ICID Young Professionals E-forum (IYPeF) Discussion outputs

- Role of Education in Irrigation and Drainage
- Role of Women in Irrigation and Drainage
- Geospatial Technologies for Sustainable Irrigation and Drainage

15th July – 2nd September, 2016

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**Background**

- There has been relatively less interest and investment in I&D
- The evolution of interest; and essentials:

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<td>Demographic</td>
<td>Increasing food production, limited land and water resources, strong linkages between water-food-energy, climate change, under-utilisation of existing infrastructures</td>
<td>Renewed interest in I&amp;D investments</td>
<td>New breed of I&amp;D professionals/more YPs</td>
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<td>Social</td>
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<td>Rising need for new &amp; innovative approaches</td>
<td>Gender balance &amp; Participation</td>
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<td>Economic</td>
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<td>Need for multi-disciplinary nature of solutions</td>
<td>Exploring potential of technological options</td>
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Complexities of development
1. Role of Education in I&D

Is there sufficient manpower in the I&D sector?

- Well-developed human resource:
  - Sustained invention and application of up-to-date technologies
  - Successful knowledge transfer
  - Reformed awareness building
  - Educating the public
  - Organized approach of tackling complex challenges
  - Systematic learning through experience sharing.

- There is apparently a big gap in (active) trained manpower.

What needs to be done to attract more Yps?

- Agricultural career pathways to children in their education system
- Improving the (YPs’) image of agricultural sector
  - continued networking and experience sharing
  - Exploring paying features, lucrative opportunities of agriculture
  - Improving present/future Job markets
- Linking YPs with entrepreneurs
- Expert discussion forums
- Taking the lead in global political contest over water:
  - Highlight achievements, showcase them, promote future innovative role
  - Revitalize partnerships, synergies with other international bodies
  - Continual transformation of I&D institutions
Roles of educational institutions

- Universities have a big role to play
  - Balance between academic theory and practical approaches
- There has been improvements, not yet adequate
  - In terms of methodology and practicability.
- Enabling methodology
  - to observe and manipulate actual objects and processes
- Standalone department/unit/research group
  - Develop a unique standard from general to advanced level
- Bringing relevant people (educators, researchers, farmers) in a common platform - international initiative
- Capacity limitation of educational institutes

Yps’ expectations from I&D organizations

- Strong enabling environment in terms of imparting additional skills
  - to apply theoretical knowledge into practice
  - to raise confidence and inspiration
- Progressive need-based knowledge and skill building

- Experienced I&D professionals are nearing retirement age
  - importance of mentoring programs.
  - International bodies, government organizations, NGO’s well placed to promote:
    - mentoring, skill building and experience sharing
      - Sponsored work placement, graduate programs
      - Internships, experience through volunteering,
      - Use of social media
2. Role of Women in I&D

- Issue at a global level since the 1977 UN Water Conference
- Women have a crucial role in the I&D sector
- Diverse skills
  - Maintaining household, Field operations, Professional roles, Decision making
  
  "women’s empowerment in agriculture has a direct positive relation to calorie availability, dietary diversity, household wealth, thereby national economy."
  (comment by participant)

- Women are an untapped resources: at all level
- Overlooking roles of women ---- food crisis in the developing world
- Glimmer of hope: Women are increasingly being involved
  - female entrepreneurs breaking into sectors

Role of Women in I&D (Cont.)

The challenges
- Socio-cultural barriers, legal restrictions, Institutional limitations
- Women’s roles are less recognized
  - Unequal pay: economic disadvantage and increased workload
- Much exertion on tasks with less direct economic value
- Lack of female participation: emanating from
  - lack of access to resources, services and information
- Challenges exacerbated in developing countries
  - limited involvement in I&D choices and decisions
  - Industry remains largely male dominated
Role of Women in I&D (Cont.)

Possible options to improve women’s Participation in I&D

• Policy provisions: to some part in place, and to some part not
  – Participatory Irrigation Management
  – Gender education from lower to higher level
  – Gender sensitive work environments
    • Examples of success in WRM:
      - Vietnamese Water Resource Ministry, Australian water trading market

• Further actions
  – Promoting shared household responsibility
  – Influencing culture: education & awareness raising
  – Provision of support networks
  • Agricultural training, education opportunities
  – Empowerment, Gender inclusive social meetings
  – promoting representation in boards and decision making roles.

Role of Women in I&D (Cont.)

• Capacity development needs for better involvement
  ❖ Training and education
    • practical water management skills
    • finance, agribusiness and value chain management
  ❖ young women professional to be promoted into decision making roles.

Under increasing pressure of population growth and changing climate it is vital that both genders are given equal chance to contribute skills, labour, expertise and knowledge to achieve the common goal of sustainable development.
### 3. Geospatial Technologies for Sustainable I&D

- Planning, design, control and modernization procedures
- Gap: potential and actual usage of new technologies
  - how megatrends of digitalization, availability of new technologies can serve I&D?
  - how they would impact involved societies?
- Available options: Remote sensing, GIS, GPS, GNSS
  - Offer geospatial data, satellite and aerial imageries

#### Applications:
- Land use classification
- Water level monitoring
- Floods risk assessments
- Estimation of crop water requirements
- Mitigating risks: early warning systems and real-time agronomic advice

#### Advanced Technologies
- Unarmed aerial vehicles (UAV) and drones
  - Data with a more local focus and higher spatial resolution
- New cheap sensors (e.g., WaterBit Inc.)
  - Spatial data with high temporal resolution
- Higher cost
- Applicable where more detailed information is required and possible to attain

#### Training Requirements
- GIS & and computer-aided design (CAD) software,
  - Relatively easy to use and widely available
- Data processing for agricultural management purposes
  - Use of computational hydrological models
Overall implication

- Appropriate governmental policies
- Broad educational and research programs
- Boosting entrepreneurship
- Hackathons
- Young generation to have a bigger role

To explore the potential of geospatial technologies?

- Profitable farming
- Optimum resource utilization
- Boost in national economies
- Sustainable agriculture

Geospatial Technologies for Sustainable I&D (Cont.)