INTRODUCTION TO THE THEME

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PLENARY I

Food Security

1. AVAILABILITY
   There is a reliable and consistent source of quality food.

2. ACCESS
   People have sufficient resources to produce and/or purchase food.

3. UTILIZATION
   People have the knowledge and basic sanitary conditions to choose, prepare, and distribute food in a way that results in good nutrition.

4. STABILITY
   People's ability to access and utilize food that remains stable and sustained over time.

FOOD SECURITY AND NUTRITION
Water Scarcity is indeed already being experienced

- Precipitations
- Temperatures
- Sea level rise
- Evaporation
- Soil moisture
- Melting of Glaciers
- Streamflow
- Groundwater
- Floods and droughts
- Low flows
Elements of climate change

- Warmer, Drier and more variable weather
  - In Arab region, during the last 100 years higher temperatures have been recorded
- Less but more intense rainfall
  - More frequent floods and droughts
- Sea level rise
- Lower groundwater recharge

Extreme hydrological variability: floods and droughts
Climate Change – An Integrated Framework

Climate Change - an integrated framework

- Climate Change
  - Temperature rise
  - Extreme events
  - Melting of ice caps
  - Sea level rise

- Emissions and concentrations
  - Greenhouse gases
  - Aerosols

- Impacts on human and natural systems
  - Food and water insecurity
  - Ecosystem and biodiversity
  - Health impacts
  - Property damage

- Socio-economic development paths
  - Economic growth
  - Technology
  - Innovation
  - Governance

Adaptation

Integration

UNCERTAINTY: cannot be the lame excuse not to act!!

- Uncertainty is the most certain thing in life
- Uncertainty in climate prediction is not sufficient reason not to act
- Act Now
- Innovation, science and technology, and investment
- Integrating scientific knowledge into decision-making is critical.
- Dialogue between science, policy and society is essential
Types of Droughts

Early season: Delayed onset, prolonged dry spells after onset

Mid-season: Inadequate soil moisture between two rain events

Late season: Early cessation of rains or insufficient rains

Importance of Irrigation

Agriculture cannot be made solely dependent on rains as it amounts to gambling with the nature.

- Kauṭilya’s Arthashastra, 371 BC

References of canals and dams found in Vedas and Smritis.

Irrigation Department of Chandragupta Mourya constructed a beautiful lake named Sudarshan at Girnar, Gujarat
Challenges of sustainable food production

- Diminishing freshwater supplies for agriculture
- 80-90% of the increase to come from already cultivated lands
- Aging irrigation infrastructures
- Weak institutions and poor water governance
- Climate variability and change affecting agricultural production
- Lack of institutional and individual capacity

Sustainable intensification of Irrigation

- Improved water governance,
- More and smarter water management systems,
- Adapted to increased climate variability and local circumstances,
- Prevention or reduction of
  - over-exploitation of water systems,
  - pollution,
  - desertification/erosion of river basins,
  - transfer of land and water due to urbanisation,
  - flooding and salinisation.
Conflicting paradigm

- Volatile markets and climatic uncertainty
- Need to increase farmer incomes,
- Reducing poverty, and
- Protecting the environment

It is anticipated that irrigated agriculture will provide close to 60% of the extra food needed over the next 25 years.

ICID network consist of member countries that represent 90% of the total irrigated area.

[Map of ICID member countries]
Agenda 2030 has provide opportunity to ICID to revisit its vision and mission

**Vision**
- Water secure world free of poverty and hunger through sustainable rural development

**Mission**
- Working together towards sustainable agriculture water management through inter-disciplinary approaches to economically viable, socially acceptable and environmentally sound irrigation, drainage and flood management

**Key to achieve the Vision**
- generating new knowledge
- compiling and collating information
- sharing experiences and good practices
- disseminating the new knowledge to the relevant stakeholders

Organization has set six goals to enable its members to meet the new development challenges

1. Enable higher crop productivity with less water and energy
2. Be a catalyst for change in policies and practices
3. Facilitate exchange of information, knowledge and technology
4. Enable cross disciplinary and inter-sectoral engagement
5. Encourage research and support development of tools to extend innovation into field practices
6. Facilitate capacity development
Water Management in a changing world:
Role of Irrigation in Sustainable Food Production

Upgrading of conveyance network
Conveyance losses of 40-50%
Conventional and Modern Control Structures in Conveyance Network and SCADA

- Remote control of structures and monitoring of flow

Sub theme 1
Key Issues of Irrigation and Drainage in balancing water, food, energy and ecology
Sub theme 2
Management of Climate Extremes with Focus on Floods and droughts

Upgrading of inefficient surface irrigation

Sub theme 3
Key and Smart actions to alleviate hunger and poverty through irrigation and drainage

Upgrading of inefficient surface irrigation
THANKS

International Commission on Irrigation and Drainage
www.icid.org

For working together towards better agriculture water management