

SDG INDICATORS CALCULATIONS - Zambia Example

true

INTRODUCTION

This R markdown template will take through computation of some SDG 3, 5 and 8 key indicators namely;

- SDG Indicator 3.7.2: Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group.
- SDG INDICATOR 5.3.1: Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18.
- SDG INDICATOR 8.6.1: Proportion of youth (aged 15-24 years) not in education, employment or training.

LOAD LIBRARIES

```
if(!require("pacman")) install.packages("pacman")
pacman::p_load(tidyverse, haven, forcats, gt, sf, ggrepel, patchwork)
```

LOAD DATA

This represent 10% from the Zambia 2010 population and houses census data whose sole purpose is for this exercise.

```
demographics <- haven::read_sav("input/DataExercise/SPSS files/DemographicsDIST.sav")
constituency_shape <- sf::read_sf("input/TUC/zambia_constituency_reproj_pop_GHS-DU-TUC.shp")
```

DATA DESCRIPTION & EXPLORATION

Description

There are two main datasets used in this exercise.

- **demographics** : 10% of Zambia 2010 individual census data with 1,321,973 records and 92 variables. This will be used to compute the SDG indicators using variables such as age, sex, activity in the past 12 months, child bird in the past 12 months and constituency.
- **constituency_shape** : Zambia constituency boundaries (admin 4) with 150 records and 34 variables including information on the DEGURBA classification. This will be used to map the SDG indicators computed from the demographic data and then later to disaggregate the indicators my DEGURBA.

Exploration

In this section, we are exploring the key variables that will be used in this exercise. These variables are

- $P4_SEX_P = Sex$

Sex unique values

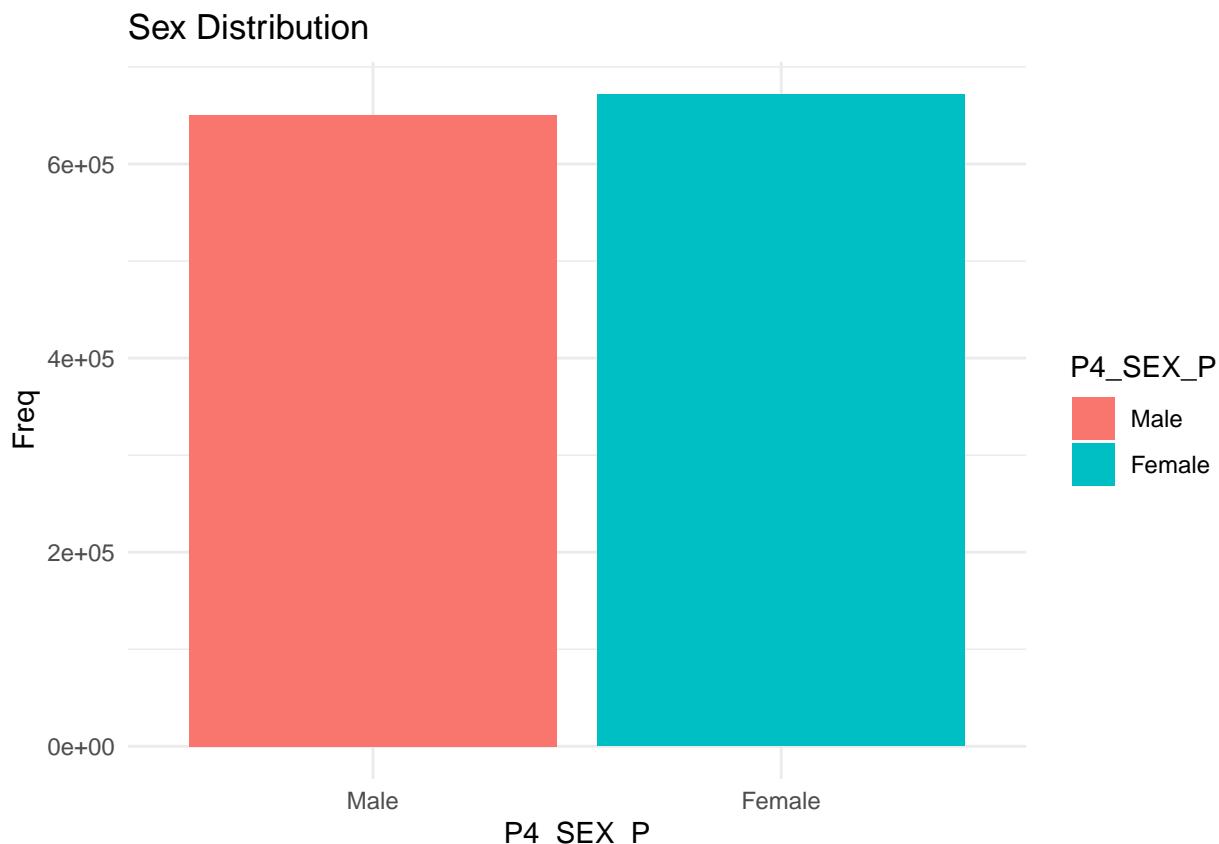
```
demographics$P4_SEX_P |> str()
```

```
## dbl+lbl [1:1321973] 2, 2, 2, 2, 1, 2, 2, 1, 2, 2, 2, 2, 2, 1, 1, 2, 1, 1, 1, ...
## @ label      : chr "Sex"
## @ format.spss : chr "F1.0"
## @ display_width: int 10
## @ labels      : Named num [1:2] 1 2
##   ..- attr(*, "names")= chr [1:2] "Male" "Female"
```

Sex distribution

demographics |>

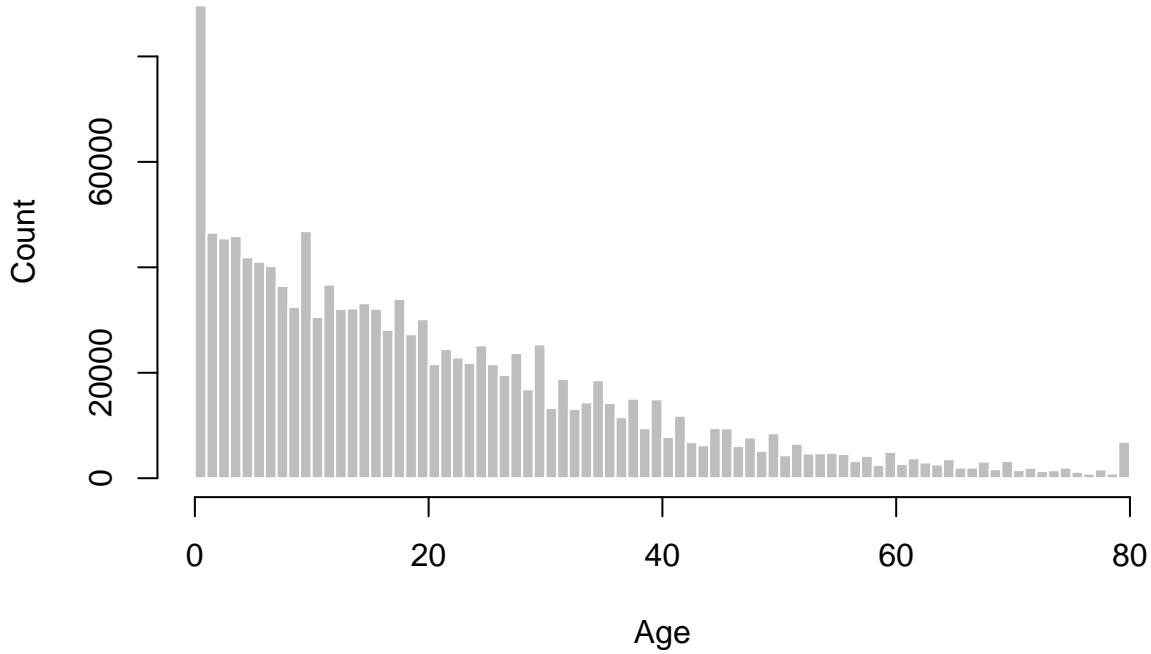
```
mutate(P4_SEX_P = as_factor(P4_SEX_P)) |>
dplyr::group_by(P4_SEX_P) |>
count(name = "Freq") |>
tibble::tibble() |>
ggplot2::ggplot() +
ggplot2::geom_bar(aes(x = P4_SEX_P, fill = P4_SEX_P, y = Freq),
                  stat = "identity") +
ggplot2::labs(title = "Sex Distribution") +
ggplot2::theme_minimal()
```



- $P5_AGE_P = Age$

```
# Age distribution
demographics$P5_AGE_P |> hist(col = "grey",
                                main = "Age Distribution",
                                xlab = "Age",
                                ylab = "Count",
                                border = "white",
                                breaks = length(unique(demographics$P5_AGE_P)))
```

Age Distribution

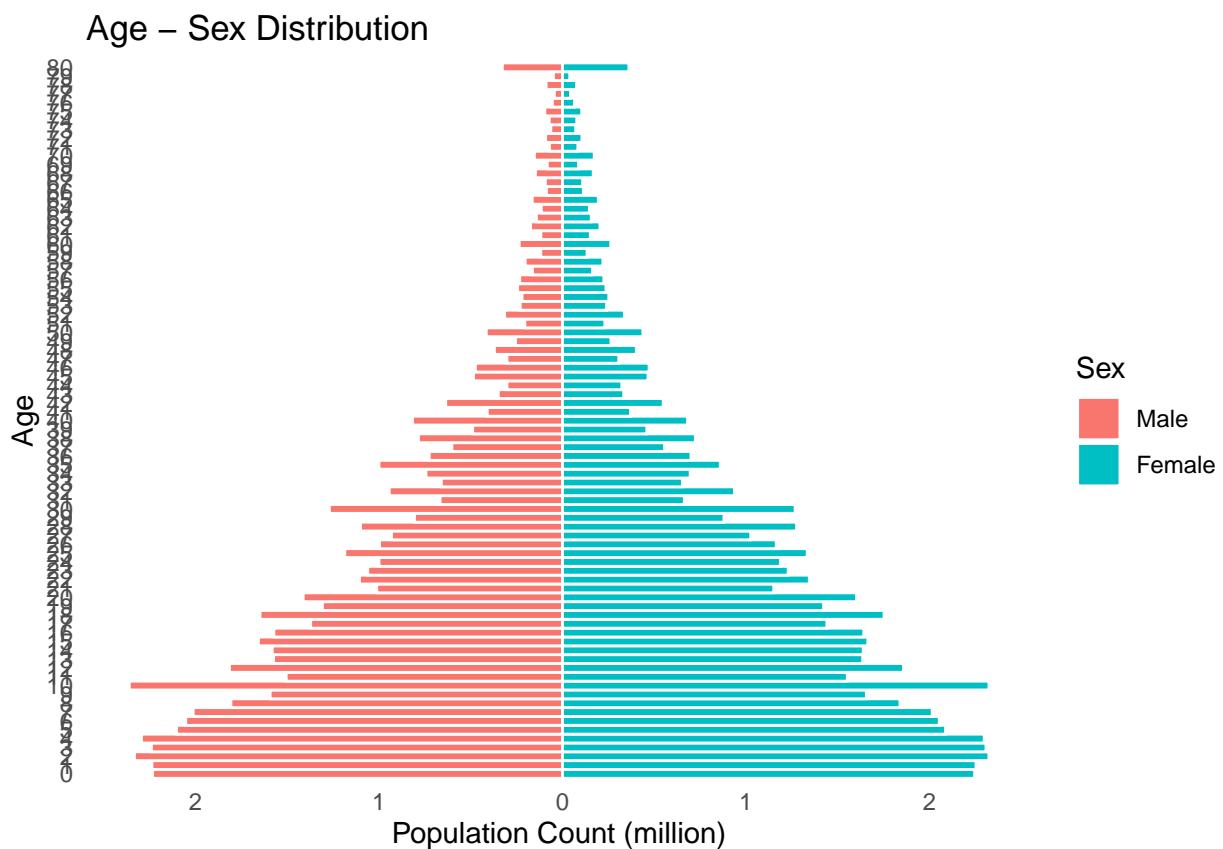


```
# Age distribution by Sex
demographics |>
  group_by(P4_SEX_P, P5_AGE_P) |>
  summarise(pop_count = n()/10000) |>
  mutate(
    pop_count = case_when(
      P4_SEX_P == 1 ~ -pop_count,
      P4_SEX_P == 2 ~ pop_count
    ),
    sex_label = factor(P4_SEX_P, levels = c(1, 2), labels = c("Male", "Female")),
    age_factor = factor(P5_AGE_P, levels = sort(unique(P5_AGE_P)))
  ) |>
  ggplot2::ggplot(aes(x = pop_count, y = age_factor, fill = sex_label)) +
  ggplot2::geom_bar(stat = "identity", width = 1, , color = "white") +
  ggplot2::scale_x_continuous(labels = abs) +
```

```

ggplot2::labs(title = "Age - Sex Distribution",
              x = "Population Count (million)",
              y = "Age",
              fill = "Sex") +
ggplot2::theme_minimal() +
ggplot2::theme(
  panel.grid = element_blank()
)

```



- *P42_LAST_12_MON_P* = Live births in the past 12 months

```

# Unique values
demographics$P42_LAST_12_MON_P |> str()

```

```

## #> #> dbl+lbl [1:1321973] 2, 2, 2, 2, NA, 2, 2, NA, 2, 2, 2, 2, 2, NA, NA...
## #> #> @ label      : chr "Any live births in last 12 months?"
## #> #> @ format.spss : chr "F1.0"
## #> #> @ display_width: int 19
## #> #> @ labels       : Named num [1:2] 1 2
## #> #> ..- attr(*, "names")= chr [1:2] "Yes" "No"

```

```

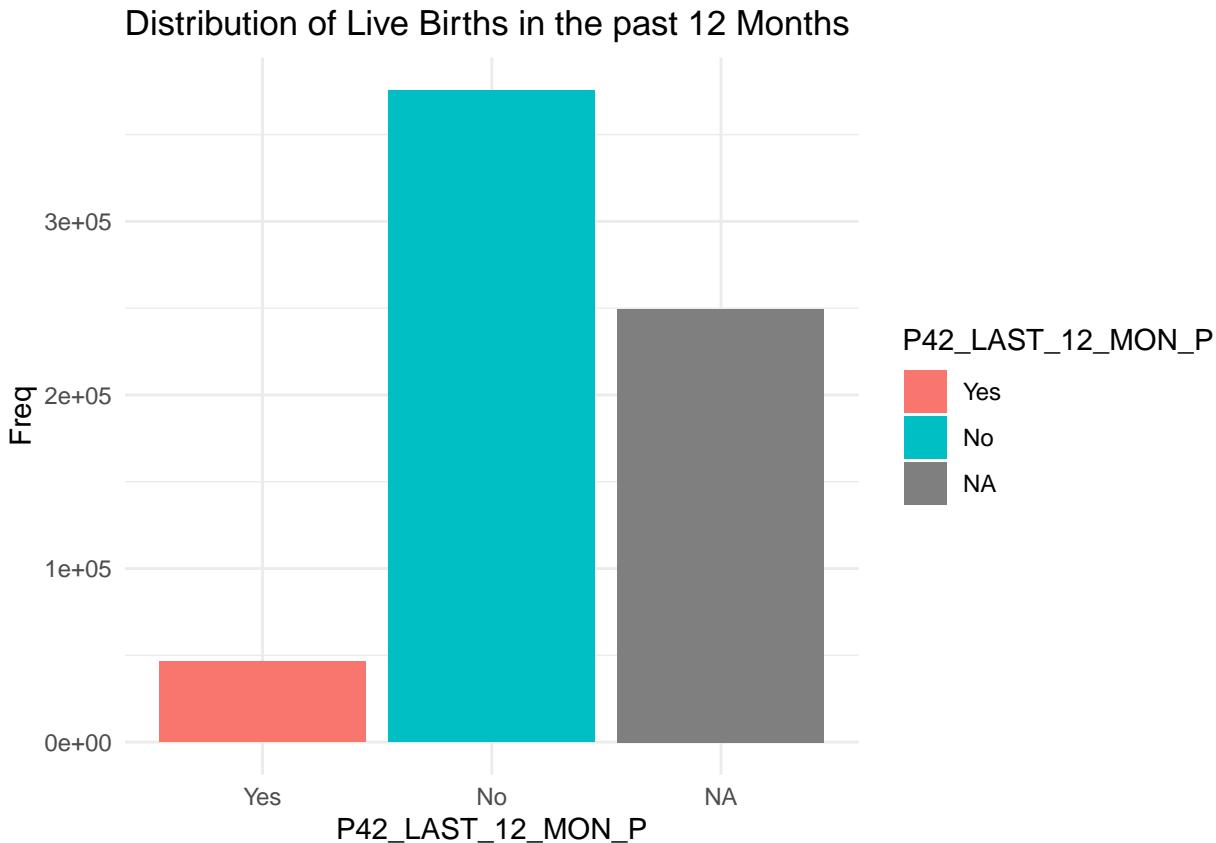
# distribution of live births in females
demographics |>
  dplyr::filter(P4_SEX_P == 2) |>

```

```

mutate(P42_LAST_12_MON_P = as_factor(P42_LAST_12_MON_P)) |>
dplyr::group_by(P42_LAST_12_MON_P) |>
count(name = "Freq") |>
tibble::tibble() |>
ggplot2::ggplot() +
ggplot2::geom_bar(aes(x = P42_LAST_12_MON_P , fill = P42_LAST_12_MON_P, y = Freq),
stat = "identity") +
ggplot2::labs(title = "Distribution of Live Births in the past 12 Months") +
ggplot2::theme_minimal()

```



- *P32_ACTIVITY_LAST_12_MONTHS_P = Activity in the last 12 months*

```

# Unique Activities
demographics$P32_ACTIVITY_LAST_12_MONTHS_P |> unique()

```

```

## <labelled<double>[12]>: Activity last twelve months
## [1] NA 7 10 2 8 9 4 6 11 3 1 5
##
## Labels:
##   value                                label
##     1          Worked - Paid non seasonal
##     2          Worked - Unpaid non seasonal
##     3          Worked - Paid seasonal
##     4          Worked - Unpaid seasonal

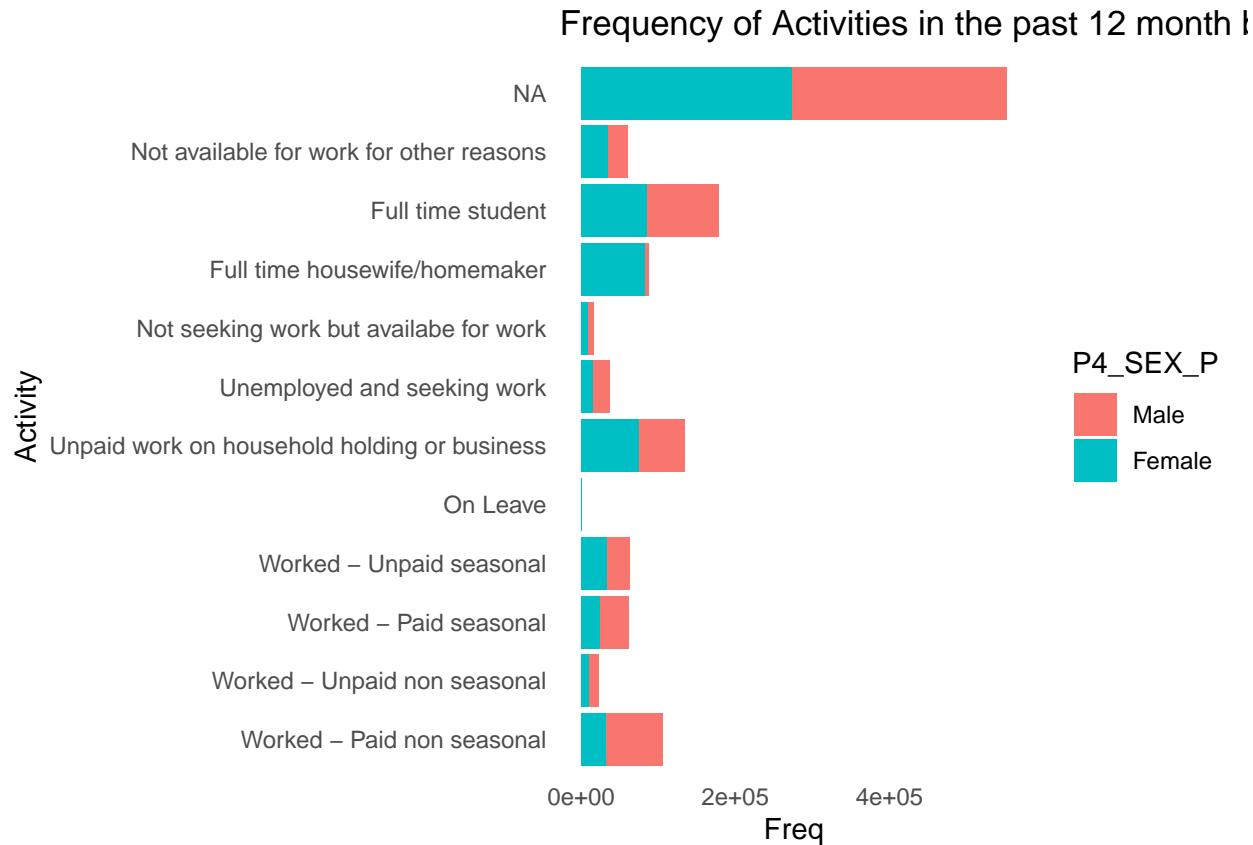
```

```

##      5          On Leave
##      6 Unpaid work on household holding or business
##      7          Unemployed and seeking work
##      8          Not seeking work but available for work
##      9          Full time housewife/homemaker
##     10          Full time student
##     11 Not available for work for other reasons

# activity distribution
demographics |>
  mutate(P32_ACTIVITY_LAST_12_MONTHS_P = as_factor(P32_ACTIVITY_LAST_12_MONTHS_P),
         P4_SEX_P = as_factor(P4_SEX_P)
  ) |>
  dplyr::group_by(P32_ACTIVITY_LAST_12_MONTHS_P, P4_SEX_P) |>
  count(name = "Freq") |>
  ggplot2::ggplot() +
  ggplot2::geom_bar(aes(y = P32_ACTIVITY_LAST_12_MONTHS_P,
                        fill = P4_SEX_P,
                        x = Freq),
                     stat = "identity") +
  ggplot2::theme_minimal() +
  ggplot2::theme(
    panel.grid = element_blank()
  ) +
  ggplot2::labs(
    title = "Frequency of Activities in the past 12 month by Sex",
    y = "Activity"
  )

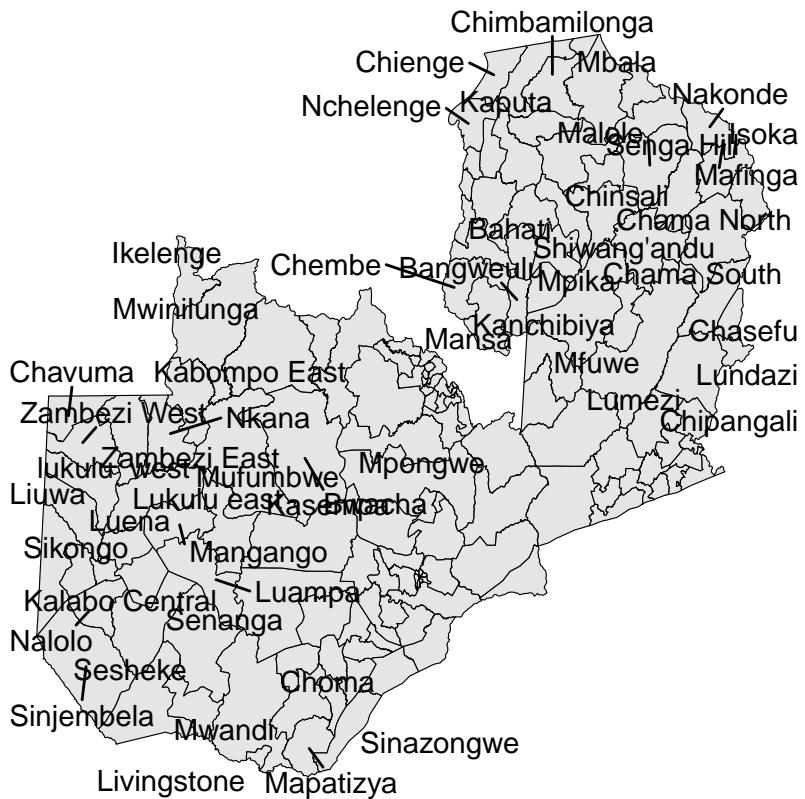
```



- $CONST_P = \text{Constituency (Admin 4)}$

```
constituency_shape |>
  ggplot2::ggplot() +
  ggplot2::geom_sf(color = "black") +
  ggrepel::geom_text_repel(data = constituency_shape,
                           aes(label = NAME1_, geometry = geometry),
                           stat = "sf_coordinates") +
  ggplot2::labs(title = "Zambia Constituencies 2010") +
  ggplot2::theme_void()
```

Zambia Constituencies 2010



SUSTAINABLE DEVELOPMENT GOALS (SDG) CALCULATION

SDG 3 : Good Health and Well Being

SDG TARGET 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.

SDG Indicator 3.7.2: Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group adolescent_birth_rate_10_14 = (number of women aged 10 - 14 with live birth in the past 12 months / number of women aged 10 - 14)*1000

adolescent_birth_rate_14_19 = (number of women aged 14 - 19 with live birth in the past 12 months / number of women aged 14 - 19)*1000

Input Variables Definition:

- $P4_SEX_P = Sex$
- $P5_AGE_P = Age$
- $P42_LAST_12_MON_P = Live\ births\ in\ the\ past\ 12\ months$
- $CONST_P = Constituency\ (Admin\ 4)$

Output Variables Definition:

- *total.ado.10_14 = Total female adolescents aged 10 to 14*
- *total.ado.15_19 = Total female adolescents aged 15 to 19*
- *total.ado.birth.10_14 = Total female adolescents aged 10 to 14 with live birth in the past 12 months*
- *total.ado.birth.15_19 = Total female adolescents aged 15 to 19 with live birth in the past 12 months*
- *abr.10_14 = Adolescent aged 10 to 14 birth rate*
- *abr.15_19 = Adolescent aged 15 to 19 birth rate*

Methodology:

- 1- Filter the Sex to Female by using the P4_SEX_P == 2
- 2- Group by the constituency
- 3- Compute summary statistics

Adolescent Birth Rate by Constituency

```
adolescent_birth_rate <-
  demographics |>
  dplyr::filter(P4_SEX_P == 2) |>
  dplyr::group_by(CONST_P) |>
  dplyr::summarise(
    total.ado.10_14 = sum(dplyr::between(P5_AGE_P, 10, 14), na.rm = TRUE),
    total.ado.15_19 = sum(dplyr::between(P5_AGE_P, 15, 19), na.rm = TRUE),
    total.ado.birth.10_14 = sum(dplyr::between(P5_AGE_P, 10, 14) &
                                P42_LAST_12_MON_P == 1, na.rm = TRUE),
    total.ado.birth.15_19 = sum(dplyr::between(P5_AGE_P, 15, 19) &
                                P42_LAST_12_MON_P == 1, na.rm = TRUE),
    abr.10_14 = round((total.ado.birth.10_14 / total.ado.10_14) * 1000,2),
    abr.15_19 = round((total.ado.birth.15_19 / total.ado.15_19) * 1000,2)
  ) |>
  dplyr::mutate(
    CONST_P_name = forcats::as_factor(CONST_P)
  ) |>
  dplyr::select(
    CONST_P_name,
    everything()
  )

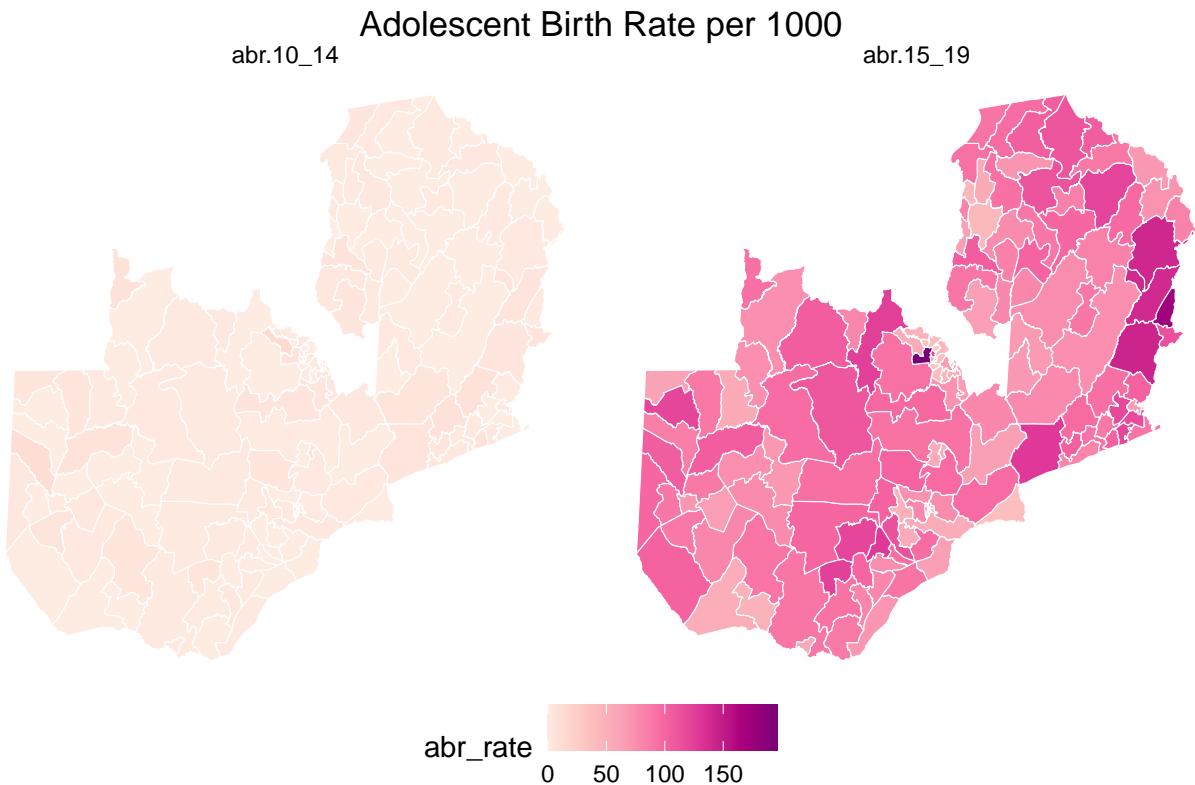
# Print table
adolescent_birth_rate |>
  head() |>
  gt::gt() |>
  tab_options(table.width = pct(50))
```

Visualization

```
constituency_shape |>
  dplyr::select(NAME1_, geometry) |>
  dplyr::left_join(
    adolescent_birth_rate,
    by = c("NAME1_" = "CONST_P_name")
```

Constituency	Constituency	total.ado.10_14	total.ado.15_19	total.ado.birth.10_14	total.ado.birt
Chisamba	1	753	622		2
Katuba	2	613	523		0
Keembe	3	883	740		4
Bwacha	4	588	559		0
Kabwe Central	5	881	950		6
Kapiri Mposhi	6	1828	1507		2

```
) |>
tidyr::pivot_longer(
  cols = c("abr.10_14", "abr.15_19"),
  names_to = "abr_cat",
  values_to = "abr_rate"
) |>
ggplot2::ggplot() +
  ggplot2::geom_sf(aes(fill = abr_rate), color = "white") +
  ggplot2::scale_fill_distiller(palette = "RdPu", direction = 1) +
  ggplot2::theme_void() +
  ggplot2::labs(title = "Adolescent Birth Rate per 1000") +
  ggplot2::theme(
    legend.position = "bottom",
    plot.title = element_text(hjust = 0.5)
) +
  ggplot2::facet_grid(~abr_cat)
```



SDG 5 : GENDER EQUALITY

SDG TARGET 5.3 : Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilations

SDG INDICATOR 5.3.1: Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18 child_marriage_before_15 = (number of women aged 20-24 who were married before age 15 / total number of women aged 20-24) * 100

child_marriage_before_18 = (number of women aged 20-24 who were married before age 18 / total number of women aged 20-24)* 100

Input Variables Definition:

- $P4_SEX_P = Sex$ (1 - Male, 2 - Female)
 - $P5_AGE_P = Age$
 - $CONST_P = Constituency$

Output Variable Definition:

- $\text{total.girls.20_24} = \text{Total number of females aged 20 to 24}$
 - $\text{married.before.15} = \text{Total number of females married before 15}$

Constituency	Constituency	total.girls.20_24	married.before.15	married.before.18	prop.cm.before.15	prop.cm.before.18
Chisamba	1	459	9	112	0.00	0.00
Katuba	2	376	13	101	0.00	0.00
Keembe	3	567	29	176	0.00	0.00
Bwacha	4	414	15	91	0.00	0.00
Kabwe Central	5	716	8	85	0.00	0.00
Kapiri Mposhi	6	1153	57	344	0.00	0.00

- *married.before.18* = Total number of females married before 18
- *prop.cm.before.15* = Proportion of child marriages before 15
- *prop.cm.before.18* = Proportion of child marriages before 18

Child Marriage by Constituency (Admin 4 Zambia)

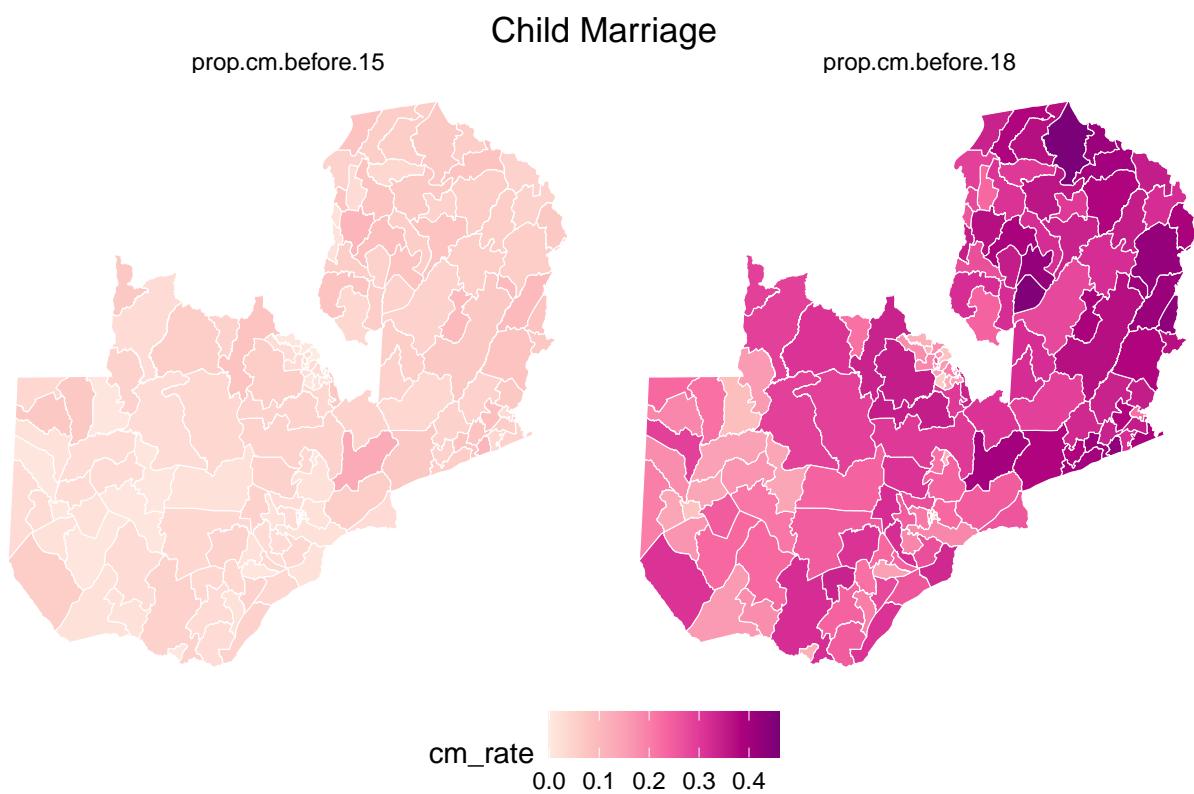
```
child_marriage <-
  demographics |>
  dplyr::filter(P5__AGE_P >= 20, P5__AGE_P <= 24, P4_SEX_P == 2) |>
  dplyr::group_by(CONST_P) |>
  dplyr::summarise(
    total.girls.20_24 = n(),
    married.before.15 = sum(P37__AGE_FIRST_MARRAIGE_P < 15, na.rm = T),
    married.before.18 = sum(P37__AGE_FIRST_MARRAIGE_P < 18, na.rm = T),
    prop.cm.before.15 = round(married.before.15 / total.girls.20_24, 2),
    prop.cm.before.18 = round(married.before.18 / total.girls.20_24, 2)
  ) |>
  dplyr::mutate(
    CONST_P_name =forcats::as_factor(CONST_P)
  ) |>
  dplyr::select(
    CONST_P_name,
    everything()
  )

# print table
child_marriage |>
  head() |>
  gt::gt()
```

Visualization

```
constituency_shape |>
  dplyr::select(NAME1_, geometry) |>
  dplyr::left_join(
    child_marriage,
    by = c("NAME1_" = "CONST_P_name")
  ) |>
  tidyverse::pivot_longer(
    cols = c("prop.cm.before.15", "prop.cm.before.18"),
    names_to = "child_marriage",
```

```
values_to = "cm_rate"
) |>
ggplot2::ggplot() +
ggplot2::geom_sf(aes(fill = cm_rate), color = "white") +
ggplot2::scale_fill_distiller(palette = "RdPu", direction = 1) +
ggplot2::theme_void() +
ggplot2::labs(title = "Child Marriage") +
ggplot2::theme(
  legend.position = "bottom",
  plot.title = element_text(hjust = 0.5)
) +
ggplot2::facet_grid(~child_marriage)
```



SDG 8 : DECENT WORK AND ECONOMIC GROWTH

SDG TARGET 8.6 : By 2020, substantially reduce the proportion of youth not in employment, education or training

SDG INDICATOR 8.6.1: Proportion of youth (aged 15-24 years) not in education, employment or training NEET rate (%) = (Youth – Youth in employment – Youth not in employment but in education or training) / Youth *100

Input Variables Definition :

- P32_ACTIVITY_LAST_12_MONTHS_P = Activity in the last 12 months

- $P5_AGE_P = Age$
- $CONST_P = Constituency (Admin 4)$

Output Variables Definition :

- $total.youth.15_24 = Total\ number\ of\ people\ aged\ 15\ to\ 24\ (Youth)$
- $total.neet = Number\ of\ youths\ not\ employed,\ not\ in\ education\ or\ training$
- $rate.need = proportion\ of\ youths\ not\ employed,\ not\ in\ education\ or\ training$

Youth Unemployment by Constituency (Admin 4 Zambia) & Sex

```
youth_umemployment <-  
demographics |>  
dplyr::mutate(  
  Employ = case_when(  
    P32_ACTIVITY_LAST_12_MONTHS_P %in% 1:6 ~ 1,  
    P32_ACTIVITY_LAST_12_MONTHS_P %in% 7:9 ~ 2,  
    P32_ACTIVITY_LAST_12_MONTHS_P == 10 ~ 3,  
    T ~ 2  
  )  
) |>  
dplyr::filter(P5_AGE_P >= 15, P5_AGE_P <= 24) |>  
dplyr::group_by(CONST_P, P4_SEX_P) |>  
summarise(  
  total.youth.15_24 = n(),  
  total.neet = sum(Employ == 2, na.rm = TRUE),  
  rate.neet = round(total.neet / total.youth.15_24, 2)  
) |>  
dplyr::mutate(  
  CONST_P_name =forcats::as_factor(CONST_P),  
  P4_SEX_P =forcats::as_factor(P4_SEX_P)  
) |>  
dplyr::select(  
  CONST_P_name,  
  everything())  
) |>  
tidyr::pivot_wider(  
  names_from = P4_SEX_P,  
  values_from = 4:6  
)  
  
# print table  
youth_umemployment |>  
  tibble::tibble() |>  
  head() |>  
  gt::gt()
```

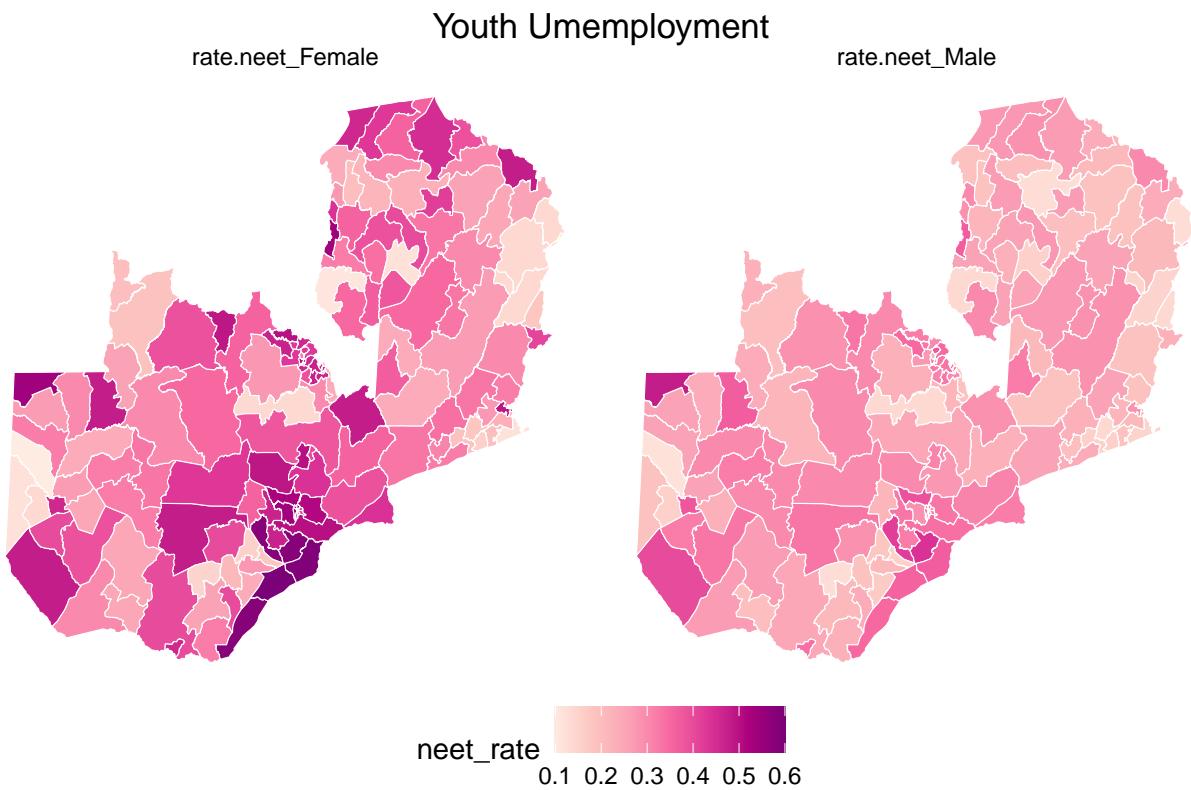
Visualization

CONST_P_name	Constituency	total.youth.15_24_Male	total.youth.15_24_Female	total.neet_M
Chisamba	1	1078	1081	3
Katuba	2	834	899	3
Keembe	3	1227	1307	3
Bwacha	4	903	973	2
Kabwe Central	5	1444	1666	4
Kapiri Mposhi	6	2571	2660	6

```

constituency_shape |>
  dplyr::select(NAME1_, geometry) |>
  dplyr::left_join(
    youth_uemployment,
    by = c("NAME1_" = "CONST_P_name")
  ) |>
  tidyr::pivot_longer(
    cols = c("rate.neet_Male", "rate.neet_Female"),
    names_to = "neet",
    values_to = "neet_rate"
  ) |>
  ggplot2::ggplot() +
  ggplot2::geom_sf(aes(fill = neet_rate), color = "white") +
  ggplot2::scale_fill_distiller(palette = "RdPu", direction = 1) +
  ggplot2::theme_void() +
  ggplot2::labs(title = "Youth Unemployment") +
  ggplot2::theme(
    legend.position = "bottom",
    plot.title = element_text(hjust = 0.5)
  ) +
  ggplot2::facet_grid(~neet)

```



EXPORT RESULTS SDG RESULTS TO CSV

1- Merge all results into one data frame

```
indicators_df <-
  child_marriage |>
  dplyr::left_join(
    adolescent_birth_rate,
    by = c("CONST_P_name", "CONST_P")
  ) |>
  dplyr::left_join(
    youth_unemployment,
    by = c("CONST_P_name", "CONST_P")
  )
# print table
indicators_df |>
  head() |>
  gt::gt()
```

2- Export the results into a CSV file for further analysis

```
readr::write_csv(x = indicators_df, file = "output/indicators.csv")
```

CONST_P_name	Constituency	total.girls.20_24	married.before.15	married.before.18	prop.cm.be
Chisamba	1	459	9	112	
Katuba	2	376	13	101	
Keembe	3	567	29	176	
Bwacha	4	414	15	91	
Kabwe Central	5	716	8	85	
Kapiri Mposhi	6	1153	57	344	

OPTIONAL: APPLICATION OF DEGURBA TO SDG INDICATORS IN R

In this section, we are Going to classify our admin data by DEGURBA classification generated from the application of the DEGURBA methodology.

Step 0: Classification of Constituencies by DEGURBA

```
# degurba level 1
degurba_l1 <- constituency_shape |>
  dplyr::mutate(
    DEGURBA_L1 = factor(DEGURBA_L1,
      levels = c(1,2,3),
      labels = c("Rural Area",
                 "Town or Semi-dense Area",
                 "City"
               )
    )
  ) |>
  ggplot2::ggplot() +
  ggplot2::geom_sf(aes(fill = DEGURBA_L1)) +
  ggplot2::scale_fill_manual(
    values = c("#375623", "#FFC000", "red")
  ) +
  ggplot2::theme_void() +
  ggplot2::labs(title = "DEGURBA LEVEL 1")

# degurba level 2
degurba_l2 <- constituency_shape |>
  dplyr::mutate(
    DEGURBA_L2 = factor(DEGURBA_L2,
      levels = c(11,12,13,21,23,30),
      labels = c("Very Disperded Rural Area",
                 "Disperse Rural Area",
                 "Village",
                 "Suburban or Peri-urban Area",
                 "Dense Town",
                 "City"
               )
    )
  ) |>
  ggplot2::ggplot() +
  ggplot2::geom_sf(aes(fill = DEGURBA_L2)) +
  ggplot2::scale_fill_manual(
    values = c("#cdf57a", "#abcd66", "#375623", "#ffff00", "#732600", "red")
  )
```

```

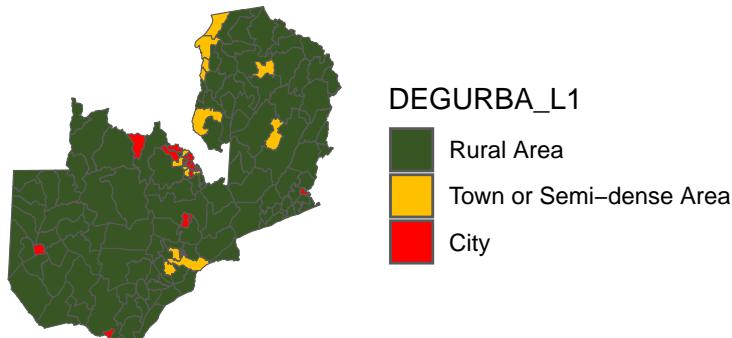
) +
ggplot2::theme_void() +
ggplot2::labs(title = "DEGURBA LEVEL 2")

# use patchwork to paste both plot side by side

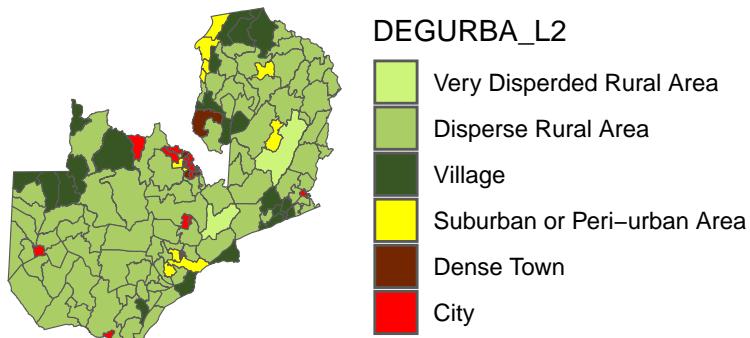
degurba_l1 / degurba_l2

```

DEGURBA LEVEL 1



DEGURBA LEVEL 2



Step 1: Join the Constituency Shapes and The SDG Indicators

```

sdg_degurba <-
  constituency_shape |>
  dplyr::select(NAME1_, DEGURBA_L1, DEGURBA_L2) |>
  dplyr::left_join(
    indicators_df,
    by = c("NAME1_" = "CONST_P_name")
  ) |>
  tibble::as.tibble() |>
  dplyr::select(-geometry)

# print table
sdg_degurba |>
  head() |>
  gt::gt()

```

Step 2 : SDG disaggregation by DEGURBA

NAME1_	DEGURBA_L1	DEGURBA_L2	Constituency	total.girls.20_24	married.before.15	1
Itezhi Tezhi	1	12	130	310	13	
Mulobezi	1	12	148	135	4	
Sesheke	1	12	150	213	4	
Sinjembela	1	12	147	454	26	
Katombola	1	12	121	463	21	
Mwandi	1	12	149	128	2	

```

sdg_degurba_diss <-
  sdg_degurba |>
  tidyr::pivot_longer(
    cols = c("DEGURBA_L1", "DEGURBA_L2"),
    names_to = "degurba_level",
    values_to = "degurba_class"
  ) |>
  dplyr::group_by(degurba_level, degurba_class) |>
  dplyr::summarise(
    total.girls.20_24 = sum(total.girls.20_24),
    married.before.15 = sum(married.before.15),
    married.before.18 = sum(married.before.18),
    prop.cm.before.15 = round((married.before.15 / total.girls.20_24), 2),
    prop.cm.before.18 = round((married.before.18 / total.girls.20_24), 2),
    total.ado.10_14 = sum(total.ado.10_14),
    total.ado.15_19 = sum(total.ado.15_19),
    total.ado.birth.10_14 = sum(total.ado.birth.10_14),
    total.ado.birth.15_19 = sum(total.ado.birth.15_19),
    abr.10_14 = round((total.ado.birth.10_14/total.ado.10_14)*1000, 2),
    abr.15_19 = round((total.ado.birth.15_19/total.ado.15_19)*1000, 2),
    total.youth.15_24_Male = sum(total.youth.15_24_Male),
    total.youth.15_24_Female = sum(total.youth.15_24_Female),
    total.neet_Male = sum(total.neet_Male),
    total.neet_Female = sum(total.neet_Female),
    rate.neet_Male = round((total.neet_Male / total.youth.15_24_Male), 2),
    rate.neet_Female = round((total.youth.15_24_Female / total.neet_Female), 2)
  )

```

```

sdg_degurba_diss <-
  sdg_degurba_diss |>
  dplyr::mutate(
    degurba_class = factor(degurba_class,
      levels = c(1,2,3,11,12,13,21,23,30),
      labels = c("Rural Area",
                "Town or Semi-dense Area",
                "City",
                "Very Disperded Rural Area",
                "Disperse Rural Area",
                "Village",
                "Suburban or Peri-urban Area",
                "Dense Town",

```

```

        "city"
    )
)
)
```

Step 3: Visualization

```

sdg_degurba_diss |>
  gt::gt() |>
  gt::tab_header(title = "SDG INDICATOR BY DEGURBA",
                 subtitle = "Zambia 2010 Pop & House Census") |>
  gt::data_color(
    columns = c("prop.cm.before.15",
               "prop.cm.before.18"
               ),
    method = "numeric",
    palette = "OrRd",
    domain = c(min(sdg_degurba_diss$prop.cm.before.15),
               max(sdg_degurba_diss$prop.cm.before.18))
  ) |>
  gt::data_color(
    columns = c("abr.10_14",
               "abr.15_19"
               ),
    method = "numeric",
    palette = "OrRd",
    domain = c(min(sdg_degurba_diss$abr.10_14),
               max(sdg_degurba_diss$abr.15_19)))
  ) |>
  gt::data_color(
    columns = c("rate.neet_Male",
               "rate.neet_Female"
               ),
    method = "numeric",
    palette = "OrRd",
    domain = c(min(sdg_degurba_diss$rate.neet_Male),
               max(sdg_degurba_diss$rate.neet_Female))
  ) |>
  tab_style(
    style = list(
      cell_fill(color = "#375623")
    ),
    locations = cells_body(
      columns = degurba_class,
      rows = degurba_class %in% c("Rural Area", "Village")
    )
  ) |>
  tab_style(
    style = list(
      cell_fill(color = "#FFC000")
    ),
    locations = cells_body(
      columns = degurba_class,
```

```

        rows = degurba_class == "Town or Semi-dense Area"
    )
) |>
tab_style(
  style = list(
    cell_fill(color = "red")
  ),
  locations = cells_body(
    columns = degurba_class,
    rows = degurba_class %in% c("City", "city")
  )
) |>
tab_style(
  style = list(
    cell_fill(color = "#cdf57a")
  ),
  locations = cells_body(
    columns = degurba_class,
    rows = degurba_class == "Very Disperded Rural Area"
  )
) |>
tab_style(
  style = list(
    cell_fill(color = "#abcd66")
  ),
  locations = cells_body(
    columns = degurba_class,
    rows = degurba_class == "Disperse Rural Area"
  )
) |>
tab_style(
  style = list(
    cell_fill(color = "#ffff00")
  ),
  locations = cells_body(
    columns = degurba_class,
    rows = degurba_class == "Suburban or Peri-urban Area"
  )
) |>
tab_style(
  style = list(
    cell_fill(color = "#732600")
  ),
  locations = cells_body(
    columns = degurba_class,
    rows = degurba_class == "Dense Town"
  )
) |>
gtsave(filename = "output/gt_degurba_disaggregation.png", vwidth = 2000)

# "#cdf57a", "#abcd66", "#375623", "#ffff00", "#732600", "red"

```

SDG INDICATOR BY DEGURBA															
Zambia 2010 Pop & House Census															
degurba_class	total.girls.20_24	married.before.15	married.before.18	prop.cm.before.15	prop.cm.before.18	total.ado.10_14	total.ado.15_19	total.ado.birth.10_14	total.ado.birth.15_19	abr.10_14	abr.15_19	total.youth.15_24_Male	total.youth.15_24_Female	total.neet_Male	total.neet_Female
DEGURBA_L1															
Town or Semi-dense Area	37060	1822	11142	0.05	0.30	56187	46653	116	4296	2.06	92.08	78193	83713	19677	
City	6963	284	1628	0.04	0.23	9724	8772	27	678	2.78	77.29	14386	15735	4113	
	21146	423	3272	0.02	0.15	24177	23791	61	1272	2.52	53.47	38909	44937	12878	
DEGURBA_L2															
Very Dispersed Rural Area	265	27	102	0.10	0.38	349	286	0	20	0.00	69.93	459	551	119	
Disperse Rural Area	29834	1412	8907	0.05	0.30	45485	37743	84	3529	1.85	93.50	63143	67577	15876	
Urban	6961	383	2133	0.06	0.31	10353	8624	32	747	3.09	86.62	14591	15585	3682	
Suburban or Peri-urban Area	5663	254	1428	0.04	0.25	7920	6862	20	574	2.53	83.65	11441	12525	3273	
City	1300	30	200	0.02	0.15	1804	1910	7	104	3.88	54.45	2945	3210	840	
	21146	423	3272	0.02	0.15	24177	23791	61	1272	2.52	53.47	38909	44937	12878	

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¹ UNFPA - SDG DISSAGREGATION BY DEGURBA / by Derrick DEMEVENG / Tanzania DEGURBA Workshop - May