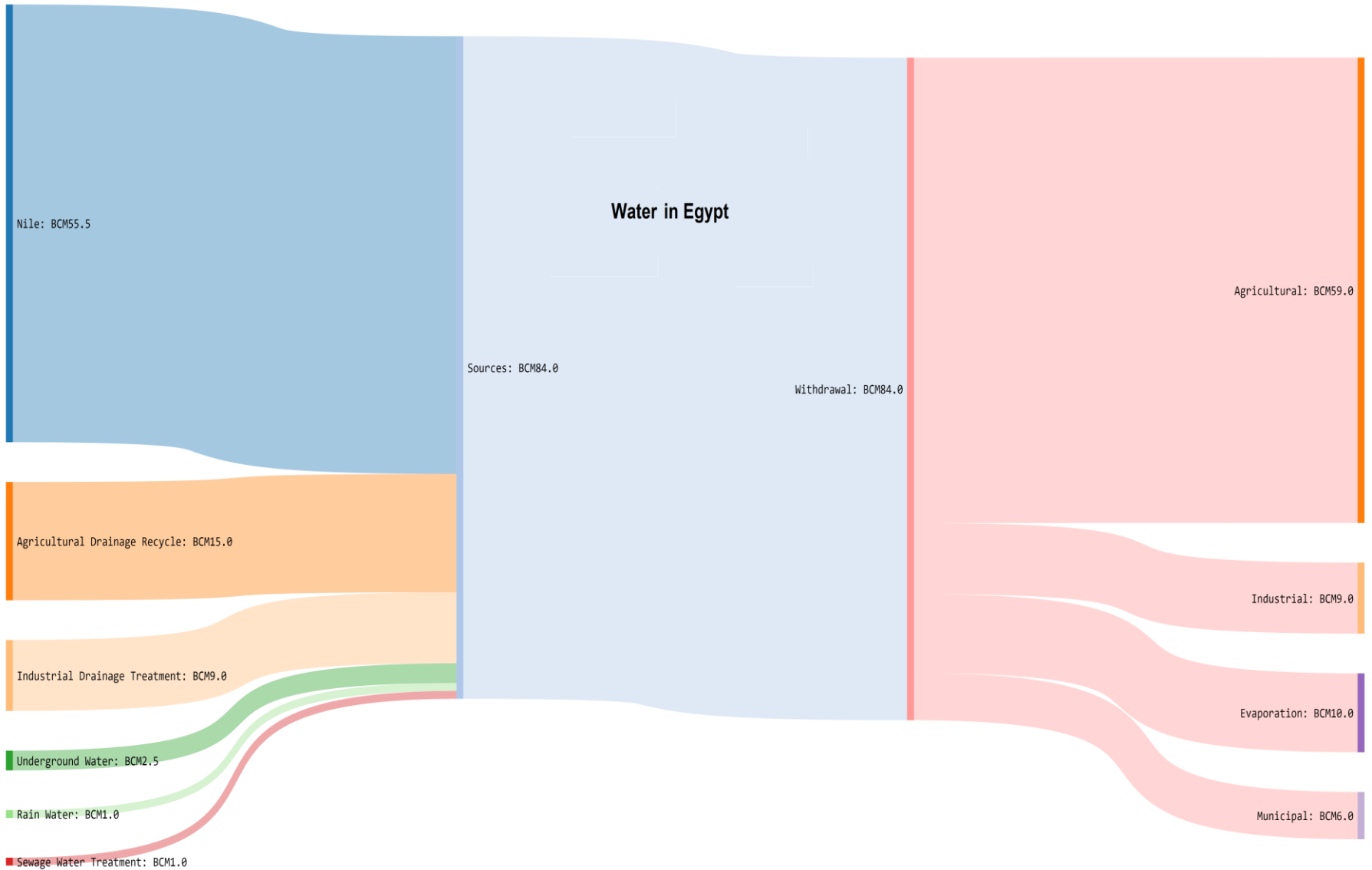
Total agricultural and cultivated area: 12.42 m feddans

- In old lands: 9.73 m feddans
- In new lands: 2.69 m feddans
  
- Around 15.6% of GDP in 2014-2015 (CBE)
- Up 30% of work force in 2016 (Worldbank)

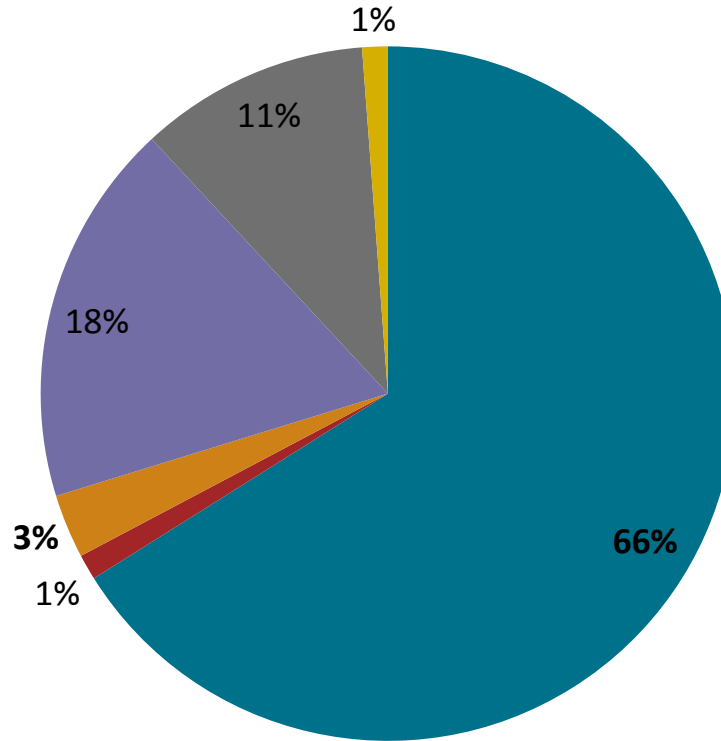
Irrigation is a closed system:

- Nile river : 55.5 m<sup>3</sup> per year
- Dependency ratio 96.9% (highest)

# Water Sources and Withdrawal in Egypt



# Water: Resources and Supply



■ Nile River basin

■ Rain water

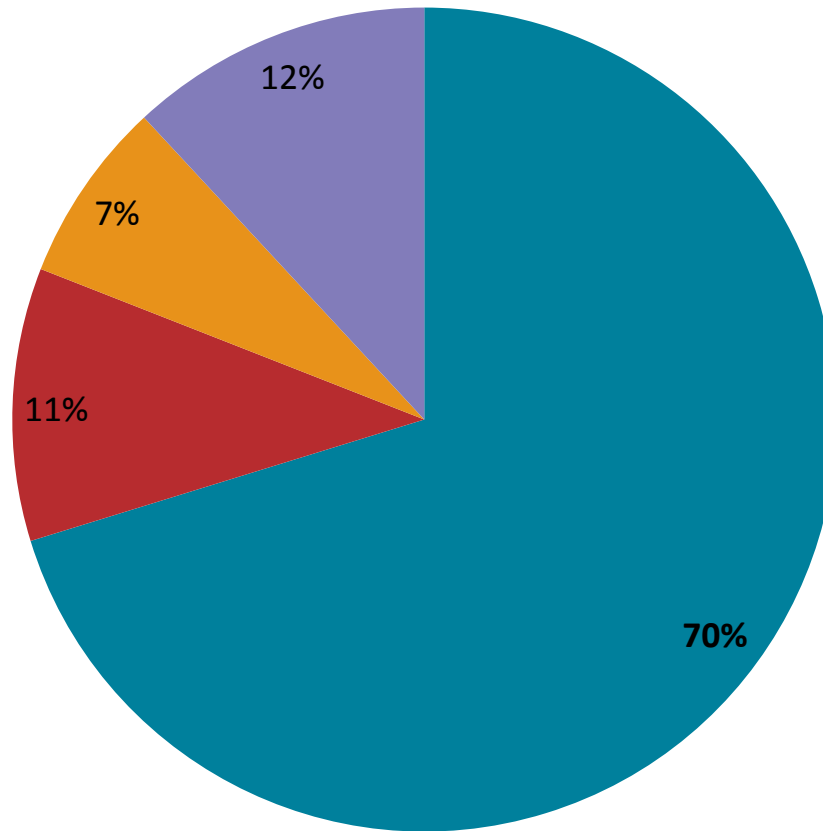
■ Underground water

■ Agriculture drainage recycling

■ Industrial water treatment

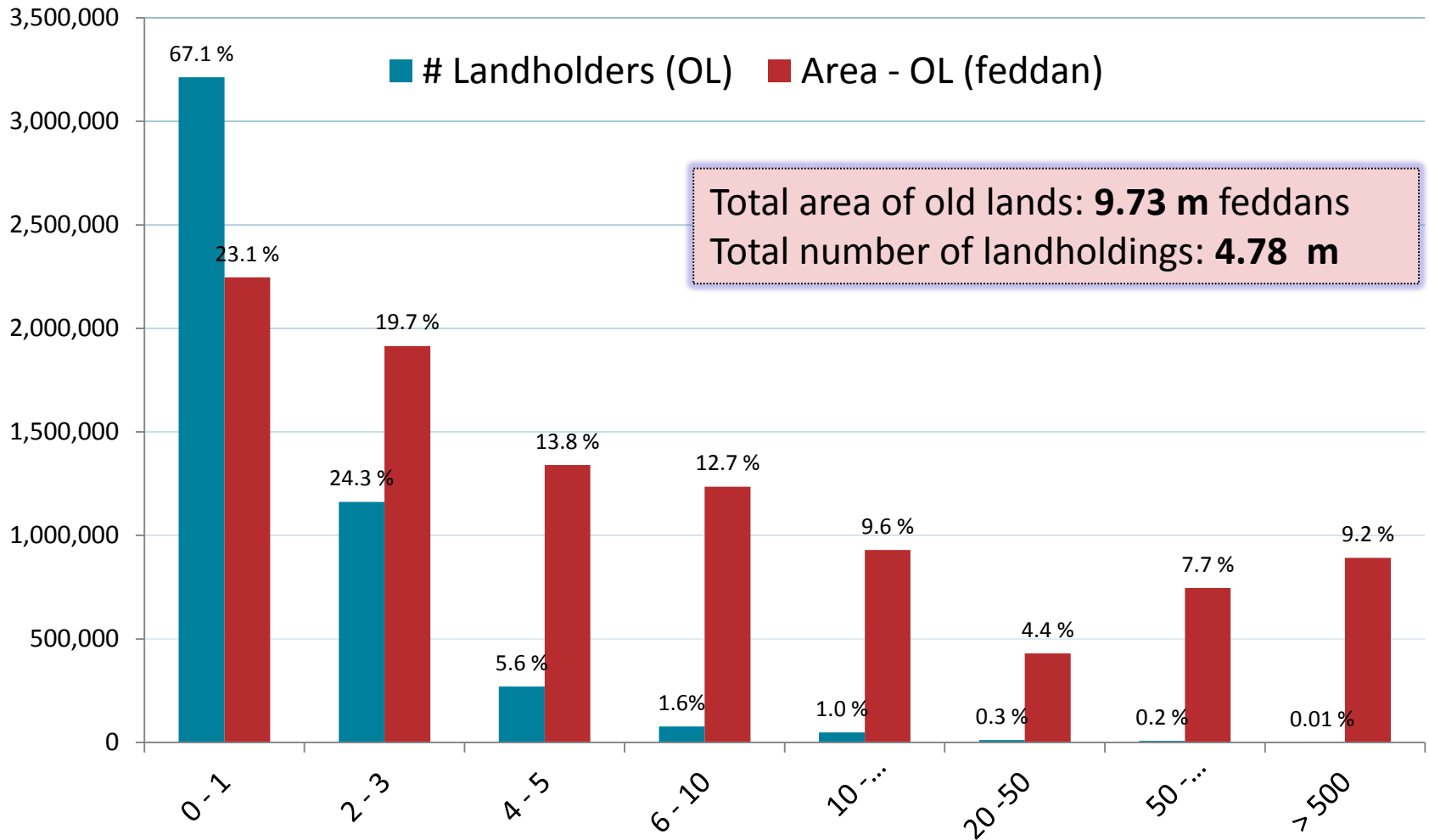
■ Sewage water treatment

# Water: Withdrawal and Demand

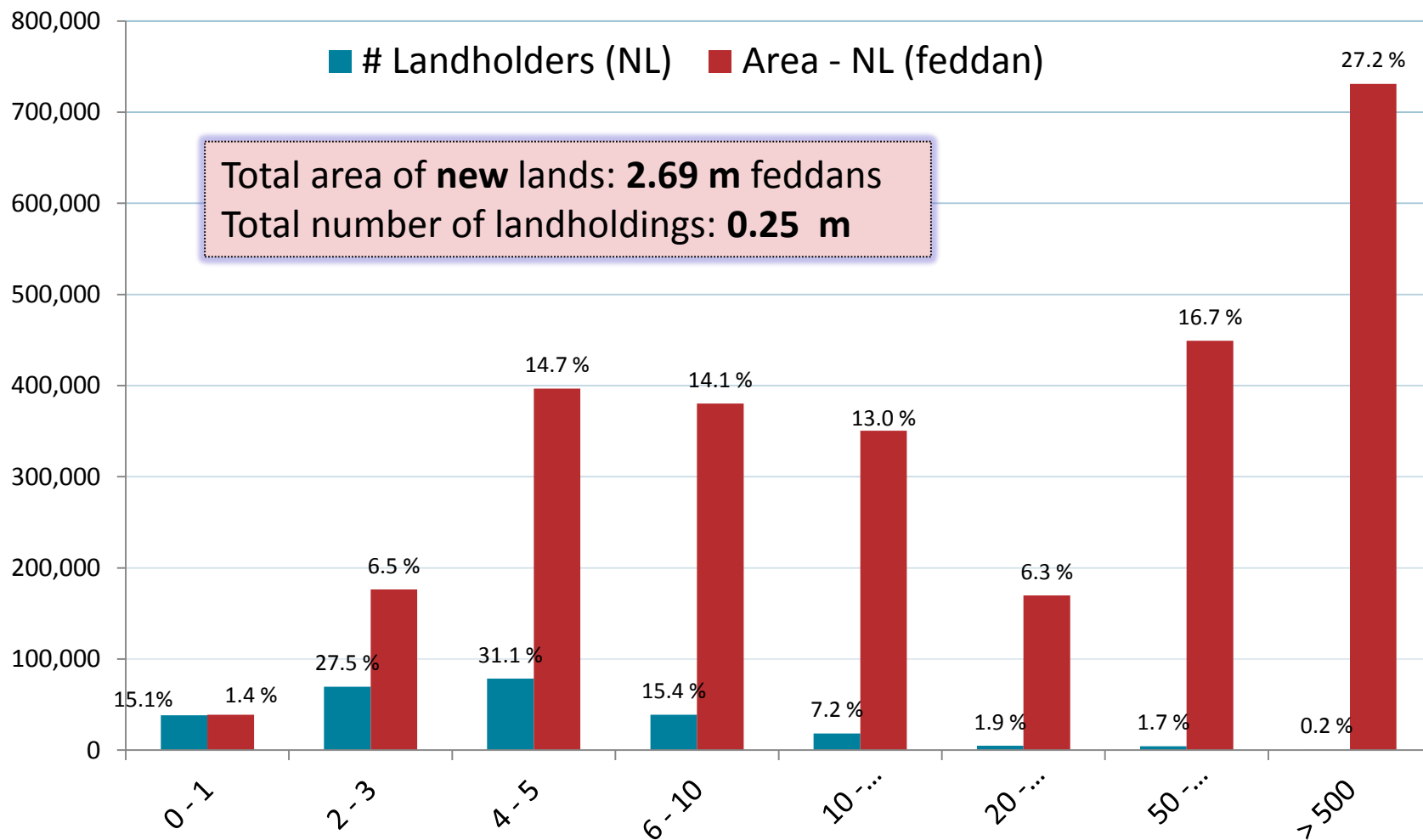


■ Agriculture sector ■ Industrial sector ■ Municipal sector ■ Evaporation losses

# Breakdown of Agricultural Landholdings



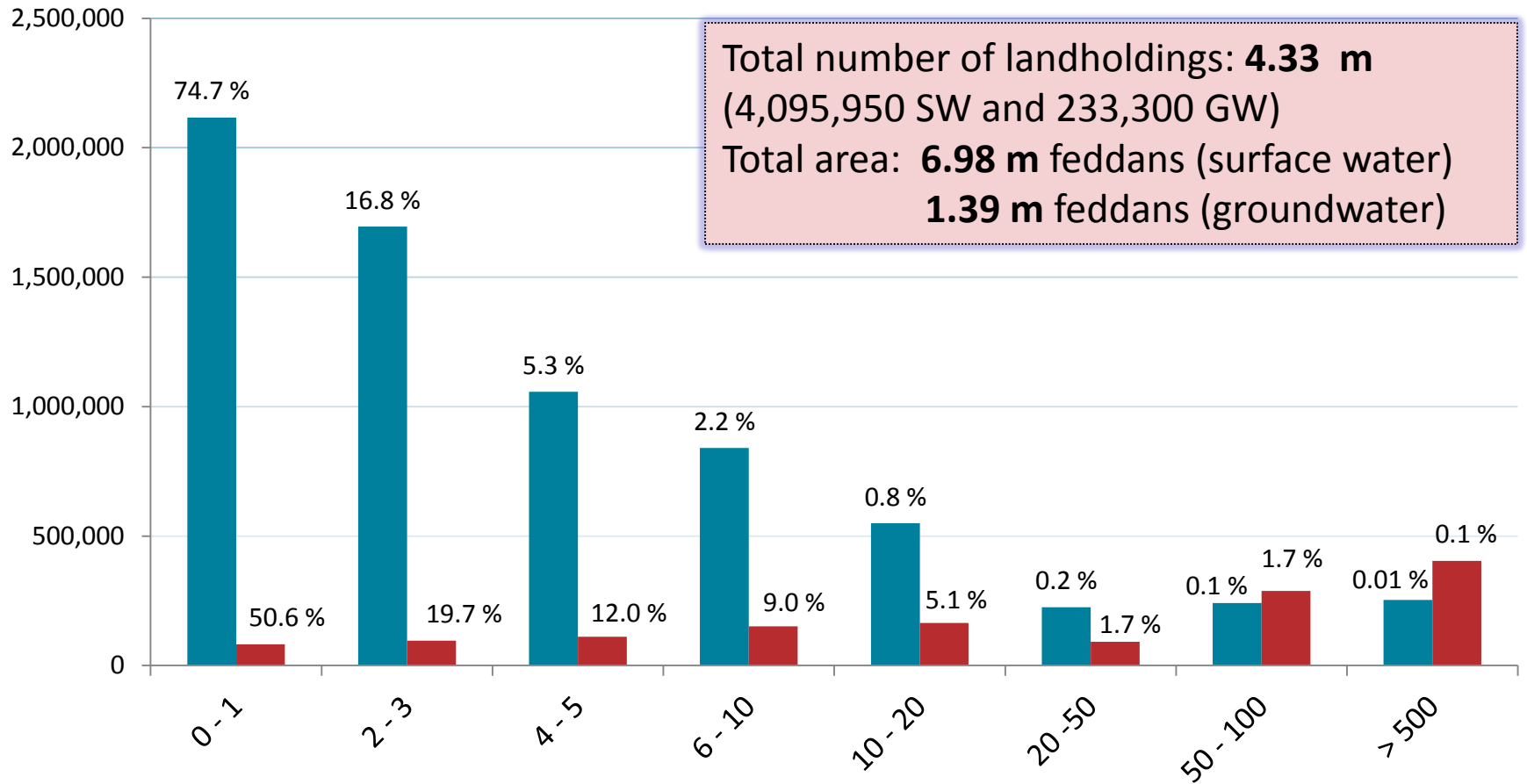
# Breakdown of Agricultural Landholdings





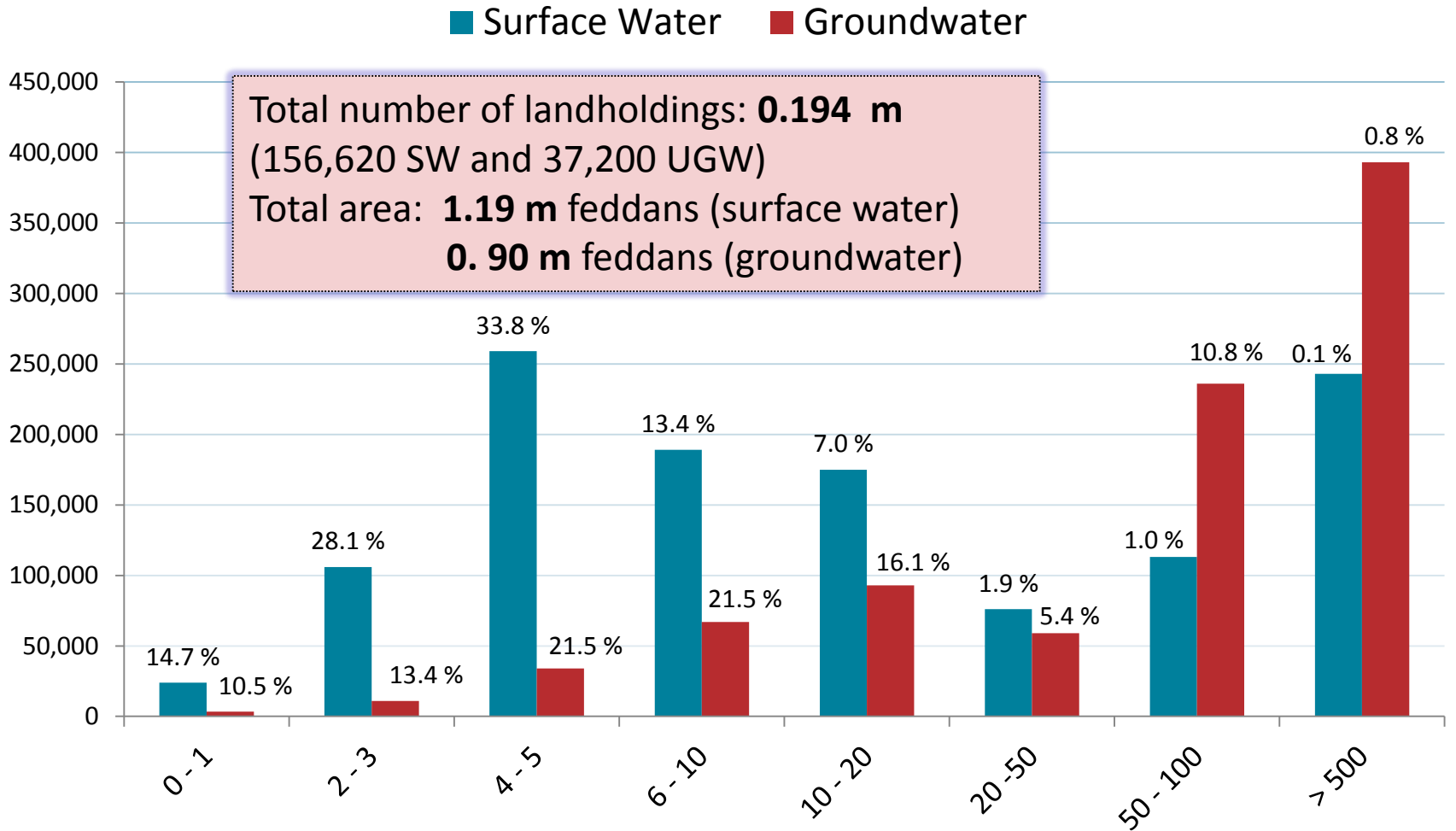
# Applied Irrigation Systems in Old Lands

■ Surface Water ■ Groundwater

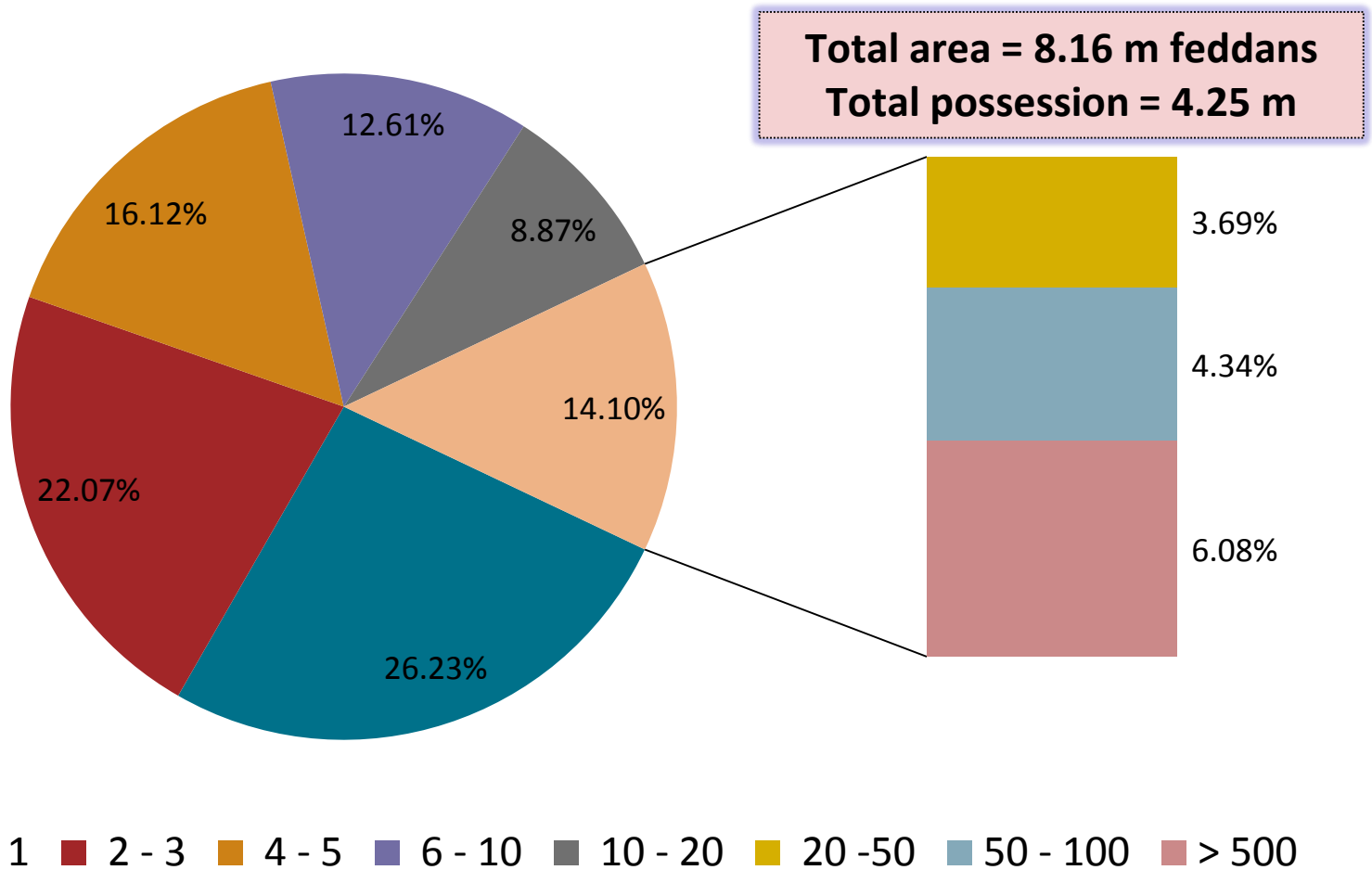


Total number of landholdings: **4.33 m**  
 (4,095,950 SW and 233,300 GW)  
 Total area: **6.98 m** feddans (surface water)  
**1.39 m** feddans (groundwater)

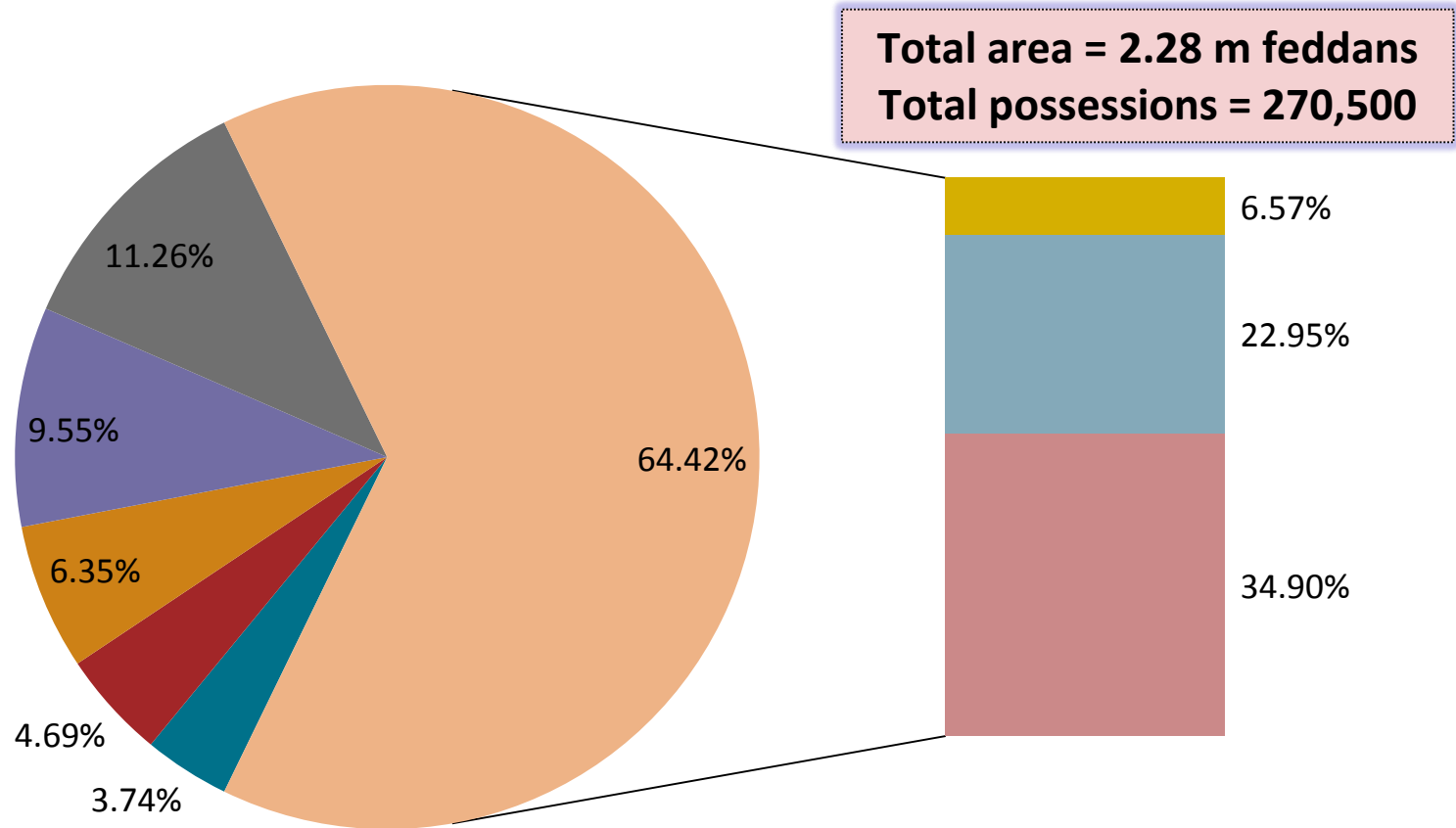
# Applied Irrigation Systems in New Lands



# Breakdown of Possessions: Surface Water Irrigation (old and new lands)



# Breakdown of Possessions: Underground Water Irrigation (old and new lands)



0 - 1   2 - 3   4 - 5   6 - 10   10 - 20   20 - 50   50 - 100   > 500

# Potential market for solar pumping

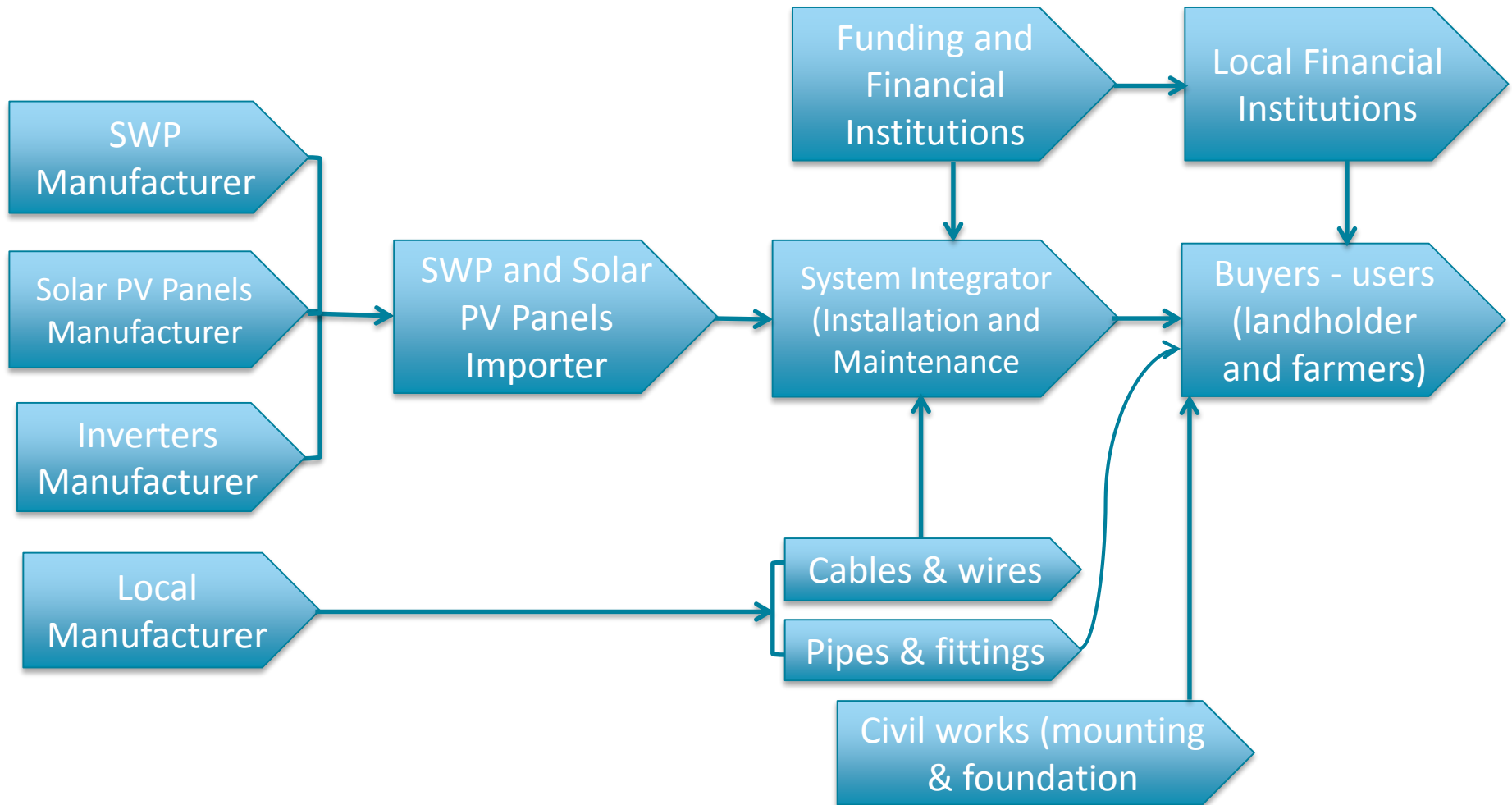
Targeted landholders (holdings > 5 feddans):

- Surface irrigation: area 2.9 m (4% landholders)
- Underground irrigation: area 1.95 m (23% landholders)
- Fragmentations is a real challenge, especially for the majority of landholders relying on surface water irrigation (4.08 m possessions, 5.26 m feddans)

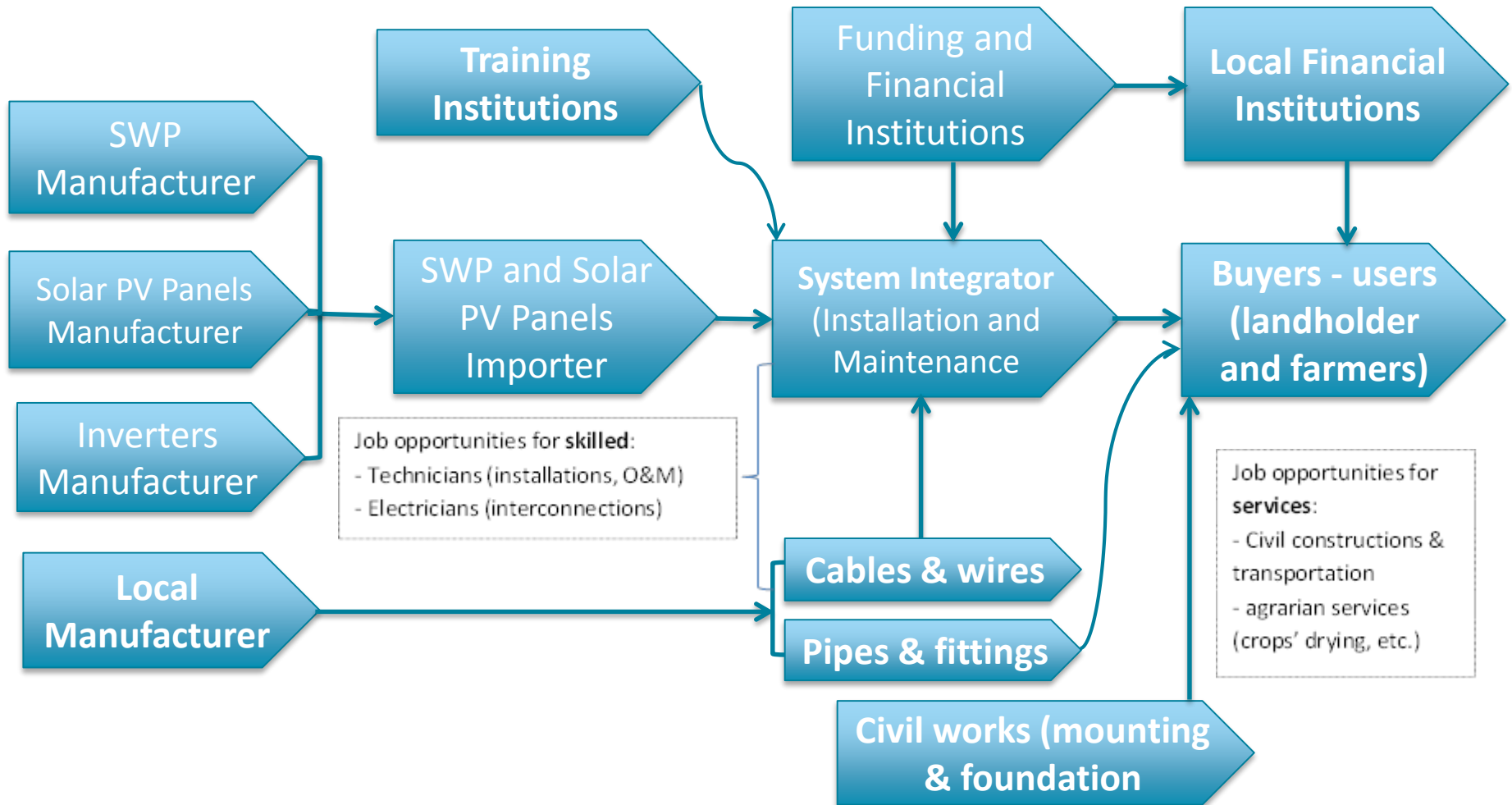
New National project (3m feddans):

- Agriculture area: 872,000 feddans,
- Underground water: 4,622 wells  
(estimated depth ~ 250 – 1,200 m)

# Local Value Chain for Solar Water Pumping Systems



# Local Value Chain for Solar Water Pumping Systems (Potential Job Opportunities)



# Preliminary Socio-Economic Impacts: Very Conservative Scenario

Average team size: **2.5** (technical)  
Average size of system: **20 kW**  
Average # of weekly installation: **2 SWP**

## Estimation for installation

- # diesel pump:  
**500,000 \***
- Conversion rate of  
**1% : 5,000 SWP**  
per year

## Existing market size

- **100 MW** per year
- Size: **~20 kW SWP**  
system

- By 2020:  
**300 MW**
- By 2030:  
**1.3 GW**

## Estimated contribution

Estimated # of:  
direct jobs: **120 / year**  
companies (O&M) : **48 / year**



# Main Market Opportunities

- Government initiatives since 2014 have the potential to increase the agriculture land by 1/6 by end of 2018
- The national project to reclaim 3 million feddans, mainly using solar pumping solutions.
- Fruits and vegetables are considered of competitive advantage in agriculture and suitable also for SWP solutions (higher value crops)

# Market Challenges and Barriers

## Economic

- Uplifting subsidies (fertilizers)
- High inflation rate (13.8%)\*
- High cost of using UGW (remote areas, quality and depth of UGW)

## Financial

- Limited financial facilities (especially for farmers)
- Inconvenient terms of loans (holdings!)
- Inadequate subsidized loans

# Market Challenges and Barriers

## Technical

- Lack of technical capacities in remote areas (skilled technicians)

## Social

- Lack of awareness
- Population growth
- High loss rate of agriculture production (lack of services)

## Others

- Land is highly fragmented
- Infrastructure is under-developed\*
- Missing numbers and figures!

# Important and Relevant Questions

## Financial mechanisms:

- To which extent is “leasing” an option
- Is it possible to consider Farmers Associations or cooperatives & ESCos as “beneficiary” for loans?

## Legal and legislative framework:

- Responsibilities of and coordination between MoALR, MoWRI
- Access to updated figures and numbers

**Thank You**