



**Water is not always sufficient, and for any successful agricultural activities, water harvesting and usage management is critical. Farmers are advised to embrace water recycling.**

# A call for water-efficient technologies

During the recent International Flower Trade Expo in Nairobi, Wageningen UR Greenhouse Horticulture project leader and greenhouse horticulture specialist Anne Elings pointed out that Kenya is not a water scarce country but management of the same is wanting. HortiNews had a chat with him.

**Can you make an informed summary of your observation about the country's water resources?**

My observations are based upon a number of visits to protected and open-field horticulture farms in Kenya, and discussions with the farm managers. It is absolutely true that the availability of water is not always sufficient, certainly if in the dry period rivers and water storage installations are running empty. The production of the farm is then at high risk. During my last visit in March this year, I visited some farms that had only a few days of water

resources left at the end of the dry season. In that situation, some serious measures have to be taken, including ceasing irrigation to one greenhouse in order to rescue the crop in another greenhouse.

The quantity of water will not increase (although it may fluctuate from one year to the other), so the use of water must be reduced. In case less water is used, more water will be available at the end of the dry season and production risks will be lower. In any case, it is better to use the available water more effectively, and increase the sustainability of the production system by increasing the water use

efficiency.

The good news is that more water-efficient technology is available. Such technology is on the whole not implemented in Kenya. And the very important thing here is that water use efficiency is not limited to water technology. As the water technology is improved, also technology climate management, crop management, etc. must be improved to get the most out of it. In other words, if the control of production factors in general is improved, then the water-use efficiency of the production system in Kenya will improve.

**Can you then, again based**

**on your own expertise tell the country, how it can get on the road to managing its water?**

Good water management knows three basic principles: use clean water, use the water as long as possible, and discharge as little water as clean as possible. Make sure that the water used in greenhouses is clean. Borehole water is in principle clean. Surface water must be purified before it is used for irrigation. Rain water can be collected and its use will save on the use of surface water. But it should be cleaned as it collects dust particles from the greenhouse cover. With clean



## || HORTINEWS CHAT ||

intensive. Therefore, management and staff must be very well trained through the formal education system, specialized courses, or as part of the package by a supplier. Investments in good training are always cost-effective, in my view. The Horticultural Practical Training Centre at Thika, will provide a Service Hub where specialized training will be given.

**Are there examples to your answer above, locally in Kenya? Would you know what it has taken such an example to get where they are?**

The GreenFarming project starts the demonstration project 'Water Management in Kenyan Horticulture'. The demonstration project is an initiative of Green Farming member Bosman BV, in cooperation with Green Farming members Hoogendoorn Automation BV, Van der Knaap Groep, Wageningen UR Greenhouse Horticulture, Genap BV, Hatendoer-Water BV and DLV Plant BV. The purpose of the project is to demonstrate that through the implementation of proper technology and management, water and nutrient use in protected and open horticultural production systems can be reduced and production quantity and quality can be increased at the same time. The aim is to realize this through a closed production system with fully controllable crop inputs and recyclable fertigation water. Green Farming wishes to convince the East African horticulture sector that Dutch technology, although having higher initial investments costs, on the long run will be most cost effective. For this demonstration project a closed production system is introduced to the Kenyan horticulture sector, which comprises a complete

system to collect, store and clean rain water, including bore hole water and recirculation water coming back from the greenhouse. The technologies are installed in an existing greenhouse within a rose crop on a gutter system with cocopeat substrate. All water will be cleaned with a reversed osmosis system. A fertilization unit regulates all types of fertilizer to prepare new irrigation water with all nutrients in a solution. A sensor system measures water levels and flows throughout the whole system and with this data, the irrigation computer will be able to automatically give the optimal amount of irrigation water to the crop in several servings spread over the day. The system is custom-made to east African conditions and realizes reduction in water and fertilizer use, while creating optimal growing conditions for increased production quantity and quality. You can check [www.greenfarming.nl](http://www.greenfarming.nl) for details.

**If we started on your advice, how long do you think it would take us to be a water sufficient country?**

That is very hard to indicate, because it not only depends on the developments in the horticultural

sector. All I can indicate is that with good technology supported by well-trained staff, less water is needed while the farm remains economically competitive.

**And how different would the scene then be, in terms of combating drought and food insecurity?**

The combat of drought and food insecurity is an issue that goes far beyond horticulture. But horticulture can contribute. If local water resources are not depleted, then vegetable production can be continued during the dry season. I understand that small greenhouses have been constructed as several places, enabling farmers to produce vegetables at times when supply is low. I think that this is a good development. The construction of a relatively simple greenhouse is a good start on the road to sustainable use of water resources and supply of vegetables during the dry season, because vegetable production in a greenhouse is more water efficient than outdoor vegetable production. So, if a limited amount of water is available, vegetable production in a greenhouse is certainly worth considering □

water you make a good start in the greenhouse. Drained water can be recirculated if it is purified through for instance reversed osmosis. This is of course only possible if the crop is grown on substrate, and not in the soil. If the water is not purified, soil-borne diseases will be spread all over the farm. From a water management perspective, the % drain must be low. There are many reasons to maintain a certain % drain, which are mostly related to the nutrient levels in the slab. At some point, the nutrients in the irrigation water are not in balance any more, and the water must be drained as otherwise the crop will suffer. Also then, the water can be purified before releasing it in a sustainable manner to the outside environment. All this must be combined with good management of the crop, the climate and pests and diseases. For example, poor pest and disease management will spoil the steps made through good water management.

Good management depends on experience and knowledge. Horticulture is very knowledge-



**Wageningen UR Greenhouse Horticulture project leader Anne Elings**