

## South Africa: A Nexus Approach Case Study

In South Africa, agriculture is the main water consumer, and the National Development Plan aims to expand its area of irrigated land by 50% as a major part of its strategy to alleviate poverty and promote rural development. But water resources are scarce, and also required to meet growing demands from the energy sector, for example in cooling water for thermal power plants. Energy is needed to exploit the country's raw resource base and has been prioritised as key water user by the Department of Water and Environmental Affairs. Climate change is likely to increase the pressure on water resources.

This poses a major nexus challenge, which the National Planning Commission is working to address by ensuring coordination across sectors and moving towards a low carbon and water-efficient economy. However, despite this integrated approach it is unlikely that South Africa's ambitions to expand irrigated land can be fully realised.

With limited water resources South Africa will need to look beyond its borders to ensure national energy and food security. This is seen in the country's investment in the expansion of the Inga hydropower project in the water-abundant Democratic Republic of Congo. While progress has been slow, South Africa and DRC signed a treaty in 2013 guaranteeing South Africa 2,500 MW of the 4,800 MW from the Inga 3 project. Challenges to regional integration include coordinated policies, trade standards, and institutional capacity.

### Key resources:

- Goga, S. and Pegram, G. 2014. Water, energy and food: A review of integrated planning in South Africa. Understanding the Food Energy Water Nexus. WWF-SA, South Africa.
- Carter, S. and Gulati, M. 2014. Climate change, the Food Energy Water Nexus and food security in South Africa. Understanding the Food Energy Water Nexus. WWF-SA, South Africa.
- Food Energy Water nexus South Africa (WWF) <http://www.youtube.com/watch?v=MGNxRZD4Uxs>
- WWF South Africa website [http://www.wwf.org.za/what we do/food energy water nexus/](http://www.wwf.org.za/what_we_do/food_energy_water_nexus/)



## California: A Nexus Approach Case Study

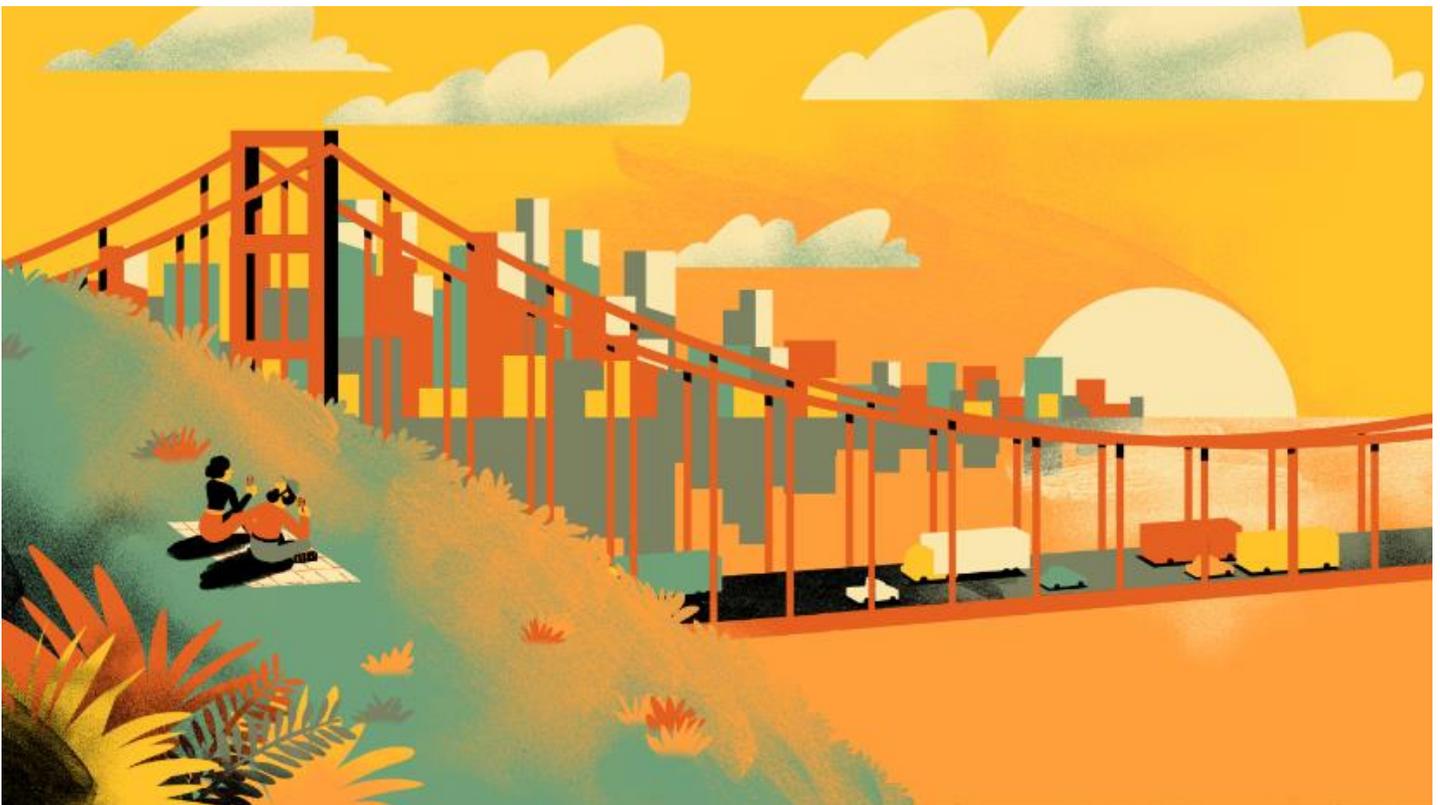
In California, USA, there are strong connections between water and energy. Water is used in the Eastern Mountains to produce hydroelectricity, which makes up as much as one fifth of the state's electricity. However, away from these mountains water is scarce, and to ensure the supply of water across the state, California has invested in the State Water Project. This involves a system of reservoirs, aqueducts, and pumping plants that store water and distribute it to 25 million Californians and 750,000 ha of irrigated agricultural land. This huge system is also the largest user of electricity in the state.

Due to extreme drought, water allocations through the State Water Project have been severely restricted. Amongst other problems, this has resulted in an increased reliance on groundwater. Groundwater normally provides around 40% of water supply in the state and acts as a critical buffer against drought. However, groundwater depletion can lead to problems such as salinisation, stream depletion and, ultimately, risks to food security. The current three-year drought has worsened these risks.

California has responded by assessing its groundwater resources, introducing new legislation for groundwater consumption, and undertaking major efforts to improve the efficiency of water and energy use. New efficiency standards are expected to save over \$1 billion a year in electricity and natural gas.

### Key resources:

- California State Water Project website: <http://www.water.ca.gov/swp/>
- California Energy Commission website <http://www.energy.ca.gov/>
- California's Water-Energy-Climate Nexus. 2013. The Climate Registry & Water Energy Innovations. <http://www.theclimateregistry.org/downloads/2013/10/California-Water-Energy-Climate-Nexus.pdf>



## China: A Nexus Approach Case Study

The forests of Heilongjiang in northeast China, which cover nearly half of the province, are vital for stabilising the region's environment, by protecting rainfall and soils. This makes them critical for agricultural production in the north-east, which is a major rice-growing region. The province's state-owned forests are also central to the country's forestry industry. However, for decades they have suffered from exploitation and poor management, resulting in depleted timber supplies and risks to China's grain supply.

To address this growing problem, the government has launched a trial ban on commercial logging of natural forests across the province. This is being backed up by 2.35 bn yuan in funds to cover the living costs of forestry workers and support the local economy until 2020. Loggers are also being encouraged to switch to alternative livelihoods by becoming forest rangers, blueberry growers and chicken farmers.

It is hoped that these measures will enable the forests to be restored, the ecosystem to be protected, and food and timber supplies to be secured in the long term.

### Key resources:

- [www.theguardian.com/environment/2014/oct/17/china-tests-outright-logging-ban-in-state-forests](http://www.theguardian.com/environment/2014/oct/17/china-tests-outright-logging-ban-in-state-forests)
- [www.gov.cn/jrzq/2014-01/13/content\\_2565718.htm](http://www.gov.cn/jrzq/2014-01/13/content_2565718.htm) (in Chinese)
- <http://finance.chinanews.com/cj/2014/03-31/6013547.shtml> (in Chinese)

