

Navigating the Nexus



Zafar Adeel

Identifying risks & research in the water-energy nexus

In recent years, strides have been made in research on the water-energy nexus, but there is room for growth. SWS Associate Editor Amy McIntosh spoke with Zafar Adeel, Ph.D., director of United Nations University's Institute for Water, Environment and Health, about the importance of the water-energy nexus and the efforts being made to learn more.

Amy McIntosh: What is the water-energy nexus and why is it important?

Zafar Adeel: Water is an essential component in energy processes and generation. Every form of energy requires water in some form. Similarly, pumping, treating and supplying water requires a lot of energy. The two sectors are closely interlinked. Efficiencies, or lack thereof, in one of those sectors have an impact on the other. At the policy level, these two sectors need to be treated jointly and managed in a development context together to ensure we are maximizing the potential of both sectors and reaching efficiencies wherever possible.

McIntosh: What are some risks municipalities and governments may face because of this relationship, and how can they prepare for these risks?

Adeel: As the climate changes, there will be serious impacts on the availability of water. There may be excessive water in some cases and water shortages in others. What we have come to take as a given in terms of water supply is going to change over time. Similarly, the energy requirements are also going to change. There is a projection of about a 50% increase in energy demand in developing countries by the year 2035. Some of that has to do with climate change, but also relates to population growth and increased industrial development. The agriculture and food sector also ties in because agriculture requires significant amounts of energy and water. In many developing countries,

food habits change, and when they switch to meat-based diets, the water and energy requirements will increase.

In looking at these drivers and their correlation with the water-energy nexus, consolidated policy planning is a key starting point. Secondly, there has to be a significant push toward behavioral changes. What we consume as individuals and communities has to be looked at carefully. The third [element] needed is awareness-raising and engagement of media in providing the right sources of information to people to make them aware of what their consumption patterns are going to mean in the long run.

McIntosh: What kind of research is being done on the water-energy nexus?

Adeel: The World Bank started a project called Thirsty Energy Initiative, [which indicated] that the energy sector has to look closely at its water consumption. World Bank is one of the major investors in developing countries, so it has leverage in determining how this work is done.

We need to better understand the trade-offs between various options. Power stations that are water cooled use a lot of water, and there is an argument now being made that we should switch to air-cooled energy generation, which reduces water usage but actually increases the cost of producing energy. It also increases the greenhouse gases that are emitted.

There is also a fair bit of effort being put into resource-efficient technologies. We have to make sure that for water treatment, we are using technologies that are the most energy-efficient, and for energy generation, we have to use technologies, within reason, that are most efficient for water consumption. **SWS**

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