Comparison of community and citizen natural resource rights across Sub-Saharan Africa

https://github.com/krm75/Environmental_Data_Analytics_2020/tree/master/ResourceRights

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1 Rationale and Research Questions

Table 1: Table 1: First 10 rows of the 5 raw data sets, 1 for each resource.

Country.code	Country	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
AO	Angola	Yes, implied	No	Yes	Yes	Partial	Partial	No	Yes
BN	Benin	Yes	No	Yes	Yes	Yes	No	No	Yes
BC	Botswana	Yes, implied	Yes	Silent	Yes	Partial	No	No	Yes
UV	Burkina Faso	Yes, implied	No, implied	Yes	No	No	No	No	No
BY	Burundi	Yes, implied	No, implied	Silent	Yes	No	No	No	Yes
CM	Cameroon	Yes, implied	No, implied	Yes	Yes	No	No	Silent	Yes

2 Dataset Information

```
kable(head(wildlife),
caption = "Table 1: First 10 rows of the 5 raw data sets, 1 for each resource.") %>%
  kable_styling(bootstrap_options = c("hover", "condensed"),full_width = F) %>%
  column_spec(3:13, width_min = "4em", width_max = "4em")
```

3 Exploratory Analysis and Data Wrangling

```
length(unique(wildlife$Country))
```

[1] 49

```
unique(wildlife$Country)
```

```
##  [1] Angola                        Benin
##  [3] Botswana                      Burkina Faso
##  [5] Burundi                       Cameroon
##  [7] Cape Verde                    Central African Republic
##  [9] Chad                          Comoros
## [11] Cote d'Ivoire                 Djibouti
## [13] Democratic Republic of Congo  Equatorial Guinea
## [15] Eritrea                       Ethiopia
## [17] Gabon                         Gambia
## [19] Ghana                         Guinea
## [21] Guinea-Bissau                 Kenya
## [23] Lesotho                       Liberia
## [25] Madagascar                    Malawi
## [27] Mali                          Mauritania
## [29] Mauritius                     Mozambique
## [31] Namibia                       Niger
## [33] Nigeria                       Republic of Congo (Brazzaville)
## [35] Rwanda                        Sao Tome and Principe
## [37] Senegal                       Seychelles
## [39] Sierra Leone                  Somalia
## [41] South Africa                  South Sudan
## [43] Sudan                         Swaziland
## [45] Tanzania                      Togo
## [47] Uganda                        Zambia
## [49] Zimbabwe
## 49 Levels: Angola Benin Botswana Burkina Faso Burundi Cameroon ... Zimbabwe
```

```
nrow(wildlife)
```

[1] 49

```
ncol(wildlife)
```

[1] 13

```
colnames(wildlife)
```

```
##  [1] "Country.code" "Country"      "Q1"           "Q2"           "Q3"
##  [6] "Q4"           "Q5"           "Q6"           "Q7"           "Q8"
```

```
## [11] "Q9"            "Q10"            "Q11"
```
```
str(wildlife)
```
```
## 'data.frame':    49 obs. of  13 variables:
##  $ Country.code: Factor w/ 49 levels "AO","BC","BN",..: 1 3 2 45 4 8 11 10 5 9 ...
##  $ Country     : Factor w/ 49 levels "Angola","Benin",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $ Q1          : Factor w/ 4 levels "No information available",..: 4 3 4 4 4 4 2 3 4
##  $ Q2          : Factor w/ 6 levels "No","No information available",..: 1 1 5 3 3 3 4
##  $ Q3          : Factor w/ 4 levels "No information available",..: 3 3 2 3 2 3 2 3 3
##  $ Q4          : Factor w/ 6 levels "No","No information available",..: 5 5 5 1 5 5 1
##  $ Q5          : Factor w/ 6 levels "No","No information available",..: 3 5 3 1 1 1 1
##  $ Q6          : Factor w/ 5 levels "No","No information available",..: 4 1 1 1 1 1 1
##  $ Q7          : Factor w/ 6 levels "No","No information available",..: 1 1 1 1 1 4 1
##  $ Q8          : Factor w/ 5 levels "No","No information available",..: 4 4 4 1 4 4 1
##  $ Q9          : Factor w/ 6 levels "No","No information available",..: 3 3 5 1 1 3 1
##  $ Q10         : Factor w/ 6 levels "No","No information available",..: 6 6 5 1 1 6 1
##  $ Q11         : Factor w/ 5 levels "No","No information available",..: 1 1 5 1 1 1 1
```
```
#summary(wildlife)
yes <- c('Yes','Yes, implied')
no <- c('No','No information available','No, implied','Silent')


wildlife[,c(4:6,8:9,11,13)] <- sapply(wildlife[,c(4:6,8:9,11,13)], FUN = function(x) ife
wildlife$count <- apply(wildlife[,c(4:6,8:9,11,13)],1,sum)

minerals[,c(4:6,8:9,11,13)] <- sapply(minerals[,c(4:6,8:9,11,13)], FUN = function(x) ife
minerals$count <- apply(minerals[,c(4:6,8:9,11,13)],1,sum)

water[,c(4:6,8:9,11,13)] <- sapply(water[,c(4:6,8:9,11,13)], FUN = function(x) ifelse(x
water$count <- apply(water[,c(4:6,8:9,11,13)],1,sum)

petroleum[,c(4:6,8:9,11,13)] <- sapply(petroleum[,c(4:6,8:9,11,13)], FUN = function(x)
petroleum$count <- apply(petroleum[,c(4:6,8:9,11,13)],1,sum)

trees[,c(4:6,8:9,11,13)] <- sapply(trees[,c(4:6,8:9,11,13)], FUN = function(x) ifelse(x
trees$count <- apply(trees[,c(4:6,8:9,11,13)],1,sum)


countrycounts <- data.frame(wildlife$Country,wildlife$count,minerals$count,water$count,p
countrycounts$Total <- apply(countrycounts[,c(2:6)],1,sum)/35
colnames(countrycounts) <- c("Country","Wildlife","Minerals","Water","Petroleum","Trees"

kable(countrycounts[order(-countrycounts$Total),],
caption = "Table 2: Number of survey question responses that support individual/communit
```

```
kable_styling(bootstrap_options = c("hover", "condensed"),full_width = F) #%>%

#column_spec(3:13, width_min = "4em", width_max = "4em")
```
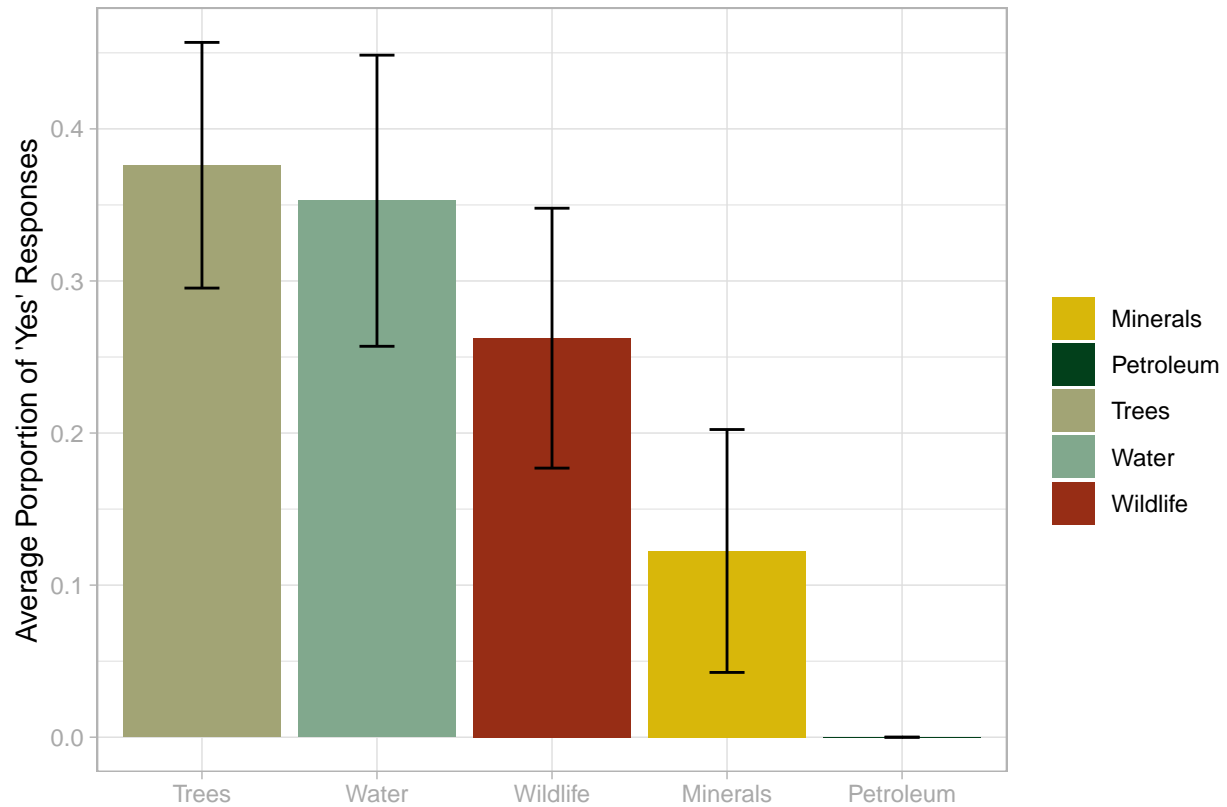

Figure 1: Average proportion of survey responses which support individual/community resource rights to some degree by resource type.

Table 2: Table 2: Number of survey question responses that support individual/community resource rights to some degree.

| Country	Wildlife	Minerals	Water	Petroleum	Trees	Total
Botswana	4	4	4	0	4	0.4571429
Namibia	6	2	4	0	4	0.4571429
Tanzania	2	3	3	0	5	0.3714286
Central African Republic	2	0	5	0	5	0.3428571
Mali	2	4	3	0	2	0.3142857
South Africa	3	2	3	0	3	0.3142857
Cameroon	2	1	3	0	4	0.2857143
Gambia	1	0	4	0	5	0.2857143
Guinea	3	1	3	0	3	0.2857143
Mozambique	3	1	4	0	2	0.2857143
Somalia	3	0	3	0	4	0.2857143
Angola	2	0	4	0	3	0.2571429
Benin	2	0	5	0	2	0.2571429
Burkina Faso	1	2	3	0	3	0.2571429
Cote d'Ivoire	2	0	4	0	3	0.2571429
Ethiopia	2	2	4	0	1	0.2571429
Malawi	3	0	3	0	3	0.2571429
Mauritius	2	2	3	0	2	0.2571429
Republic of Congo (Brazzaville)	2	2	3	0	2	0.2571429
Togo	3	0	3	0	3	0.2571429
Zimbabwe	1	1	4	0	3	0.2571429
Chad	2	0	3	0	3	0.2285714
Ghana	1	2	3	0	2	0.2285714
Kenya	1	1	2	0	4	0.2285714
Niger	2	1	2	0	3	0.2285714
Nigeria	3	1	1	0	3	0.2285714
Sierra Leone	1	0	4	0	3	0.2285714
Zambia	2	0	3	0	3	0.2285714
Gabon	3	2	0	0	2	0.2000000
Lesotho	1	3	2	0	1	0.2000000
Madagascar	1	0	3	0	3	0.2000000
South Sudan	3	0	2	0	2	0.2000000
Sudan	3	2	0	0	2	0.2000000
Swaziland	2	0	3	0	2	0.2000000
Uganda	2	1	1	0	3	0.2000000
Guinea-Bissau	2	0	2	0	2	0.1714286
Liberia	2	0	1	0	3	0.1714286
Senegal	3	0	1	0	2	0.1714286
Burundi	1	1	1	0	2	0.1428571
Djibouti	0	0	1	0	4	0.1428571
Eritrea	0	0	3	0	2	0.1428571
Rwanda	1	0	2	0	2	0.1428571
Comoros	0	0	1	0	3	0.1142857
Democratic Republic of Congo	2	0	2	0	0	0.1142857

4   Analysis
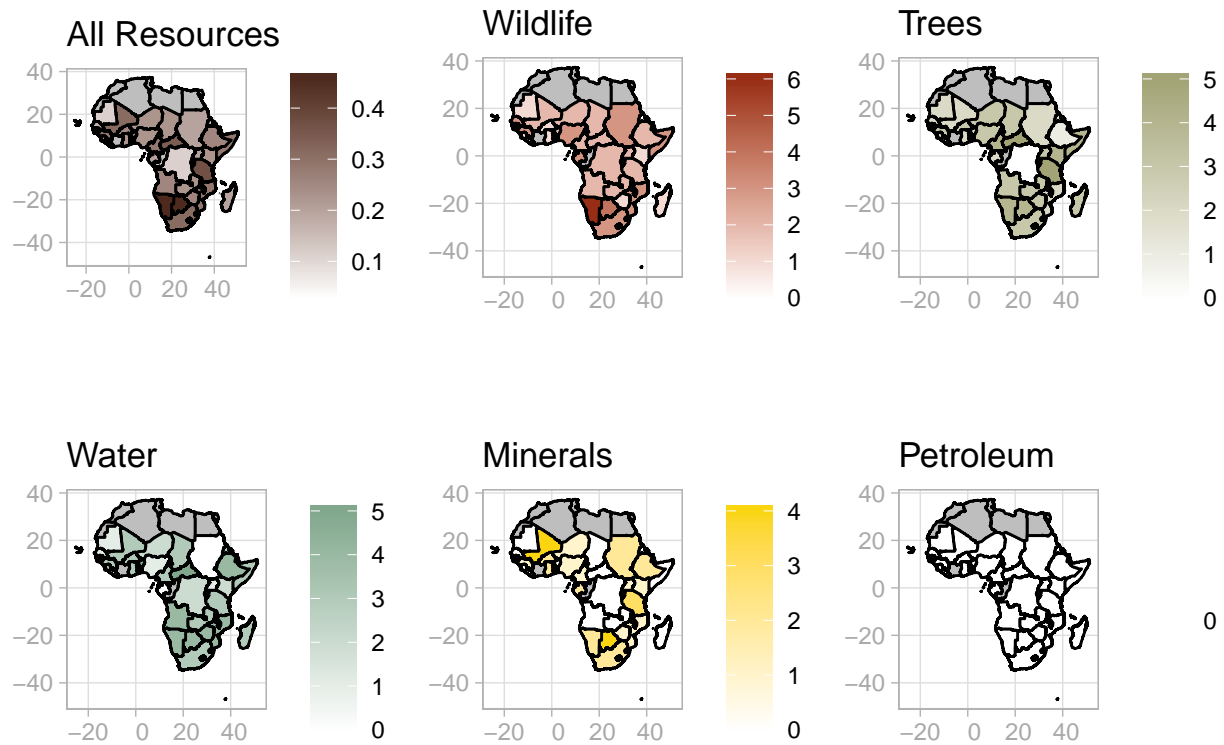
Figure 2: Total number of survey questions from the Rights to Resources dataset that support individual or community resource rights. The highest possible sum for each resource was 7. In the All Resources panel, values equal the proportion of responses that promote resource rights.

```
country.counts.rcorr <- cor(countrycounts[,c(2:4,6)])

corrplot(country.counts.rcorr) #discluded petroleum
```
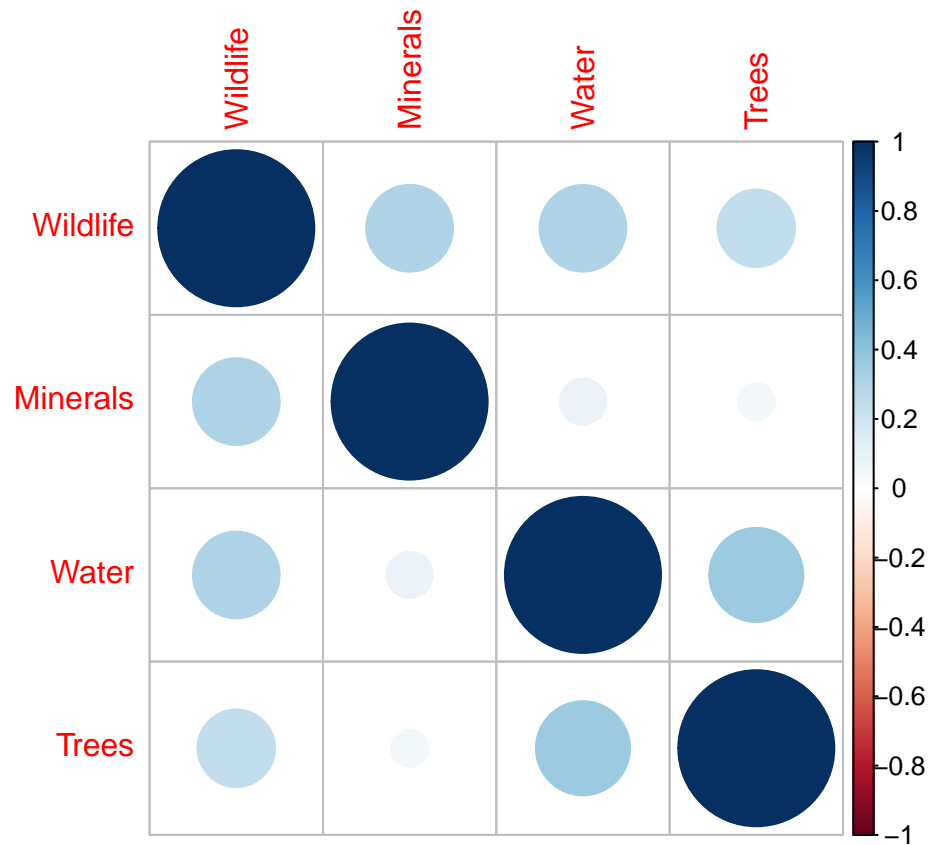
```
ggplot(countrycounts) +
  geom_point(aes(x=Wildlife, y=Minerals)) +
  geom_point(aes(x=Wildlife, y=Water)) +
  geom_point(aes(x=Wildlife, y=Trees))
```
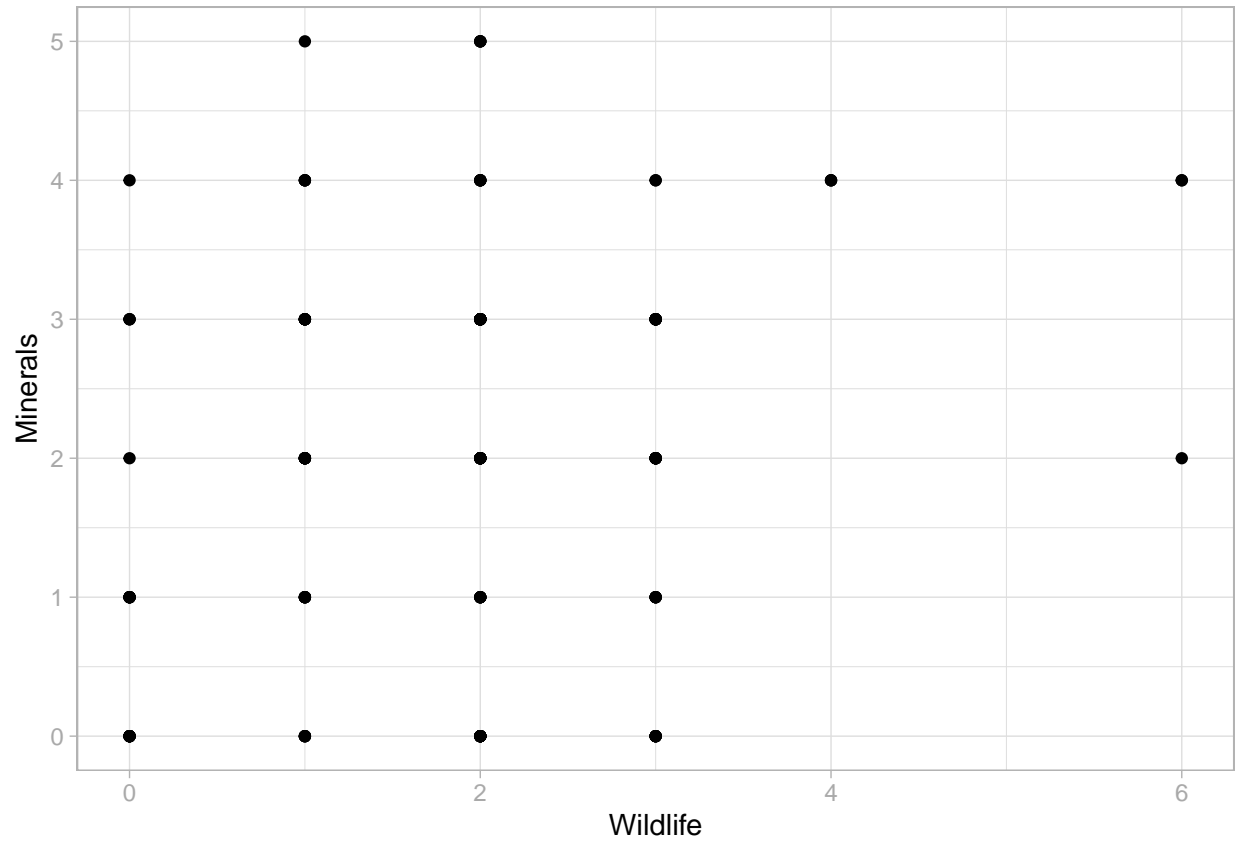
4.1 Question 1: <insert specific question here and add additional subsections for additional questions below, if needed>

4.2 Question 2:

5   Summary and Conclusions

6   References