To Whomever this May Concern,

Below is our updated content for EduVentures Climate Change Exhibition panels numbered 7-12. 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. We had some difficulties finding and gaining access to future projection statistics regarding the area of cattle farming and small stock farms. If anyone has any information or sources that may, please send it our way.

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

Panel 7: The Green City

Mitigation section: *Reworded section for clarity*

Mitigation strategies can often be large projects such as greening existing urban environments, but with small changes over time these strategies can become a reality. With an increase in urbanization in Namibia, the need for these strategies is ever growing.

Urban Farming: *Found new initiative to replace old*
Throughout Windhoek the practice of urban farming is becoming a norm with farms such as Farm Okukuna in Goreangab. Through these large projects as well as smaller individual horticulture projects, food can be locally sourced and reduce the need for imported produce. (*Urban Gardening Is Helping to Fight Hunger and Malnutrition in Goreangab, Windhoek City.* | *United Nations Development Programme*, 2021)

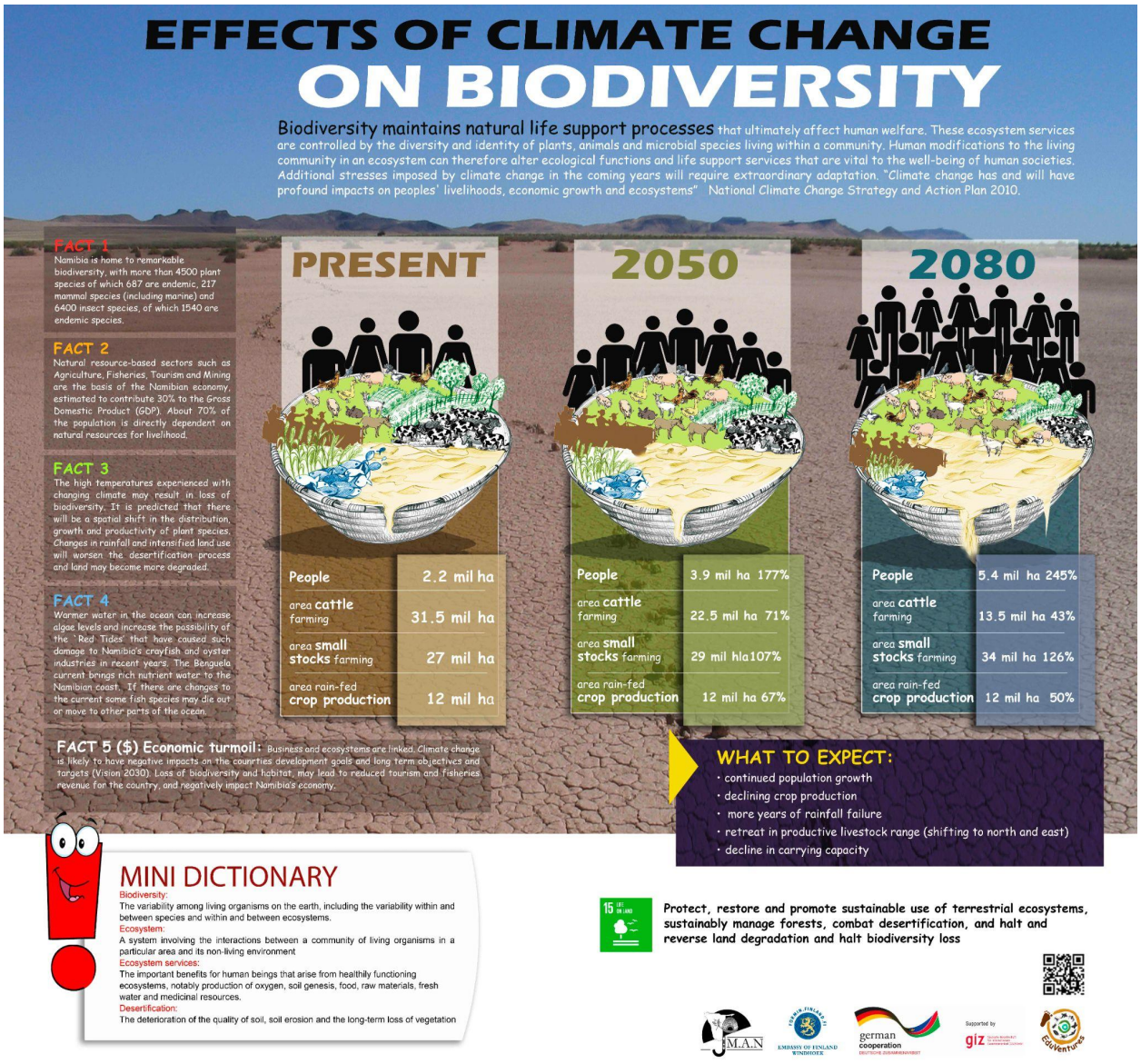
Green Building: *New Initiative to replace outdated ones*
The places we live, work, and learn account for 40% of our greenhouse gas emissions due to energy consumption and the use of heating and cooling. The Green Building Council of Namibia (GBC) promotes a future of environmentally conscious buildings and allows for a more sustainable future for all namibians. (*Green Building Council*, n.d.)

Electric Cars: *New Initiative to replace outdated ones*
Petrol-powered vehicles cause local air pollution and increase carbon emissions. Throughout Namibia there is an ongoing push to increase the number of electric vehicles on the roads. Over the lifetime of a car, an electric vehicle can emit 30% less carbon than its gas powered counterpart. (*Benefits of Electric Cars on the Environment*, n.d.)

Rent-A-Drum: *New Initiative to replace outdated ones*
Is a company that aims to collect and remove waste from cities across Namibia. Utilizing their drums keeps cities clean and prevents land degradation due to litter. In addition to waste collection, the company sorts and recycles.(*Rent-A-Drum*, n.d.)

We are still looking for input on other initiatives we could talk about on this panel

Panel 8: Effects of Climate Change on Biodiversity



First Line: *Reworded for conciseness*
Biodiversity maintains the natural life support process that ultimately affects human welfare. Each ecosystem is controlled by the diversity of plants, animals and microbes living within a community. Human modifications in an ecosystem can alter and destroy the functionality and biodiversity, which can take years of adaptation to solve.

Data of food baskets: *Hangula will be redrawing each basket with more content and clarity*
https://www.giz.de/en/downloads/giz2022-en-namibia-agriculture.pdf

Present Data: *Data from Statista, need to be questioned about whether the area can be found or can just percentages be used*

- Population of 2.6 Million in 2023 (*Namibia Population 2023 (Live)*, 2023)
- Commercial Farming takes up 44% total land, supports 10% population
- Communal Farming takes up 41% total land, supports 60% population
- 47.1% of land used for agriculture
- Area of commercial cattle farming is 21.5% for commercial cattle farming (Engler et al., 2019)
- Area of small stocks farming is 275,000 square kilometers so it is 33.41 % of total land (Mendelsohn, n.d.)
- 260 square kilometers for intensive farming so 0.03 % land used for intensive

Future Data 2050 *Projected data and approximations*

- Population projected to be 3.78 million in 2050 (*Namibia Population 2023 (Live)*, 2023)
- Agriculture land use projected 47.38% of land used for agriculture (*Namibia - Agricultural Land (% Of Land Area) - 2023 Data 2024 Forecast 1961-2020 Historical*, 2021)
- Area of commercial cattle farming is
- Area of small stocks farming is 35.24 %
    - *If anyone has access to a data set for area of farms that would be appreciated as they are based off of the previous data set*
- Area of intensive farming is project to be

Future data 2080: *Projected data and approximations done by using average growth rates*

- Population projected to be 4.73 million in 2080 (*Namibia Population 2023 (Live)*, 2023)
- Agriculture land use projected to be 47.45% of land used for agriculture (*Namibia - Agricultural Land (% Of Land Area) - 2023 Data 2024 Forecast 1961-2020 Historical*, 2021)
- Area of commercial cattle farming projected
- Area of small stocks farming is projected to be 41.31%
    - *If anyone has access to a data set for area of farms that would be appreciated as they are based off of the previous data set*
- Area of intensive farming is projected to be

Simplification of the Facts: *Make the Facts into bullet points allowing for the background to be more of the entire panel, makes it a bit more clear, also make them up to date*

Fact 1: *Reword to a bullet point format and updated with information*

- Namibia's biodiversity contains over 4000 plant species (WildWeb, 2023), 223 mammal species, 4464 reptile species, over 10,000 species of birds, 3421 species of Amphibians and 4906 species of mollusk (*Mammals of Namibia*, 2023)

Fact 2: *Reword and updated statistics*

- Agriculture, Fisheries, Tourism and Mining are the basis of the Namibian economy, contributing to approximately 33% of the Gross Domestic Product. Seventy percent of the population depends on agriculture for income or livelihood (GIZ, 2019)

Fact 3:*Replace with a better up to date fact, still about biodiversity*

- Human activities are causing a loss of Biodiversity which leads to a decrease for the suitability of eco-tourism, along with limiting land productivity (*Namibia's NDC UPDATE*, 2021).

Fact 4:*Reword and explain why redwave is deadly*

- Human activities disturb ecosystems causing Harmful Algal Blooms or a red wave, to occur more often. HABs are toxic to the ecosystem and wildlife in it, killing fish, mammals and even humans in some cases (NOAA, 2016).

Fact 5: *New fact about improving the resilience to climate change*

- Bush thinning can improve resilience to climate change for the livestock industry, which accounts for 90% of Namibia's agricultural production as well as 60% of the population owning cattle (*Namibia's NDC UPDATE*, 2021).

Remove mini Dictionary

- *Shift definitions to the booklet.*

Remove What to Expect Section

- *Ideas can be placed in the booklet, essentially saying what will be stated about how each category above is changing. May need to update based upon what data has been found*

Move SDG over and enlarge so it is easier to read

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Kavango Region Land use

- Land will decrease due to desertification, loss of graze lands
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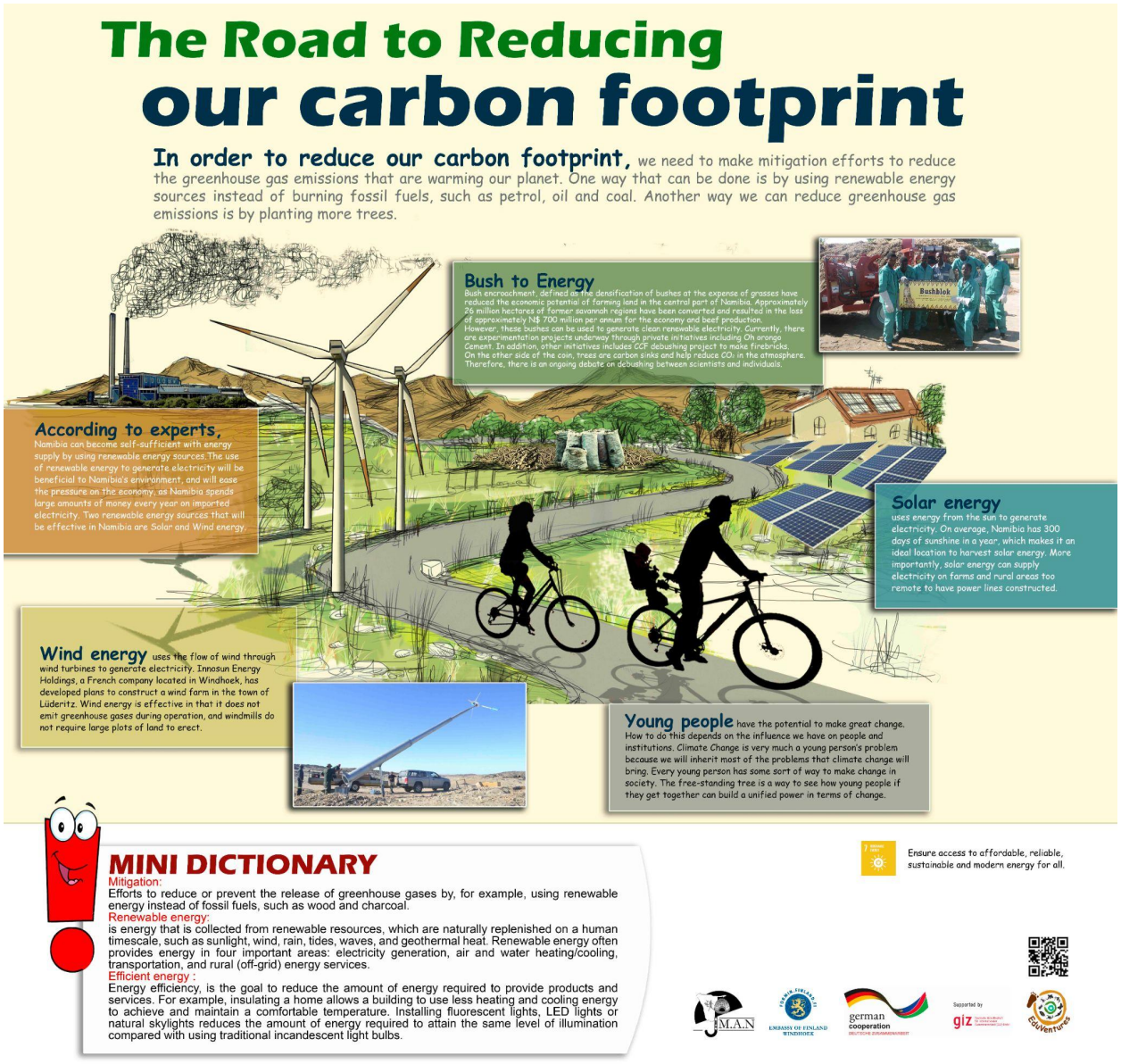
Panel 9: The Road to Reducing our Carbon Footprint



First Line: *Reworded, was very wordy initially*

To reduce our carbon footprint, we need to make mitigation efforts to reduce greenhouse gas emissions. Renewable energy is a great alternative to burning fossil fuels that release these greenhouse gasses.

According to Experts: *Reword and add statistics. Also give a new title that makes more logic sense*

Renewable Energy in Namibia: *(New Title)*

Namibia plans to reduce its carbon emissions by 91% by 2030 (UNDP Climate Promise, 2021). To do this, renewable energy sources will play a huge role as they have zero carbon emissions. Solar, wind energy ,wave power and green Hydrogen can be extremely effective in Namibia

Wind Energy: *Reworded section on wind farms and included a better image of a windfarm*

Wind turbines use the flow of wind to generate electricity. Wind energy does not emit greenhouse gasses and does not require large amounts of land to operate.

- *Include a picture of wind farm*

(Zaafarana, 2007)

Young People Section: *Reword title and the section*

Younger Generations: *(New Title)*

Young people have the potential to make a great change. The youth will inherit the climate change problems and have the ability to make a change in society.

- Maybe add example of how youth have changed society in Namibia
    - Need examples from committee

Bush to Energy: *Reworded and condensed slightly*
Unwanted invading bush is collected from cattle rangelands and burned into a suitable energy form. The project is implemented by Ohlthaver & List Group and was found to be effective and sustainable compared to the burning of fossil fuels (Fund, 2016).

Solar Energy: *Reword and verified the stat was correct*
Solar panels absorb energy from the sun and convert it into electricity. Namibian has 300 sunny days a year, which allows for efficient harvesting of solar energy. Solar panels can also be used in rural regions, allowing for electricity in remote regions of the country.

- *Solar panel picture included*

Wave Power: *Add New Section for Energy, may not be added but is an option*

Wave power is the energy harnessed from the up and down motion of the waves powering a turbine. Namibia's coastline is 1572 km Along the Atlantic ocean and has a potential of harvesting 21 TWh a year from the waves (*Wave Energy Potential Namibia* -, 2021). Namibia as a whole consumed 3.8 TWh in 2020 (*Namibia - Countries & Regions*, n.d.).

Green Hydrogen: *Add New Section for Energy,may not be added but is an option*

Green hydrogen is the process of using renewable energy such as wind and solar energy to split water into hydrogen and oxygen. The hydrogen can then be used to power cars, trucks, and other forms of transportation. (*What Is Green Hydrogen*, n.d.)

Hydro Power: *Add New Section for the energy*

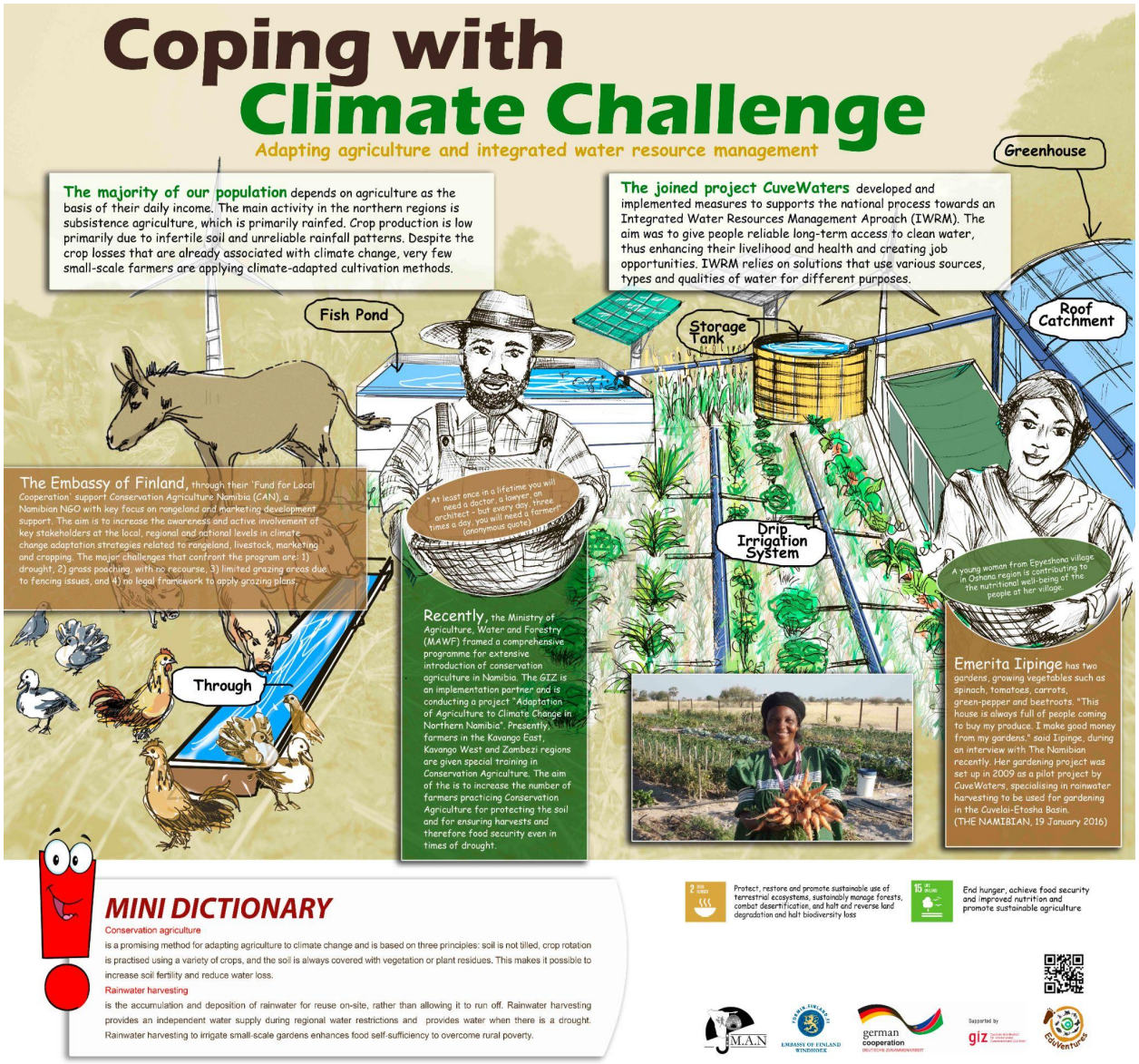
Hydro Power is using rivers and dams to make electricity. Namibia Currently has the Ruacana hydro power station capable of generating 330 MW and the potential to generate 2250 MW of hydro electric power. (*Namibia: Country Profile | Hydropower & Dams International*, 2018)

Remove singular photo of the wind turbine

Remove Mini dictionary

- *Move to the booklet*

Panel 10: Coping with Climate Challenge



Removing the bottom section allows for larger pictures and boxes for paragraphs.

Majority of our population *Reworded the section*

- Sixty percent of the population relies on subsistence agriculture for income. Mainly used
- In northern regions, this type of agriculture is largely rainfed. Income in the area remains
- low due to limited market access and high-quality switch needs that can grow in drought
- conditions. Despite this, few farmers in the region are practicing climate adapted
- cultivation methods. (*Sector Brief Namibia: Agriculture*, n.d.)

The joined project CuveWaters *Removed and replaced with new projects*

Recently (under male farmer) *Removed and replaced with new projects*

Remove Embassy of Finland section

F4R initiative *New Initiative that is up to date about farming resilience in rural areas*

- GIZ in partnership with the ministry of agriculture, water, and land reform are conducting
- this initiative with the goal of making the farming sector of namibia more resilient in the
- face of droughts. The initiative takes a holistic approach in helping smaller farms
- become more resilient by adapting both production and distribution aspects of these
- farms.(giz, 2021)

The Green Schemes *New initiative to replace outdated ones*

- The green scheme is a government initiative to maximize efficiency of irrigation to small
- stock farmers along the perennial rivers bordering Namibia. Agribank has begun work on
- this project implementing the Project Etunda for 82 small scale farmers. (*Green*
- *Schemes Agribank - Your All Season Bank*, 2023)

Neckartal Dam *Initiative that is ongoing and the irrigation process is coming*

- The Neckartal Dam stores 857 Million cubic meters of water with the primary purpose to
- irrigate high-value crops and accelerate agriculture activity. Planning of the irrigation
- scheme has begun as various stakeholders begin to collaborate on the initiative. (*Namibia - Agricultural Sector*, 2022)

Panel 11: Meeting the Challenge

Hangula will clean up the drawings and the font - The drawings are nice and the point comes across well, the font can be hard to read at times

Text box sizes will be adjusted so that they are the same, more neat and appealing - Boxes on the bottom are different sizes and not aligned, just needs to be adjusted

Pictures remain the same - The point of the pictures comes across well and don't need to be changed

“Achieving the Goals” will be redundant from the SDG description on the first slide and will be removed - No need to have two descriptions of the SDGs

Panel 12: Hand

Will be redrawn by hangula

Will update initiatives.

Will update the population.

Current Population: 2.6 mil (*Namibia Population (2023) - Worldometer*, n.d.)

Government and Politics

Add updated policies and government agencies

- Paris Agreement
- National Climate Change Committee (NCCC)
- Ministry of Environment and Tourism (MET)
- National Policy on Climate Change (NPCC)
- Harambe Prosperity Plan
- National Development Plan (NDP5) 30% reduction of emissions against Business as usual projection
- Namibian Environmental Education and Education for Sustainable Development Policy

Initiatives and NGOs

- The Green Scheme
- F4R Initiative
- Rent-a-Drum
- Urban Farming

Schools and Environmental Societies

- Fridays for Future Windhoek
- Goethe Institute 'Schools Go Green with Goethe'

Private Sector and Business Communities

- Nedbank (Green Building Council)
- Namibian Community-based Natural Resource Management & Enhance Direct Access (EDA)

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