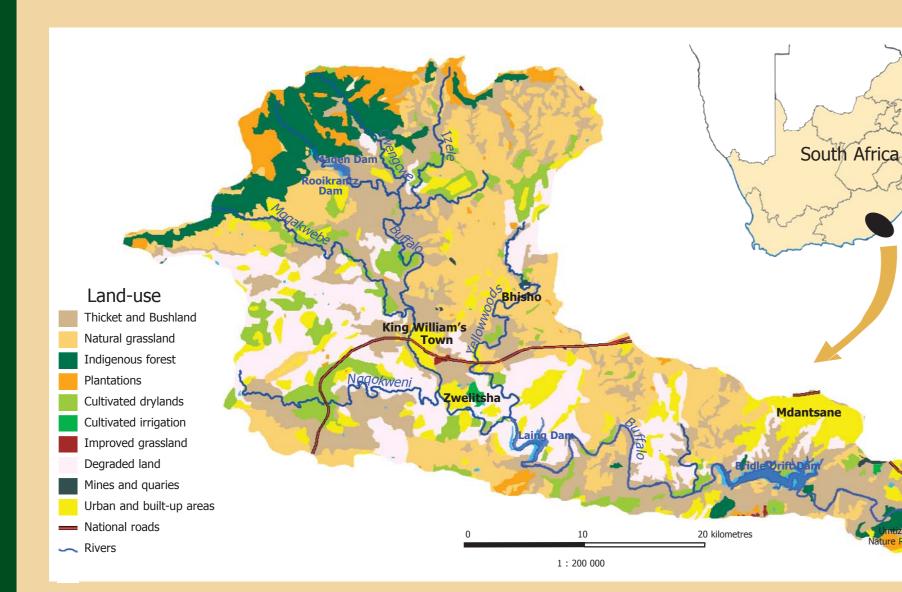
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### Catchment overview

Catchment size: 1280 square kilometre Major tributaries: Mgqakwebe, Ngqokweni, Yellowwoods River flow: Easterly direction Dams: Maden, Rooikrantz, Laing and Bridle Drift Length: 125 kilometre Population supported by the catchment: 570 000

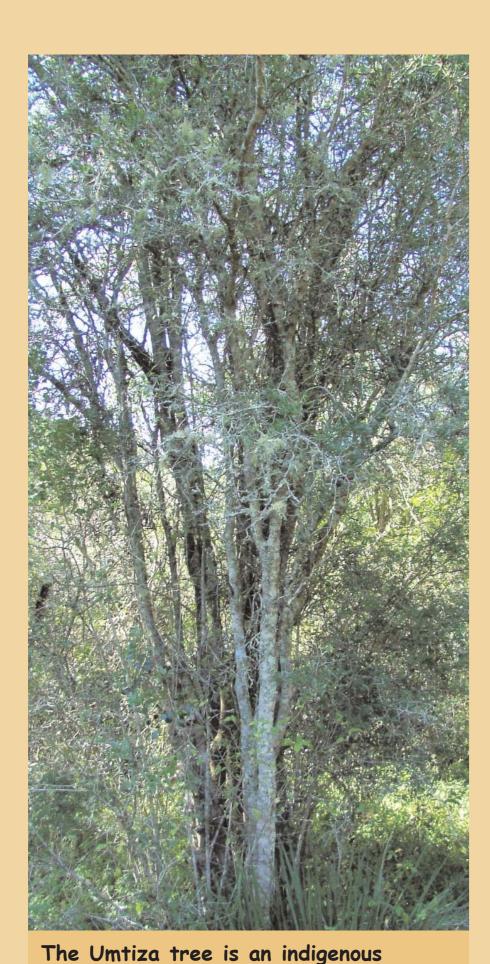
Geology: Sedimentary rock consisting of mud stones, shales and sandstone which is highly erodable Vegetation: Forest, Savannah, False Machia, Thicket

### Iliso lawonemifudlana egalela kuwo

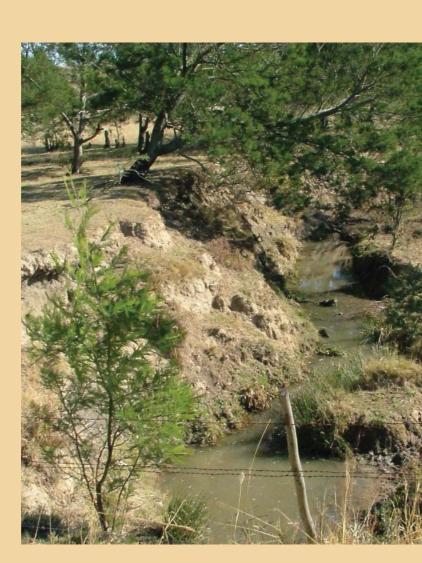
Ububanzi: 1280 ikhilomitha eziskwere Imilanjana enesixa egalela apha: nguMqgakhwebe, Inqgokweni neYellowwoods

Icala obheka ngakulo: ngasempumalanga ukusuka kwiliso Amadama akuwo: YiMaden, yiRooikrans, yiLaing neBridledrift Ubude: Zikhilomitha eziyi - 125 Abantu abatya amanzi alo mlambo: 570,000 Ijiyologi: Udongwe, Amadwala, namatye aphuqeka abe yisanti.

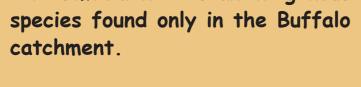
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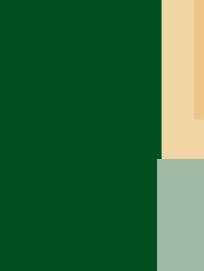
DEPT: ENVIRONMENTAL AFFAIRS AND TOURISM











### Introduction

The Buffalo River drains the forested Amatola Mountains of the Eastern Cape, crossing the coastal plateau before reaching the Indian Ocean where the East London harbour is situated in the Buffalo Estuary. Presented below is the state of the Buffalo River using the Driving force-Pressure-State-



**Responses and Management** Recommendations

Inform local communities about sustainable use of plants including grazing practices. Remove alien vegetation and control aquatic alien plants, destroy seeds also upstream and follow up. Restore river banks that have collapsed or eroded. Explore public/private partnerships. Upgrade and monitor sewage treatment works, employ and train staff and monitor the success. Start managing on a catchment basis. Rehabilitate wetlands.

### Iziphakamiso ema zilandelwe.

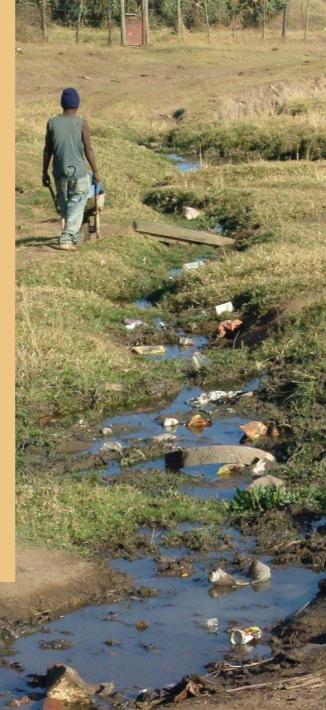
Abantu abaphahle lo mlambo mabacaciselwe ngendlela yokulolonga izihluma (ingca nemithi) namadlelo zingatshabalali; Mazitshatyalaliswe izihluma ezinobungozi ezikhula kufuphi nomlambo nezo zikhula apha emlanjeni kunye neembewu zazo ukususela apho ungena khona elwandle ukuya kutsho elisweni lalo mlambo; Mazivuswe iindonga zomlambo kwezo ndawo zidilikileyo nakwezo zithe zakhukuliseka; Makujongwe indlela ekunokuthi kubanjiswane ngayo nabantu nabahlali abakufuphi kulomlambo kunye neenkampani ezizimeleyo; Oobhuqa nemibhobho yabo mababekwe emgangathweni wezimini basoloko bebekwe esweni; Makugeshwe abantu bagegeshelwe lomsebenzi ukuze zenzeke zonke ezizinto ngukuthe tyhatyhasini; Eli dabi maliqalwe apho aphuma khona la manzi alo mlambo; Imigxobhozo mayipheliswe.

### Impacts

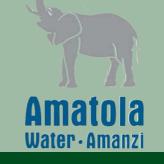
Impacts include sand mining, rubbish dumping, uncontrolled and excessive removal of wood from the riparian zone for firewood, cattle crossings and trampling of the riparian zone. Soil erosion due to human activities such as removal of vegetation, is also evident, thus increasing sediment which has a negative impact on the river channel, e.g. water not fit for drinking and fish dying. Proper sanitation is inadequate.

### Izinto eziwuntlitha kakubi lo mlambo Kukumbiwa kwesanti apha kuwo, kukulahlwa kwenkunkuma apha kuwo, kukugawulwa kwemithi yokubasa apha enyeleni lomlambo de iphele, ziinkomo ezingumla apha kuwo ezithi zixovule izihluma/notyani olukhula apha ecaleni komlambo. Ukhukuliseko lomhlaba

olwenza kube kho udaka oluninzi ngaphakathi kwamanzi oluthi lukhule luxabe kule ndawo afanele ukubaleka kuyo amanzi, neentlanzi ezibulawa yiloo nto. Zonke ezi zinto zenza amanzi omlambo angaseleki. Akukho lucoceko nampilo inle xa kunje.













Impacts-Response framework. This framework describes the human activities which create pressures on the river, the current status and trends of environmental conditions, the consequences on human livelihoods and the natural environment as well as actions that have to be taken to manage the river properly.

### Intshayelelo

Umlambo i-Qonce (Buffalo River) uphuma kwintaba zakwaMathole eMpuma Koloni, ugwegweleze unxweme ude uye kungena kuLwandle lweNdiya apho isikhululo seenqanawe sikhoyo eMonti.

Apha ngezantsi sibonisa imeko okuyo lomlambo ebangelwa zizinto ezenziwa ngabantu abanje ngabarwebi

nangabasemagunyeni. Isikhokelo esiza kusisebenzisa siguka izinto ezenziwa ngabantu ezibe negalelo kwimekombi yalo mlambo. Imeko okuyo wona ngoku nemeko yale ngingqi utyhutyha kuyo; iziphumo zokwenzekileyo kuwo ezibonakala kwintlalo yabantu nakwindalo; kunye namanyathelo anokuthathwa ukulolonga isimo salo mlambo singaphazamiseki.

## Driving forces

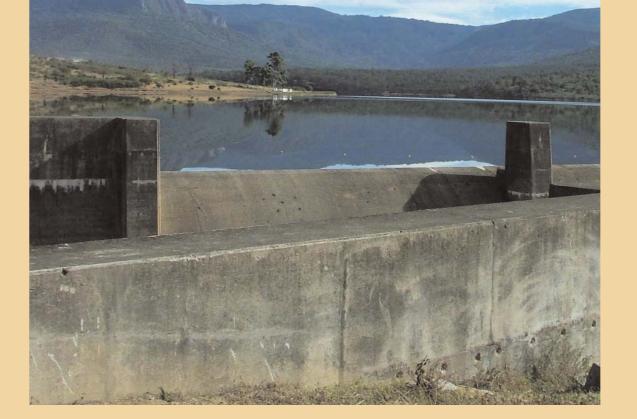
High population densities, dense peri-urban and rural settlements, construction of dams, urban and industrial developments are the major driving forces of change in the river.

Iziphazamiso

Nazi ingxaki: Ingxinano ezilalini nakwindawo ezikufuphi needolophu

- Ukwakhiwa kwamadama ×haphetshu Uphuhliso kwimizi-mveliso ezidolophini Ukusetyenziswa kwalo mlambo ngokungaphaya kwamandla awo.
- Unkcenkcesho olwenziwa ngamafama arwebayo. Ukukhula kwenani labantu abafuna amanzi

aphuma ezitepini, Oompompi bokugutyula ilindle, abasetyenziswa bade baphuphume bengasebenzi ngendlela efanekileyo.





### Uses and Pressures

Human related activities such as irrigation by commercial farmers, demand for clean tap water by the growing population and sewage treatment works that are overloaded and malfunctioning exert pressure on the river. Trout and other alien fish species are found in the river and these put pressure on the indigenous fish. Some disturbed areas due to human activities have been invaded by alien vegetation, resulting in undercutting and slumping of river banks, siltation and reduced runoff.

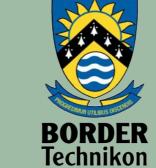




State of the Buffalo River The Buffalo River is almost pristine in its upper reaches. Industrial effluents, inadequate treatment, overloaded sewage treatment works and poor management of the sewage systems result in the discharge of untreated effluent into the river, especially in the middle and lower reaches. High nutrient loads cause eutrophication and result in potentially toxic algal blooms.









DAIMLERCHRYSLER

UNILEVER CENTRE FOR ENVIRONMENTAL

Lo Mlambo Usetyenziselwa Ni? Zonke ezizinto zixhwitha ngokungaphaya kwamandla alo mlambo. Itrawuti nezinye intlobo zeentlanzi ezingezizo ezingezizo ezemveli zidakasa kulo mlambo zinciphise ezi zalo mlambo. Kukhula izihluma/utyani eziziphazamiso kwezi ndawo zimoshwe ngabantu, yenza ke loo nto ukuba umlambo ungabaleki ngendlela yawo ngenxa yeendonga zawo ezidilikela ngaphakathi zaza zaxaba indlela yamanzi kwakhula nomhlaba oyisanti kwezinye indawo nawo waxaba indlela yamanzi.

Eastern Cape rocky, an endangered species.

### Imeko yomlambo i-Qonce Apho uphuma khona, kwaMathole, imeko yawo

iseyileyaa yamhla mnene. Izinto zonakala apha embindini ukuya kutsho apho utyekezela khona elwandle – wonke lo monakalo wenziwa zizibi ezivela kwimizi-mveliso namabibi avela koobhuqa abaphuphumayo. Ezi tyuwa ziza nala mabibi zicutha iokayini apha emlanjeni, yenze loo nto kukhule izihluma ezityhefu apha emlanjeni.





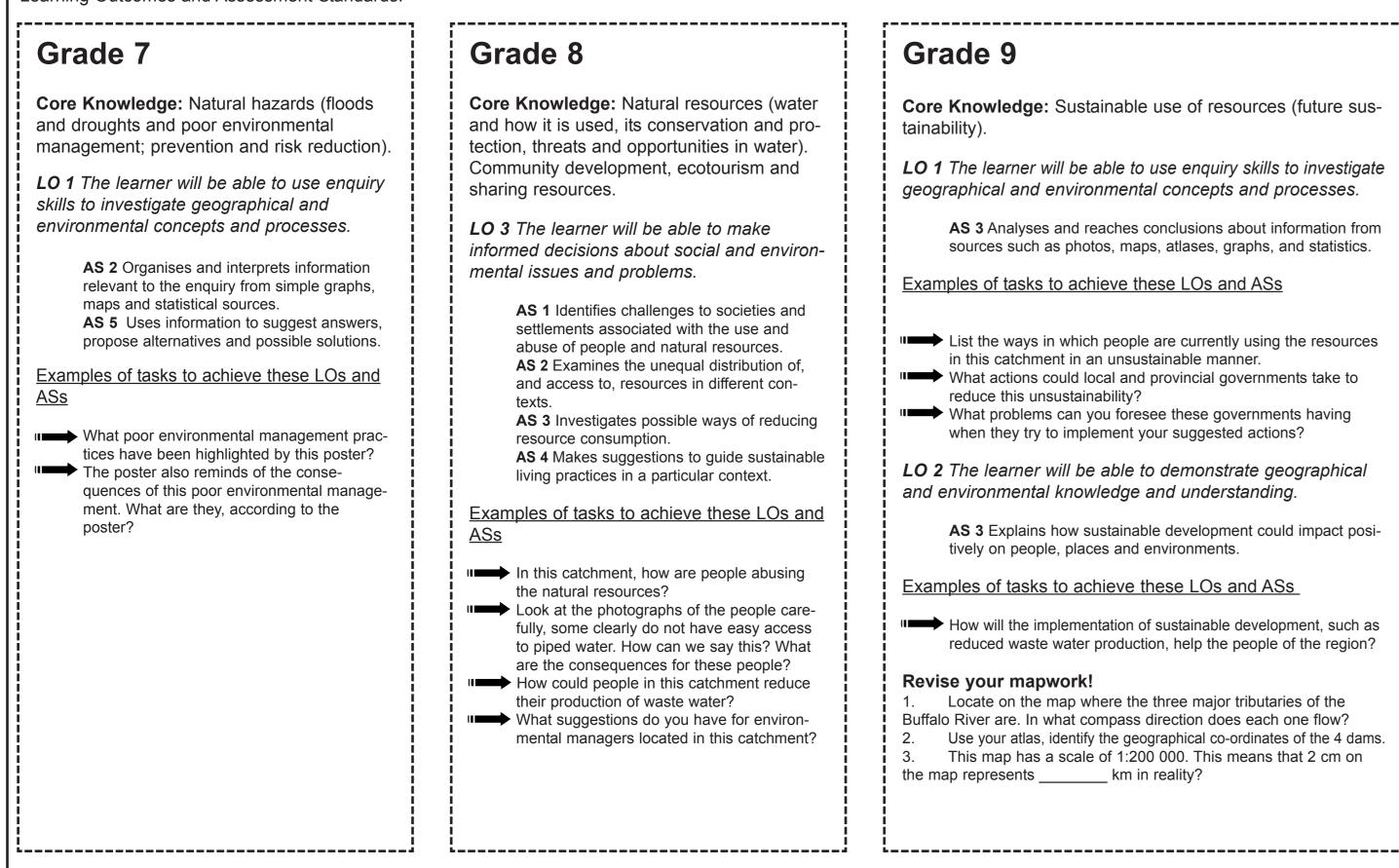


NORAD DIREKTORATET FOR UTVIKLINGSSAMARBEID NORWEGIAN AGENCY FOR DEVELOPMENT COOPERATION

# **SENIOR PHASE**

## Social Science Geography

This poster can be used effectively in the classroom to promote the achievement of the following Learning Outcomes and Assessment Standards:



## Unpacking this scene

This poster highlights how human activities have impacted on the ecological integrity of the Buffalo River. The poster highlights a particular theoretical framework for analysing the impacts of humans on this river.

### Population density

Population density refers to the number of people living in an area per km2. Urban areas, especially large cities (such as East London) have high popula tion densities.



### Peri-urban settlement

Peri-urban settlements are residential areas found on the outskirts of cities. The areas usually, in South Africa anyway, house poor people. People

who cannot afford to pay the rents charged in the main city. Such poor people man-

age to cope with their low incomes by living in informal settlements, where housing costs are as low as possible (however, costs are not that low, it can cost between R 3000 and R 4000 to build a shack). In such informal settlements, services are few. There is usually a lack of clinics, ade quate schools (especially high schools), post offices, police stations etc. The immediate environment is usually degraded, with piles of rubbish (because of the poor, inadequate or no refuse removal), pools or streams of dirty water (from the lack of waste water and storm water systems), loss of vegetation (people cut trees and bushes for firewood), air pollution (home fires generate a lot of smoke) and inadequate sanitation (no toilets or long drops or chemical toilets that are not cleaned often enough).

Rural settlements

The rural settlements of this catchment are unusual by international standards. Rural areas are usually characterised by low population densities and the engagement of the local rural population in primary activities, especially agriculture. However, in this catchment, many rural people live close together in dense communities and only a few engage in traditional agricultural

> activities. There are many reasons for this. One of the most significant is that parts of the catch-

ment was used as an "apartheid dumping ground" for people forcibly removed from white farms or from their land. Another reason, is that most rural people in this catchment are very poor and so have no access to the land, water, seed, fertilizer and cattle etc needed to farm. Finally, many people lack the knowledge and skills required to be successful farmers, and perhaps, to some extent, the interest as well. The result is, that these rural dwellers are very poor and they lack sufficient or effective services, especially electricity, sanitation and piped water. These rural people, therefore, rely on rivers or wells for water, use inadeguate or no toilets and burn wood for fuel. This makes them vulnerable to cholera and other water-borne diseases.

## Sanitation and water saving tips for your school

Saving water and ensuring safe sanitation in schools is one of the ways in which catchments can be managed well and future sustainability ensured.

### Saving water in the school grounds

Many schools have garden staff that love to water with a hosepipes for hours on end. Is your school such a school? A garden hosepipe uses thousands of litres of water every hour. Manage this wisely by setting up a system to manage the use of hosepipes in the garden, focus on reducing the number of hours of watering each day.

### Adopt water wise gardening methods such as:

- Water plants only in the mornings.
- $\bigcirc$  If the school has a sprinkler system, make sure it is on a timer. © Put mulch on the flower beds. This will significantly reduce evaporation and cut down on weeds.
- Plant indigenous plants that do not need regular watering.
- Avoid all ornamental water fountains or water features that do not use recycled water.

### Saving water in the school toilets

Almost every school has damaged or leaking toilets, at least some of the time. A leaking toilet can cause the loss of hundreds of litres of water a day. Check ALL the school toilets on a regular basis. Get a repair team in if necessary to fix the broken ones.

- (i) Do not use the toilet as a dustbin.
- Encourage learners to report leaking or damaged toilets immediately.
- Adjust the float level in the cistern to use
- less water per flush.
- (i) Insert small sealed bottles of water into the cistern to use less water per flush.

### EDUCATOR'S FACILITATION GUIDE **SENIOR PHASE** Natural Science Working with this poster and conducting the suggested research will enable your learners to work towards achieving the following Learning ,-----Outcomes and Assessment Standards: Grade 7 Core Knowledge: LO 1: Scientific Investigations Core Knowledge: Sustainable use of resources (future sus-AS 2 Conducts investigations and colle Life and Living data, organises sources to Interactions in Environment gather and record information. **LO 1** The learner will be able to use enquiry skills to investigate O Each species of animal has charac-AS 3 Evaluates data and communicat geographical and environmental concepts and processes. teristic behaviours which enable it to findings. feed, find a mate, breed, raise **AS 3** Analyses and reaches conclusions about information from LO 2: Constructing science knowledge young. sources such as photos, maps, atlases, graphs, and statistics. AS 3 Interprets information by identify • All organisms have adaptations for ideas in text, finding patterns in recor Examples of tasks to achieve these LOs and ASs survival in their habitats. data, and making inferences from info • O An ecosystem maintains numerous tion in various forms. food webs and competition for food AS 4 Applies knowledge: applies con List the ways in which people are currently using the resources O among different individuals and popknowledge by linking a taught concept in this catchment in an unsustainable manner. variation of a familiar situation. ulations. South Africa has certain What actions could local and provincial governments take to • O ecosystems which have exceptional LO 3: Science, society and the environ biodiversity. All uses of these areas What problems can you foresee these governments having AS 2 Understands sustainable use of when they try to implement your suggested actions? • O must be based on the principles of earth's resources: analysis sustainable development. information about sustainable and uns **LO 2** The learner will be able to demonstrate geographical able use of resources. and environmental knowledge and understanding. AS 3 Explains how sustainable development could impact positively on people, places and environments. Examples of tasks to achieve these LOs and ASs How will the implementation of sustainable development, such as reduced waste water production, help the people of the region? Locate on the map where the three major tributaries of the Buffalo River are. In what compass direction does each one flow? Use your atlas, identify the geographical co-ordinates of the 4 dams. This map has a scale of 1:200 000. This means that 2 cm on

### Eutrophication

Nitrates and phosphates are natural plant "food". If there is a lot of these two chemicals in a body of water, small plants known as algae grow rapidly, because there is a lot of food. However, algae soon die. Decomposing bacteria, then flourish, living off the dead algae, and, thus, decomposing or breaking it down. After a while, however, the water body is left with very little dissolved oxygen in it, because the decomposing bacteria use up the oxygen in the process of decomposition. Therein is the problem for other aquatic organisms, they die due to the lack of dissolved oxygen in the water. This is eutrophication.

### **River Health**

The River Health Programme was launched in 1994 by the Department of Water Affairs and Forestry. The programme makes use of biological indicators, such as fish, riparian vegetation and aquatic insects, to decide if a river is healthy or not. The programme reports on the condition of rivers in order for rivers to be managed well.

# Protecting river water quality

There are many ways in which the river can be protected. One important way is to make sure that factories do not release chemicals into rivers. This can be done by making such activities illegal and prosecuting the offenders. Another way is to look after sewer systems. Not using the toilet as a dustbin is a good start. Reporting sewer leaks to local

We can also clean up the litter from along the river banks and from the river itself. A river free from litter is a pleasure to look at. Water pollution is reduced and it becomes safer for children to play and picnic along the river banks. Nature reserves are special places that have been set aside to preserve the local plants and animals. No developments such as houses and petrol stations or office blocks are allowed. Nature reserves play an important role in reducing water pollution. Nature reserves also provide excellent ecotourist sites. By protecting and preserving our local plants and animals, we can make sure that all South Africans can enjoy them, make use of them and pass on this biological inheritance onto their children.

Toxic algal blooms

Usually linked to eutrophication. Nitrites and phosphates cause algae to grow rapidly. This rapid growth is known as an algal bloom, when the individual numbers of algae increase radically. Some of the algae species, however, are poisonous or toxic. At the time when such algae "blooms" it is advised not to swim in the river / dam or make use of the water for domestic purposes.

Do not condone the vandalising of toilets.

### Watch the taps!!! Stop that drip!!!!!!!!!!!

For every 3 minutes that a tap is left running (open) 10 litres of water is lost. Imagine how much is lost in schools when learners leave taps running, sometimes for hours!!!! A tap that has even a small drip loses thousands of litres of water in a year.

- Turn taps off.
- Taps should turn off easily, if not, adjust
- If possible, change the taps to a system that turns off automatically.
- Check all taps for leaks.

Replace the washers in leaking taps.

## Your health is in your hands - literally

Doctors will tell you that the single most important action you can take to keep healthy is to wash your hands regularly with soap and water. Many South Africans suffer from Hepatitis A and gastro-enteritis because they do not use soap and water to wash their hands after using the toilet.

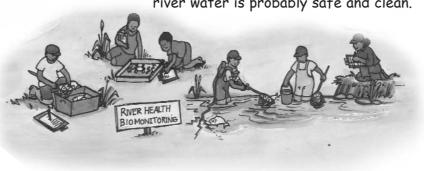
### Wash your hands with soap and water:

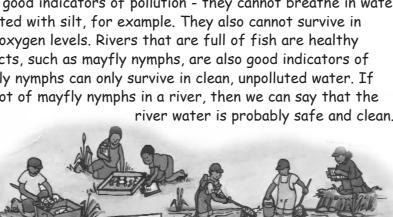
- After using the toilet.
- After changing baby's nappy.
- Before you prepare food. Before you eat food.
- After handling waste (human, animal or household waste).
- Anytime you think your hands might be dirty!

# Scientists use insects, fish and frogs etc to "tell" them about the condition of

Biomonitoring

the river. Frogs, for example, have skins that are very sensitive to pollution. That means that rivers with high levels of pollution will usually only have a few frogs. Fish are also good indicators of pollution - they cannot breathe in water that is heavily polluted with silt, for example. They also cannot survive in water that has low oxygen levels. Rivers that are full of fish are healthy rivers. Aquatic insects, such as mayfly nymphs, are also good indicators of water quality. Mayfly nymphs can only survive in clean, unpolluted water. If scientists catch a lot of mayfly nymphs in a river, then we can say that the



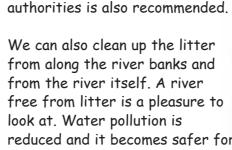


	Grada 8	Grado 9	Tasks for
lects tes ving key ded orma- ceptual t to a nment the sustain-	<ul> <li>Grade 8</li> <li>LO 1: Scientific Investigations</li> <li>As 2 Conducts investigations and collects data, collects and records information as accurately as equipment permits and investigation purposes require. As 3 Evaluates data and communicates findings, considers the extent to which the conclusions reached are reasonable answers to the focus question of the investigation.</li> <li>LO 2: Constructing science knowledge AS 3 Interprets information by translating tabulated information into graphs, reading off graphs and by making predictions from patters.</li> <li>As 4 Applies knowledge: applies conceptual knowledge to somewhat unfamiliar situations by referring to appropriate concepts and processes.</li> <li>LO 3: Science, society and the environment AS 2 Understands sustainable use of the earth's resources: identifies information required to make a judgement about resource use.</li> </ul>	<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	Conduct a resea         1.       The Umtize         Provide:       A descrip         When do       When do         When do       When do         When do       When do         When do       When do         What so       A descrip         What so       A descrip         What is t       What are protection         Present your f       A descrip         What are protection       Present your f         A descrip       What are does it rain and so that we officials for the some         Present your f       Present your f         What rol       What rol         What we officials for the some       Although you cam and 9, the kind of for sophistication of assessment stand

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### Dams

Dams have been built along the river to store water and reduce the possibility of flooding. The water stored in these dams is used for irrigating commercial crops, such as bananas and tobacco. The dams also supply piped water to the urban areas of East London; Mdantsane, Bhisho and King William's Town. The building of such large dams costs a great deal of money, but is necessary if we want to make sure that we have an adequate supply of water during drought periods. However, we should also acknowledge that the average urban consumer wastes a lot of water. This is also true for farmers who irrigate. Crops could be irrigated more efficiently and people could use less water when they bath, wash clothes, use the toilet and water their gardens.



### Sand mining

### Sewage Treatment Works

The treatment of sewage is necessary because we rely on a water-borne sewage system in urban areas (a flushing toilet). Toilet water is dangerous to human health as it contains pathogens (bacteria that make you sick) such as E. Coli. So we need to treat this waste sewage water before returning it to the river. This treatment is done at the sewage or waste water treatment works.

Water entering the sewage plant contains floating material (such as plastic, wrappers, rags), dirt, oils, small solids, bacteria and dissolved nutrients (nitrites and orthophosphates). The water must first go through a filter screen to remove the floating material. Grit chambers slow the water down so that stones, sand etc drop to the bottom and can be removed. A settling tank then removes the fine or small solids and some of the bacteria. Bioreactor bacteria are added to the water to feed on (and so remove) the dissolved nutrients. Another settling tank removes the bioreactors and yet more bacteria. Lastly chlorine gas is added to the water to kill of any remaining bacteria, so that the water is ready to be pumped back into the river. Sludge from the settling tanks is treated and used as fertilizer.

The sewage treatment works is usually designed to deal with a certain amount of waste water everyday. If this amount is exceeded, then it is possible that the water returned to the river is not as clean as it should be. It could also result in sewage pipes bursting due to the increased volumes and pressures. Some people also put objects (such as towels) down their toilets, causing huge blockages and burst pipes.

Urban communities need to manage their sewage systems more wisely. This means not using the toilet as a dustbin, keeping their toilets working well and repairing them if they start to leak.

Communities should also switch to low flow toilets, so that each flush uses no more than 9 litres of water. Burst sewer pipes should be reported to loca municipalities immediately.

### **Rainbow Trout**

This is an alien fish species deliberately introduced to the rivers if the Eastern Cape by fly-fishermen. These fish have become a huge problem in the catchment as they eat the smaller, local indigenous fish. These small fish are now under severe threat from the introduced fish.

As urban areas expand and demand for housing and roads etc increases, so more and more sand and gravel is needed to build them. Companies respond to this demand by digging up river banks (and beds if they can) and selling the river sand to developers etc. This process of mining is highly destructive of river systems. It destroys the river banks, and the river stops functioning as a true river, it becomes nothing more that a storm water

drain. After the company has completed the mining, it usually leaves the mining site. There is no rehabilitation. Managing this mining is difficult, as the issuing of permits to companies and the monitoring and rehabilitation of the site fall under different government departments.



- Have ongoing health and hygiene education

A hygienic sanitation system: Makes use of safe, clean toilets. Cleans toilets regularly.

All toilets MUST be kept in a good condition, be well maintained and cleaned daily, using a germ killer (such as bleach).

Safe sanitation is the path to good health!

A safe and effective sanitation system and good hygiene are essential parts of primary

quality of life. A high quality of life is a cornerstone of sustainability. You should

preventative health care. Good sanitation and adequate hygienic practices improve

make an informed decision on your personal, community and environmental health.

A hygienic sanitation system is one that ensures that people do not come into direct

contact with human waste, bad smells are prevented and flies do not flourish. A dirty

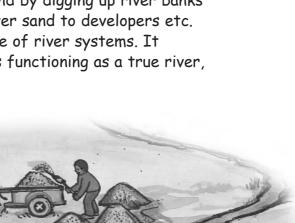
toilet can be extremely harmful to human health, it can spread water borne illnesses

(such as cholera), cause diarrhoea or even pass on Sexually Transmitted Diseases.

## School sanitation systems:

According to the Dept of Education, all schools must:

- Provide facilities for children to wash their hands (with soap!).
- Maintain toilets and keep them clean. Prevent vandalism of toilets.
- with all members of the school community.



## r Grades 7.8 and 9

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arch project into:

za Tree

ption of its leaves

bes it flower and what the flowers look like ort of habitat does the tree prefer? ption of the seeds.

local people use the tree for? the current conservation status of this tree re your recommendations regarding the on and preservation of this tree?

findings as a poster

ern Cape Rocky Fish

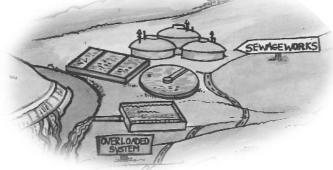
ption of its habitat.

es an adult fish of this species look like? e the breeding habits of this fish? How aise its young?

the feeding habits of this fish. s the conservation status of the fish? ole does the fish play in the ecosystem? ould you suggest nature conservation do to protect this fish from extinction?

indings orally and use graphs to support of your statements.

give the same topics to Grade 7, 8 information. the detail and the level expected will vary according to the





### **Environmental Education** Organisations you can contact for more information. for classroom resources and for environmental field trips:

BirdLife South Africa P O Box 515 Randburg 2125 Tel Kathy Stone 041 367 4503

Cape Nature Conservation Pvt Bag X 100 Cape Town 8000 Tel 021 483 4615

Department of Water Affairs and Forestry's Water **Education Programme** Lingiswa Radebe Tel 043 604 5530 Fax 043 604 5587

EarthLife Africa P O Box 176 Observatory 7935 Tel 021 683 5182

EcoSchools Kim Ward Tel 033 330 3931

Endangered Wildlife Trust Pvt Bag X 11 Parkview 2122 Tel 011 486 1102 Fax 011 486 1506

EnviroKids magazine Joanne Anderson Tel 033 330 3931

Environmental Education Association of Southern Africa (EEASA) Jane Burt

Tel 046 603 8390 Fax 046 636 1495

**Eskom Education Team** Brigitte Morais Fax 011 800 5839 P O Box 1091 Johanneburg 2000 brigitte.morais@eskom.co.za

Food and Trees for Africa, incorporating EduPlant Jeunesse Park P O Box 2035 Gallo Manor 2052 Tel 011 784 6399 Fax 011 783 2134

Mondi Wetlands Project David Lindley Tel 012 667 6597

National Environmental Education Project GET Prisha Ramsarup Tel 031 274 4046 Fax 031 205 1704

National Botanical Institute (NBI) Pvt Bag X 7 Claremont 7735 Tel 021 799 8800 Fax 021 761 4687

**River Health Programme Regional Director** Private Bag X7485 King William's Town 5600 Tel: (043) 604 5400 Fax: (043) 604 5592

SADC Regional Environmental Education Programme Tel 033 330 3931 Fax 033 330 4576

Share-Net Nathi Ndlovu Tel 033 330 3931 Fax 033 330 4576

South African National Parks (SAN Parks) P O Box 20419 Humewood 6013 Tel 041 508 5411

South African Water Information Services P O Box 359 Pretoria 0001 Tel 012 841 2048

South African Working Crane Group Pvt Bag X 11 Parkview 2122 Tel 011 486 1102 Fax 011 486 1506

Wildlife & Environmental Society of South Africa (WESSA) Jim Tavlor

P O Box 394 Howick 3290 Tel 033 330 3931 Fax 033 330 4576 Wildlife Biological Resource Centre Tel 012 305 5831 Fax 012 305 5840

Working for Water Toll Free 0800 005 376

Working for Wetlands Pvt Bag X 101 Pretoria 0001 Piet-Louis Grundling Tel 012 804 3200 Fax 012 804 3211

### **Teaching Tips**

Set questions on the poster and give learners a certain amount of time e.g. one week, to view the poster (stuck up on the classroom wall) and write down the answers. Check their answers as a whole class.

### Focus Questions on the: Map

Each photograph

Driving force-Pressure - State - Impacts - Response framework

### Use the poster to:

Introduce the topic of sustainability.

- © Informally evaluate their understanding of issues, such as Alien Invasive Species, sewage pollution.
- $\odot$  To provide an overview of sustainability in a regional setting.  $\odot$  To sum up or wrap up a topic e.g. cholera.
- © To reinforce concepts e.g. infrastructure.
- © To provide learners with additional opportunities to demonstrate understanding of a topic e.g. harbours.