

# **Institutional innovation for energy, food and water security in South Asia: the Sustainable Development Investment Portfolio (SDIP) Programme**

Dr Jim Woodhill

Environmental Change Institute, University of Oxford

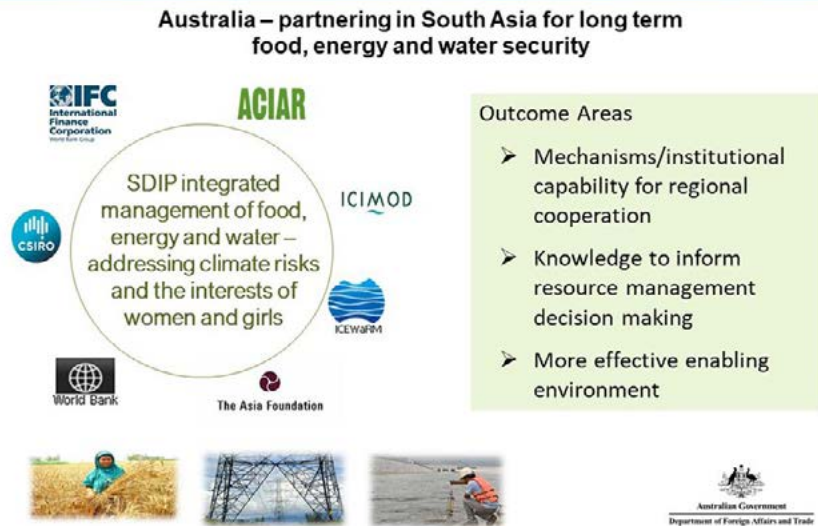
## **Abstract**

Rising populations, rapid urbanisation, industrial expansion and economic growth are projected to significantly increase the demand for water, energy and food in South Asia over the next two decades. Energy demand alone is projected to more than double by 2040. Water availability per capita is expected to continue its long-term decline, particularly in Pakistan and parts of India where, within 20 years, it could reach crisis levels in some subregions. Arable land per capita will also continue to shrink and increases in food supply will need to come from intensified agricultural production systems and/or increased food imports. Climate change is expected to exacerbate these emerging issues of resource scarcity. Rising temperatures, changes to water resource availability – resulting from melting glaciers and changed precipitation regimes – and increases in the intensity and frequency of extreme weather events (droughts, floods and heat waves) are all projected to adversely impact on economic activity, especially in the agriculture and energy sectors. Maintaining water, energy and food security will be a significant challenge for South Asian countries. Competition for land and water resources is set to intensify, driven by increased demand from agriculture, the energy sector and industry. Emerging resource constraints may involve difficult resource allocation trade-off decisions across sectors. Balancing the competing demands will be essential to sustaining future economic growth, poverty alleviation (especially achieving Sustainable Development Goals) and in maintaining national and regional political security. The extent to which South Asian countries can effectively manage these emerging issues will largely determine the region's future economic development trajectory. Adopting a more integrated 'nexus'-based approach to natural resource management and development planning offers much potential for improved water, energy and food (WEF) security and enhanced climate change resilience. Australia, through the Sustainable Development Investment Portfolio (SDIP), is supporting countries to better manage these emerging WEF security constraints, through targeted aid program investments and public/economic diplomacy. This paper highlights some of the innovative approaches that have been supported through SDIP and how they are contributing to improved development outcomes in the agriculture and energy sectors in South Asia.

I want to share with you some of the experiences of the Sustainable Development Investment Portfolio. First, imagine that you are a female farmer, somewhere in the Eastern Gangetic Plain. You have three children. Their diet has not been great, and they are probably a bit smaller than some other kids

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This paper has been prepared from a transcript and the illustrative slides of the presentation.



**Figure 1.** Sustainable Development Investment Portfolio (SDIP)

of a similar age elsewhere. Thinking about how you can pay for their education and their health over the coming few years, you see around you opportunities to produce more. You see solar pumps, you see mobile phones, and agricultural inputs. You know these could help you be more profitable, but to access them will involve a trade-off with the food and education your children need – today.

The reality for tens of millions of farmers and people across that Eastern Gangetic Plain is that water, food and energy are inextricably linked in their day-to-day lives.

What creates incentives for that woman farmer to have opportunities and do something differently? What happens when all of that goes to scale? And how do you ensure that scaling up happens in an equitable way so that the poorest of the poor still can benefit from the opportunities?

Energy, food and water are the resources that we try to tackle in an integrated way through the Sustainable Development Investment Portfolio (SDIP) program. SDIP is a collaboration between the Australian institutions CSIRO, ACIAR and ICE WaRM and others (Figure 1), with linkages to research organisations, and other partners in the region such as the The Asia Foundation, ICIMOD and the World Bank. We are working together around this challenge of how to create long-term institutional mechanisms for tackling water, food-aid, energy nexus issues.

Cross-border issues are very important in relation to water, energy and trade. In SDIP we focus on how to create the capacities, scientific knowledge policies, and institutional mechanisms to improve cross-border collaboration. However, these

ICE Warm: International Centre of Excellence in Water Resources Management  
 ICIMOD: International Centre for Integrated Mountain Development

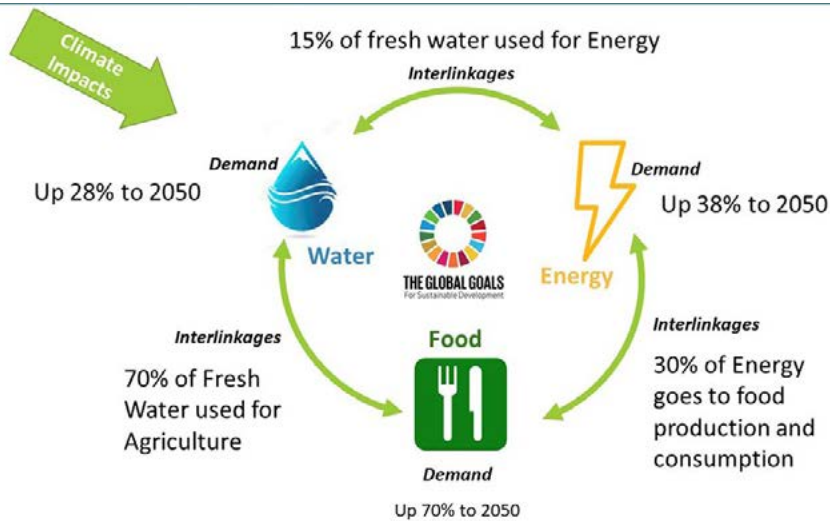


Figure 2. The food, energy and water nexus.

challenges are not solved by short-term technical fixes. I think SDIP is unique because it is not saying, “How can we get a development result tomorrow?”. It is saying, “We’ve got some deep challenges that are going to take long-term thinking, commitment and engagement. We recognise that they are enormous challenges.”

I took you to the very local level, imagining you are a woman farmer. Now, take a global perspective for a moment as we start thinking about the nexus. Figure 2 presents a few big figures that predict how demand is going to change over the coming decades. We know that 30% of energy produced goes to agriculture; we know demand for food is going to go up enormously; we know that energy demand is going to go up by about 38%, and water demand is consequently also going to increase.

Already for South Asia, this all just doesn’t add up. For South Asia demand is growing faster than in the rest of the world. When we add climate change predictions onto that, we really have to radically rethink how to structure, organise and integrate our use of these three resources in this region. This situation is a ‘hot spot’ on Australia’s doorstep (Figure 3). South Asia’s population will soon be 2.2 billion or so, and 15% live in poverty; there is a high proportion of stunting in children; and climate change is potentially going to have massive impacts in that region. Climate change related natural disasters are already experienced on a significant scale, and are likely to become more frequent.

Unfortunately, there are significant institutional constraints to more integrated approaches. People still work in separated areas – ‘stove pipes’: policy stove pipes; sector stove pipes; government, business, civil society stove pipes (Figure 4). In the SDIP program we are trying to build bridges between these stovepipes. Australia has much expertise in working in more integrated way, and not always successfully.

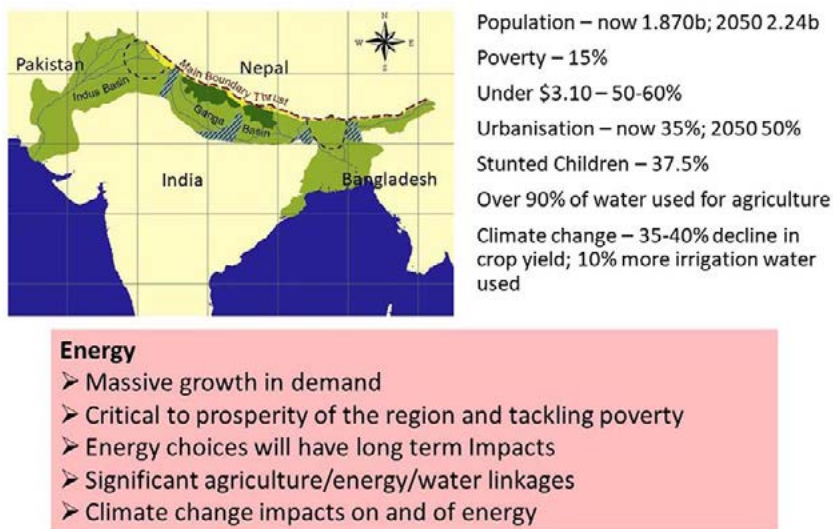


Figure 3. The nexus challenges for south Asia.

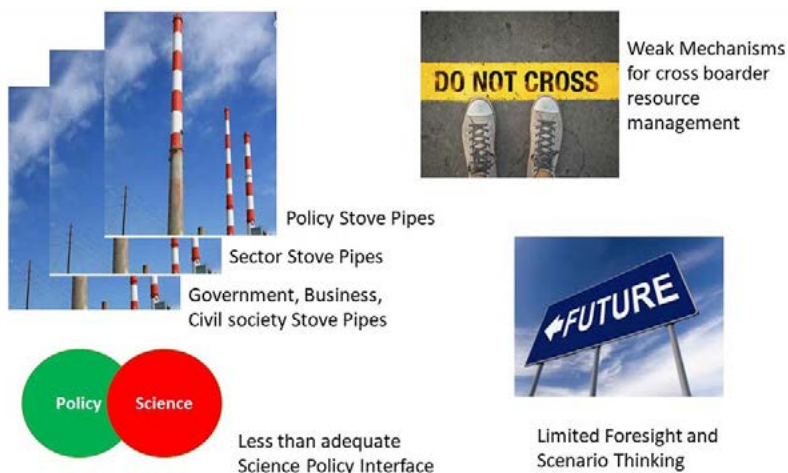


Figure 4. Institutional constraints.

Our future thinking (foresight) is often limited. Part of the SDIP work is looking at the long-term implications of changing food systems, and trying to understand the implications of different future scenarios.

We have a less-than adequate science–policy interface in many areas. Figure 5 lists examples of where the SDIP program is having an impact, including: improved energy and water use in agriculture (see Dr Ajay Mathur’s paper, p. 55, this Proceedings) through the adoption of conservation agriculture; improving resource use in key industries; improving analysis of resource-use trade-offs; supporting analysis of the Himalayan mountain regions; and helping create new opportunities for dialogue.

- Improved energy and water usage in Agriculture – reduced GHGs and increased yield - adoption of conservation agriculture across EGP
- More energy and water efficient industries – sugar industry in Nepal, garment manufacturing in Bangladesh
- Large scale solar energy in India reduction in water use from 5 to 0.03 ltr per kw/h relative to coal – and 18 million access to off grid small home appliances – reducing dependence on kerosene and biomass
- Co-developed the trial Indus River System Model (IRSM) – Water Apportionment Accord (WAA) tool that can support foresight and trade-off analysis
- Support for the Hindu Kush Himalaya Assessment - categorical assessment that 1.5 degree increase is too hot
- Development of food systems foresight and policy processes
- Spaces for dialogue- cross institutional and cross jurisdictional

Figure 5. Examples of impacts achieved through the SDIP program.

Figure 6 (sideways, next page) outlines thinking about innovation systems to support dialogue. Quantitative models can support more informed dialogue process and improve policy-making. There will also always be a ‘Beyond Science’ dimension (top left) to decision making. A conference like this is an opportunity to integrate science and dialogue and drive greater synthesis science (middle part of the diagram).

I think it is synthesis work that is needed to tackle many of the issues addressed in this conference. Investment is needed in this space. It is important to gain a much deeper understanding of the institutional mechanisms that underpin a nexus approach to water, energy and food security and to get such institutions established.

I really like the work of Ulrich Beck who says we need to think about shifting from a society that structures its institutions around wealth creation and distribution, to a society that has much better mechanisms for coping with the risks that we are facing.



We need to stay optimistic, and that we can do that by gaining a deeper understanding of both the systemic risks and the transformational opportunities. In looking at the pressures in South Asia, we see plenty of opportunities for doing things very differently.

However, to realise these transformational opportunities we must become much smarter in connecting political innovation, institutional innovation and technical innovation.

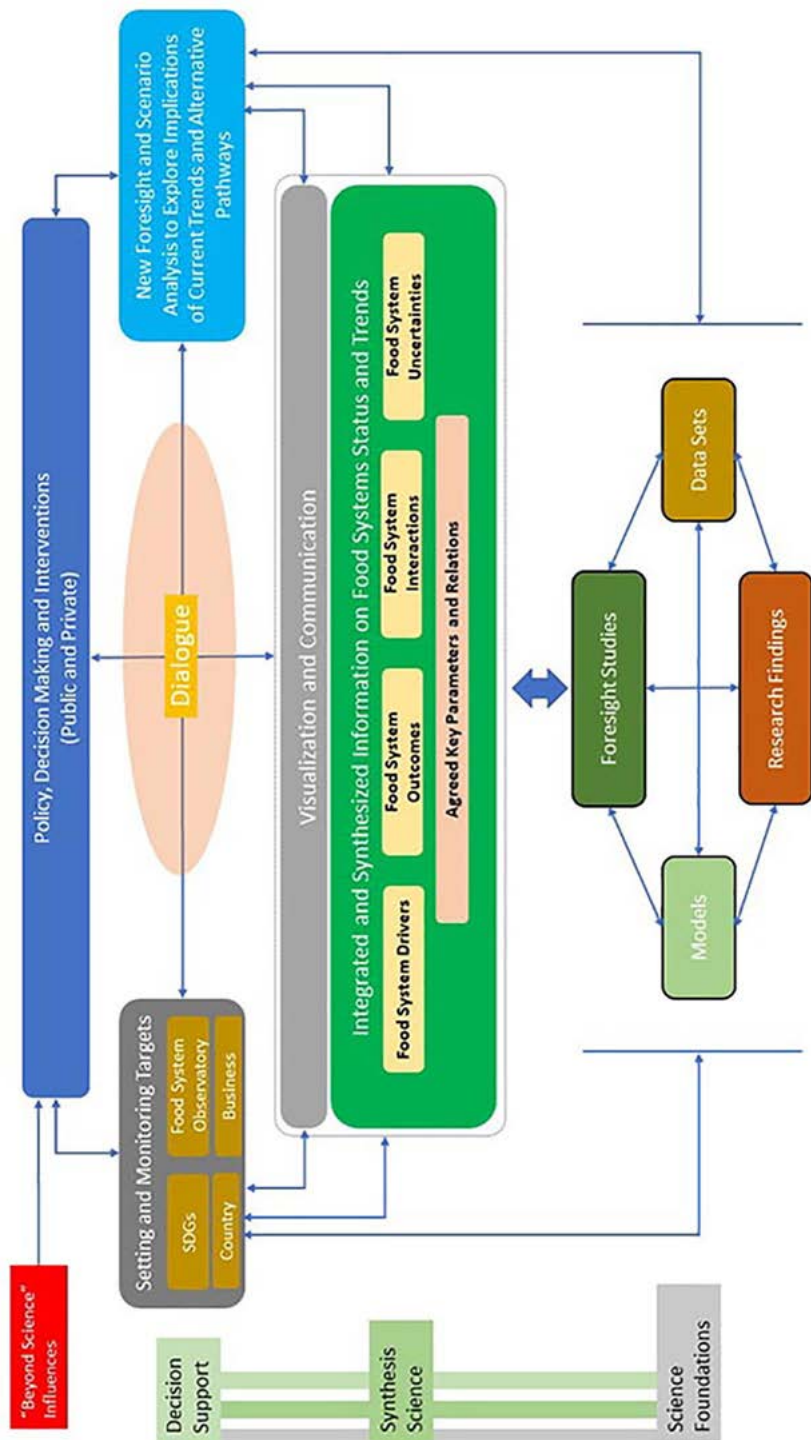


Figure 6. Innovation systems for tackling the nexus.

Dr Jim Woodhill is an Honorary Research Associate with the University of Oxford's Environmental Change Institute and an independent consultant. He is an adviser to the South Asia Sustainable Development Investment Portfolio (SDIP), a program of the Australian Department of Foreign Affairs and Trade (DFAT). Jim is a specialist on inclusive agribusiness, rural development, food security and multi-stakeholder partnerships, with over 25 years of international development experience. Formerly Jim was the Principal Sector Specialist for Food Security and Rural Development with DFAT. Prior to this he was Director of the Centre for Development Innovation at Wageningen University and Research Centre in the Netherlands. He holds a PhD in political economics and a degree in agricultural science.