To Whomever this may concern,

Below is our updated content for EduVentures Climate Change Exhibition panels numbered 1 to 6. The finalized panels are being redrawn with a new artistic style by Hangula Werner while the content is being updated by the WPI team. The content below is being sent to be verified and to receive any additional feedback.

The updated content is listed by each Panels Name and Order in the Sequence given to our team. Each section has a newly written and simplified structure along with the removal of some major parts of the panel. The content will be added to the physical panels once the illustrations are completed. We also felt that it was necessary to shift the mini dictionary to the climate change booklet along with some other information as it cluttered each panel with a lot of words.

If you find any sections are incorrect or are deemed too simplified, please let us know and we will be happy to make edits. The highlighted yellow sections below are comments explaining our thinking and understanding for specific parts of this exhibition.

Thank you for your time and cooperation,
Robert Doyle, Braeden Fruchtman, Sam Griffiths, Nick Moy

Panel 1: Changing Climate Changing Namibia

Addition of a QR code where Hangula has an audio recording of him presenting the panels so if he is unable to be at the exhibition, viewers may still get an enjoyable and interactive experience.

Over the Past Century: *Reworded to make structure flow better*

The Earth has experienced an alarming change in climate, a trend which is expected to continue over the next century. This occurrence is known as climate change which negatively impacts the environment and our livelihood.

Vulnerability Quote: *Updated Quote digging more into vulnerability about Namibia and more recent.*

"Continued adaptation efforts are focused on the country's most vulnerable sectors: agriculture, forestry, water resources, and health, and on increasing the country's resilience capabilities, and strengthen the country's social and economic structures against vulnerability" (Climate Risk Country Profile: Namibia. World Bank Group. 2021).

Sustainable development goals: *Felt that it was a good idea to explain what SDGs are at the start of the exhibition, allowing for an easier understanding of the viewers as more appear.*
Created by the United Nations in 2015, Sustainable Development Goals aim to create a more sustainable world through 17 actionable goals. Throughout this exhibition, several sustainable development goals will be explained including their connection to the future climate success of Namibia (*THE 17 GOALS | Sustainable Development*, n.d.).

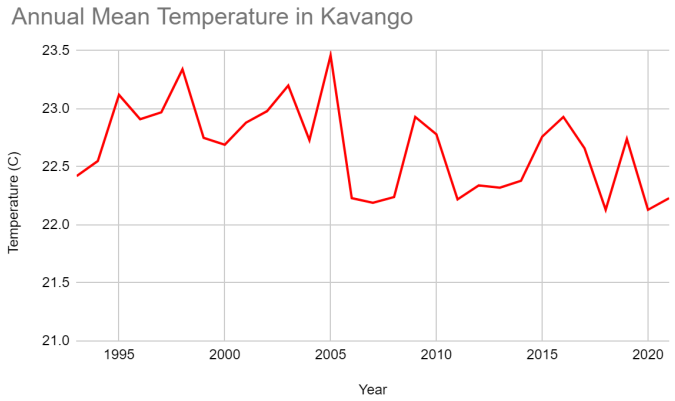
Food For Thought: *Idea is to allow for a more interactive booklet so the viewer can follow along while Presentation*

- Move to the guide booklet but also make sure that hangula knows about the connection to the background drawing

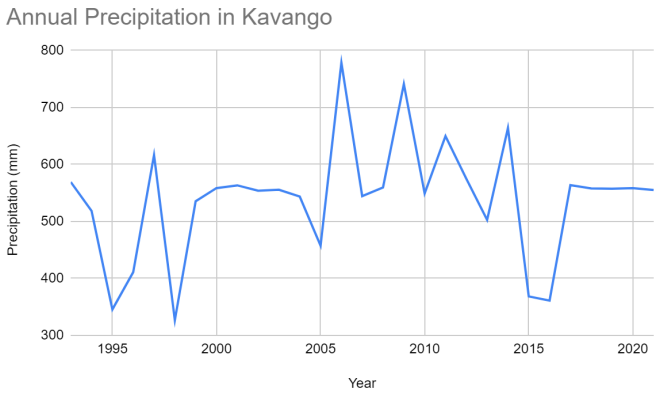
Deficit: *This is subject to change as Hangula is Redrawing the background illustration. Goal is to connect it to rain fall in each region as well based upon color or other key specifics.*

Change to the RainFall key instead, allowing for more clarity.

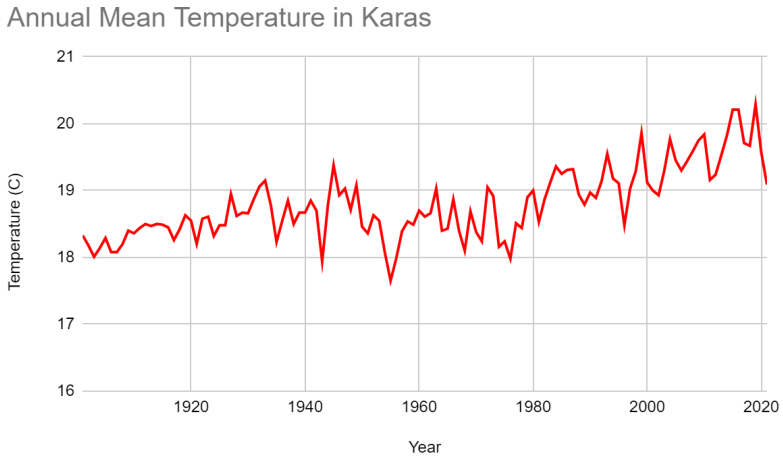
Updated Graphs: *Found using World Bank Climate knowledge portal, annual temperature and precipitation in 3 regions in Namibia: Kavango, Karas and Kunene.*



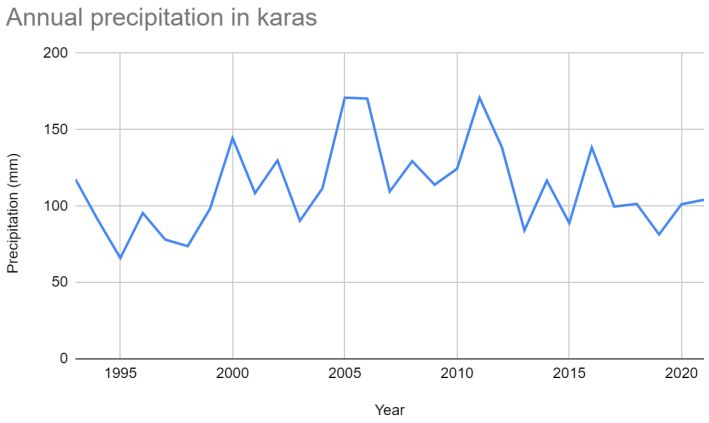
(*Namibia - Climatology | Climate Change Knowledge Portal*, n.d.)



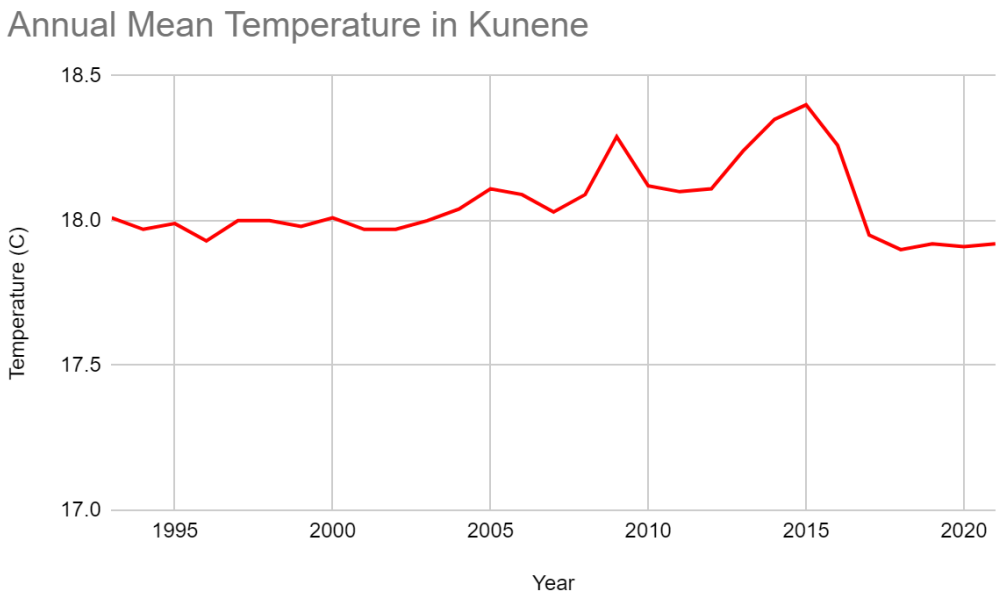
(*Namibia - Climatology | Climate Change Knowledge Portal*, n.d.)

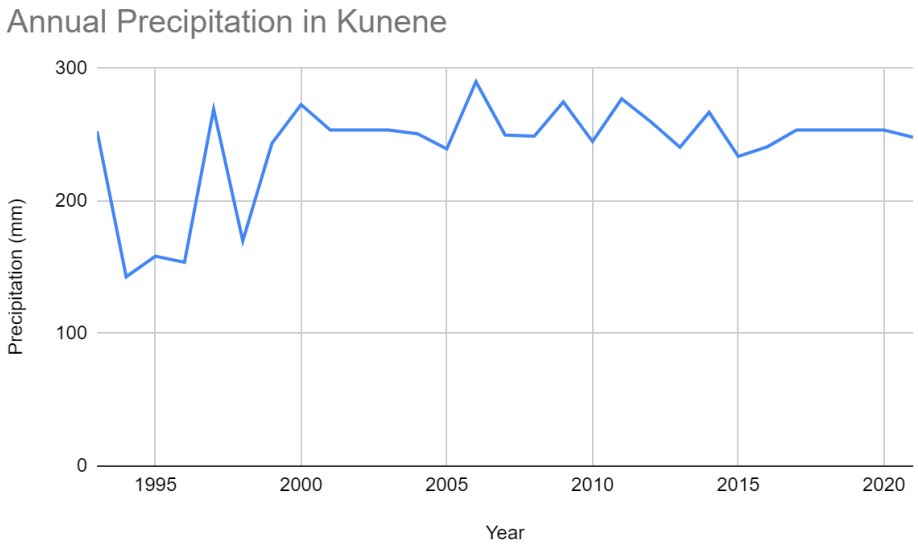


(*Namibia - Climatology | Climate Change Knowledge Portal*, n.d.)



(*Namibia - Climatology | Climate Change Knowledge Portal*, n.d.)





(*Namibia - Climatology | Climate Change Knowledge Portal*, n.d.)

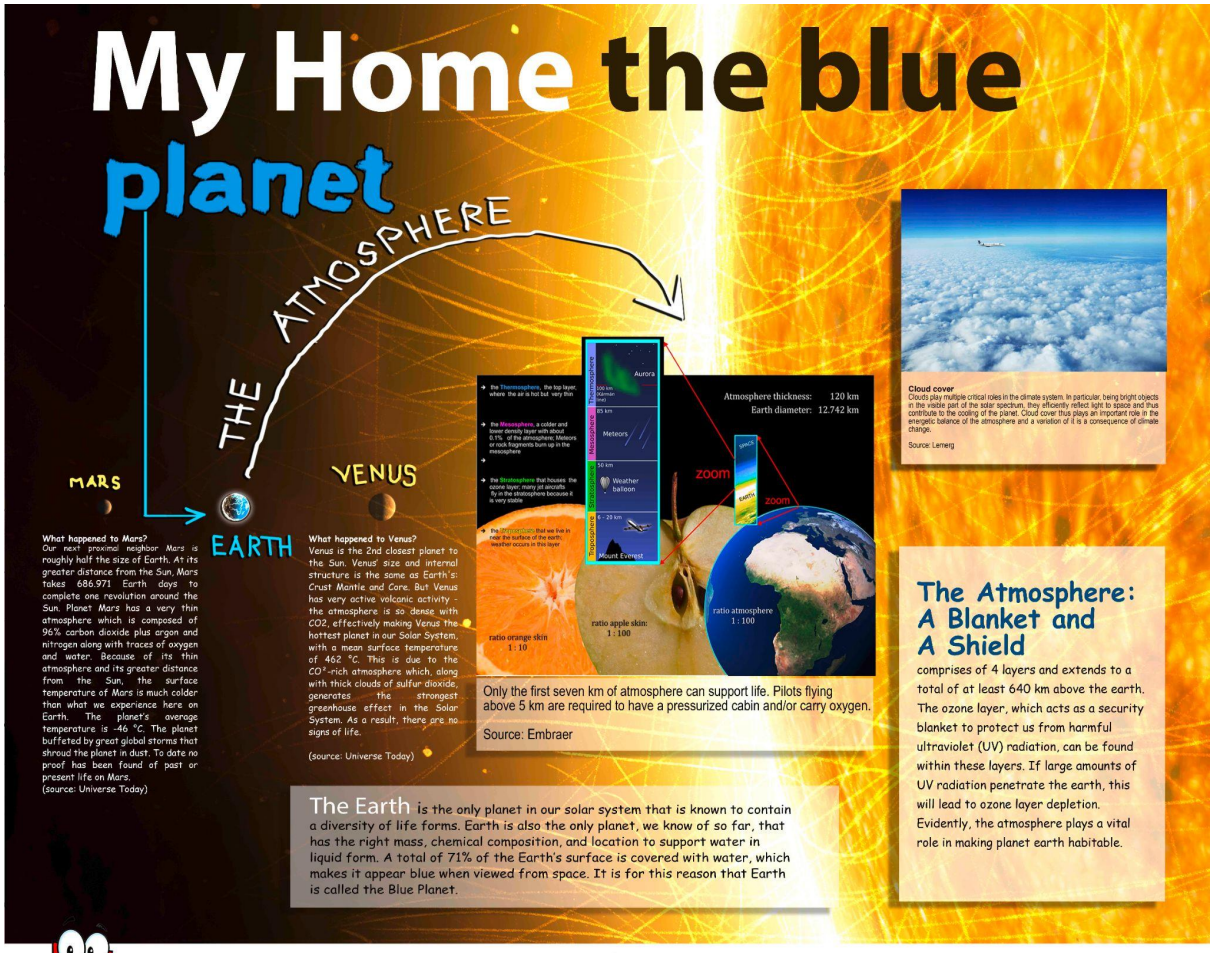
Acknowledgements: *Would be placed in the bottom of the first panel*

This exhibition will share information regarding the reality of climate change and the implications for Namibia. However, it will also highlight the ways in which organizations and individuals can make changes and adapt their lifestyles and economic activities to reduce the effects of climate change on both a local and global scale. Namibia is committed towards reducing the impact of climate change and supports the international campaign to combat these causes and effects.

This exhibition was compiled by the Museums Association of Namibia (MAN), GIZ, Hanns Seidel Foundation, National Ozone Unit (NOU), and EduVentures Trust from the National Museum of Namibia

- *Want to ensure that no organizations need to be added/removed from this list of acknowledgements at the bottom of panel one*

Panel 2: My Home, The Blue Planet



Earth Description-
The Earth is the only planet in our solar system capable of sustaining life. What is different about it compared to Mars and Venus ?

Remove the Mars and Venus Description- *Hangula mentioned never covers this in the presentation, so remove it. Lots of Excess info that distracts*

Remove the cloud cover section - *Lots of Excess info that distracts*

Remove the Atmosphere Blanket - *Lots of Excess info that distracts*

This Section will become larger due to having more space now, allowing for a better comparison of the atmosphere to apple skin. Also makes it more clear on paper when looking at the panel.

Apple Description:

- Ratio of an Apple Skin to an Apple is 1:100

Orange Description:

- Ratio of an Orange Peel to an Orange is 1:10

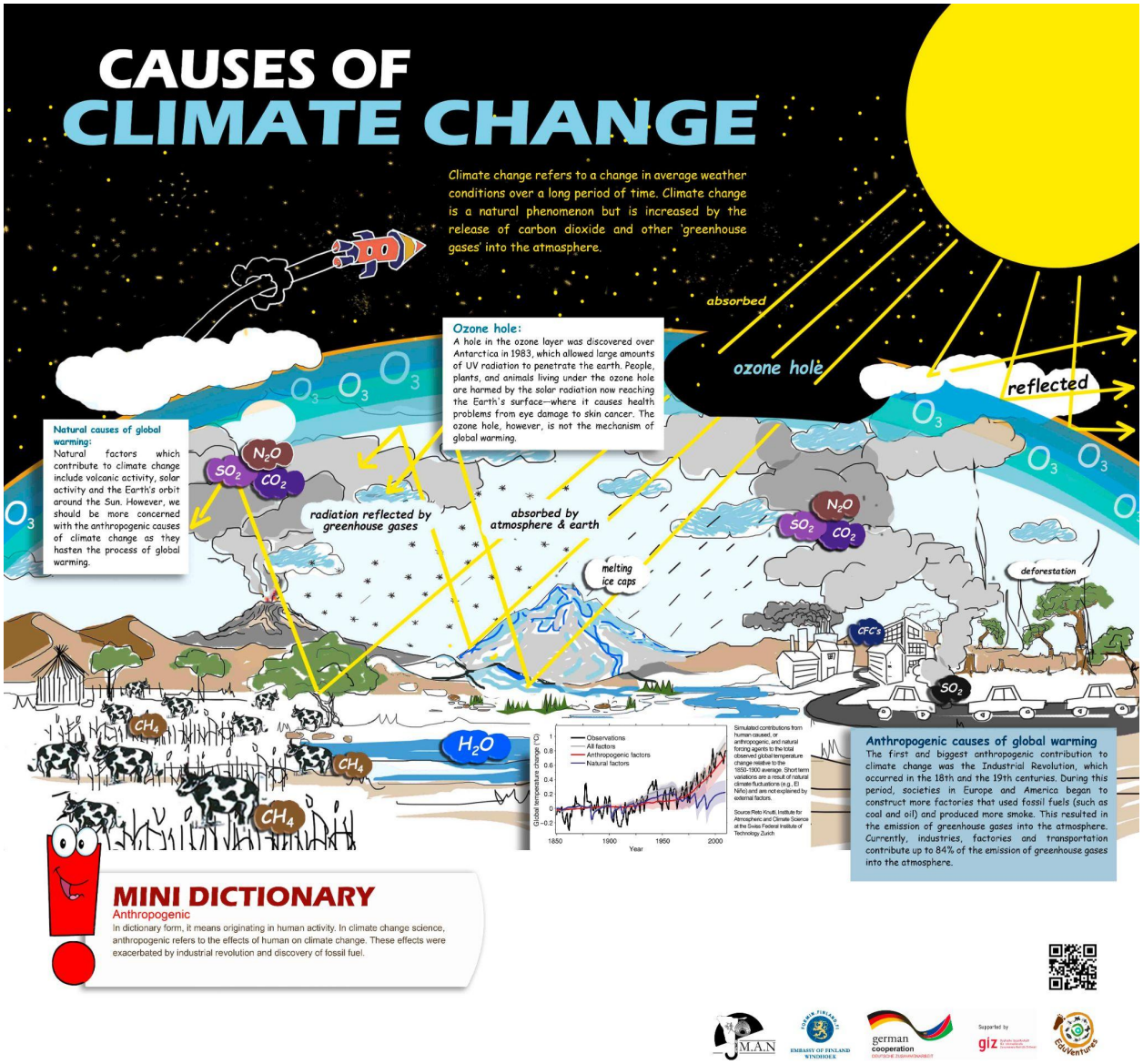
Earth Description:

- Ratio of Earth's Atmosphere to Earth is 1:100

Move Dictionary to the Booklet

- *Terms seem to fit better here instead of taking up a ton of room on each panel*

Panel 3: Cause of Climate Change



Remove the Graph at the bottom of the page

Hangula says he never mentions graph either so can be removed

Remove the Mini Dictionary at Bottom of Page

Move to the booklet again

First Line: *Slight Reword for Clarity*

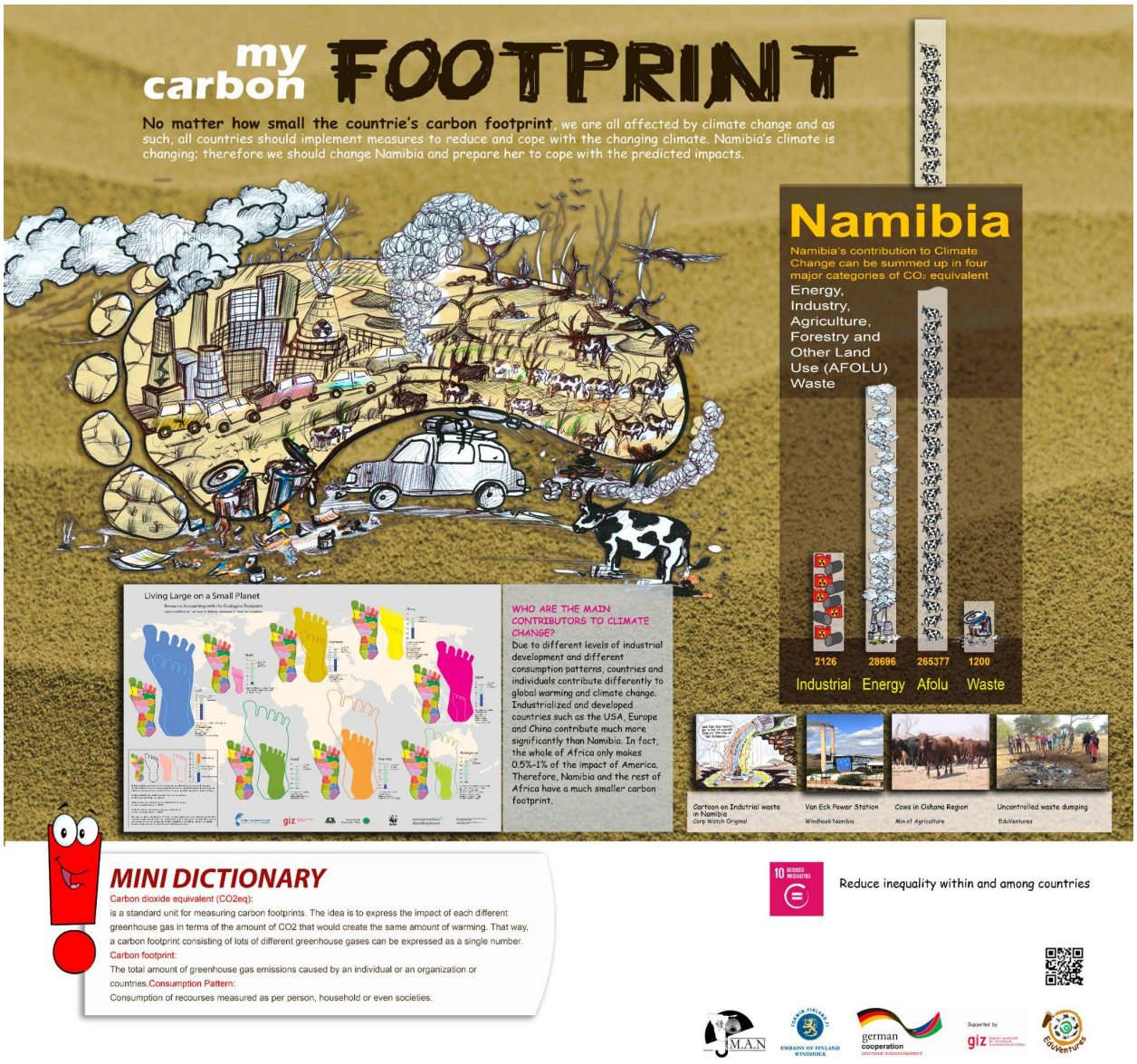
Climate change refers to a change in average temperature and weather conditions over a long period of time. While it is a naturally occuring change, it is increased by humans' release of carbon dioxide and other greenhouse gasses into the atmosphere.

Ozone Hole: *Simplification of Larger Passage, was very wordy before*
Discovered over Antarctica in 1983, holes in the Ozone layer cause UV radiation to penetrate the Earth's atmosphere. UV radiation causes damage to plants and animals, specifically eye and skin damage in humans. The ozone hole does not contribute to global warming and has continued to shrink over the past decade (Torkington, 2023)

Natural Causes of Global Warming: *Simplification of Larger Passage, was very wordy before*
Volcanic activity, solar activity and the Earth's orbit around the sun are some of the natural factors that contribute to climate change. These causes still impact global warming but have a much smaller influence compared to Human Effects (Turrentine, 2022).

Reword Anthropogenic Section:
Human Causes of Global Warming
Human activity is by far the largest contributor to climate change. Since the Industrial Revolution in the 18th and 19th century, the burning of fossil fuels like coal, oil, and gas have produced large amounts of greenhouse gasses. Today, the burning of fossil fuels accounts for 75% of greenhouse gas emissions. (Nations, n.d.)

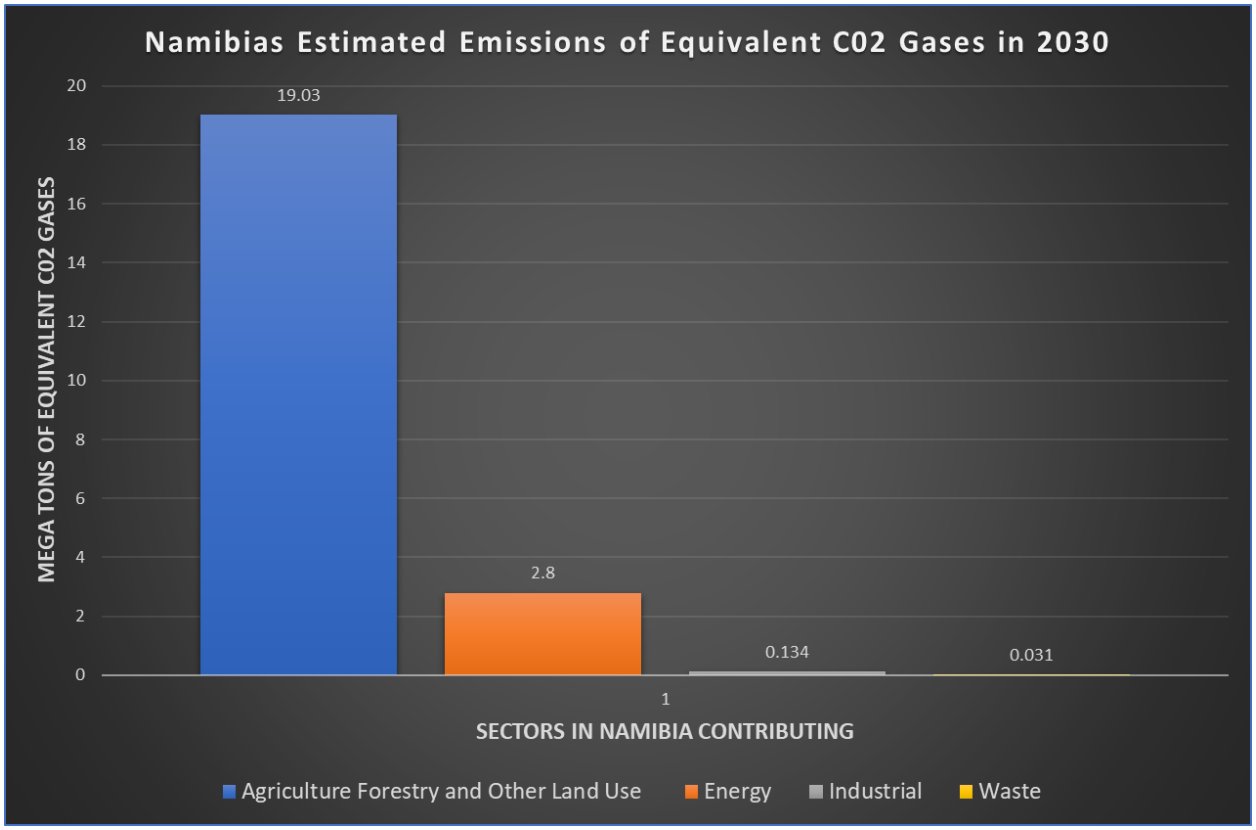
Panel 4: My Carbon Footprint



First Sentence: *Reworded for Better Clarity*
Namibia, like the rest of the world, is affected by climate change and because of this, it should implement measures to reduce and cope with the changing climate.

Remove the Mini Dictionary
Stretch out the footprint diagram with bigger imagery

Namibia's Contribution to Climate Change



(*Namibia's NDC UPDATE*, 2021)

Bullet Points Explaining this: Each Bar may include an image of what it is as well, see below:

- **Hangula could also draw this in his own style if he is interested in doing so**
  - *AFOLU is agriculture items, cow and crops, RAC could be a refrigerator or industrial thing,energy could be gasoline or coal, waste could be a trash can*

- AFOLU, Agriculture Forestry and Other Land Use, is Namibia's Largest contributor, often due to deforestation and poor agricultural practices (*Namibia's NDC UPDATE*, 2021)

- Energy is the second largest contributor of Namibia's emissions. Namibia has a lot of potential for renewable energy if implemented properly. (*Namibia's NDC UPDATE*, 2021)

- Industrial, Refrigeration and Air Conditioning, RAC, and Industrial Processes and Product use, is the emissions from refrigerants and industrial processes and products used. It has a much smaller contribution compared to the other two main sectors (*Namibia's NDC UPDATE*, 2021)

- Waste is the smallest contributor of Namibia's Carbon footprint, but still can be prominently seen in landfills and dumps. Even the smallest footprint is bad (*Namibia's NDC UPDATE*, 2021)

Main Contributors to Climate Change: *Will need to add a drawing of footprints comparing Namibia to a few other countries in the world. Can also go about this in a different approach too.* Every country contributes differently to climate change and global warming. Industrialized countries such as the United States, Japan and China contribute significantly more than Namibia. Namibia has a tiny carbon footprint compared to the rest of the world, and contributes only 0.01% to the global scale (European Commission. Joint Research Centre., 2021).

Footprint Data *Updated Data of the ecological footprints of various countries, from 2018*

Global

- Biocapacity available per person is 1.6 gha and the ecological footprint per person is 2.8, -1.1 biocapacity deficit (Global Footprint Network, 2018)

Namibia's Footprint

- 6.3 Biocapacity per person, 2.4 ecological footprint per person = + 3.9 biocapacity reserve, units of Global Hectares per person (amount of waste per person on Earth) (Global Footprint Network, 2018)

Americas Footprint

- 3.4 Biocapacity per person, 8.1 ecological footprint per person, -4.7 biocapacity deficit (Global Footprint Network, 2018)

Germany's Footprint

- 1.5 Biocapacity per person, 4.7 ecological footprint per person, - 3.2 biocapacity deficit (Global Footprint Network, 2018)

China's Footprint

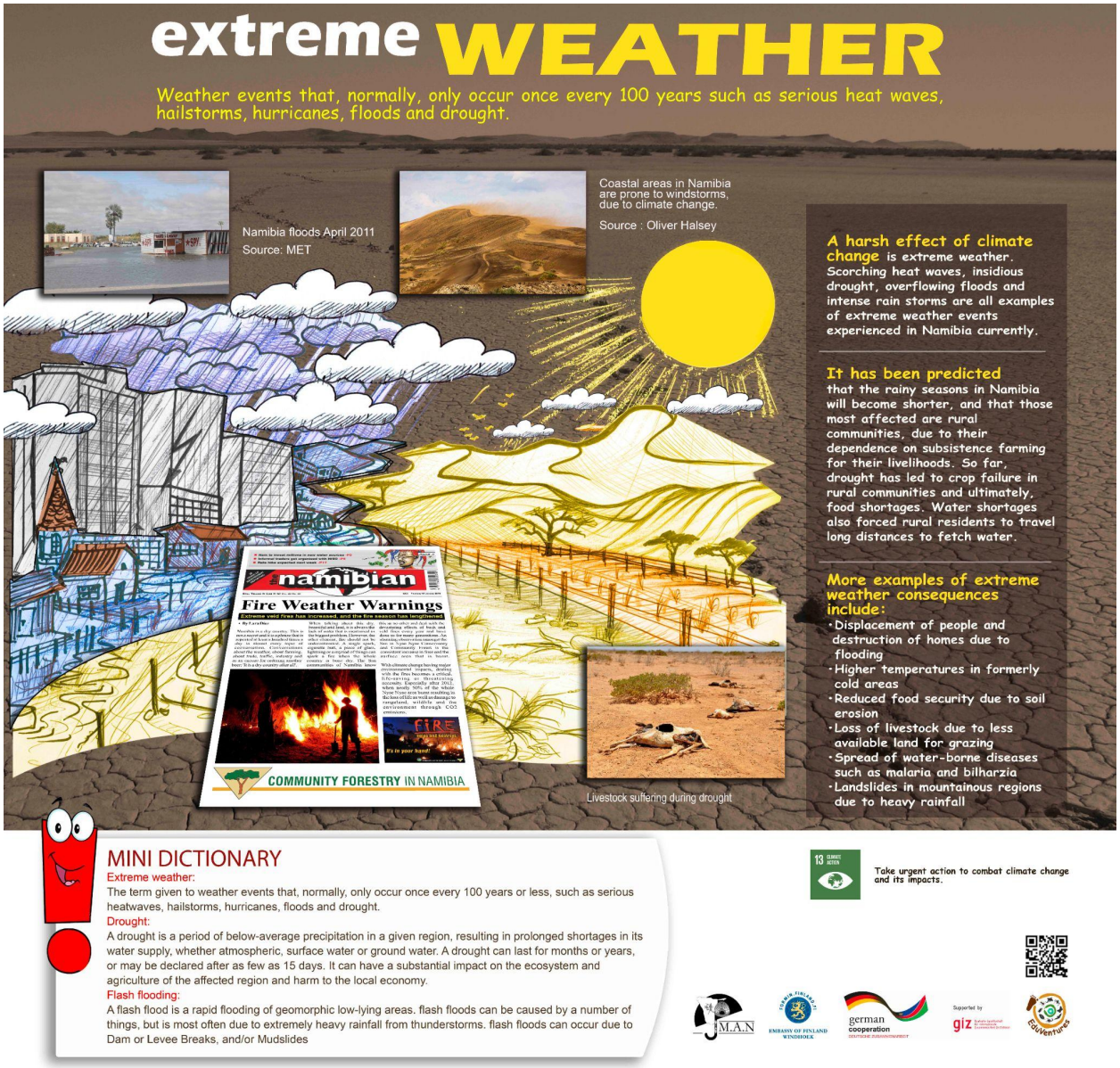
- 0.9 Biocapacity per person, 3.8 ecological footprint per person, - 2.9 biocapacity deficit (Global Footprint Network, 2018)

Key for the Footprints *This explains what the footprint diagram is displaying along with allowing for a better understanding. The initial key is incredibly small and hard to see and understand.*

The Colored footprint outline is the country's biocapacity per person, Gha (Global Hectares per person)

The Solid footprint is the country's ecological footprint per person, Gha

Panel 5: Extreme Weather



First Line *Reworded for Clarity*
Uncommon weather events and disasters have become significantly more common due to the effects of global warming.

Harsh Effect of Climate Change: *Will be adding more imagery for extreme weather along with another new updated illustration from Hangula. All text paragraphs are made into bullet point style and more information is presented in the booklet.*

Climate change can cause extreme weather such as:

- Heatwaves

- Floods
    - 2011 flood

(*Northern Namibia Flooding 2011*, n.d.)

- Hurricanes
- Droughts.
    -  (Zairon, 2017)

Remove "It has been predicted section"

- Leaves more room for the pictures of consequences and feels repetitive

Examples of Weather Consequences: *Images here may be included in the final copy, however there is a possibility we will be taking our own pictures and replacing them as they will be the most up to date possible and all potential licensing issues would be avoided.*

It is predicted that with the worsening effects of climate change, the following will occur:

- Crop failures

 (International Federation of Red Cross and Red Crescent Societies 2016)

- Water shortages
- Loss of livestock

 (Hp.Baumeler, 2018)

- Destruction of Homes
- Spread of diseases

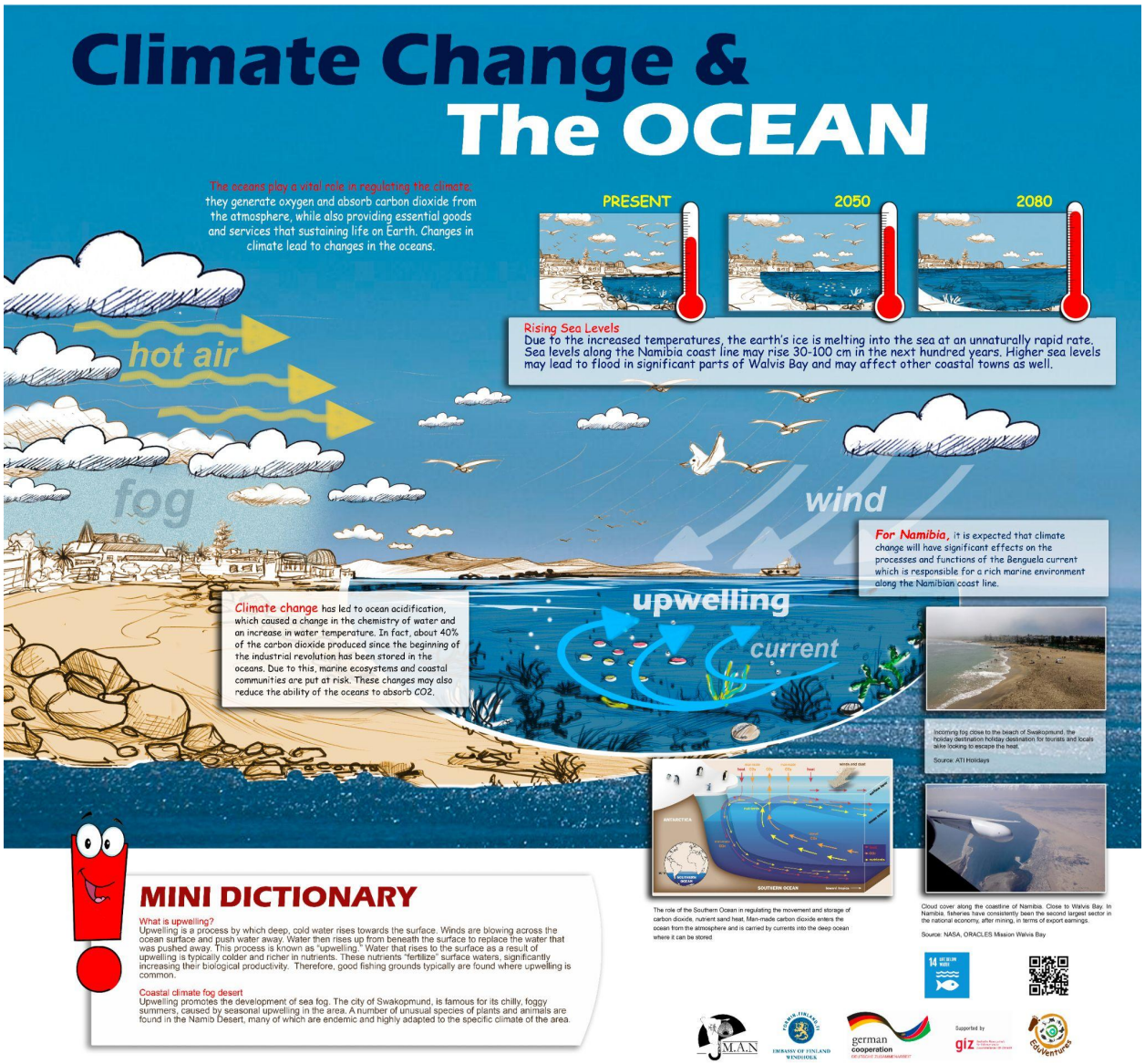
Need an Up to date newspaper about climate change and disasters

- *Or we delete it and allow the illustrations to tell the story*

Remove mini Dictionary

Move to the booklet along with more information on consequences

Panel 6: Climate Change & The Ocean



The Oceans play a vital role in regulating the climate: *Simplification of the section*

- Oceans generate oxygen as well as absorb carbon dioxide from the atmosphere. They also provide other essentials for life on earth

Climate change: *Simplification of the section*

- About 30% of the carbon dioxide produced during the industrial revolution has been stored in the oceans(*What Is Ocean Acidification?*, n.d.). This has led to ocean acidification causing a change in ocean chemistry and increased ocean temperature. Ocean acidification puts marine ecosystems and coastal communities at risk as well as potentially reducing the ocean's ability to absorb CO2.

Rising Sea Levels: *Simplification of the section*

- Due to increased temperatures, Earth's ice is melting at an unnaturally rapid rate. Sea levels may rise by 44-88 cm by 2100(*World Bank Climate Change Knowledge Portal*, n.d.). Higher sea levels may flood Walvis Bay and other coastal towns.

New drawings from Hangula of Swakopmund,

- remove one of the upwelling diagrams

Removal of the pictures in the bottom right,

- *they add take up extra room and repeat the same information as the background illustration*

Leave the talk about the Benguela Current,

- *add additional detail when making the booklet to go more in depth about it, allows for a bigger connection to the viewers*

Remove the mini dictionary

- *Terms can be added in the booklet*

References

European Commission. Joint Research Centre. (2021). *GHG emissions of all world: 2021 report.* Publications Office. https://data.europa.eu/doi/10.2760/173513

Global Footprint Network. (2018). https://data.footprintnetwork.org/?_ga=2.28153215.2118030000.1679560625-1713718163.1679560625#/

International Federation of Red Cross and Red Crescent Societies. (2016). *Southern Africa drought—Mozambique* [Photo]. https://www.flickr.com/photos/ifrc/29256364530/

Namibia—Climatology | Climate Change Knowledge Portal. (n.d.). Retrieved March 16, 2023, from https://climateknowledgeportal.worldbank.org/country/namibia/climate-data-historical

Namibia's NDC UPDATE. (2021).

Nations, U. (n.d.). *Causes and Effects of Climate Change*. United Nations; United Nations. Retrieved March 23, 2023, from https://www.un.org/en/climatechange/science/causes-effects-climate-change

Northern Namibia Flooding 2011. (n.d.). Retrieved March 17, 2023, from https://www.sustainche-farm.org/location-maps/northern-namibia-flooding-2011/

THE 17 GOALS | Sustainable Development. (n.d.). Retrieved March 24, 2023, from https://sdgs.un.org/goals

Torkington, S. (2023, January 26). *The hole in the ozone layer is slowly shrinking | World Economic Forum*. https://www.weforum.org/agenda/2022/12/ozone-layer-hole-update-nasa/

Turrentine, J. (2022, September 13). *What Are the Causes of Climate Change?* NRDC. https://www.nrdc.org/stories/what-are-causes-climate-change

World Bank Climate Change Knowledge Portal. (n.d.). Retrieved March 23, 2023, from https://climateknowledgeportal.worldbank.org/

What is Ocean Acidification? (n.d.). Retrieved March 23, 2023, from https://oceanservice.noaa.gov/facts/acidification.html

Zairon. (2017). *Deutsch: Fußweg zwischen dem Sossusvlei und dem Dead Vlei im Namib-Naukluft-Nationalpark, Region Erongo, Namibia*. Own work. https://commons.wikimedia.org/wiki/File:Namibia_Namib-Naukluft-Nationalpark_auf_dem_Weg_zum_Dead_Vlei_04.jpg