

Towards a Green Economy in Jordan

A scoping study towards the achievement of economic, social and environmental priorities through improved climate change adaptation, efficient use of resources in different sectors of the Jordanian economy, domestic policy reforms and the strengthening of institutional and human capacities.

Agenda

The Case for Jordan

Water

Energy

Food

Nexus approach to integrative policy

The Case of Jordan

Desert is the prevalent ecosystem

- Covers 80% of country with 88% of the population living on less than 20% of the land. Approximately 5% of the land is arable

High population growth

- 2.4 % annual growth and high influx of refugees.

Agriculture highly linked to GDP

- Contributes approximately 12% to total exports.

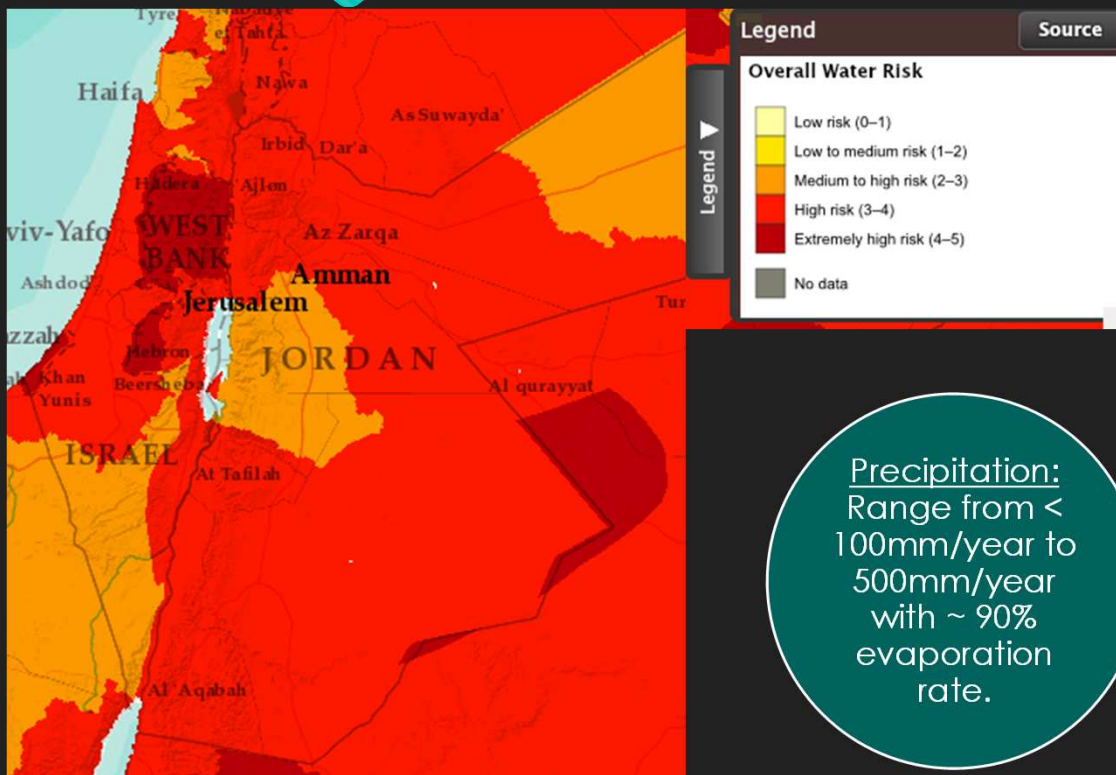
Imports all energy

- 96 per cent of all energy used is imported. The cost of imports of energy is estimated at US\$3.6 billion or 13.5 per cent of GDP.

Renewable energy potential

- mainly in the form of direct solar energy

Scarce Water Resources



Above ground:
Jordan river is severely stressed due to the trans boundary river basin

Water resources are severely limited

Precipitation:
Range from < 100mm/year to 500mm/year with ~ 90% evaporation rate.

Ground water:
Brackish and Saline or deep fossil water

Water - Utilization

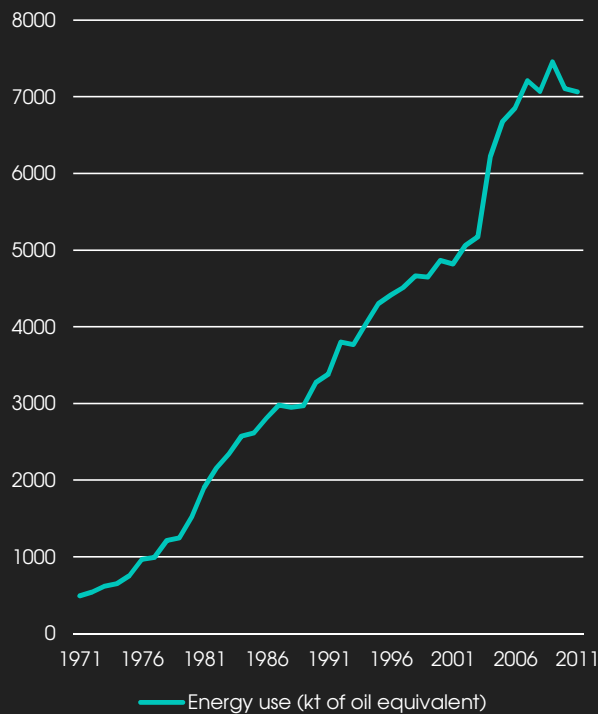
- Comprises 3 main areas:
 - Municipal (32%),
 - Industrial (5%),
 - Agriculture (63-73%)
- Water use increased from 800 MCM to 900MCM from 2000-2011
- Current demands exceeds renewable water resources.
- Deficit of 240 MCM projected to reach 360 MCM by 2020

Water - Access

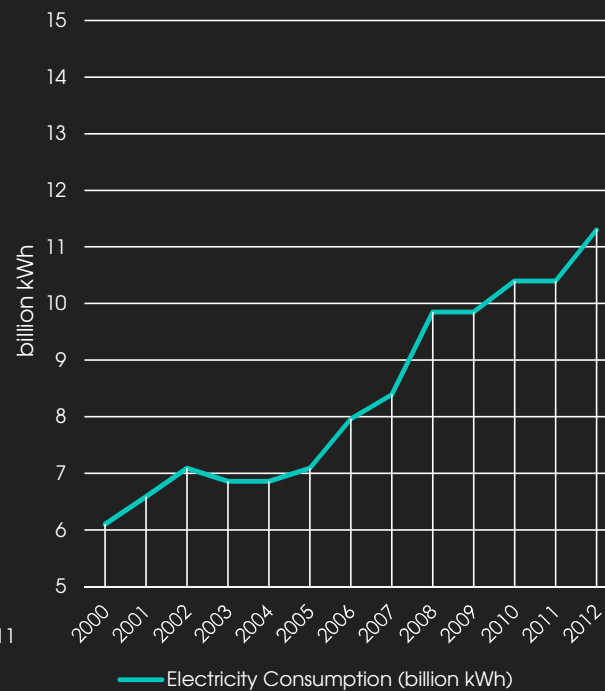
- Managed by 3 institutions: Ministry of Water and Irrigation(MWI), Water Authority of Jordan(WAJ), and the Jordan Valley Authority(JVA)
- Water rights to surface water are shared by Israel and Palestine with the bulk of the water transported to Amman for irrigation is by the King Abdallah Canal bringing water from the Yarmouk River.
- Future supplies are reliant on 2 megaprojects
 - Red-Dead connection
 - Disi Aquifer pipeline (325 km pipeline from the boarder of Saudi Arabia)

Energy - Utilization

Primary Energy Consumption



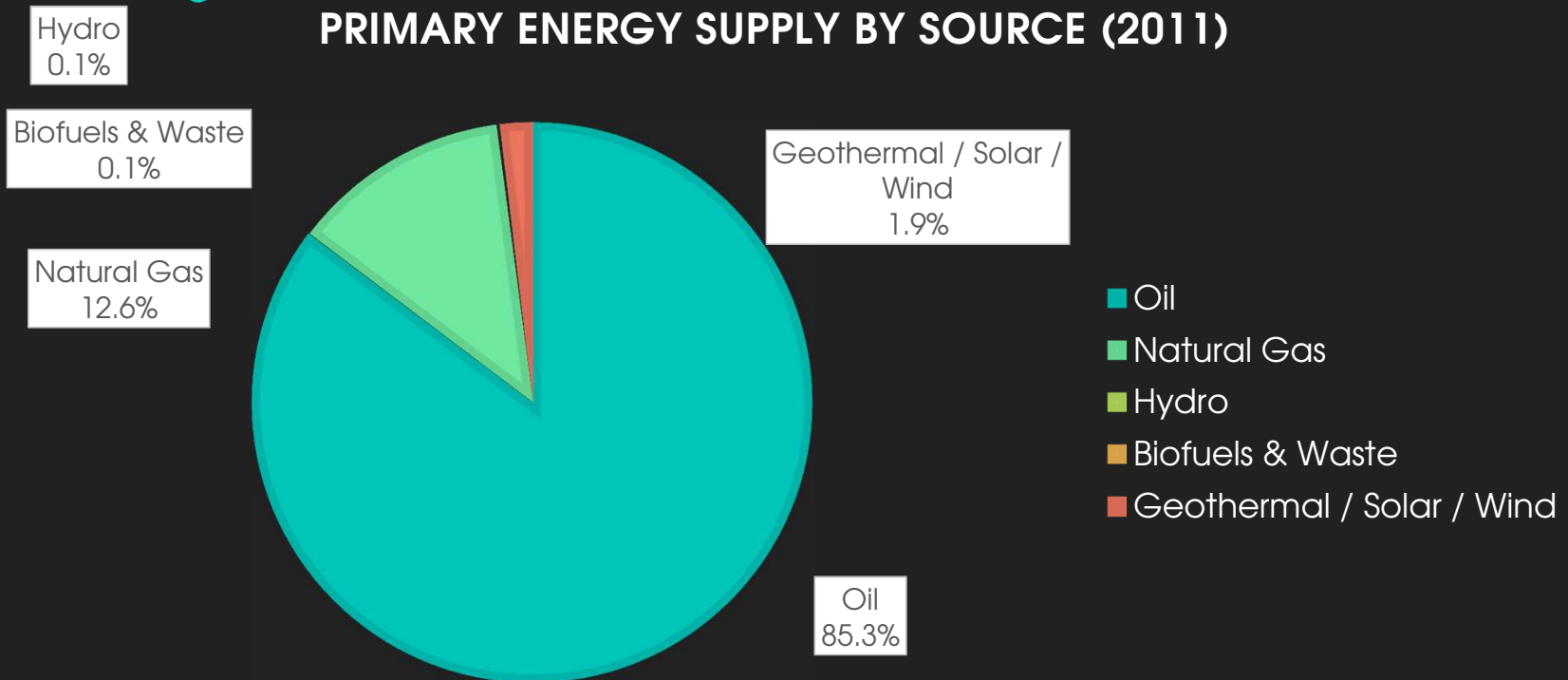
Total Annual Electricity Consumption (2000-2012)



- Primary energy consumption has been growing for the past 20 years
- Consumption at 7,064 kilotons of oil equivalent, which is 46% more than the total energy consumption for the country ten years ago
- Energy use per capita basis remained consistent over the past ten years, growing 16% between 2001 and 2011
- Total electricity consumption has increased 58%, to 10.4 billion kWh
- Annual electricity consumption per capita between rose 25% between 2001 and 2011, from 1,280 to 1,598 kWh per capita.

Energy - Access

PRIMARY ENERGY SUPPLY BY SOURCE (2011)

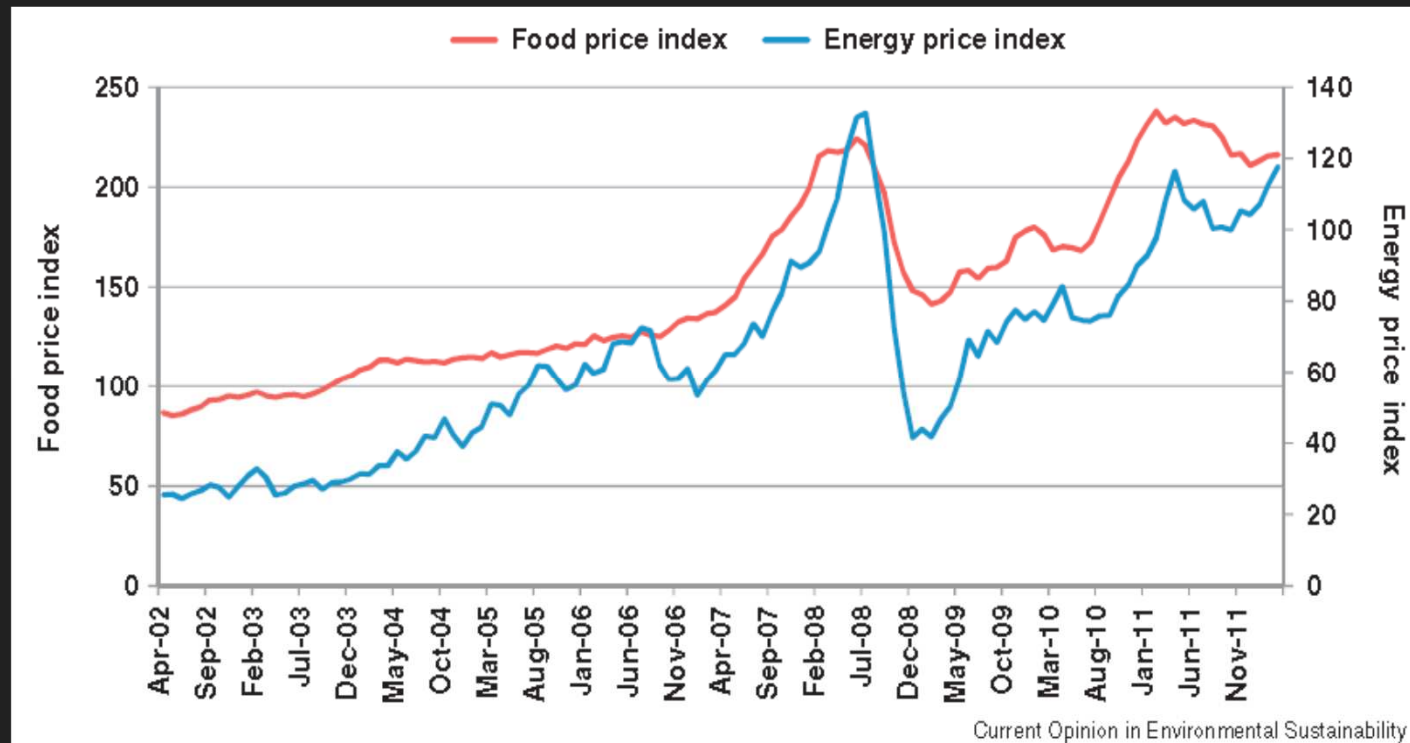


Food - Availability

- 5% of the land is Arable – Increased pressure due to development
- Self-sufficient in vegetables, poultry, eggs and fruits and 50% of milk and dairy consumption.
- Bread, fodder grain(what maize and barley), cooking gas are heavily subsidized
- Remaining food demand is met from import.
- Future policy to meet nutrition demand:
 - Social protection initiatives: e.g., increases in distribution of cash, food or vitamin supplements
 - Short-term responses to economic events: e.g., removal of taxes and tariffs on essential commodities
 - Longer-term Poverty alleviation interventions: e.g., policy support and project-based actions for increasing agriculture; income generation projects

Food - Availability

- High correlation between world food and energy prices
- Agriculture is becoming increasingly energy intensive through increased use of fertilizers, machinery and groundwater pumping



Initiatives towards a Green Economy

- Jordan Identified 6 Areas of green economy opportunities:
 - Water Sector
 - Energy Sector
 - Transport Sector
 - Waste Sector
 - Organic and Sustainable farming
 - Sustainable tourism, eco-tourism

Water Policy Initiatives

- Disi Water Conveyance Project
- The Red-Dead Canal
- The development of sanitary infrastructure
- The Water Demand Management Policy
- Jordan Water Demand Management Policy

Green Economy Benefits: Water

- As part of the national strategy to address the water shortage, the Jordanian government has begun plans to build a water desalination plant in Aqaba. The JD 30 million plant will be set up on the southern shores of Aqaba with a capacity of 5 million m³ annually
- Cutting power usage by one fifth could save US \$1 billion yearly, while cutting water usage by one fifth could save up to 200 million m³ of water. Water losses result in the nation losing JD 100 million yearly, which represents almost third of the total environmental degradation which costs 5 % of the Jordanian GDP.
- The total job creation from moving toward a green economy in water is over 31,000 jobs.

Energy Policy Initiatives

- Jordan pursued sector reform by implementing the energy components of the National Social and Economic Development Program for 2009-2011, and the Energy Master Plan for 2007- 2020. The National Energy Strategy 2008-2020 was created as a result.
- A renewable energy target equivalent to 7% of the energy mix by 2015 and 10% by 2020. The plan also calls for up to 1,000MW of wind, 600MW of solar and 50MW of waste-to-energy to be brought online by 2020. This plan would boost electricity generation capacity from renewable sources to 1.8 gigawatts by 2020, up from just 18 megawatts at present.
- In April 2012 the country passed the Renewable Energy and Energy Efficiency Law (REEL), which requires the national utility company to purchase electricity from renewable energy projects and for the government to cover the cost of grid connection
- The energy strategy of Jordan emphasizes :
 - Significant progress in and expansion of, all types of clean energy technologies
 - Encouraging prudence in energy usage, and cost effective demand management
 - Creation of an energy grid, utilizing renewable sources, to be supplied to rural areas

Green Economy Benefits: Energy

- Large potential for cost savings as energy prices rise.
- The Jordan National Energy Strategy is set to generate approximately 3,000 new jobs, for the installation, maintaining and running of renewable energy facilities by 2020

Company name	Total cost saving (JD/year)	Energy consumption (JD/year)	Saving/year %	Pay back period (yr)	Investment required (JD)
Arab Center For Health And Special Surgery	67,989	313,832	22%	1.8	123,102
Movenpick Resort & Spa Dead Sea	76,821	665,625	12%	0.8	60,052
Movenpick Resort Aqaba	86,449	358,223	24%	1.9	164,819
Four Seasons Hotel (Amman)	120,307	648,569	19%	1.4	170,670
Jordan Kuwait Bank	17,854	103,505	17%	1.3	23,579
Industrial Development Bank	4,020	33,065	12%	2.9	11,711

Source: Ministry of Environment, 2010 NERC

Agriculture and Food Initiatives

- POLICIES AND INITIATIVES FOR PROMOTING INVESTMENT IN ORGANIC FARMING
- The Jordan River Foundation. 3 Phases
 - Phase 1: Establishment of a legislative framework for organic farming
 - Phase 2: Increase awareness and knowledge of organic farming
 - Phase 3: Increase both the marketing and output of organic farms, and support organic farming in both the public sector and in NGO's
- Improve management of water for Irrigation

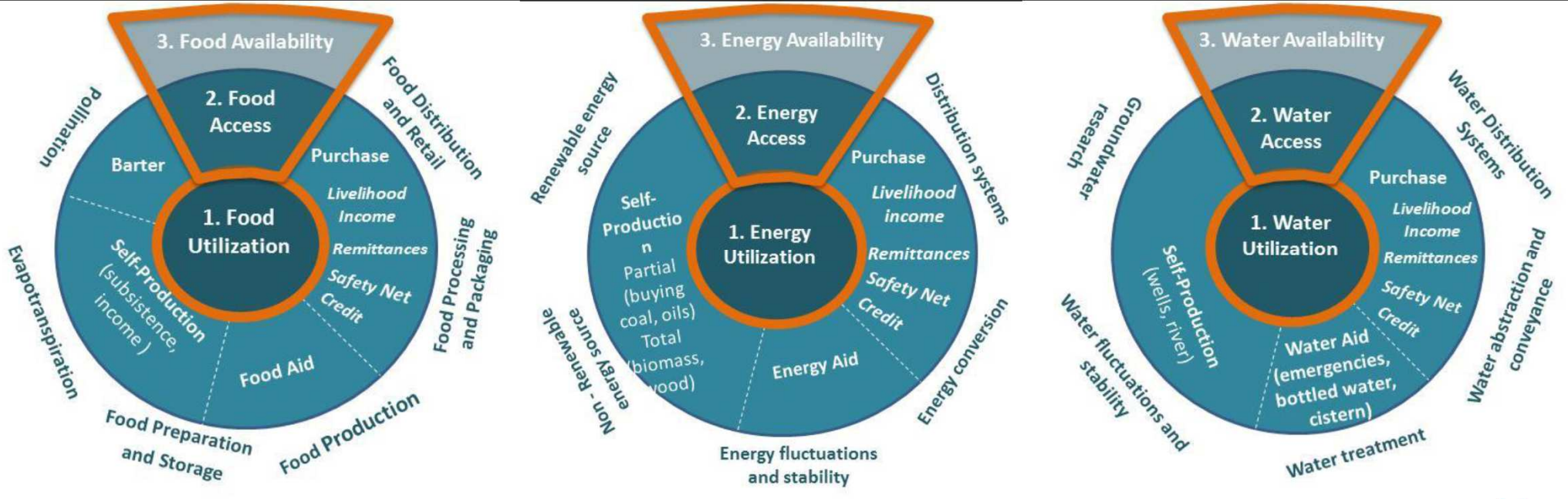
Green Economy Benefits: Agriculture

- The government is aiming to have 5 per cent of farms offering organic goods by 2014, thus increasing the need for employed personnel.
- Within the agricultural sector there is an estimated total of JD 2.22 billion in investments, approximately 50 per cent of which are foreign
- Assuming a goal of 5 per cent of total agricultural land to be used as organic farmland, would lead to approximately JD 111 million in investments.
- Create 1,700 new jobs in sustainable agriculture.

Nexus approach towards G.E. integration

- Applied nexus thinking allows for optimization of resource efficiency by evaluating connections between water-energy-food systems and identifying weak spots that are missed from Silo thinking.
- Allows for the development of Water-energy-and food resources and not at the expense of any singular pillar.
- Define Key Resource Securities.
 1. Utilization: How is the resource currently being used? What are the themes and issues?
 2. Access: Where does the resource come from? Describe the resource supply systems and issues
 3. Availability: Describe future supply of resource and factors that influence it

Defining Key Resources Securities



Looking Forward

- Achieving the MDGs and moving to the SDG's and integration of the Green Economy
- Areas of focus:
 - Increase transparency between Government ministries.
 - Develop and provide relevant, quantified information and tools across the nexus
 - Optimize market and trade solutions
 - Reach national resource efficiency and security in water energy and food.

THANK YOU