In [40]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")
```

In [41]:

```
import plotly.express as px
```

In [42]:

```
china_data = pd.read_csv("china_dept_trap.csv")
```

In [43]:

```
china_data.head()
```

Out[43]:

	Expand All | Collapse All	YEAR	AMOUNT	LENDER	BORROWER	SECTOR	SENSITIVE TERRITORY OVERLAP	Cour
0	“Lar Patriota" Infrastructure (Phase 1)	2011	$50M	CDB	Government	Transport	None Known	Ang
1	10-Year Oil Supply Plan (10Mt/Year), "Oil for ...	2009	$7.0B	CDB	Petrobras	Extraction, pipelines	None Known	Br
2	1000 housing project	2012	$47M	ExImBank	Government	Government	None Known	Surina
3	115kV Transmission Line and Substation from Ph...	2009	$475M	ExImBank	Electricite Du Cambodge	Power	None Known	Cambo
4	151 Multisector infrastructure projects	2016	$600M	CDB	Central Bank of Kenya	Mulit-sector/discretionary	None Known	Ke

In [44]:

```
china_data.tail()
```

Out[44]:

	Expand All | Collapse All	YEAR	AMOUNT	LENDER	BORROWER	SECTOR	SENSITIVE TERRITORY OVERLAP	Country
853	Zalingei-El Geneinah Road Construction	2009	$120M	ExImBank	Government	Transport	None Known	Sudan
854	Zanzibar Airport Terminal 2 Expansion	2010	$73M	ExImBank	Government	Transport	None Known	Tanzania
855	Zemun-Borca bridge	2009	$217M	ExImBank	Government	Transport	None Known	Serbia
856	Zongo II Hydropower Station	2011	$367M	ExImBank	Government	Power	None Known	Congo, Democratic Republic of the
857	Zungeru Hydropower Plant Project	2013	$984M	ExImBank	Government	Power	Within Indigenous Peoples' Lands	Nigeria

In [45]:

```
china_data.shape
```

Out[45]:

```
(858, 8)
```

In [46]:

```
china_data.columns
```

Out[46]:

```
Index(['Expand All | Collapse All', 'YEAR', 'AMOUNT', 'LENDER', 'BORROWE
R',
       'SECTOR', 'SENSITIVE TERRITORY OVERLAP', 'Country'],
      dtype='object')
```

In [47]:

```
china_data = china_data.rename(columns = {'Expand All | Collapse All' : 'Title'})
```

In [48]:

```
china_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 858 entries, 0 to 857
Data columns (total 8 columns):
 #   Column                        Non-Null Count  Dtype 
---  ------                        --------------  ----- 
 0   Title                         858 non-null    object
 1   YEAR                          858 non-null    int64 
 2   AMOUNT                        858 non-null    object
 3   LENDER                        858 non-null    object
 4   BORROWER                      857 non-null    object
 5   SECTOR                        858 non-null    object
 6   SENSITIVE TERRITORY OVERLAP   858 non-null    object
 7   Country                       858 non-null    object
dtypes: int64(1), object(7)
memory usage: 53.8+ KB
```

In [49]:

```
china_data.describe()
```

Out[49]:

	YEAR
count	858.000000
mean	2013.268065
std	2.894155
min	2008.000000
25%	2011.000000
50%	2013.000000
75%	2016.000000
max	2019.000000

In [50]:

```
china_data.isnull().sum()
```

Out[50]:

```
Title                         0
YEAR                          0
AMOUNT                        0
LENDER                        0
BORROWER                      1
SECTOR                        0
SENSITIVE TERRITORY OVERLAP   0
Country                       0
dtype: int64
```

In [51]:

```
china_data.dropna(inplace = True)
```

In [52]:

```
china_data.nunique()
```

Out[52]:

```
Title                          827
YEAR                            12
AMOUNT                         346
LENDER                           7
BORROWER                       120
SECTOR                          10
SENSITIVE TERRITORY OVERLAP      8
Country                         94
dtype: int64
```

In [53]:

```
china_data['YEAR'].unique()
```

Out[53]:

```
array([2011, 2009, 2012, 2016, 2015, 2017, 2018, 2014, 2008, 2010, 2013,
       2019], dtype=int64)
```

In [54]:

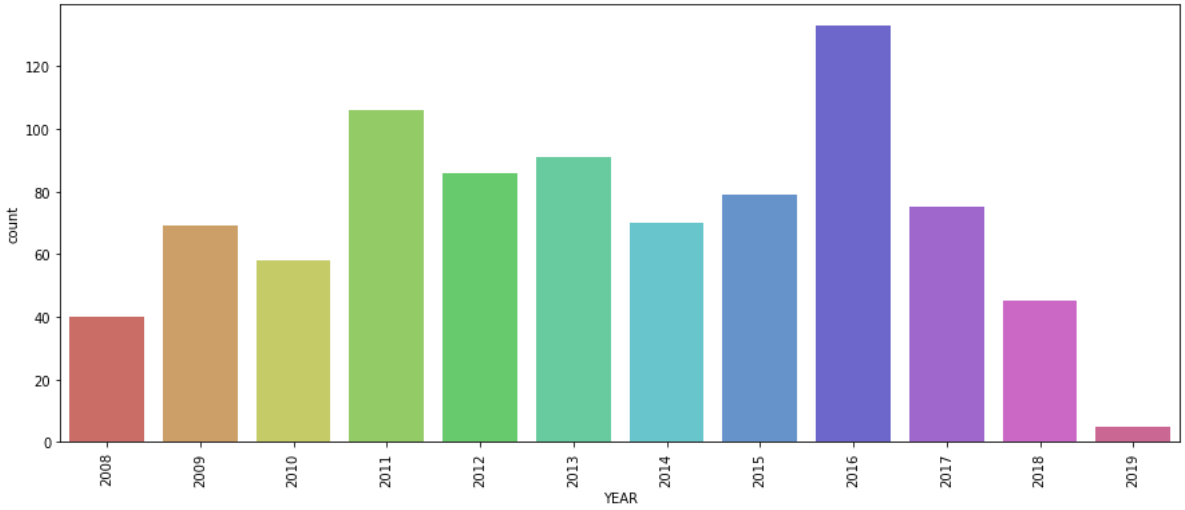
```
china_data['YEAR'].value_counts()
```

Out[54]:

```
2016    133
2011    106
2013     91
2012     86
2015     79
2017     75
2014     70
2009     69
2010     58
2018     45
2008     40
2019      5
Name: YEAR, dtype: int64
```

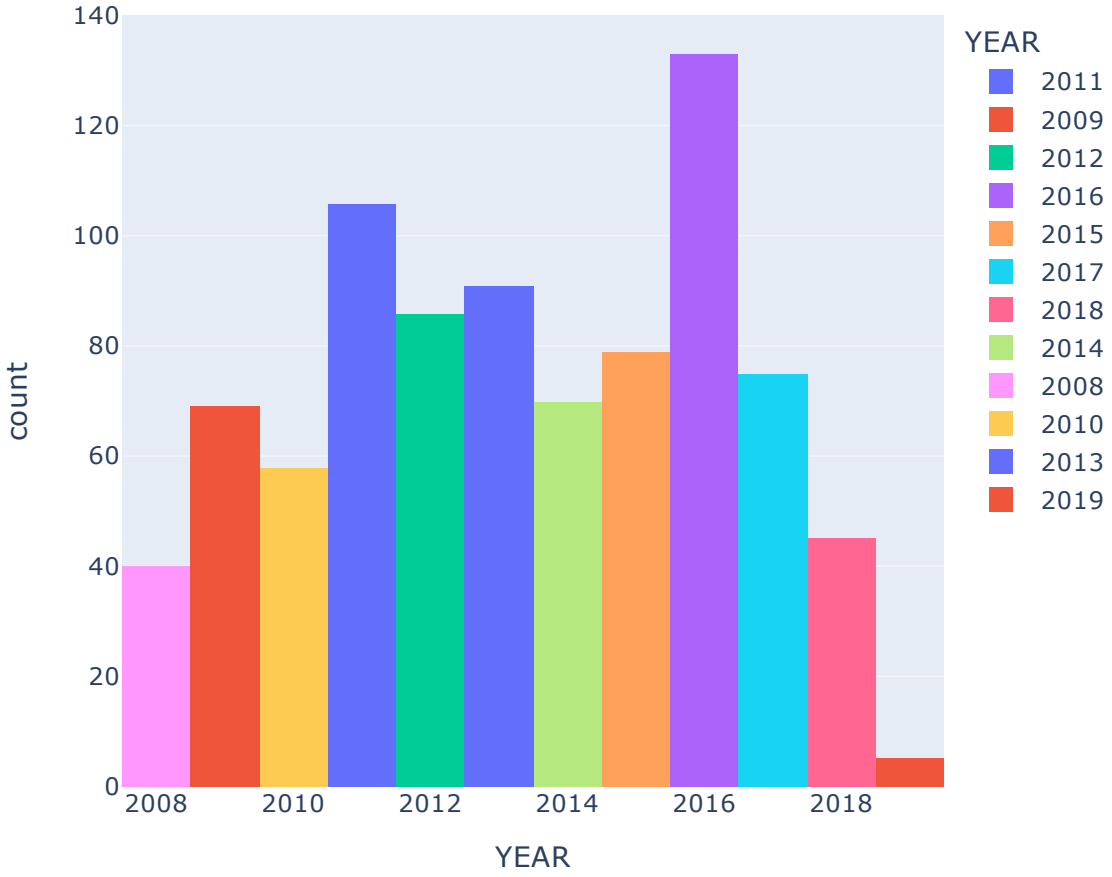
In [55]:

```
plt.figure(figsize=(15,6))
sns.countplot('YEAR', data = china_data, palette='hls')
plt.xticks(rotation = 90)
plt.show()
```



In [56]:

```
fig1 = px.histogram(china_data, x = 'YEAR', color = 'YEAR')
fig1.show()
```



In [57]:

```
china_data['LENDER'].unique()
```

Out[57]:

```
array(['CDB', 'ExImBank', 'CDB, ExImBank', 'BOC, CDB, ExImBank',
       'CDB, ICBC', 'CDB, others', 'CDB, Citic'], dtype=object)
```

In [58]:

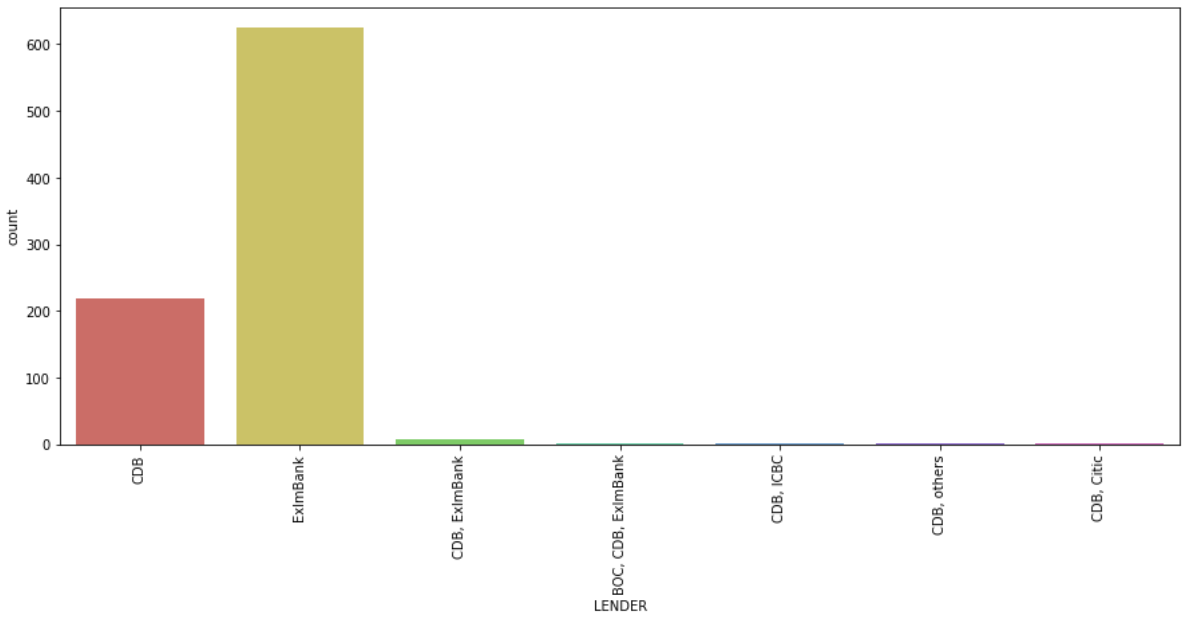
```
china_data['LENDER'].value_counts()
```

Out[58]:

```
ExImBank              625
CDB                   219
CDB, ExImBank           8
CDB, ICBC               2
BOC, CDB, ExImBank      1
CDB, others             1
CDB, Citic              1
Name: LENDER, dtype: int64
```

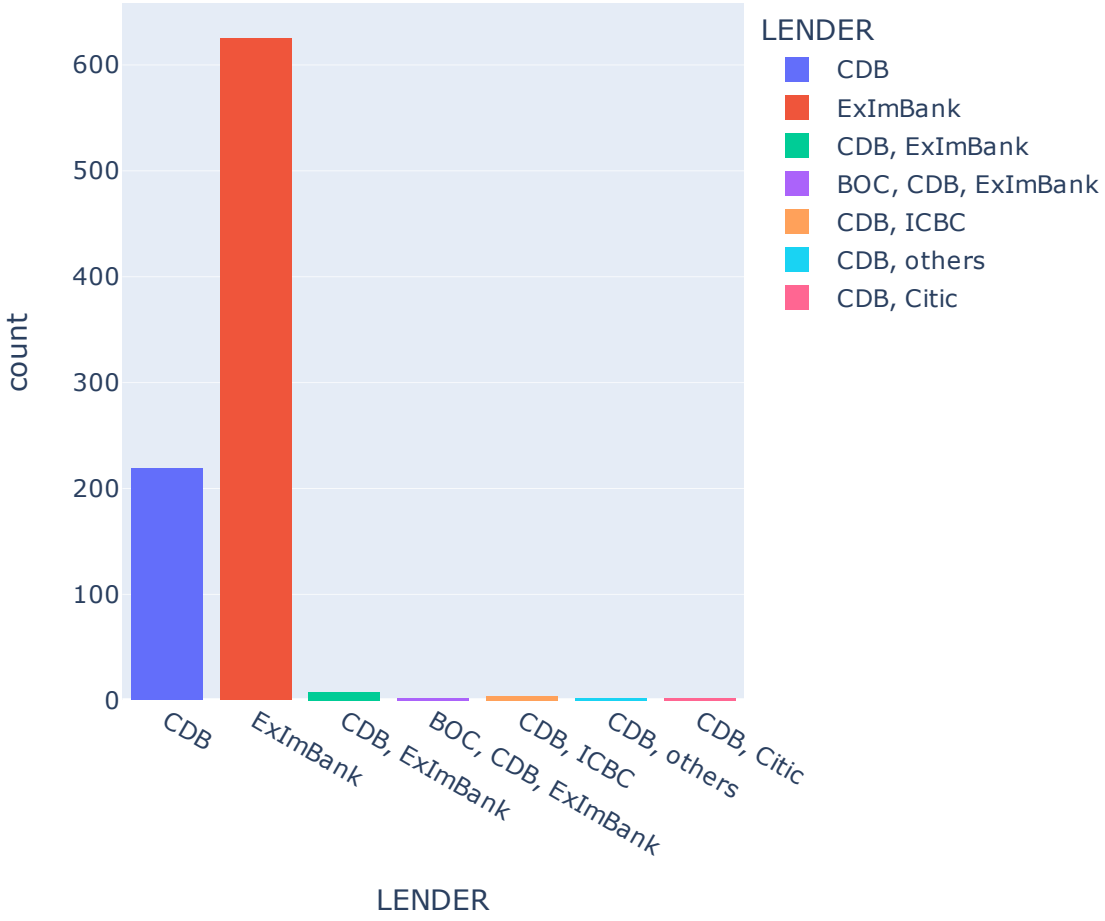
In [59]:

```
plt.figure(figsize=(15,6))
sns.countplot('LENDER', data = china_data, palette='hls')
plt.xticks(rotation = 90)
plt.show()
```



In [60]:

```
fig2 = px.histogram(china_data, x = 'LENDER', color = 'LENDER')
fig2.show()
```



In [61]:

```
china_data['SECTOR'].unique()
```

Out[61]:

```
array(['Transport', 'Extraction, pipelines', 'Government', 'Power',
       'Mulit-sector/discretionary', 'Telecom', 'Other construction',
       'Agriculture, food', 'Manufacturing', 'fTransport'], dtype=object)
```

In [62]:

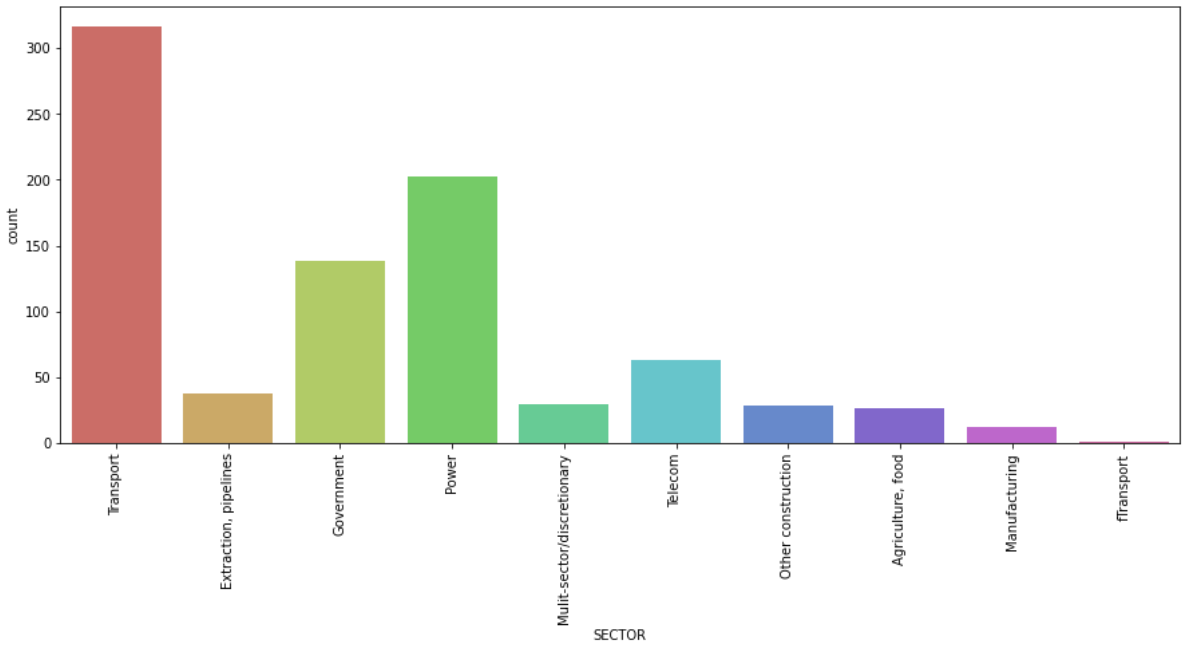
```
china_data['SECTOR'].value_counts()
```

Out[62]:

```
Transport                    316
Power                        203
Government                   138
Telecom                       63
Extraction, pipelines         38
Mulit-sector/discretionary    30
Other construction            29
Agriculture, food             27
Manufacturing                 12
fTransport                     1
Name: SECTOR, dtype: int64
```

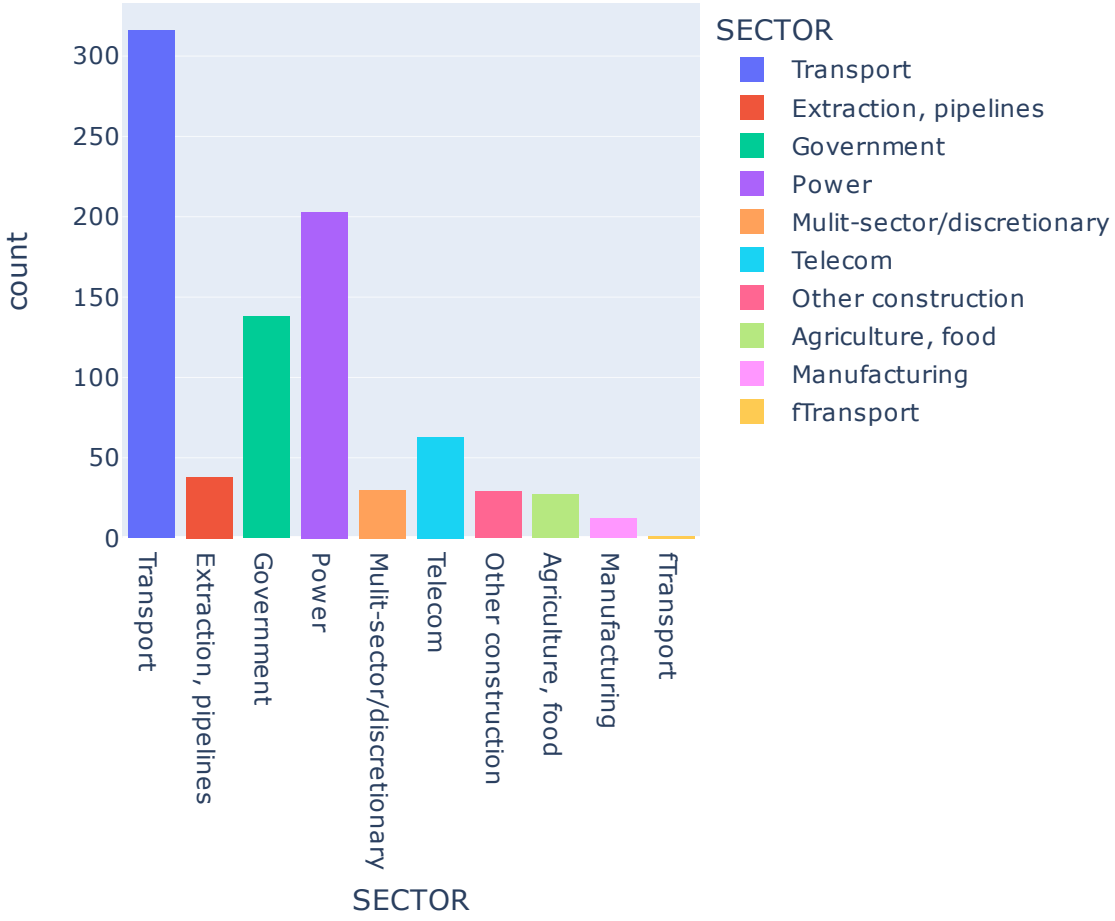
In [63]:

```
plt.figure(figsize=(15,6))
sns.countplot('SECTOR', data = china_data, palette='hls')
plt.xticks(rotation = 90)
plt.show()
```



In [64]:

```
fig3 = px.histogram(china_data, x = 'SECTOR', color = 'SECTOR')
fig3.show()
```



In [65]:

```
china_data['SENSITIVE TERRITORY OVERLAP'].unique()
```

Out[65]:

```
array(['None Known',
       "Within Indigenous Peoples' Lands\n Within Critical Habitats",
       "Within Indigenous Peoples' Lands",
       "Within Indigenous Peoples' Lands\n Within National Protected Area
s",
       'Within Critical Habitats\n Within National Protected Areas',
       'Within Critical Habitats',
       "Within Indigenous Peoples' Lands\n Within Critical Habitats\n With
in National Protected Areas",
       'Within National Protected Areas'], dtype=object)
```

In [66]:

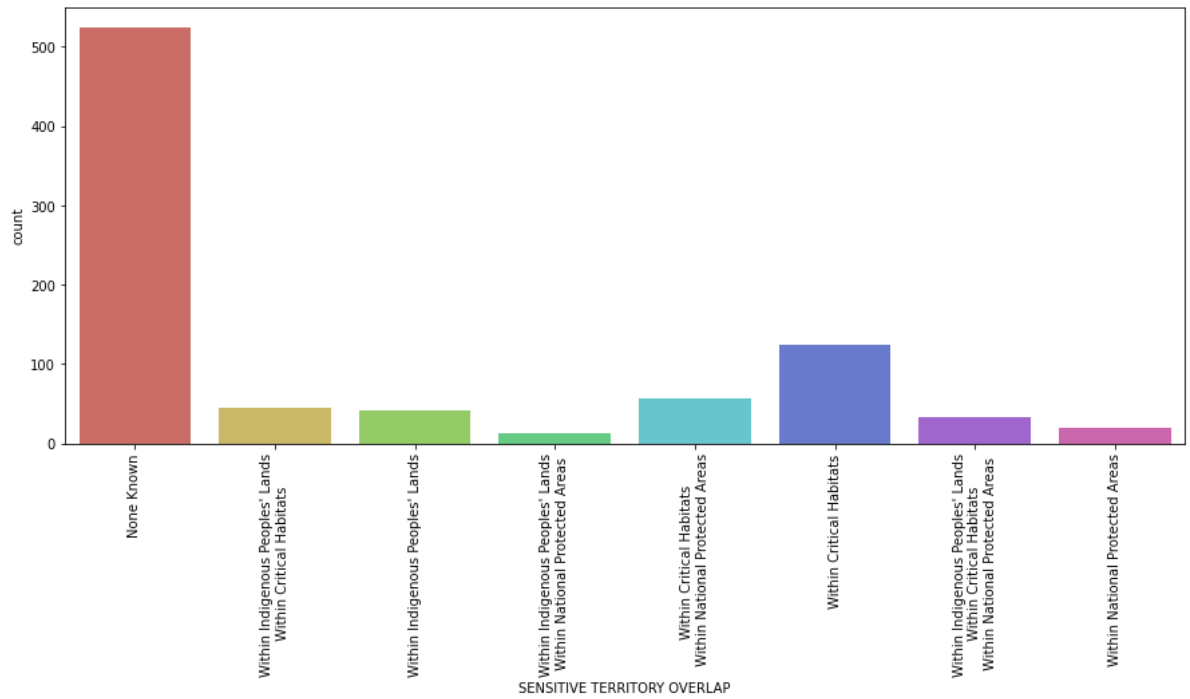
```
china_data['SENSITIVE TERRITORY OVERLAP'].value_counts()
```

Out[66]:

```
None Known
524
Within Critical Habitats
124
Within Critical Habitats\n Within National Protected Areas
57
Within Indigenous Peoples' Lands\n Within Critical Habitats
45
Within Indigenous Peoples' Lands
41
Within Indigenous Peoples' Lands\n Within Critical Habitats\n Within Natio
nal Protected Areas     34
Within National Protected Areas
19
Within Indigenous Peoples' Lands\n Within National Protected Areas
13
Name: SENSITIVE TERRITORY OVERLAP, dtype: int64
```

In [67]:

```
plt.figure(figsize=(15,6))
sns.countplot('SENSITIVE TERRITORY OVERLAP', data = china_data, palette='hls')
plt.xticks(rotation = 90)
plt.show()
```



In [68]:

```
china_data['Country'].unique()
```

Out[68]:

```
array(['Angola', 'Brazil', 'Suriname', 'Cambodia', 'Kenya',
       'Congo, Democratic Republic of the', 'Laos', 'Bangladesh',
       'Nigeria', 'Benin', 'Zambia', 'Bahamas', "Cote d'Ivoire",
       'Ethiopia', 'Djibouti', 'Indonesia', 'Togo', 'Philippines',
       'Myanmar', 'Mozambique', 'Eritrea', 'Ukraine', 'South Sudan',
       'Sudan', 'Kyrgyz Republic', 'Uzbekistan', 'Ecuador', 'Mauritania',
       'Kazakhstan', 'Jordan', 'Niger', 'Mauritius', 'Pakistan', 'Mali',
       'Hungary', 'Serbia', 'Belarus', 'Morocco', 'Regional', 'Malawi',
       'Egypt', 'Tanzania', 'Congo, Republic of the', 'Fiji', 'Nepal',
       'Rwanda', 'Ghana', 'Senegal', 'Sri Lanka', 'Argentina', 'Guyana',
       'Trinidad and Tobago', 'Maldives', 'Bolivia', 'Vietnam', 'Gabon',
       'Montenegro', 'Papua New Guinea', 'Samoa', 'Iran', 'Cameroon',
       'Venezuela', 'Timor-Leste', 'Peru', 'Tajikistan', 'Malaysia',
       'Dominican Republic', 'Uganda', 'Russian Federation', 'Madagascar',
       'Turkmenistan', 'Jamaica', 'Gambia', 'Lesotho', 'Zimbabwe',
       'Mongolia', 'Cuba', 'Guinea', 'Macedonia', 'Vanuatu',
       'Equatorial Guinea', 'Grenada', 'South Africa', 'Namibia', 'Chad',
       'Tonga', 'Barbados', 'Liberia', 'Costa Rica', 'Antigua & Barbuda',
       'Comoros', 'Mexico', 'Tunisia', 'Bosnia & Herzegovina'],
      dtype=object)
```

In [69]:

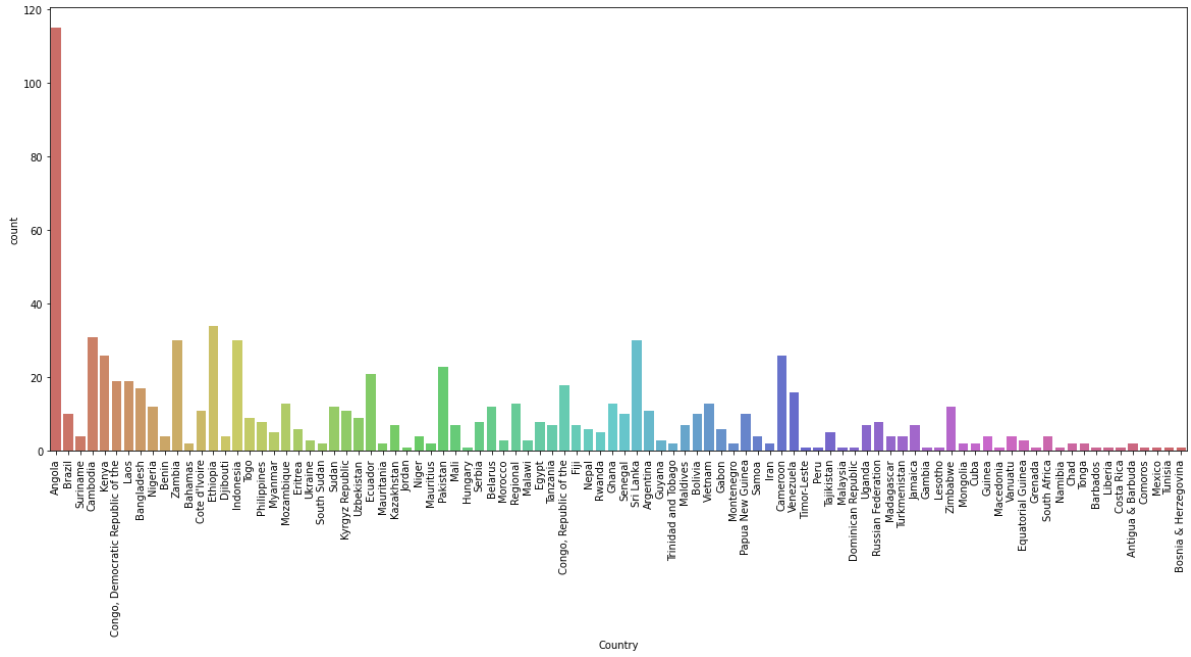
```
china_data['Country'].value_counts()
```

Out[69]:

```
Angola                  115
Ethiopia                 34
Cambodia                 31
Sri Lanka                30
Indonesia                30
                       ...
Malaysia                  1
Peru                      1
Hungary                   1
Jordan                    1
Bosnia & Herzegovina      1
Name: Country, Length: 94, dtype: int64
```

In [70]:

```
plt.figure(figsize=(20,8))
sns.countplot('Country', data = china_data, palette='hls')
plt.xticks(rotation = 90)
plt.show()
```



In [71]:

```
def amount(a):
    y=a
    if ',' in a:
        a=a.replace(',','')
    a=float(a[1:-1])
    if y[-1]=='M':
        return a*1000000
    elif y[-1]=='B':
        return a*1000000000
    else:
        return 'Please check'
```

In [72]:

```
china_data['AMOUNT']=china_data['AMOUNT'].apply(amount)
```

In [73]:

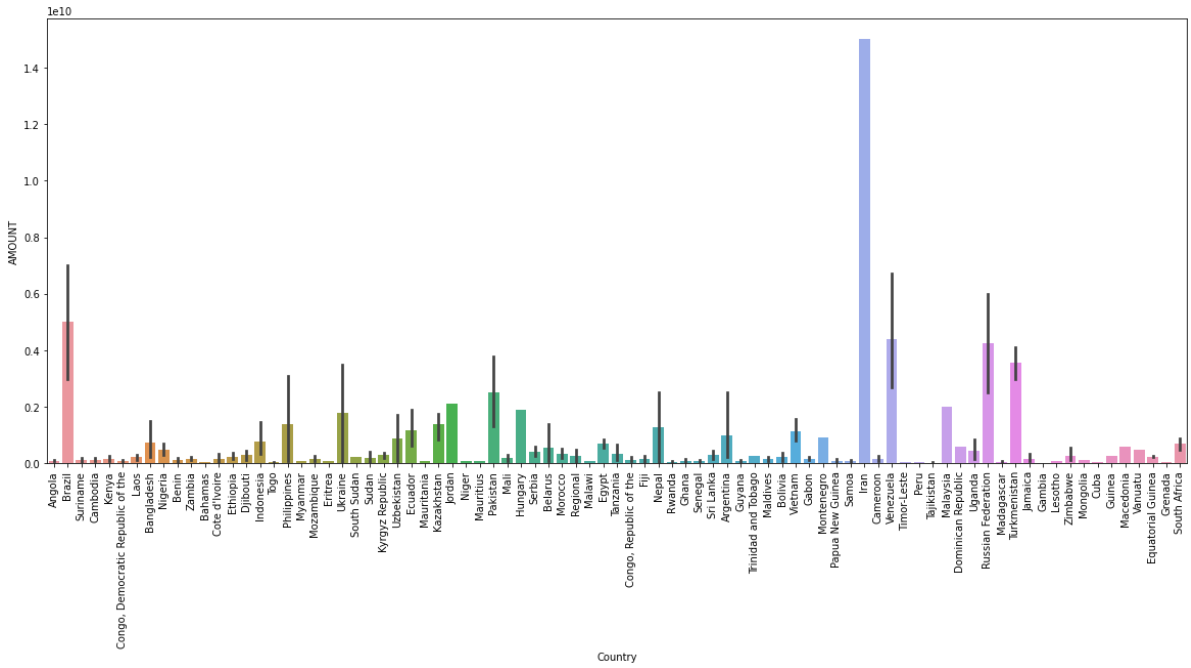
```
china_data.head()
```

Out[73]:

	Title	YEAR	AMOUNT	LENDER	BORROWER	SECTOR	SENSITIVE TERRITORY OVERLAP	
0	“Lar Patriota" Infrastructure (Phase 1)	2011	5.000000e+07	CDB	Government	Transport	None Known	
1	10-Year Oil Supply Plan (10Mt/Year), "Oil for ...	2009	7.000000e+09	CDB	Petrobras	Extraction, pipelines	None Known	
2	1000 housing project	2012	4.700000e+07	ExImBank	Government	Government	None Known	S
3	115kV Transmission Line and Substation from Ph...	2009	4.750000e+08	ExImBank	Electricite Du Cambodge	Power	None Known	Ca
4	151 Multisector infrastructure projects	2016	6.000000e+08	CDB	Central Bank of Kenya	Mulit-sector/discretionary	None Known	

In [74]:

```
plt.figure(figsize=(20,8))
sns.barplot(x = 'Country',y = 'AMOUNT', data = china_data.head(500))
plt.xticks(rotation = 90)
plt.show()
```

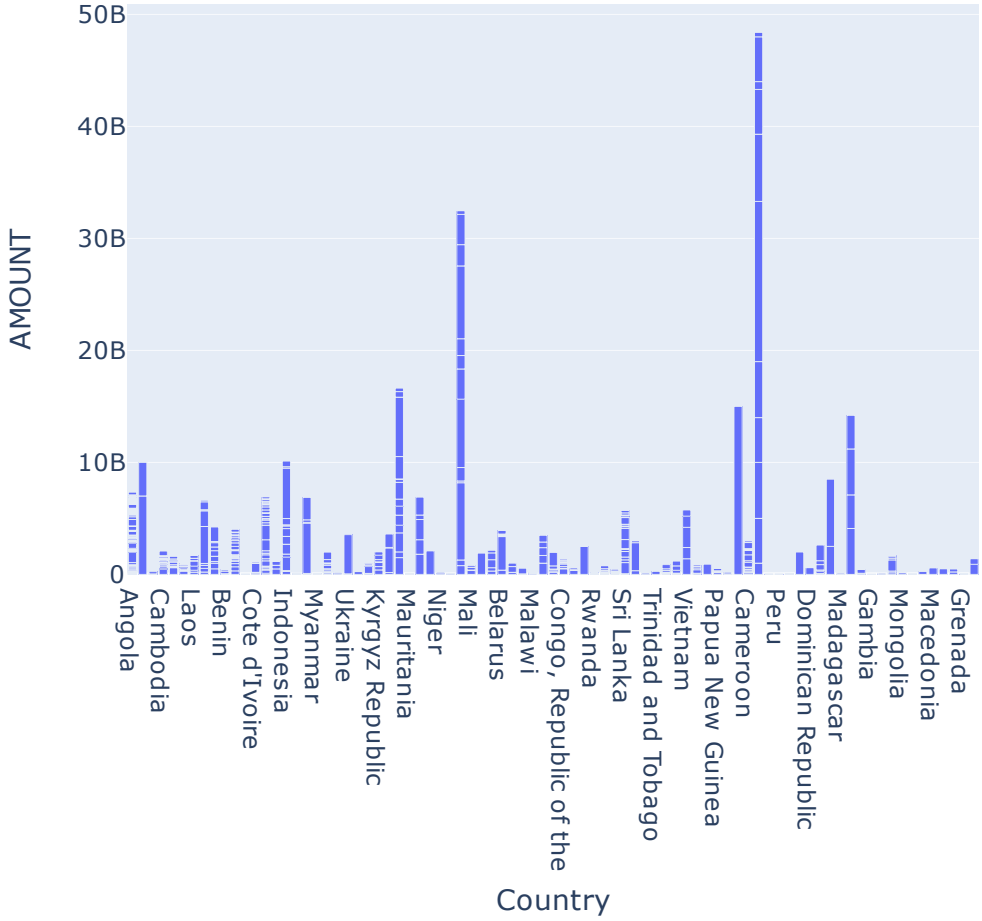


In [ ]:

```
plt.figure(figsize=(20,8))
fig = px.bar(x = 'Country',y = 'AMOUNT', data = china_data.head(500))
plt.xticks(rotation = 90)
plt.show()
```

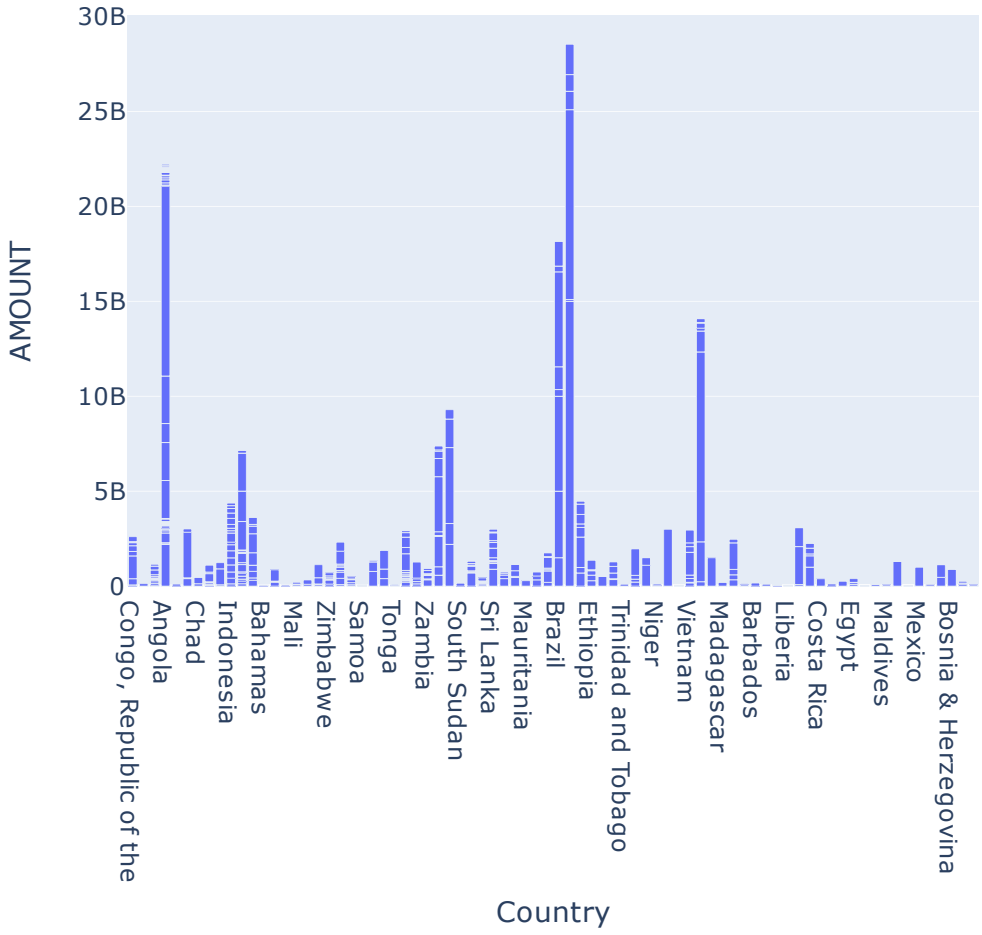
In [87]:

```
fig4 = px.bar(china_data.head(500),
                    x = "Country", y = "AMOUNT")
fig4.show()
```



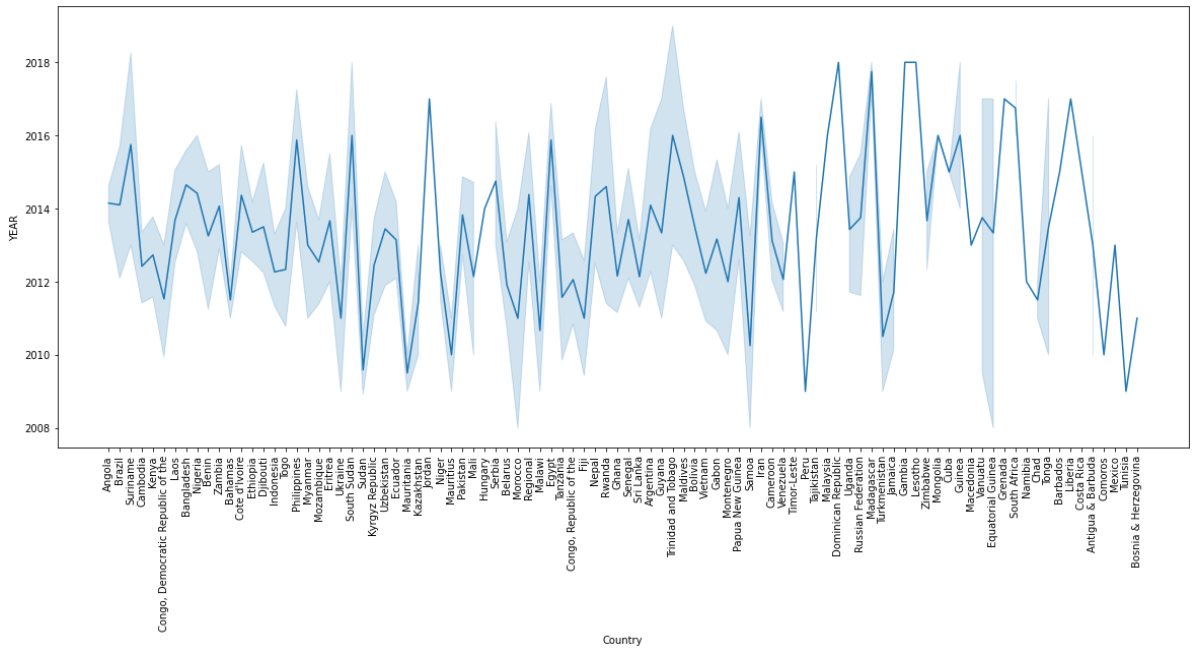
In [86]:

```
fig5 = px.bar(china_data.tail(358),
                    x = "Country", y = "AMOUNT")
fig5.show()
```



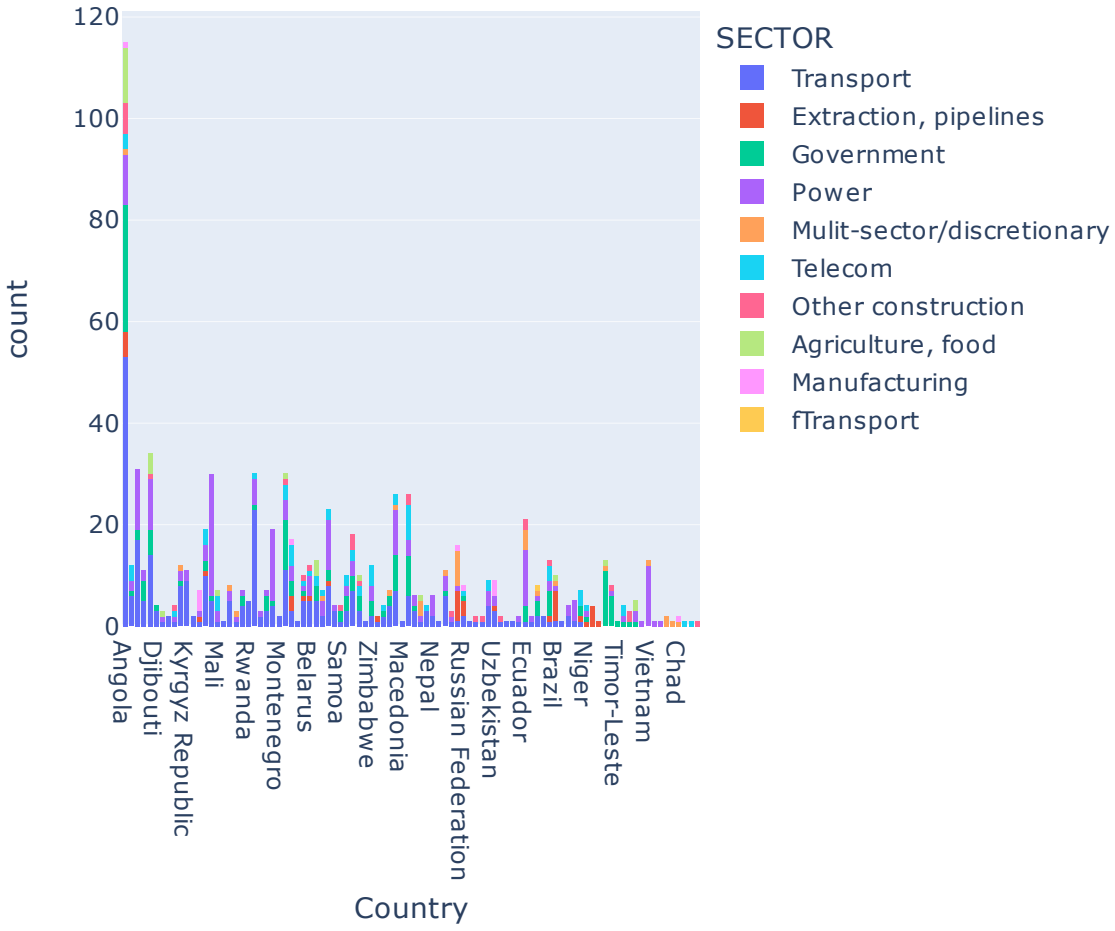
In [93]:

```
plt.figure(figsize=(20,8))
sns.lineplot(x = 'Country',y = 'YEAR', data = china_data)
plt.xticks(rotation = 90)
plt.show()
```



In [97]:

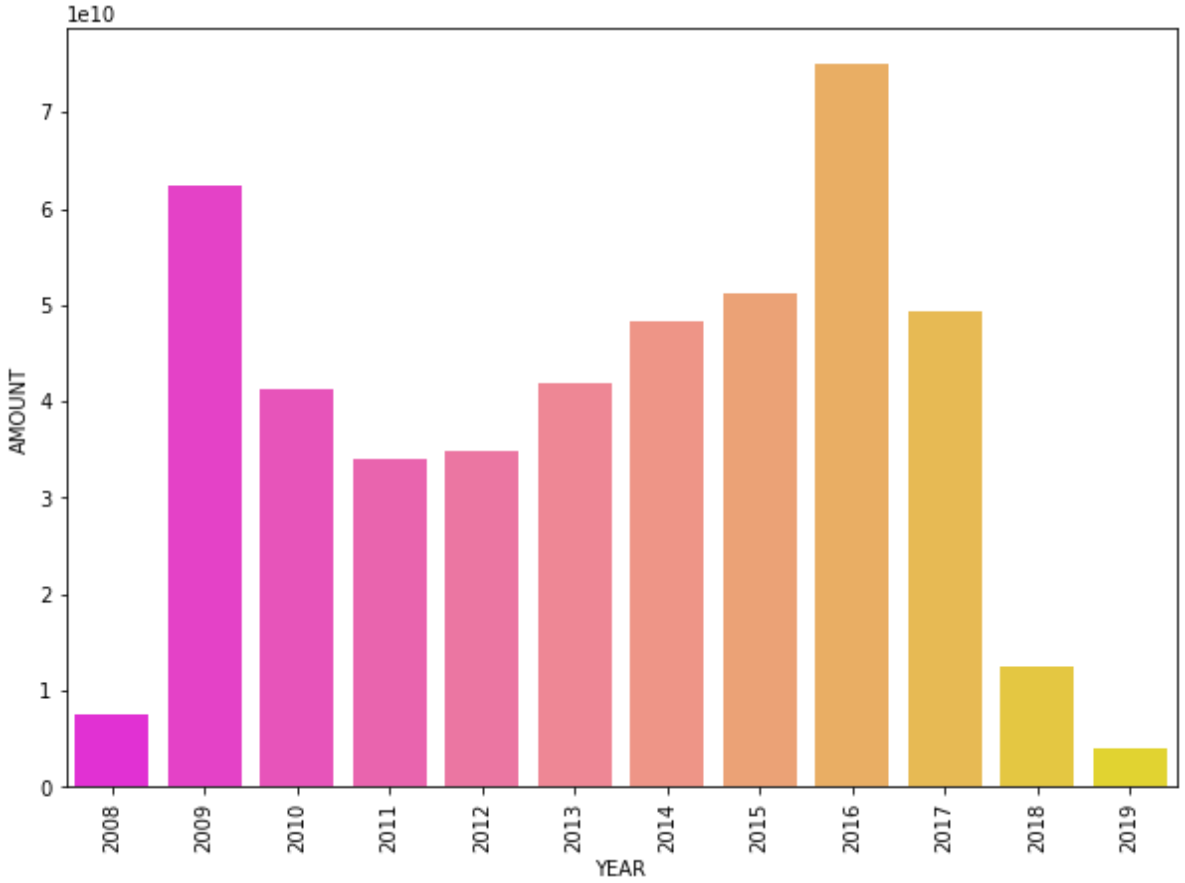
```
fig6 = px.histogram(china_data,
                    x = "Country", color = "SECTOR")
fig6.show()
```



In [99]:

```
plt.figure(figsize=(10,7))
plt.xticks(rotation=90)
data=china_data.groupby('YEAR').sum().reset_index().sort_values('YEAR').sort_values('YEA
display(data)
sns.barplot(data=data,x='YEAR',y='AMOUNT',palette='spring')
plt.show()
```

	YEAR	AMOUNT
0	2008	7.565000e+09
1	2009	6.240000e+10
2	2010	4.123500e+10
3	2011	3.394900e+10
4	2012	3.488600e+10
5	2013	4.185200e+10
6	2014	4.839100e+10
7	2015	5.110400e+10
8	2016	7.500100e+10
9	2017	4.924100e+10
10	2018	1.258300e+10
11	2019	3.940000e+09

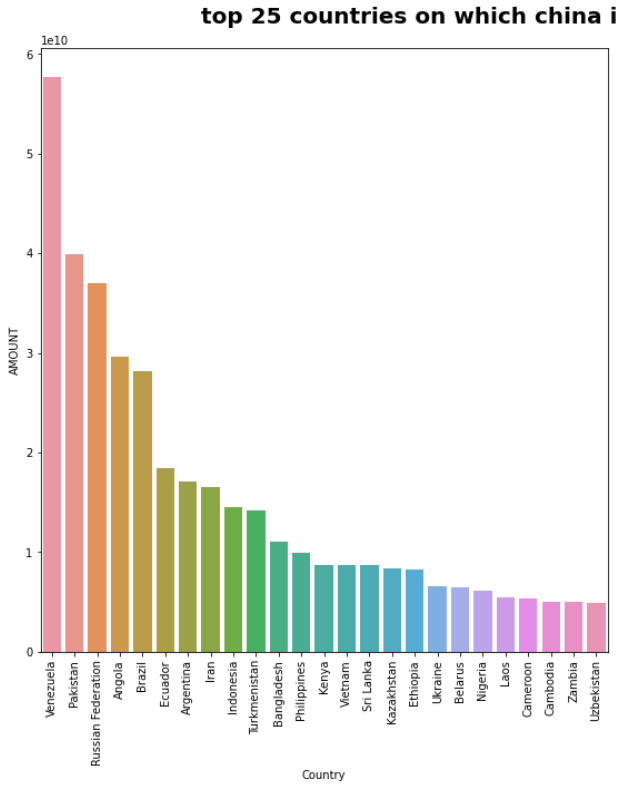


In [100]:

```
plt.figure(figsize=(15,10))
plt.suptitle('top 25 countries on which china invested the most(world wide)',size=20,wei
data=china_data.groupby('Country').sum().reset_index().sort_values('AMOUNT',ascending=Fa
plt.subplot(1,2,1)
plt.xticks(rotation=90)
sns.barplot(data=data.head(25),x='Country',y='AMOUNT')
plt.subplot(1,2,2)
plt.axis('off')
plt.tight_layout()
plt.table(cellText=data.head(25).values, colLabels=data.columns, loc='center')
```

Out[100]:

```
<matplotlib.table.Table at 0x2df31151c0>
```



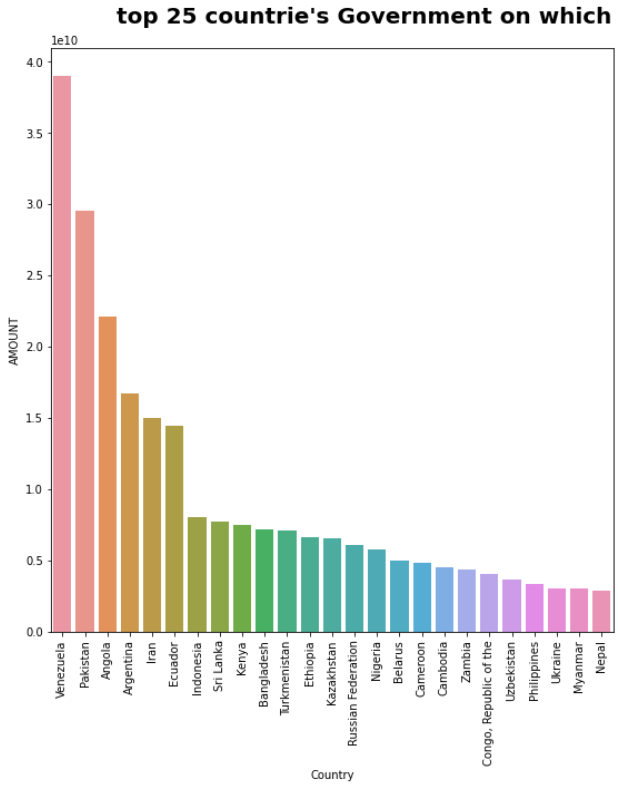
Country	AMOUNT
Venezuela	57691000000.0
Pakistan	39853000000.0
Russian Federation	37045000000.0
Angola	29640000000.0
Brazil	28156000000.0
Ecuador	18390000000.0
Argentina	17083000000.0
Iran	16500000000.0
Indonesia	14499000000.0
Turkmenistan	14200000000.0
Bangladesh	11089000000.0
Philippines	9954000000.0
Kenya	8756000000.0
Vietnam	8713000000.0
Sri Lanka	8709000000.0
Kazakhstan	8400000000.0
Ethiopia	8291000000.0
Ukraine	6552000000.0
Belarus	6440000000.0
Nigeria	6119000000.0
Laos	5463000000.0
Cameroon	5309000000.0
Cambodia	5008000000.0
Zambia	4957000000.0
Uzbekistan	4890000000.0

In [101]:

```
plt.figure(figsize=(15,10))
plt.suptitle("top 25 countrie's Government on which china invested the most(world wide)"
data=china_data[china_data['BORROWER']=='Government'].groupby('Country').sum().reset_inc
plt.subplot(1,2,1)
plt.xticks(rotation=90)
sns.barplot(data=data.head(25),x='Country',y='AMOUNT')
plt.subplot(1,2,2)
plt.axis('off')
plt.tight_layout()
plt.table(cellText=data.head(25).values, colLabels=data.columns, loc='center')
```

Out[101]:

```
<matplotlib.table.Table at 0x2df7bd9d00>
```



Country	AMOUNT
Venezuela	39000000000.0
Pakistan	29528000000.0
Angola	22140000000.0
Argentina	16741000000.0
Iran	15000000000.0
Ecuador	14489000000.0
Indonesia	8061000000.0
Sri Lanka	7729000000.0
Kenya	7529000000.0
Bangladesh	7221000000.0
Turkmenistan	7100000000.0
Ethiopia	6651000000.0
Kazakhstan	6600000000.0
Russian Federation	6097000000.0
Nigeria	5791000000.0
Belarus	5040000000.0
Cameroon	4860000000.0
Cambodia	4533000000.0
Zambia	4415000000.0
Congo, Republic of the	4056000000.0
Uzbekistan	3690000000.0
Philippines	3369000000.0
Ukraine	3052000000.0
Myanmar	3019000000.0
Nepal	2916000000.0

In [103]:

```
import textwrap
```

In [105]:

```
country='Pakistan'
data=china_data[china_data['Country']==country]
ax=plt.figure(figsize=(15,10))
plt.suptitle(f"China's investments on {country}",weight='bold',size=20)
plt.subplot(2,2,1)
plt.title('Year-wise Investment')
sns.lineplot(data=data.groupby('YEAR').sum().reset_index(),x='YEAR',y='AMOUNT',color='r
plt.subplot(2,2,2)
plt.title('Sector-wise Investment')
data['SECTOR'].value_counts().plot.pie(autopct='%.2f%%')
plt.subplot(2,2,3)
plt.title('Borrower-wise Amount invested')
plt.xticks(rotation=90)
ax=sns.barplot(data=data.groupby('BORROWER').sum().reset_index(),x='BORROWER',y='AMOUNT
labels = [textwrap.fill(label.get_text(), 12) for label in ax.get_xticklabels()]
ax.set_xticklabels(labels)
plt.subplot(2,2,4)
plt.title('YEAR-wise Amount invested')
ax=sns.barplot(data=data,x='YEAR',y='AMOUNT',hue='SECTOR',ci=False)
labels = [textwrap.fill(label.get_text(), 12) for label in ax.get_xticklabels()]
display(data.sort_values('AMOUNT',ascending=False)[['YEAR','AMOUNT']].reset_index(drop=T
```

	YEAR	AMOUNT
0	2009	6.900000e+09
1	2014	6.500000e+09
2	2017	6.100000e+09
3	2016	2.900000e+09
4	2015	2.700000e+09
5	2015	2.700000e+09
6	2014	1.900000e+09
7	2014	1.600000e+09
8	2017	1.500000e+09
9	2017	1.200000e+09
10	2013	1.200000e+09
11	2016	9.560000e+08
12	2015	7.850000e+08
13	2015	5.760000e+08
14	2016	5.000000e+08
15	2012	4.480000e+08
16	2011	3.770000e+08
17	2008	3.270000e+08
18	2015	2.070000e+08
19	2008	2.000000e+08
20	2011	1.570000e+08

	YEAR	AMOUNT
21	2017	7.600000e+07
22	2013	4.400000e+07

China's investments on Pakistan