

# Appropriate Technologies to Deliver Sustainable Sanitation Services in a Water Scarce Country

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# Layout of Presentation

- How Water Scarce is South Africa?
- What is an appropriate development paradigm?
  - WEALTH Model
- Conclusion




# How Water Scarce is South Africa?

- The global average for annual precipitation is 860 mm.
- The four most economically developed countries in the SADC Region have annual precipitation levels below this.
  - South Africa
  - Botswana
  - Namibia
  - Zimbabwe
- Water scarcity poses a significant constraint to future economic growth and development in these four countries.

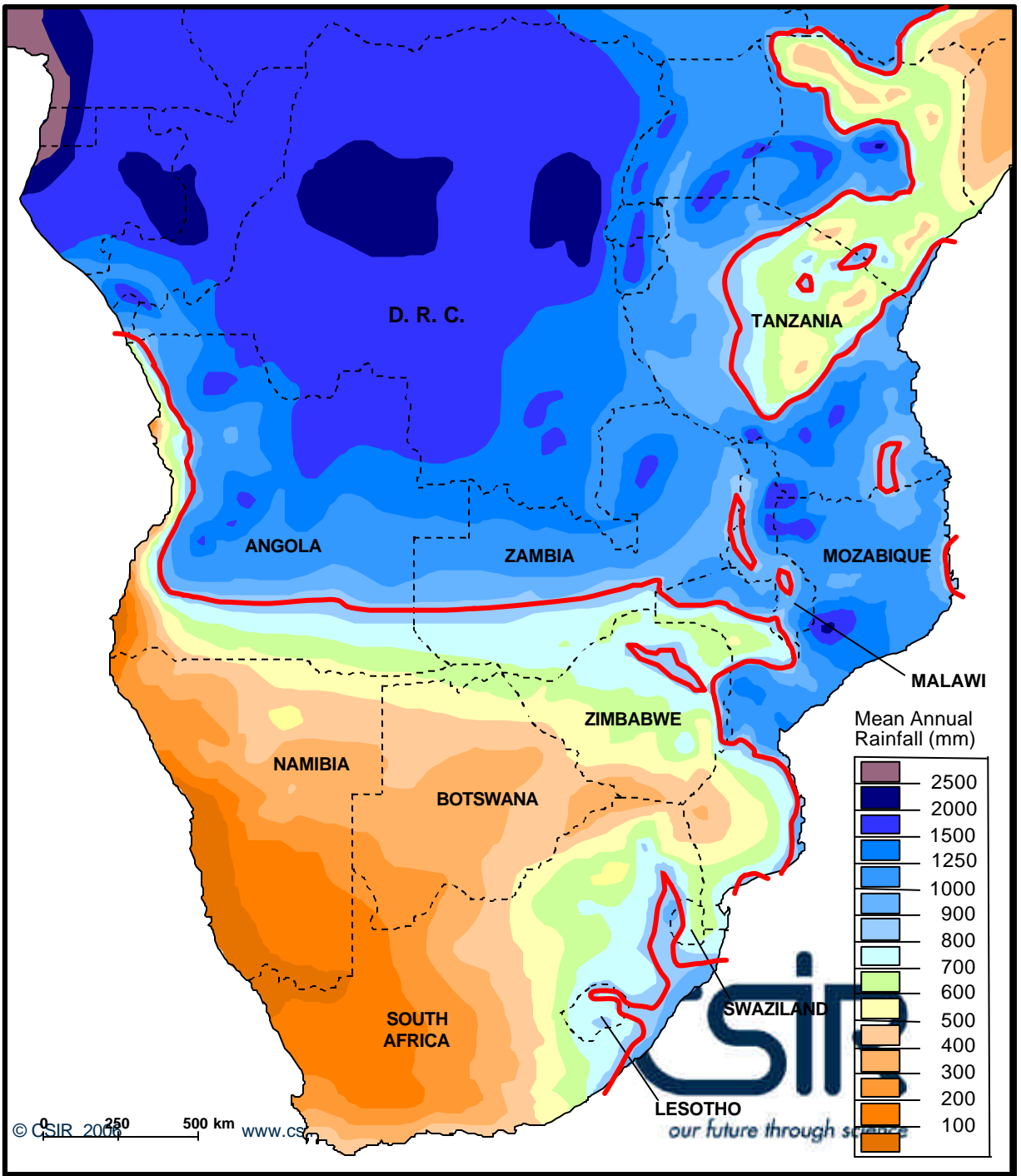


# MEAN ANNUAL RAINFALL



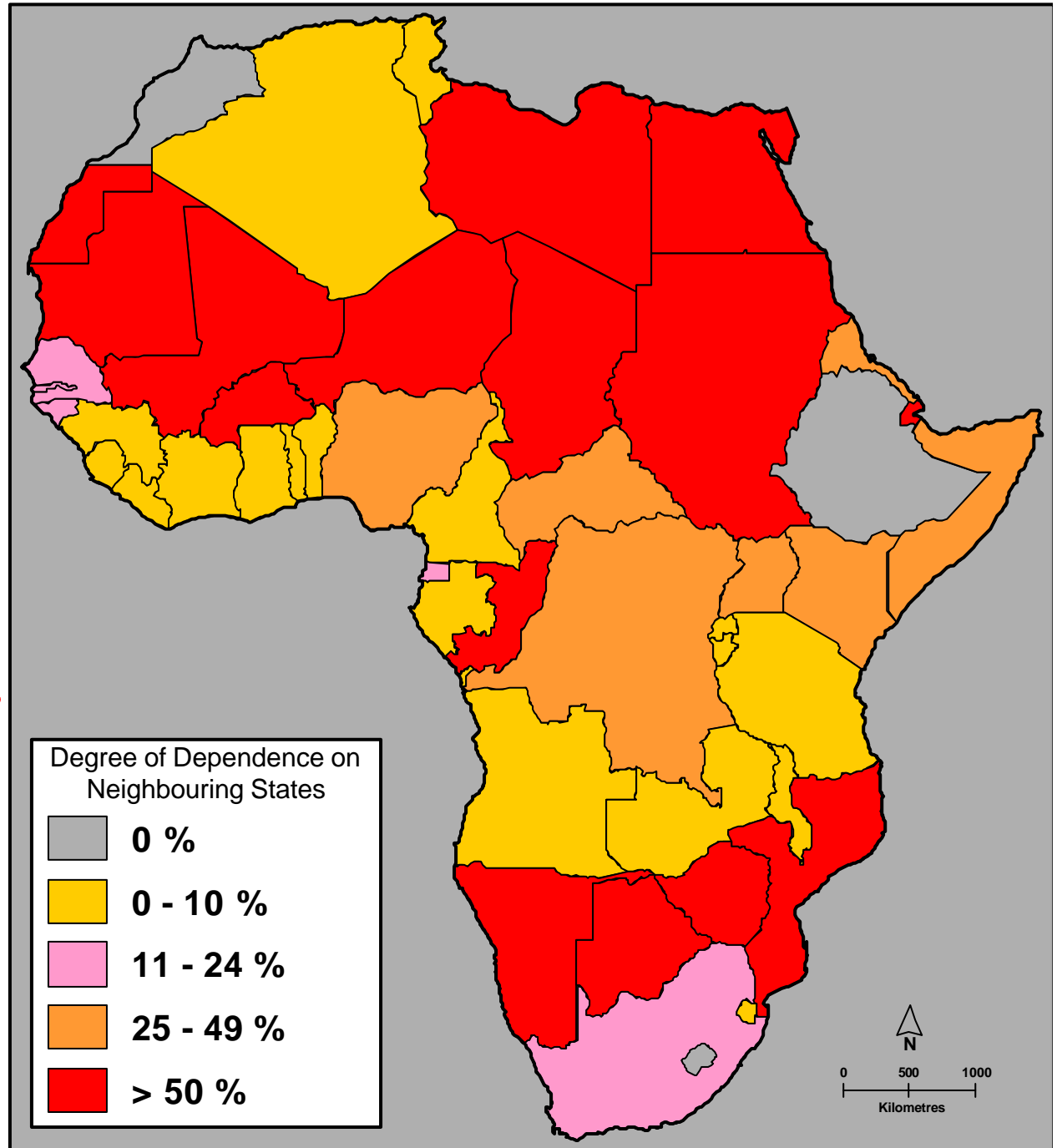
 = 860 mm isohyet  
= World average rainfall

SADC Average Annual Rainfall = 948 mm

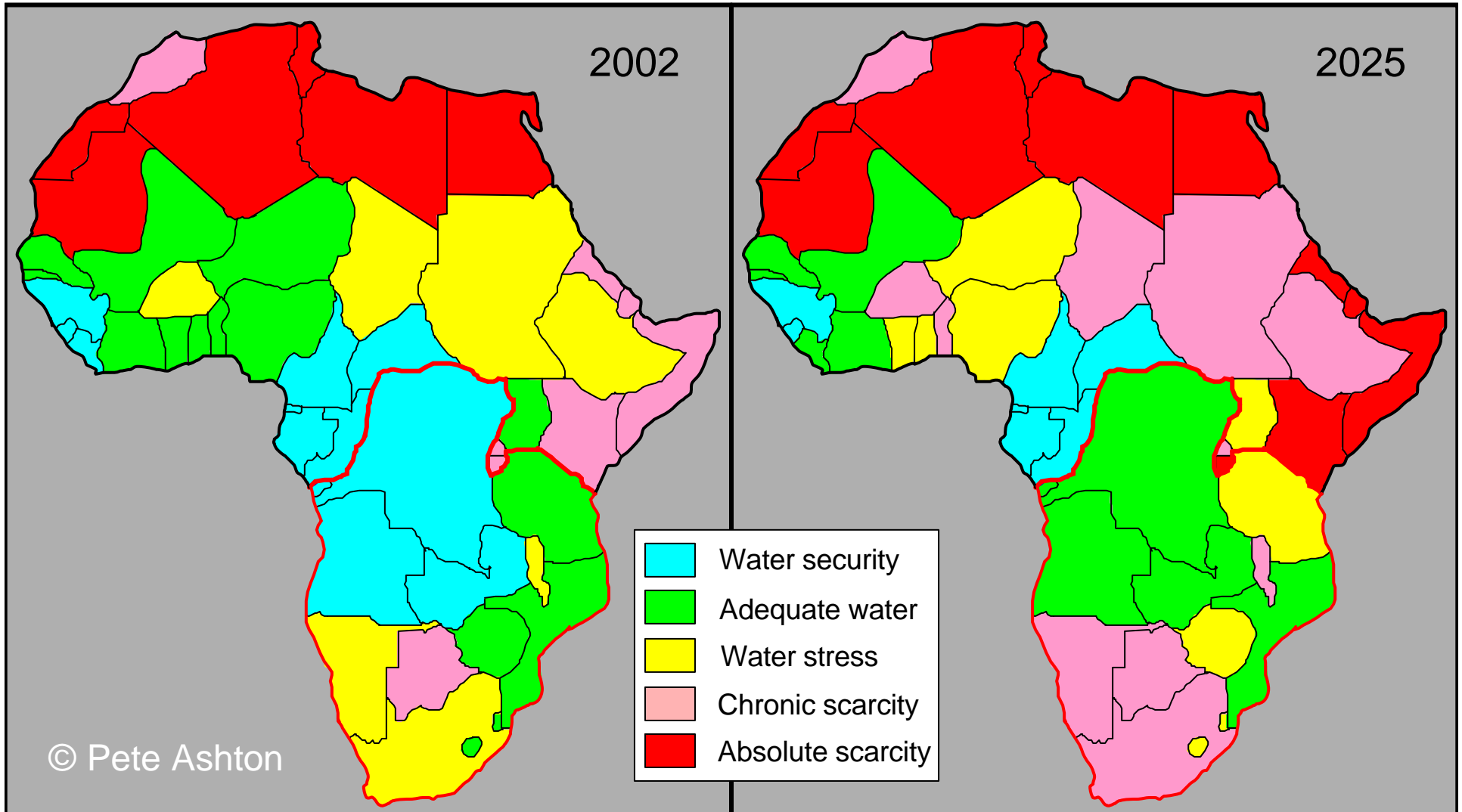


# Dependence on Neighbouring States for River Inflows / Water Transfers

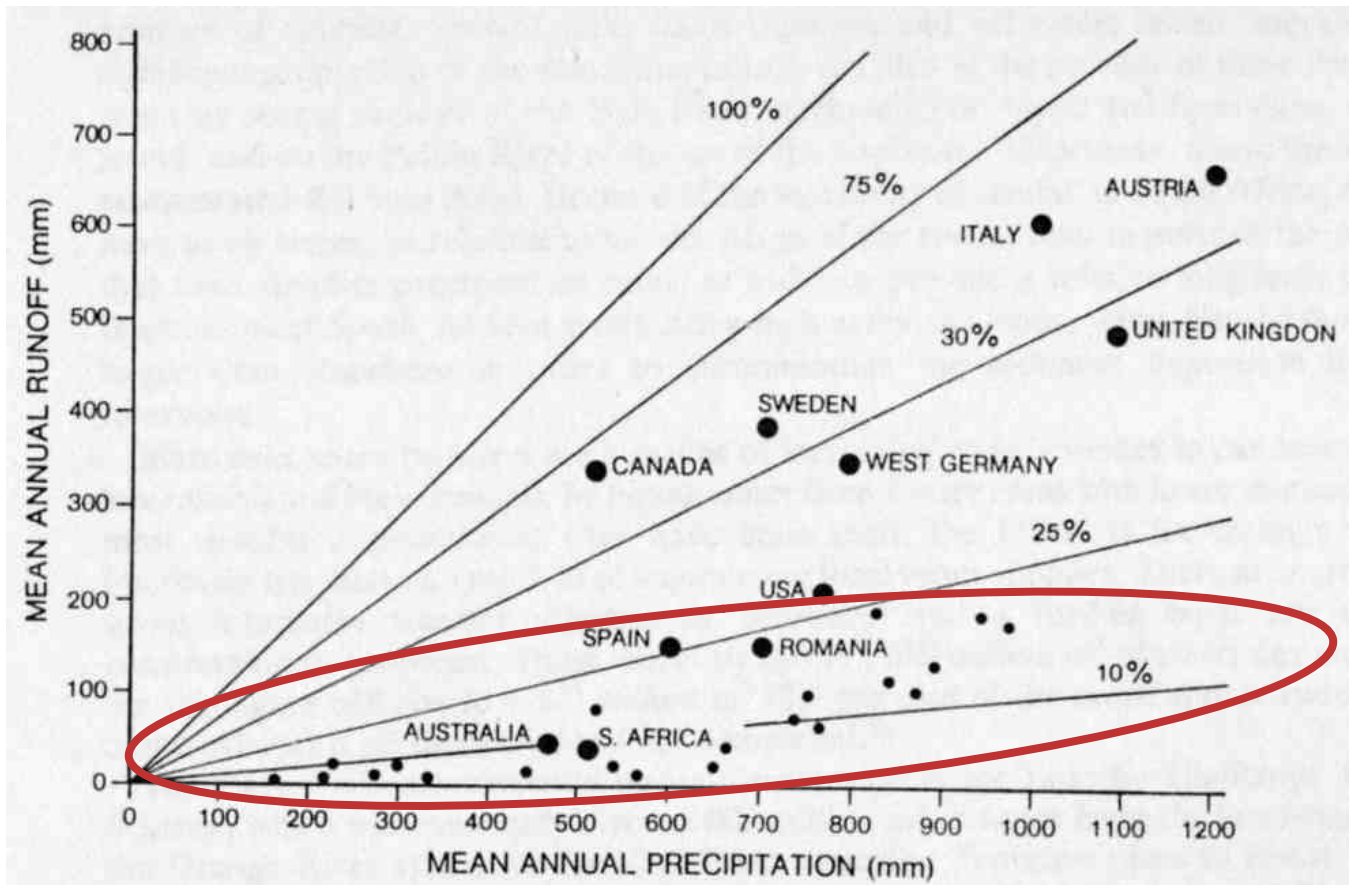
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# WATER AVAILABLE PER PERSON IN 2002 AND 2025

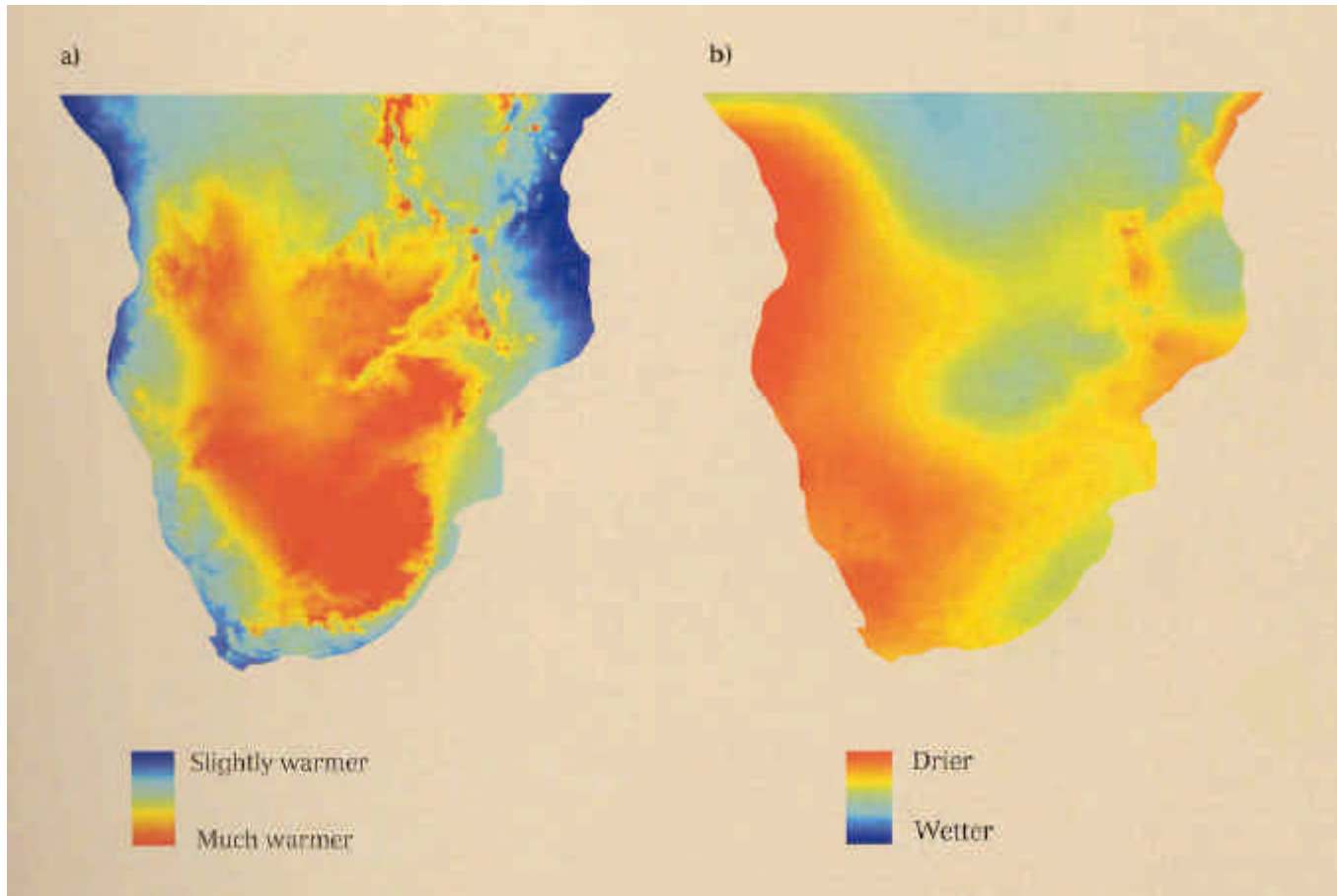


# The Core Problem is the Conversion of Rainfall to Runoff



© O'Keefe *et al.*, (1992:281)

# Which is set to get worse due to Global Climate Change



Source: Scholes & Biggs (2004:4)

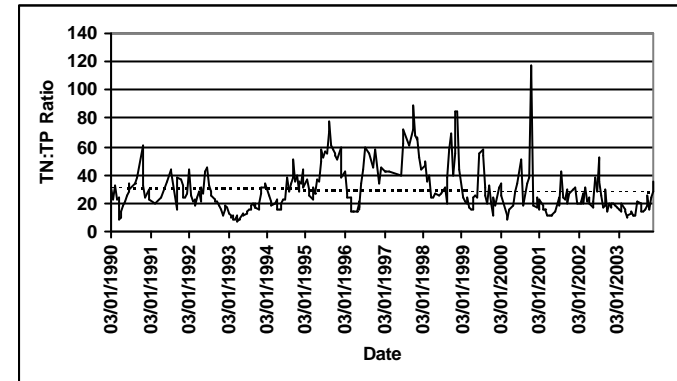
# So Return Flows are increasingly important to manage and understand

- Reduced base-flow in rivers means that dilution will no longer be a solution to pollution
- Contamination of rivers in heavily developed mining areas exacerbates the problem
- Radioactivity is being found in some water and land around inactive mining areas but more work needs to be done to increase our knowledge of this
- Western technology often seeks to reduce flow which concentrates effluent



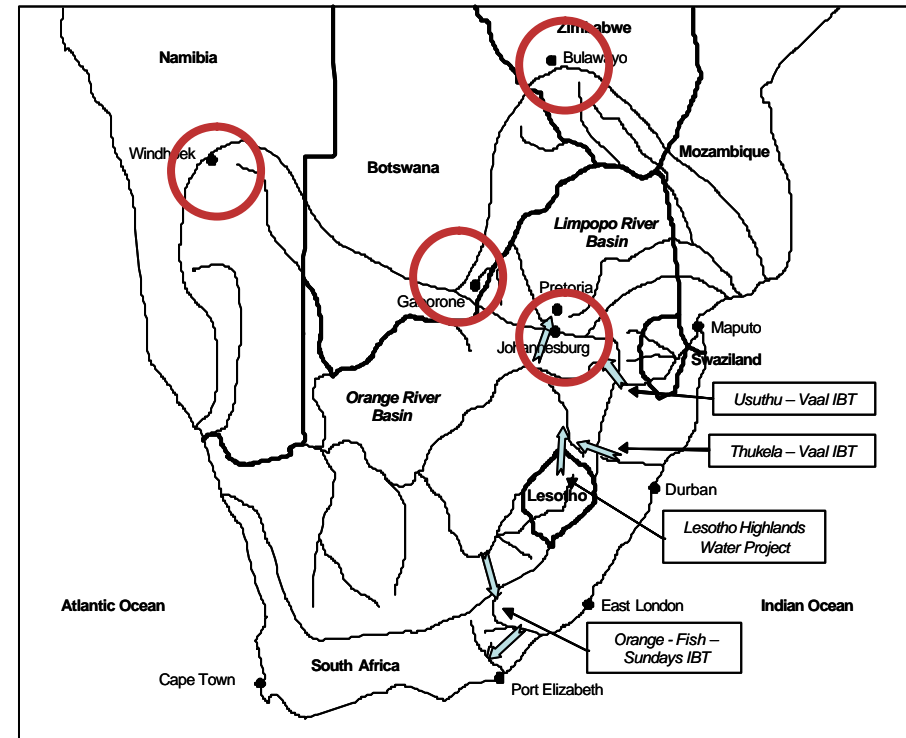
# Managing Highly Eutrophic Systems

- Need to improve water treatment technology by orders of magnitude if we are to reduce N & P loads to manageable proportions
- Need to radically re-think our water management paradigms
- How to stimulate new technology in a developing country where “foreign” technology is not necessarily appropriate?
- Answer is to develop new type of partnerships.



# A Unique Challenge of Managing Return Flows in Southern Africa

- The most developed centres are all on watersheds
- Therefore development is only sustainable by means of massive infrastructural projects
- Return flows pollute the upper reaches of major river systems and cascade this reduced quality downstream



# The WEALTH Model of Sustainable Development

**W**ater infrastructure

**E<sup>2</sup>**nergy & education

**A**ccess –markets, justice, health, credit

**L**and

**T**echnology – that is appropriate & affordable

**H<sup>2</sup>**ealth – human and ecosystem



# Remember as Managers in Strategic Leadership positions.....



**You must be prepared to open your mouth to give clear instructions**

**Your eyes to see justice being done**

**And your ears to listen to advice**

# Siyabonga



Gijima ka khulu