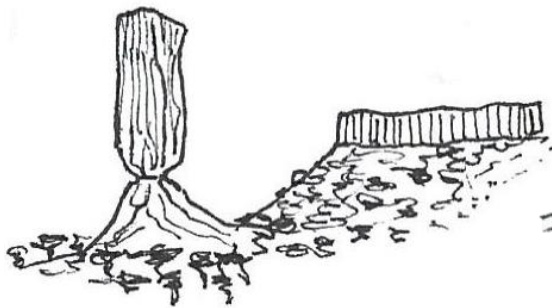


TEACH for ESD

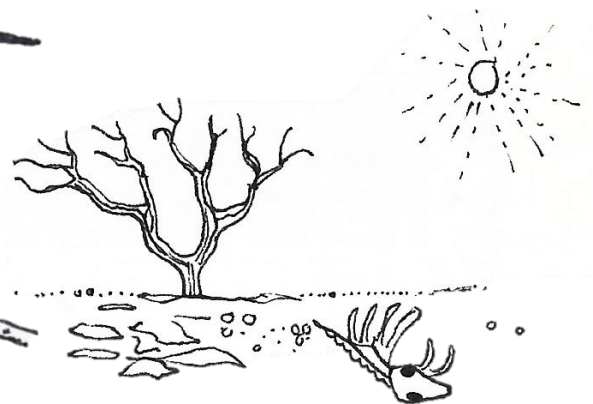
TEACH ABOUT THE ENVIRONMENT



Teach about
Namibia's Environment

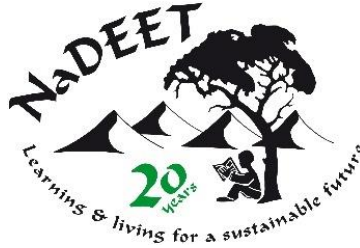


Biodiversity
Education



Climate Change
Education

Teach for ESD - Toolkit Guide 3.1
TEACH ABOUT THE ENVIRONMENT



Published in 2024 by the Namib Desert Environmental Education Trust (NaDEET).

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Brot
für die Welt

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OVERVIEW

Regardless of which subject or phase we teach, there is always an opportunity to teach about the environment, or to link what we teach back to the environment. We can team-teach with teachers from other subjects, taking an interdisciplinary approach which is an essential part of ESD. This guide looks at how we can teach about the environment in our different subjects, as part of our formal classroom lessons. **Toolkit 3.9 – Teach in Nature** provides information for outdoor investigations that can complement what we teach in class.

Our learners should know and love **Namibia’s environment** as well as be aware of local environmental issues. The first section provides teaching resources on Namibia’s unique environment, with a focus on the non-living environment, as well as general environmental issues in our country and what we can do about them. We then can progress to focus on two of the overarching environmental problems. In **biodiversity education**, we can teach in more depth how we depend on ecosystem services, and how we need to maintain and restore biodiversity. Through **climate change education** our learners need to understand the causes, impacts *and* the solutions to global warming and climate change to equip them to address this global issue.

TABLE OF CONTENTS

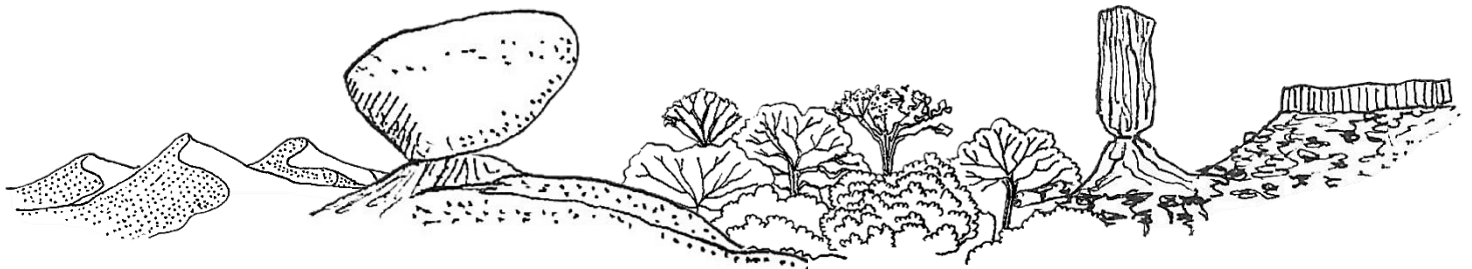
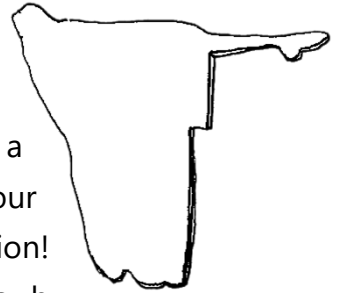
OVERVIEW	1
1. TEACH ABOUT NAMIBIA'S ENVIRONMENT	2
NAMIBIA'S UNIQUE ENVIRONMENT	2
ENVIRONMENTAL ISSUES IN NAMIBIA	4
RESOURCES FOR TEACH ABOUT NAMIBIA'S ENVIRONMENT	7
2. BIODIVERSITY EDUCATION	10
PRE-PRIMARY & JUNIOR PRIMARY PHASE	10
SENIOR PRIMARY & SECONDARY SCHOOL PHASE	11
RESOURCES FOR BIODIVERSITY EDUCATION	16
3. CLIMATE CHANGE EDUCATION	23
CLIMATE CHANGE SCIENCE	23
CLIMATE CHANGE AND US	24
RESOURCES FOR CLIMATE CHANGE EDUCATION	25

1. TEACH ABOUT NAMIBIA'S ENVIRONMENT

NAMIBIA'S UNIQUE ENVIRONMENT

Knowing and loving our environment, should be part of our national identity!

Namibia is known for its vast, beautiful, and contrasting landscapes. We are blessed to live in a large country with awe-inspiring deserts, mountains, salt pans, woodlands, a dynamic coastline, and dark night skies – it is what makes our country unique and why it is such a popular tourist destination! Let us inspire our learners to be proud Namibian citizens, by bringing Namibia's different environments "alive" across all subjects!



We can use many of the resources from **Toolkit 1 – Environmental Knowledge**, to teach about Namibia's environment. This section provides additional resources that can be used directly for teaching various phase levels about the environment.

We need to emphasize that humans are part of the environment, and that we depend on it for all our needs.

TEACHING 'WHAT IS THE ENVIRONMENT'

When teaching our learners about 'the environment' as our immediate surroundings, we can explore different aspects of it, which include: the non-living (abiotic), living (biotic) and human-made environment. With younger learners we can learn about non-living environments through topics such as the sun, soil, water and weather. With senior primary school learners, we can explore topics such as the water cycle or Namibia's climate in more depth.



Let our junior primary learners practice their reading, writing, number sense and other skills by completing the **Water, Sun** and **Recycling** activity booklets from the **It's Time to Grow** series.



For storytelling in English, read **The Science and Spectacle of Soil Life** to your learners – use the glossary on pg. 12 to explain new concepts.



Environmental Education Activities for Primary Schools is a great resource to teach about natural science concepts in a practical way, using inexpensive materials.



DESERTS & GEOLOGICAL FORMATIONS

The Namib Desert, our country's namesake, is the oldest desert in the world! Namibia is also often referred to as a geologist's dream. Because most of our country is sparsely vegetated, one can clearly see the many fascinating geological formations. We can use Namibian examples to investigate weathering processes, different types of rocks, river systems, types of rainfall, nutrient cycling, soil types etc. We can use iconic mountains, such as the Brandberg or the Spitzkoppe, to teach about inselbergs or igneous rocks in geography, or about the cultural significance that these had for hunter-gatherer societies in history.



Use the ***Bush Telegraph: Deserts*** with your senior primary learners to explore this place of extremes.



Use **Chapter 2** in ***Teaching Resource Kit for Dryland Countries*** to teach secondary school learners about land, rocks, and erosion.

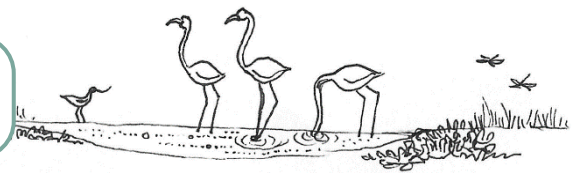


PRECIOUS FRESHWATER

Namibia is the driest country in sub-Saharan Africa, and yet we *do* have a variety of freshwater sources, such as wetlands, groundwater, springs, estuaries, oshanas, sinkholes, pans, and perennial rivers. These all play an important role to sustain Namibians and all other forms of life.



Use the ***Bush Telegraph: Water is Life*** to explore freshwater in Namibia with your senior primary learners.



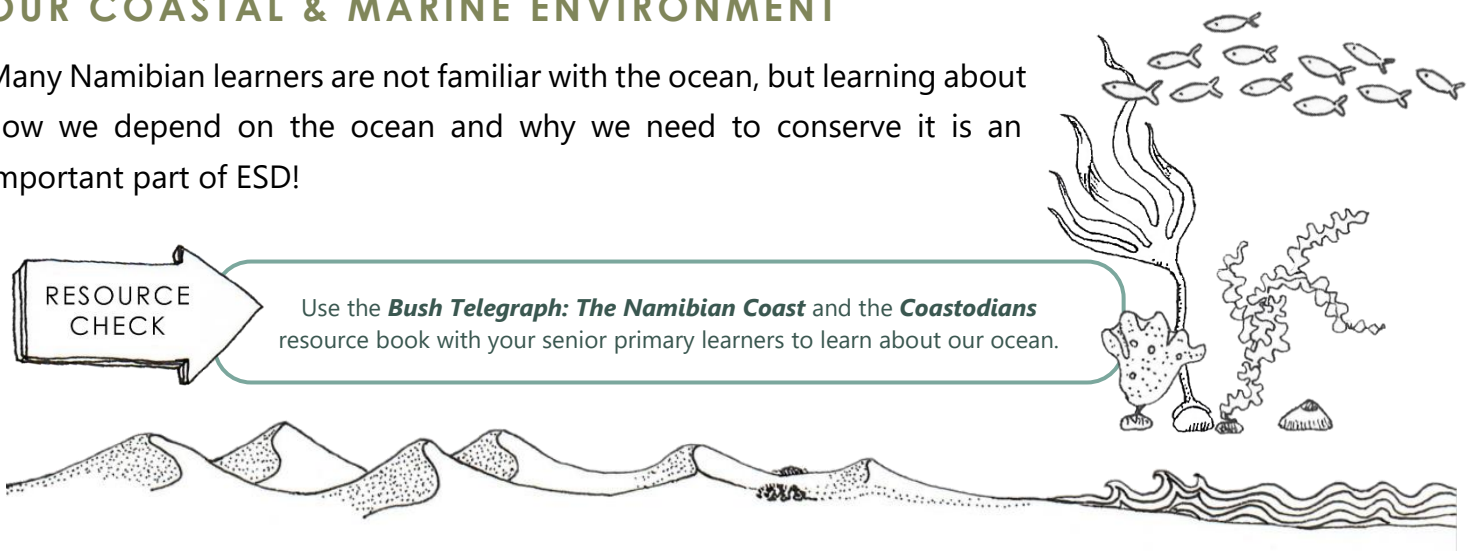
Refer to the section on 'Awareness' in ***Toolkit 3.6 – Reduce Resource Use***, for more resources on water.

OUR COASTAL & MARINE ENVIRONMENT

Many Namibian learners are not familiar with the ocean, but learning about how we depend on the ocean and why we need to conserve it is an important part of ESD!

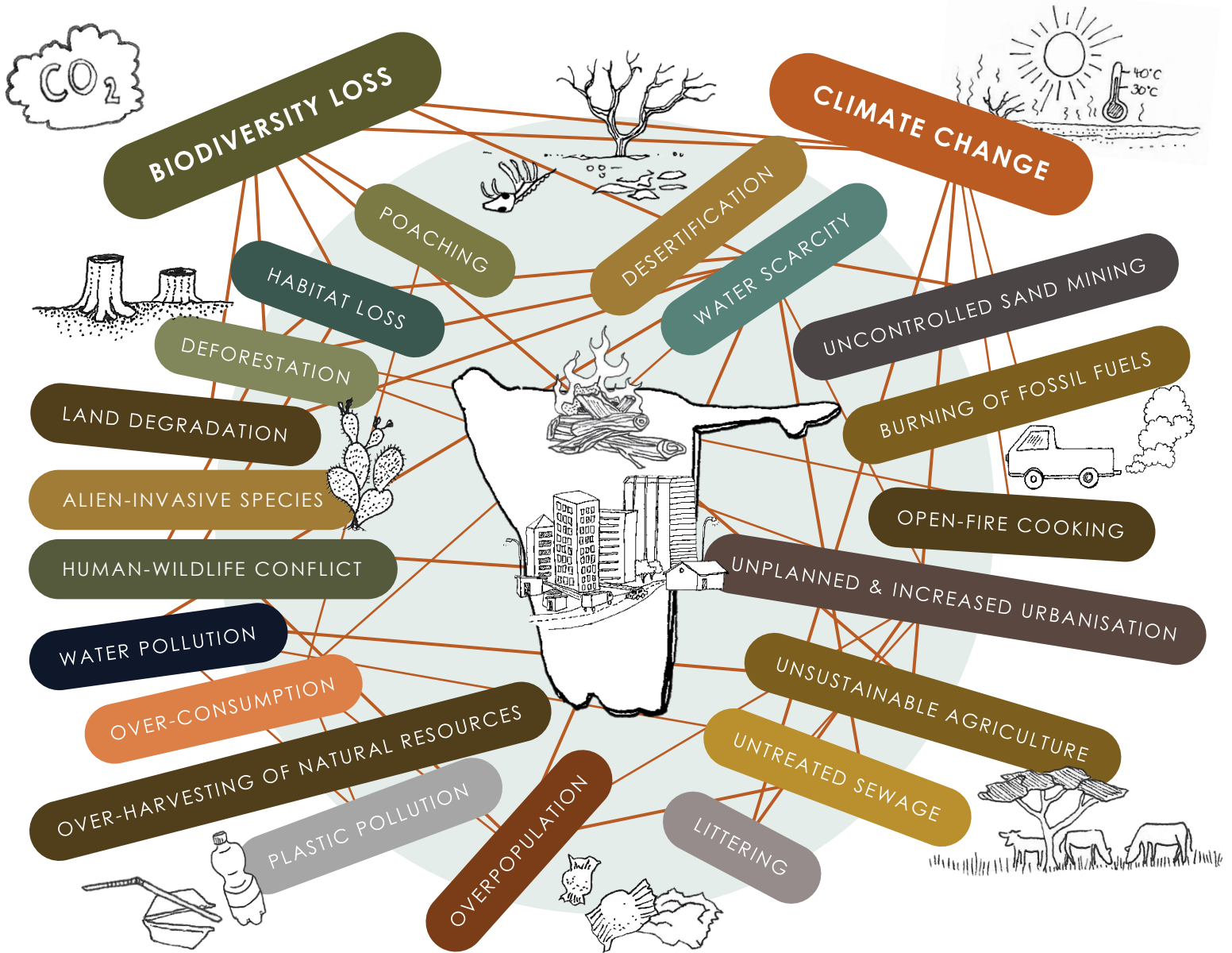


Use the ***Bush Telegraph: The Namibian Coast*** and the ***Coastodians*** resource book with your senior primary learners to learn about our ocean.

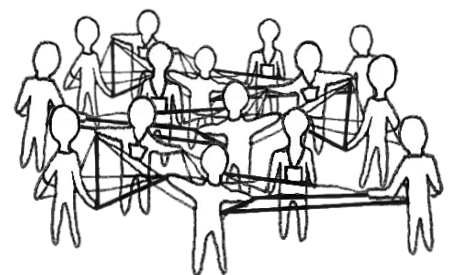


ENVIRONMENTAL ISSUES IN NAMIBIA

As Namibian teachers, we also have an obligation to teach our learners about the **environmental issues** that our country is facing. One of the greatest threats to the environment is the lack of awareness and ignorance regarding the urgency of addressing the issues. Therefore, the first step towards addressing environmental problems, is to *learn about them to understand them correctly*. We need to make our local environmental challenges *relevant* and clarify how many of these are connected, and how they contribute to the global environmental crisis of biodiversity loss and climate change.



As explored in *Toolkit 1 – Environmental Knowledge*, environmental problems are closely interlinked with social, economic, and political issues. Hence, most environmental problems are **wicked problems** as they are difficult to solve by themselves. We need to make sure that we teach our learners in a way that develops their systems thinking abilities and other 21st century skills.



TEACHING CURRENT ENVIRONMENTAL ISSUES

We often teach from a theoretical viewpoint, overlooking pressing issues that are unfolding around us in our local community, region, nation or globally. Exposing learners to **current** and **local** environmental issues, will enable them to gain a better understanding of the environmental crisis at both a local and a global level. It allows them to make connections between *theory* and *reality*, and makes environmental problems “come alive”, more relevant, meaningful, and perhaps even makes them personal. This makes our learners more likely to want to participate and engage in solving local environmental problems.

There are some key points to consider when teaching current environmental affairs:

1. GET THE FACTS

- Use news sources, such as daily newspapers, radio, TV and/or invite guest speakers who have direct knowledge about a current environmental affair.
- It is essential to have accurate data and the science behind the environmental issue. We need to ensure that our sources are well-proven and not fake media!



Check out **How to Spot Fake News** to learn how to identify good vs bad information, presentation, and news sources.



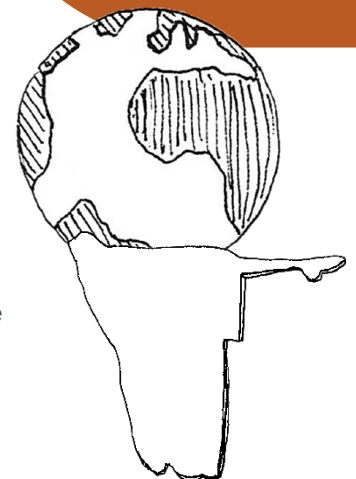
2. TEACH “BOTH SIDES” OF THE STORY

- Engage with the various positions that stakeholders may have on an issue, as everyone may not agree.
- As teachers, we also must be aware of our own biases and personal opinions that we might have about certain issues.
- Use activities that give learners the opportunity to voice different viewpoints.

Understanding ‘wicked’ environmental problems can be challenging. Take time to study and learn the issues from valid scientific sources.

3. BRING IN BOTH LOCAL AND GLOBAL CONTEXT

- While we are teaching about local environmental issues, we need to clarify how these are contributing to global environmental issues, e.g. plastic pollution in the ocean, climate change, and biodiversity loss.



Learners may also be the ones to start an inquiry by asking **us** a question.

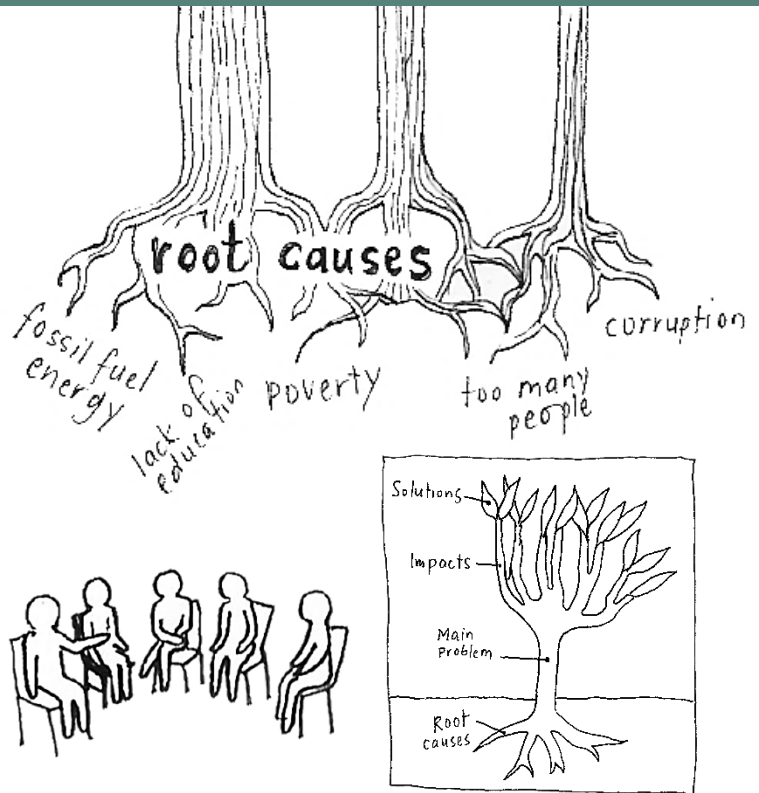
A good way to get started is to raise awareness and spark an initial interest in an environmental topic. Once the topic is introduced, it is important for learners to engage with it further to understand the context, causes, impacts, and stakeholders involved in the issue.

TOOLKIT 3.1 TEACH ABOUT THE ENVIRONMENT

We can use a variety of activities to teach about current environmental affairs. These activities can be done in one class period or over multiple periods as a class project. We can use activities such as:

- debates
- mock press conferences
- investigative journalism
- informative posters
- concept mapping
- environmental problem trees

Learners can analyse the topic in depth by digging for **root causes**, **impacts** and **potential solutions** around the current environmental issue, which often include many social, economic, and political aspects.



Use the following resources to explore the root causes, impacts and potential solutions for some of our local environmental issues along our coastline and rivers. Land-use change is one of the main threats to biodiversity. Part of land-use change is urbanisation, large-scale agriculture, and mining (including sand mining).

RESOURCE CHECK

Watch the videos *The Namib Desert Coast* and *The River People* with senior primary and secondary school learners.

RESOURCE CHECK

Use the *Think Namibia* factsheet and video *Land Degradation* with your secondary school learners.

RESOURCE CHECK

With your learners, watch Namibia's *One Africa Television* video *Oniipa Illegal Sand Mining* to introduce the issue of sand mining.

Some topics may be difficult to confront because they directly affect us. This is true for both learners and adults. In Namibia, one such topic is Human-Wildlife Conflict - and specifically poaching. In these situations, it can be helpful to 'unpack' the issue by using a resource such as a comic or story.

RESOURCE CHECK

Use the *Speak up Against Wildlife Crime* comic or the short film *Baxu and the Giants* to teach about poaching.

RESOURCES FOR TEACH ABOUT NAMIBIA'S ENVIRONMENT

Junior Primary

JP

Senior Primary

SP

Junior Secondary

JS

Senior Secondary

SS

Teacher

T



JP

It's Time to Grow: Sun, Water & Recycling

ACTIVITY BOOKLET: These activity books, offered in 6 Namibian languages, on *Sun*, *Water* and *Recycling* are activity based educational materials. With illustrations and activities, children can connect to topics.

AUTHOR: V. Keding, NaDEET (2019)

Link: <https://nadeet.org/its-time-toseries>



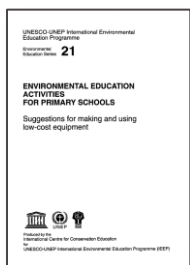
JP

The Science and Spectacle of Soil Life

BOOK: This illustrated book aims to educate young children about soil and the health of underground life systems. It includes the relationship between healthy soil and humans.

AUTHOR: S. Keats (2020)

Link: http://54.229.242.119/booklets/1_Ref12.pdf



JP

SP

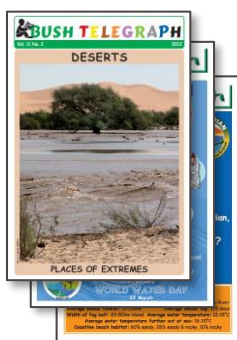
T

Environmental Education Activities for Primary Schools

MANUAL: A collection of activities for primary school level, to be integrated into an environmental education programme. The list of ideas suggested specifically use low-cost equipment and easily accessible materials.

AUTHOR: UNESCO, International Centre for Conservation Education (1992)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000096345>



SP

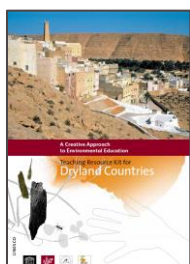
T

Bush Telegraph Issues

BOOKLET: *Deserts, Water is Life, The Namibian Coast*. These issues provide information about the Namib Desert (and also the Succulent Karoo and Nama Karoo), freshwater sources in our country, such as wetlands, and information about our coastline.

AUTHOR: NaDEET (2012, 2007, 2008)

Link: <https://nadeet.org/bush-telegraph-series>



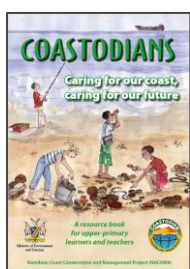
T

Teaching Resource Kit for Dryland Countries

MANUAL: Designed for teaching environmental education specifically in dryland countries, this guidebook contains lesson plans and activities based on a creative and artistic educational approach for ages 6-15.

AUTHOR: UNESCO (2007)

Link: https://unesdoc.unesco.org/ark:/48223/pf0000163264_eng



SP

T

Coastodians: Caring for our Coast, Caring for our Future

MANUAL: A Namibian resource on coastal conservation for upper-primary learners and teachers, this booklet aims to aid environmental educators. It includes education material and subject specific activity suggestions.

AUTHOR: Namibian Coast Conservation and Management Project (2009)
Link: <https://studylib.net/doc/8223115/coastodians--caring-for-our-coast--caring-for-our-future>



JS

SS

T

How to Spot Fake News

PRESENTATION: This presentation outlines the basics of fake news and misinformation, the negative impacts it can have and the various factors to be considered when identifying it.

AUTHOR: Morton Grove Public Library (2020)
Link: <https://www.mgpl.org/sites/default/files/2020-09/How%20to%20Spot%20Fake%20News.pdf>



JS

SS

T

The Namib Desert Coast

VIDEO: This short documentary showcases Namibia's coastal environments: the biodiversity and how humans interact with the environment here.

AUTHOR: NACOMA (2013)
Link: https://www.youtube.com/watch?v=fRYlqxq_cyU



JS

SS

T

The River People

VIDEO: This short documentary showcases Namibia's northern river environments: the biodiversity and how humans interact with the environment here.

AUTHOR: NNF (2023)
Link: <https://www.youtube.com/watch?v=G6O-pRYXerl&t=192s>



JS

SS

T

Think Namibia: Land Degradation

FACTSHEET & VIDEO: This factsheet and video were produced as part of Think Namibia's national information campaign to educate on topics of environmental awareness, specifically relating to land degradation and the country's sustainable development.

AUTHOR: Think Namibia (2015)
Link: https://www.thinknamibia.org.na/images/projects/enviro/Climate_Change_Factsheet_07.pdf
Link : <https://vimeo.com/180603967>



SS
T

Oniipa Illegal Sand Mining

VIDEO: This news report documents the Oniipa community's issue with illegal sand mining by calling on Minister of Environment, Forestry and Tourism to intervene. It reports on both the council and residents' side of the conflict.

AUTHOR: One Africa Television (2021)

Link: <https://www.youtube.com/watch?v=dfJSoZA7GRs>



SP
JS
SS

Speak Up Against Wildlife Crime

COMIC: This comic illustrates consequences of wildlife crime in Namibia by telling the story of a child who gets tied up in a crime and how the situation is dealt with by the authorities; a story with a strong message.

AUTHOR: Legal Assistance Centre (2016)

Link: <https://www.baxuandthegiants.com/media/baxu/docs/lac-lead-comic--wildlife-crime-2016--web-quality.pdf>



JP
SP
JS
SS

Baxu and the Giants

FILM: This short film was funded by the Legal Assistance Centre. It tells the story of rhino poaching through the eyes of a nine-year-old girl in Northern Namibia.

AUTHOR: Florain Schott (2019), MaMoKoBo Video & Legal Assistance Centre

Link: <https://www.youtube.com/watch?v=u9OeS-aHiR0&t=10s>

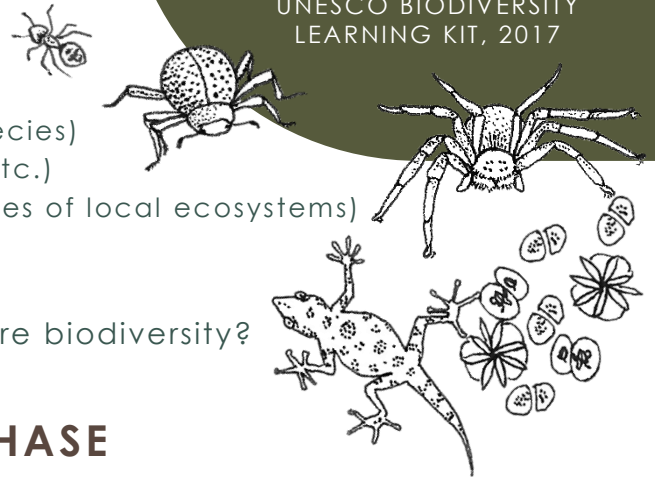
2. BIODIVERSITY EDUCATION

As we learned in *Toolkit 1 – Environmental Knowledge*, ‘biodiversity’ is the variety of life on earth. This key scientific concept may seem difficult to understand, as it includes many levels, but it is an extremely important part of being *ecologically literate*. How can we teach about the variety of life throughout all phases and all subjects? Biodiversity education usually entails the following topics and themes:

“...the future of biodiversity will depend on the global collective action of an educated society, including a moral obligation to promote traditional and indigenous knowledge of biodiversity.”

UNESCO BIODIVERSITY LEARNING KIT, 2017

- What is biodiversity?
 - **Genetic** diversity (the variations within a species)
 - **Species** (classifications, individual species etc.)
 - **Ecosystems** (interactions within different types of local ecosystems)
- Why is biodiversity important?
- What are the main threats to biodiversity?
- What can we do to save, protect, and restore biodiversity?



PRE-PRIMARY & JUNIOR PRIMARY PHASE

Young children are naturally curious and drawn towards the natural world and animals. Our role as educator is to encourage this curiosity, and model enthusiasm, love, and care for Namibia’s unique biodiversity in all subjects, not just in environmental studies. We don’t have to go into scientific detail, nor do we need to use the word ‘biodiversity’ to teach about it. We can simply explore the variety of different animals, plants, and other living organisms.

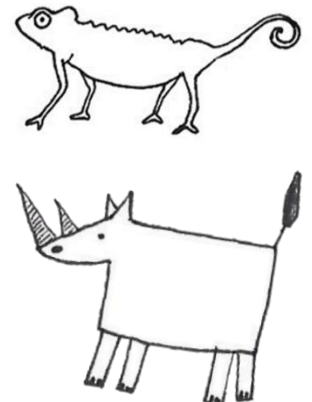


RESOURCE CHECK → Let your junior primary learners complete the ***Animals and Plants*** activity booklet from NaDEET’s ***It’s Time to Grow*** series.

RESOURCE CHECK → Teach the alphabet with ***WWF Animal ABC Flashcards*** or use it as an inspiration to make your own Namibian Biodiversity ABC.

RESOURCE CHECK → Use the Namibian ***PAKO Kids Magazine*** and their **website** to teach your junior primary learners about wild animals in a fun way.

RESOURCE CHECK → SPAC’s EduConservation comic and activity pages ***Follow the Adventures of Ben the Honey Badger in Namibia*** is ideal for young children to learn about Namibian animals and how they interact with each other.



SENIOR PRIMARY & SECONDARY SCHOOL PHASE

With senior primary and secondary school learners we can start to look at biodiversity in more detail and scientific accuracy and learn why it is important for ecosystem services. We can also start to explore the root causes of threats and solutions to biodiversity loss.



In *EduVentures' Teachers Training Manual – Biodiversity*, pg. 36-37 provides pointers on how to incorporate biodiversity into different subjects. This manual also provides baseline information about biodiversity (pg. 14-17), ecosystem services (pg. 19-21) and threats to biodiversity (pg. 23-24).

Regardless of the subject we teach, we strongly encourage all teachers to have a look at *all* biodiversity resources in this section, to find the sections that *do* relate to our own subjects and be creative in incorporating biodiversity into their subjects.

NATURAL SCIENCES: LIFE SCIENCE, BIOLOGY & AGRICULTURE

In natural science, biology and life science, (and to some degree the agriculture subjects) most of the curriculum can be considered biodiversity education (even if it is not called that), as it entails studying the environment and how it works, from a cellular to a biosphere level. Let us teach this essential topic in the most exciting way!



GCF's *Nature Workbook* is a wonderful resource for senior primary learners, where they learn about all levels of biodiversity.

Sit down with your natural science colleague and compare your curricula and identify potential overlap of skills and themes related to biodiversity.

Our learners can start to understand **genetic diversity** by simply learning about the differences among individuals of the same species, e.g., no human looks the same. In agricultural subjects we can see this when we plant the very same type of mealies, some are still bigger, smaller, or more drought resistant. From there we can look at genetic diversity among other species.



Let your senior primary learners read the *Bush Telegraph: Biodiversity* and completed the activities. Introduce them to genetic diversity on pg. 3.



We can then look at **species diversity**. This entails learning about different types of species and how to classify them (also see *Toolkit 3.9 – Teach in Nature* for resources on identification and classification).



Let your senior primary learners learn how to classify plants by reading and doing the activities with them in the *Bush Telegraph: Kingdom Plantae*.

SPECIES

A group of organisms consisting of *similar individuals* capable of *producing fertile offspring*.



TOOLKIT 3.1 TEACH ABOUT THE ENVIRONMENT

We can learn more about local animals and plant species, that are found in our immediate local environment or within Namibia.



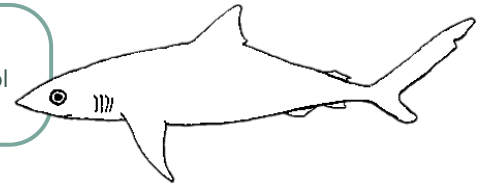
Use the ***Bush Telegraph: Are you sticking your neck out for giraffe?*** and GCF's ***Giraffe's Placemat*** (activity sheet) for senior primary school learners. For secondary phase learners, use GCF's ***African Giraffe Conservation Guide Booklet*** and posters.



Use EHRA's ***Junior Elephant Guard*** workbook for senior primary and junior secondary learners. Use the ***Community Elephant Conflict Mitigation Workshop*** notes for senior secondary learners.



Watch the NNF video ***Deep Connection: An Introduction to Namibia's Sharks*** with your senior primary and secondary school learners to learn about the importance of these apex predators.



ECOSYSTEM

The interaction between living organisms with each other and the non-living environment.

We can then explore **ecosystem diversity** by studying various ecosystems within Namibia and their different habitats in more depth. Refer to the previous section, for resources on marine ecosystems, fresh water ecosystems, desert ecosystems etc. Here are more resources on Namibia's woodlands and forests. When learning about ecosystem diversity, we must also make sure to introduce our learners to the concept of **ecosystem services**.



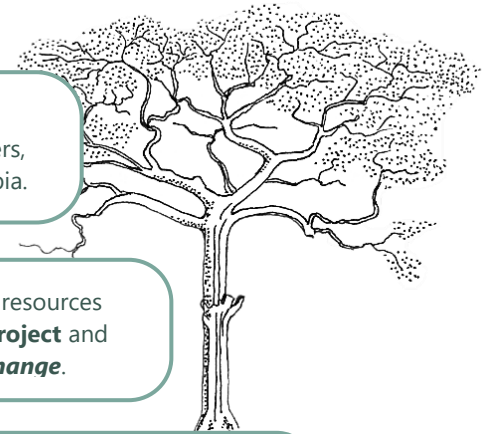
Use the ***Bush Telegraph: Forests for People*** and the booklet ***10 Trees of the Zambezi Region*** with senior primary school learners, for them to learn more about the trees found in the north of Namibia.



Provide your secondary school learners with the *Think Namibia's* resources from their ***Namibia Sustainable Forest Management (NSFM) Project*** and the factsheet and video ***Forests, Rangelands and Climate Change***.



The WWF's ***Nature's Services – A Guide for Primary School on Ecosystem Services*** is full of great activities for upper primary school learners – adapt them to our Namibian context!



Finally, we can make our secondary phase learners aware of the **biodiversity crisis** – the fact that humans are causing the 6th mass extinction. With them, we can learn about global initiatives to reduce biodiversity loss, like the UN Decade on Ecosystem Restoration.





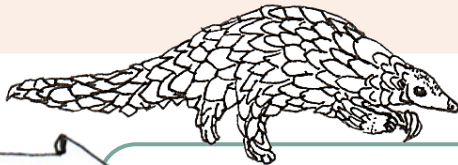
Let your secondary phase learner study the WWF's ***Living Planet Report 2022 Youth Edition*** or use the presentation or video, for them to understand the severity of the biodiversity crisis.

Several animals and plant species in Namibia are threatened, and on the **IUCN Red List**. Let us learn and raise awareness about them! Many of these threatened species, such as the rhino, can also be celebrated on an environmental day (see **Toolkit 3.8 - Create Environmental Awareness**).

THE IUCN RED LIST

In 1964 the International Union for the Conservation of Nature (IUCN) established the **Red List**, which has grown to become the largest and most comprehensive global database of extinction risks to plants and animals. Some of the categories are as follows:

Vulnerable (VU)	Endangered (EN)	Critically Endangered (CR)
 <p>Black-footed cat Leopard Lion Pangolin</p>	 <p>Cheetah Ground Hornbill White-backed Vulture Basking shark</p>	 <p>African wild dog Pel's Fishing Owl Cape Vulture Common eagle ray</p>



For senior primary learners, use the **Bush Telegraph: Vulture Conservation** and for secondary school learners use the **Birds to Watch in Namibia** booklet.



Use the **Conservation Status and Red List of the Terrestrial Carnivores of Namibia** book and poster to explain the IUCN Red List ratings and learn about various endangered species.



The **A Predator's Role in the Ecosystem** teacher's guide focuses on cheetahs, but also provides information on various other big cats.



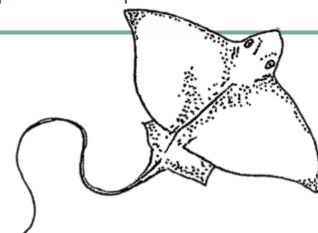
Use the **Background Information and Species Management Guidelines for Namibia's Rare and Valuable Wildlife: African Wild Dog** book and poster to teach about the African wild dog.



Read the comic **Petrus: The Temminck's Ground Pangolin Guardian** with junior and senior primary learners. Use the **Pangolins in Namibia** and **Protect Pangolins** posters for secondary school learners.



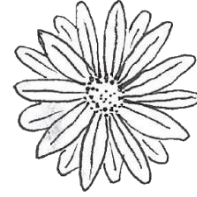
Teach about the endangered and critically endangered sharks, skates and rays that are found in our Namibian waters using the **Chondrichthyans of Namibia** and poster to explain the IUCN Red List ratings.



MATHEMATICS

1, 1, 2, 3, 5, 8, 13, ...

- 1 + 1 = 2
- 1 + 2 = 3
- 2 + 3 = 5
- 3 + 5 = 8
- 5 + 8 = 13
- 8 + 13 = 21
- 13 + 21 = 34
- 21 + 34 = 55 ...



In mathematics, we can incorporate biodiversity education when we teach topics such as data handling / statistics and probability, measurements, geometry, and mensuration. A fun activity is to explore the Fibonacci sequence in nature!

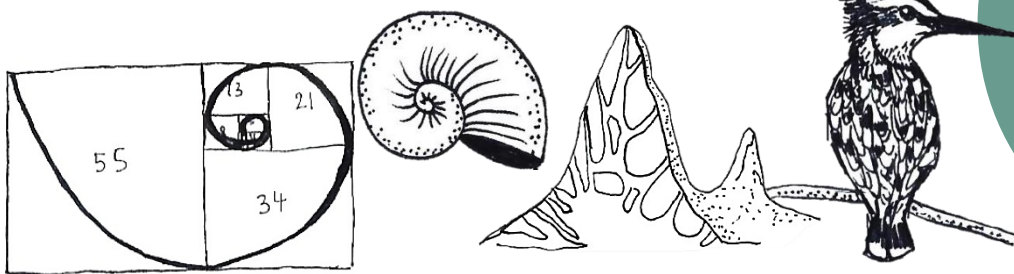


For some inspiration, watch the videos *Nature by Numbers* and *Fibonacci for kids* with your senior primary learners. Watch *Spirals, Fibonacci and Being a Plant* with your secondary phase learners.

PHYSICS, CHEMISTRY AND DESIGN & TECHNOLOGY

Biomimicry is a relatively new concept that we can introduce across several science subjects. We can learn about biomimicry and its design principles together with our learners and help them to apply these in inquiry-based lessons and projects.

BIOMIMICRY is a new and exciting, interdisciplinary field in science and design, where human problems are solved by learning and drawing inspiration from nature.



For an introduction to biomimicry, watch the videos *The World is Poorly Designed but Copying Nature Helps* and *5 Amazing Biomimicry Examples*.



Read the teacher guide *Sharing Biomimicry with Young People* and *Inspiration from Nature* to learn more about biomimicry and how to teach it. Use the lesson plans in *Techniques from Nature* for ideas.

SOCIAL STUDIES, GEOGRAPHY, HISTORY & ART

When we teach about climatic regions in geography, we can link it to biomes. With older learners, we can also study climate, geology, and soil type maps to identify which non-biotic factors give rise to higher levels of biodiversity. When practicing map skills, we can let our learners study maps on biodiversity patterns or habitat loss. Our learners can also practice creating habitat or vegetation maps when doing a biodiversity survey as explained in the section on fieldwork in *Toolkit 3.9 – Teach in Nature*. For more resources and ideas for incorporating biodiversity into art, refer to the section 'Art Environmental Education' in *Toolkit 3.8 Create Environmental Awareness*.



In our social studies or history lessons we can learn more about biodiversity by exploring how different cultures across the world and through time viewed nature, and what role it played in their belief systems, their art and food.



Explore cultural ecosystem services on **pg. 59 – 64** in *Environmental Education Trainers' Guide for Nature Conservation*, and on **pg. 30-34** and **pg. 42-48** in the *UNESCO Biodiversity Learning Kit*.

LANGUAGES AND INFORMATION & COMMUNICATION

Whether we are teaching a first, second or a foreign language, we can easily bring biodiversity into our lessons, at any phase level! Incorporate biodiversity into the following activities:

- spelling bees
- writing & reading poems
- oral presentations & debates
- comprehension & reading exercises
- argumentative or descriptive essays
- narrative essays & short stories



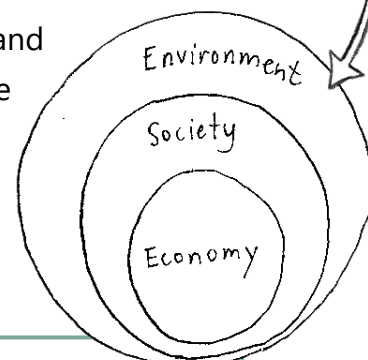
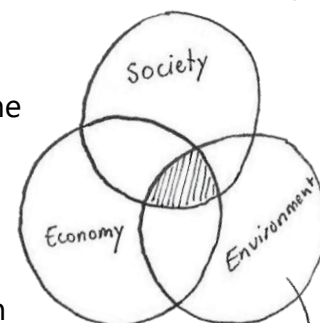
For the subject 'Information and Communication', we can critically assess whether the media is promoting biodiversity conservation and learn about how to spot fake news. For resources on effective communication about environmental issues and environmental journalism, see **Toolkit 3.10 – Share ESD with Others**.



ACCOUNTING, BUSINESS AND LIFE SKILLS

In business, financial and lifestyle related subjects, we can teach about the importance of biodiversity by studying ecosystem services. Our economies and businesses all depend on these ecosystem services in a direct or indirect way. With secondary students, we can start discussing how we can add more value by putting a price on ecosystem services, as many of these are not accounted for in the price of products - known as **environmental externalities**.

We can also use real data in our accounting classes, e.g. the school's water and electricity bills – this can be part of our school's environmental audit (see **Toolkit 3.6 – Reduce Resource Use**). Together with our secondary school learners, we can learn more about the green economy (also see the section on career guidance in **Toolkit 3.7 - Promote Learner Wellbeing**).



Read Chapter 11 "Money and jobs, linking them with biodiversity" on **pg. 41 - 44** in *UNESCO's YouthXchange - Biodiversity and Lifestyles Guidebook*. The activity described in *Environmental Education Trainer's Guide for Nature Conservation* on **pgs. 50 - 58** explores how economics, consumerism and the environment are connected.

RESOURCES FOR BIODIVERSITY EDUCATION

Junior
Primary



Senior
Primary



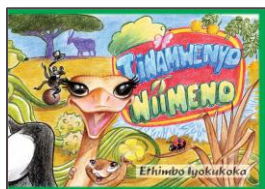
Junior
Secondary



Senior
Secondary



Teacher



It's Time to Grow: Animals and Plants

ACTIVITY BOOK: Aimed at young children, this educational booklet (in 6 Namibian languages) focuses on animals and plants, and their interaction. It uses age-appropriate activities for junior primary school.

AUTHOR: V. Keding, NaDEET (2019)

Link: <https://nadeet.org/its-time-toseries>



WWF Animal ABC Flashcards

FLASH CARDS: This is an excellent tool to teach the alphabet, while also teaching about animals. The back of the flashcards have a short description for each animal.

AUTHOR: WWF (n.d.)

Link: <https://www.worldwildlife.org/teaching-resources/toolkits/species-abcs>

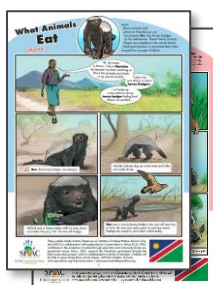


PAKO Kids Magazine

MAGAZINE & WEBSITE: A local children's educational magazine on nature and animals, issues include activities, information and tips. The website links to all issues, and educational materials.

AUTHOR: PAKO (n.d.)

Link: <http://pako4kids.com/cleverkids/pakos.htm>

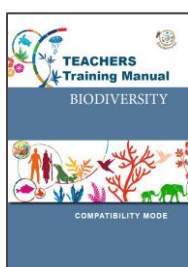


Follow the Adventures of Ben the Honey Badger in Namibia

COMIC: This series of comics explores the roles, feeding behaviours and interactions between different Namibian animals. Use the activity pages to teach junior primary learners – lower grades will need assistance from adults.

AUTHOR: SPAC EduConservation (2023)

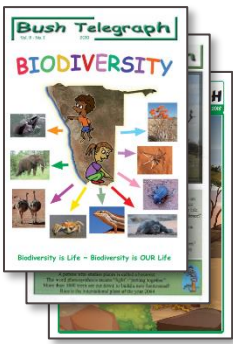
Link: <https://www.spacafrika.org/resources>



Teachers Training Manual - Biodiversity

MANUAL: This teacher's manual covers the theory behind EE and ESD, before educating on the topic of biodiversity, including ecosystem services. It also contains related activity ideas for the classroom.

AUTHOR: EduVentures (2020)



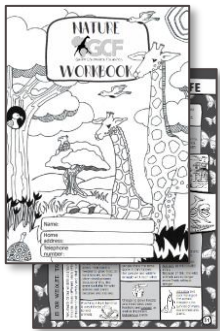
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Bush Telegraph Issues

BOOKLET: *Biodiversity; Forests for People; Kingdom Plantae; Are you sticking your neck out for giraffe?; and Vulture Conservation.* These issues of the *Bush Telegraph* cover various topics of biodiversity in Namibia.

AUTHOR: NaDEET (2011, 2010, 2004, 2018, 2004)

Link: <https://nadeet.org/bush-telegraph-series>



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GCF Giraffe Activity Resources

ACTIVITY BOOK & ACTIVITY SHEET: The *Nature Workbook* (Part 1 and Part 2) is an educational activity book on nature for young children, including educational material. The activity sheet is designed in the form of a placemat and provides information about giraffe in Africa on the front page, and fun educational activities on the back page.

AUTHOR: Giraffe Conservation Foundation (2021)

Link: <https://giraffeconservation.org/wp-content/uploads/2021/04/GCF-Nature-Workbook-LR-pages-1-32.pdf>

Link: <https://giraffeconservation.org/wp-content/uploads/2021/04/GCF-Nature-Workbook-LR-pages-33-68.pdf>

Link: <https://giraffeconservation.org/wp-content/uploads/2020/07/Placemat-HR-3mm-Bleed-c-GCF.pdf>



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GCF Giraffe Book & Posters

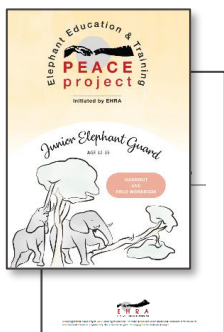
BOOKLET & POSTER: *Africa's Giraffe: A Conservation Guide* booklet educates on giraffe conservation efforts within Africa and Namibia. The poster *Africa's Giraffe: Can you spot the difference?* challenges readers to differentiate between the four giraffe species of Africa by their patch shape. The *Namibia's Giraffe: A Conservation Guide* poster informs readers about the two sub-species of giraffe found in Namibia.

AUTHOR: Giraffe Conservation Foundation (2022)

Link: <https://giraffeconservation.org/wp-content/uploads/2019/04/GCF-Conservation-Guide-Booklet-2022-SPREADS-compressed.pdf>

Link: <https://giraffeconservation.org/wp-content/uploads/2016/03/GCF-Spot-Pattern-Poster-2022-LR.pdf>

Link: <https://giraffeconservation.org/wp-content/uploads/2016/03/Namibias-Giraffe-2022-LR.pdf>



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EHRA Educational Resources

BOOKLET & ACTIVITY BOOK: Designed to be used with different age groups, these educational resources from the Elephant-Human Relations Aid (EHRA) cover species knowledge, elephant-human conflict and elephant protection. It also gives practical how-to information during elephant encounters.

AUTHOR: EHRA (2019 and 2020)

Link: <https://static1.squarespace.com/static/5cab5076797f7475f98c1b42/t/5d237c8f9813d80001e01c18/1562606748846/04+Community+Training+2.pdf>
 Link: <https://static1.squarespace.com/static/5cab5076797f7475f98c1b42/t/5feae8177ded4178ae93b33d/1609230426336/EHRA+Handout+Schools.pdf>



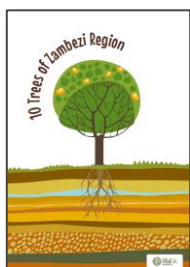
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Deep Connection: An Introduction to Namibia's Sharks

VIDEO: This short film provides an introduction to the wide diversity of sharks, skates, rays and chimaeras living in Namibian waters. It explains they are important components of a healthy marine environment, and why we all rely on healthy oceans for our wellbeing. Also available in Oshikwanyama.

AUTHOR: NNF (2023)

Link: <https://www.youtube.com/watch?v=retb5s45pdU>
 Link: <https://www.youtube.com/watch?v=Ixil3S2dWdM&t=99s>



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10 Trees of Zambezi Region

ACTIVITY BOOK: This activity book is designed by and for primary school learners, around Grades 3 – 5, from the Zambezi Region. Besides basic information about trees and their lifecycle, it has in-depth descriptions of 10 local trees.

AUTHOR: Wild Kids Academy (2022)



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Th!nk Namibia - Sustainable Forest Management

FACTSHEET, VIDEO & POSTER: These factsheets and videos are part of *Th!nk Namibia's* Namibia Sustainable Forest Management (NSFM) Project. There are several factsheets, posters and videos provided about forests. All the resources are available also in Silozi, Rumanyo and Rukwangali.

AUTHOR: THINK NAMIBIA (2021)

Link: <https://www.thinknamibia.org.na/projects/sustainable-forest-management>



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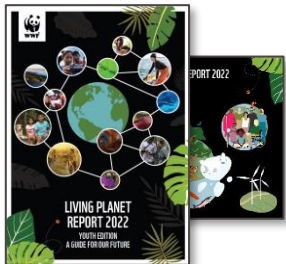
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Nature's Services: A Guide for Primary School on Ecosystem Services

MANUAL: Beginning by explaining the concept ecosystem services, this booklet then guides on best practice to teaching the topic, including activities and evaluation methods.

AUTHOR: P. Wiborn (2013)

Link: <https://www.wwf.se/dokument/natures-services-a-guide-for-primary-school-on-ecosystem-services/>



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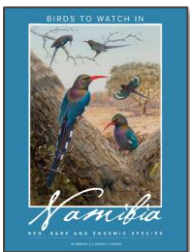
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Living Planet Report 2022 Youth Edition

REPORT & VIDEO: This youth edition of the official Living Planet Report presents major environmental events, trends, challenges and movements over the last two years. It is available in different formats for classroom use.

AUTHOR: WWF (2022)

Link: <https://www.worldwildlife.org/teaching-resources/toolkits/living-planet-report-2022-youth-edition>



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Birds to Watch in Namibia

BOOK: This book focuses on the "Red, Rare and Endemic Species" of Namibian birds. It explains the meaning of the categories together with a full list and explanation of bird species.

AUTHOR: R.E. Simmons, C.J. Brown, J. Kemper (2015)

Link: <https://www.researchgate.net/publication/277308856>

[Birds to watch in Namibia red rare and endemic species](#)



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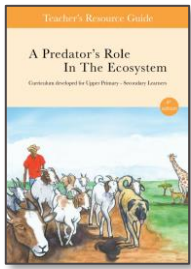
Conservation Status and Red List of the Terrestrial Carnivores of Namibia

BOOK & POSTER: This book provides information about the IUCN status of all the large carnivores in Namibia. The poster presents the findings of the book in a visual, infographic-like format.

AUTHOR: MEFT, LCMAN & NCE (2022)

Link: <http://the-eis.com/elibrary/sites/default/files/downloads/literature/Conservation%20Status%20and%20Red%20List%20of%20the%20Terrestrial%20Carnivores%20of%20Namibia.pdf>

Link: <http://the-eis.com/elibrary/sites/default/files/downloads/literature/Poster%20Conservation%20Status%20and%20Red%20List%20of%20the%20Terrestrial%20Carnivores%20of%20Namibia.pdf>

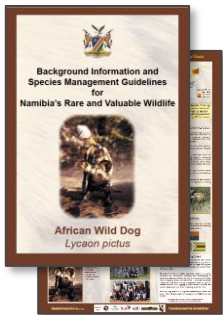


A Predator's Role in The Ecosystem

MANUAL: A guide designed to complement the Namibian curriculum for senior primary and secondary phases. It focuses on cheetahs and other big cats, provides lesson plans and activity ideas.

AUTHOR: Cheetah Conservation Fund (2016)

Link: <https://cheetah.org/wp-content/uploads/2019/09/CCF-Teachers-Resource-Guide-4th-Edition.pdf>



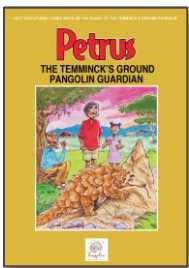
African Wild Dog Resources

BOOKLET & POSTER: The book *Background Information and Species Management Guidelines for Namibia's Rare and Valuable Wildlife: African Wild Dog*, provides an overview of the African Wild Dog in Namibia. The poster presents the information in a more concise form.

AUTHOR: NNF (2009)

Link: <https://www.nnf.org.na/images/Publications/books-pamphlets/information-booklet.pdf>

Link: <https://www.nnf.org.na/images/Publications/books-pamphlets/information-poster.pdf>

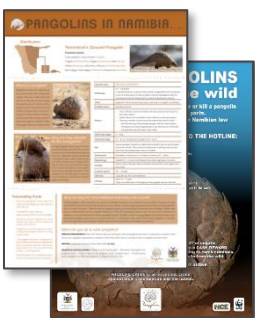


Petrus: The Temminck's Ground Pangolin Guardian

COMIC: This comic follows the story of Petrus and how he learns about the plight of the pangolin from his grandfather.

AUTHOR: SACT & NPWG (n.d.)

Link: <https://n-c-e.org/sites/default/files/2023-02/Educational%20comic%20book%20on%20the%20plight%20of%20Temmincks%20ground%20pangolin.pdf>



Pangolin Posters

POSTER: The *Pangolins in Namibia* poster provides interesting facts about the Temminck's Ground Pangolin. *The Protect Pangolins: Keep them in the wild* poster provides information on how to report suspicious activity.

AUTHOR: NPWG (n.d., 2020)

Link: <https://n-c-e.org/sites/default/files/2021-07/Pangolins%20in%20Namibia%20Poster.pdf>

Link: <https://n-c-e.org/sites/default/files/2021-07/Protect%20pangolins%20poster%202020.pdf>



Chondrichthyans of Namibia

POSTER: This poster shows the Chondrichthyan species known to Namibian waters that are classified as critically endangered or endangered on the IUCN Red list.

AUTHOR: NNF (2023)

Link: https://www.nnf.org.na/images/Endangered_Species_Poster_Copyrightedconverted-revised_compressed.pdf



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Fibonacci Videos

VIDEO: These videos show the presence of the Fibonacci sequence in nature, and other numeracy examples that occur in the natural world.

They illustrate and explain the presence of math and science in nature.

AUTHOR: Etérea Studios (2010), Lumox Nox Pixel Art (2018) Vihart (2012)

Link: <https://www.youtube.com/watch?v=kkGeOWYOFoA>

Link: https://www.youtube.com/watch?v=X_mNMracw5E

Link: https://www.youtube.com/watch?v=IOIP_Z_-0Hs



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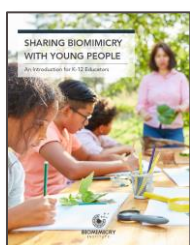
Biomimicry Videos

VIDEO: These videos illustrate how nature's designs can provide an example for the human-built world to imitate in design and practice. They include examples of biomimicry techniques, explaining this principle.

AUTHOR: Vox (2017), Sustainably Illustrated (2020)

Link: <https://www.youtube.com/watch?v=iMtXqTmfta0>

Link: <https://www.youtube.com/watch?v=5FZ9Ryx5zAk>



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Sharing Biomimicry with Young People – An Introduction for K-12 Educators

MANUAL: This guidebook gives a foundation to understanding how to teach biomimicry. It includes resource material and suggestions for introducing the topic to learners.

AUTHOR: Biomimicry Institute (2017)

Link: <https://asknature.org/resource/sharing-biomimicry-with-young-people/>



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Inspiration from Nature – Science, Design and Technology

MANUAL: Acknowledging the role of nature in inspiring and informing science, design and technology, this teacher's guidebook gives activities and resource sheets for learning from and about nature and biomimicry.

AUTHOR: WWF (2020)

Link: https://www.wwf.org.uk/sites/default/files/2020-01/WWF-Biomimicry-Handbook_Activities.pdf



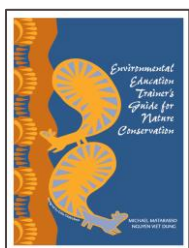
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Techniques from Nature

LESSON PLAN: Exploring the concept of biomimicry, these lesson plans focus on design cycles, biomimicry understanding and using nature-based solutions to solve technical problems.

AUTHOR: P. Janssen, M. de Koning, M. Nijssen, B. Wijffels (2019)

Link: <https://biolearn.eu/wp-content/uploads/2019/10/Techniques-from-nature-Teachers-guide-year-8-11.pdf>



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Environmental Education Trainer's Guide for Nature Conservation

MANUAL: Directed at environmental educators, this guide gives information and correlating activities to build an educator's knowledge and understanding of EE with a focus on conservation.

AUTHOR: M. Matarasso, N. Viet Dung (2002)

Link: https://wwf.panda.org/wwf_news/?88780/Environmental-Education-Trainers-Guide-to-Nature-Conservation



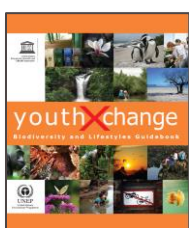
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UNESCO Biodiversity Learning Kit – Volume 2, Activities

MANUAL: This collection of activities on the various aspects of biodiversity, forms an educational kit for inter-disciplinary teaching on the topic; including step-by-step teacher guidance and projected activity outcomes

AUTHOR: UNESCO (2017)

Link: <https://unesdoc.unesco.org/ark:/48223/pf0000245982>



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Biodiversity and Lifestyles Guidebook

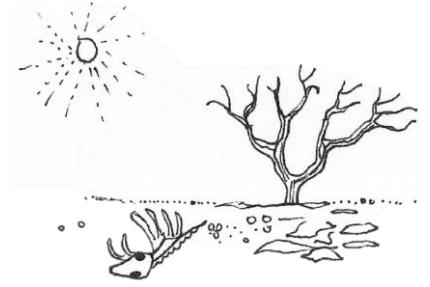
BOOKLET: Aimed at ages 15-24, this booklet in the YouthXchange series contains educational material to build knowledge on biodiversity, and guide on the corresponding practical life skills that protect and sustain the planet.

AUTHOR: UNESCO, UNEP (2015 and 2016)

Link: <https://www.unep.org/resources/publication/youthxchange-guidebook-series-biodiversity-and-lifestyles>

3. CLIMATE CHANGE EDUCATION

Climate Change Education encompasses many different fields including science, society, economics, and politics. It is also interwoven to almost all other environmental topics. The immediate impacts of climate change may not be felt and identified by most of us. We can explore this complex issue through a variety of subjects and areas. We can divide the topic up into:

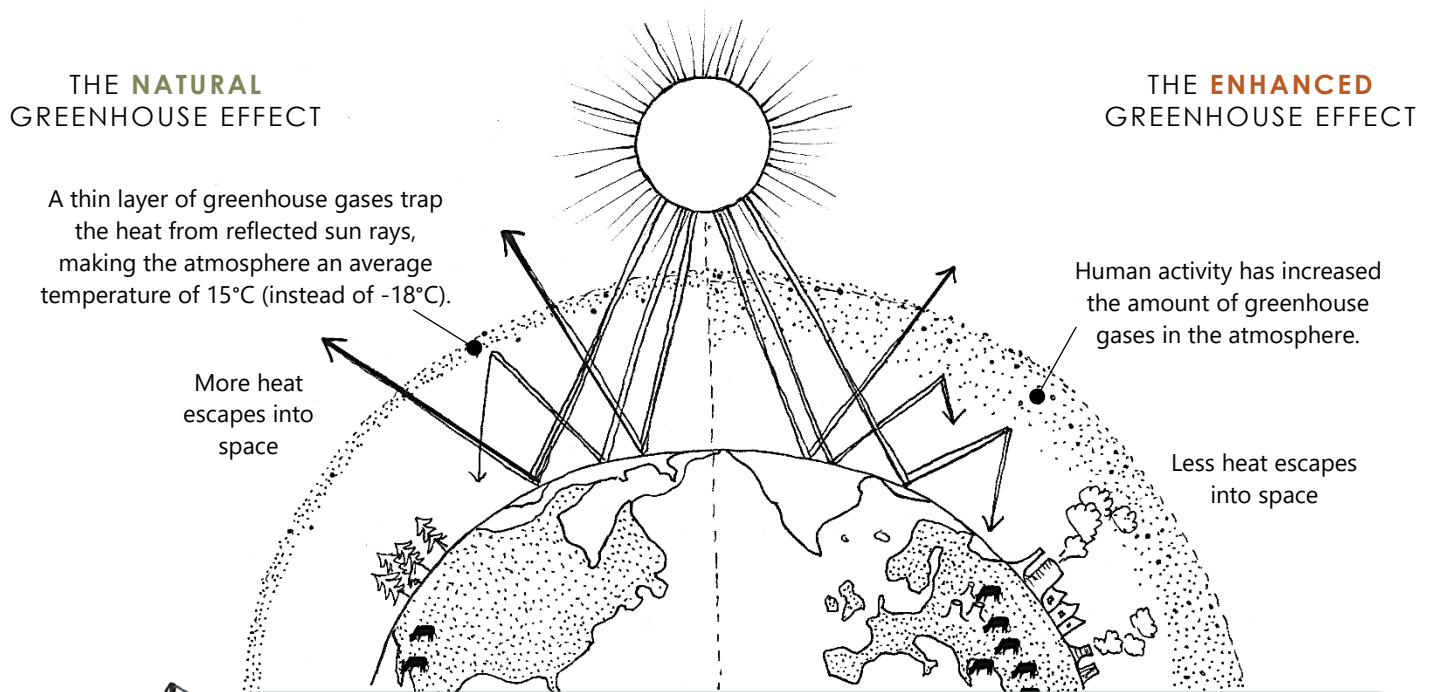


1. the **science** of global warming & climate change and “hot house earth”
2. the **root (human) causes** of global warming & climate change
3. the **impacts** of climate change: on people, countries, biodiversity, and economies
4. the **solutions** to climate change

There are many climate change education resources in *Toolkit 1 – Environmental Knowledge*, that we can use to teach our learners, about the various aspects of climate change. Depending on the topic, we can combine this with climate change fieldwork in *Toolkit 3.9 – Teach in Nature*.

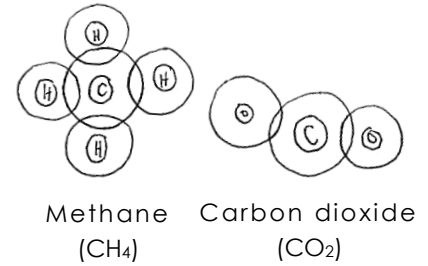
CLIMATE CHANGE SCIENCE

It is important that we teach the science of climate change correctly. Important concepts to distinguish between are the **natural greenhouse effect**, the **enhanced greenhouse effect**, **global warming**, and **climate change**. Understanding climate change goes together with understanding weather and climate in general. We can explain the science of the natural greenhouse effect and pre-historic climate changes.



To explore climate change, use the *Bush Telegraph: Climate Change and Now?* for senior primary learners, and *EduVentures' Changing Climate - Changing Namibia* guide for secondary school learners.

Explore what greenhouse gases are and then look at the industrial revolution where humans started extracting fossil fuels, burn them and release more greenhouse gases into the atmosphere.



CLIMATE CHANGE AND US

IMPACTS

If our learners understand the local impacts that climate change will have - and is having - on our different regions within Namibia, they will be better equipped to adapt to the upcoming challenges, and hopefully be more motivated to reduce further greenhouse emissions.

Keep a lookout for news articles about droughts, floods and heat waves in Namibia, or other natural disasters around the world and map these on a big map of the world. With your secondary school learners, explore what will happen if we do not reign in global warming and experience a state of '**hot house earth**' in a few years.



Use the *Think Namibia* factsheet, poster, and video **Climate Change** to teach the science and impact of climate change in Namibia to secondary school learners. Show them the video and poster **Namibia is Heating Up!** from **Toolkit 1**.

RESPONSES

Let's remember to make the link to climate change when we teach environmental issues such as plastic pollution.

We can explore different responses to climate change including both **mitigation** (reducing further global warming) and **adaptation** (adapting to the change) solutions. Many of these solutions to climate change are also covered in the other toolkits where we can focus on taking action to address climate change. Energy efficiency and climate-smart agriculture are some of these.



Use the *Think Namibia* factsheet, poster, and video **Climate Smart Agriculture** to inspire your learners to start their own climate-smart gardens.

For older learners, one of the most key components of climate change education is to understand the role of **politics and governance**. Large-scale, systemic change cannot be accomplished by individual lifestyles changes alone. Countries and governments need to adopt climate change policies and make commitments and implement adaptation and mitigation strategies.



Let your secondary school learners understand the annual UN Framework Convention on Climate Change (UNFCCC) Convention of the Parties (COP) by studying **My Little COP Pocket Book**.

RESOURCES FOR CLIMATE CHANGE EDUCATION

Junior Primary



Senior Primary



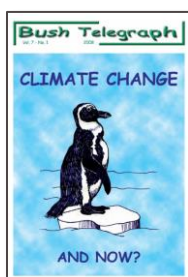
Junior Secondary



Senior Secondary



Teacher



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Bush Telegraph: Climate Change and Now?

BOOKLET: This issue of the *Bush Telegraph* delves into the topic of climate change, looking at past climate shifts, and looks at how Namibia might be affected by future climate change.

AUTHOR: NaDEET (2008)

Link: https://nadeet.org/sites/default/files/ctools/BT_Climate%20Change.pdf



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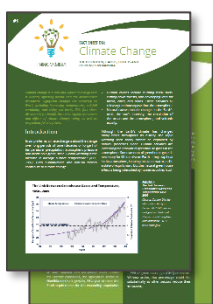
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Changing Climate Changing Namibia

BOOKLET: This booklet delves deeper into the issue of climate change in Namibia, looking at the causes, impacts and solutions within our countries.

AUTHOR: EduVentures (n.d.)



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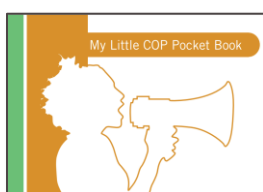
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THINK NAMIBIA - Climate Change & Climate Smart Agriculture

FACTSHEET, VIDEO & POSTER: These factsheets and videos were produced as part of *Think Namibia's* national information campaign to educate on topics of environmental awareness, specifically relating to climate change and the country's sustainable development.

AUTHOR: THINK NAMIBIA (2015)

Link: <https://www.thinknamibia.org.na/projects/environmental-awareness>



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My Little COP Pocket Book

BOOKLET: This is a book to inform the average young person in simple language about the climate change negotiations processes that take place during the annual Conference of the Parties (COP) and by providing a short historical summary of climate change negotiations from the early 1990s.

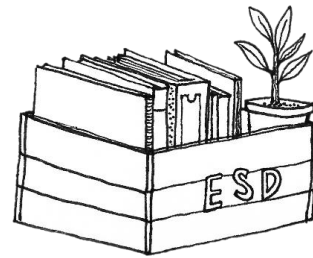
AUTHOR: Green bits Initiative (2018)

Link: https://climatenetwork.org/wp-content/uploads/2021/02/my_little_cop_pocketbook2012.pdf



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