River Health Programme - Mthatha River

Sand mining
Kombiwa isanti/intlabathi
Road Construction
Ukwakhiwa kwendlela
PLANTATIONS
LANGENI FOREST
Closed canopy forest
Ihlathi elenzele umthunzi umlambo
River bank destruction
Indonga zomlamba zitshatyalaliswe
POLLUTION
Indawo ecoca amanzi
Water purification plant
KAMBI FOREST
Erosion
Ukhukuliseko
DONGAS
Alien vegetation
Izityalo ezingezozemveli
AIRPORT
Erosion
Ukhukuliseko
SMALL GARDENS
Kambi Location
MTHATHA DAM
IRRIGATED CROPS
R61 TO ENGCOBO
1st BATTALION
Kwa Dosi
LUCHABA NATURE RESERVE
DAM WALL
CULTIVATED LAND
HIBURY LOCATION
RUBBISH DUMPING
POLLUTION
PRISON
TIMBER YARD
POLLUTION
PIPELINE
N2
TO DURBAN
WATER TREATMENT PLANT
NGANGELIZWE
SEWAGE TREATMENT PLANT
POLLUTION
OVERWORKED SYSTEM
POLLUTION
NEW BRIGHT
MTHATHA
BRD
Mandela Park
Industrial pollution
Ungcoliseko olubangwa yimizi-mveliso
Sewage spill
Amanzi elindle angacocwanga
Raw sewage spill
Ilindle elichithekayo ngobunjalo balo
NDULI NATURE RESERVE
NELSON MANDELA ACADEMIC HOSPITAL
HOLIDAY INN
WALTER SISULU UNIVERSITY
OWEN DAM
CARAVAN PARK
CAR WASH
POLLUTION
HYACINTH BLOCKAGE
KEITPIN DUMP SITE (BADLY MANAGED)
FIRST FALLS
ESKOM HYDRO ELECTRICITY PLANT
BRICK MAKING
RIVER SIDE SCHOOL CORANA
CLINIC
NTAPANE SCHOOL
CORANA
NGOBOZI LOCATION
N2
R61
TO PORT ST JOHNS
VIEDGESVILLE
T36 to COFFEE BAY
N2 TO EAST LONDON
WORKING FOR WATER TEAM cleaning river bacoca umlambo
using waste bin
usebenzisa umgqomo wenkunkuma
NO DUMPING
dirty river
umlambo ongcolileyo
testing water
baxilanga amanzi
dumping !
balahla inkukuma !
chopping down indigenous trees
ugawula ihlathi lemveli
MTHATHA RIVER
animals trampling river bank
izilwanyana zixangxatha iindonga zomlambo
washing the car away from the river
uhlambela imoto kude kunomlambo
kuyalinywa phezu komlambo
gardening on the river bank
MQANDULI
CULTIVATED LAND
cliff
iliwa
ALIEN VEGETATION
NGQUNGQU
Kulinywa apho umlambo unokukhukhulisa khona
floodplain cultivation
KWA-NTSAKA Location
fetching water
uyokukha amanzi
WATER PURIFICATION PLANT
INDIGENOUS FOREST
RIVER BANK DESTRUCTION
ALIEN VEG
Sand mining
Kombiwa isanti/intlabathi
RIVERINE FOREST
MANGROVE FOREST
COASTAL DUNE FOREST
B+B1
ESTUARY
MUD FLATS
Island
SMALL DUNES
BEACH
COFFEE BAY
HOTEL
RESORT
LAGOON
WILD COAST
HOLE IN THE WALL
MTHATHA RIVER MOUTH
Ukuhlolwa komlambo, kusetyenziswa izilwanyana zasemanzini
Biomonitoring
Abantwana besikolo bayacoca
School group clean up
cooking
uyapheka
Watering the garden
Unkcenkceshela isitiya/igadi
swimming
uyaqubha
drinking water
usela amanzi
brick making
wenza izitena
weaving grass mats
Woluka amakhuko ngemizi
washing clothes
uhlamba impahla
fishing
bayaloba

water & forestry
Department: Water Affairs & Forestry
REPUBLIC OF SOUTH AFRICA

Water Research Commission

environment & tourism
Department: Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

O.R. TAMBO DISTRICT MUNICIPALITY

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August 2007

Foundation Phase: Grade 1

Languages

HOME LANGUAGE: LO2: - SPEAKING
The learner will be able to communicate confidently and effectively in spoken language in a wide range of situations.

AS 2: - Contributes to class and group discussions.

HOME LANGUAGE: LO5: - THINKING AND REASONING
The learner will be able to use language to think and reason as well as to access, process and use information for learning

AS 2: - Use language to think and reason: understands and use language for logic and reasoning.

HOME LANGUAGE: LO1: - LISTENING
The learner will be able to listen for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in text.

AS 1: - Uses pictures to understand written text.
Relates pictures to own experience.
AS 2: - Makes meaning of written text

HOME LANGUAGE: LO4: - WRITING
Learners will be able to write different kinds of factual and imaginative texts for a wide range of purposes.

AS 1: - Writes with increasingly legibility i.e. develops letter formation and handwriting skills, drawing patterns.
Tracing and copying.

EXAMPLES OF TASKS/ACTIVITIES TO ACHIEVE THE ABOVE LOs & ASs

- Ask learners what are the things they can not survive without.
- Ask learner what are the things they cannot do if we do not have water. Re-inforce the answer by emphasising that water is our basic need for survival and personal hygiene.
- Ask learners to look into the poster and say what they see i.e. their observations of the activities around the river.
- Educator can tell a story about the river i.e. the state of the river - pollution.
- Learner can draw up own conclusions on what must be done in order to keep our rivers healthy.
- Educator concludes by telling learners about the importance of rivers (source of water i.e. natural resource)

Numeracy

LO 2: - PATTERNS, FUNCTIONS AND ALGEBRA
The learner will be able to recognize, describes and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

AS 1: - Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes)
• Describes observed patterns.

Natural Sciences

LO 1: - SCIENCE INVESTIGATION:
The learner will be able to act confidently on curiosity about natural phenomenon, and to investigate relationships and solve problems in scientific, technological and environmental context.

AS: PLANNING INVESTIGATION
Learner plans an investigation independently

AS: CONDUCTING INVESTIGATION AND COLLECTING DATA
Learner independently participates in planned activity

AS: EVALUATING DATA AND COMMUNICATING FINDINGS
Learner thinks about what has been done and says what has been found

Social Science: Geography

LO 2: - GEOGRAPHICAL KNOWLEDGE AND UNDERSTADING:
The learner will be able to demonstrate geographical and environmental knowledge and understanding.

AS 2: - Describes own likes and dislikes about a local area or place (people and the environment)

Social Science: History

LO 3: - EXPLORING ISSUES:
The learner will be able to make informed decisions about social and environmental issues and problems.

AS 1: - Identifies and describes issues affecting personal health or safety in the school and\or home environment [the issue]

AS 2: - Identifies the factors which make certain places harmful or unsafe in the school and\ or home environment [factors affecting the issue]

AS3: - Suggests ways to improve personal health or safely by proposing solutions or alternatives that will reduce the risk to personal health or safely [making choices]

Life Orientation

LO 1: - HEALTH PROMOTION:
The learner will be able to make informed decisions regarding personal, community and environmental health.

AS 2: - Explains steps to ensure personal health and links these steps with environmental health.

AS 3: - Distinguish between situations that are safe and those that require precaution against communicable diseases.

Foundation Phase: Grade 2

Languages

HOME LANGUAGE: LO3: - READING AND VIEWING
The learner will be able to read and view for information and enjoyment, and respond critically to the easthetic, cultural and emotional values in text.

AS 2: - Makes meaning of written texts: reads a picture story on own or with the educator.

ADDITIONAL LANGUAGE: LO 1: - LISTENING
The learner will be able to listen for information and enjoyment, and respond appropriately and critically in a wide range of situations.

AS 3: - Shows understanding of a short sequence of instructions.

LO2: - SPEAKING
The learner will be able to listen for information and enjoyment, and respond appropriately and critically in a wide range of situations.

AS 1: - Responds appropriately to simple questions
AS 5: - Talks about a drawing or picture.

HOME LANGUAGE: LO 4: - WRITING
The teacher will be able to write different kinds of factual and imaginative texts for a wide range of purposes.

AS 5: - Builds vocabulary and starts to spell words so that they can be read and understood by others: uses dictionary to check on spelling and meanings of words.

EXAMPLE OF TASKS\ACTIVITIES TO ACHIEVE THE ABOVE LOs & ASs.

- Ask learners to read the picture and write their view of what they think is happening in the poster.
- They should report in class.
- Learners to come up with recommendations on what they think should be done to keep the river clean and healthy.
- Learners to use the dictionary to look for the meaning of the words that they do not understand. (e.g. pollution)
- Learners must come up with reasons of why they think it is important for us to keep our rivers clean.
- Learners to use dictionaries to check on the meaning of the words ALIEN INVASIVE.
- Educator explains the concept ALIEN INVASIVE PLANTS to the learners.
- Give learners examples of such plants/trees.

Numeracy

LO 2: - PATTERNS, FUNCTIONS AND ALGEBRA
The learner will be able to recognize, describes and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

AS 1: - Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes)
• Describes observed patterns.

Natural Sciences

LO 1: - SCIENCE INVESTIGATION:
The learner will be able to act confidently on curiosity about natural phenomenon, and to investigate relationships and solve problems in scientific, technological and environmental context.

AS: PLANNING INVESTIGATION
Learner plans investigation as part of a group

AS: CONDUCTING INVESTIGATION AND COLLECTING DATA
Learner participates independently or as part of a group

AS: EVALUATING DATA AND COMMUNICATING FINDINGS
Learner shows and explains what was intended and how it was done

Social Science: Geography

LO 2: - GEOGRAPHICAL KNOWLEDGE AND UNDERSTADING:
The learner will be able to demonstrate geographical and environmental knowledge and understanding.

AS 2: - Identifies some resources that are available and are used in the local area (e.g. water, minerals), and explains where they come from (people and resources)

AS 3: - Identifies and describes links and networks in the local area (e.g. transport routes) (parents and environment)

Social Science: History

LO 3: - EXPLORING ISSUES:
The learner will be able to make informed decisions about social and environmental issues and problems.

AS 1: - Identifies and describes environmental issues in the place where the learner lives and goes to school.

AS 2: - Describes the factors leading to the problem or issue [factors affecting the issue]

AS 3: - Identifies the impact of the issue on the place and on people (home, school, local environment) [factors affecting the issue]

AS 4: - Suggests things that could be done to solve the problem and improve the place in which the learner lives or goes to school [making choices]

Foundation Phase: Grade 3

Languages

HOME LANGUAGE: LO2: - SPEAKING
The learner will be able to communicate confidently and effectively in spoken language in a wide range of situations.

AS 5: - Contribute to group and class discussion.
AS 7: - Makes oral presentations
- With support and guidance from educator, develop class guidelines for a good presentation.
- Uses visual aids to supplement oral presentations.

ADDITIONAL LANGUAGE: LO 2: - SPEAKING
AS 5: - Talks about the picture photograph or object

HOME LANGUAGE: LO5: - THINKING AND REASONING
The learner will be able to use language to think and reason, as well as to access, process and use information learning.

AS 2: - Uses language to think and reason: uses higher order thinking and the language associated with it.

HOME LANGUAGE: LO 4: - WRITING
The learner will be able to write different kinds of factual and imaginative text for a wide range of purposes.

AS 2: - Drafts a piece of writing for different purposes: e.g. one-or two paragraph stories.

EXAMPLE OF TASKS\ACTIVITIES TO ACHIEVE THE ABOVE LOs & ASs.

- Engage the class in a discussion to brainstorm their prior knowledge about the sources of water (natural resources, man made) and to use that information as a base of the observation lesson that they are going to do. Ask them questions like:
  - Where do you get your water from at home?
  - Is the water clean\suitable for drinking?
  - If not, what do you do to make your water clean\suitable for drinking?
  - If you get water from Taps, do you know where does that water come from?
- Tell the learners that they are going to go for an environmental walk to a nearby river.
- The purpose of the walk is to identify areas of the river where water is polluted.
- What are the pollutants
- Who do they think is responsible
- Investigate the reasons why pollution happens
- Check for Alien Plants (AP) and Alien Invasive Plants (AIP)
- Discuss their understanding of these plants.
- They must write a report on the information gathered and prepare for a presentation in class which will be assessed.
- Form of assessment will be Peer Assessment.

Natural Sciences

LO 1: - SCIENCE INVESTIGATION:
The learner will be able to act confidently on curiosity about natural phenomenon, and to investigate relationships and solve problems in scientific, technological and environmental context.

AS: PLANNING INVESTIGATION
Learner uses materials selected by the group in order to communicate the group's plan.

AS: CONDUCTING INVESTIGATION AND COLLECTING DATA
Learner participates constructively in the activity with understanding of its purpose

AS: EVALUATING DATA AND COMMUNICATING FINDINGS
Learner explains and reflects on what action was intended, and whether it was possible to carry out the plan.

Numeracy

LO 2: - PATTERNS, FUNCTIONS AND ALGEBRA
The learner will be able to recognize, describes and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

AS 1: - Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes)
• Describes observed patterns.

Social Science: History

LO 3: - EXPLORING ISSUES:
The learner will be able to make informed decisions about social and environmental issues and problems.

AS 1: - Identifies one or more forms of pollution in a particular context (e.g. wasting water energy or physical resources, safe disposal of refuse or chemicals) [the issue]

AS 2: - Describes the factors leading to the pollution problem in the local context [Factors affecting the issue]

AS 3: - Identifies the impact of the pollution on the local environment [factors affecting the issue]

AS 4: - Suggest things that could be done to solve the problem and improve the place in which the learner lives and goes to school.[making choices]

Foundation Phase: Grade 4

Languages

FIRST ADDITIONAL LANGUAGE: LO 1: - LISTENING
The learner will be able to listen for information and enjoyment, and respond appropriately and critically in a wide range of situations.

AS 1: - Understanding stories (told or read to learners):
- Discuses ethical and social issues (e.g. whether something is just or fair), codeswitching if necessary.
- Retells the story in the right sequence
- Summarises the story with teacher support
  – Understands oral instructions, directions and descriptions:
- Listens to simple oral directions and follow route or locates a place on a simple map or plan.

LO2: - SPEAKING
The learner will be able to communicate confidently and effectively in spoken language in a wide range of situations.

AS 3: - Uses additional language to communicate information:
- Recalls and describes (recounts) a sequence of actions using
connecting words (e.g. first, then, next)
- Describes people, objects and simple process.

HOME LANGUAGE: LO3: READING AND VIEWING
The learner will be able to read and view for enjoyment, and respond critically to the aesthetic cultural and emotional values in text.

AS 2: - Understands and responds to appropriately to information to texts:
- Identifies main and supporting ideas.
- Scans for specific details in text (e.g. weather reports, maps)
- Follows short printed instructions and directions.

– Interprets simple visual text (tables, charts, posters, graphs, maps) and can change text from one form to another (e.g. poster to explanatory paragraph)

LO 5: - THINKING AND REASONING.
The learner will be able to use language to think and reason, as well as to access, process, and use information for learning.

AS 1: - Uses language to think and reason
- Discusses cause and effect in written text and the language used to expess it (e.g. 'when….. 'then….. 'if…. 'then…. '
- Infer meanings that are not obviously stated and can explain how the meaning was conveyed.

AS 2: - Uses language to investigate and explore.
- Identifies relevant sources of information.
- Locates information using key words or concepts.

Natural Sciences

LO 1: - SCIENCE INVESTIGATION:
The learner will be able to act confidently on curiosity about natural phenomenon, and to investigate relationships and solve problems in scientific, technological and environmental context.

AS: PLANNING INVESTIGATION
Learner contributes ideas of familiar situations, needs or materials, and identifies interesting aspects which could lead to investigation.

AS: CONDUCTING INVESTIGATION AND COLLECTING DATA
Learner explores the possibility in available material, finding out how they can be used.

AS: EVALUATING DATA AND COMMUNICATING FINDINGS
Learner talks about observations and suggests possible connections to other situations

LO2: - CONSTRUCTING SCIENCE KNOWLEDGE:
The learner will be able to interpret and apply science, technological and environmental knowledge.

AS 1:
- Recalling meaningful information when needed.
- Learner, at the minimum, uses own most fluent language to name and describe objective, materials and organisms.

Numeracy

LO 2: - PATTERNS, FUNCTIONS AND ALGEBRA
The learner will be able to recognize, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

AS 1: - Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes)
• Describes observed patterns.

Social Science: Geography

LO 1: - GEOGRAPHICAL ENQUIRY:
The learner will be able to use enquiry skills to investigate geographical and environmental concept and process.

AS 1: - Identifies information from various sources (maps) [find sources]

AS 2: - Organizes information under given headings [works with sources]

LO 3: - EXPLORING ISSUES:
The learner will be able to make informed decisions about social and environmental issues and problems.

AS 1: - Identifies issues associated with resources and services in a particular context [identify the issue]

Setting the Scene

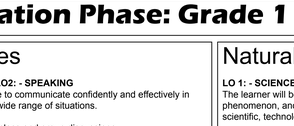
This poster highlights human interactions with the Mthatha River. The poster provides an overview of the catchment for this river.

Dams

The catchment showed here has several small dams and the bigger Mthatha Dam. This dam, together with all the dams along this river are very important water storage facilities. South Africa must store water in dams to ensure that we have enough water in our taps. The dams have to be big, as South Africa experiences many long droughts. Dams cost millions of rands to build and maintain. Dams are owned and managed by the Department of Water Affairs and Forestry on behalf of all the citizens of the country.

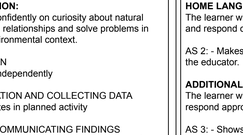
Dams can also have a negative impact on the river if not well designed, planned and managed.

In the Mthatha River we also find a dam that is used to store water until it is used for electricity generation. Electricity that is generated by using the force of water is called hydro-electricity.



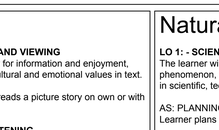
Waste disposal

Everything that we throw away in dustbins will end up at a dump site. Dump sites are usually big, because we throw a lot of stuff away. We do not recycle or reuse enough. To reduce the amount we throw away we should firstly use less, secondly we should re-use the items and thirdly we should recycle them. We can easily reduce the amount of food packaging that we use. We can re-use plastic bags when we go to the grocery store. We can recycle items such as paper, glass and cans. This dump site, like most, will contain items such as plastic, glass, paper, old tyres, rotten food, clothing and garden refuse. Dump sites are dangerous for rivers, as they can pollute the ground water when rain falls onto the rubbish and seeps into the soil. This rain gets contaminated by the rubbish and carries the pollution into the underground water. From there it moves slowly into the river and so the river water will be polluted too. Dump sites have to be regularly monitored to try and prevent such pollution. Dump sites can be lined underneath to prevent water moving through them.



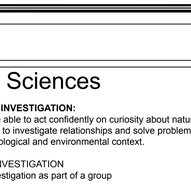
Stock farming

Many local farmers use the river to water their cattle. Cattle have to drink water everyday (rather like humans!) or else they will die. It is also important that cattle drink water of a good quality. Polluted water, especially water polluted with bacteria, can make them sick and even cause them to die. It is also important that cattle do not pollute the river water themselves. Cattle dung is full of bacteria (rather like humans!) and will pollute the river water. Farmers need to ensure that their animals do not drink directly from the river, but rather from drinking troughs that are away from the river bank.



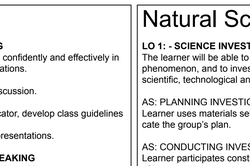
River Health

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



Domestic uses of water

In the Mthatha catchment, many local residents are collecting water from the river to use it for their family food gardens and for household purposes such as cooking, cleaning, drinking, washing etc. Water is essential for human life. We all need to drink water to stay alive. We can only live between four and seven days without water. We wash ourselves and other things (such as clothing and pots) with water. If we did not do this we would get sick.



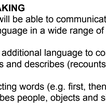
Water purification

As so many people use the river, it is no longer safe to drink the water directly from the river. So, water purification plants have to be built in order to purify the water. Raw river water (untreated) is pumped into the purification station and put through a series of processes, such as sedimentation, filtration and chlorination in order to make the water safe to drink. Once the water is safe to drink, it is known as potable water.

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 authorities is also recommended.

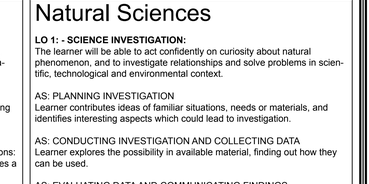
We can also clean up the litter from along the river banks and from the river itself. A river free from litter is a pleasure to look at, water pollution is reduced, and it becomes safer for children to play and picnic along the river banks. Nature reserves are special places that have been set aside to preserve the local plants and animals. No developments such as houses and petrol stations or office blocks are allowed. Nature reserves 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.



Alien invasive plants, plants and the river

Alien invasive plants such as the water hyacinth can block water flow. This means that the water becomes stagnant, which is a health hazard. Bilharzia can be found in stagnant river water. Other alien invasive plants have invaded the river banks, causing the banks to collapse and erosion to take place.

The removal of trees and bushes alongside the river causes problems, especially if too many are taken. Collecting too much wood result in soil erosion and habitat loss. People are collecting this wood to make fires in their homes, for cooking and keeping themselves warm. Some people have to do this because they do not have electricity or cannot afford to pay for electricity or buy electrical appliances.



Working for Water

Working for Water teams remove alien trees such as black wattle. The Working for Water Project is an inter governmental / departmental project that aims to remove alien invasive plants which are a problem in South Africa. Alien invasive plants, such as the black wattle, are plants that we do not want growing uncontrollably in South Africa. These plants are able to grow fast and spread very easily and they have taken over millions of hectares of land. Alien invasive plants were introduced to South Africa from other parts of the world. The black wattle for example originally came from Australia. Some were brought here as garden plants, others for firewood or windbreaks. Then they started to spread and became a problem.

Alien invasive plants are unwanted plants (we can call them weeds) in South Africa because they use up our water resources (such plants remove much more soil water from the ground compared to indigenous trees), they push out indigenous plants, cause severe veld fires and make our land less productive.

Working for Water trains and pays previously unemployed people (especially the disabled and women) to remove these alien invasive plants by a variety of means: mechanical, chemical, biological and even fire! Working for Water is helping to reduce poverty while they save the bio-physical environment. To date, the Working for Water Programme has won many environmental awards, including the prestigious Green Trust Award.

Industrial pollution

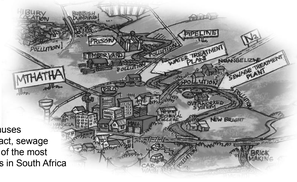
Pollution of rivers by industries is common in large cities. Some industrial wastewater makes the river "foam" and turn green. Fish and other water creatures die and the water starts to smell bad. Some pollution does not look bad or smell bad, but it can cause illness and death if you drink it.

Where there are industries, you must never take water from the river and use it in your home for drinking or preparing food.

Large urban settlements and rivers

Downstream of Mthatha, the damage from large cities on river systems can be clearly seen. When it rains, rain water washes the streets clean and all the dirty water (called street run-off) runs into storm water drains. These storm water drains take the water to the river. Scientists who have tested this street run-off have found that this water is very poor quality, as bad as untreated sewage!! Street run-off, therefore, is a major river pollutant, as it contains faeces, bacteria, dirt, plastics, sand, etc.

The sewage works that serves Mthatha is also a problem. A sewage works takes waste water (from toilets and kitchens for example) and puts it through a series of processes to remove the grit, destroy the disease carrying organisms and clean the water. Usually sewage works do this quite well. They return relatively clean water to the river (although you cannot drink this water). However, not all sewage works can do their job effectively. Some are old and their pipes burst often. Others are small and cannot cope with the increased waste water flows. Some people throw things into the sewer that can not be treated properly in the sewage works. Many more people use the sewage works compared to when it was first built, this has greatly increased the amount of waste water that the sewage works have to deal with. This overloads the system and so sometimes raw, untreated sewage spills over directly into the river or the pipes burst. This causes major water pollution. In fact, sewage and street run-off are two of the most significant water pollutants in South Africa today.

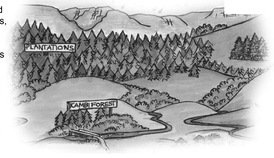


Plantations

A plantation is a forest planted by people, typically growing alien trees such as pine and gum trees. Pine and gum trees are not indigenous to South Africa, but are very fast growing in comparison with natural trees such as yellowwoods. Once the trees are 15 to 20 years old, they will be harvested (cut down) and sent to the sawmill. Once cut into logs, the wood will be used for paper, furniture, house frames, tools, kraalwood and firewood. Plantations are very useful for producing wood and also create jobs in the forest and the timber industry. People working in the forest station will look after this plantation in order to protect it from fires. People can also find jobs in the sawmills and pulp and paper factories.

We also get natural forests. A natural forest is home to indigenous trees, bushes and other plants. It is also a home to an entire ecosystem of birds, small mammals, reptiles and insects which are indigenous to South Africa and some may not be found in any other country in the world. So the preservation of forests such as these is very important. We want to protect our biological inheritance for our children and our grandchildren.

We can also use indigenous forest to attract ecotourists who like to visit natural areas and watch the birds and animals. For example in Knysna, thousands of visitors come each year to see the elephants in the forest sanctuary. In this catchment ecotourists could experience the tranquility of the area. Tourists help South Africa earn valuable foreign exchange, create jobs and improve local infrastructure, hotels, restaurants, guest houses etc. Indigenous forests also use less water than plantations. Indigenous trees help to prevent mud and other pollutants from reaching the dam. It prevents erosion. The forest helps to slow down floods that are caused by heavy storms, giving us time to warn people and move them out of the danger area.



Poor river health can cause poor human health

Pollution results in river water of a poor condition. Fish and aquatic insects (insects that live in water) will struggle to survive under such conditions. Polluted water is not safe for humans to drink, wash or cook with. If people do use this water for household purposes, there is a strong chance that they will get ill with gastroenteritis or many other diseases. Even swimming in a polluted river is dangerous, a person could get an eye or skin infection.

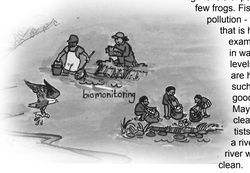
Gastroenteritis is dangerous for human health, especially for young children, older people and people living with HIV. Gastroenteritis is the second biggest killer of South African children under the age of 5 years.

Cholera patients suffer from dehydration caused by constant vomiting and diarrhoea. A cholera patient should be taken to hospital in order to be put on a drip to be re-hydrated. If you know of someone who is sick with cholera, get them medical attention immediately.

You can protect your health by preventing a cholera outbreak. This can be done by being very careful when drinking water. Drink only from a source that you know is safe. Always keep your hands clean by washing them with soap, especially after using the toilet and changing nappies and before preparing or eating food. Even when there is no cholera in your area, you must never use water directly out of a river or dam without boiling it for 7 minutes first, or by adding a teaspoon of Jik to a bucket of water.

Biomonitoring

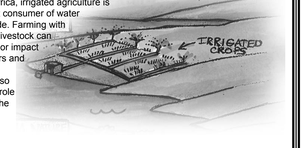
Fish, insects and river plants are important for the proper functioning of a river and thus to keep it healthy and clean. Scientists use insects, fish and frogs etc to "tell" them about the condition of the river. Frogs, for example, have skins that are very sensitive to pollution. That means that rivers 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 find many mayfly nymphs in a river, then we can say that the river water is probably safe and clean.



Cropping

When local farmers pump water from a river or a dam to grow their crops, it is called irrigation. Commercial farmers are farmers who sell their harvest and do not only grow food for their family's needs. In this area irrigation is essential for commercial farming, as the rainfall is not enough to grow the crops. Commercial farmers sell their crops to supermarkets, food processors and perhaps even internationally. It is important to know how much water these farmers pump out of the river, because too much pumping can drop the flow of water in the river. This will cause aquatic life to suffer and perhaps even die. Worst still, it will mean much less water for those people who live downstream. Commercial farmers also use artificial fertilizers, pesticides and herbicides. These chemicals tend to get washed into the river, thus polluting it. Even when these farmers plough their fields, they tend to pollute the river with the soil and silt that moves from the land to the river during the process of soil erosion. Soil erosion makes it difficult to farm after some time, as the soils becomes poor and the crops are not good. To keep the soils on the land, farmers should not plough closer than 30 meters from the edge of a river and leave the natural vegetation to grow next to the river. This will stop the erosion of precious soil from the land. It will also keep the river safe from mud and other agricultural pollution.

In South Africa, irrigated agriculture is the biggest consumer of water country wide. Farming with crops and livestock can have a major impact on our rivers and dams, and they can also play a key role to protect the rivers.



Environmental Education Organisations: 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
Private 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
Private 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)
Private 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
Private Bag X 11 Parkview 2122
Tel 011 486 1102
Fax 011 486 1506

Wildlife & Environmental Society of South Africa (WESSA)
Jim Taylor
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
Private Bag X 101 Pretoria 0001
Piet-Louis Grundling
Tel 012 804 3200
Fax 012 804 3211

Teaching Tips

Foundation Phase:

Form a "teaching ring" in the front of the class, where all the learners are seated on the floor and can see the poster. Use a ruler to indicate which aspect of the poster you are referring to.

Intermediate Phase:

With the poster on the wall, explain it in general terms to the whole class and let the learners come up in groups to examine the poster more closely.

Senior Phase:

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.

Use the poster to:

- Introduce topics e.g. water pollution or settlement types.
- Informally evaluate aspects of the curriculum e.g. can learners extract information from sources?
- 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.

Links to other Learning Areas

Technology: Let your learners conduct an investigation into how sewage works and purification plants work.

LLC: Tell your learners to imagine that they were one of the people depicted in the poster. Write an essay about themselves entitled "A Day in My Life".

EMS: Let your learners conduct an investigation into textile manufacturing. The process, the workforce, the product and the waste management system used.

NS: Investigate the conservation status of the Crowned Crane, its habitat, feeding habits and reproduction.

NS: Evaluate the impact of water pollution on ecosystems.

NS: Find out more about Alien Invasive Plants, such as who brought them to South Africa, why they are here, where do we find most of the AIPs, what their effects are, which species are involved and how are they removed.

LO: Discuss sanitation and hygiene with your learners, exploring exactly how to maintain good sanitation and hygiene practices.

Arts and Culture: Take any of the themes highlighted in the poster and suggest to learners that they script and perform an original play to inform others of the situation in the Mthatha catchment.