----------Portfolio Project 01---------- ¶

----------Geopandas: Spatial Data Analysis----------

In [31]:
```
import geopandas as gpd
import matplotlib.pyplot as plt
import pandas as pd
```

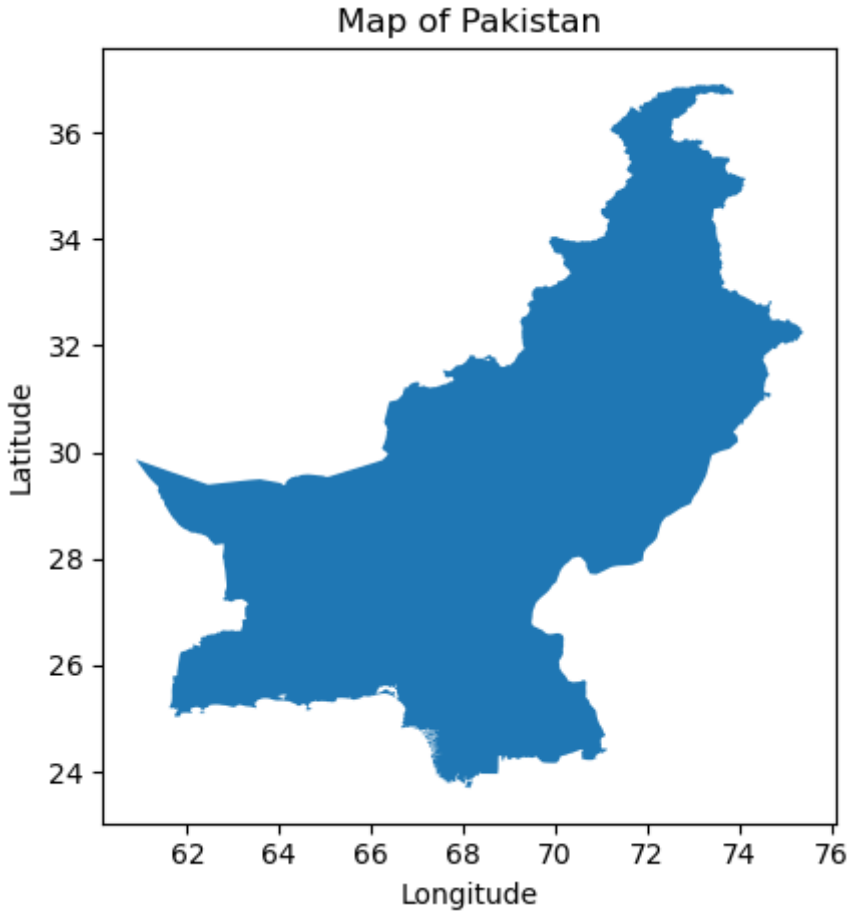
In [3]:
```
pak.head()
```

Out[3]:

	geometry
0	MULTIPOLYGON (((68.18577 23.83741, 68.19128 23...

In [33]:
```
pak = gpd.read_file(r"D:\QGIS\QGIS dataset\Google Earth\pak_admbnda_adm
```

In [34]:
```
pak.plot()
plt.title('Map of Pakistan')
plt.xlabel('Longitude')
plt.ylabel('Latitude')

plt.tight_layout()
plt.show()
```



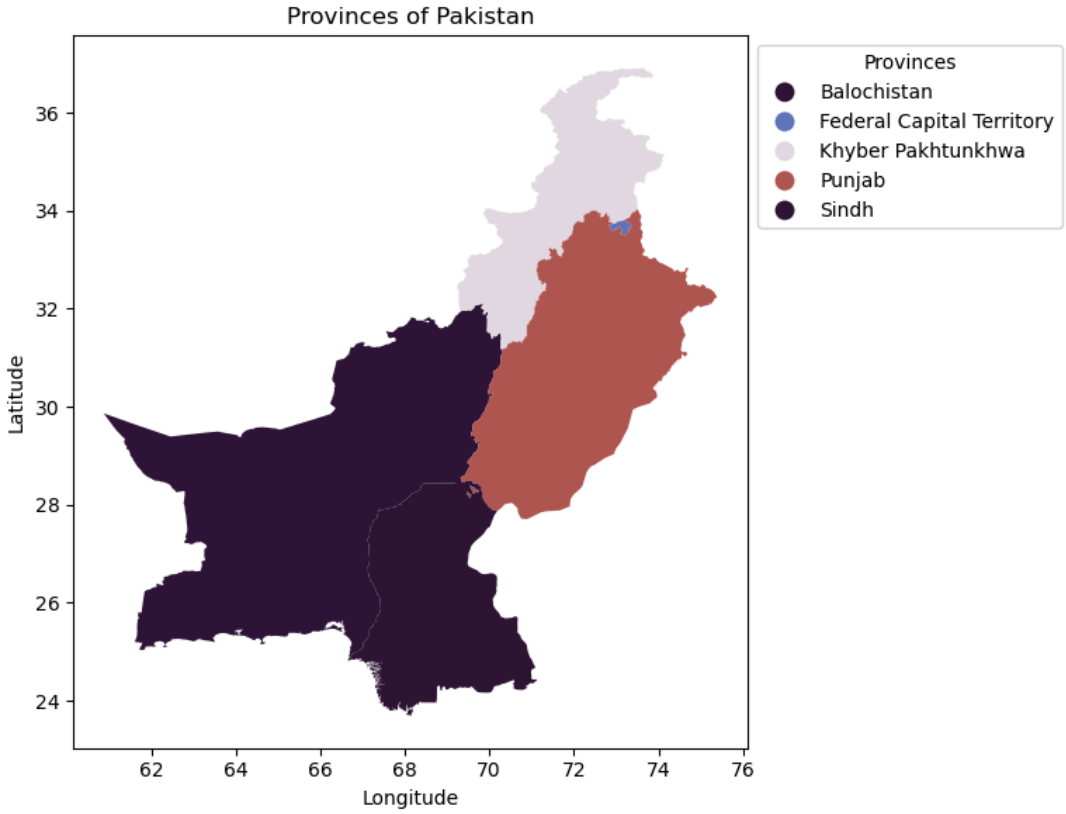
In [35]:
```
prov = gpd.read_file(r"D:\QGIS\QGIS dataset\Google Earth\pak_admbnda_ad
```

In [6]:
```
prov.head()
```

Out[6]:

	Shape_Leng	Shape_Area	ADM1_EN	ADM1_PCODE	ADM1_REF	ADM1ALT1EN	A
0	41.407021	31.910371	Balochistan	PK7	None	None	
1	1.659222	0.087285	Federal Capital Territory	PK5	None	None	
2	27.479368	9.901186	Khyber Pakhtunkhwa	PK2	None	None	
3	27.408452	19.362386	Punjab	PK6	None	None	
4	30.150964	12.725140	Sindh	PK8	None	None	

In [7]:
```
fig, ax = plt.subplots(figsize=(12, 6))
prov.plot(ax=ax, cmap='twilight_shifted', column='ADM1_EN', legend=True
          legend_kwds={'title': "Provinces", 'loc': 'upper left', 'bbox
plt.title('Provinces of Pakistan')
plt.xlabel('Longitude')
plt.ylabel('Latitude')

plt.tight_layout()
plt.show()
```



In [8]:
```
district = gpd.read_file(r"D:\QGIS\QGIS dataset\Google Earth\pak_admbnd
```

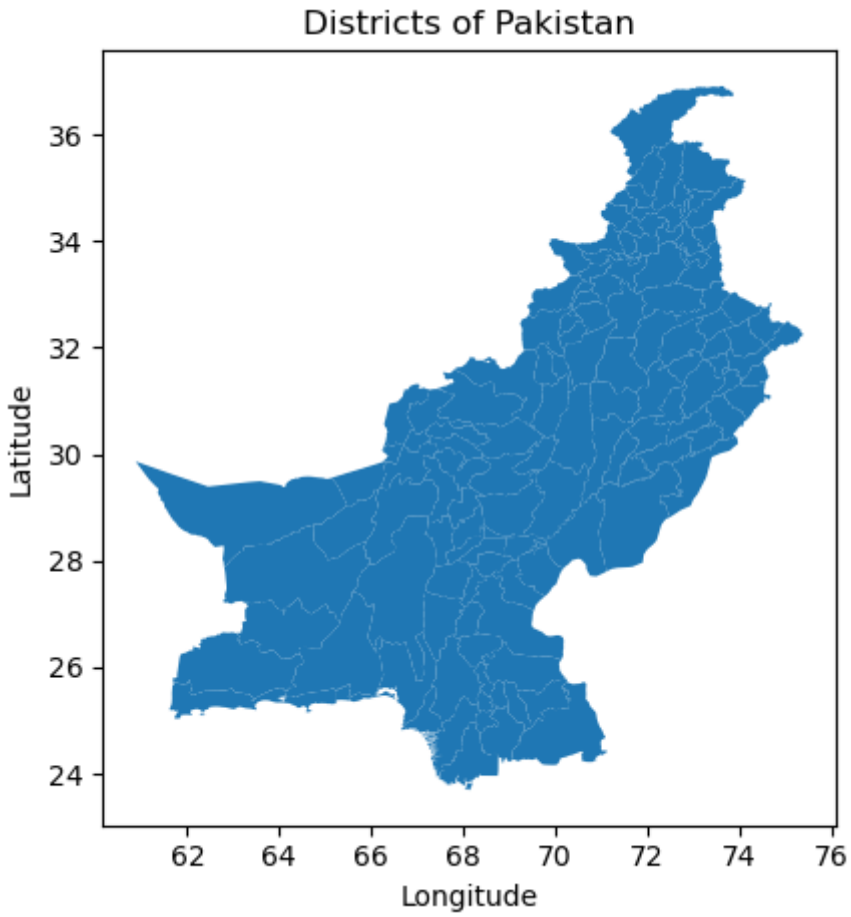
In [9]:
```
district.head()
```

Out[9]:

	Shape_Leng	Shape_Area	ADM2_EN	ADM2_PCODE	ADM2_REF	ADM2ALT1EN	A
0	2.187495	0.171564	Abbottabad	PK201	None	None	
1	4.739696	0.662449	Attock	PK601	None	None	
2	8.774626	2.252602	Awaran	PK701	None	None	
3	4.516057	0.600593	Badin	PK801	None	None	
4	7.041104	0.795837	Bahawalnagar	PK602	None	None	

In [10]:

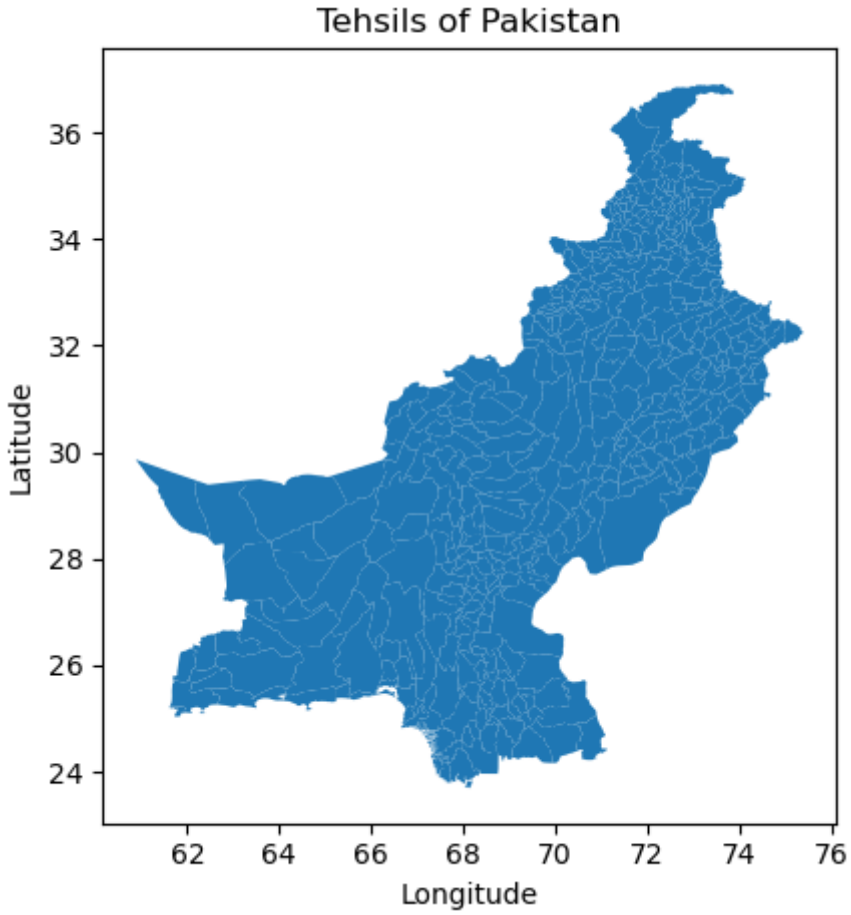
```
district.plot()
plt.title('Districts of Pakistan')
plt.xlabel('Longitude')
plt.ylabel('Latitude')

plt.tight_layout()
plt.show()
```



In [11]:

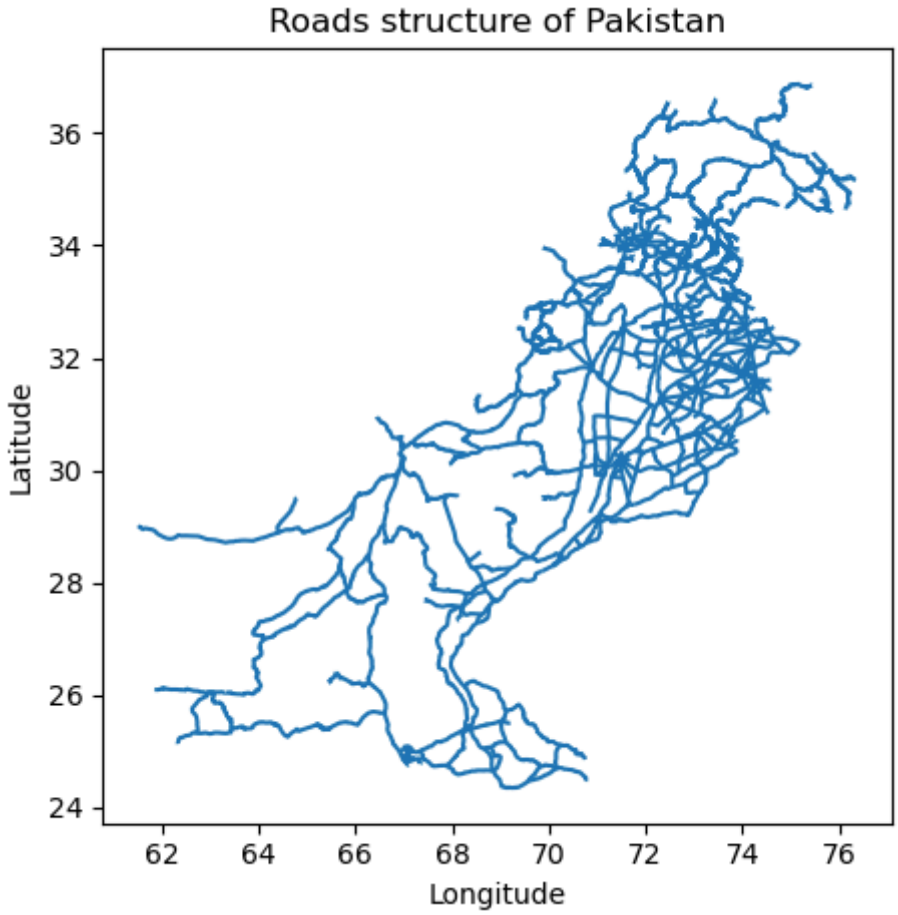
```
tehsil = gpd.read_file(r"D:\QGIS\QGIS dataset\Google Earth\pak_admbnda_
```

In [12]:
```
tehsil.plot()
plt.title('Tehsils of Pakistan')
plt.xlabel('Longitude')
plt.ylabel('Latitude')

plt.tight_layout()
plt.show()
```



In [13]:
```
roads = gpd.read_file(r"D:\QGIS\QGIS dataset\QGIS 3d\MajorRoads.shp")
```

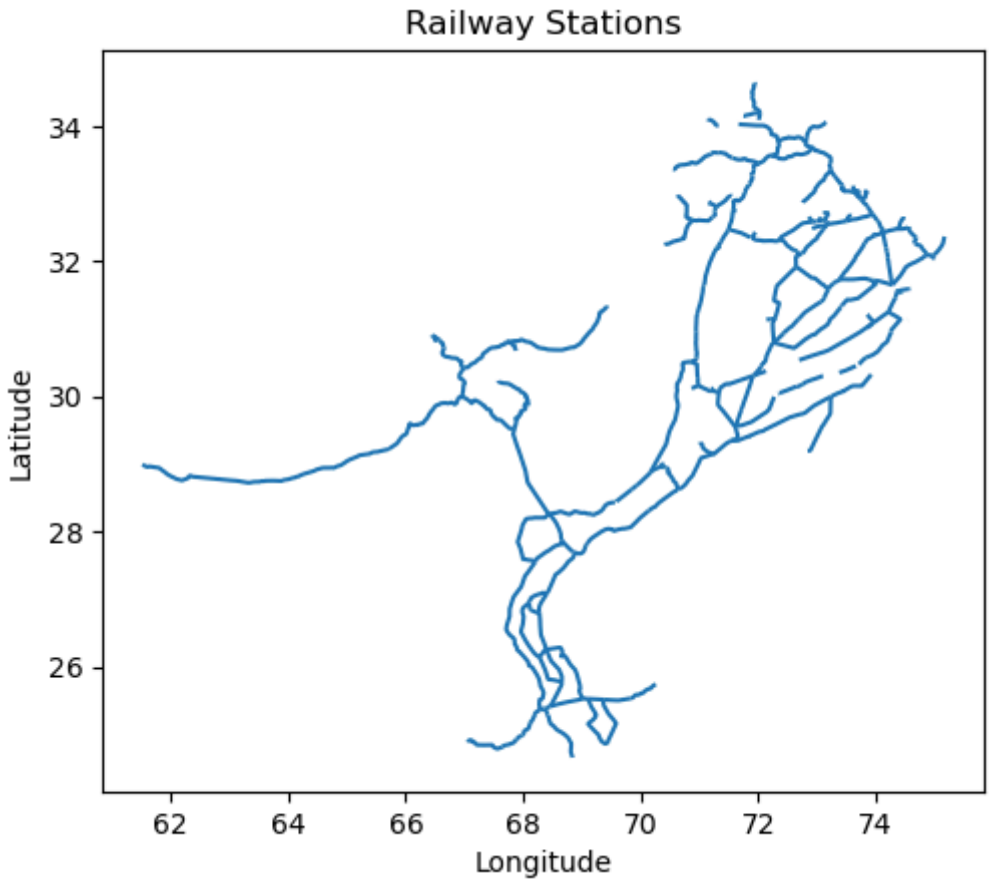
In [14]:
```
roads.plot()
plt.title('Roads structure of Pakistan')
plt.xlabel('Longitude')
plt.ylabel('Latitude')

plt.tight_layout()
plt.show()
```



In [15]:
```
railway = gpd.read_file(r"D:\QGIS\QGIS dataset\QGIS 3d\PAK_rails.shp")
```

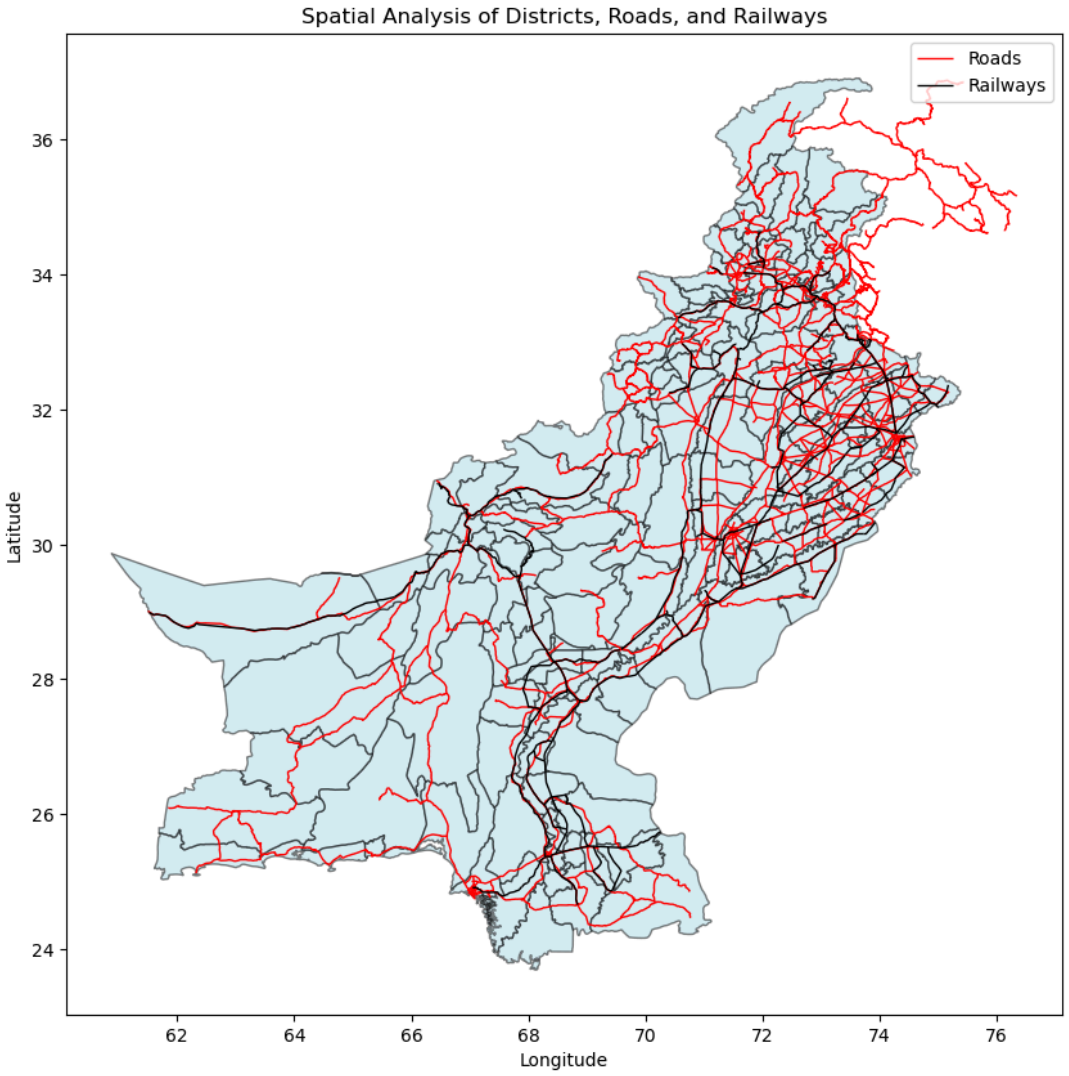
In [16]:

```
railway.plot()
plt.title('Railway Stations')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.show()
```



In [17]:

```
fig, ax = plt.subplots(figsize=(10, 10))
district.plot(ax=ax, color='lightblue', edgecolor='black', alpha=0.5)
roads.plot(ax=ax, color='red', linewidth=1, label='Roads')
railway.plot(ax=ax, color='black', linewidth=1, label='Railways')
plt.legend()
plt.title('Spatial Analysis of Districts, Roads, and Railways')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.show()
```

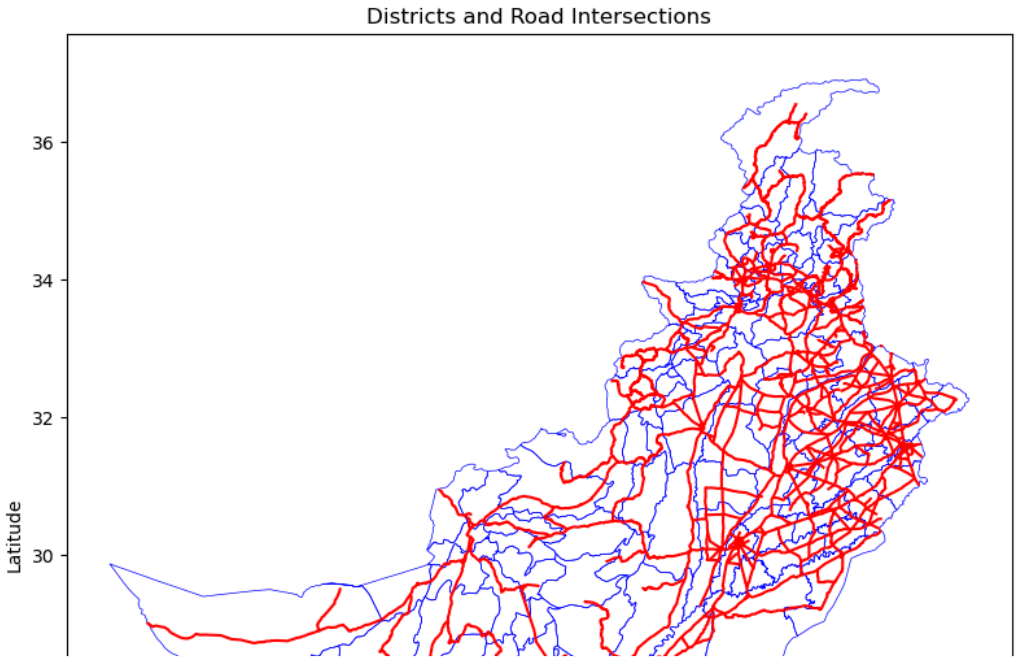


In [18]:

```
intersections = gpd.overlay(district, roads, how='intersection', keep_g
```

In [19]:

```
import matplotlib.pyplot as plt
plt.figure(figsize=(15, 10))
district.plot(ax=plt.gca(), color='none', edgecolor='blue', linewidth=0
intersections.plot(ax=plt.gca(), color='red', markersize=5)
plt.title('Districts and Road Intersections')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.show()
```



In [36]:

In [ ]: