Calls to protect Cape Flats aquifer and Philippi farming area

An irrigation water pond in Philippi.

Maryke Malan

Rapid urbanisation and the growing need for water is threatening the Cape Flats aquifer, key water supplier to the agricultural hub of Philippi, outside Cape Town. Recent PhD graduate, Maryke Malan, shares some insights following her recent study in the area, conducted under the auspices of the University of the Western Cape (UWC).

Cape Town's population is expanding and so also the need for food and fresh water. The Philippi farming area is key in meeting Cape Town's demand for food, but its future is uncertain as urban development swallows more of this agricultural area. The Cape Flats aquifer, a natural water reservoir underneath the greater Cape Town region, supplies irrigation water to the Philippi farmers but could potentially also supply fresh water for domestic use in Cape Town.

The protection of the Philippi farming area and the Cape Flats aquifer is thus extremely important and of great urgency. Earlier this year, a seminar arranged by the Philippi Horticultural Area for Food and Farming Campaign, the Environmental Monitoring Group and the Western Cape Water Caucus brought together community members, farmers, academics, government officials and non-governmental organisations to share their concerns and knowledge about the Cape flats aquifer and the Philippi farming area.

For more than a century vegetables have been grown in Philippi and today much of Cape Town's fresh produce still comes from Philippi. The Schaapkraal Civic and Environmental Association reported at the seminar that almost 70% of Cape Town's vegetables were produced in Philippi. This great demand for vegetables places much pressure on the Cape Flats aquifer from which most of Philippi's irrigation water is drawn.

The importance of protecting this aquifer was the main topic of discussion at the seminar, but many concerns were raised about the encroachment of urban developments on the Philippi farming area

as a whole. In the light of the fact that fresh water is a scarce resource in South Africa and that global warming will most likely lead to its increased scarcity, it is imperative that all stakeholders take note of the deteriorating water quality of the Cape Flats aquifer and contribute to its protection. This point was echoed by the Environmental Monitoring Group who spoke about the importance of water security in Philippi.

The Philippi farming area is partly situated on the Cape Flats aquifer and water is drawn from it through boreholes and then stored in ponds for later irrigation use. The groundwater table in Philippi is very shallow and various pollutants could easily seep into it. Several community members, government officials and academics mentioned their concerns in this regard.

Group discussions highlighted problems with dumping of waste along farm roads, oil leaks from vehicles, run-off from informal settlements, overflowing septic tanks and air pollution as burning issues. Some farmers felt that they were unfairly blamed for polluting the aquifer but, as discussions continued through the course of the seminar it became very clear that not only agricultural activities affected the quality of the aquifer.

Other threats to the aquifer included the situation of solid waste disposal sites and wastewater treatment works on the heart of the aquifer as well as various effluents from surrounding urban and industrial areas. In Philippi, expansion of the local sand mine, growing informal settlements and intruding residential and commercial areas were also mentioned.

Community members noted that one of the big problems was the removal of water from the area by storm water pipes. This water could have replenished the aquifer and diluted pollutants in irrigation water ponds and soils. Salinisation of water from several boreholes and irrigation water ponds was also mentioned by some farmers. Fortunately academics from UWC could confirm that seawater had not yet seeped into the aquifer and was not the cause of salty borehole water.

In some parts of Philippi, salinisation of borehole water is partly due to salts that are naturally present in the soils and rock formations, which have gradually washed into the water over time. Chloride, potassium and sodium salts seem to enter borehole water and ponds in this way. Fertilisers also contain salts, which can eventually end up in ponds and contribute to the salt content of the water, this can however be managed physically.

Philippi farmers and their workers preparing to harvest crops.

Maryke Malan

Nitrates, which are essential for plant growth, are salts that come from fertilisers and have been found in some ponds. During summer the salinity of irrigation water in ponds increases significantly due to the evaporation of water. Fortunately, winter rains dilute the concentration of salts in pond water and also replenish the aquifer.

Although several boreholes and ponds in Philippi have brackish water, there are boreholes and ponds with fresh water in the centre part of the Philippi farming area. In general, Philippi's irrigation water is still deemed suitable for irrigation purposes. Means of controlling salinity effectively needs to be investigated while salt tolerant crops could be selected for planting in the future.

Also shared at the seminar was research by UWC around the concentrations of heavy metals in crops, soils and irrigation waters from Philippi. Some salts, are classified as heavy metals. Some heavy metals are essential for human health while others are harmful.

This research suggested that Philippi soils seem to act as a filter that could, to some extent, protect the aquifer from chemical pollutants, like heavy metals. One farmer also pointed this out at the seminar. For example; although the concentrations of metals like copper and zinc were high in Philippi soils these metals were almost absent in irrigation waters.

The concentrations of beneficial as well as harmful heavy metals were determined in Philippi's irrigation waters and none of these metals exceed the limits set by South African regulations. A decrease over time in the concentrations of copper, lead and zinc was observed in Philippi soils.

There was also a decrease in the concentrations of cadmium and lead in crops which was great news since these metals are harmful. It was interesting to see that although copper concentrations were high in some soils, vegetables grown in this soil did not necessarily take up the copper and thus contained little copper. Although zinc concentrations in some crops were considered too high, this could be good since human diets are often zinc deficient and zinc is important for good human health. In terms of heavy metal concentrations, the water, soils and crops from Philippi are considered relatively clean. Although heavy metal pollution is not currently a problem it must still be monitored.

At the seminar the Department of Water and Sanitation indicated that groundwater from the Cape Flats aquifer was being monitored across Cape Town. Unfortunately since several monitored boreholes have been vandalised, monitoring was difficult. The City's municipality often experiences water shortages, which are inflated by the need for domestic water by the growing urban population.

These water shortages could be met by the Cape Flats aquifer, if it is properly protected, monitored and managed, as is the case in the Atlantis area. At the seminar a representative from the Schaapkraal Civic and Environmental Association mentioned that the aquifer could supply up to 30% of the City's water needs. A representative of the CSIR explained how groundwater from the same Cape Flats aquifer is successfully applied for domestic use in Atlantis.

Although it is disheartening to hear of continued urban and industrial developments that intrude on the Philippi farming area and other seemingly negative activities, there is still hope to protect the Cape Flats aquifer in this area if all stakeholders stand together.

The seminar held in Philippi was a positive step towards uniting people from all spheres of society in actively participating in research and other activities to protect our precious groundwater resources and farming areas.

The Cape Flats aquifer is still not fully understood nor appropriately valued and UWC invited interested parties to join them in finding out more about the aquifer so that it could be protecting and managing for the benefit of all. ❑

The illegal dumping of waste is an increasing problem around Philippi.

Maryke Malan