Fluid Thoughts

WRC CEO, Dhesigen Naidoo

The global hunger crisis – Water as a route to nutritional security

According to the official statistics of the United Nations Food and Agriculture Organisation (FAO), in 2011-13, there were 842 million people defined as chronically undernourished in the world.

Chronic hunger is defined as 'not getting enough food to lead active and healthy lives'. This is one in eight people in the world. Of this, 826.3 million are in the developing world while only 15.7 million reside in OECD countries.

According to FOA DG, Jose Graziano da Silva, this was a vast improvement on the 1990 figures when more than a billion people worldwide were deemed to be chronically hungry. This progress is significant especially given that there has been an exponential growth in population in that period.

The largest gains though have been in East Asia, South East Asia and Latin America where we have witnessed a 17% decrease in the total number of undernourished people from 995.5 million in 1990-92 to 826.6 million in 2011-13. In 2013, it was estimated that only 50 out of nearly 190 countries had already achieved the Millennium Development Goal of halving the number of hungry in the world.

The central message is that nutritional security remains unachieved for 12.5% of human beings today, and most of these people are in the developing world. The secondary message is that great strides have been made in recent times, strides that demonstrate that we have some of the core elements of solutions that may eventually lead to universal nutritional security.

This nutritional security defined by 'access to food' is the end point of a complex web of factors and interdependencies as illustrated in Figure 1.

The complexity of the resource factors (water, energy, land and finance) are exacerbated by the behaviour of the markets. This is compounded exponentially by consumer behaviour. It is estimated that as much as a third of all food produced is dumped as waste. This amounts to approximately 1.1 billion tons.

The WRC and its partners have been pursuing a research and development programme to directly address various parts of this puzzle with encouraging contributions. These include landmark work in the irrigation domain. Smart solutions with high impact include the water administration system or WAS, which is now being rolled out under the auspices of the Strategic Water Partnership Network (SWPN). Further beacons include creative combined water and power off-grid solutions (using rain water harvesting and bio-digesting pastoral waste) such as the Green Village project in Okhombe, KwaZulu-Natal.

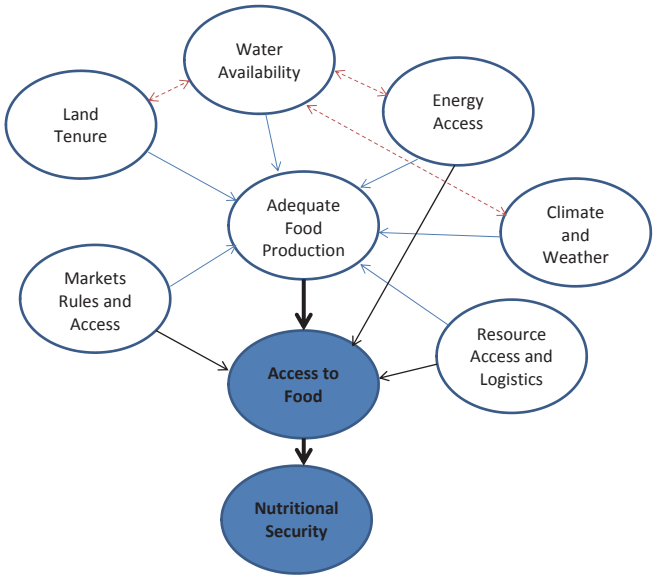


Figure 1. An illustration of the complexity of the interdependent relationships between resource availability and the market that eventually determines nutritional security.

More recent work is geared toward direct empowerment of poorer communities who have the tradition of growing and/or harvesting indigenous crops. While these crops have been proven to be more resilient in harsher conditions, there has been a debate as to whether there was a nutritional sacrifice associated with this choice. Recent WRC projects have demonstrated that the nutritional content of traditional crops, including African leafy vegetables, is high and, in some cases, higher than commercial crops. In addition, the water budgets of these crops remain positive with lower than average water use and the advantage of being primarily rainfed.

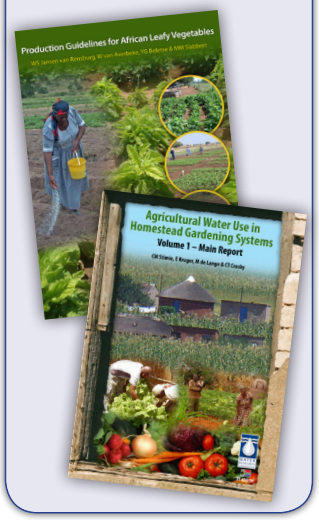
The additional boons include the possibility of developing whole new market mechanisms for indigenous crops. This may mean that economic access may be improved as indigenous crops are shielded from the commodity trading mechanisms which are the current key price drivers and in many instances, together with the sophisticated distribution chains, the mainstay reason for food price inflation.

While water wise indigenous crops will not in the short term offer the solution to bring 850 million people out of chronic hunger, it certainly holds promise for several million people, particularly

in Sub-Saharan Africa to not only ensure an end to hunger, but also offers the possibility of sustainable livelihood to very small scale, largely subsistence farmers and their communities.

Recently published WRC reports related to food security

- Water use and nutrient content of crop and animal food products for improved household food security (**Report No. TT 537/12**)
- Nutritional status of South Africans: Links to agriculture and water (**Report No. 362/P/08**)
- Agricultural water use in homestead gardening systems (**Report No. TT 430/09 and TT 431/09**)
- Water use and drought tolerance of selected traditional crops (**Report No. 1771/1/13**)
- Nutritional value and water use of African leafy vegetables for improved livelihoods (**Report No. TT 535/12** and **TT 536/12** (production guidelines))



River biomonitoring tool scoops international award

GroundTruth (a specialist consulting company) and the Wildlife and Environment Society of South Africa (WESSA) have jointly received a RCE Recognition Award for an 'Outstanding Flagship Project' on behalf of the KwaZulu-Natal Regional Centre of Expertise (RCE).

This award recognises the achievements of the Stream Assessment Scoring System (miniSASS), and it was received by Tich Pesanayi from WESSA REEP (Southern African Development Community Regional Environmental Education Programme) at a high-profile event held at the United Nations University as part of the 8th Global RCEs Conference on Education for Sustainable Development. The conference was held in Kenya late last year.

The citation on the award acknowledges 'River health monitoring and public mobilisation using the miniSASS community river health monitoring tool'. The citation further notes the project's 'contribution to the development of an innovative platform for citizens to measure and express their concerns around water quality and service delivery'.

The miniSASS biomonitoring project is now implemented on a Google Earth platform, which makes all of the results visible in the public domain. The research of miniSASS is supported by the Water Research Commission (WRC).

The international award from the United Nations is the second award that miniSASS has received in the last few months, following the recognition received from WRC in the form of a 'Community Empowerment Award'.

To learn more about the miniSASS project, including how to sample the health of a river, submit river health data and gain access to a host of supporting resource materials, visit: www.minisass.org

Water Diary

Water innovation
May 25-29
Nelspruit

The Water Institute of Southern Africa Biennial Conference & Exhibition will be held in Nelspruit. *Enquiries: Jaco Seaman; Tel: (011) 805-3537; Fax: (011) 315-1258; Email: events@wisa.org.za; Visit: www.wisa.org.za*

Water resource management
June 11-12
Bloemfontein

The Second African Water Symposium titled 'Planning for the future' will be held in conjunction with the 6th Orange River Basin Symposium at the University of the Free State. *For enquiries Tel: (051) 401-2863'Fax: (051) 401-2629; Email: info@africanwatersymposium.co.za or Visit: www.africanwatersymposium.co.za*

Drinking water reticulation
June 17-20

The Department of Civil Engineering, Stellenbosch University, is presenting a block course on water services planning. The focus is on water reticulation network planning and modelling, including pipes, pumps, reservoirs and valves. One session also addresses O&M. An optional 4th day (20 June) involves a hands-on modelling experience and is available to those who attend the 3 day course. The course is co-ordinated by Prof HE Jacobs, with experts from industry, other universities and local authorities contributing expertise. Presentation and all course material is in English. An iPAD Mini is up for grabs in our hydraulic network modelling competition, open to course delegates only. *Enquiries: Rene Burger, Tel: (021) 808 2100, Email: burgerr@sun.ac.za or visit www.civeng.sun.ac.za.*

Aquatic science
June 22-26
Thaba 'Nchu

The 2014 conference of the Southern African Society of Aquatic Scientists will be held in Thaba Nchu, Free State. *Enquiries: Petrie Vogel; Tel: (012) 346-0687; Fax: (012) 346-2929; Email: petrie@savetcon.co.za; or Visit: www.savetcon.co.za to register.*

Sediment water science
July 15-18

The International Association for sediment water science (IASWS) brings together and fosters collaborative research and dialogue between earth scientists, biologists, chemists and environmental engineers whose interests pertain to sediment-water interactions in all aquatic systems. Conference themes include the impact of sediments on ecosystem functioning and human health; multiple stressors; scale-dependent connectivity in aquatic systems; technical and methodological advances in sediment-water science; and physical and biochemical processes in sediment systems. *Enquiries: Prof Kate Rowntree; Email: k.rowntree@ru.ac.za or visit: www.iasws2014.co.za for more information.*