Understanding Our Water World: Nature as the Mentor

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On behalf of Sedgefield Ratepayers Association.

Beneath the dunes, lakes and indigenous forest of the Sedgefield area, from Groenvlei in the east to Rondevlei in the west, including the Swartvlei estuary, lies a hidden world of water-saturated sands and fractured rock. This groundwater system, an aquifer, is the lifeblood of our wetlands and estuary, a critical household resource, and a biodiverse ecosystem that provides vital environmental services to all.

Paging through old notes, I found a line that caught my eye: *Will we ever heed the teachings of nature?* I can't recall who wrote it or why I noted it, but it made me think.

If humanity is to achieve sustainability, it needs a mentor with proven practice. Nature is that mentor. Over millennia, nature has evolved into a sustainable system of countless interconnected sub-systems that use self-organising principles. We understand many of these systems and principles; by applying them, sustainable development becomes possible. Our planning must be embedded within nature.

A natural system is a set of interconnected living and non-living parts that function as a unified whole. Its structure is defined by its components and the processes that connect them, and their interactions create properties not visible in the parts alone. Change or remove one component and the system can collapse. A car engine is a helpful analogy: each part has a role, but the engine works only when all parts work together.

The case study below highlights humanity's non-adherence to nature's teachings, though I acknowledge that some individuals and groups do observe nature's mentorship.

We understand how water gets underground, we have good knowledge of Sedgefield's aquifer systems, and we understand the risks of seawater intrusion, pollution and over-extraction. We also understand (or believe we do) the systems and functions of floodplains, primary dunes and their vegetation, and the services they provide in Sedgefield.

However, we still plan intensive development in floodplains without proper concern for flooding or for how development disrupts natural water flow. These hard surfaces originated from the development increasingly block natural absorption (recharge) in what was once sandy soil. Recharge is the heartbeat of any groundwater system, and rainfall can take months—or even years—to filter down and top up the aquifer.

The risk of ground and surface water pollution also increases, and contamination is a serious concern. Shallow aquifers are vulnerable to pollutants seeping down from the surface: failing septic tanks, agricultural runoff, illegal waste disposal and fuel spills can introduce bacteria, nitrates, phosphates and chemical compounds, compromising the supply of healthy groundwater.

Stormwater runoff will increase in both volume and velocity; in highly erodible sandy soils this accelerates erosion and, eventually, siltation of the estuary. The aquifers are intimately connected to Groenvlei, Swartvlei, Rondevlei and the surrounding wetlands we cherish. Groundwater feeds these systems during dry periods, maintaining water levels and sustaining remarkable biodiversity, including fish, birds and rare plant species, making this area so special.

Groundwater is not limitless; it is a shared commons. What one person does affects everyone else and every ecosystem downstream. Any action that could disturb the surface or groundwater system should not be approved or promoted. Protecting it requires awareness, monitoring and sensible management, along with vigilance against greenwashing, where entities mislead the public with false “environmental” solutions that distract from, and delay, concrete and credible action.

All ratepayers ultimately contribute, through taxes, to municipal costs to remediate flood damage. The more development in the floodplain, the greater the remediation costs and environmental damage. Floods are real and happen as photographs already show. It is predicted that with climate change, flood events will also be more common.

The subsurface and surface water, dunes, fynbos and forest systems have sustained this landscape for thousands of years. They can continue to do so, but only if we understand them, respect them, and take collective responsibility