

Tracing Synergies and Trade-off Across Water-Energy Food Nexus: A Practical Step to Achieve SDG 2, SDG 6 and SDG 7

The 9th International Forum for Sustainable Asia and the Pacific
-Transformational Changes: Putting Sustainability at the Heart of Action-
25-26 July, 2017

Bijon Kumer Mitra
Senior Water Resource Specialist

Where are we now?

Food



Globally, 795 million people remain undernourished (FAO, IFAD and WFP 2015)

Water



Nearly 1 in 10 people live without clean safe water (WHO and UNICEF, 2012)

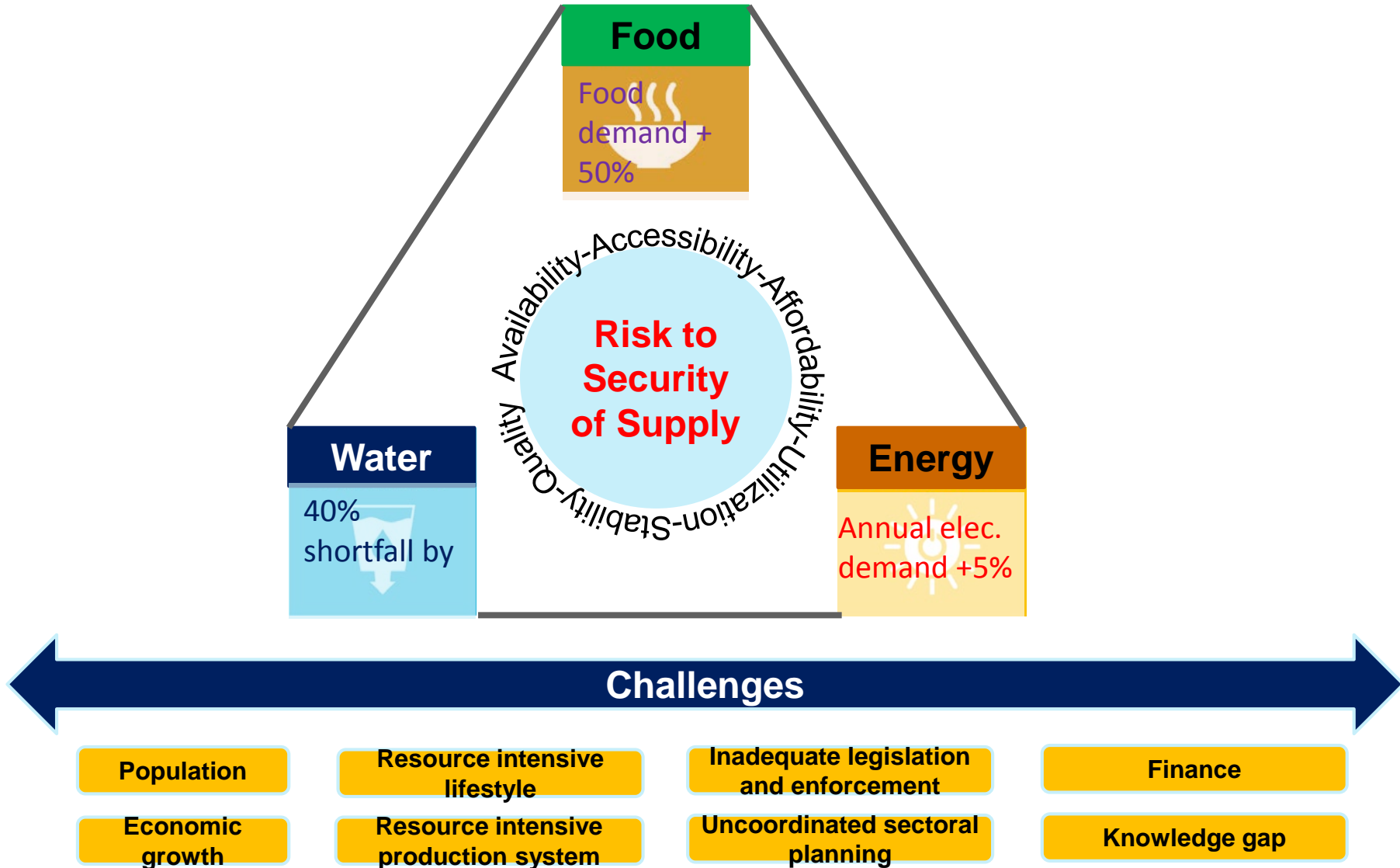
Energy



Nearly 1.2 million people have no access to Electricity (IEA, 2016)

where are we heading for?

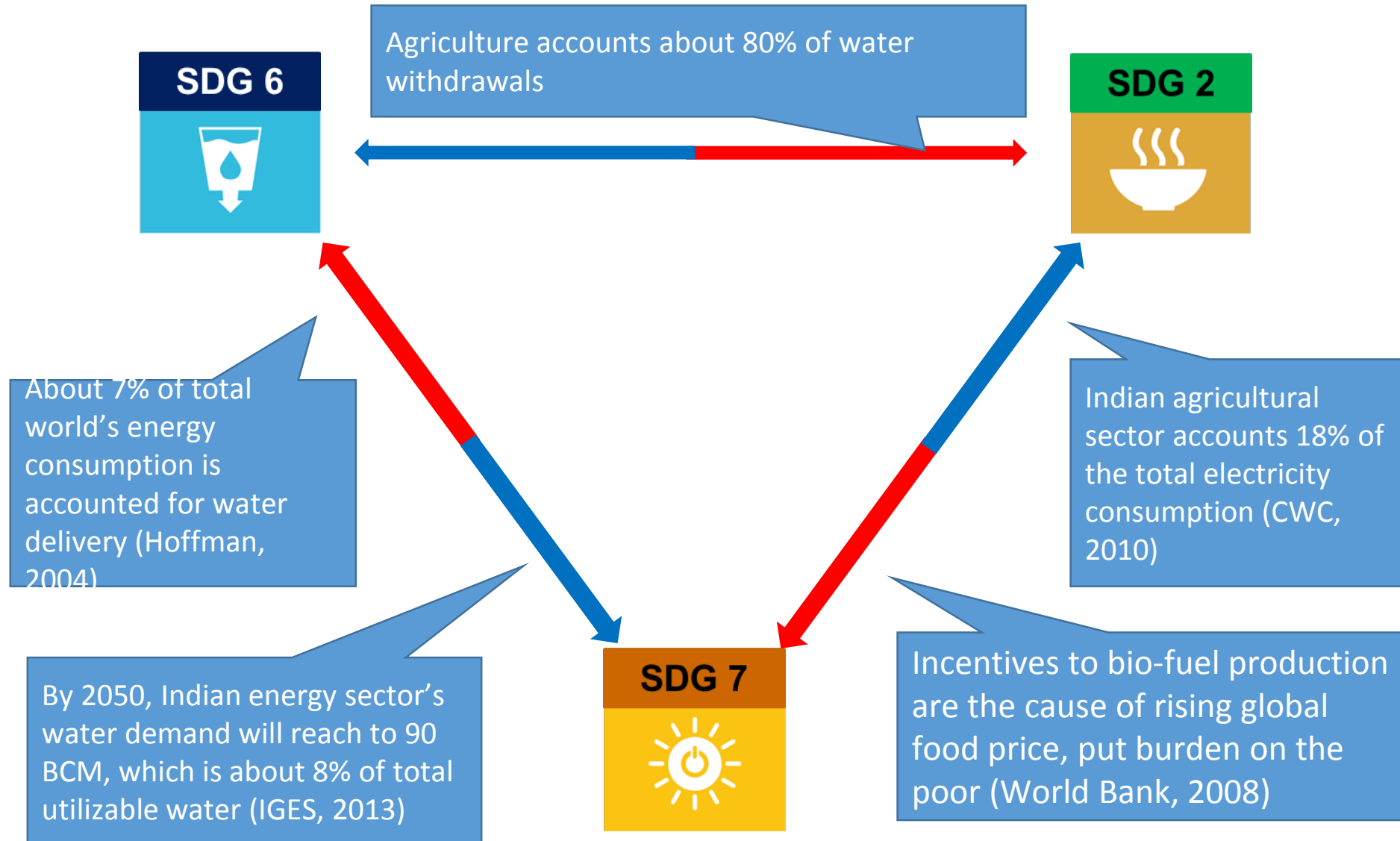
Food, water and energy security are not going to be ensured



Key questions to achieve SDG 2, SDG 6 and SDG 7

- ✓ What solutions and strategies can be carried out to close identified gaps between resource demand and supply
- ✓ How we can identify and enhance synergies and minimize trade-off within the resource supply-demand systems.
- ✓ What are the key enabling factors and conditions can lead to achieve SDG 2, SDG 6 and SDG 7

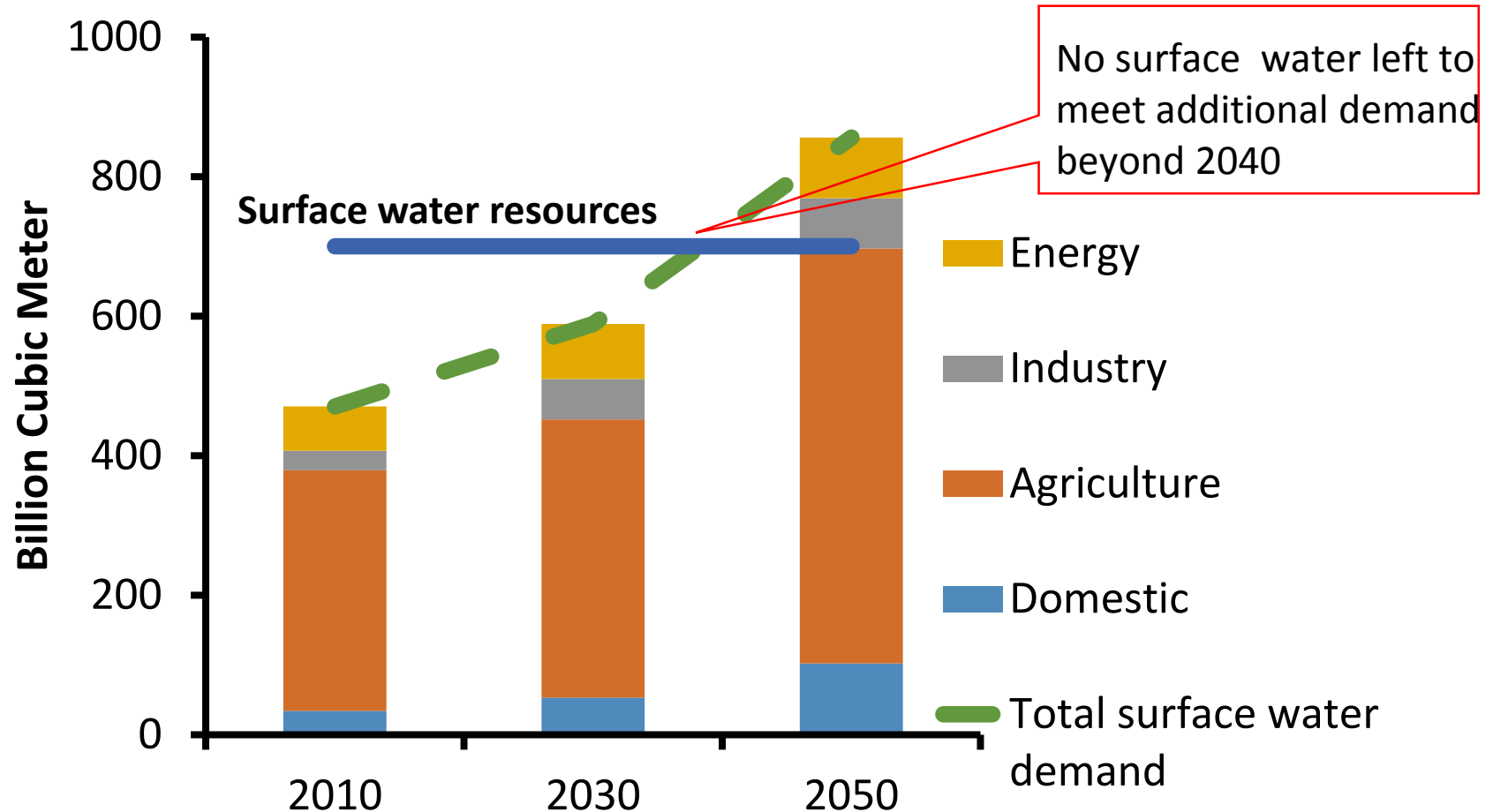
SDG-2, SDG-6 and SDG-7 are not in an isolated but nexus manner



Nexus is not explicitly reflected the SDGs, but critical for country actions

- Each country is primarily responsible to make implementation plan of sustainable development
- Current unilateral sectoral approach, causes unintended trade-offs and conflicts among relevant sectors or areas, will hindering sustainable development
- The country will be the main sufferer, if it fails to address how the efforts to attain sectoral goal and targets would effect each other

Water supply-demand gap scenario- Case of India

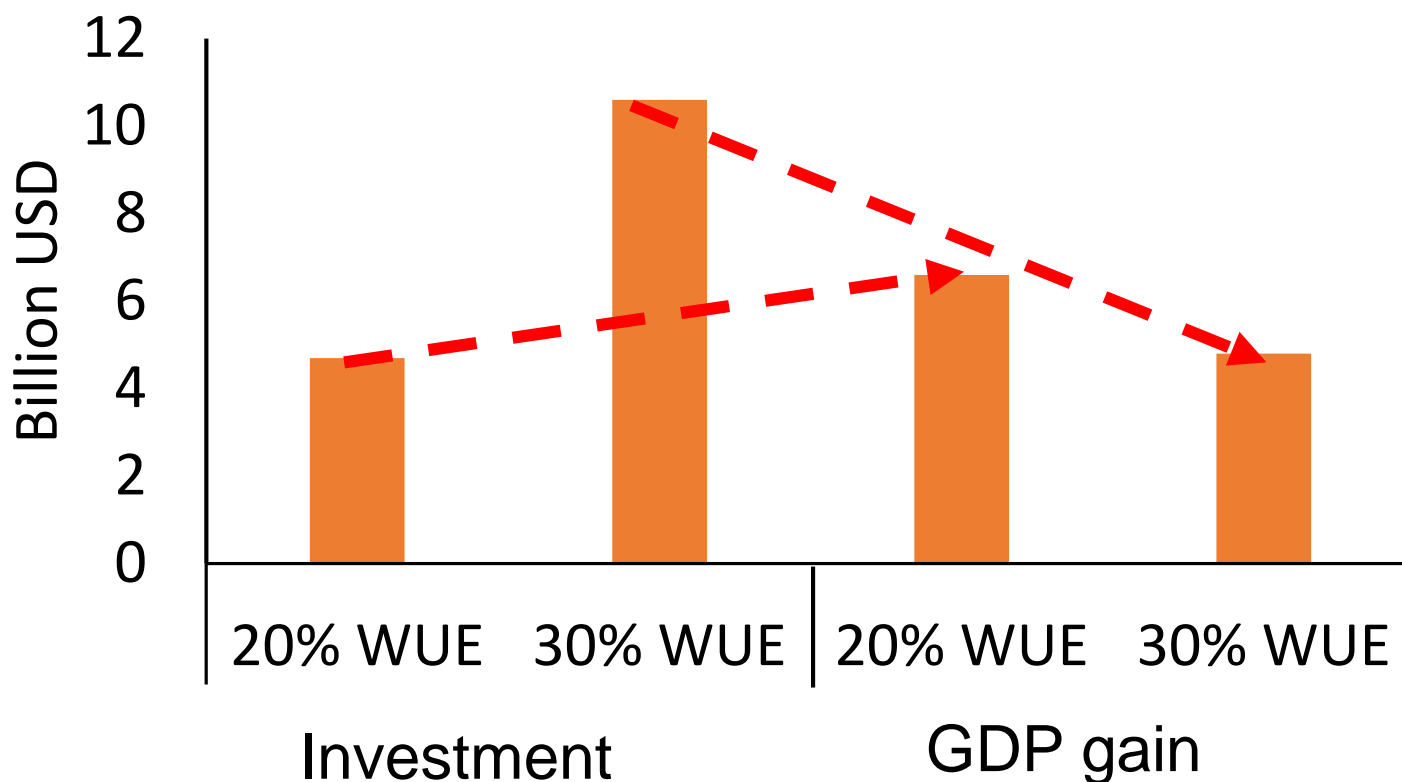


Overuse of water in the production cycles results from low water use efficiency is the main reason of this large gap

Huge potential of irrigation WUE- Case of India

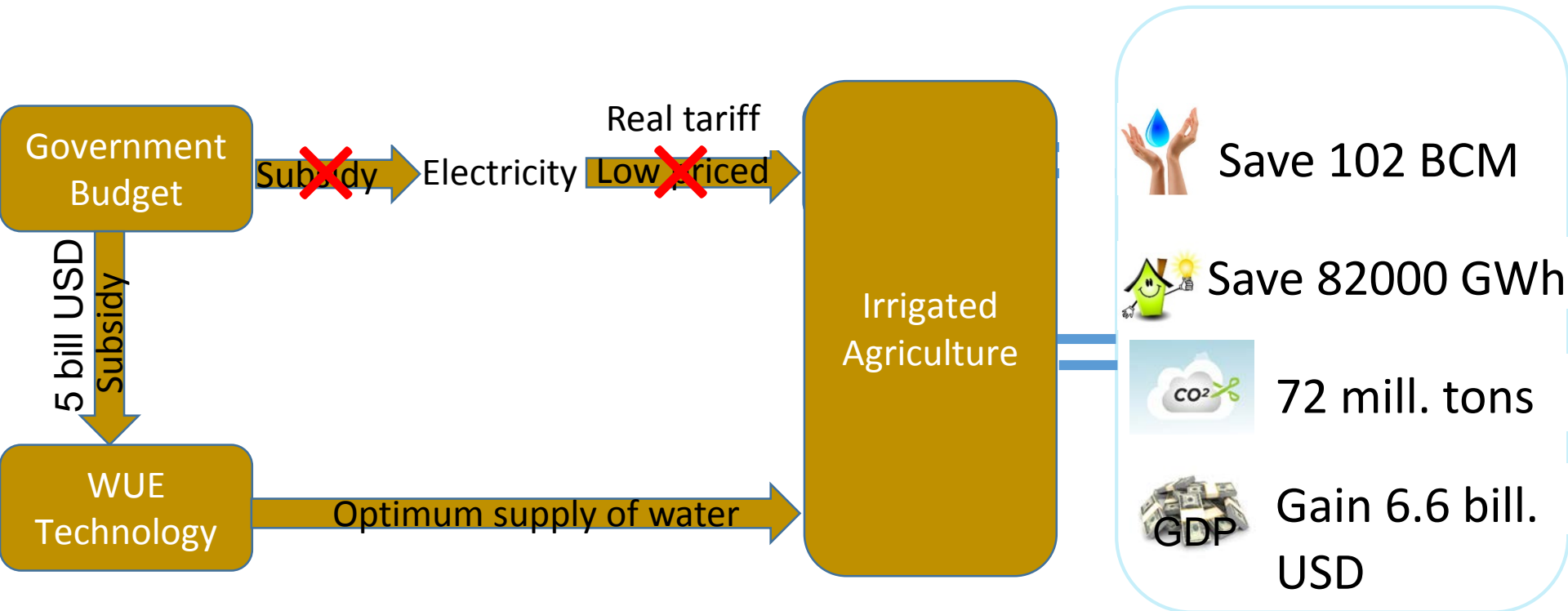
From Current 40% WUE level  to 70% WUE level

But needs billions dollar investment

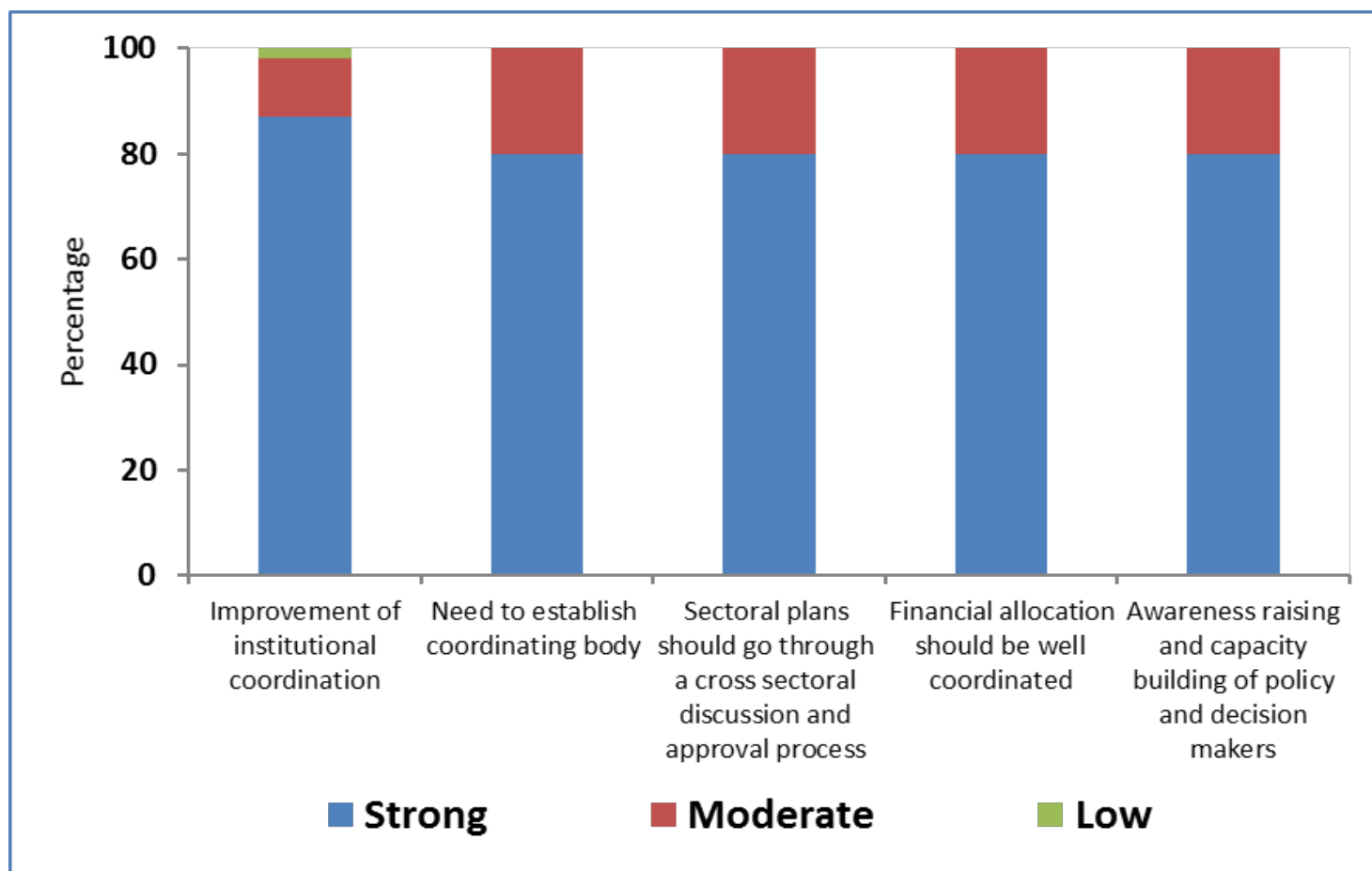


Source: Prepared based on Taheripuri et al. 2016

A nexus solution: Shifts the subsidy amount from power supply to WUE




Enabling factors for operationalisation of FWEN in the country actions



Source : Based on stakeholders survey in developing countries of Asia

Relevant publications



POLICY BRIEF

June 2017
Number 29

Improving Irrigation Water Use Efficiency Holds the Key to Tackling Water Scarcity in South Asia: Technical Potential and Financing Options

Key messages

- Water scarcity is worsening to the point that it has become a limiting factor to the growth of major economies in South Asia, and agriculture is by far the largest water-using sector.
- Overuse of water for crop production is one of the main causes of water scarcity. This overuse results from low irrigation water use efficiency (IWUE) associated with water intensive cropping systems, use of unoptimised irrigation supply systems, uneven water distribution in crop fields, and subsidised electricity for pumping irrigation water.
- There is huge potential to improve irrigation water efficiency in South Asia by promoting low water consuming crops. For example, paddy and wheat need about 75% less water than flooded rice cultivation. Therefore, crop diversification is one of the practical options to reduce water scarcity in water-stressed areas by increasing agriculture IWUE in the region.
- Water-saving technologies such as micro irrigation (including sprinkler and drip irrigation) and laser land levelling can significantly reduce the agriculture sector's water footprint in South Asia. If the full potential of these technologies were to be utilized, Bangladesh, India and Pakistan could save 21%, 31% and 26% of their water respectively, compared with current levels of water use.

...continued on next page

IGES

Author: Rajan Kumar Mitta
Senior Researcher, Sustainable Energy, Technology and Environment

Editor: Arati Mahalingam
Senior Researcher, Sustainable Energy, Technology and Environment

Photo credit: Nagesh Kumar
Water and Energy

The United Nations World Water Development Report 2014

FACING THE CHALLENGES

VOLUME I

INCLUDES DATA AND INDICATORS ANNEX FOR WATER AND ENERGY

WWDR 2014

IGES

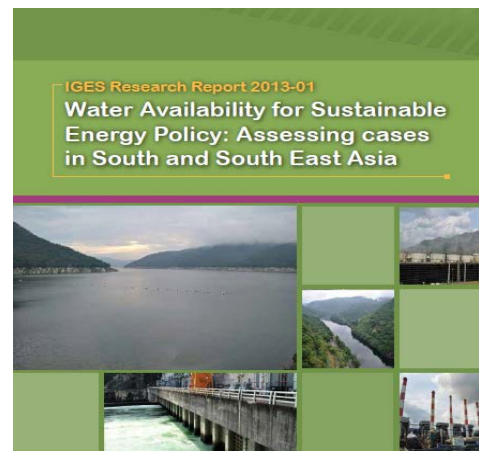
United Nations

World Water Assessment Programme

UN WATER

IGES Research Report 2013-01

Water Availability for Sustainable Energy Policy: Assessing cases in South and South East Asia



Institute for Global Environmental Strategies, December, 2013

IGES



POLICY BRIEF

July 2012
Number 20

Long Term Electricity Scenario and Water Use — A case study on India

Key Messages

- Increasing water demand for electricity generation will intensify inter-sectoral conflicts for freshwater, especially in the countries with water scarcity like India. To mitigate conflicts for freshwater, appropriate policies should be taken in a timely manner. Such policies could be the introduction of water efficient technologies in power plants, promoting low water consuming renewable energy (wind, solar photovoltaic) and the implementation of water demand management approaches for major water users.
- Water constraint is suspected to be a major hindrance for sustainable development of water scarce developing countries such as India to follow the existing projected electricity scenario to fuel desired economic growth.
- With the given technological intervention and its mid to long-term projection in India especially in the electricity sector, it is estimated that by 2050 water demand for electricity generation will increase by fivefold compared to 2010. Such an increased role of freshwater use for electricity generation will exceed the capacity of total utilisable freshwater to meet total water demand by 2050.

IGES

Author: Rajan Kumar Mitta
Senior Researcher, Sustainable Energy, Technology and Environment

Editor: Arati Mahalingam
Senior Researcher, Sustainable Energy, Technology and Environment

Our partners



Thank you very much



For further contact: Bijon Kumer Mitra
Senior Water Resource Specialist
Institute for Global Environmental Strategies,
2108-11 Kamiyamaguchi
Hayama, Japan 240-0115
E-mail: b-mitra@iges.or.jp