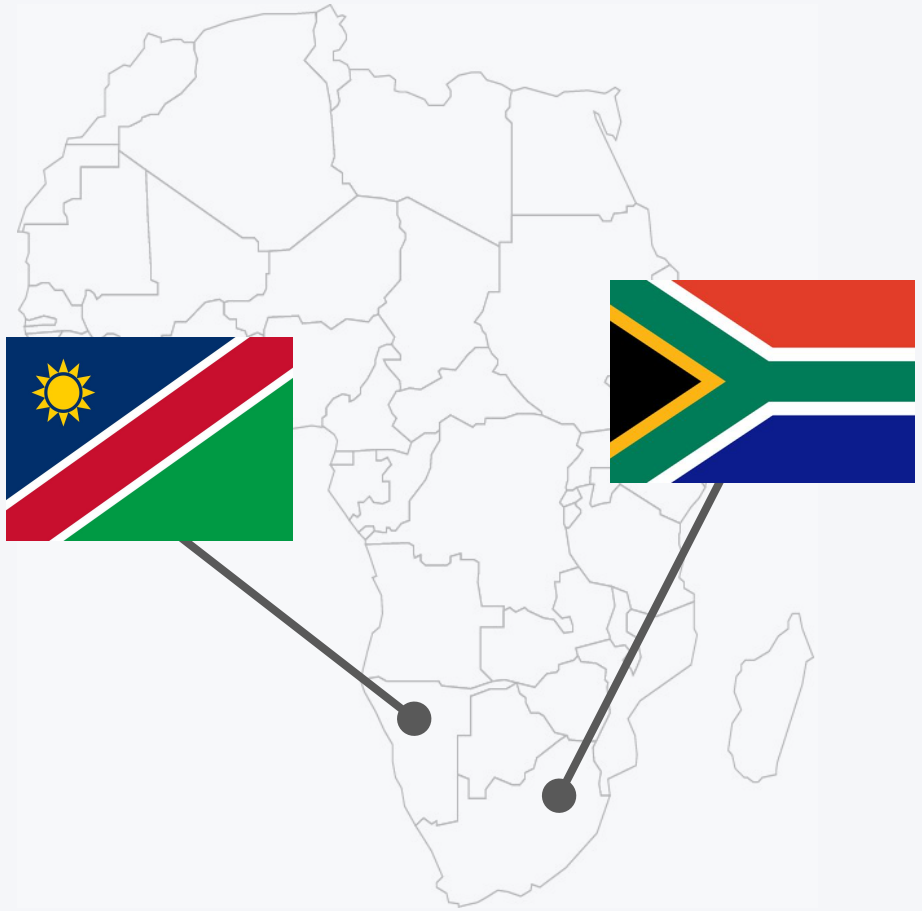
Namibia and South Africa Populations

Evaluating each Post Namibia's Independence

EEP153 SP'24
Team Malthus



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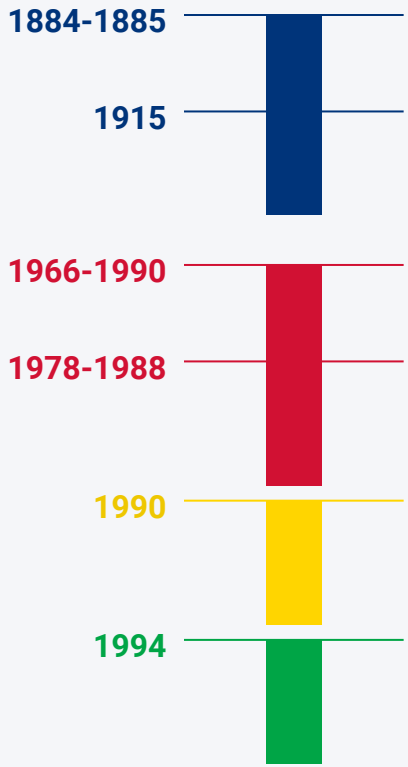


Pre - Independence

Namibia becomes a German colony known as German South-West Africa.

South African forces occupy Namibia during World War I, establishing a League of Nations mandate.

Independence Struggle

SWAPO launches a guerrilla war for independence against South African rule.

UN Resolution 435 outlines a plan for Namibian independence, and negotiations with South Africa begin.

Independence

Namibia gained independence from South Africa. Sam Nujoma becomes the first President.

Post-Independence

Democratic elections, leadership changes, and ongoing challenges, including economic issues, land reform, and responses to global events like the COVID-19 pandemic.

Goals of our Project

How have Namibia's and South Africa's population differed after Namibia's independence?

- How do the **population growth rates** in each country reflect this?
- How do **rural** and **non-rural areas** in Namibia and South Africa differ?
- How does **land use** and **land quality** play into this?
- How does **agricultural production** vary in each country?
- What are the **major industries** supporting each country's economy?

Population Growth Rates

Breakdown of each population growth percentage in contrast to the world average

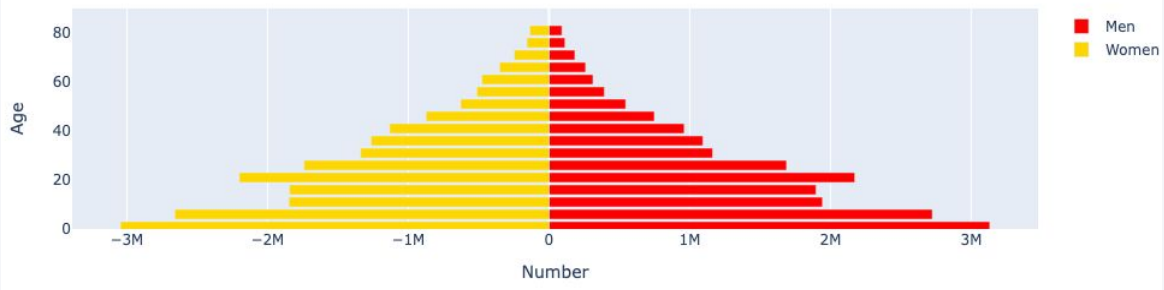
- The Namibian population growth rate faced a huge **spike** post-independence
- Namibia also has **higher** growth rates than the **world**
- High growth rates are associated with **developing countries**
- **Factors** affecting growth:
  - birth rates
  - death rates
  - migration

Country Population Compositions

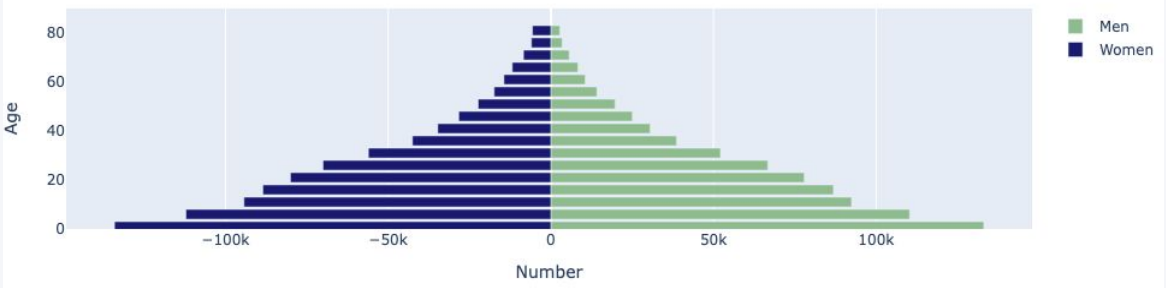
Breakdown of each population by gender and age in 1990

Similarly shaped pyramids but completely different population sizes

South Africa Population Composition



Namibia Population Composition

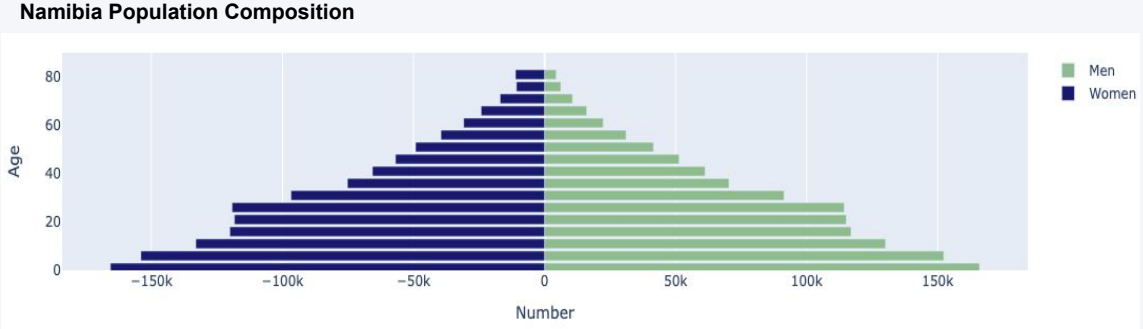


Country Population Compositions

Breakdown of each population by gender and age in 2020

Slightly more “rounded” pyramid for South Africa

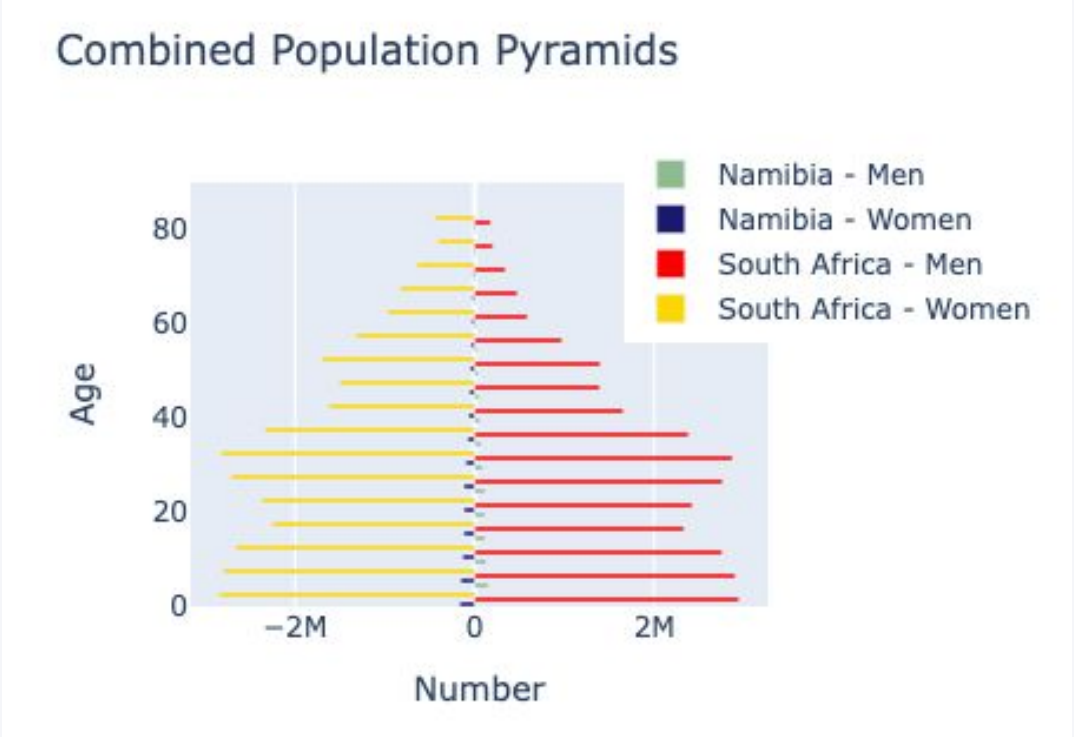
Young population in Namibia



Population Comparison

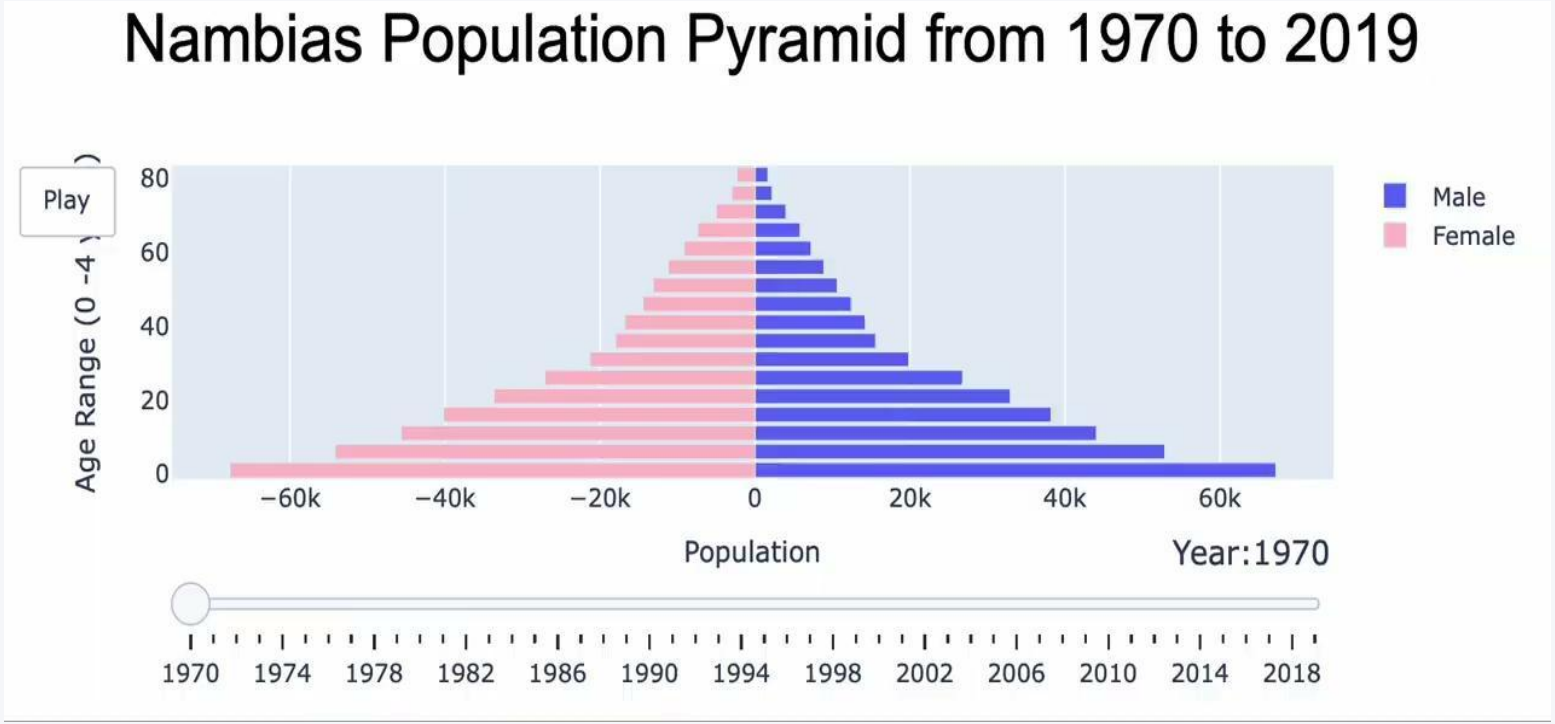
Contrasting each country's population composition side-by-side

Namibia is much smaller in population than South Africa



Population Comparison - Live

Contrasting each country's population over times



Population Comparison - Code

Reviewing the code to our animated pyramid

```python
def ages_range():
    ls = [] # List
    #Five year increments
    for i in range(0,80,5):
        ls += [(f"{i:02d}"+f"{i+4:02d}")]
    ls = ls + ["80UP"]
    return ls
def pop_dataframe(setting):
    catgry = catgry_ls()
    try:
        pop = wbdata.get_dataframe(catgry,country=setting)
        return pop
    except:
        print(f'Could Not Return valid Dataframe for {setting}')
        return 'Invalid Country'
def catgry_ls():
    ls = []
    for i in range(0,80,5):
        ls += [(f"{i:02d}"+f"{i+4:02d}")]
    ls = ls + ["80UP"]
    fem_catgry = {"SP.POP."+s+".FE":"Females "+s for s in ls} #Female
    mal_catgry = {"SP.POP."+s+".MA":"Males "+s for s in ls} # Male

    catgry = {**mal_catgry, **fem_catgry}
    return catgry
def anim_pyr(pop, years):
    py.init_notebook_mode(connected=True)
    layout = go.Layout(
        barmode='overlay',
        yaxis=go.layout.YAxis(range=[0, 90], title='Age'),
        xaxis=go.layout.XAxis(title='Number'),
        title=dict(text='Initial Plot Title', x=0.5, font=dict(color='black', family='Arial', size=32))
    )
```

```python
)
ls = ages_range()
frames = [go.Frame(
    data=[
        go.Bar(
            y=[int(s[:2]) + 1 for s in ls],
            x=pop.loc[str(year), :].filter(regex="Male").values,
            name = 'Male',
            marker=dict(color='light blue'),
            orientation='h',
        ),
        go.Bar(
            y = [int(s[:2]) + 1 for s in ls],
            x = -pop.loc[str(year), :].filter(regex="Female").values,
            name = 'Female',
            marker=dict(color = 'pink'),
            orientation='h',
        )
    ],
    name=str(year),
) for year in years]
fig = go.Figure(data=frames[0]['data'],frames=frames, layout=layout)
fig.update_yaxes(title_text='Age Range (0 -4 years)')
fig.update_xaxes(title_text='Population')
fig.update_layout(title_text=f'Nambias Population Pyramid from {years[0]} to {years[-1]}')
fig.update_layout(updatemenus=[dict(type='buttons', showactive=False, buttons=[dict(label='Play',
                                    method='animate', args=[None, dict(frame=dict(duration=
                                    fromcurrent=True)])])])
fig.update_layout(sliders=[dict(yanchor='top', xanchor='left', currentvalue=dict(font=dict(size=16),
                          prefix='Year:', visible=True, xanchor='right'), transition=dict(duration=
                          steps=[dict(args=[[frame.name], dict(frame=dict(duration=300, redraw=True
                          transition=dict(duration=300))], label=str(frame.name), method='animate')
```

```python
            x=pop.loc[str(year), :].filter(regex="Male").values,
            name = 'Male',
            marker=dict(color='light blue'),
            orientation='h',
        ),
        go.Bar(
            y = [int(s[:2]) + 1 for s in ls],
            x = -pop.loc[str(year), :].filter(regex="Female").values,
            name = 'Female',
            marker=dict(color = 'pink'),
            orientation='h',
        )
    ],
    name=str(year),
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fig = go.Figure(data=frames[0]['data'],frames=frames, layout=layout)
fig.update_yaxes(title_text='Age Range (0 -4 years)')
fig.update_xaxes(title_text='Population')
fig.update_layout(title_text=f'Nambias Population Pyramid from {years[0]} to {years[-1]}')
fig.update_layout(updatemenus=[dict(type='buttons', showactive=False, buttons=[dict(label='Play',
                                    method='animate', args=[None, dict(frame=dict(duration=480,
                                    fromcurrent=True)])])])
fig.update_layout(sliders=[dict(yanchor='top', xanchor='left', currentvalue=dict(font=dict(size=16),
                          prefix='Year:', visible=True, xanchor='right'), transition=dict(duration=320,
                          steps=[dict(args=[[frame.name], dict(frame=dict(duration=300, redraw=True), mo
                          transition=dict(duration=300))], label=str(frame.name), method='animate') for

fig.show()
```
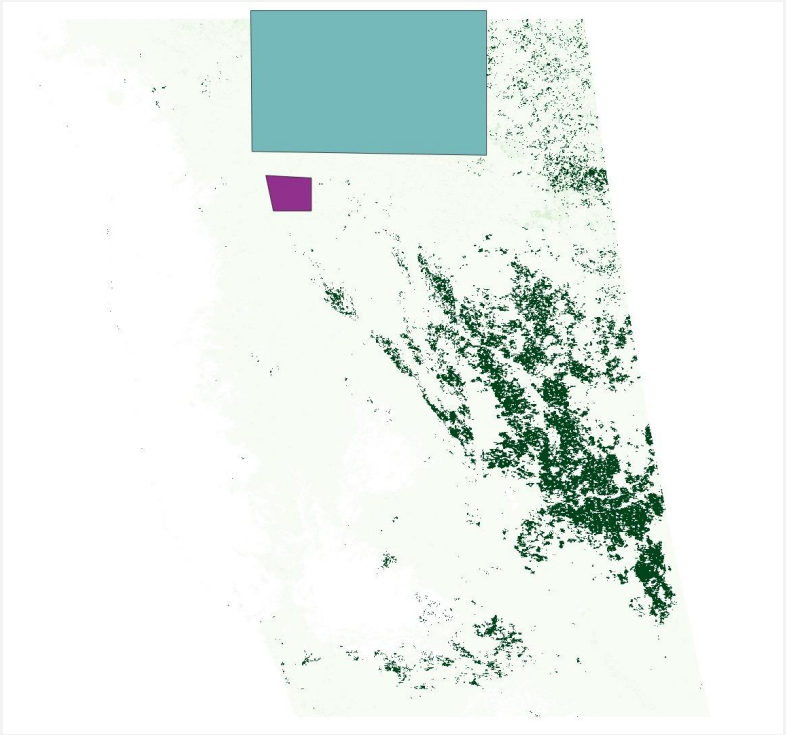

```python
rangeyear = np.arange(1970, 2020)
pop = pop_dataframe("NAM")
anim_pyr(pop, rangeyear)
```

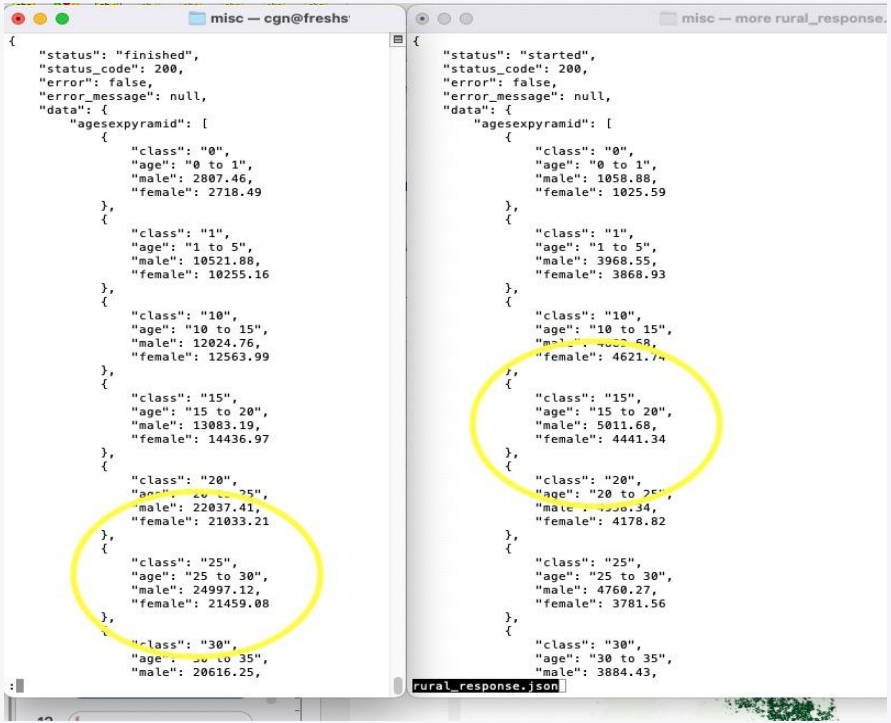
Population Maps

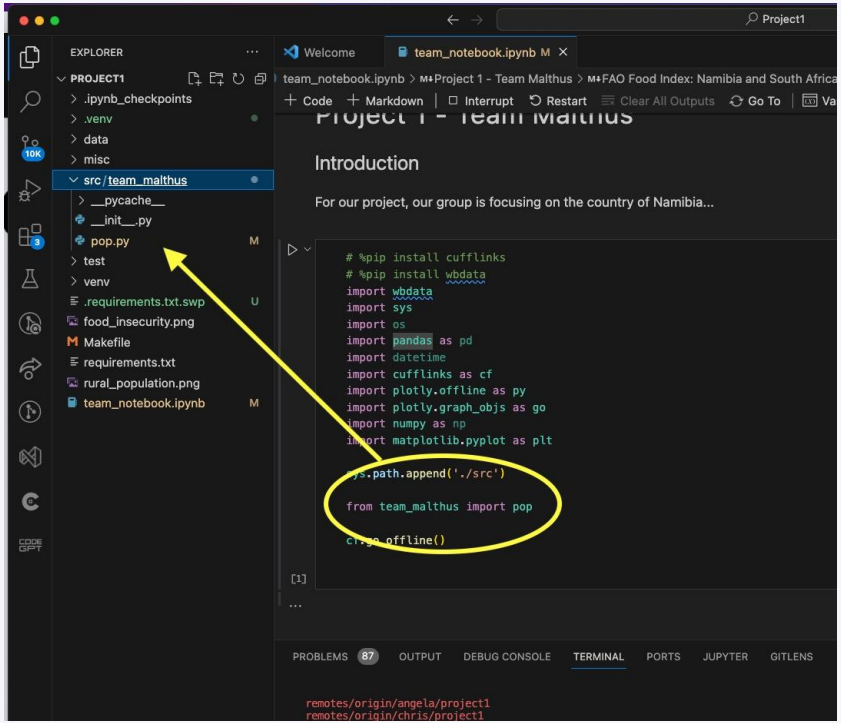
Looking at maps of Namibia sparse population density



Urban vs Rural Population

Data source - “Worldpop.org”

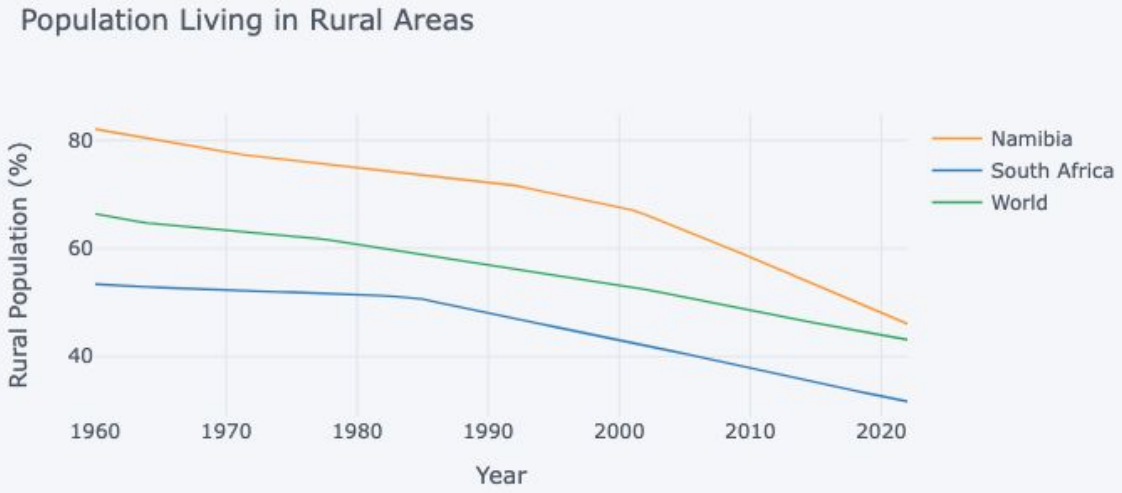




Population - Rural to Urban Migration

Indicates rural-to-urban migration consistent with global trend

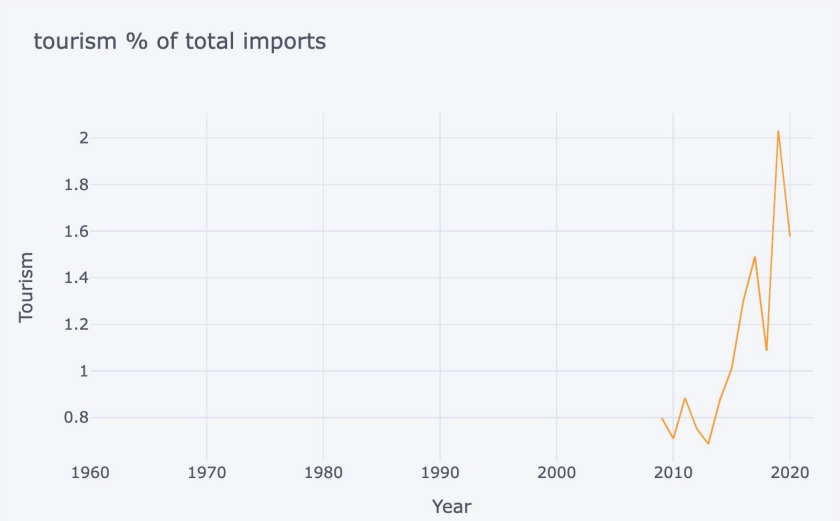
Very high rural-to urban migration rate in Namibia ~2000 onwards

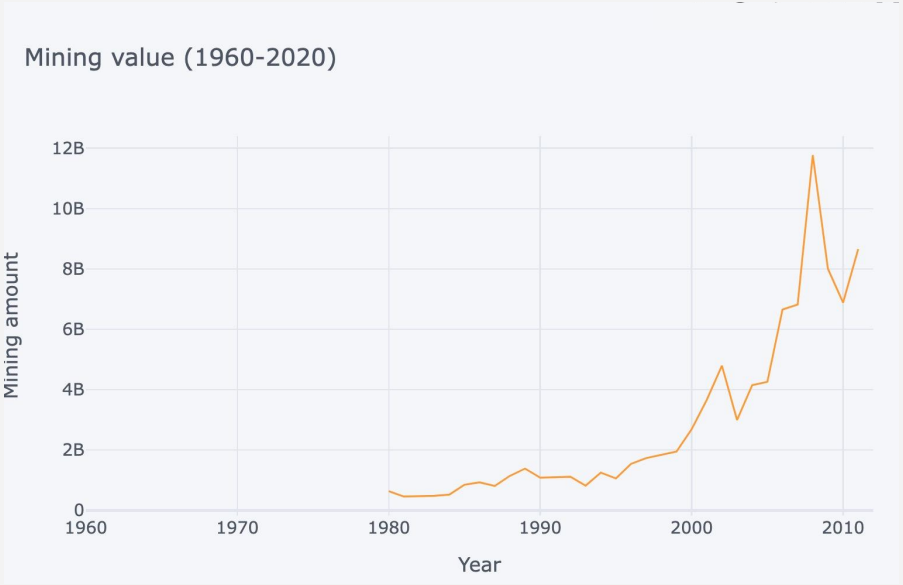


Major Industries in Namibia

Concentrated wealth and growth in urban areas

Rise in tourism in recent years



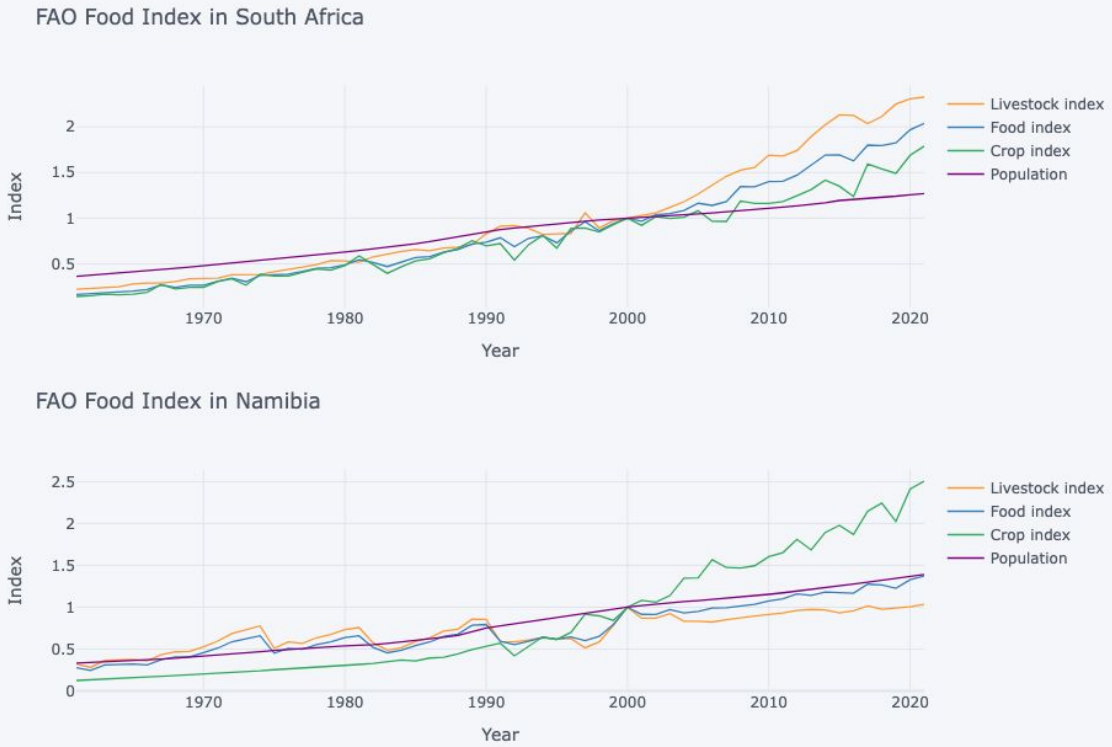


- Mining accounts for billions of dollars in Namibia
- History of German diamond mining

Food Index

A measure of the monthly change in international prices of a basket of food commodities

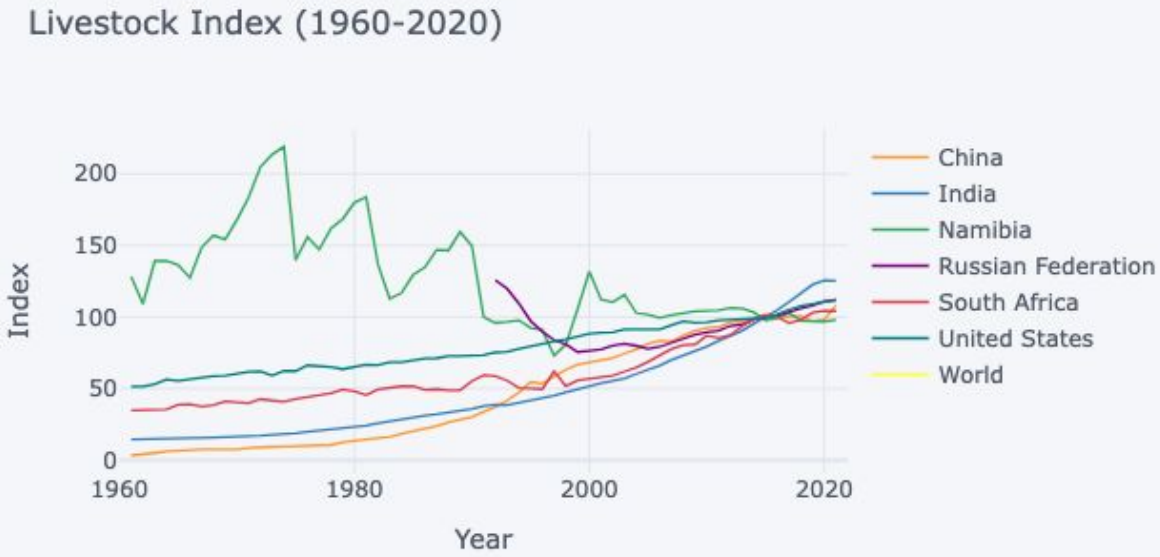
- Although Namibia's Crop Index was **higher** than South Africa's after 2000, its Food and Livestock Indexes remained **low**
- Most of the food indexes have a **higher** growth rate than population after 2000
- This **contradicts** Malthus's claims regarding population and food production growth



Food Production - Livestock

Looking at the production of livestock in each country

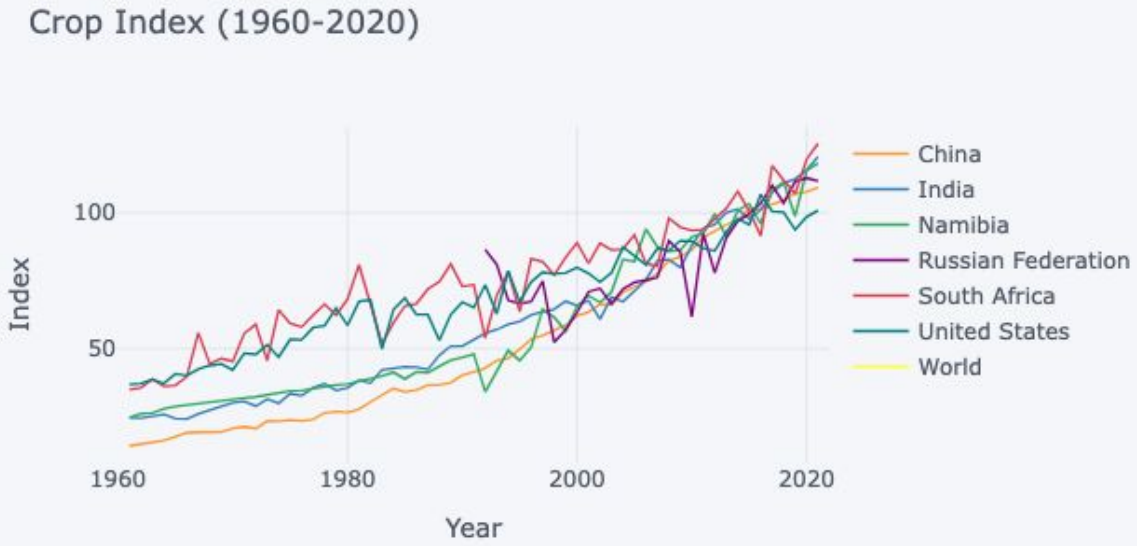
- Climatic Conditions
- Livestock Export
- Diversity Livestock
- Government Support
- Extensive Grazing Land



Food Production - Crops

Breakdown of crop production by country

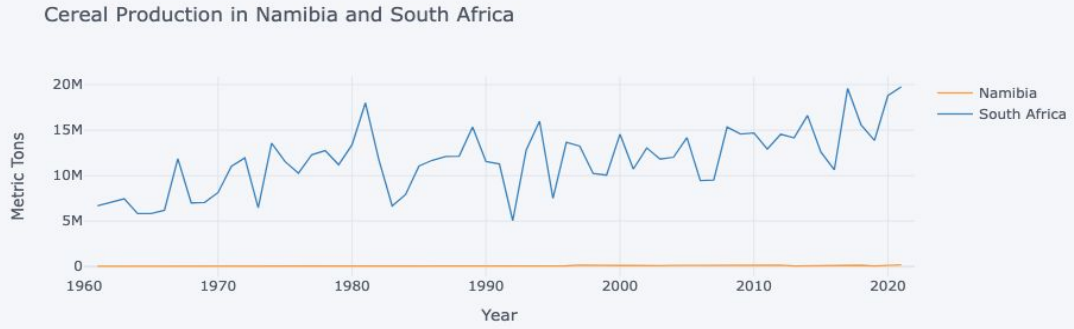
Crop production index shows agricultural production for each year relative to the base period 2004-2006.

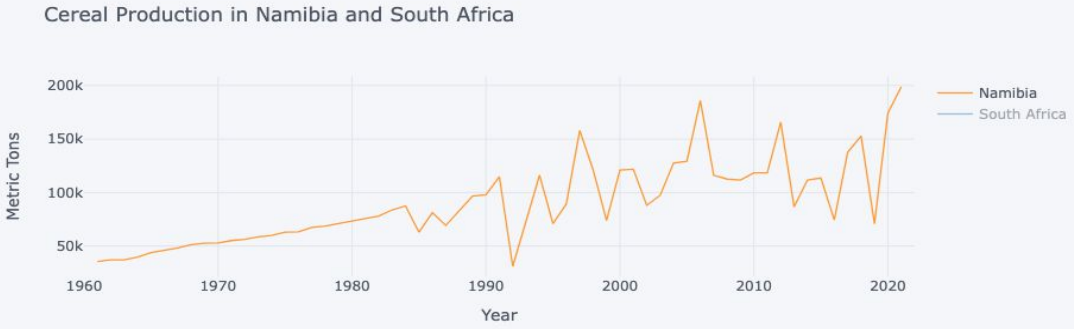


Food Production - Cereal

Looking at the production of cereal in each country

Namibia - Cereal production (metric tons) - actual values, historical data, forecasts and projections were sourced from the World Bank on February of 2024.



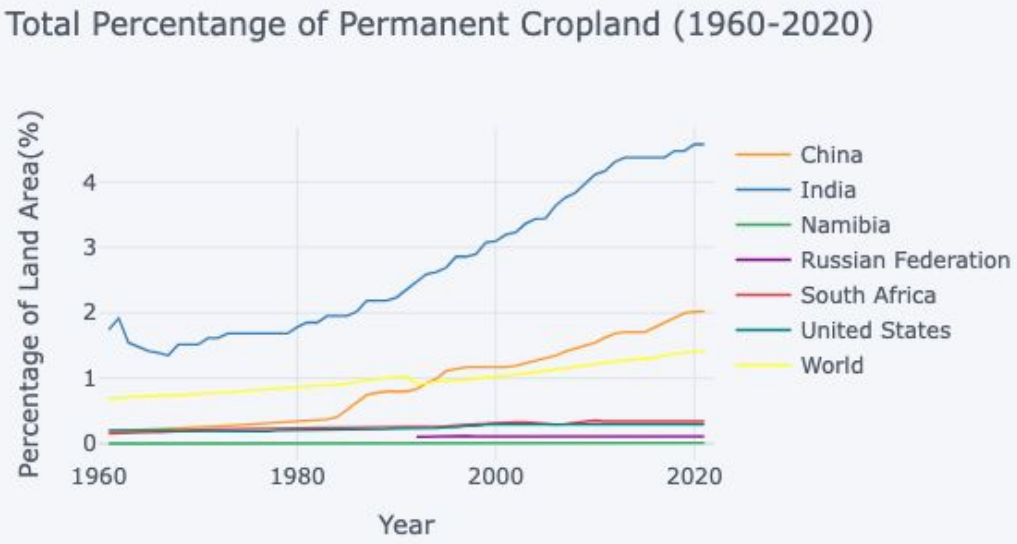


Food Production - Land Allocation

Looking at the allocation of cropland in different countries

Arid climate: Namibia has low land allocation to crops compared to crop-rich countries

South Africa below world average



Conclusion

Malthusian theory: Population tends to grow exponentially, while the production of food increases at an arithmetic rate

- Namibia is in lack of arable land and has an extensive history of colonization and inequality, which has influenced extreme inequality and poverty in the country
- You can see the difference between South Africa's urban growth and prosperity as opposed to Namibia's rural subsistence
- Namibia's food insecurity has risen in just the past few years, partially because fuel is a significant factor of production
- The difference in growth in each population can be somewhat attributed the lack of food production in Namibia as opposed to South Africa