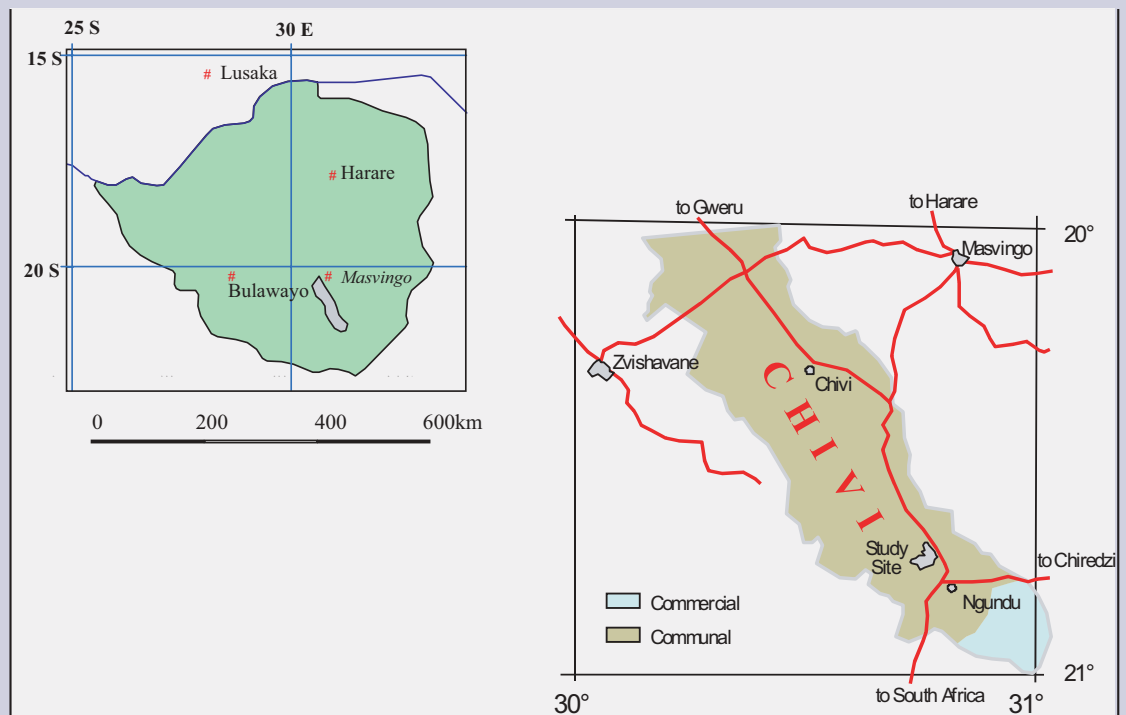


# Integrated catchment management and sustainable water resource development in semi-arid Zimbabwe

## Appendices



Map of Zimbabwe and study area

## **IRC International Water and Sanitation Centre**

IRC facilitates the creation, sharing, and use of knowledge so that sector staff and organisations can better support poor men, women and children in developing countries to obtain water and sanitation services they will use and can sustain. It does this by improving the information and knowledge base of the sector and by strengthening sector resource centres in the South.

As a gateway to quality information, the IRC maintains a Documentation Unit and a web site with a weekly news service, and produces publications in English, French, Spanish and Portuguese both in print and electronically. It also offers training and experience-based learning activities, advisory and evaluation services, applied research and learning projects in Asia, Africa and Latin America; and conducts advocacy activities for the sector as a whole. Topics include community management, gender and equity, institutional development, integrated water resources management, school sanitation, and hygiene promotion.

IRC staff work as facilitators in helping people make their own decisions; are equal partners with sector professionals from the South; stimulate dialogue among all parties to create trust and promote change; and create a learning environment to develop better alternatives.

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**The University of Reading**

**Integrated catchment management and sustainable water  
resource development in semi-arid Zimbabwe**

A thesis submitted for the degree of Doctor of Philosophy

by

Patrick Barré Moriarty

Department of Geography  
June, 2000

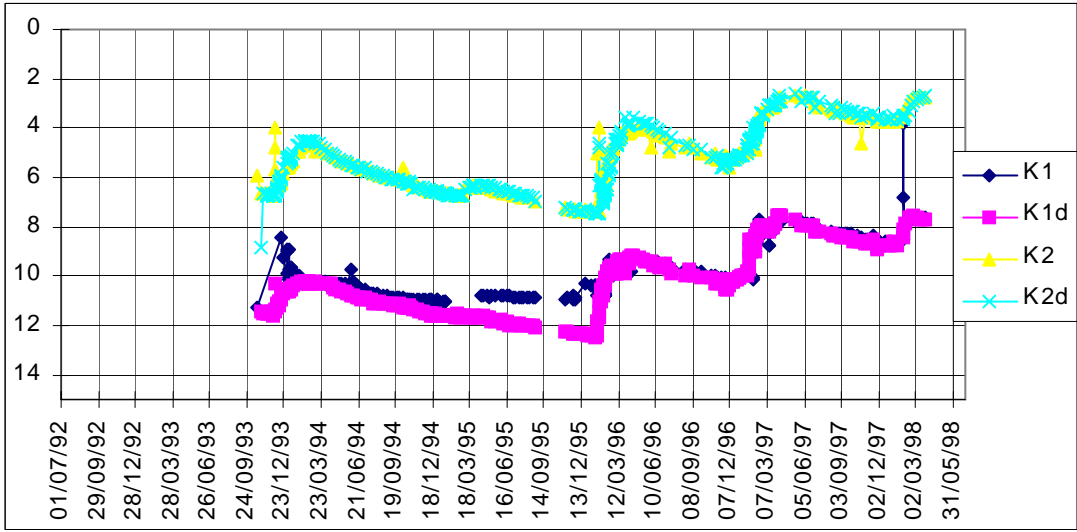
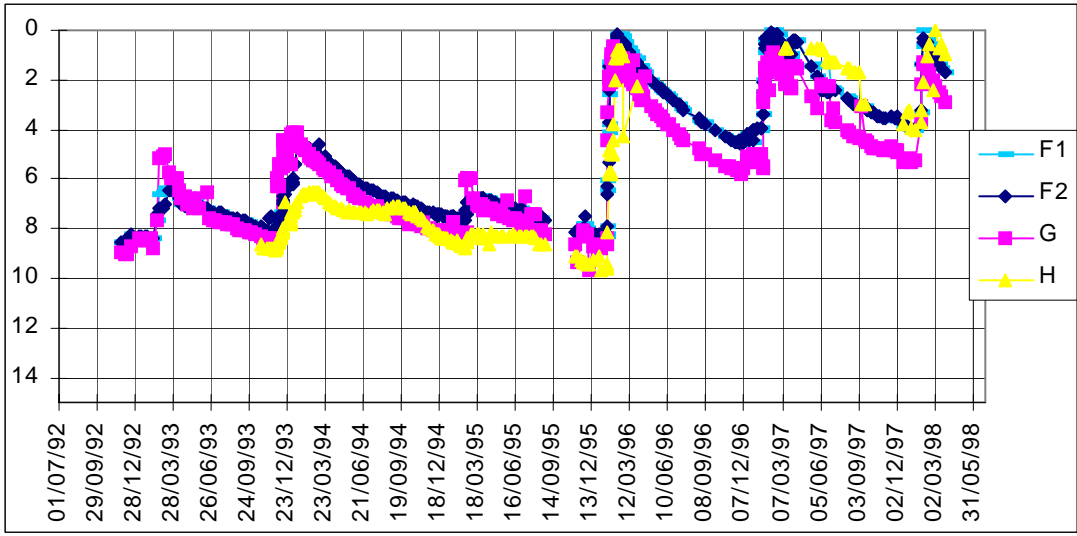
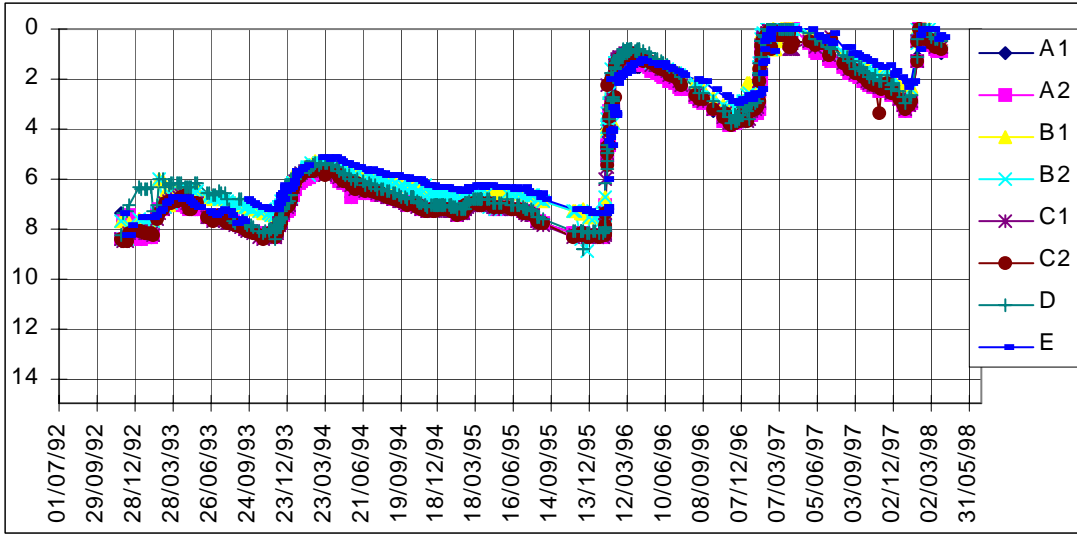
For Saoirse who wasn't born until near the end, and then did her best to  
make sure it was never finished!

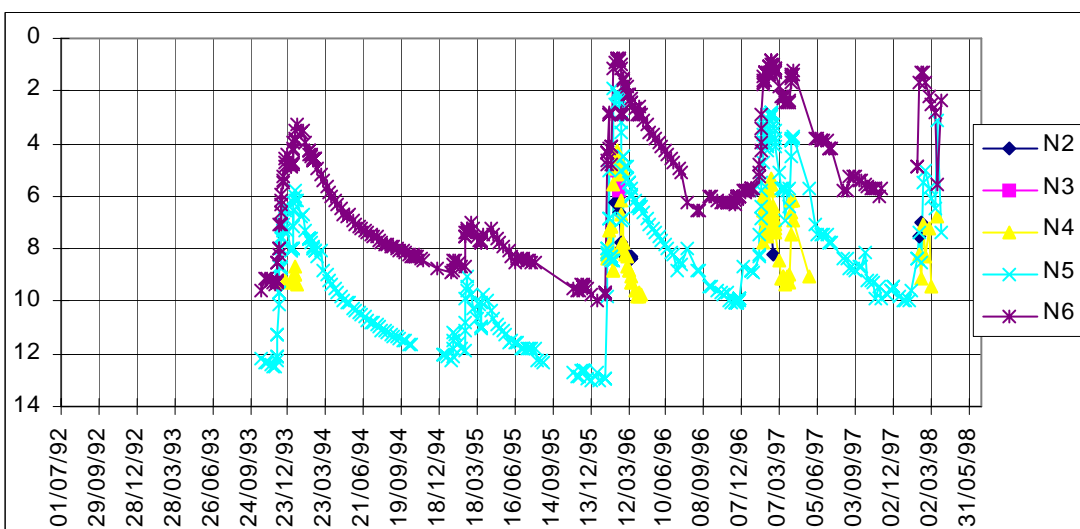
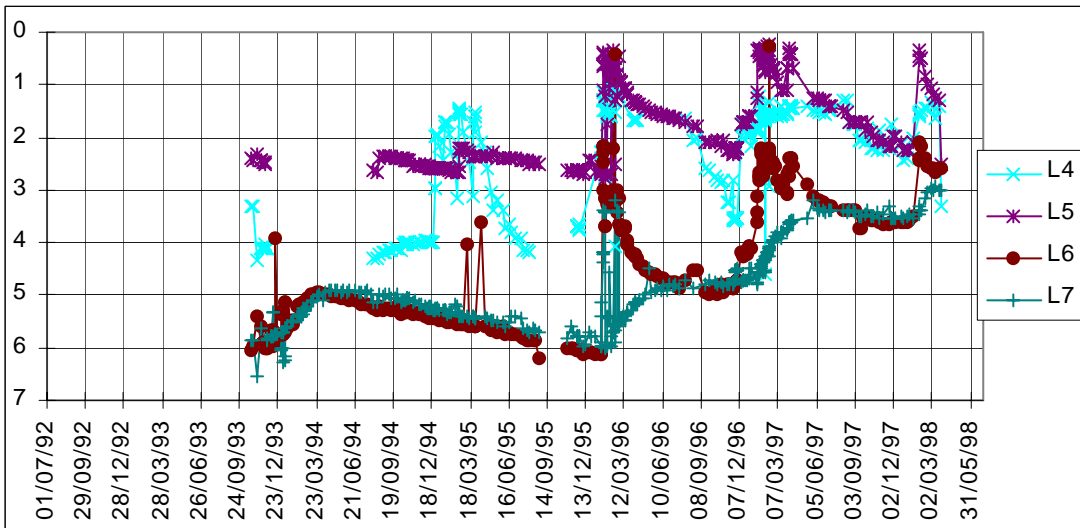
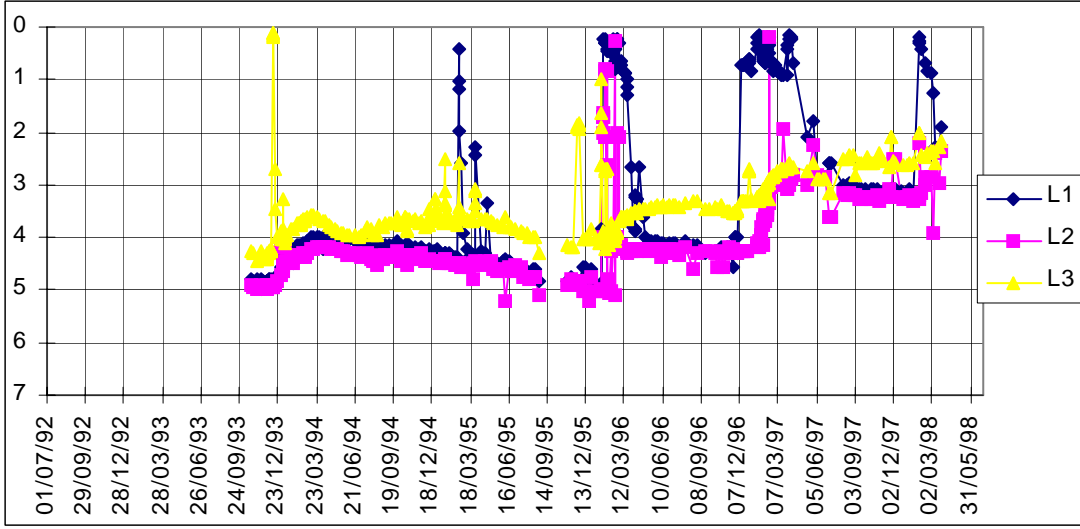
*Appendix A:*

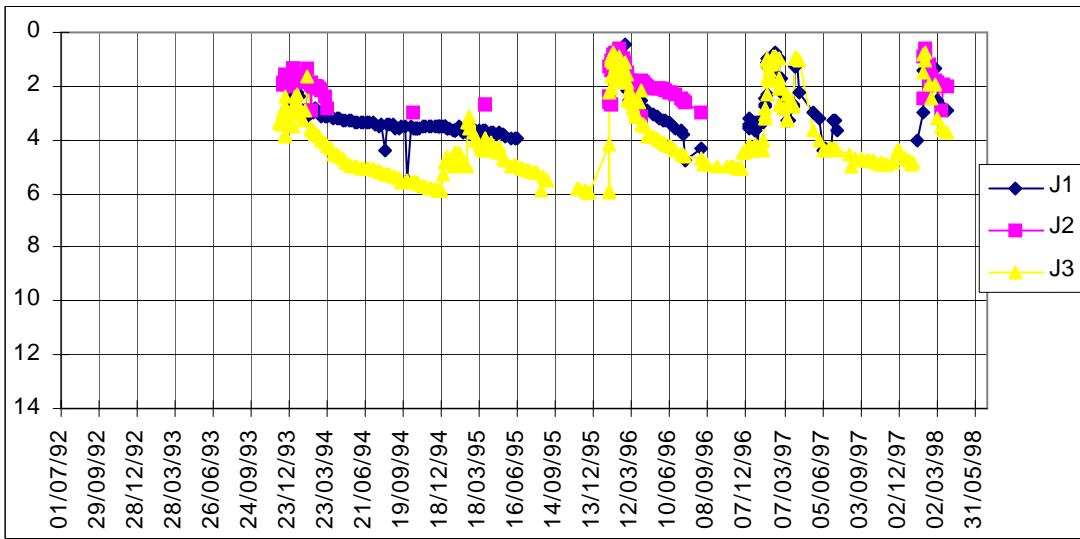
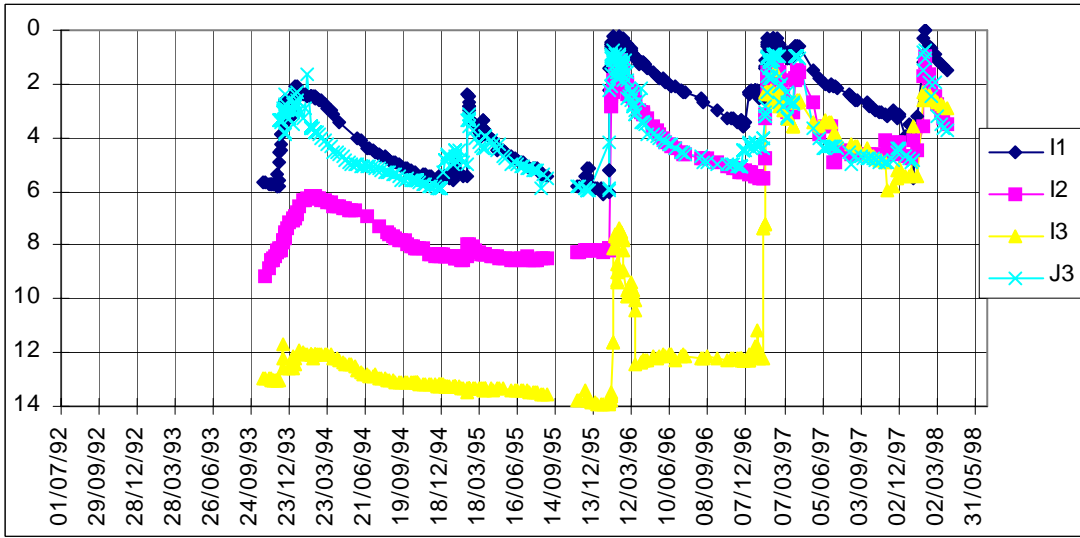
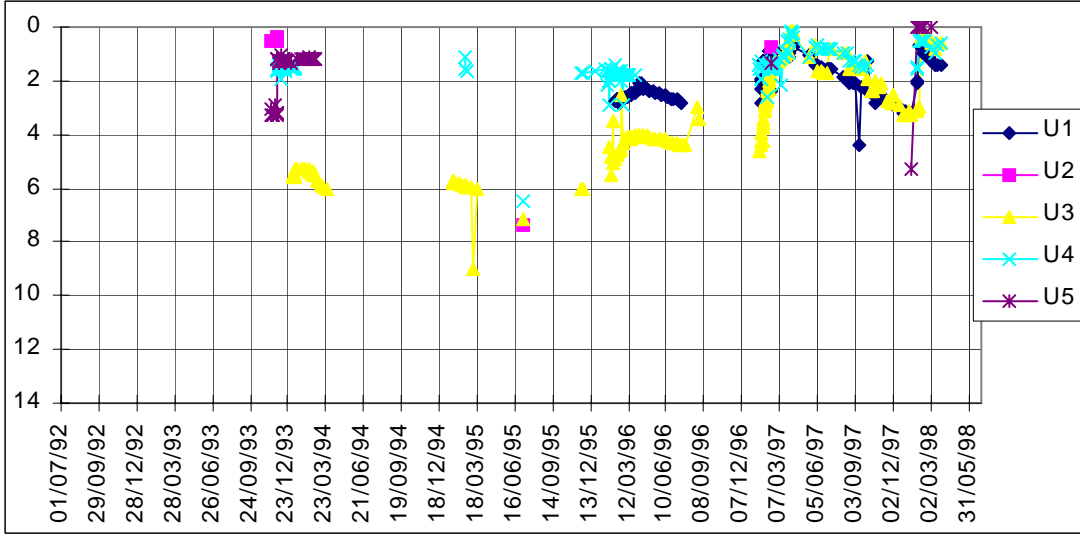
**Map of catchment showing position of all piezometers**

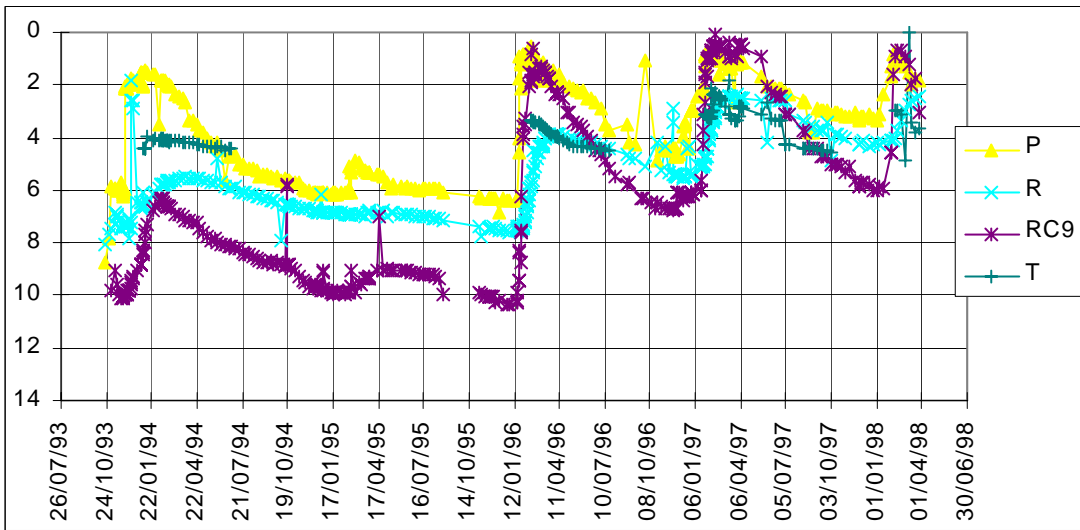
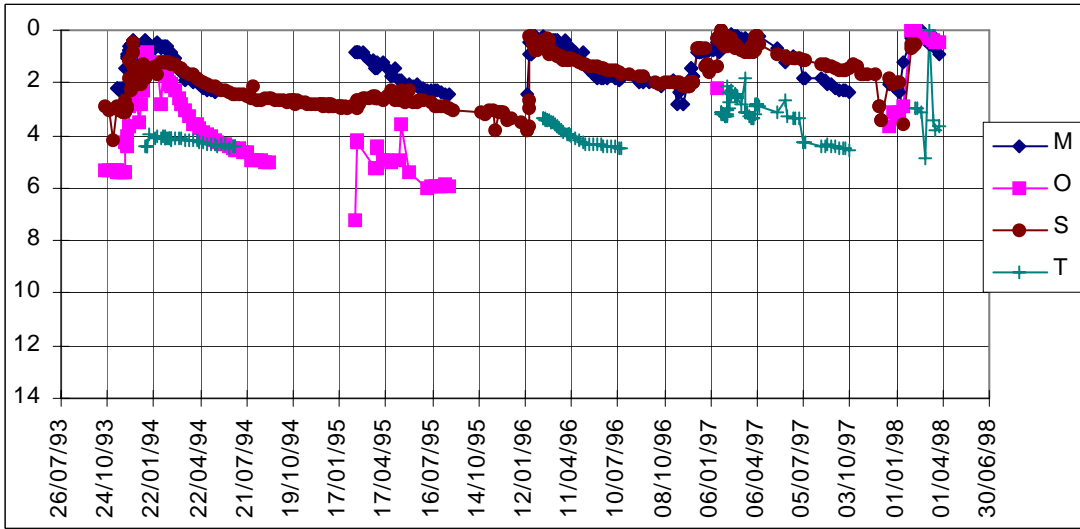
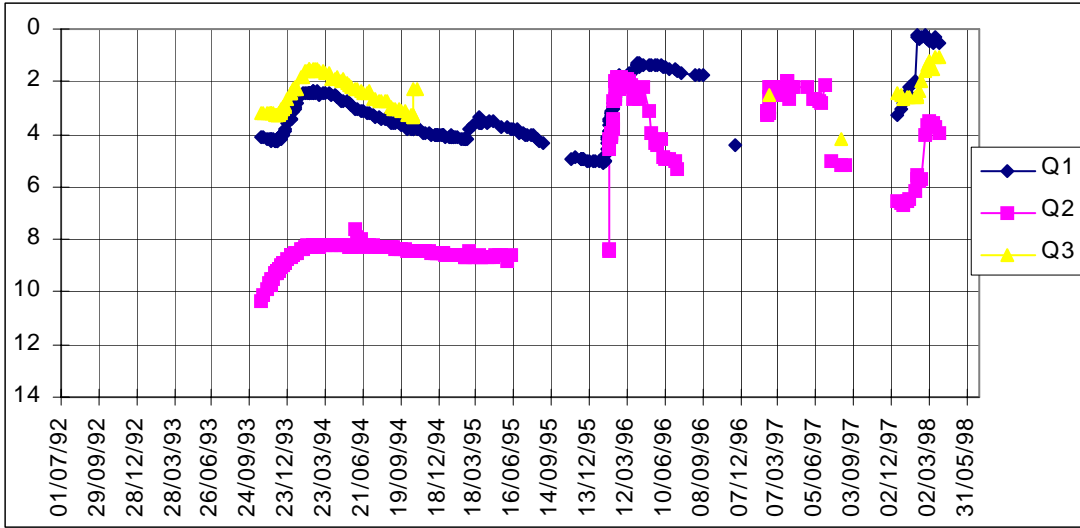
**Times series for all piezometers**

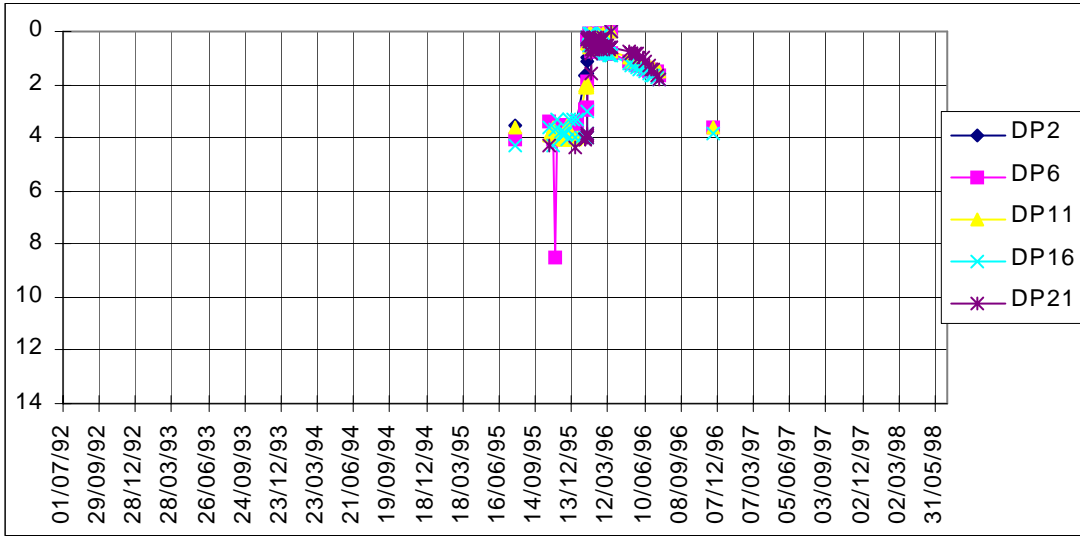
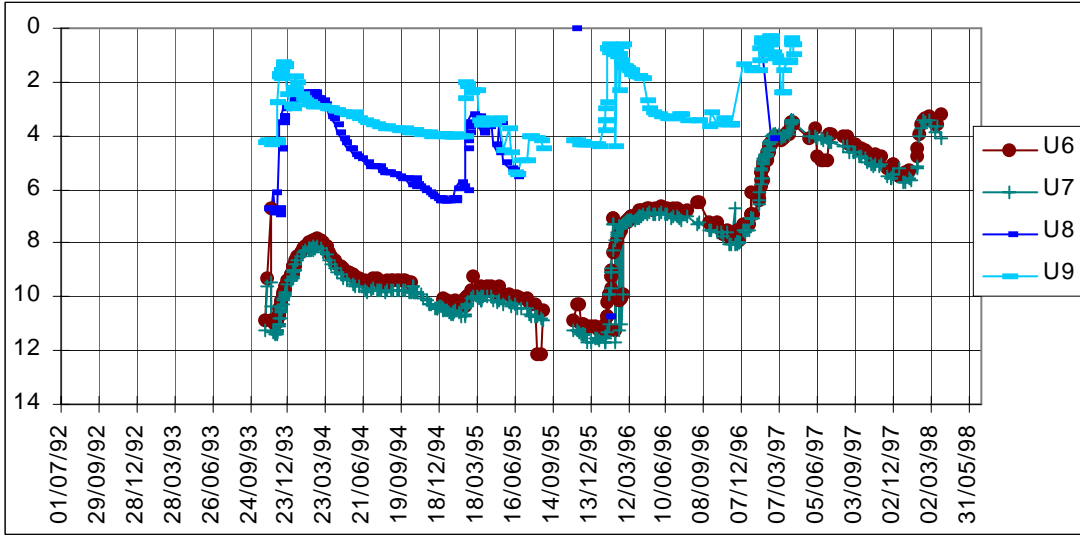
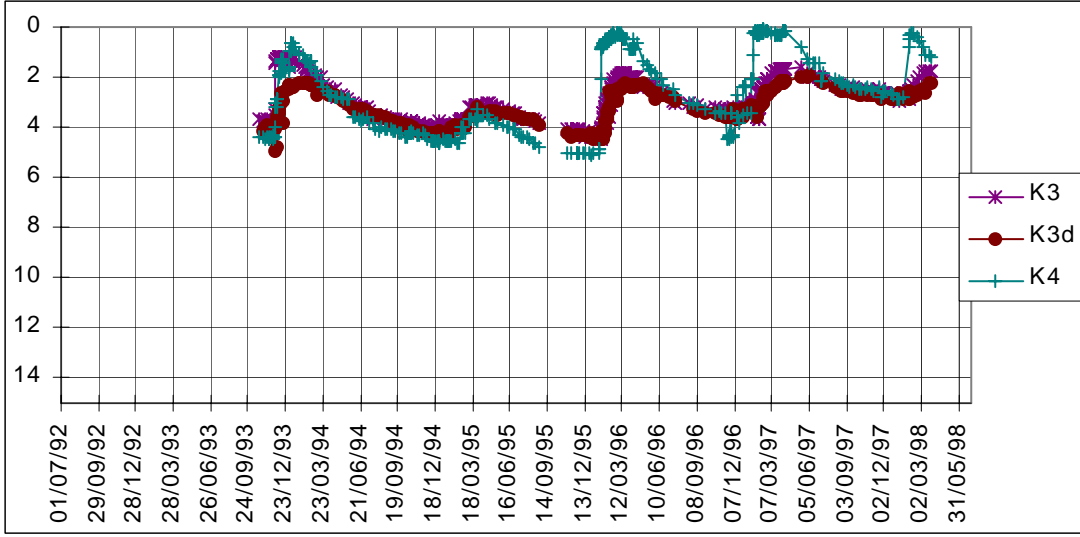


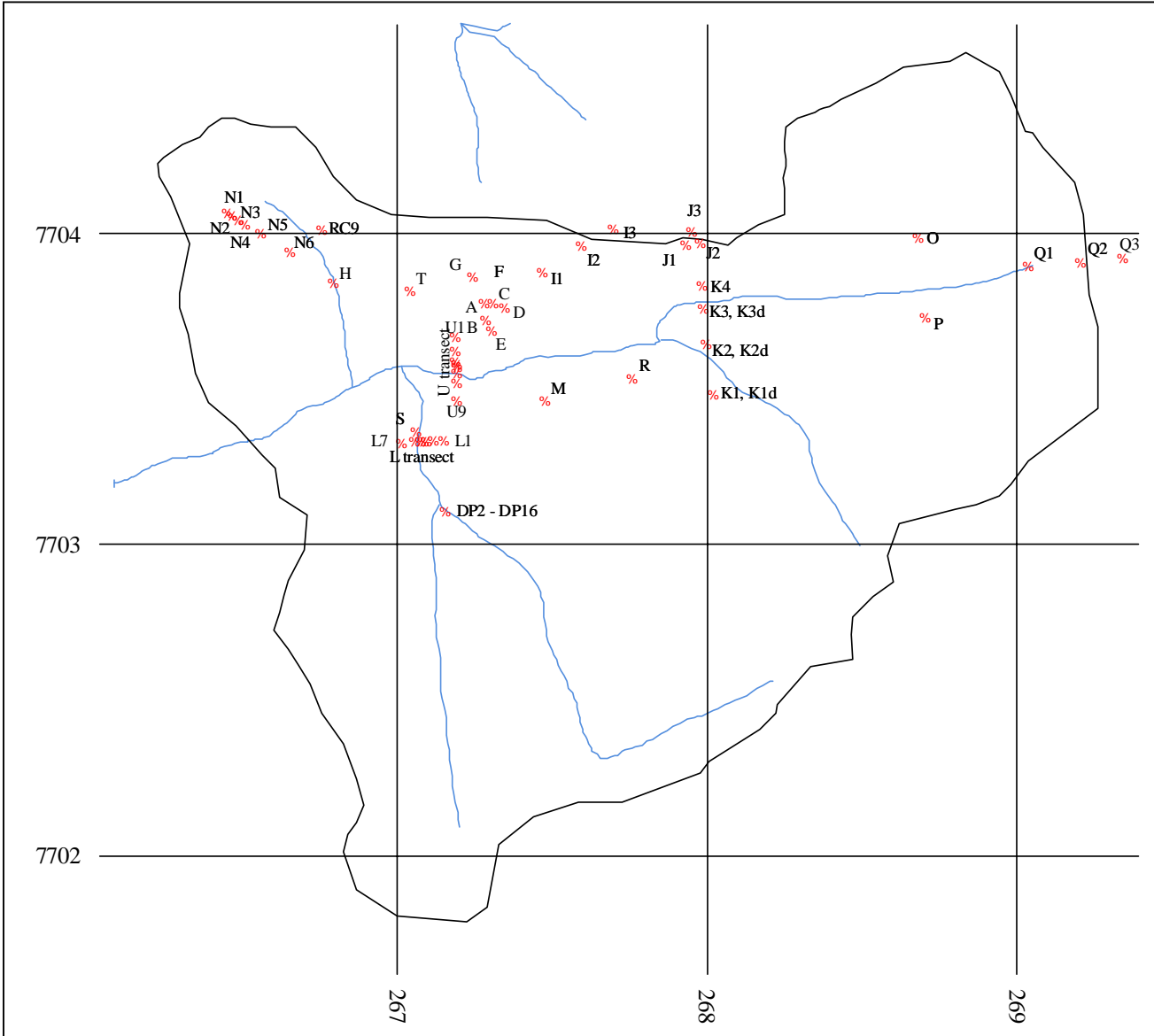












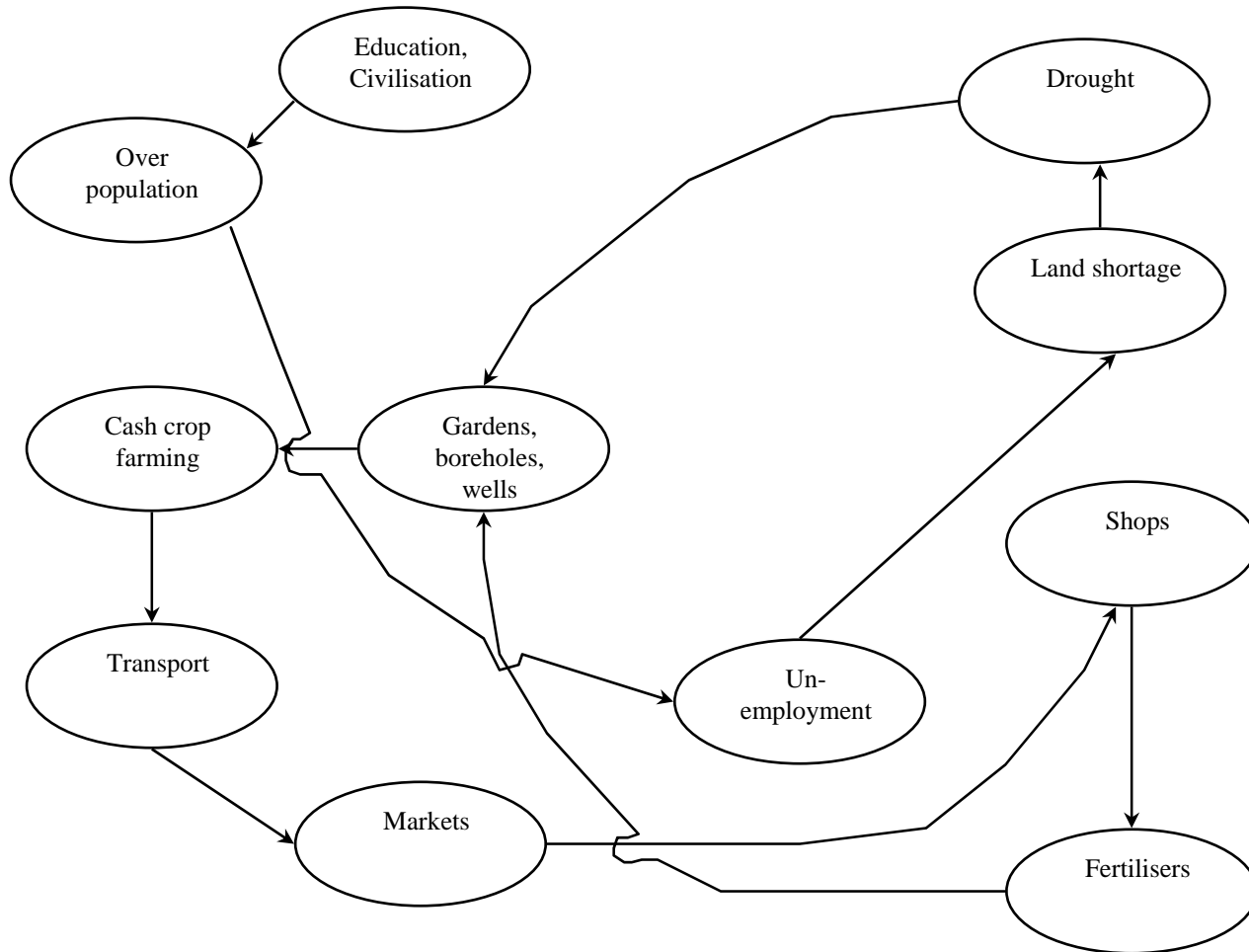
*Appendix B:*

**Histroical profiles (time-line matrices) for all kraals**

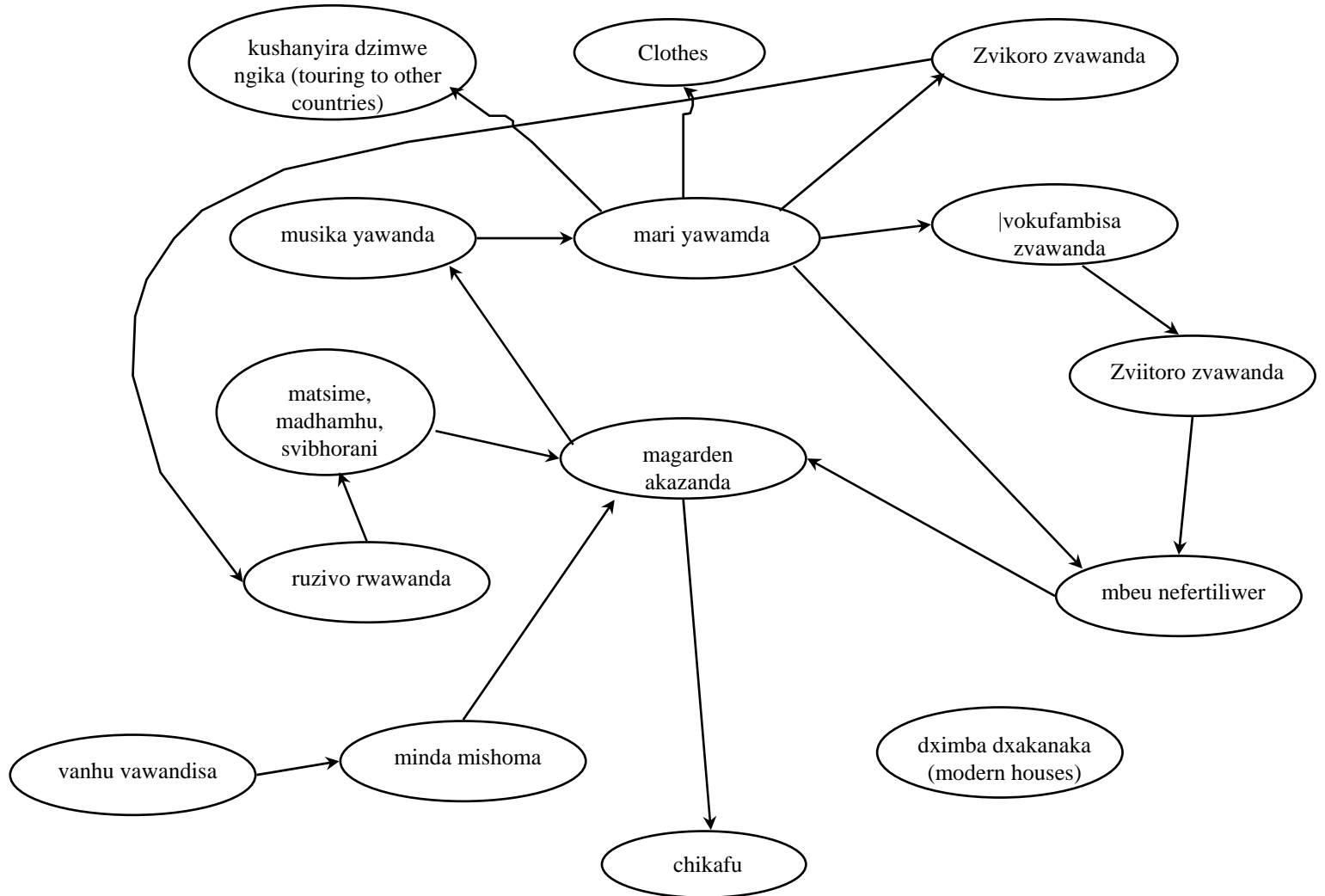
**Influence diagram for all kraals**



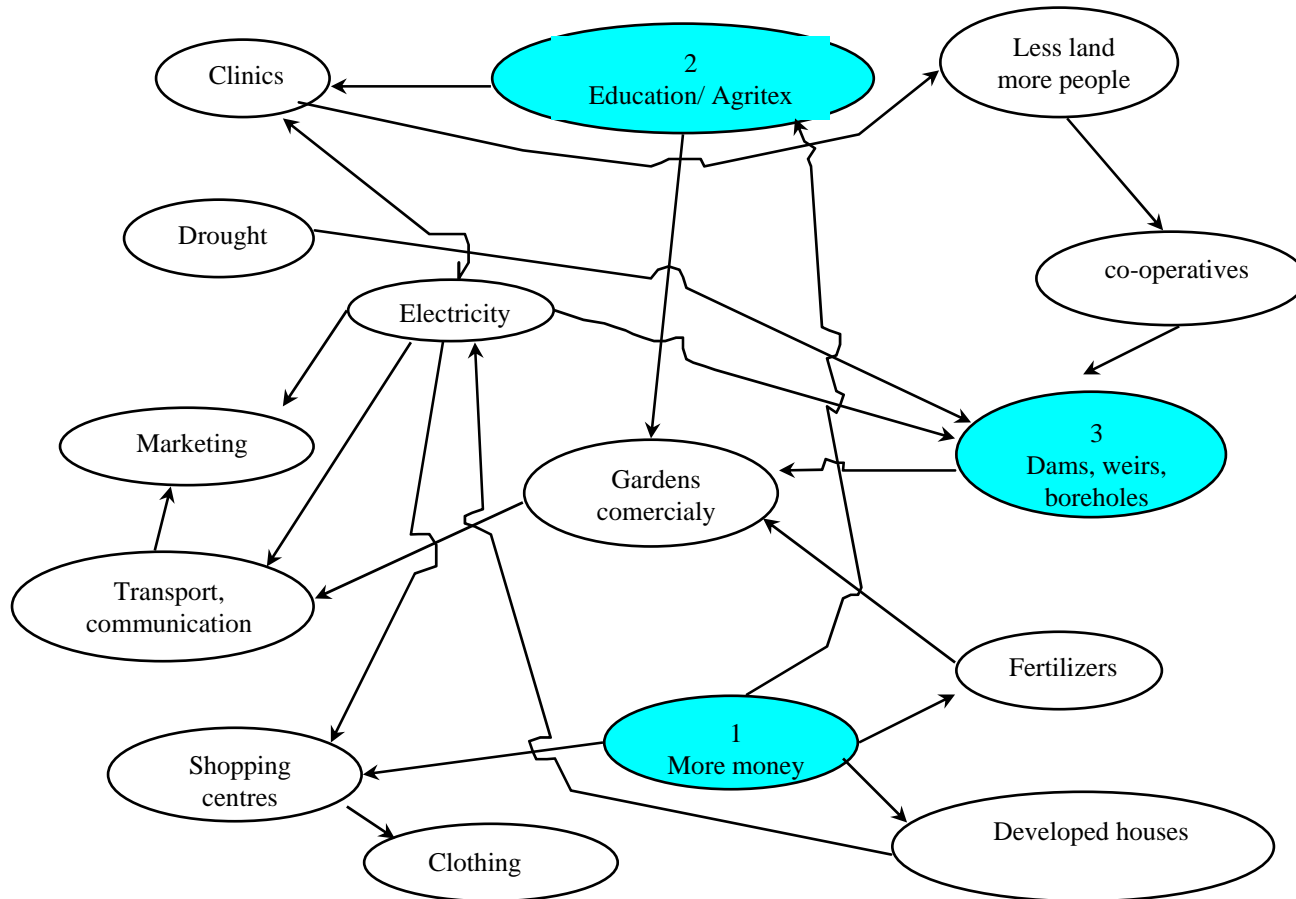
# Joni



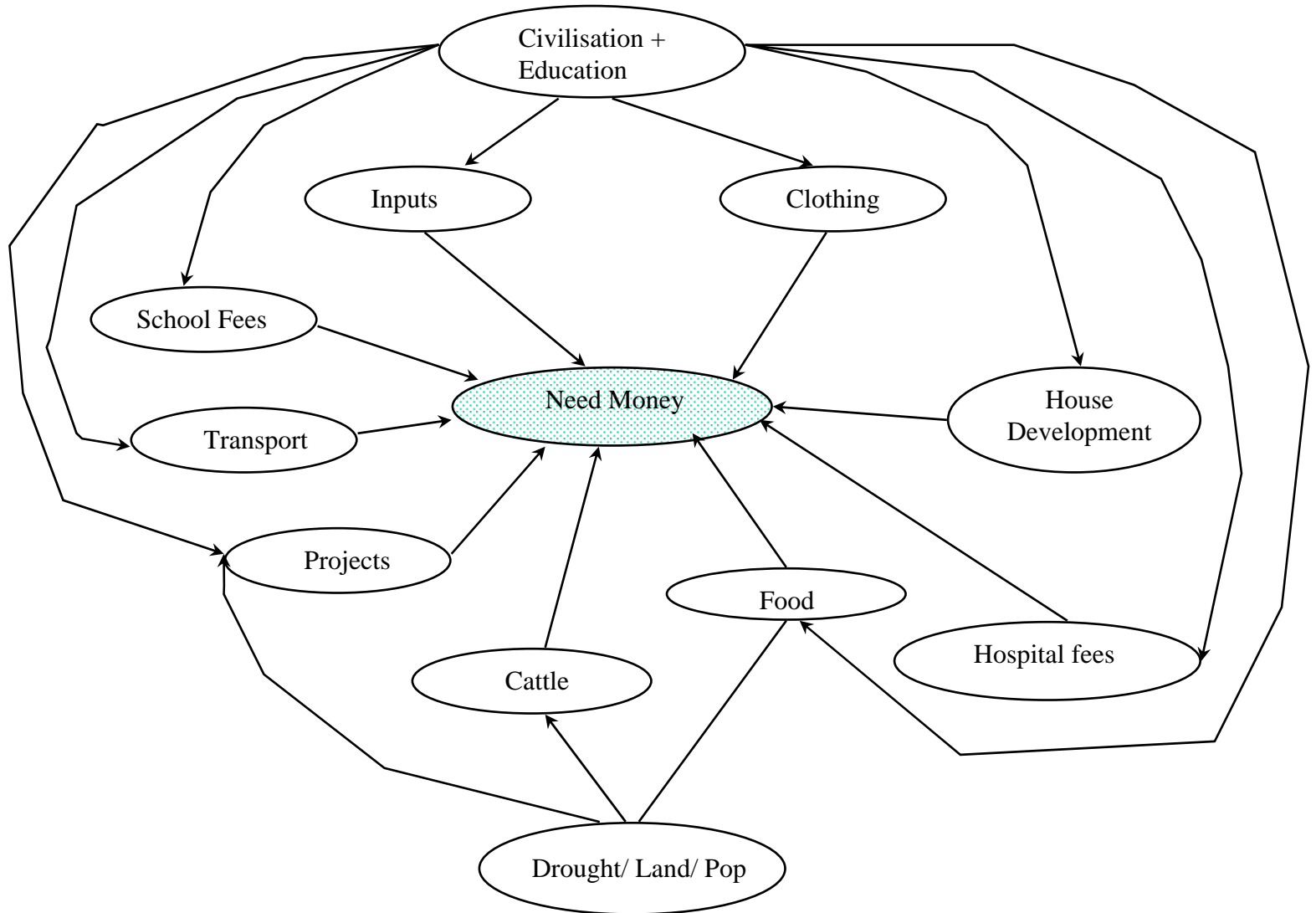
# Matenhese



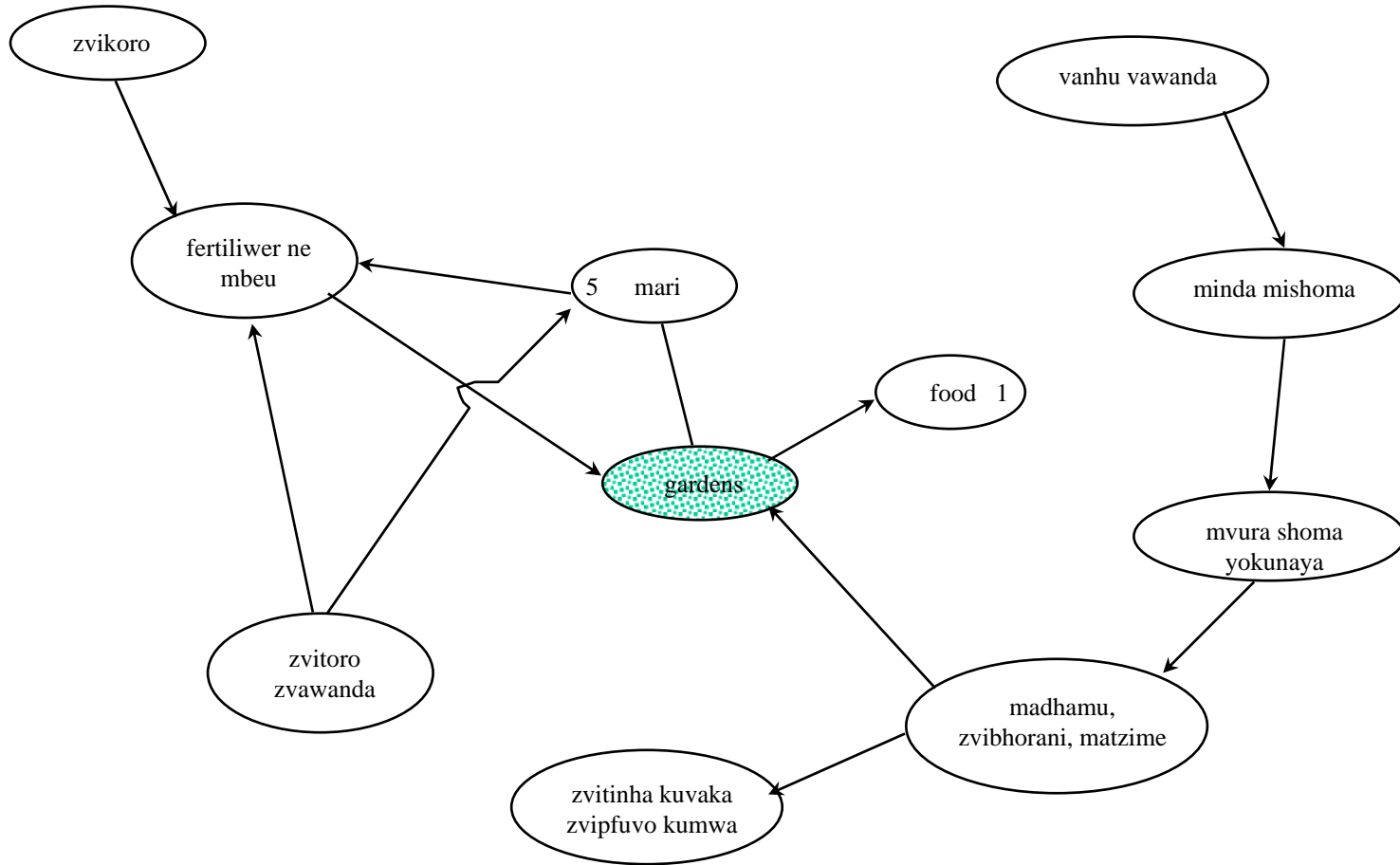
# Ndavaningi



# Sihambe



# Tamwa



Sihambe kraal - historical profile

Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	
Main crops	Maize, Millet, Ground nuts, Rapoko, Rice	No change									
Garden	No gardens, people relied on wild animal meet, mushrooms, and wild vegetables	No change			One garden + one well (J. Mhlanga)	one garden, well not giving enough water	no garden				
Makandiwa	No contours, fields were under preparation	no change							Contours introduced	No change	
Goho	Yield was very poor. Paul gave food	High yields	Good yield	good yield	good yield	good yield	poor yield	good yield	good yield	good yield	
Mvura kunaya	Plenty of rains as from 16.10 1953 water logged	Good for crops	Good for crops	good for crops	good for crops	note enough	poor rains	good rains for crops	good rains	good rains	
Matsime	Spring				1 well	No change					
Livestock	Average no of cattle 15, 2-4 donkeys, 5 goats	constant due to livestock control					No change				
Minda	Vast land was allocated to each and there was no limit	Digging of roots			no change					new allocations - more land	
Misha	12 families, kraal head was Dhbani, Chief Nemaузhe	Average 5 people/ family	average 8 people/ family	no change	addition 1-2 per family	increase of 1 per family	no change	no change	increase of 1 2 per family	some people left for Zambia	
Population	12 families, kraal head was Dhobani, Chief Nemaузhe										

Origin - Shurugwi

Sihambe Siwawa - Born 1918

No of people who made the village = 11 families

Had approximately 15 cattle each

Came from Four Wheel Ranch

Sihambe kraal - historical profile

1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	
no change												Cotton sunflower, 3 families grew millet		
no garden														
no change														
poor yields	good yields	good yields	good yields	poor yields	good yields	good yields	good yields	good yields	drought	good yield	not enough for year	good yields	good yields	
poor rains	good rains	good rains	good rains	not enough	good rains	good rains	good rains	good rains	poor rains	poor rains	poor rains	good rains	good rains	
no change														
No change									rise of 3-5 beasts per family	no change	more by about 3 calves per family	more livestock		
contours dug	no changes, land was enough													
increase in no of families but no new homesteads established	increase of 2-3 per family	no changes at all	no new homes, more kids			1 kid for every 3-4 families		no new homes, more kids					1 new home from Tafira and 1 from Chivi	
	90 people										20 families, 150 people			

N.B. No gardens, people were getting relish from ordinary traditional plants

Sihambe kraal - historical profile

1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	
Cotton, maize, sunflower, ground nuts							Cotton, maize, sunflower, ground nuts, sorghum						
no garden					3 gardens					4 gardens	5 gardens		
no change													
good yields	good yields	good yields	good yields	good yields	good yields	good yields	good harvest	not enough yields	not enough yields	good yields	poor yields	poor yields	
poor rains	good rains	good rains	good rains	good rains	good rains	good rains	not very ok	good rains - enough for animals to survive	good rains	poor rains	poor rains	good rains	
2 wells	No change			3 wells	No change				4 wells	5 wells	6 wells	no change	
constant. no increase no decrease			cows were taken by army		no change								
no changes, land was enough													
no new homes		no new homes, some went to live in town			no new homme, more people from town			new homes, 5 families		No change			
							30 families, 170 people						

Sihambe kraal - historical profile

1989	1990	1992	1997
no changes		no changes but people are planning to plant rapoko	
5 gardens	5 gardens	13 in total, 8 more new gardens were established	no new garden, 13 in total
no change			
good yields	good yields	poor yields	good harvest
good rains	good rains	more rains	more rains
no change		8 more wells were dug during 1991/92	no new wells dug
no change		most of the livestock died during this 1991-92 drought, most families left with nothing	livestock is coming up with at least one or 2 per 5 families
enough land	shortage of land to young man		
no change		four new homes established	
	190 people		

1992-1997 People were getting quite a lot of food, its only in 1997 when they didn't get enough food to join the 1998 rain season

