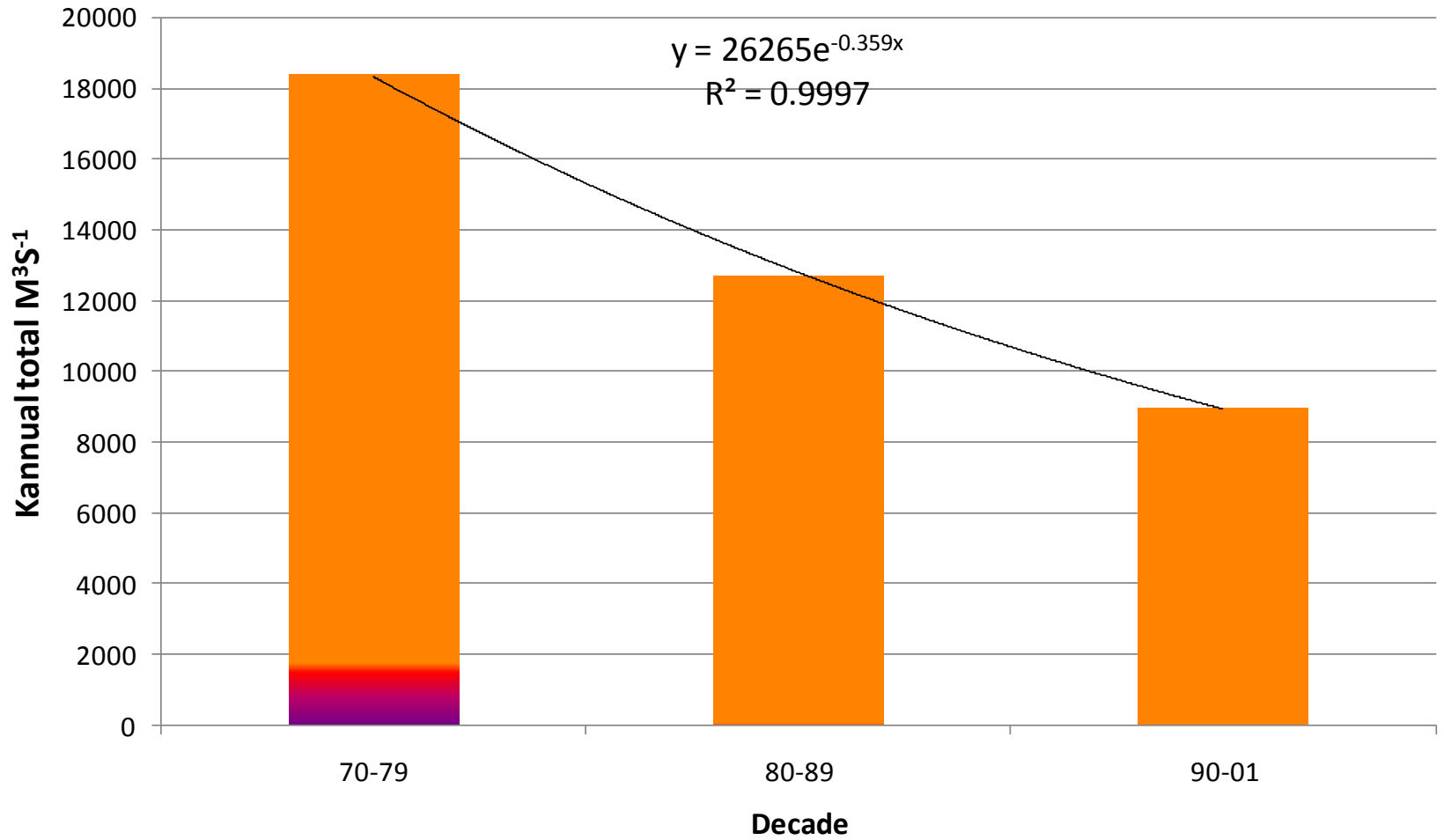


Challenges in Water in Southern Africa: Zimbabwe situation.

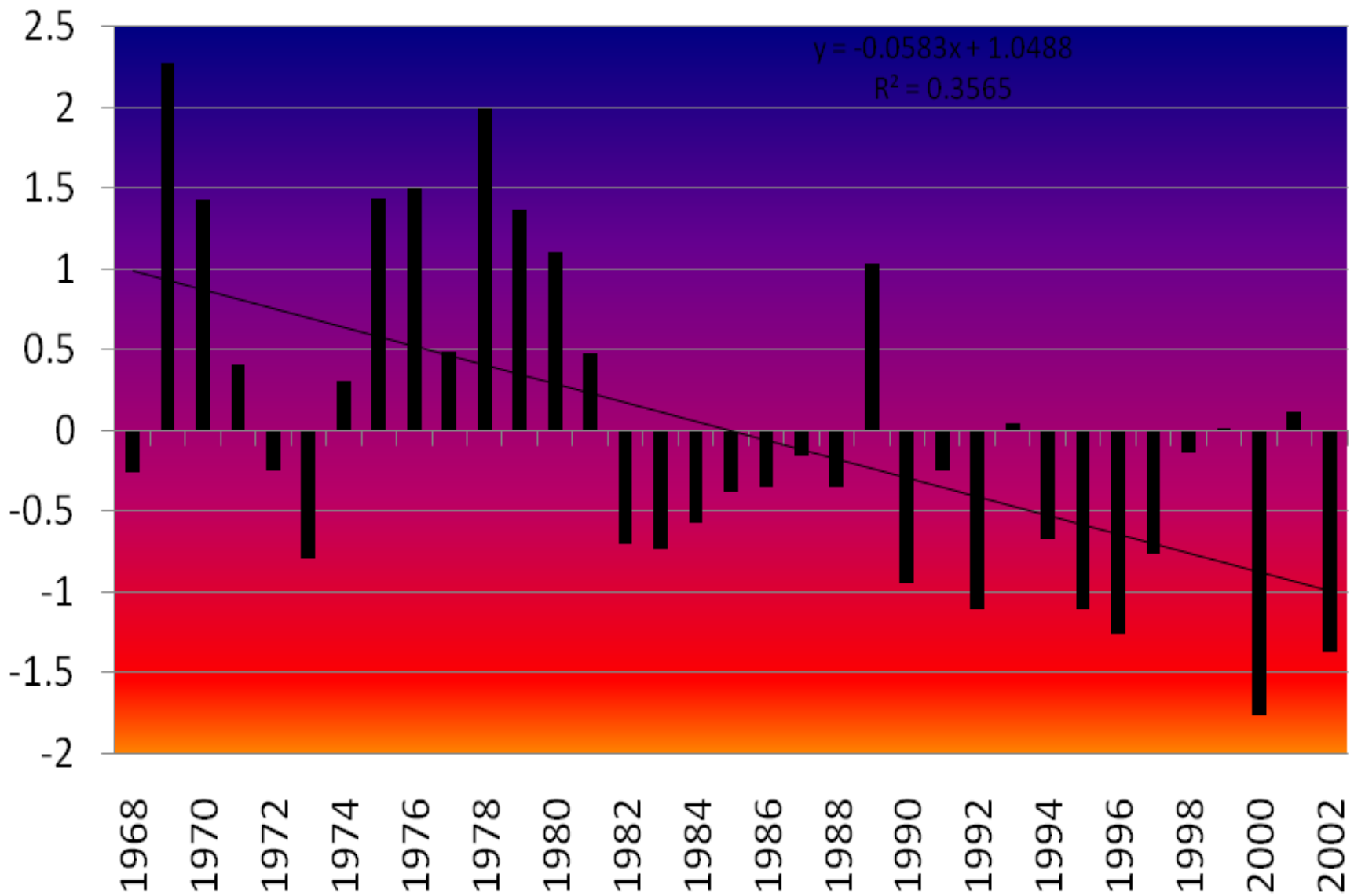
C.H.D. Magadza

Hydrology: The Zambezi

Decadal means

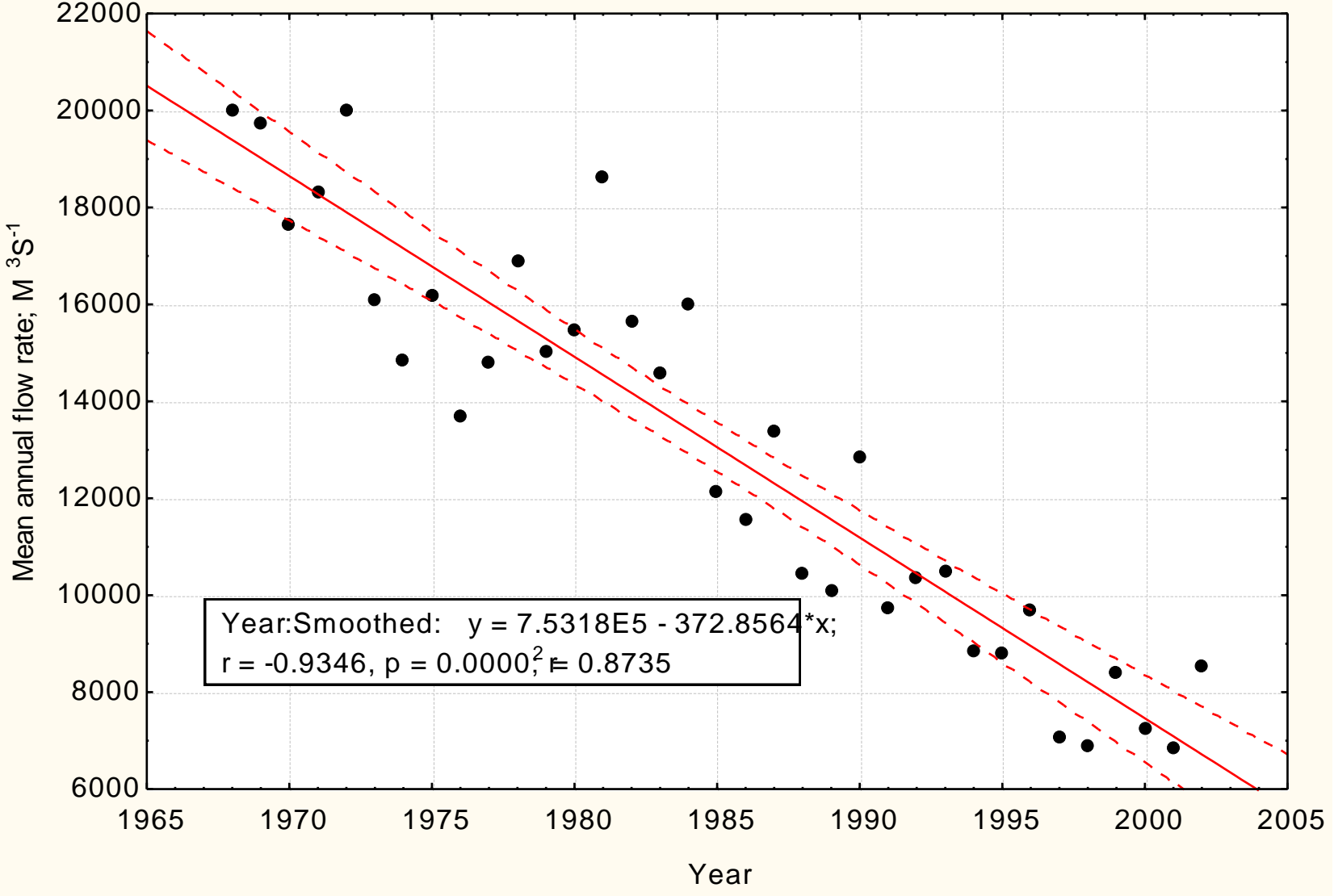


Standardised flow Zambezi flow @ Katimamulilo; m³s⁻¹

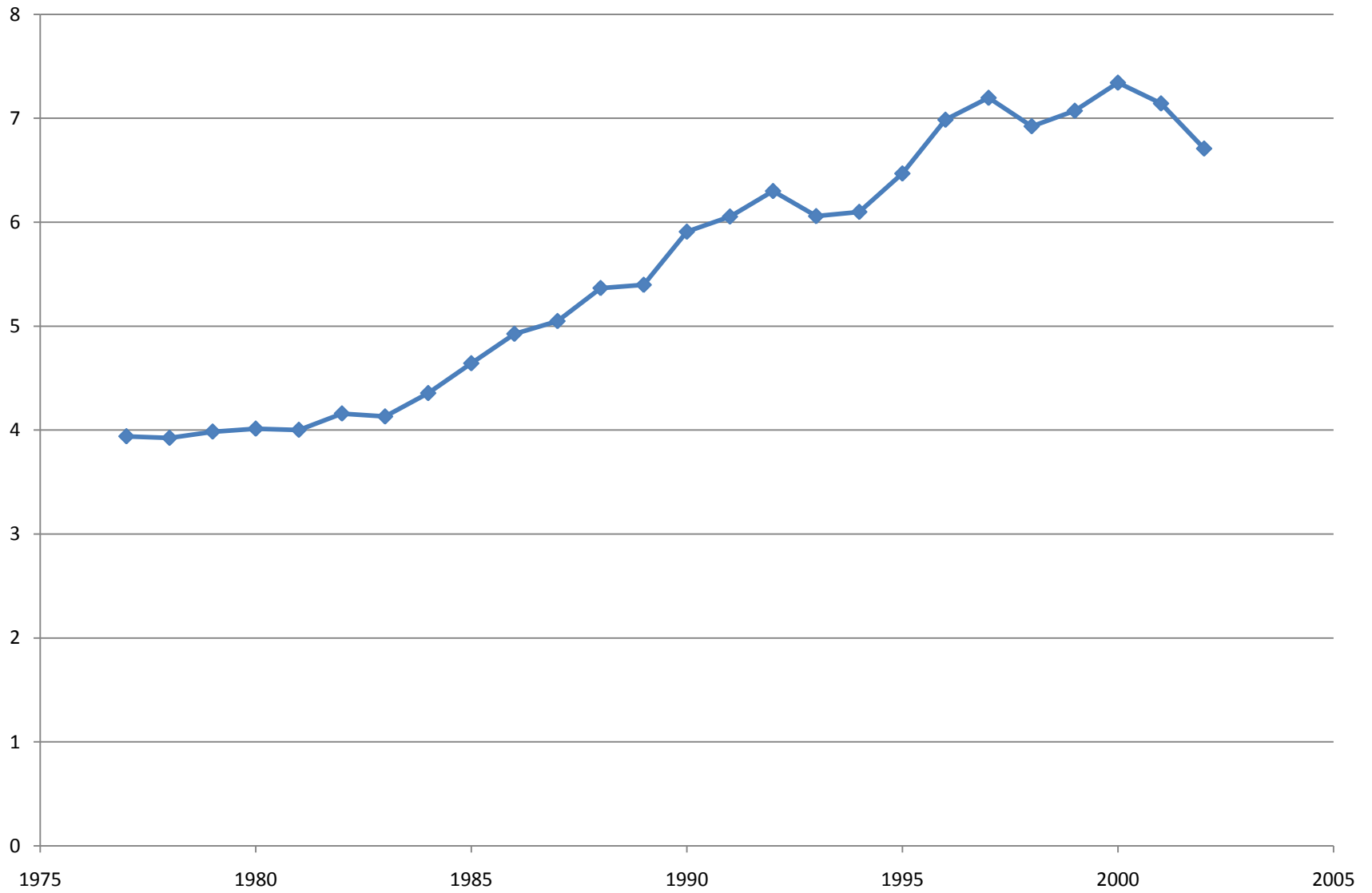


Scatterplot (5v*35c

Flow = $7.5318E5 - 372.8564 * x$; 0.95 Conf.

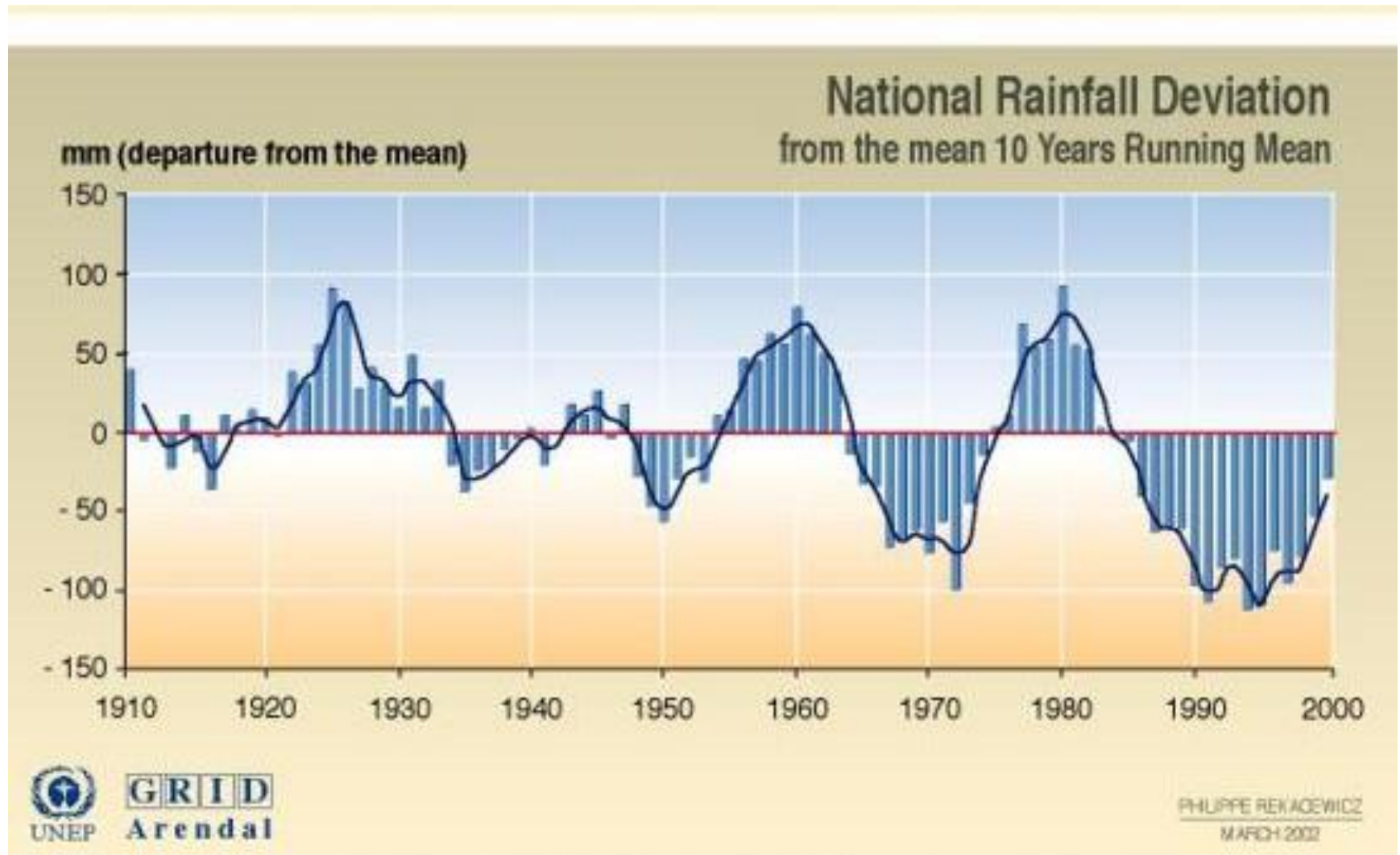


10 yr average Retention time



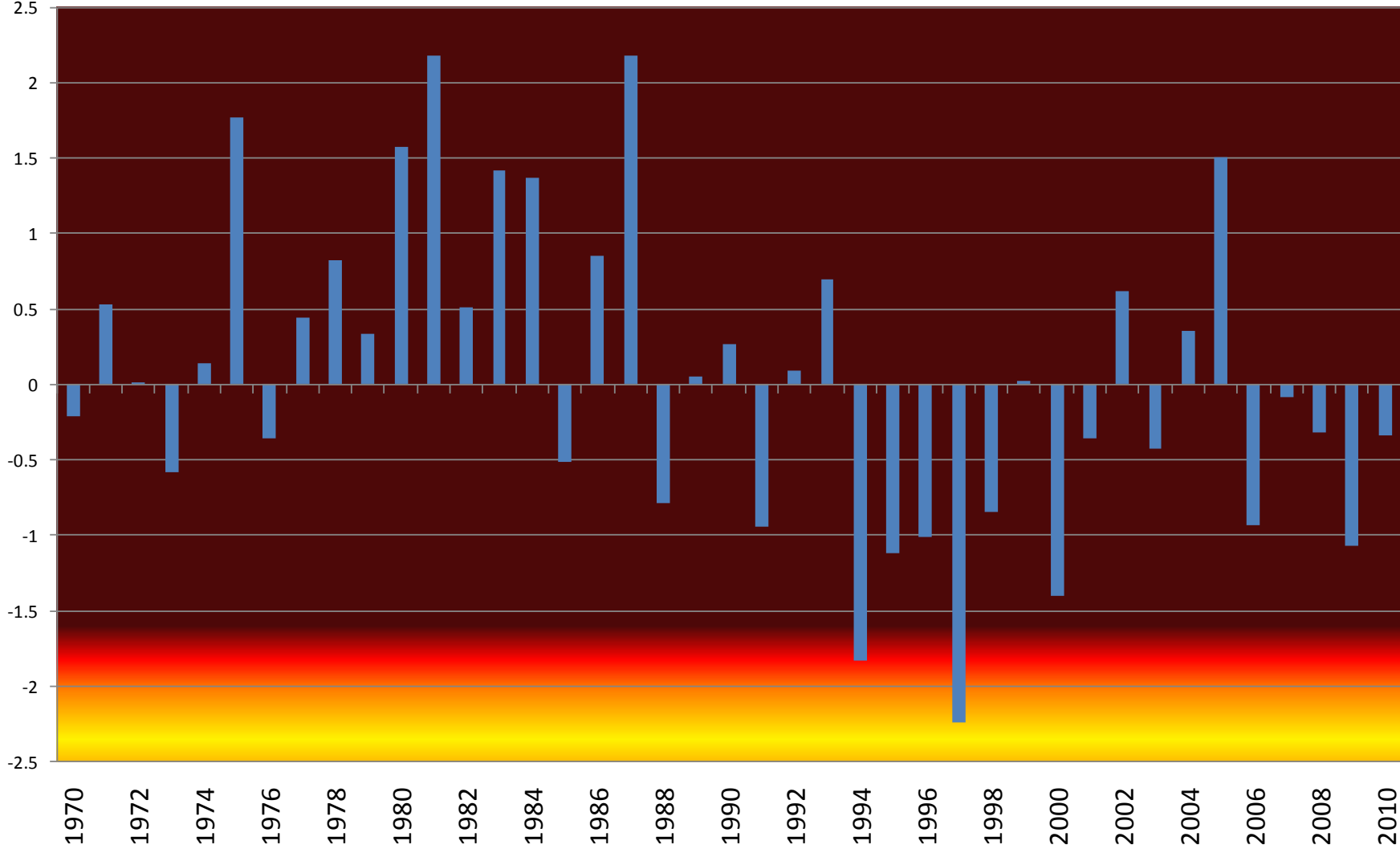
Zimbabwe precipitation

Precipitation variation in Zimbabwe



Source: Zimbabwe Department of Meteorological Service at <http://weather.utande.co.zw/climate/climatechange.htm>

Standardised annual runoff; Manyame River



Reconstructed Harare population

Fig 2A. Populatin growth of Harare and satellite settlements

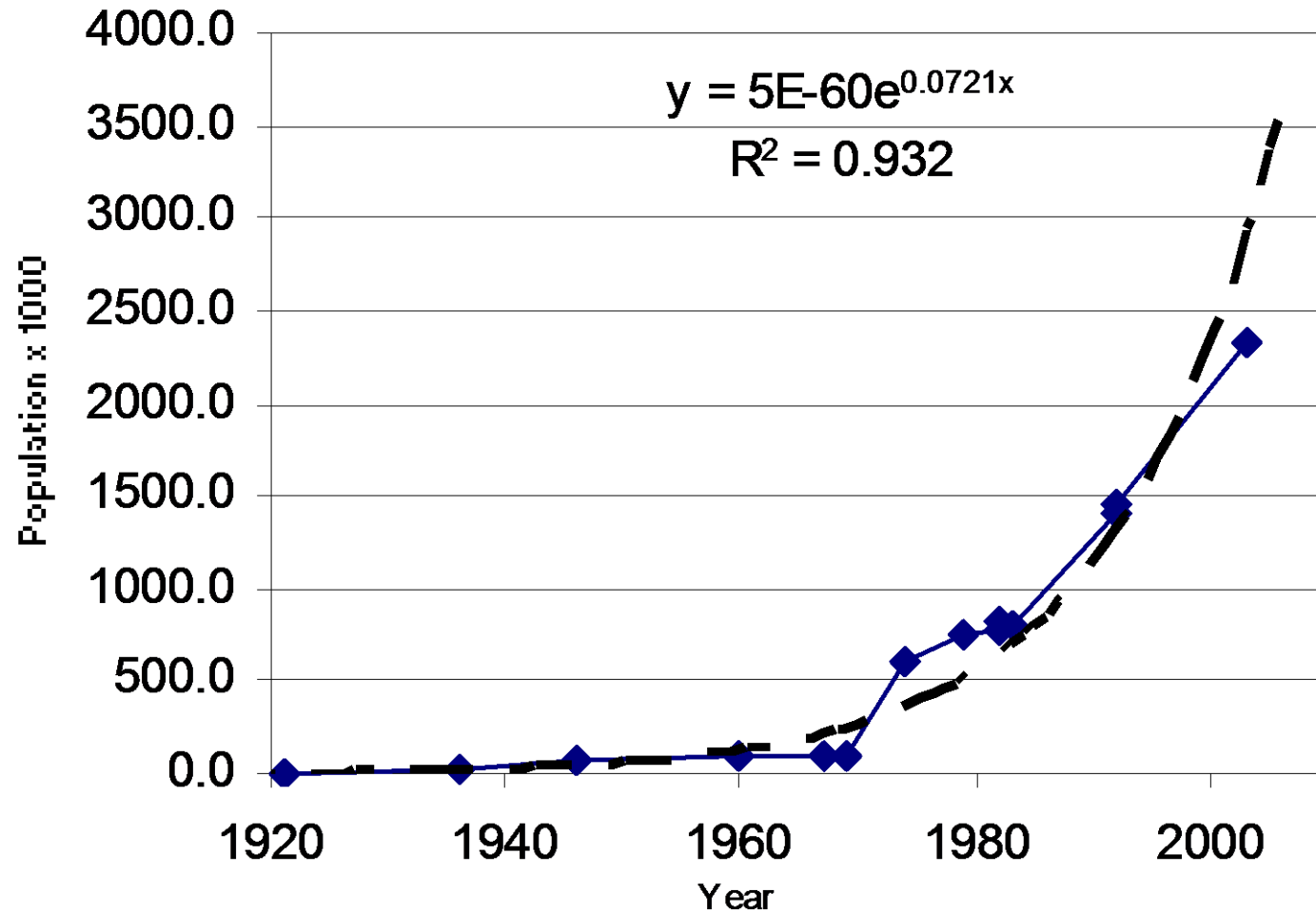
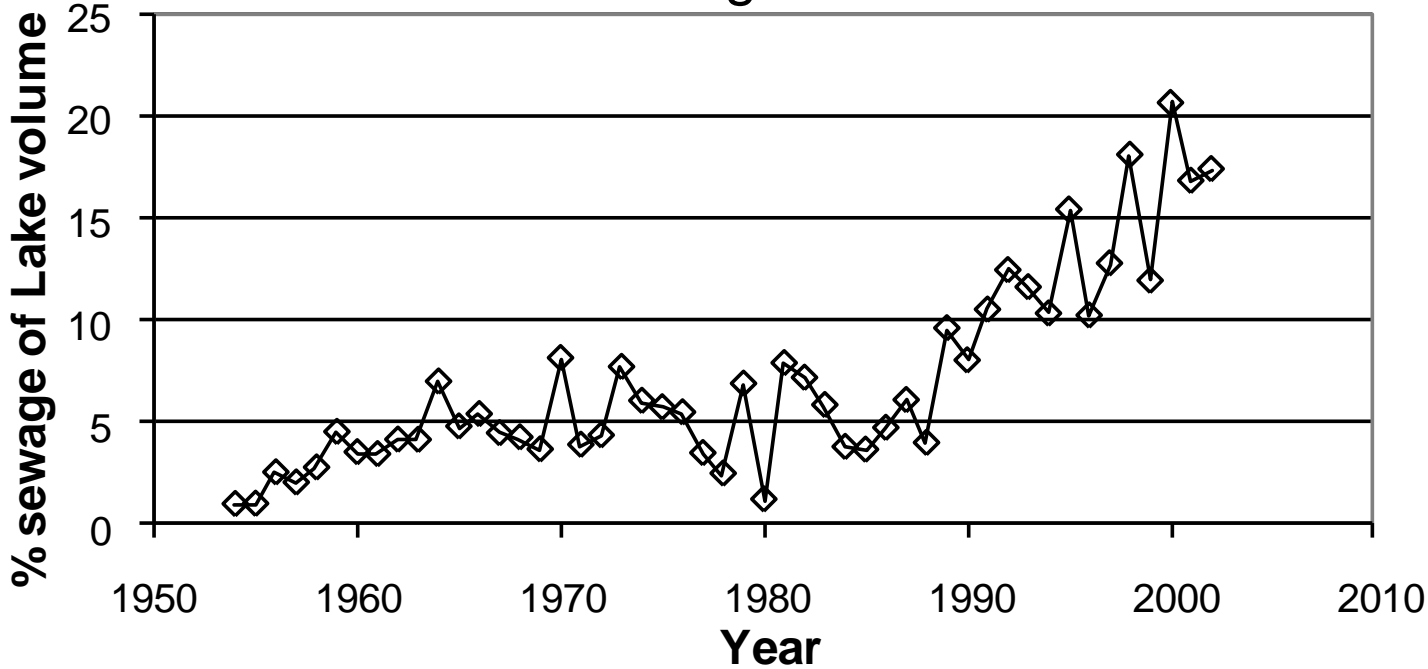


Fig.. % contribution of sewage to lake volume from Ferle & Croborough sewage works: after Magadza 2008



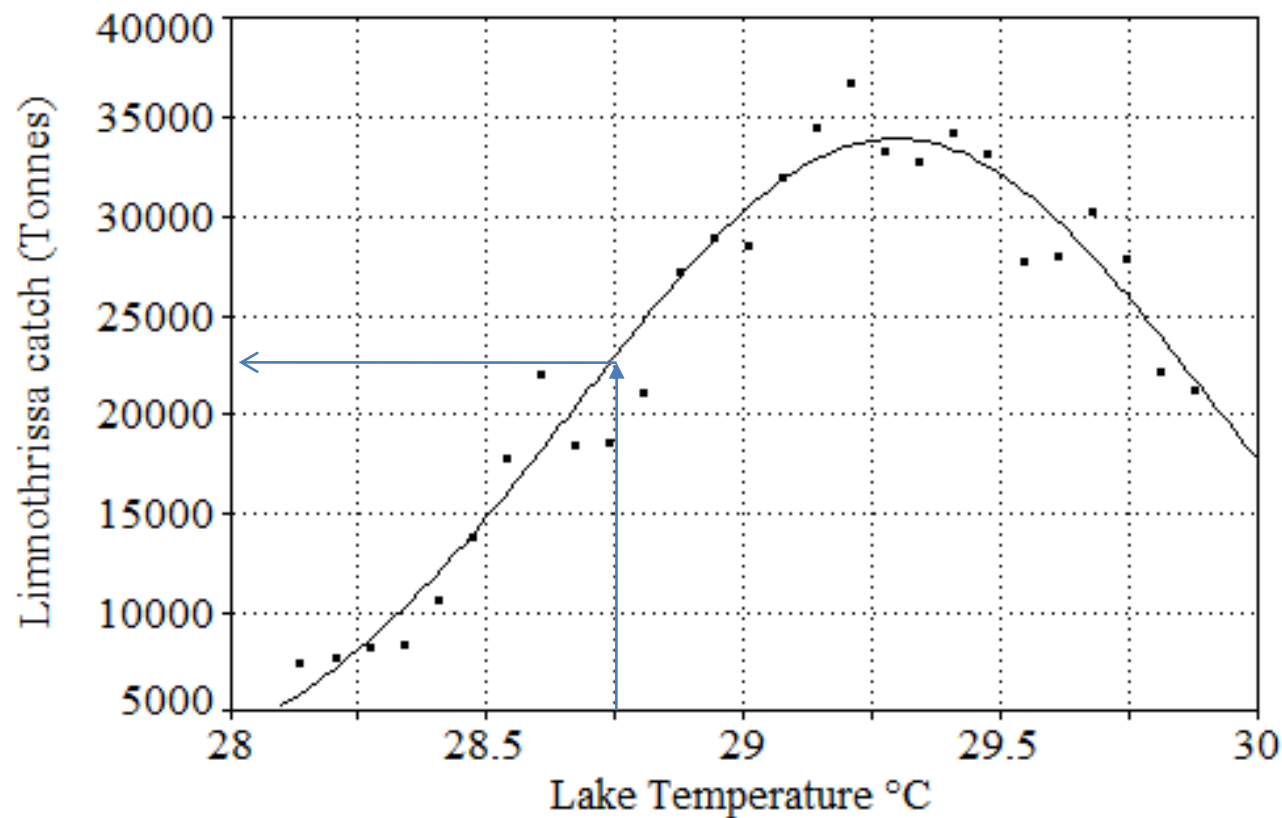


Ecosystem impacts

Limnothrissa catch vv lake temperature

$$\ln y = a + bx + cx^2$$

$r^2=0.95314141$ DF Adj $r^2=0.94702942$ FitStdErr=2098.946 Fstat=244.08963



The vulnerability paradigm: Land use issues

After the Land Apportionment Act:

Is our policy to communal lands any different from Western anthropology
Social evolution Darwinism



Siltation on Shangani River

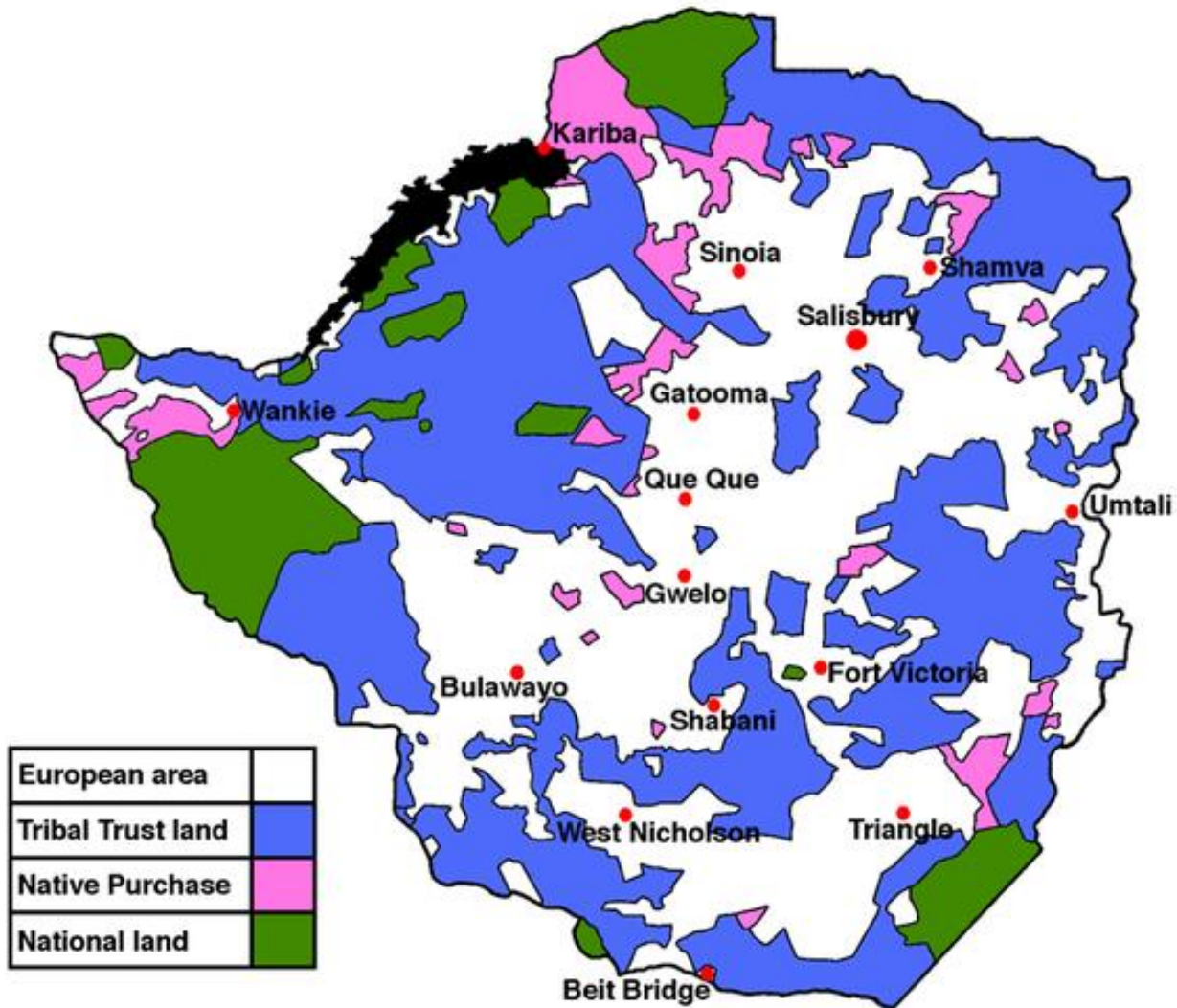


Siltation on mouth of Osborne Dam



Policy issues

Land apportionment, 1981



Transformation of the communal lands: ending the Rhode legacy

- Surplus water
- Homestead agro-industries for all year production
- Marketing
- Technical support services
- Minimal investment risk
- Security of tenure

Watershed management

- Manage ranch lands for erosion reduction
- Managed grazing (padocking)
- Wetlands (dambo) conservation
- Zero tillage technology

Control of urban drift

- Encourage serviced villagisation in rural areas
- Create an investment friendly atmosphere in rural areas to create employment.

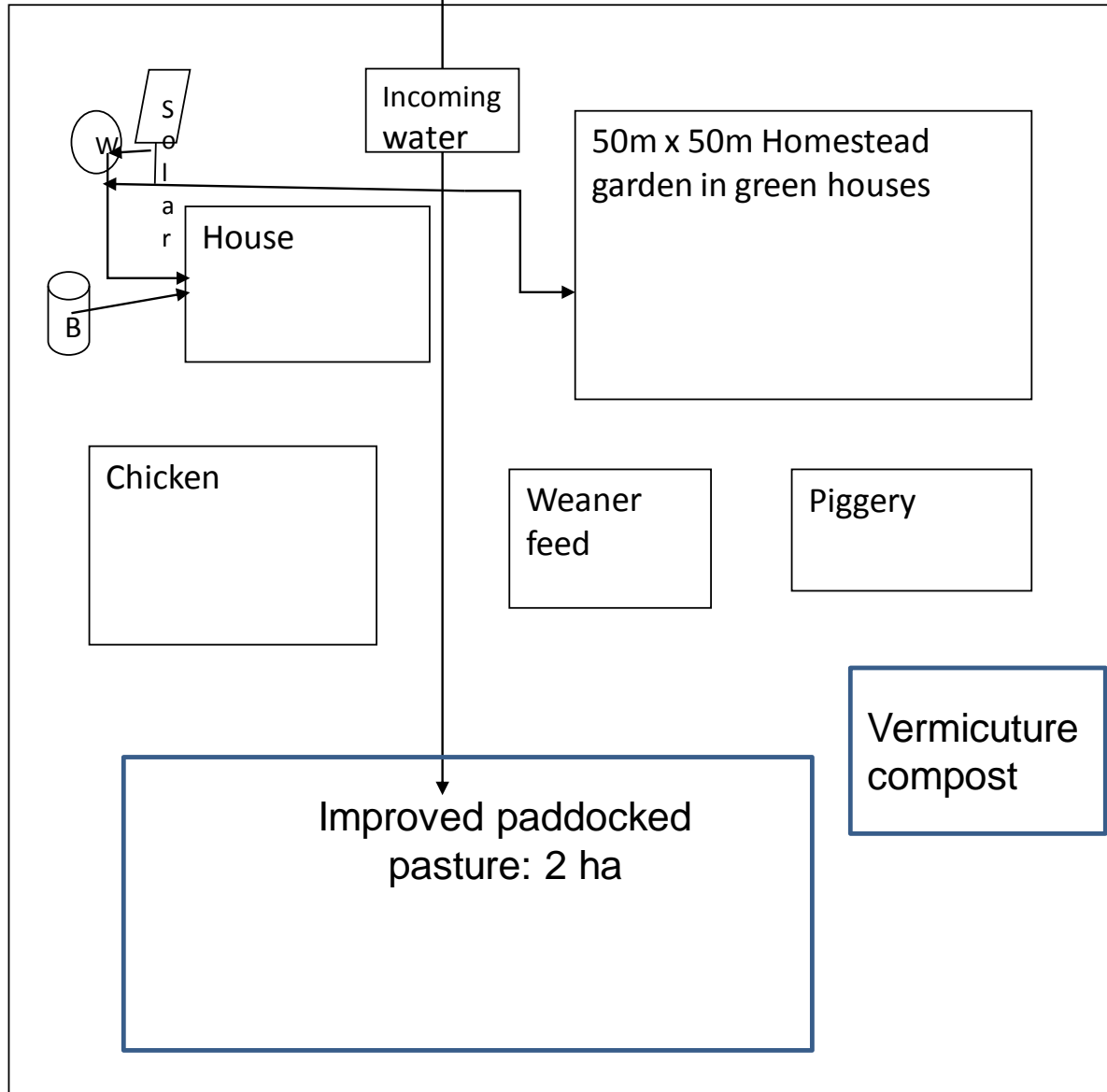
Management of wastewater

- Efficient and functional wastewater treatment works
- Use of natural as well as constructed wetland for nutrient removal

Energy

- Mandatory domestic solar heating appliances
- Promote solar lighting in rural areas
- Biogas heating in rural areas
- New designs in hydro-power generation
- Wind power
- Clean coal technology

Fig 1. Possible rural homestead configuration: romantic dream?



The features of this homestead are

- It is an all year round production, underpinned by supply of “surplus” water
- It has potential of employing non family members
- It requires initial investment of probably several thousand dollars (estimated at \$20 000), which the farmer can borrow and payback with interest in 5 years.
- It removes cattle from the communal grazing land, leaving that for watershed rehabilitation by tree planting, which in time can be used for carbon credits trading.
- It requires marketing support
- It requires technical support
- **It opens communal lands for investment**



Thank you