

**Sustainability of Food Production System in Bahrain  
under the challenge of water scarcity; food security and  
climate change**

**By: Salma Bani**

10th Gulf Water Conference



# Sustainability of Food Production System

Sustainable Food production is a complex and interrelated system . It operates within complex systems and is multifunctional in it is nature. For example we cannot simply maximise production, without also ensuring that the system which delivers those increased yields meets society's other needs.

# Sustainability of Food Production System

Sustainable agriculture is defined as the ability of farmland to produce food and other agricultural products to satisfy human needs indefinitely as well as having sustainable impacts on the broader environment.



## Sustainability of Food Production System

The principle of sustainability implies the use of resources at rates that do not exceed the capacity of ecosystems to replace them. By definition, dependency on non-renewable inputs is unsustainable, even if in the short term it is necessary as part of a bath toward sustainability.

# Sustainability of Food Production

Due to interconnectedness of Agriculture's different roles and functions There are many difficulties in making sustainability operational.

For example dependency on non-renewable inputs such as water is unsustainable, even if in the short term it is necessary as part of a bath toward sustainability.

# Sustainability of Food Production System

Therefore, how can we create a more sustainable approach to agriculture while recognizing those wider and important social and economic parameters is the question we need to answer.

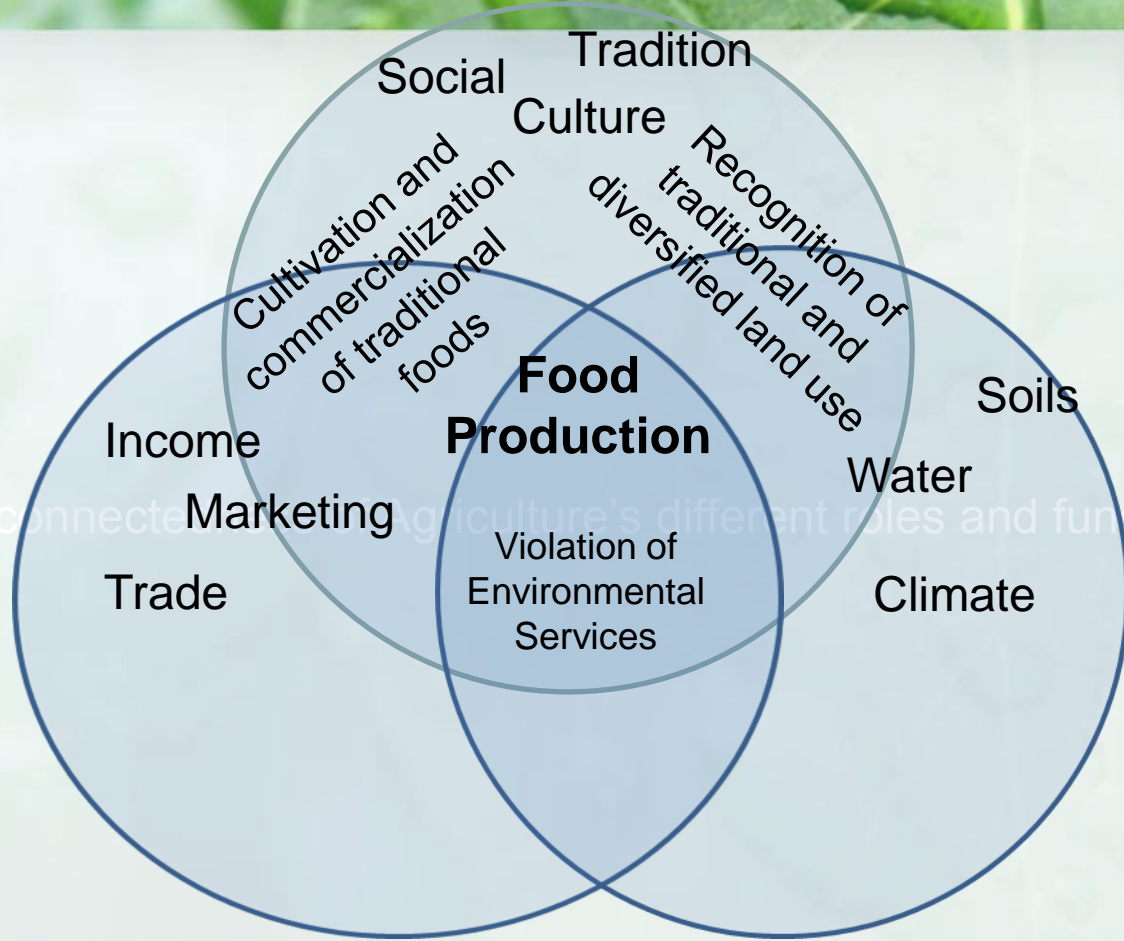
This requires agriculture to avoid severe or irreversible damage to the ecosystem services (such as soil fertility, water quantity and quality, genetic variability, etc.)

# Perspectives underpin the concept of sustainable food production systems

Following perspectives are shown to underpin the concept of sustainable food production systems:

1. Environmental accounting identifies biophysical limits for agriculture.
2. Sustained yield refers to output levels that can be maintained continuously.
3. Production unit viability refers to the capacity of primary producers to remain in agriculture.
4. Product supply and security focuses on the adequacy of food supplies.
5. Equity is concerned with the spatial and temporal distribution of products derived from resource use.

# Social



Interconnected Agriculture's different roles and functions

**Economic**

**Environment**





# Adaptation strategy in response water scarcity and climate change

The complex connections between water, food security and climate change will create significant negative impact on food production and remains a crucial policy issue.

The aim of this paper is to review the role of local production system in ensuring food security, with major emphasis on the approaches and actions to be taken towards ensuring food security as well as adaptation strategy in response water scarcity and climate change in the Kingdom of Bahrain.



# Challenges

The biggest challenges Bahrain agriculture is facing are limited agricultural lands and shortage of water resources.

Ground water is the major resource of irrigation in Bahrain because of limited rainfall which about 70 mm per year and unavailability of the surface water.

Water allocated to the agriculture sector represents more than 80% of the available water resources in the country which is about 180 million m<sup>3</sup>/year.

# The three irrigation systems commonly used in Bahrain



**Traditional irrigation systems**



**Modern irrigation hydroponic**

# Agricultural production is supported through provision of subsidies

Government provides subsidies in several forms, such as:

- 84 percent of the cost of machinery services
- 40 percent of the price of modern irrigation equipment
- and 50 percent of the price of pesticides
- 40 percent of the price of plastic sheet
- 50 percent of the price of veterinary drugs and animal vaccines
- 5 percent of the price of local poultry meat.
- Loans are also, provided to farmers intending to launch programs to protect date palms, and other farming activities.
- ( Food security Scheme)

# Reallocation of domestic resources

Bahrain require a reallocation of domestic resources in order to increase agricultural production lowering its food imports and boost the contribution of agricultural sector to its Gross Domestic Product.

Agriculture contributes only 0.4% to Bahrain's real GDP. Therefore, Bahrain remains heavily dependant on imports to meet its domestic demand for most agricultural products.

# Food security and Food production Sustainability

In order to address the growing demands of an ever-increasing population, combined with the scarcity of natural resources, in particular water and with the world facing perfect storm of food scarcity, Bahrain established Food Security Scheme to :

- ✓ Optimize the exploitation of agricultural land.
- ✓ Empower farmers and grant them land to boost production.
- ✓ Encourage agricultural investment and optimize the role of the private sector in developing the sector.

# Strategy to improve water management and sustainability in the agricultural sector

To preserve natural resources for the present and future generation effort is being made in the agricultural sector on:

- ✓ Adoption of sustainable development agricultural policies.
- ✓ Promote improved water use efficiency in agriculture
- ✓ Utilization of treated sewage effluent (TSE).

However, new policies and institutions are needed for implementing a sound sustainable agricultural policy on:

- ✓ water use development program .
- ✓ Production of certain strategic crop-(commodities that have comparative advantage).
- ✓ Promotion of vertical intensified farming.
- ✓ Explore the possibility of agricultural investments in other countries for agricultural and animal products.



# Conclusion

The key element towards sustainable solutions is fundamentally lying in the way we are using and managing our resources in the agricultural sector. Therefore, answers to the resolving issues of food security and stability in food production will increasingly come from improved water management and its sustainable use in the agriculture sector.





**The End  
Thank you**

10/29/2012

10th Gulf Water Conference

