



Orange-Senqu Storytelling Mascots - Thabana Ntlenyana & Maluti

Start-Up Stories

Action Learning For a Living River



The Orange-Senqu River Learning Box



ORASECOM
THE ORANGE-SENQU RIVER COMMISSION

Background

The Orange-Senqu River Learning Box, Action learning for a Living River is an innovative and creative education response to the sustainable water resources management needs of the Orange-Senqu River Basin overseen by the **Orange-Senqu Youth River Learning and Programme Development (OSYRL&PD)**

The development of this project has been undertaken by the Orange-Senqu River Commission (ORASECOM). The project is being implemented by WESSA (the Wildlife and Environment Society of South Africa) in partnership with Mokolodi Nature Reserve in Botswana; the National Curriculum Development Centre (NCDC) in Lesotho, the Desert Research Foundation; Namibia (DRFN) in Namibia; and WESSA; Northern Areas Region in South Africa.

The project is supported by the German Federal Ministry for Economic Co-operation and Development (BMZ), the UK Department for International Development (DFID), the Australian Agency for International Development (AusAID) through the Deutsche Gesellschaft for Internationale Zusammenarbeit (GIZ) and the United Nations Development Programme - Global Environmental Facility (UNDP - GEF).

Sharing the Water Resources of the Orange-Senqu River Basin



Prepared by:



In partnership with



In collaboration with



RHODES UNIVERSITY
Where leaders learn

environmental
LEARNING RESEARCH CENTRE



GroundTruth
Water, Wetlands and
Environmental Engineering

Contents

Background	2
1.1.4. A Start-Up Story from Botswana, Tamani, Water Hero	4
1.2.4. A Start-Up Story – The Water Cycle, From Sea To Sky	6
1.3.4. A Start-Up Story from Botswana, Tsepo Learns About Groundwater.....	9
1.4.4. A Start-Up Story from South Africa, Sweet Water And The Early Nguni People.....	12
1.5.4a. A Start-Up Story from Lesotho, Crystal Clear Water From The Sky	16
1.5.4b A Start-Up Story from Botswana, Mmapula And Rrapula – Children Of Rain.....	18
2.1.4. A Start-Up Story, People And The River - An Introduction.....	20
2.2.4. A Start-Up Story from Lesotho, People And The River	24
2.3.4. A Start-Up Story from South Africa, People And The River	26
2.4.4. A Start-Up Story from Botswana, People And The River.....	28
2.5.4. A Start-Up Story from Namibia, People And The River	30
3.1.4. A Start-Up Story, Wonderful Wetlands	32
3.2.4. A Start-Up Story from South Africa, A miniSASS Water Study	34
3.3.4. A Start-Up Story from Namibia, Adaptation To Life In The Desert	37
3.4.4. A Start-Up Story from South Africa, Ecology And The River.....	40
3.5.4. A Start-Up Story from Namibia, The Orange River Mouth.....	42
4.1.4. A Start-Up Story from South Africa, Fishing Livelihoods	45
4.2.4. A Start-Up Story from Namibia, The Voice Of A Pot.....	47
4.3.4. A Start-Up Story from Lesotho, Molikeng’s Legacy	49
4.4.4. A Start up Story from Namibia, A Sparkling Conversation	51
4.5.4. A Start-Up Story from Namibia, Flooded By The Hardap Dam.....	54
5.1.4a A Start up Story from Lesotho, The Miracle Of Trees.....	56
5.1.4b A Start up Story from South Africa, Millie Sentie and Her Hope For Clean Water	60
5.2.4. A Start up Story from South Africa, U...tro...fi...k...shin	62
5.3.4. A Start up Story from Botswana, Roseo Catus	65
5.4.4. A Start up Story from Botswana, Catchments And Animals.....	68
5.5.4. A Start up Story from Lesotho, A Resilient Future For All	70
5.5.8. A Closing Story from Lesotho, A Closing Story from Thabana Ntlenyana And Maluti	72

1.1.4. A Start-Up Story from Botswana

Tamani, Water Hero

Tamani woke up. It was still dark outside and the cool night air blew in at his open window. He wanted to set out for school before the day started to get hot. In Tamani's village the temperature could reach 41 degrees Celsius by afternoon!

Tamani checked the clay water pot before leaving. There was just a little water left and that meant a long walk to the borehole to refill it. There is no surface water nearby Tamani's house, only the salty tasting underground water of the deep borehole.



Tamani's older sister called to him from the outside table to come have some millet porridge for breakfast. She had put goat's milk, his favourite, in it for him. "Enjoy your day at school, I'll see you later," she smiled at him. "I have to go fetch water." She got up and balanced the water pot on her head before walking off into the bushveld.

While Tamani scooped the warm porridge into his mouth he remembered the day he nearly died of thirst. He and his Uncle had taken a long journey into the dry arid Kalahari sands near Bokspits to collect honey.

His uncle, who had a wide knowledge of plants, had shown him a plant tuber that grows underground. Together they had dug it up and ground the root to a white paste with a stone. Then they had both had a drink of the water from the tuber.

When Tamani had finished his breakfast and chores he set off for school. The sun was already up and it was getting hot. When he reached school he had a long drink from the standpipe. "We are so lucky to have water available like this," Tamani thought.

Then Tamani noticed that water was leaking from a burst pipe. "This water is so precious, it can't go to waste!" thought Tamani as he ran to tell his teacher.

His teacher wasn't worried and said, "Someone will come and fix it when they have time. Maybe this afternoon or tomorrow," she continued. But Tamani was worried; he knew what it was like to be without water. He decided to do something about it himself.

Tamani found an inner rubber tube from an old bicycle tyre and ran back to tie up the burst pipe. The rest of his class gathered around to see what he was doing. Tamani told them of the day he nearly died of thirst. "Water is very important," he said. "We cannot let it go to waste."

Tamani's teacher was very impressed with him. "You are a hero, Tamani," said the teacher, "thank you for sharing your story, now we all understand the importance of water."

Use these questions to help your learners understand the story in its local setting:

- Why is water so important to Tamani?
- How much water is available to Tamani and his family each day?
- Where did Tamani's sister go to fetch water?
- Why do you think it was her responsibility to do this?
- Do you think that Tamani's uncle holds important knowledge about this place?
- Is there surface water near to where Tamani stays? Why is this?

1.2.4. A Start-Up Story – The Water Cycle

From Sea to Sky

Far out at sea, Drip the Water drop floated with his friends. Drip rolled over slowly in the sunlit ocean. The warmer he got, the harder it was for him to stay still. “I feel jumpy,” he said.

Suddenly he was gone! Drip’s friends vanished too; they burst from the water’s surface and disappeared. They had evaporated. Drip was now a misty, invisible water droplet floating up to the sky. “I’m finally rid of that itchy salt” he said. “Who wants to be seawater anyway?”



No one answered Drip. His friends were rising too quickly. Winds carried Drip and his friends over the huge ocean towards the land. As he floated through the air, Drip gasped “What a view! But we are so high up in the sky! Those birds way down there look like tiny dots.”

As Drip floated over the land, more drops evaporated and joined him. “Hey, where did all of you come from?” Drip shouted. “I came from the salty sea.” “We came from the damp forests, lakes and rivers down below,” they all shouted back.

From Cloud to Rain: Soon the air got cooler and the droplets crowded closer together. They gathered so close that they formed a thick cloud. “Boy, it’s getting dark in here!” whispered Drip, a bit afraid. The air got even cooler. “I feel wet,” Drip murmured. He and his friends were condensing, or changing from mist into raindrops.

Kaboom! With a flash and a crash, lightning ripped through the clouds. The raindrops began falling. “Umpff” groaned Drip as he splashed onto a rock and rolled onto the ground. “Now where are we going?” he asked some friends who had splashed down next to him. Nobody answered him because nobody knew.

From Stream to River: The water drops joined together and hurried along as part of a tiny stream. They played games as the stream flowed through the grasses and rocks. "I've got you!! You're on!" Drip shouted as he caught another drop. Instead of being "on", though, the drop disappeared!! "Wait!" yelled Drip. "That's not fair. Where did you go?"

But the drop *couldn't* answer. It had soaked, (infiltrated) into the ground, and was on its way to join millions of other drops in an underground lake, also called an **aquifer**. A short time later, Drip's tiny stream joined another tiny stream to form a bigger one. This stream joined others until they all grew so big that they became one great, wide river.

The force of the flowing water amazed Drip. He and his friend held fast to each other as they bounced off the rocks, whipped around the bends, and splashed all over the place.

A Dirty Journey: After a long while, the river began to slow down. Drip drifted along, silent for once until "Oomph! What was that?" Drip cried as a floating object bumped into him. Looking about, he saw crushed cartons, bobbing cans and cups, and bits of tar all around him. "How did I get into this horrible mess?" he wondered.

Drip edged away, trying to find a cleaner place. Then all at once everything went dark. "Oh no" he moaned. Dirty water was gushing from some pipes on the river's edge from a nearby town. A flood of mud was running into the river from the farms! Drip and his friends moved blindly through this mess.

"If water drops had to breathe, we'd choke to death on all this rubbish and dirty water" he complained to his friends. "Why do people allow this to happen? Don't they care?"

As the river widened, more water flowed with Drip and his friends. More drops helped carry the dirty load downstream. Drip just missed being swallowed by an open bottle that was slowly sinking. In making his escape, he ran right into a large clump of water grass. Further along, more grass, reeds and other water plants spread out in a huge **wetland**. All the drops had to drift through it. When they got to the end of the wetland, they were much cleaner!

“Where did that disgusting junk go?” Drip asked. Then he realised that the leaves, stems and roots of the plants in the wetlands had trapped much of the rubbish, dirt and chemicals (pollution).

Back at Sea: Drip and his friends passed out of the wetland and into a large bay. Just as he looked to the horizon, he noticed a salty taste. Then he remembered and understood. “Well! What do you know! We’re back where we started in the sea” Drip exclaimed, as he and his friends rode the top of a big wave. “So, where do you think the sun and the wind will send us next time?” No one knew, but wherever they went the next time round, it was sure to be a great adventure again!!

Use these questions to help your learners understand the story in its local setting.

- ◆ Where did Drip come from and go back to?
- ◆ Do you think that Drip enjoyed his journey?
- ◆ What parts of it did he not like?
- ◆ Why do you think that the water that came out of the pipe was dirty?
- ◆ Where do you think the pollution came from?
- ◆ Why did Drip feel cleaner after going through the wetland?
- ◆ Did Drip feel that people cared about the Orange-Senqu Basin?
- ◆ Write a letter to tell Drip about what you are doing to make rivers healthy?
- ◆ Draw a picture of Drip during one part of his journey. Help tell the story of what is happening to drip by using some key words in your picture.

1.3.4. A Start-Up Story from Botswana

Tsepo Learns About Groundwater

Tsepo sighed heavily to himself. There had been no rain in his small village for ten long months. It was hot and dusty and Tsepo longed to swim in the river that flowed in the valley five kilometres from his village. Tsepo sighed again, the severe drought had left the Molopo river dry.

The Molopo river was the villagers' main source of water. Water is a very important resource and now that the river was dry, it meant hardship for Tsepo's village.



Tsepo heard the village elders discussing the problem and what to do about it. He walked over and listened. Tsepo remembered his friend Mpho, who came from a nearby village, telling him about how their village elders had called a government official to help.

He politely suggested this to his grandfather who passed the suggestion onto the other elders. Soon a government official came to explain to the village that water could be found under the ground.

Tsepo found it hard to understand how water could be under the ground! The next day he asked his teacher about it. "Yes," replied Tsepo's teacher, "there is water underground, it is called groundwater."

"How does the water get there?" asked Tsepo's friend, Mpho. "Is there a river under the ground?" The whole class crowded round the teacher asking questions. This idea of groundwater filled Tsepo with hope.

Their teacher explained, "not all rainwater flows into rivers on top of our earth's surface. Some water seeps slowly down through tiny pores or spaces in the soil and in between rock, forming underground rivers and lakes. This underground water is called an aquifer."

"Can groundwater help our village through the drought?" asked Tsepo. "Yes," his teacher replied, "to find Groundwater we can dig a deep well or drill a borehole into the ground."

"How deep?" asked Mpho. The teacher smiled at the children. "Groundwater can be found at many depths below the Earth's surface. Wells and boreholes can be anything between three to three hundred metres deep!" she said. Tsepo gasped, "That's like three whole football fields deep!"

When Tsepo and Mpho got home from school the elders had called all the strong men together to start digging for water. "They are going to be digging for a long time!" thought Tsepo, remembering the class discussion.

Luckily the government official was still in the village. He explained that they first needed to ask a water expert to survey the area for groundwater. "He will help you find the best place for the well or borehole. Then your village needs to apply for a licence" said the government official.

The government official then called all the villagers and explained that groundwater needs to be well managed. "Drawing out too much water can dry out other streams and rivers. Other villages could be left without water. That is why we need to be careful about how much water we use" continued the official.

"You will need to take samples of your groundwater to the laboratory for testing. Groundwater travels long distances therefore many different pollutants such as fertilisers and herbicides used on commercial farms and chemical effluents from factories can make it unsafe for use." The villagers thanked the government official as he drove off.

Tsepo went home to help his mother cook dinner. It had been a long day and he had learnt lots. He was also feeling a lot better about how the village would get through the drought. He made a secret promise to himself to always use the ground water wisely.

Tsepo's teacher continued to teach the class about conserving the water resources in the Orange-Senqu Basin. They learnt that groundwater was the only fresh water source for many people all over the world.

Tsepo was happy again, even though life was tough during the drought. He kept thinking that when he grew up, he would help communities find solutions to their water problems.

Adapted from the book, Water World, Children's voices: an educational booklet on water for children, UNEP

Use these questions to help your learners understand the story in its local setting.

- In which Country does Tsepo live?
- Why has it not rained for ten months in Tsepo's village?
- Which river is the villagers' main source of water?
- What happened to this river that worried the elders?
- Who did the elders call to help them with their problem?
- What did they decide to do?
- What water source did the villagers decide to use?
- Can you think of some of the important things that the villagers needed to do to ensure proper management of this water source?
- What water source does your water come from?
- Write a story about what happened in your village or town during a drought. (This can be a real or a made-up story)

1.4.4. A Start-Up Story from South Africa

Sweet water and early Nguni people

(In the story, comments and scientific observations are in brackets and italicised so that we can see the practical wisdom behind some water collection myths and techniques of the past).

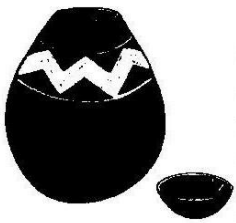
Before the time of the Zulu King, Shaka, sweet water was called “amanzi amnandi”. Shaka’s mother was called Nandi and it is said that because it was not considered respectful to use the queen mother’s name in this way, Shaka referred to sweet water as “amanzi amtoti”. *(This is how the town of Amanzimtoti, south of Durban, got its name).* Today both terms are



used and many people of Nguni origin will sniff, smile and hold up “sweet” water, collected from a river, spring or well for their daily household needs. *(Water quality scientists today still have people smell and taste household water. Human senses give a good indication of whether water is good and clean and fresh).*

Historically, water was usually collected in areas where people could hear it running over stones or dripping down rocks *(well oxygenated water supports natural biological cleansing processes)*. If a spring was for human use, it was protected by a circle of rocks with a small outlet. Cattle drank elsewhere. An area nearby was cleared and the site soon became a meeting place for young people. Young men would hang around these water collection sites, playing musical instruments and admiring the young girls who came to collect water. The girls would walk along slowly and gracefully, singing and flirting. Water collecting was rarely seen as a tiring or boring chore because of the prospect of courtship!!

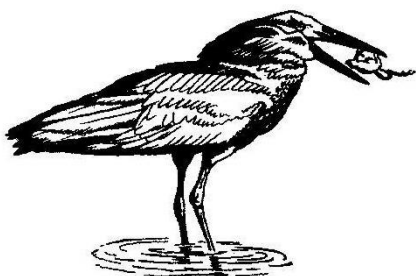
A water source would always be approached with care so as not to frighten crabs and other small water animals. When disturbed, their movement would stir up sediments and the collector would have to wait for the silt to settle. The surface film was brushed aside for "sweet water" to be collected. (Sediments and surface films have higher bacteria numbers than the middle waters of pools and rivers. Today scientists take water samples below the surface film, taking care not to suck up sediments. In this way, scientists can get consistent and reliable measures of bacterial contamination).



Clay pots were filled with water and covered with a collecting bowl, a piece of skin or a mat made from incema (*Juncas kraussii*) grass. The water would thus stay cool and fresh. (Water evaporating through the sides of a porous clay pot cooled the contents. Most water bacteria cannot reproduce in cool, dark conditions. Some micro-organisms envelop themselves in a calcium secretion in the pores of clay pots. Scientists spoken to were uncertain about the detail of these issues but it is of note that, in earlier times, great care was taken to scour out a calcium-like scale in water pots. Also of note is that when the grass "lids" and head rings for carrying pots became old they were simply thrown away and new ones were woven. Discarded lids did not pollute the river like today's bottle tops and plastic waste).

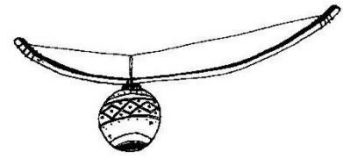
There were many other customs and traditional practices surrounding water. Children were warned that urinating in a river would change them into the opposite sex! (This myth was probably sufficiently frightening to prevent people urinating in streams and rivers. This would have limited a disease like bilharzia. The bilharzia parasite is passed on from human urine and faeces to small water snails. From these, its life cycle takes the disease back to people through river water).

Nguni water collectors say that where there are frogs, one does not find sweet water. Frogs are eaten by hammerkops (luthekwane, the "lightning bird") and the prospect of collecting water while being watched by a "witch-



bird” must have been terrifying in earlier times when spirits, myths and mystery had a more central place in everyday social life. Children were told that if they killed this bird or stole its eggs, their homes would go up in flames. (Where there are frogs, one will usually find snakes. Both animals are feared by many people today, not least the children who were told the Nguni myths of witches and lightning to fill their hearts with terror. Today, scientific tests suggest that many frog species need “sweet water” if they are to live and reproduce successfully. There must be some doubt about the Nguni suggestion that frogs are an indication of water that is not fit for human consumption).

It is also said that it was not advisable to collect water from a river after heavy rain at the start of the annual rainy season. Indigenous common sense told people to put out pots to collect rain-water. River water would again be collected four days after the rains stopped and the water had cleared. (Heavy rains wash human and animal wastes into rivers. There is thus a rapid increase in faecal bacteria and disease. In KwaZulu-Natal, health workers have to warn rural people not to collect river water after heavy rains as few remember the earlier Nguni practice of collecting rain-water only four days after the rains have stopped).



Today human and livestock numbers have increased vastly, catchments have become degraded and rivers are often polluted dumping places. The best indigenous practices for the collection of “sweetwater” may not prevent people getting serious diseases from river water. Learning about historical water collection and storage practices can, however, develop a respect for early people and might also help our understanding of water quality issues.

Use these questions to help your learners understand the story in its local setting.

- What traditional name do people of Nguni origin give to 'sweet water'?
- How would you describe 'sweet water'?
- How did people collect 'sweet water'?
- How many days did people wait after it rained before collecting water?
- Why did people wait this long before collecting water from the rivers again?
- What did they do in the meantime to collect water?
- What are some of the problems that are facing catchments that may make collecting 'sweet water' today, a difficult thing to do?
- Why is it important that the water stays cool and fresh?
- What was the story (myth) that elders told children to prevent them from going to the toilet in the river?
- What disease is passed on from human urine and faeces to small water snails and then via its life cycle back to people through river water?
- Would frogs be a good sign near where you want to collect 'sweet water'?
- Why do you say so?
- How did people protect springs that were for human use?
- Why was water collecting an exciting activity for boys and girls to do?
- Do you collect water? Tell the class an exciting story about what happened to you one day when you were collecting water.

1.5.4a. A Start-Up Story from Lesotho

Crystal clear water from the sky

If you want to drink crystal clear water, you should start harvesting rainwater, like Felling's father is doing. Felling and her family live in Qacha's Nek in Lesotho.

The rain actually represents one of the purest forms of water that you can find on Earth. I guess this is because it has not yet come in contact with anything dirty. But, of course, if you stay in a big city this will not be the case.



The air in many towns and in areas close to big factories can be full of poisonous gases. When it rains, these gases dissolve in the water and reach the ground together with the rain. When the rainwater gets polluted like this it cannot be used for drinking.

In rural areas, this problem is not as serious as in big cities though airborne pollutants can travel quite long distances in the air. Actually, many people in rural areas all over the world harvest rainwater and use it for drinking.

One of my friends from India sent me a letter saying in his country rainwater harvesting has been included into the new building rules. Each new building must have gutters and a storage tank for the rainwater. There are many ways in which rainwater can be harvested. Last year we went on a field trip to one of the dry areas of our country where rivers are only seasonal.

When it is not raining the communities have to dig deep into the riverbeds to get some water. I must say ... my country-men and women can come up with good ideas!

By the end of the first day of our field trip we passed a large community where the people had found a very clever solution to the problem of water scarcity. The method was simple and made it possible to provide water to a number of people and even some water for irrigating crops.

The method used involved scooping off the soil from a large area to create something like a pan. The rainwater then collects into the earth pan and is stored there even after the rain stops. In this way the community can have a water supply during the dry months.

Some of the people who took the water from this pan also used a simple filtration process to make the water cleaner.

These people knew, just like you and me, that when the water is meant for drinking, it has to be very clean.

Use these questions to help your learners understand the story in its local setting.

- How did Felling's father harvest rain water?
- What do you think he used to store the rainwater?
- Is pure rainwater safe for drinking?
- What happens to rainwater when it gets polluted?
- What are some of the things that can pollute rain water?
- What can you do to rainwater to make it cleaner?

1.5.4b A Start-Up Story from Botswana

Mmapula and Rrapula – Children of Rain

Botswana has 1.8 million inhabitants and has rich diamond deposits and many cattle – something her people are very proud of.

Botswana has an arid climate. Only the north and north east of the country have a few strong – flowing rivers. It is these which supply the capital with water, thanks to several dams.

The Okavango Delta – the planet's largest inland delta and the country's principal tourist attraction is off limits as a water resource. In the south west of the country, part of the Orange-Senqu River Basin, people are dependent on ground water – an invisible, deeply buried resource until brought to the surface by an estimated 20 000 boreholes.



“Luckily for us, people realise that water is scarce so consider it very valuable” says Tracey. “It’s deeply rooted in Botswana culture. In our language, Setswana, the word for rain is pula and that’s also our currency. Our flag is light blue to represent water, we even say ‘Pula’ when we greet people and express goodwill. A girl (Mma) that is born during the rainy season may be called Mmapula. A boy (Rra) may be given the name Rrapula. And should it not rain until October, two months before we sow in December, we BaTswana still practice the gofethla pula – the traditional rainmaking rites. Not only that, but the government encourages citizens to pray for rain in church.

It is a greater challenge to ensure water supply in rural areas, not just for farmers, but also for city dwellers that have second or third homes there. Maybe they have a small house with maize fields, where members of the family will live from December to March; or maybe a house or kraal for cattle goats and sheep (a cattle post) where someone will live all year round.

“Isolated families or small settlements in rural areas need to be self-sufficient,” That explains. “As a rule they have access to a deep well or borehole. “Settlements with over 500 inhabitants are entitled to public services such as schools, basic healthcare and drinking water. If necessary the government will supply the water by tanker.

“Our overall demand for water continues to grow,” adds Tracey. Yet Botswana is already tapping into most of its accessible water sources. This includes “fossil groundwater” stored in deep aquifers; in effect water from previous climatic eras, which is not likely to be replaced. “For this reason, we need to plan ahead. We need to examine our participation in future international water transfer projects – for example, the third phase of the Lesotho Highlands Water Project. It’s quite possible that by 2025, pure water from the mountains of Lesotho could be piped to Botswana as a substitute for our slowly depleting aquifer reserves.”

Adapted from the book, Orange-Senqu: Artery of Life by Thomas Kruchem

Use these questions to help your learners understand the story in its local setting.

- How do we know that people in Botswana respect and value their water resources?
- What are some of the cultural practices that show this?
- Why do you think that this is?
- What are some of the challenges to supplying water in Botswana?
- What source of water is most used in Botswana?
- Why is this?
- What is “fossil groundwater” and where is it found?
- What is happening to the ground water supplies in Botswana?

2.1.4. A Start-Up Story

People and the River

An Introduction

Thabana Ntlenyana and Maluti discover the history of the Orange-Senqu Basin, explore the value of cultural diversity and learn that traditional knowledge is a precious resource that should be kept alive.

Thabana Ntlenyana, Warrior of the mighty Orange-Senqu River climbed higher and higher up the Maluti Mountains. Her little otter nephew, Maluti, followed close behind her. He was very tired and his little paws were sore from climbing all the rocks. Thabana stopped outside a little cave and smiled at Maluti. “We are here at last” she said.



On the cave walls were beautiful paintings. Maluti could not take his eyes off them. “What do they mean?” he asked Thabana.

Thabana looked at the pictures drawn thousands of years ago by the San people who lived in the mountains. She called Maluti to her side, “they tell a special story of a people and place so long ago.” “Please tell me the story” begged Maluti.

Thabana began: “Long long ago the mountains, savannahs and deserts of the Orange Senqu Basin were home to our animal friends, the eland, kudu and springbok, lion, hyena and jackal.

Then the first people, the San hunter-gatherers came to this area about 40 000 years ago! They lived in family groups of 20 – 50 people and followed the wildlife around, as they were their source of food. Other San people settled along the coastal regions and ate seals, shellfish, crayfish, birds and sometimes a beached whale!

About 2500 years ago, the San were joined by the Koi people from the north-east area that borders modern Angola, Zambia and Botswana). The Koi people were pastoralists who kept cattle, sheep and goats.

Later the Bantu people arrived from West Africa and settled in Southern Africa. They liked to grow crops such as sorghum, black beans and peanuts and so they did not move to the western parts of the Basin, because it did not rain enough there for them to grow their crops.

In 1488 the first Europeans arrived at the Cape, led by the Portuguese sailor, Bartolomeu Dias. Gradually Europeans moved northwards.

The first Europeans settled in the Orange-Senqu River Basin in the 1690s. During the "Great Trek" of the 1830s and 1840s, Boer settlers moved further into the Basin. In the 1870's there was a diamond and gold boom. This promoted the development of a partly industrialized South Africa, in which the European settlers held the economic power. Between 1870 and 1900 these people established large-scale commercial farms!

"Gosh! That is a lot to remember", said Maluti. Thabana smiled and led Maluti to a little gorge. A ribbon of water cascaded down in a little waterfall and dropped into the foothills below. Thabana pointed at the source of the little stream. "Here high in the Maluti Mountains, the Orange River is known as the "Senqu Lesotho" she said, but the river in other places has other names!

Thabana pointed her little paw to the far north. "The Koi people called the Orange-Senqu River downstream of the Vaal River, the Gariep. It means "big water" or "great river!" The upper part was known as Nu-Gariep or "Black River" Many of the Bantu settlers used this name too."

"What did the San call the river?" Maluti had been paying close attention to Thabana's story.

Thabana continued, "The San called the Orange River the "Dragon River". The first name that the Europeans gave the river was the "Vigiti Magna!"

"That's a funny name!" laughed Maluti. "It's Latin" said Thabana. "Then it was renamed the "Oranje Rivier" (Orange River) by Colonel Robert Gordon who was commander of the Dutch East India Company garrison at Cape Town. He named it in honour of Prince William of Orange."

"Wow" said Maluti, the Orange-Senqu River Basin has had so many different peoples and cultures staying in it" "You are right, traditional knowledge is a precious resource, we must take care that it is not forgotten and that people use it to help them work together to protect the waters of this basin" said Thabana. "I'll never forget the stories you've showed me in these beautiful paintings!" said Maluti.

Thabana stood looking over the mountains and plains stretching far into the east. There in the mighty Orange-Senqu Basin, lay the savannah and over to the north, desert. She looked at her little nephew, "Come", she said, let's have a good rest in the cave. "Tomorrow we start our long journey to the sea."

Content Adapted: Artery of Life by Thomas Kruchem

Use these questions to help your learners understand the story in its local setting.

- What did Thabana Ntlenyana and Maluti find in the cave up in the Lesotho highlands?
- What did these represent?
- Describe the daily life of the San people.
- What did the San people who lived near the coast eat?
- Which people were the pastoralists who kept cattle, sheep and goats?
- What crops did the Bantu people like to grow?
- What is the name for the big movement of European (Afrikaner) people that resulted in the settlement of the Orange-Senqu Basin?
- When did the gold boom start?
- What started to develop in South Africa as a result of the gold boom?
- Who held the economic power at this time?
- What did these people use their money and power to buy?
- Give another name for the Orange River.
- Give one example of traditional knowledge from your own experience.
- Do you think it is important to remember knowledge from the past?
- Why do you say so?

2.2.4. A Start-Up Story from Lesotho

People and the River

Maluti sat close to his Aunt Thabana Ntlenyana. She was going to tell another story! This one is about the people of Lesotho and the river. Maluti listened wide-eyed as Thabana told him about the violent battles by Shaka, the Zulu leader, known as the *mfecane* ("the crushing") by the Nguni people and *difegwane* ("the scattering") by the Basotho and Batswana people. "So about 200 years ago" said Thabana, "this caused many people to flee outside of their homelands."



The San people lived in the area known as Basutoland (or Basotholand) until the sixteenth century when Bantu-speaking herders started bringing their cattle up into the Mountains.

Nearly three hundred years later King Moshoeshoe I brought tribes and thousands of refugees together that had been scattered by Inter-African wars. Then between 1856 and 1868 Basutoland was caught up in the Anglo-Boer conflict. This was when Britain and the Boers were fighting in South Africa. King Moshoeshoe I asked the British Queen Victoria for help and in 1868 the country was placed under the protection of the British.

Nearly a century later in 1966, Basutoland gained independence from Britain and became the Kingdom of Lesotho. The Basuto National Party held power for the first twenty years with King Moshoeshoe II, the official monarch.

The King's name was Constantine Bereng Seeiso and he was the Paramount Chief (King) of Lesotho when the country gained independence in 1966 and went on to be better known as King Moshoeshoe II, reigning from independence in 1966 until his death in 1996.

King Letsie III (King Moshoeshoe's son) is the present Chief of State and holds a ceremonial role while the Prime Minister makes the political decisions. The Lesotho Congress for Democracy controls a majority

government with the All Basotho Congress, the National Independent Party, and the Lesotho Workers Party among nine opposition parties.

“Wow” that is an amazing story about some great leaders!” said Maluti. “Yes,” said Thabana, these were good leaders.”

The Basotho have a patriarchal society (fathers hold authority over women and children) and all men have to pay a bride price. Traditional authority is through a system of chieftaincy from the Paramount Chief and his court, down through senior chiefs and sub-chiefs, to local headmen and sub-headmen.

All Basotho belong to a clan and members share a name that links them with a specific animal totem or an ancestor.

“I wonder if any of them have the otter as their totem?” asked Maluti. Thabana Ntlenyana smiled at her little nephew. “You’d make a good totem Maluti”, she said. “Are there other nations in Africa that are ruled by a King?” asked Maluti. “Not many”, said Thabana, “Lesotho is one of the last standing monarchies in Africa”

Use these questions to help your learners understand the story in its local setting.

- Why did the Bantu people flee their homes during the time of Zulu King Shaka?
- What did the people call these times? Can you explain what this means?
- Who gathered the scattered Bantu people into the Basotho nation?
- What happened to drive the San people from their mountain homes?
- Basutoland gained independence in 1966, what was the new name for the country?

2.3.4. A Start-Up Story from South Africa

People and the River

“Tell me about the people of South Africa and the river” asked Maluti. He loved listening to his Aunt, Thabana Ntlenyana’s stories about the Orange-Senqu Basin. Maluti sat quietly as Thabana began. “The San and the Khoi peoples were the earliest known people who lived in South Africa, although it is believed that early humans had lived in the country more than a hundred thousand years before that.”



The Bantu-speaking people arrived from the North several hundred years before the first Europeans who were Portuguese sailors. In 1652, the Dutch traders were first Europeans to establish a harbour stop-over at the Cape of Good Hope. This was to break the long journey on the spice trade route from the Netherlands to the Far East.

Then the British seized the Cape of Good Hope in 1806 causing the Afrikaners (known as the Boers) to move their territory to the north.

Gold and diamonds were discovered in the late 19th century and this caused a sudden growth in the wealth in the country.

In 1897, the British fought the Zulu people and won and this meant that they could include Zululand into Natal. This was called colonialism which means when a powerful nation takes over land to use the resources for their own countries good. Since then, South Africa’s history has been marked by wars and apartheid.

After the unbanning of the African National Congress, South Africa became a democracy in which all people could vote. The country is now more stable with great cultural diversity.

One great achievement of this diversity is that all eleven of its official languages are recognized by the Constitution: Ndebele, IsiXhosa, IsiZulu, Sepedi, Sesotho, Setswana, SiSwati, Venda, Xitsonga, Afrikaans and English. Apart from English, IsiZulu, Sesotho, Setswana and Afrikaans are most frequently spoken.

“I wish I could speak all those languages!” Said Maluti. “All of them?! Thabana Ntlenyana was surprised at her Nephew’s wish! “Then I could speak to all the children in South Africa and tell them how very important it is to respect rivers and to take good care of them. I’d tell them that water is the most precious resource on Earth!” said Maluti.

“Well!” laughed Thabana, “if an otter could speak eleven languages I think the whole world’s children would listen to you!

Content adapted Source: Orange-Senqu River Awareness Kit

Use these questions to help your learners understand the story in its local setting.

- Who were the earliest people who lived a peaceful life in the mountains and plains of Southern Africa?
- What people came into Southern Africa and disturbed these peoples way of life?
- Soon European sailors started using the sea route around the Cape, from what country did they come?
- The Dutch people who arrived next came from a country where they were very good at building ships. What did they set up at the Cape of Good Hope (now Cape Town) and why?
- Who came to upset the Dutch people in 1806 and what did they do?
- Where did the Dutch people (also called Boers) go and what did they discover? Was this a good thing at the time? What about now?

2.4.4. A Start-Up Story from Botswana

People and the River

Thabana Ntlenyana sat with her nephew Maluti in the shade of a big Kokerboom tree. Parts of Botswana are found in the Northern Sub-Basin of the Orange-Senqu and it was time to tell Maluti all about the history of the people in Botswana.

“About 200 years ago” began Thabana, the Boers moved into new parts of southern Africa across the Vaal River. The Zulu people were also very militant, which means they liked fighting with other peoples in these areas. So to keep safe many people moved to what is today called, Botswana. They came from the Transvaal and Natal between 1820 and 1840.



At this time the Boers claimed land for their own in southern Botswana causing land conflicts that kept going for a long time.

The Difaqane tribal wars spread across Botswana in the early 1880s and one of the most important wars was the one between the Boers and the Batswana people. The Batswana asked the British for help and the British sent troops and occupied the vast area to the north of the country.

On September 30, 1966, the republic of Botswana gained independence under the president, Sir Seretse Khama.

Botswana is a democratic republic and the Botswana Democratic Party has been democratically elected from the 15 running parties during every election since independence. Around 79% of the population are Batswana who speak the Setswana language and share the Sotho-Tswana culture.

The main ethnic group from which the royal family comes from are Bamangwato. Ethnic groups other than Tswana include: Kalanga 11%, Basarwa 3%, other, including Kgalagadi and white 7%.

The San people (also known as the Basarwa in Botswana) live mainly in the Kalahari Desert. There are about 50 000 San people, which is about 3% of the population of Botswana.”

Maluti listened very carefully to Thabana’s story. She smiled at her nephew, “English is the official language with Setswana and Ikalanga also widely spoken. So if you want to speak to the children here, Maluti, you have two more languages to learn!” she laughed.

“I think it will be easier if the children learn to speak the language of the Otters!” said Maluti.

Source: Orange-Senqu River Awareness Kit

Use these questions to help your learners understand the story in its local setting.

- In which sub-basin of the Orange-Senqu is Botswana situated?
- Why did people move north to the place now known as Botswana around 200 years ago?
- Who claimed land in southern Botswana and fought with the Batswana people over it?
- Who helped the Batswana people gain independence in 1966 and how did this happen?
- Which people live mainly in the Kalahari Desert?
- Where did these people originally come from?
- What political system does Botswana have today and what does this mean?

2.5.4. A Start-Up Story from Namibia

People and the River

Listen as Thabana Ntlenyana tells Maluti the story of the people of Namibia...

Long ago, Namibia was called South West Africa. It remained largely unexplored, with very few people until the mid-nineteenth century when the ivory trade, explorers, prospectors and missionaries began to cross its borders.



In 1884 the country was colonized (occupied) by Germany after negotiations between the United Kingdom and Germany.

Diamonds were discovered in Lüderitz in 1908 in what was then referred to as German South West Africa, drawing international attention and people to the country.

The Ovambo people make up the majority of the population and most work as subsistence farmers in the north along with the Kavango and Caprivi peoples. The Nama, Damara and Herero live in central Namibia although industrialization has seen the migration of these people within the country.

The Nama are the main ethnic group living along the Orange-Senqu River. The Nama traditionally have a pastoral way of life, tending flocks of goats and sheep, gathering firewood and collecting wild honey, but are not fully nomadic, as they gather in settlements where they erect portable huts. The Nama have much in common with the San. Their languages have the same roots and features, and the people have light skin and a small delicate frame. The Nama also share a common language with the Damara people.

One of the first leaders of the liberation struggle in Namibia was Hendrik Witbooi. Witbooi, a cultural hero in Namibia, led an underground movement to harass the occupying German colonials. Today Hendrik Witbooi's face can be found on all Namibian banknotes.

Namibia or South West Africa, as it was called while it was a German territory was placed under the South African administration by the League of Nations after the First World War. Namibia gained its independence in 1990.

Source: Orange-Senqu River Awareness Kit

Use these questions to help your learners understand the story in its local setting.

- Who were the first people to cross into South West Africa?
- Which country ruled Namibia from 1994?
- What happened when diamonds were found in Namibia?
- What are then names of the various peoples that make up Namibia?
- Describe the way of life of the Nama people.
- What did Henrik Witboer do?
- Which country ruled Namibia after the Second World War?
- When did Namibia get its independence?
- What does it mean when a country gets its independence?

3.1.4. A Start-Up Story

Wonderful Wetlands

Thabana Ntlenyana and Maluti were in their element! They loved wetland areas because there were always lots of fish, crabs and other food to eat! They were hungry after journeying so far down the Orange-Senqu River, finding out so many fascinating historical facts about the different countries that formed part of the Orange-Senqu basin.



“Wetlands are one of my favourite places” said Thabana Ntlenyana. Her sleek fur glistened in the sunlight as she shook the water from her oily coat. “I love wetlands too,” said Maluti, but how do I know if they are my favourite place if I still need to visit so many places that I’ve never been to before! “How is a wetland different to a river?” Maluti asked Thabana Ntlenyana.

“Well wetlands have special functions that help rivers and river life survive throughout the year,” said Thabana. “The first thing you will notice about a wetland is that the water is moving very very slowly through them.” She continued. “Why is that?” asked Maluti. “Well do you see all these reeds and sedges? They are specially adapted to live in the water, look how smooth, slim and waxy their long stems are. They help to slow the water down and when the water slows down it loses the energy to carry silt and gravel, and it gets trapped amongst the reedbeds as the water flows through” “That’s amazing,” said Maluti, so they act as a giant silt trap!”

“Yes, and these water plants are able to take up extra nutrients and filter out pollution so wetland also act as a giant filtration plant! That means that wetlands both clean and purify water as it moves through the system.” said Thabana Ntlenyana.

Maluti dived under the water and came up with a big crab. “Mmm he said, there is so much life here in this wetland, if we stay here we will never go hungry!” he said. “That’s what is so special about wetlands!” said Thabana Ntlenyana. “They are like a giant sponge that hold back and release water

into the river system all year round, even when there is no rain! That means that there is always water here and so the plants and animals are able to grow quickly and have lots of young. It is a very rich place!”

A heron stood very still at the side of the wetland, it was partly hidden by the long grass. Maluti swam over to where he was standing. He didn't move. “What's he doing” asked Maluti. “Fishing” said Thabana Ntlenyana. “That's a strange way to fish! Just standing there for hours on end!” said Maluti. Before Maluti could finish his sentence the heron had dived like a flash into the wetland and emerged with a long golden fish half dangling out his sharp pointed beak. “I see!” said Maluti with surprise, so we otters are not the only ones that have worked out a special way of catching fish!”

“All animals have special ways of catching their food Maluti, that's how wetlands keep in balance. Every plant and creature plays a special role in keeping the system healthy. Only people sometimes mess up the system by not understanding how it works and by doing things that break it down. Not all people harm wetlands. Many rural people come here to collect reeds to make their baskets and mats and they also graze their livestock here, but they know that they can only do this at certain times of the year, otherwise it will damage the wetland.” Said Thabana Ntlenyana. “The most damaging things to wetlands are when they are dammed up, or when they are developed or when roads are built through them. Pollution, solid waste, fires and overgrazing also degrade wetlands.” said Thabana Ntlenyana.

“I've been thinking...” said Maluti, “even if there are amazing places that I still need to discover in the Orange-Senqu basin, wetlands will also always be one of my favourite places to be!”

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- Write a story about a special wetland. Include all the important functions that wetlands have that help people and place.

3.2.4. A Start-Up Story from South Africa

A miniSASS Water Study

Thabana Ntlenyana and Maluti were sunning themselves on a rock along the banks of the Orange-Senqu River. The morning's catch of fish, crabs and fairy shrimp was very good and they were feeling very sleepy after such a big breakfast!

The sound of children's laughter disturbed the quiet sounds of the riverine forest. The birds fell silent for a while and only the frogs carried on with their calls, some chirping, some croaking and others sounding like they had also had too much for breakfast! A huge monitor lizard crashed away through the undergrowth and swam quickly across the stream to the far bank.



Thabana and Maluti were quite well hidden from the children as they arrived at the river bank. The children unpacked their gear, took off their shoes and with white containers and nets in their hands started splashing through the stream. Every now and again there was a shout of delight and everyone bent over the little white containers to see what had caused such excitement.

"What are they doing" asked Maluti puzzled. "I've seen it happen many times," smiled Thabana Ntlenyana. "I even know that they call it miniSASS," she said. "That's a funny name! What does it mean?" Asked Maluti. "It stands for Mini Stream Assessment Scoring System," Thabana replied. "It is a way of looking at rivers called 'biomonitoring'. The children are looking for different types of river creatures, and from what they find, they can tell a lot about how healthy the stream is!"

"If they knew what we have eaten all for breakfast, they'd know it was a healthy stream!" said Maluti. "Well they may find our scats from earlier! Then they would know that otters are an indicator of healthy rivers," laughed Thabana.

"So what exactly are they looking for?" asked Maluti. "There are thirteen groups of creatures that they are trying to find. Each one tells a story about the river and has a different score depending on how much pollution they can withstand, Thabana replied.

"That's amazing," said Maluti. "You mean they are looking for the tiny creatures that live in the gravel and under rocks that are too small for us to eat?" "Yes," said Thabana, and some that we do love to eat, like freshwater fairy shrimp!"

Maluti watched the children more closely. Some of them were twisting their little bodies from side to side, making their feet disturb the stream bed. Their nets billowed out into the current as the water rushed through them. Others were choosing rocks from the stream bed, lifting them out, turning them over and gently washing off the tiny creatures underneath into their white containers. Some children were catching creatures in the shallow, fast running water; others were up to their waists in a deep pool swishing their nets alongside the riverbank vegetation. "They are disturbing my lunch!" said Maluti.

Then there was much shouting from the river bank and the children made their way out of the river. "Now they are counting up what they have found so that they can score the river," said Thabana Ntlenyana. "When you add the score up and divide by the number of groups that are found, it gives you a reading for the health of the river!" Suddenly a great cheer went up! They've found it is a healthy stream," laughed Thabana Ntlenyana.

"I wonder what the score is for this river?" asked Maluti. "I'm pretty sure it's 7.9!" said Thabana Ntlenyana looking around at the natural vegetation and unmodified stream. They've found it is in a natural condition. I am sure that's so unlike most of the streams that run through the town where they go to school!" said Maluti.

"Now that they've visited a healthy stream I really hope they will help tell others about it!" Shall we give them a reminder that they will never forget?" Asked Maluti hopefully. "Yes, let's do that," replied Ntlenyana. The two otters slipped quietly off their rock and into the little stream. They dived down underwater till they got to the deep pool where the children were sitting. Then ever so slowly they emerged at the surface of the water. Maluti had a nice fat crab in his paws and Thabana Ntlenyana had caught a bright silver fish. The two otters rolled over onto their backs to eat their meal. Thabana Ntlenyana crinkled her whiskers at Maluti as they both pretended not to see the children rush over to the river bank in astonishment and delight.

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- What disturbed the monitor lizard? What do you think he was doing at the river?
- What was causing so much excitement amongst the children?
- Why it was important to know what creatures were living in the river?
- Was the river healthy? Why do you say so?
- What was the name of the activity that the children were engaged in?

3.3.4. A Start-Up Story from Namibia

Adaptation to life in the desert

Thabana Ntlenyana and Maluti were hot, tired and thirsty! They were following a deep dry river gorge that wound its way up away from the Orange-Senqu river into the Namibian desert! The day temperatures in the desert can reach above 60 degrees and otters are not adapted for this kind of heat!



“How do the plants and animals survive here? It is so hot! How is it possible for anything to live?” panted Maluti. Thabana Ntlenyana and Maluti crawled into the deep shade of an overhanging rock. They were overjoyed to find a little pool of ground water. The huge rock had formed a barrier to deep underground water and it had pushed its way up to the surface.

“This is lucky for us!” said Thabana as they drank thirstily from the cool fresh water. “All the creatures that live here know where and how to find water and to survive the heat! When the temperatures are so high, evaporation rates increase and plants and animals risk becoming dehydrated through loss of water.”

“So what do they do to avoid that?” asked Maluti. “Each plant and animal is specially adapted to survive here,” said Thabana, “There are three things they all need to do to survive. They need to find water when it is available, they need to preserve the water they absorb or drink for as long as possible, and they need to avoid overheating!” “I wish I knew how to do that!” sighed Maluti. The huge bare sand dunes reflected the heat of the sun and even though he was in the shade of the big rock, Maluti was feeling very hot and thirsty again.

“One of the creatures that live here, between the savannah and the desert is the African Ground Squirrel. He makes his own sunshade!” said Thabana Ntlenyana. “His own sunshade?!” Maluti looked surprised, wondering

how any animal had the energy to make anything out here in the desert! Thabana laughed, "He has a big bushy tail which he holds up high towards the sun on hot days when the wind is not blowing. This means he can shade his little body from its scorching heat and so preserve water!"

"Wow, that's clever" said Maluti. He tried holding his tail up in the air but it was made for swimming and was so thick and muscular it just wouldn't lift at all! He nearly fell over. Oh gosh! "said Maluti, "all this effort is making me hotter not cooler! What else can I try?!"

"Antelope like the Oryx and Springbok have a special way of cooling the blood that circulates to their brain. This means that they can spend longer out in the sun. Their bodies can get several degrees hotter than body temperature, but their brain temperature keeps constant." said Thabana. "I'd need to be an antelope for that to work for me," sighed Maluti.

"Maybe we need to learn from the plants around here," smiled Thabana. She pointed at a strange plant growing in the sand dune on the opposite river bank. "That is called a Nara plant and it has very very long roots that go deep down to find moisture under the dunes. Other plants that live here, like lichens, come to life when the mists roll in and bring some moisture. Then become inactive again as the hot sun dries them out later in the day!"

"Oh dear, I don't think that would work for me either!" said Maluti. "What other different plants and animals can survive here?" he asked.

"Other species that are specially adapted to live here include the tattered looking *Welwitschia mirabilis* which is a plant with only two leaves! The most famous animals that live here are the 'desert elephants'. Other animals that have learnt how to live in this extreme climate include suricates (meerkats), the Cape and bat-eared fox, the short-eared elephant-shrew, striped tree squirrel and Grant's golden mole. The secretive brown hyena lives here but is seldom seen and can you believe that about 40% of Africa's cheetah population lives in arid areas like this!" Maluti shifted his weight nervously and started to look carefully at all the shadows under the rock ledge. "And"...Thabana continued, "This vast area supports the largest free-ranging population of black rhino on the continent!"

“I think it is time we started heading back to the Orange-Senqu River,” said Maluti suddenly. “In this heat!” smiled Thabana Ntlenyana. “Well now I’ve learned a bit about the ecology of this region, I think I can adapt to its conditions much better,” said Maluti. “Just like that?!” asked Thabana, “this is the oldest desert in the world! Plants and animals have taken millions of years to learn how to live here!” she said.

Suddenly the sun disappeared behind thick billowing storm clouds and large drops of rain started to beat down. “That’s amazing!” said Thabana Ntlenyana, “it never rains here for years and years!”

“That’s because they didn’t have me wishing and wishing that something would adapt so we could get back home safely!” cried Maluti happily. Come Thabana, look the flash flood has filled the river just enough to give us a ride back to the Orange-Senqu. Let’s go quickly while all the plants and animals are making the best of this unexpected gift from the sky!”

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- Describe some ways in which the animals in the desert are specially adapted to conserve water.

3.4.4. A Start-Up Story from South Africa

Ecology and the River

Thabana Ntlenyana, warrior of the Orange-Senqu river sat her nephew Maluti down on a large rock near a beautiful pool of water along the Orange-Senqu River. “I want to tell you all about ‘The Web of Life!’” she said. Did you know that all things are connected, just like the rivers, forests, oceans and the water cycle you have been learning about?” Whatever happens to the Earth happens to all the biodiversity on Earth, and that includes people! It is important to make sure that it is a safe and healthy place for all of us to live and bring our children into.”



“Tell me more about all the living things on Earth,” asked Maluti. Thabana Ntlenyana replied: “the study of the relationships between the living organisms and the non-living things in our environment is called ‘ecology’ which is taken from the Greek word ‘oikos’ meaning ‘our home’”.

“Although South Africa covers only 1 % of the Earth’s total land surface, it is home to about 10% of the world’s bird, fish and plant species and about 6% of the world’s reptile and mammal species!”

“Wow!” said Maluti. “Ecology studies the way all these species link with each other and are interdependent on all the non-living, physical things on Earth,” said Thabana Ntlenyana. “You mean like water and air, rocks and soil?” asked Maluti. “Yes, you’ve got it!” replied Thabana. We need to learn how to use all these resources wisely and conserve them so that they can support life for the future. This is called *sustainability*,” added Thabana Ntlenyana.

I’d like to study the ecology of this pool right here! said Maluti. He started jumping up and down with excitement and nearly fell in the river. “Let’s get started then,” Thabana said smiling at her nephew’s eagerness.

We call the ecology of an area an eco-system and we study it by looking at all the plants, the animals and all the non-living things as well as the interactions between them. The living parts of the eco-system are called ‘biotic’ and the non-living ‘abiotic’. The living parts rely on the sun’s energy

to survive. These living organisms need energy to live, grow, breathe and reproduce. 'What about living things that have died, like leaves and branches that have fallen?' asked Maluti? "These are also called 'biotic'" said Thabana Ntlenyana.

"Then the 'abiotic' parts are the sun, water soil and air?" asked Maluti. "Right!" said Thabana, "ecologists study the flow of energy, food and other nutrients through an eco-system. All growing things, like plants and animals, need energy. Plants absorb this from the sun by making glucose and starch from carbon dioxide and water. Plants can produce proteins which animals need to grow. They are called 'producers'.

"What are animals called?" asked Maluti. Animals eat plants or other animals and so they are called 'consumers', said Thabana Ntlenyana. Plants and animals that die, rot (decompose) and provide the soil with nutrients which plants take into their roots." "Ah, now I can get the idea of how linked everything is in nature", said Maluti, "I can see how everything works together.

"Well done, Maluti" you are going to be a star ecology researcher one day!" The stages that energy goes through as food is called a food chain, and the interconnections between the plants and animals in an eco-system is called a food-web! "I'd love to learn more about that!" said Maluti. Mmm Yes, said Thabana Ntlenyana, "but all this talk of food has made me hungry!" "So we form part of the food web too!" said Maluti excitedly.

Thabana Ntlenyana smiled, "Shhhh Maluti, let's go do some studies under the water" she said, and with that the two otters slipped quietly into the resource rich pool along the Orange-Senqu river to catch fish for their dinner.

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- Write a story about the ecology of a river near you. Describe some of the local plants and animals that live there. What do they feed on?

3.5.4. A Start-Up Story from Namibia

The Orange River Mouth

After their journey down the longest river in Southern Africa, all the way from the highlands of Lesotho and exploring the main stem and tributaries of the Orange-Senqu river, Thabana Ntlenyana and Maluti were so excited to finally reach the Orange River Mouth!

The great expanse of water was alive with bird life! Beautiful pink flamingos sieved the water for krill with their specially adapted beaks. Cormorant perched high in trees along the river bank, were waiting to dive in to catch an unsuspecting fish. Shelduck bobbed up and down on the surface of the water, disappearing every now and then to look for fish. A great flock of large white birds flew overhead. Maluti had never seen such giant beaks before! Thabana Ntlenyana said, "Those are Great White Pelican!"



There was a faint taste of sea spray in the air and the water in the estuary tasted salty. "Doesn't the water flow out the mouth anymore?" Maluti asked. Thabana answered, "Before the dams were built the river would pulse with the tides and the highs and lows of flooding and drought. Now mostly the river mouth stays closed to the sea and the river doesn't act much like an estuary anymore. If they build any more dams, the river may dry up altogether in times of low flow. They say that if they build another dam and let enough water through to open the mouth from time to time then the salt marsh will recover again!" "Oh, I do hope things improve" said Maluti, "what would happen to all this wonderful wildlife if it didn't!"

"The people are already concerned Maluti, that's why this has been declared a special Ramsar Site, that gives it special international protection. But there is a question over its status at the moment because it is not as healthy as it should be. There is a special commission called ORASECOM and their task is to ensure that everyone in the four countries works together to make sure that the basin and river mouth is restored and remains healthy for future generations."

"That's a good thing" said Maluti. Suddenly he caught sight of white breakers and whirling sea gulls! Now everything tasted of sea salt! The two otters made their way over the vast open stretch of salt marsh towards the sea. "This

marsh used to be full of life,” said Thabana. “My grandfather used to tell us stories about this special place between river and sea! It’s so sad that it cannot support so many species anymore,” Thabana added. “Why is that?” asked Maluti.

“Many reasons”, sighed Thabana. “Aside from the impact of the dams, the people have been mining for diamonds for a long time right next door to this beautiful place and that has really hurt it and its wildlife. Then there is runoff from the agricultural lands that people grow as well as dirty water from the factories and waste water works...” said Thabana Ntlenyana. Our job now, Maluti, is to teach the children about all the things we’ve learnt on this trip down the river and hope that they will learn to love the river and help take care of the Orange-Senqu basin.”

“I can’t wait!” said Maluti as they neared the breakers. Maluti was fascinated with everything he saw! This was the first time he had been to the sea! In the distance there were some people holding long sticks and standing very very still for a long time, just like the heron he had seen in the wetland. “What a strange sight! What are they doing?!” asked Maluti. Thabana laughed! “They are catching fish from the sea, Maluti!” They have long lines at the end of their sticks, with food for the fish – they call it bait, on the end of a hook!”

Maluti looked carefully at the people on the beach. “It’s no wonder they need sticks to catch fish!” he said, “they don’t look especially well adapted for catching fish at all! “Come Thabana! Let’s show them how it’s done!”

Thabana Ntlenyana and Maluti slipped into the sea surf and started to dip and dive amongst the waves chasing the shoals of shining fish. The muddy brown waters of the Orange-Senqu river streamed into the sea just to the side of where they were swimming, carrying with it everything it had collected on its long journey to the sea.

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- What is the place where the river meets the sea called?
- Why do you think this is such a special place for bird life?
- Why did the water taste salty to Maluti?
- What problem did the dams upstream on the Orange-Senqu River cause for the estuary?
- What is the name of the special international status that the Orange River Mouth has been given?
- What is ORASECOM's task in helping to take care of the Orange River Mouth?
- What is the name given to a wetland where it meets the sea?
- What are some of the things that have impacted on the ability of this area to function properly?
- What are some of the things that you can do to help the Orange River Mouth?

4.1.4. A Start-Up Story from South Africa

Fishing Livelihoods

Now that Thabana Ntlenyana and Maluti had found out all about the biodiversity and ecology of the Orange-Senqu River, they were very interested to know more about some of the ways people in the basin made a living.

“I love fishing!” said Maluti and I can see that many people here do too! Please tell me more about fishing in the Orange-Senqu river,” asked Maluti.



“There are two types of fishing that people practise here. One is called artisanal fishing where some of the catch is sold or made into products for sale, and the other is subsistence fishing, where the catch is used to feed the family.” said Thabana Ntlenyana.

“There must be a lot of different fish in the Orange River if people can catch enough to sell!” said Maluti. “Actually there are not a lot of different fish in the Orange River at all! said Thabana. “There are only fifteen different types of indigenous fish that have been found, with yellowfish being the most common!”

“What about those delicious rainbow coloured trout we find in the mountain streams of Lesotho?” asked Maluti. “Are they counted in?” “No,” said Thabana, “the Rainbow and Brown trout, Common carp, Largemouth bass and Bluegill sunfish are all exotic species!” “What does that mean?” asked Maluti. “It means that they were introduced into the Orange-Senqu river from another country far away from here!”

“Is that a good thing?” asked Maluti. “At first people thought it was a good thing, because lots of trout meant that fisherman could pay money to catch them, and that was good for tourism. But soon conservation officers

saw that the exotic fish were out-competing the local indigenous fish species for food! Some, like the bass, even eat all the local fish in the river!" "Gosh, that's a problem, I'm quite scared of the large mouthed bass myself, it always looks like it wants to eat me too!"

So what have people decided to do? said Maluti. "They've stopped introducing any more exotic species into the rivers now," said Thabana. "In some areas like near the Naute Dam in Keetmanshoop, Namibia, people are breeding fish in ponds. It's called **aquaculture**. This means that the fish don't get into the rivers and people can earn money after growing the fish to a suitable size to sell."

"Do you think we could visit that fish farm some time? Just imagine swimming through a pond with hundreds of fish that can't get away!" said Maluti, he was feeling hungry again.

Thabana Ntlenyana smiled at her eager little nephew. "Why don't you go see how many types of fish you can find in the river today, Maluti!" "Maybe there will be a nice big yellowfish for dinner!"

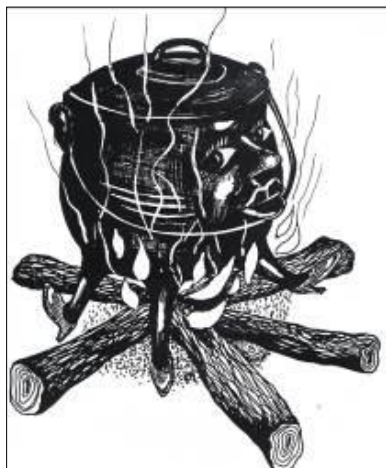
Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- ♦ *What is the name for the livelihood where people catch fish and sell some of them?*
- ♦ *How many different kinds of indigenous fish are found in the Orange-Sengqu River?*
- ♦ *Can you name some alien invasive fish species that are found in the Orange-Sengqu River? Why are they a problem?*

4.2.4. A Start-Up Story from Namibia

The Voice of a Pot



I'm a pot. You've seen me, or my brothers, sisters, parents or cousins, all over this country of ours. Wherever there are people, there are pots.

We pots are useful things. Can you imagine cooking without us? For almost as long as people have

used fires they have used containers to cook in. Meat and some veggies are fine on the coals, but if you want a really tasty stew or porridge... mmmmmh, I can see your mouth watering already!



I was thinking the other day about all the things that are cooked in me. What? You didn't know pots were aware of what goes on inside them? Well, we can teach you humans a thing or two. Not only do I know what I cook, but the foods that I'm cooking tell me stories of the places they come from, their way of life, how people use them... oh yes, there's a lot you can learn from a pot.

For instance, in my youth, I met many interesting foodstuffs... wild fruit and vegetables, tubers and roots, game meat and fish - you would hardly believe the number of different foods that I cooked. But times have changed, and now I cook mostly maize meal or mahangu porridge, usually three times a day. I sometimes wonder if such an unvaried diet is good for my owners, and wonder why they have abandoned the veld foods that served them well for so long. I know I no longer have as many vitamins to talk to, as I used to. Still, all these different foods - yesterday's and today's - have one thing in common ... they come from the Namibian environment and are dependent on our sunshine and rain, our soils and our groundwater.

I sometimes hear horrible stories about damage and abuse of these resources, but I hope that the people who use me know the importance of using the resources in a way that will not do lasting harm to them.

And that's another thing! I'm not only aware of what goes on inside of me, but also underneath me. Some of you people are really wasteful when it comes to fires. It pains me to see all the heat from the piles of wood you burn escaping and disappearing without doing its work.

There are ways of using less fuel, and ways of cooking effectively... there's not much point in sacrificing a tree if you're going to waste all its wood.

Dry wood is better for cooking than wet wood is, and if you split up large logs, they'll give you fast, intense heat in a lot quicker time.

Using me on a stove, especially a fuel efficient one, can save up to two thirds of the wood you would otherwise use. And for goodness sake, keep my lid on! Do you realise just how much of my heat you are letting escape by making me sit around without my hat?

Ah well, I suppose you'll learn. And now, excuse me. I'm off to cook lunch and shall be far too busy to talk.

Keep well, eat well, and don't forget your message from the pot.

Adapted from the book, My Land My Life published by Enviroteach, DRFN

Use these questions to help your learners understand the story in its local setting.

- What is the main difference that the pot noted between meals today and meals in the past?
- What did the meals from today and the past have in common?
- What are some of the things that are worrying to the pot?
- What advice does the pot give us?

4.3.4. A Start-Up Story from Lesotho

Molikeng's Legacy

Maseredse Musi, now 84 years old, grew up in a town called Morija near Maseru. Like her mother she became a teacher. When she married Molikeng Fanuel Musi, a motor vehicle mechanic, they moved to his place of birth – a Basotho custom – where the couple created something exceptional.

The chief of Molikeng's hamlet had granted them three fields, the largest of them was two hectares. One night in January 1986 this field was devastated by a storm. "On the following morning, my husband could not even walk on his land," the old woman said.



Torrential downpours of rain had ripped the field to pieces and it was riddled with dongas each several metres deep. Making matters worse, water was still running in the dongas and carrying away yet more soil.

"My husband got angry," Maseredse says. "He did not want strangers further down the Senqu to benefit from his topsoil."

At a village assembly, Musi tried to persuade other farmers to unite in fighting the erosion and loss of land, and to rebuild the fields. "But they just laughed". "Musi," they said. "You will be wasting your time."

To try make a difference, Molikeng Musi received the chief's permission to give nature a helping hand. He carried rocks, first on his back, then by wheelbarrow, and finally by tractor and trailer. With his neighbours watching, he built stone barriers in the dongas so as to stop erosion. Within a short period, fertile topsoil began collecting.

"Our neighbours up the hill didn't realise they were giving us their soil. Before long, we were able to plant grapes, apple and peach trees, maize, wheat, beans and tomatoes."

Molikeng Musi worked for 11 years, with his wife and growing children doing what they could to help. Their neighbours envied the project's success but still refused to copy him.

When Musi died in 1997, his legacy was a green paradise of fruit trees and vegetable patches which are now the responsibility of his son Albert.

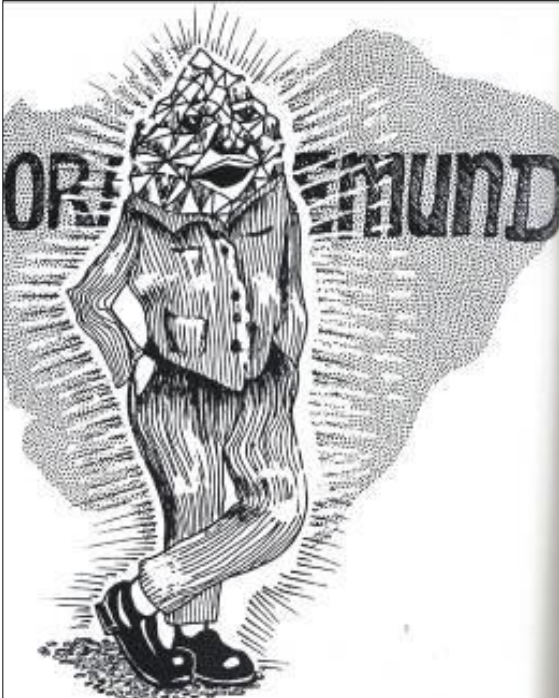
Maseredse Musi now lives in retirement in her comfortable home. A trained fitter, her second eldest son has installed a pipe from a nearby spring to provide running water. Though old, this energetic woman is always busy with something. When the weather is dry she tends the flower garden and her husband's grave under the fruit trees. When it rains she makes peach preserves. She also weaves baskets using grass, reeds, and maize leaves.

Use these questions to help your learners understand the story in its local setting.

- What happened to Molikeng's field?
- What did he decide to do?
- What did his neighbours say about this work?
- How long did it take for Molikeng to rehabilitate his field?
- Is his field still productive today? How do you know this?
- How has the field contributed to Maseredse's retirement?
- What does Maseredse like to do to keep herself busy?

4.4.4. A Start up Story from Namibia

A Sparkling Conversation



I'm a diamond – a symbol of strength and purity – and I come from Oranjemund, at the mouth of the Orange River.

How did I get there? You may well ask. I was born millions of years ago in a volcanic pipe, not far from the source of the Orange River.



Over centuries and centuries, the volcanic pipe that was my home was gradually worn away by the wind and rain, until finally I was freed from the rock that had held me for so long.

I was washed into the river, and from there, tumbling and turning, I made my way downstream to where the Orange-Senqu River meets the Atlantic Ocean. Here the cold Benguela current waited for me.

We diamonds from Oranjemund are usually of a very high quality. Our friends or relatives with cracks or flaws mostly broke on their way here, due to the rough and bumpy trip down the river. That's why we fetch such high prices on the international diamond market.

We live on a terrace that once used to be a beach but is now above sea level. My home is a pothole on the surface of this ancient beach that has now solidified. I live under a meter or so of thick, wet sand, but this layer is now being removed by miners in search of diamonds to sell. I'm an important economic resource for Namibia, and the area where I live is the base of a large and profitable mining company that provides jobs for thousands of people and provides the Namibian government with a lot of money in taxes.

I'm made of carbon. That's right, the same substance that makes up the charcoal you use for your braai. But unlike charcoal, I was formed under very high pressure, deep within the Earth's crust, millions of years ago.

I'm the hardest mineral known to people, so hard, in fact, that I have many important industrial uses, as well as being a precious jewel. Think of that next time you see a diamond sparkling on someone's finger or glittering in the window of a jewelry store.

Another thing you should remember about us diamonds is that we are a non-renewable resource. This means that once you've found the lot of us, that's it! There are a finite number of diamonds in the world and once we're used up, we're gone forever. "Diamonds are forever", the old song goes... well it's true that not much can break us, but we certainly aren't as numberless as the stars. You had better treat us with caution and respect, as we won't always be around to contribute to your national economy.

The trick is to use the money you gain from us wisely, to build up your country so it is in a better position to face the future. Being as old as I am, I've had time to think deeply about many of these things. When they finally uncover me and ship me off for sale to a distant continent, my only wish is that the money that I earn contributes to a better way of life for all, both now and in the years to come."

Adapted from the book, My Land My Life published by Enviroteach, DRFN

Use these questions to help your learners understand the story in its local setting.

- ♦ What wore away the volcanic pipe in which the diamond was trapped?
- ♦ What is the name of the Ocean into which the River carrying the diamond flowed?
- ♦ Which current caught the diamond as it made its way into the sea?
- ♦ Where does the diamond live now?
- ♦ What is a diamond made of?
- ♦ Why are the diamonds from Oranjemund of such high quality?
- ♦ What is special about the properties of a diamond?
- ♦ What are some of the things diamonds are used for?
- ♦ Is a diamond a renewable or non-renewable resource?
- ♦ What does this mean?
- ♦ Do diamond mines have an impact on the environment and water resources?
- ♦ In what ways do they have an impact?
- ♦ Can you think of some ways diamond mines can lessen the impact that they have on the environment and water resources of an area being mined?

4.5.4. A Start-Up Story from Namibia

Flooded by the Hardap Dam!

Mariental is home to 15 000 people. It has petrol stations, supermarkets and workshops that repair equipment for the farmers.

It is in this town where you also find a beautiful church, built with red bricks in 1898.



Mr Barry Husselmann is one of the people who live in Mariental. He has a company specializing in irrigation systems. As a volunteer he also helps the water supplier, NamWater, to look after the Hardap Dam.

The dam has a 862-metre-long wall and it can hold 300 billion litres of water. The dam was completed in 1963 and is 15 kilometres north of Mariental.

The dam blocks the Fish River, and in the rainy seasons, it gives Barry a headache. “For days, it has been raining like crazy.” says Barry as he drives in his truck packed with tools, pumps and pipes. On this particular day, he is giving Mr Thomas Kruchem a tour around Mariental.

Barry stops on a hill several hundred meters below the dam wall. When there is too much water in the dam, the dam will not be able to hold it, so the flood gates need to be opened to let some water out.

Barry looks on as the four floodgates release 600 kilolitres of water per second, a relatively small volume.

“By tonight we need to increase the rate of flow to at least 700 kilolitres. We had 30 millimetres of rain last night and at the moment there are 1 400 kilolitres flowing into the dam every second. The forecast says there’ll be further heavy rains tonight.”

Mariental had a major flood in February 2006. Barry remembers it very well. "The dam was quite full. Then came heavy rainfall, and we had to release 2 400 kilolitres of water per second. The whole town was flooded - I had to visit the Spar supermarket by boat" says Barry.

In the three days that the rain kept pouring down, NamWater recorded that, about 500 million m³/s was released from the dam.

On a happier note, the dam provides purified water to Mariental town and it makes irrigation possible. More than 2 200 hectares of crops are under irrigation. These include maize, wheat, lucerne, watermelons and also grapes for export.

*Adapted from the book, Orange-Sengou: Artery of Life by Thomas Kruchem.
Photograph, DRFN*

Use these questions to help your learners understand the story in its local setting.

- Describe the town of Mariental.
- How big is the Hardap dam?
- On which river is it situated?
- What is happening on the day that Mr Kruchem visits Mariental?
- What happened in 2006 to the town of Mariental?
- What kind of damage do you think was done?
- What are some of the positive benefits of the Hardap dam?

5.1.4a A Start up Story from Lesotho

The miracle of trees

Lately, something happened to me which made me appreciate the elderly people around us as a very important source of knowledge. I will tell you the story.

I live in an informal settlement in Maseru. Some weeks ago, one of my younger brothers fell sick. He had a fever and you know that when you have a fever, you should drink a lot of water.



Though I had already collected water in the morning, my mother told me to go down to the stream once again in the afternoon. We had to ensure that my brother would have enough water to drink during the night.

I didn't mind walking that extra trip since I wanted my brother to get better as quickly as possible. My only fear was that I would find the water in the stream too dirty since it was already late in the afternoon.

Unfortunately I was right; the water was extremely muddy and dirty! I sat down in despair, wondering what to do. There was no way my brother could drink that water!

Suddenly I saw an old lady coming towards me. I had never seen her face before but I soon remembered that my friend, Makatleho, had told me something earlier that day about her mother having a visitor from Sudan.

The lady came up to me. Seeing my disappointed face she asked, "my dear, you look miserable, what is wrong?" I told her about my brother being ill and then pointed at the dirty water in the stream. She looked at me and said, "Don't worry, my daughter, I will help you out."

I waited suspiciously – what did she have in mind? As far as I could see she didn't carry any water so I knew she wouldn't give me any pure water to take home to my brother.

While putting down the big bag she was carrying, she asked me "Have you ever heard about Moringa?" I had not, so I said "no, who is Moringa?" The lady laughed, "Moringa is a tree, some people call it a miracle tree because it has so many uses. The leaves are very nutritious and it can cure a number of diseases."

She took something out of her pocket and showed me, "These are seeds of a Moringa tree. The seeds have been used traditionally to purify water for many, many years. In Sudan, where I come from, we use it to purify the water we draw from the River Nile and that water can sometimes be five times as dirty as the one here in your stream!"

I looked at her curiously while she continued, "You first remove the outer part of the seed, like this, and then you grind the inner part. After grinding, you put the white powder into your dirty water. You then stir for about 20 minutes and after that, you do nothing but wait."

She took a small bowl from her bag and told me to fetch some of the dirty water from the stream. We followed her instructions.

After waiting for some thirty minutes something started to happen in the bowl! I could not believe my eyes! All the dirt started to settle at the bottom of the bowl, leaving much clearer water on top. I was impressed!

At the same time, it reminded me of what I had learnt in school about the big water treatment plants. I recalled that in the treatment process, vast amounts of chemicals are often used in order to achieve the same type of sedimentation.

The lady told me that scientists are currently carrying out experiments to find out more about Moringa.

She said that in some African countries, Moringa powder has been used as a natural alternative to the chemicals used in large-scale treatment plants.

Before she left, she gave me a small bag of Moringa seeds. When I got home I repeated the procedure before my family. Obviously, they were as impressed as I had been.

However, what I didn't tell them was that I kept a few of the seeds for myself. Before going to bed that night I sneaked out and planted the remaining seeds a few metres from our house.

Please don't tell anyone, I want it to be a surprise. Hopefully these trees will grow big and produce a lot of seeds. I can only imagine how happy my parents will be when they realise that we can use our own Moringa seeds to purify our water, every day.

Use these questions to help your learners understand the story in its local setting.

- Why do you think that the water was muddy and dirty in the late afternoon?
- What did the visitor from Sudan say could help with the problem of dirty water?
- What part of the tree has been traditionally used to purify water?
- How do you go about purifying water in this way?
- What happened to the dirty water in the bowl after thirty minutes?
- What did the process of 'sedimentation' remind the little girl about?
- What was usually used in this process at water treatment plants?
- Do you think that this traditional knowledge was useful for the village people to know? Why do you say so?

5.1.4b A Start up Story from South Africa

Millie Senti and her hope for clean water

I'm looking at small, cement and brick houses and corrugated iron shacks surrounded by dry grasslands. I see women huddled among the buildings, selling chewing gum, soap and tomatoes. They are using open fires to cook Morongo, a stew of maize, spinach and chicken legs.

There are car wrecks, piles of planks and a young skinny woman on a mat, holding a glass of water from which she takes occasional sips. There is no protection from the midday sun.

"You want to hear about the water problems on the Orange Farm?" I am asked by an old woman wearing an orange and red-striped T-shirt, as she shakes my hand. "Then you are at the right place. My name is Millie Senti and many days I cannot even wash the three grandchildren I look after.

Do you see the public tap on the concrete platform over there? Every day we wait in a queue. But often the water is switched off – those in charge usually say it is a burst pipe. Then at ten at night I'm woken up by the sound of running water. I get dressed and join the queue again.

A few others are smarter. They have taps in their house – illegally of course."

Orange Farm, part of greater Johannesburg, is 40 kilometres south of its centre. Since 1977 it had an official status as a "formal" township, but it is still a collection of shacks with potholed paths and litter covering any open spaces. Rubbish removal is not regular and about half of the adults are unemployed.

"The tap water is often cloudy," says Millie. "But because electricity and coal are expensive, most people do not boil it. We stir two tablespoons of bleach into a bucket of water and leave it to react overnight."

The old woman lifts the cloth covering the entrance to her shack. She and her three grandchildren live in an area 15 square metres with no windows. They have a dresser, a refrigerator that has no power connection and a single bed hidden behind a cardboard wall. The shack walls are so hot one cannot touch them.

Then Millie points at a tiny outhouse surrounded by flies and giving off an almost horrible smell. "We normally use this pit latrine, but at the moment I have no money to have it emptied. So we use a bucket, and every morning I tip it into the compost heap over there. I use compost to fertilise my cabbage and carrot beds.

Adapted from the book, *Orange-Sengu: Artery of Life* by Thomas Kruchem.

Use these questions to help your learners understand the story in its local setting.

- ◆ Near what big city does Millie Senti live?
- ◆ What kind of housing settlement does Millie and her grandchildren live in?
- ◆ What kind of water supply does the settlement have?
- ◆ What problem does Millie have with the water supply?
- ◆ What does Millie have to do in order to ensure that the water is safe for drinking?
- ◆ Do you think life is easy for Millie? Why do you say this?
- ◆ What are some of the problems that she experiences each day?
- ◆ Do you think that the Gold Mining Company next door helped Millie and the people in the settlement improve their way of life? Why do you say so?

5.2.4. A Start up Story from South Africa

U...tro..fi..k...shin!

Thabana Ntlenyana, River Warrior, and her nephew Maluti were sitting near a small vleï on the outskirts of Oranjemund, near the mouth of the Orange River.

“Why is the water lime green?!” asked Maluti, “this vleï looks very sick to me!” Thabana Ntlenyana nodded. Her nose wrinkled and whiskers twitched with a worried expression.



“In many rivers, dams and aquifers of the Orange-Senqu River basin, there are increasing amounts of nutrients like nitrates and phosphates that causes the excess growth of plants.” said Thabana Ntlenyana. “It is called eutrophication!”

“That’s a big word!” said Maluti, “what causes U..tro...fi....” Maluti couldn’t pronounce it at all “...k...shin”, he finished out of breath. “Well extra nutrients wash into rivers mostly from the land where people have over fertilized their agricultural crops and from human settlements when the sewerage gets into the river”

“You haven’t yet seen the Vaal River basin where there are many industries, agricultural lands, mines and human settlements. Huge amounts of extra nutrients run into the rivers and even whole dams turn bright green! Here in the lower Orange-Senqu it often happens that there are bright green algal blooms. It is very dangerous, you know,” said Thabana sadly. The green colour comes from a tiny plant called a *Cyanobacteria* or blue-green algae, which is poisonous to animals and man if he drinks the water.” “You mean they could die?” asked Maluti. “Yes, they can die very quickly” sighed Thabana Ntlenyana.

"Where do phosphates come from?" asked Maluti. "Phosphates are used by people to preserve food like meat and are also found in detergents! Other countries have realised that they are a threat to water supplies and have banned them." said Thabana Ntlenyana.

"But even so, the excreta of animals and people contain phosphates" said Thabana Ntlenyana. "So when water treatment plants don't work properly and organic waste gets into the waterbodies, it is a very serious matter, she continued.

Maluti watched some children playing in the green slimy water. "The people don't seem worried about it," said Maluti. "Couldn't those children get very sick?" "Yes," said Thabana Ntlenyana, "many people don't worry because they don't know how dangerous the water is, they don't realise that the pollution from fertilizers and their waste can make their children very sick and even kill them!" "Not just the children," said Maluti, watching an old Gogo fetching water from the stagnant pool, "I think it can make everyone that drinks it very sick".

"There are thousands of cattle in the Orange-Senqu basin that are also at risk of dying from drinking water when it looks like that!" exclaimed Thabana Ntlenyana. "Water high in nitrites can be deadly to cattle drinking the water. Bacteria from their digestive process convert nitrite to nitrate which lowers their blood's ability to absorb oxygen. The cows suffocate from inside!"

"That's so strange!" said Maluti, puzzled. "Many cattle have died in South Africa, Namibia and Botswana." "None in Lesotho?" asked Maluti. "The water is cleaner there" explained Thabana Ntlenyana.

"Nitrite poisoning can also poison babies" It is called "methemoglobinemia" said Thabana, "or blue baby syndrome".

"I'm not going to try and pronounce that word!" said Maluti. "We must tell the children at our next school visit about how deadly this pollution can be in rivers and dams" said Maluti. "I am sure they will tell their parents too!"

"I hope so," said Thabana Ntlenyana. "That way people will clean up the land and there will be healthy rivers, healthy animals and healthy people again!"

Adapted from the Orange-Senqu River Awareness Kit

Use these questions to help your learners understand the story in its local setting.

- ♦ What causes eutrophication?
- ♦ What is it caused by?
- ♦ Why is it dangerous to drink water that contains cyanobacteria?
- ♦ What are some of the things that we must do to prevent pollution of rivers and water sources?

5.3.4. A Start up Story from Botswana

Roseo Cactus

Thabana Ntlenyana, River Warrior and her nephew Maluti had travelled to the far north to Botswana. It had been a long, hot, dry journey full of danger for the two little otters.

Suddenly Maluti cried out in pain. Thabana Ntlenyana rushed to his side. Maluti had stood on a very thorny piece of cactus. He tried to lift his tiny little paw to shake off the thorny plant but it was too painful to move.



“Oh Maluti!” cried Thabana, “let me help you!” Thabana Ntlenyana gently pulled the thorn out of Maluti’s paw. He was very brave and didn’t cry out again. “This is a horrible alien invader!” said Thabana Ntlenyana. “An ALIEN INVADER?” Maluti’s voice quivered. “Is it from another planet? Can it come alive and chase me?”

Thabana Ntlenyana laughed. “No Maluti it not from another planet, but it is from another country, that’s why it is called an ‘alien’. It is an ‘invader’ because it takes over the land where the natural vegetation grows and spreads so quickly that the indigenous plants aren’t able to come back into that area!”

“It’s no wonder it spreads all over, if bits like that break off and get stuck in animals paws!” Maluti pointed at the piece of cactus that had been stuck on his foot.

“That is called Cactus Rosea,” said Thabana Ntlenyana, “it originally comes from Mexico.” “Mexico!” cried Maluti, “then how did it get here!”

Thabana Ntlenyana sighed, “well people brought it to plant in their rockeries when they came to stay in these parts. Some people liked to collect

different plants from all over the world. I don't think they realised that the plants would spread and turn into alien invaders in this country!" explained Thabana Ntlenyana.

Other alien invasive plants came over on ships with fodder for animals, some were introduced as beneficial pasture crops and some for hedges for cattle kraals. Many trees were introduced for shade for homesteads and also for timber because there were no suitable trees for poles or planks growing naturally in these parts of southern Africa."

"Come down to that little pool in the river bed so we can bathe your foot" said Thabana Ntlenyana. We still have a long way to go."

"In the Orange-Senqu basin alien invasive plants grow mainly along or in the rivers where they take up a lot of water that should be available for indigenous plants and to keep the river flowing. Only a few species, like this cactus can survive away from the rivers in this harsh climate" Thabana Ntlenyana told Maluti.

So what can farmers and conservation managers do to get rid of it?" asked Maluti. "It must be very difficult to get rid of it cause it's so very thorny!" he said. "You cannot dig this plant," said Thabana, "All the chopped bits would just start growing all over again!"

"There are three ways of eradicating alien invasive plants, by chopping them out (mechanical), by spraying them with herbicide (chemical) and by introducing insects that damage their growth and reproduction (bio-control)" said Thabana Ntlenyana.

"Herbicides?! Aren't they poisonous too!" asked Maluti. "Yes, they can be poisonous if people come into contact with them, or when not applied properly" said Thabana, "the person applying the herbicide must be well trained!"

"Well I do hope some well-trained teams will come and clear these prickly aliens!" said Maluti. Maluti held his aching paw under the cool water of the little pool to relieve the pain. "Roseo Cacti like to grow here because they

like the desert where it almost never rains. How lucky that the area has had some rain recently and there is a pool of clean water for you to soothe your paw and for us to drink.” smiled Thabana Ntlenyana.

Pandora Schep (2015)

Use these questions to help your learners understand the story in its local setting.

- What are alien invasive species?
- How did they get to be growing in southern Africa?
- Why are they a problem for indigenous species?
- What other problems do they create?
- Can you name an alien invasive species that is found in your area?
- How are alien invasive species controlled?

5.4.4. A Start up Story from Botswana

Catchments and Animals

Thabana Ntlenyana and Maluti were resting under a large Quiver tree after their long journey through the Orange-Senqu basin.

“Do you know that the San people used to make their arrows from the stem of this tree?” asked Thabana Ntlenyana. “That’s why it’s called a ‘quiver’ tree. Arrows ‘quiver’ in the air as they race to hit the animal that is being hunted” she explained.



“What animals did they hunt?” asked Maluti. “I can’t see any animals around here, it’s just wide open sandy plains and desert in the far distance, not even a tree for a bird to rest on!” “All the African wildlife used to live here in great numbers!” replied Thabana, “but the changes that man brought along with his gun means they are gone forever.” said Thabana Ntlenyana. “It can’t be forever!” said Maluti. “Do the children know what a paradise these lands were in the past?”

Thabana Ntlenyana shook her head. “Grannies and Granpas have stopped telling children stories about the land because life is hard and everyone has to work at earning a living. No one has time. Moms and Dads are also too busy to tell their children what it was like when they were little. The children themselves have often got so much homework to do!”

“Besides,” said Maluti, “the children don’t play outside as they used to, so they don’t learn first-hand about how important river catchments are!” he added.

“Catchments are not just important because they absorb rain water and filter it into the river for us. They are important because they provide all of our basic needs for water, food and shelter” said Thabana Ntlenyana.

“That’s right” replied Maluti. “We need to remind children that they are part of nature too and help them develop a healthy ‘sense of belonging’ to this beautiful Orange-Senqu Basin where we all live.

“You are right” said Thabana Ntlenyana, “with a good ‘sense of place and healthy ‘sense of belonging” we can all start to work together towards a new way of seeing ourselves as an interconnected part of nature. We can start on another exciting journey to find new ways of living as sustainable communities. We can learn how to share resources fairly amongst people, plants and animals, and be part of a beautiful biodiverse world that takes good care of our land and water resources. In this way there will always be resources for all the generations to come.”

Pandora Schep 2015

Use these questions to help your learners understand the story in its local setting.

- What was the name of the tree that Thabana Ntlenyana and Maluti were sitting under? Why was it called by this name?
- What happened to all the animals that used to roam the areas in the Orange-Senqu basin?
- Do the children know what life was like back then? If not, why is this?
- Why is it important for children to play outdoors?
- Why are catchments important?
- What is needed for people to work together to ensure a future in which generations to come will also benefit from the beauty and natural resources of the Orange-Senqu Basin?

5.5.4. A Start up Story from Lesotho

A Resilient Future for All

Thabana Ntlenyana, River Warrior of the Orange-Senqu Basin and her nephew, Maluti, were back home in the mountains of Lesotho. What an amazing journey they had undertaken.

“Are you glad to be home,” Thabana Ntlenyana asked Maluti. The little otter lay stretched out on the soft green grass of the hillside, soaking up the warmth of the late afternoon sun. “I miss all the children,” he said softly. “It was so much fun learning real stuff about monitoring and managing rivers and river basins that I forgot that it was supposed to be ‘school work’,” said Maluti.



Thabana Ntlenyana laughed, “Well just because we are home, doesn’t mean we have to stop learning! The world is changing so fast and we have to learn new ways of working together so that we can change with it! You don’t have to wait till you are big to be a citizen scientist! “I want to help children to connect to nature, Thabana,” said Maluti. “That way they can learn that they are part of nature and its cycles. I want to teach them more about the plants, trees and animals that live in the Orange-Senqu basin. Oh if only all children could know about the little creatures that help clean and heal our rivers!”

Thabana smiled, “Wasn’t the journey wonderful. The best part is knowing that the relationships we built with the children in the basin will be the foundation stone of taking much better care of the Earth.” said Thabana Ntlenyana. “A new way of learning to live sustainably, making sure that there are resources for the generations to come. Creating a new future together and building resilience so that we can adapt to a changing world.”

“What’s resilience, Thabana?” asked Maluti.

Thabana Ntlenyana looked at her nephew fondly. “Resilience is being able to withstand a sudden shock and making the changes needed to carry on with life.”

Maluti said thoughtfully, “you mean like the Orange-Senqu river withstanding the sudden shock of all the impacts that happen in the basin?” “Yes” smiled Thabana Ntlenyana, “it is like that”

“So the river is resilient when it has all those little water creatures helping to keep it clean? Maluti asked. Thabana Ntlenyana added, “and healthy river banks with indigenous vegetation and an annual cycle of flooding and low water, these are the things that keep rivers resilient,” said Thabana Ntlenyana.

“Then a resilient river would be full of fish?” Maluti was feeling hungry again. “I can see where this is leading too!” smiled Thabana Ntlenyana, “come on Maluti let’s go catch the biggest yellow fish you can hold in your paws for lunch! Then we can plan our next journey and what we are going to teach children about working together for a sustainable future!”

Pandora Schep 2015

Use these questions to help your learners understand the story in its local setting.

- What do you think a citizen scientist does?
- What does it mean to live sustainably?
- Explain what helps keep rivers resilient.
- If you had to teach others to take good care of the Orange-Senqu River basin so that there was enough for everyone currently living and also for future generations to come, what would you say and what would you do to get them to work in peace and harmony together towards this goal?

5.5.8. A Closing Story from Lesotho

A Last Word from Thabana Ntlenyana and Maluti

This has been the most exciting journey of our lives and it has been wonderful to share it with all the wonderful teachers, boys and girls in the Orange-Senqu Basin!

Maluti and I are sad to take our leave and go back to our home high in the mountains of Lesotho. I hope you will remember all the friends that we've met and the amazing things that we've discovered together along the way!

I hope that like Tamani, from the Kalahari, you will be the local water hero at your school! I hope that Felling and his father have inspired you to 'harvest' rain water and that by doing so you will have access to clean water to drink.

I hope that you will help heal erosion and conserve the soil near your school, growing lots of healthy vegetables like Musi and his wife Maseredse. Most of all I hope that you will take good care of that special place where you live in the basin.

Will you remember that children are just as much an interconnected part of nature as we animals are! As Drip the Drop so cleverly pointed out on his journey from sea to sky, water has been around and will go around forever! Our bodies are made of 80% water and the water we share now is the same water that the dinosaurs shared millions of years ago! It will be the same water that our children and grandchildren drink.

Remember the wisdom of our friend the diamond, that we met in Namibia? His only wish was that when he was finally uncovered from his home in the pothole and was shipped off for sale on a distant continent, that the money that he earned would contribute to a better way of life for all, both now and in the years to come.



Remember Tsepo and how his advice helped the villagers find groundwater and how the government official taught them all to take good care of this water source and to be very aware of how pollution, even far from the well, could contaminate ground water.

I hope that you will remember Milli Sentie, and her challenges at The Orange Farm. Her hope for clean water and how just across the way from her tiny shack are the abandoned gold mines that have killed all the wetlands in Gauteng with the acid-mine drainage that also threatens the Orange-Senqu basin.

Lastly I want you to remember how excited the children were when they discovered all the water creatures in the river and learnt that these tiny little creatures helped heal the river and that each kind had a different sensitivity to pollution.

I hope that these stories have made you sensitive to pollution too and to the threats to our water resources. I hope that you've been challenged to think creatively and come up with new ideas that bring solutions to the many challenges that the Orange-Senqu Basin faces. I hope that you will stand up for our rivers and become environmental leaders in your classes and communities.

You are now ready to be recognised as River Warriors of the Orange Senqu-Basin! It is time to take Mtini's Secret Otter pledge to protect and share our water resources wisely. To do what is safe for one-another and for the rivers; to remain committed and not give up, no matter how hard the journey is, to show love and respect, for both people and place, to think 'what can I do?' rather than blame others, to encourage one another and share with open and loving palms. Now you are ready to join hands with others to help learn new ways of living sustainably, for we are all interconnected and what we do affects the whole Orange-Senqu basin both now and into the future.

Pandora Schep 2015

P.S. Mr Mtini is a Cape Clawless otter who with his friend Mo, the Malachite Kingfisher are river warriors in the uMngeni River catchment in Kwazulu-Natal, South Africa. Mtini has passed on his secret eco-code (Mtini's High Five) to Thabana Ntlenyana and Maluti to share with the children in the Orange-Senqu basin.