Madhya Pradesh Census Development

Problem Statement:

Analyzing the gaps in Drinking Water and Infrastructure Development Across Regions of Madhya Pradesh using SQL, Excel, and Power BI

Objective:

The objective of this analysis is to assess the state-wise discrepancies in the availability of drinking water facilities and infrastructure development in India. By examining the variables provided in the dataset, we aim to identify states that require targeted interventions to improve access to safe drinking water and enhance overall development. Students will utilize SQL, Excel, and Power BI to conduct data analysis and gain insights into the socioeconomic development of different states.

Dataset Used:

Census 2011 Modified data

ETL operations using RDBMS

1. Created a Database name **NIC** in pgAdmin4.
2. Created a table **infra**

```
CREATE TABLE IF NOT EXISTS infra
(
    state_lgd_code text , state text ,
    district_lgd_code text , district text ,
    sub_district_lgd_code text , sub_district text
    , ulb_rlb_village_lgd_code text ,
    ulb_rlb_village text ,
    total_geographical_area text ,
    number_of_households text ,
    rural_population text ,
    male_rural_population text ,
    female_rural_population text ,
    scheduled_castes_rural_population text ,
    male_scheduled_caste_rural_population
    text ,
    female_scheduled_caste_rural_population
    text , scheduled_tribes_rural_population text
    , male_scheduled_tribes_rural_population
    text ,
```

female_scheduled_tribes_rural_population text , availability_of_educational_facilities text , number_of_primary_schools text , distance_to_the_nearest_location_with_primary_schools_facility text , number_of_middle_schools text , distance_to_the_nearest_location_with_middle_schools_facility text , number_of_secondary_schools text , number_of_senior_secondary_schools text , number_of_colleges text , distance_to_the_nearest_location_with_college_facility text , number_of_industrial_schools text , number_of_training_schools text , number_of_adult_literacy_class_centres text , number_of_other_educational_facilities text , availability_of_medical_facilities text , number_of_allopathic_hospitals text , distance_to_the_nearest_location_with_allopathic_hospitals text , number_of_ayurvedic_hospitals text , number_of_unani_hospitals text , number_of_homeopathic_hospitals text , number_of_allopathic_dispensaries text , number_of_ayurvedic_dispensary text , number_of_unani_dispensaries text , number_of_homeopathic_dispensaries text , number_of_maternity_child_welfare_centres text , dist_to_nearest_location_with_maternity_and_child_welfare_centr text , number_of_maternity_homes text , number_of_child_welfare_centres text , number_of_health_centres text , number_of_primary_health_centres text , distance_to_the_nearest_location_with_primary_health_centre text , number_of_primary_health_sub_centres text , number_of_family_welfare_centres text , number_of_tuberculosis_tb_clinics text , number_of_nursing_homes text , number_of_registered_private_medical_practitioners text , number_of_subsided_medical_practitioners text , number_of_community_health_workers text , number_of_other_medical_facilities text ,

availability_of_drinking_water_facility text ,
distance_to_the_nearest_location_with_drin
king_water_facility_i text ,
availability_of_tap_water_facility text ,
availability_of_well_water_facility text ,
availability_of_tank_water_facility text ,
availability_of_tubewell_water_facility text ,
availability_of_handpump_facility text ,
availability_of_river_water_facility text ,
availability_of_canal_water_facility text ,
availability_of_lake_water_facility text ,
availability_of_spring text ,
availability_of_other_drinking_water_source
s text ,
availability_of_various_sources_of_drinking
_water_during_summer text ,
distance_to_the_nearest_location_with_vari
ous_sources_of_drinki text ,
nearest_location_with_various_sources_of_
drinking_water_during_ text ,
availability_of_post_telegraph_and_telepho
ne_facilities text , number_of_post_offices
text ,
distance_to_the_nearest_location_with_pos
t_office text , number_of_telegraph_offices
text ,
number_of_post_and_telegraph_offices text
, number_of_telephone_connections text ,
distance_to_the_nearest_location_with_tele
phone_connections text ,
availability_of_communication_facility text ,
availability_of_bus_service_facility text ,
distance_to_the_nearest_location_with_bus
_service_facility text ,
availability_of_railway_service_facility text ,
distance_to_the_nearest_location_with_rail
way_service_facility text ,
availability_of_navigable_water_way_includi
ng_river_canal_etc text ,
distance_to_the_nearest_location_with_navi
gable_water_way_inclu text ,
availability_of_bank_facility text ,
number_of_commercial_banks text ,
distance_to_the_nearest_location_with_co
mmercial_banks text ,
number_of_cooperative_commercial_banks
text ,
distance_to_the_nearest_location_with_coo
perative_commercial_ba text ,

availability_of_credit_societies text ,
number_of_agricultural_credit_societies text
,
distance_to_the_nearest_location_with_agri
cultural_credit_socie text ,
number_of_non_agricultural_credit_societie
s text ,
distance_to_the_nearest_location_with_non
_agricultural_credit_s text ,
number_of_other_credit_societies text ,
distance_to_the_nearest_location_with_oth
er_credit_societies text ,
availability_of_recreational_and_cultural_fac
ilities text , number_of_cinema_video_halls
text ,
distance_to_the_nearest_location_with_cine
ma_video_halls text ,
number_of_sports_clubs text ,
distance_to_the_nearest_location_with_spo
rts_club text ,
number_of_stadiums_or_auditoriums text ,
distance_to_the_nearest_location_with_sta
dium_or_auditorium text ,
availability_of_paved_roads text ,
availability_of_mud_roads text ,
availability_of_foot_path text ,
availability_of_navigable_rivers text ,
availability_of_navigable_canals text ,
availability_of_navigable_water_way_other_
than_river_or_canal text ,
nearest_town_name_of_village text ,
distance_from_the_village_to_the_nearest_t
own text , availability_of_power_supply text
,
availability_of_electricity_for_domestic_use
text ,
availability_of_electricity_of_agricultural_us
e text ,
availability_of_electricity_for_other_purpose
s text ,
availability_of_electricity_for_all_purposes
text , availability_of_newspaper_magazine
text , availability_of_news_paper text ,
availability_of_magazine text ,
difference_in_income_and_expenditure text
,
total_income_if_income_and_expenditure_a
re_not_same text ,
total_expenditure_if_income_and_expenditu

```
    re_are_not_same text ,
    first_manufactured_item text ,
    second_manufactured_item text ,
    third_manufactured_item text ,
    forest_land_area text ,
    land_area_irrigated_by_government_canals
    text , land_area_irrigated_by_private_canals
    text ,
    land_area_irrigated_by_wells_without_elect
    ricity text ,
    land_area_irrigated_by_wells_with_electricit
    y text ,
    land_area_irrigated_by_tube_wells_without
    _electricity text ,
    land_area_irrigated_by_tube_wells_with_el
    ectricity text , land_area_irrigated_by_tanks
    text , land_area_irrigated_by_rivers text ,
    land_area_irrigated_by_lakes text ,
    land_area_irrigated_by_waterfall text ,
    land_area_irrigated_by_other_sources text ,
    total_irrigated_land_area text ,
    total_unirrigated_land_area text ,
    culturable_waste_land_arealand_available_
    for_cultivation text ,
    total_land_area_not_available_for_cultivatio
    n text , crop_rotation text ,
    main_crop_in_the_village text
);
```

3. Imported data from csv file
4. Filtered the required data by:
    a. Selecting **common columns, columns for "development"** (as assigned) as per metadata
    b. Filtering data for "**Madhya Pradesh"** using where condition

```
select state,
 District,
 Sub_District,
 ULB_RLB_Village,
 Difference_in_Income_and_Expenditure,
 Total_geographical_area,
 Number_of_households,
 Rural_population,
 Male_rural_population,
 Female_rural_population,
 Scheduled_Castes_Rural_population,
 Male_Scheduled_Caste_Rural_population,
 Female_Scheduled_Caste_Rural_population,
```

```
Scheduled_Tribes_Rural_population,
Male_Scheduled_Tribes_Rural_population,
Female_Scheduled_Tribes_Rural_population,
Distance_from_the_village_to_the_nearest_town,
Total_Income_if_income_and_expenditure_are_not_same,
Total_Expenditure_if_income_and_expenditure_are_not_same,
Nearest_Town_Name_of_Village,
Availability_of_Drinking_water_facility,
Distance_to_the_nearest_location_with_Drinking_water_facility_if_not_available_
within_the_village,
Availability_of_Tap_Water_facility,
Availability_of_Well_water_facility,
Availability_of_Tank_water_facility,
Availability_of_Tubewell_water_facility,
Availability_of_Handpump_facility,
Availability_of_River_water_facility,
Availability_of_Canal_water_facility,
Availability_of_Lake_water_facility,
Availability_of_Spring,
Availability_of_Other_drinking_water_sources
Availability_of_various_sources_of_Drinking_Water_during_Summer,
Distance_to_the_nearest_location_with_various_sources_of_Drinking_Water_dur
ing_Summer,
Nearest_location_with_various_sources_of_Drinking_Water_during_Summer,
Availability_of_Recreational_and_Cultural_facilities,
Availability_of_Paved_Roads,
Availability_of_Mud_Roads,
Availability_of_Foot_Path,
Availability_of_Navigable_Rivers,
Availability_of_Navigable_Canals,
Availability_of_Navigable_water_way_including_River_Canal_etc,
Availability_of_Power_Supply,
Availability_of_Electricity_for_Domestic_use,
Availability_of_Electricity_of_Agricultural_use,
Availability_of_Electricity_for_other_purposes,
Availability_of_Electricity_for_All_purposes,
Availability_of_Newspaper_Magazine,
Availability_of_News_Paper,
Availability_of_Magazine
from public.infra where state = 'Madhya Pradesh';
```

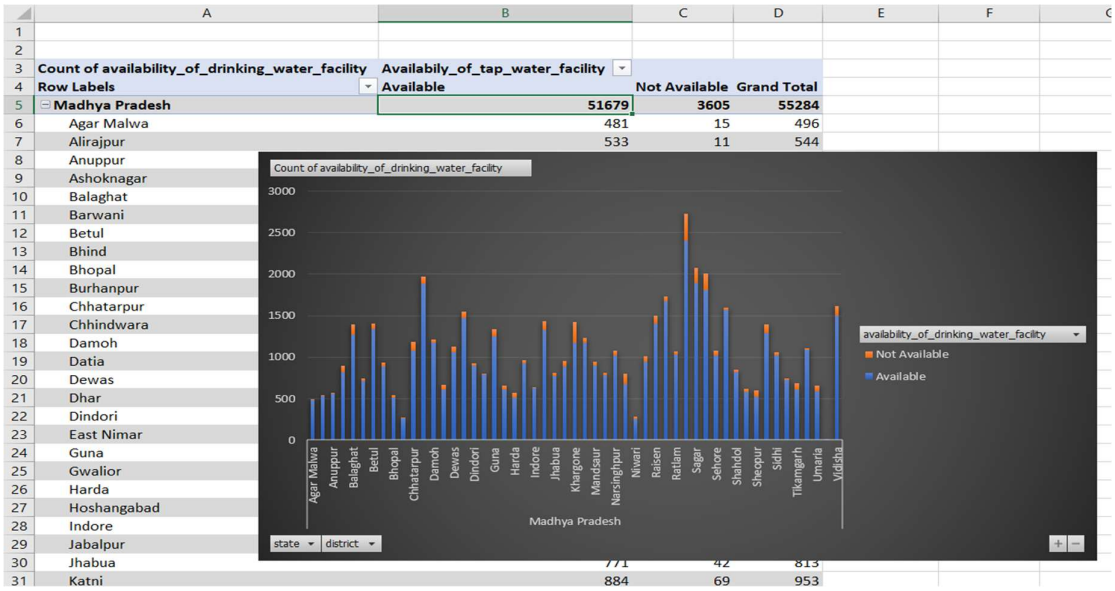
5. Exported the data into a csv file "Development_Madhya_Pradesh.csv"

Analysis/Visualization using MS-Excel

Converted "Development_Madhya_Pradesh.csv" into an .xlsx(Excel Workbook) format.

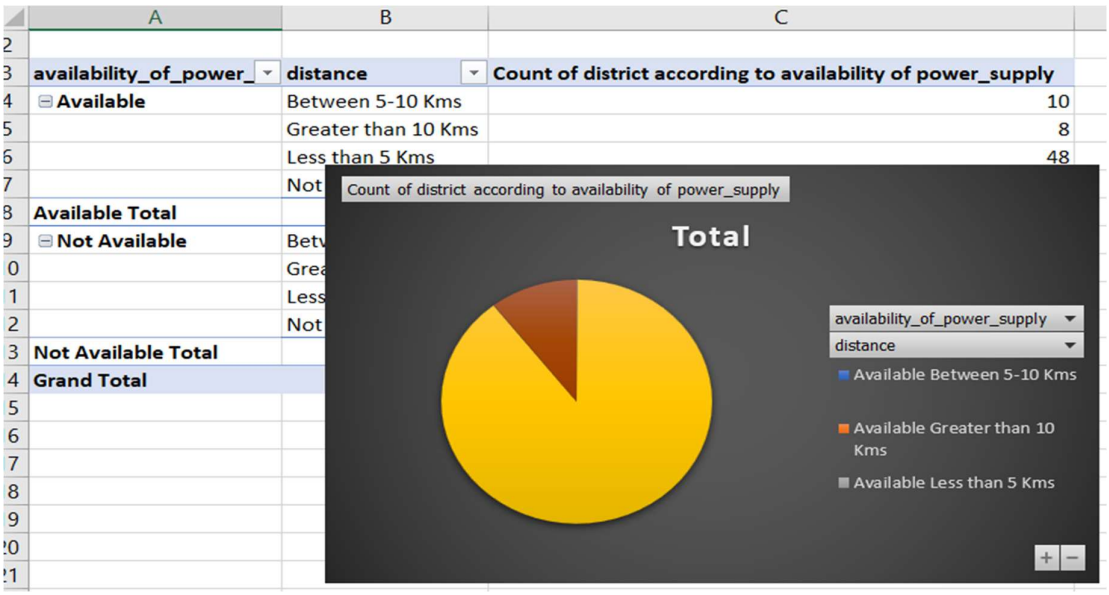
Various Analysis Performed :-

1. Availability of drinking water facility among different districts :



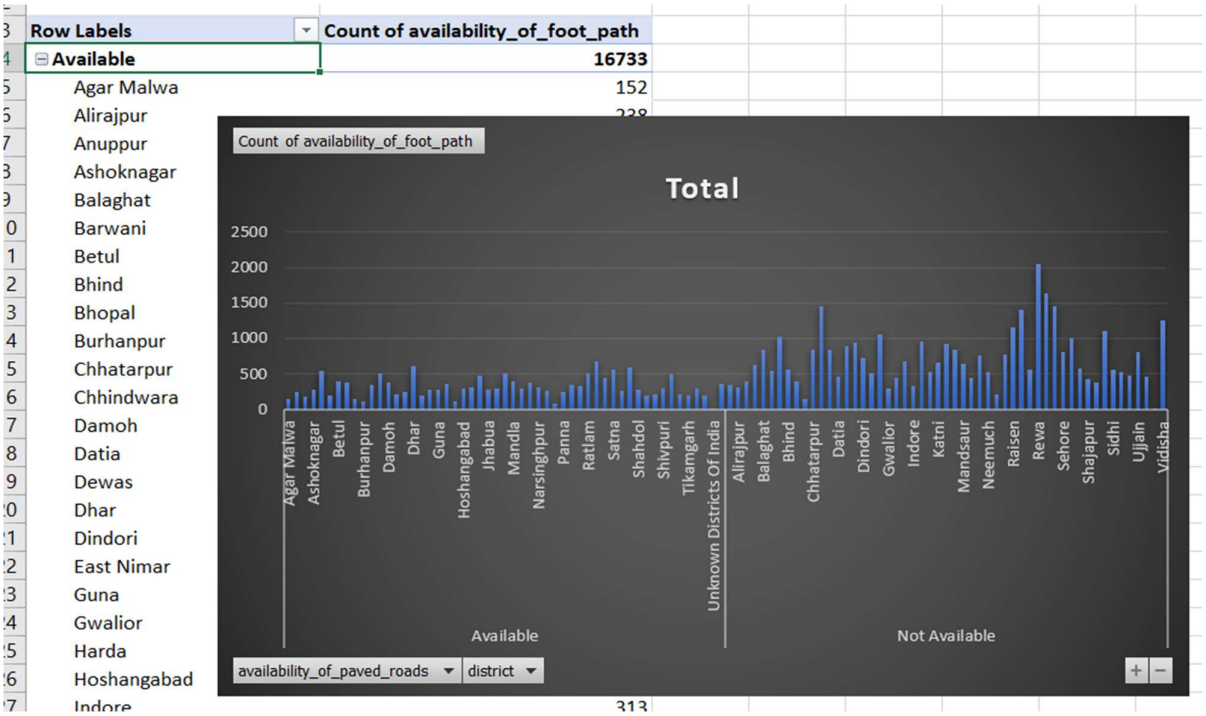
Count of availability_of_drinking_water_facility	Availabily_of_tap_water_facility		
Row Labels	Available	Not Available	Grand Total
Madhya Pradesh	51679	3605	55284
Agar Malwa	481	15	496
Alirajpur	533	11	544
Anuppur			
Ashoknagar			
Balaghat			
Barwani			
Betul			
Bhind			
Bhopal			
Burhanpur			
Chhatarpur			
Chhindwara			
Damoh			
Datia			
Dewas			
Dhar			
Dindori			
East Nimar			
Guna			
Gwalior			
Harda			
Hoshangabad			
Indore			
Jabalpur			
Jhabua	771	42	813
Katni	884	69	953

2. Availability and distribution of Power facility among different districts :

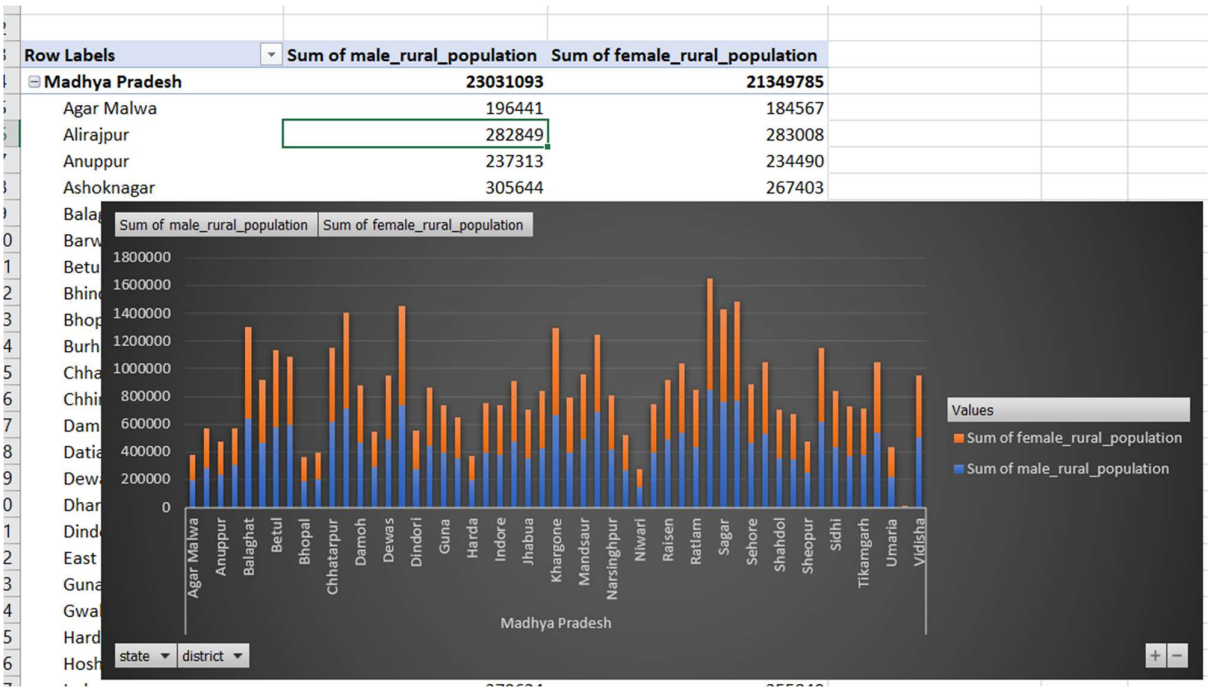


availability_of_power_	distance	Count of district according to availability of power_supply
Available	Between 5-10 Kms	10
	Greater than 10 Kms	8
	Less than 5 Kms	48
	Not	
Available Total		
Not Available	Betv	
	Grea	
	Less	
	Not	
Not Available Total		
Grand Total		

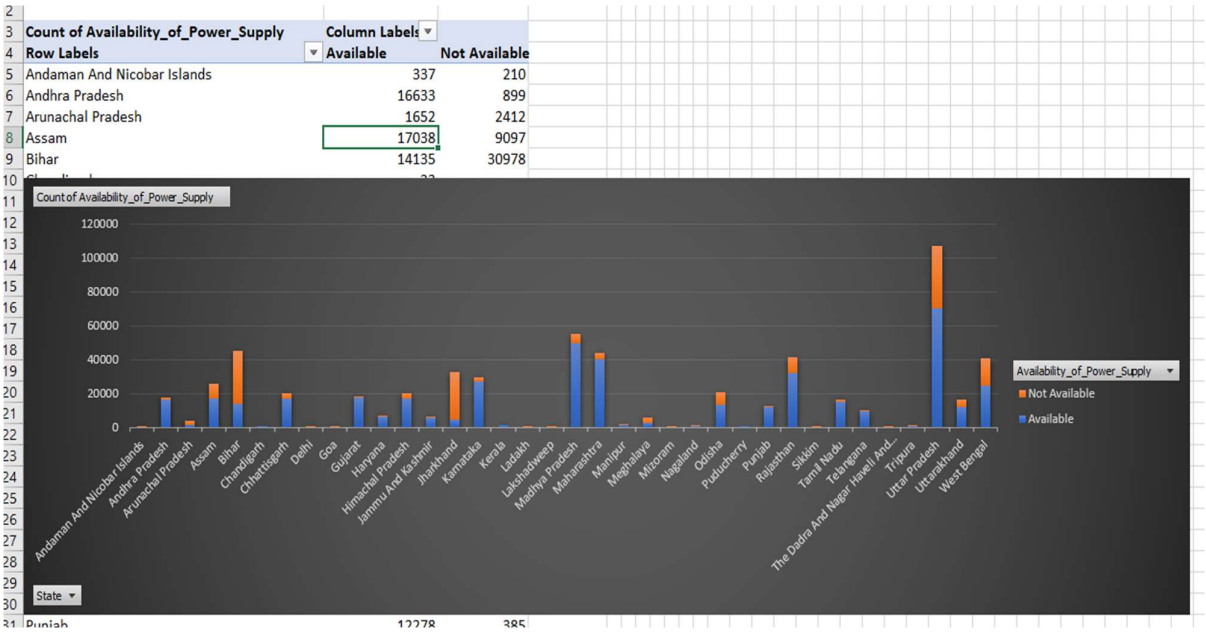
3. Availability & Non-availibility of foot_paths among different districts :



4. Difference among male & female rural population among different districts :

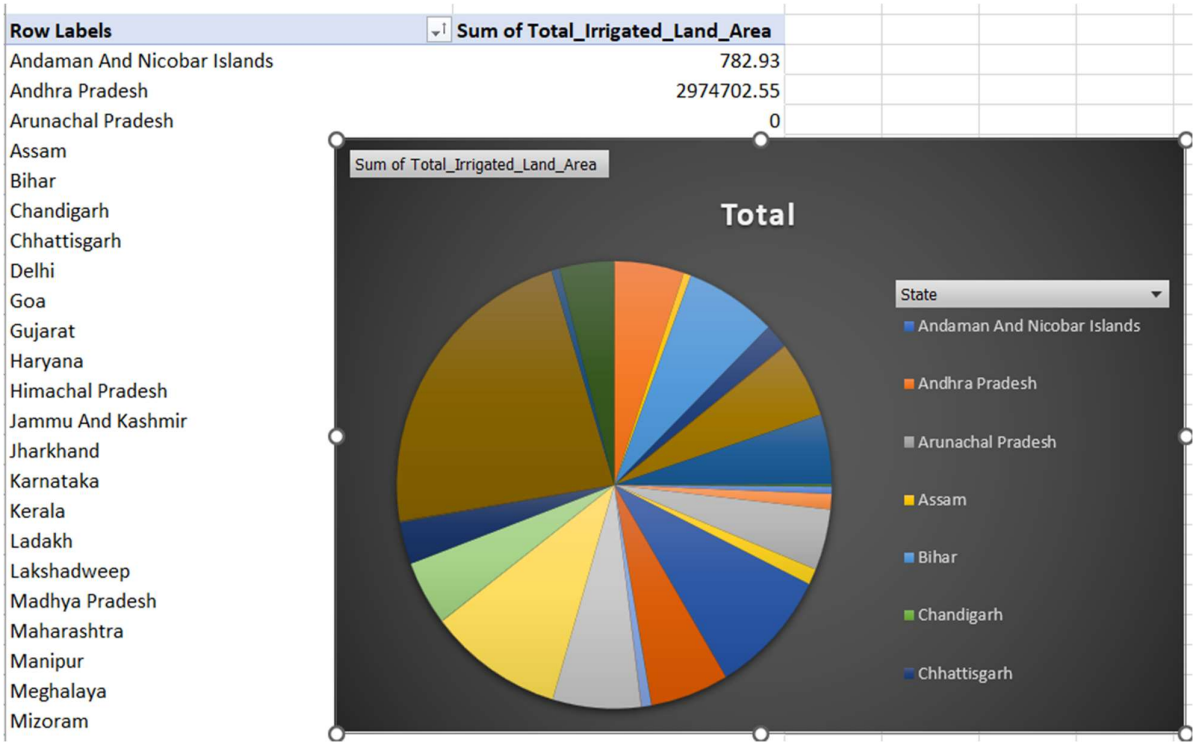


5. Distribution of power supply across the various states of India :



Count of Availability_of_Power_Supply	Column Labels	
Row Labels	Available	Not Available
Andaman And Nicobar Islands	337	210
Andhra Pradesh	16633	899
Arunachal Pradesh	1652	2412
Assam	17038	9097
Bihar	14135	30978
Punjab	12278	385

6. Sum of total irrigated land area across the various states of India :



Row Labels	Sum of Total_Irrigated_Land_Area
Andaman And Nicobar Islands	782.93
Andhra Pradesh	2974702.55
Arunachal Pradesh	0
Assam	
Bihar	
Chandigarh	
Chhattisgarh	
Delhi	
Goa	
Gujarat	
Haryana	
Himachal Pradesh	
Jammu And Kashmir	
Jharkhand	
Karnataka	
Kerala	
Ladakh	
Lakshadweep	
Madhya Pradesh	
Maharashtra	
Manipur	
Meghalaya	
Mizoram	

Analysis using Power BI

1. Imported the csv file into power BI
2. Created a report

Analysis Done :-

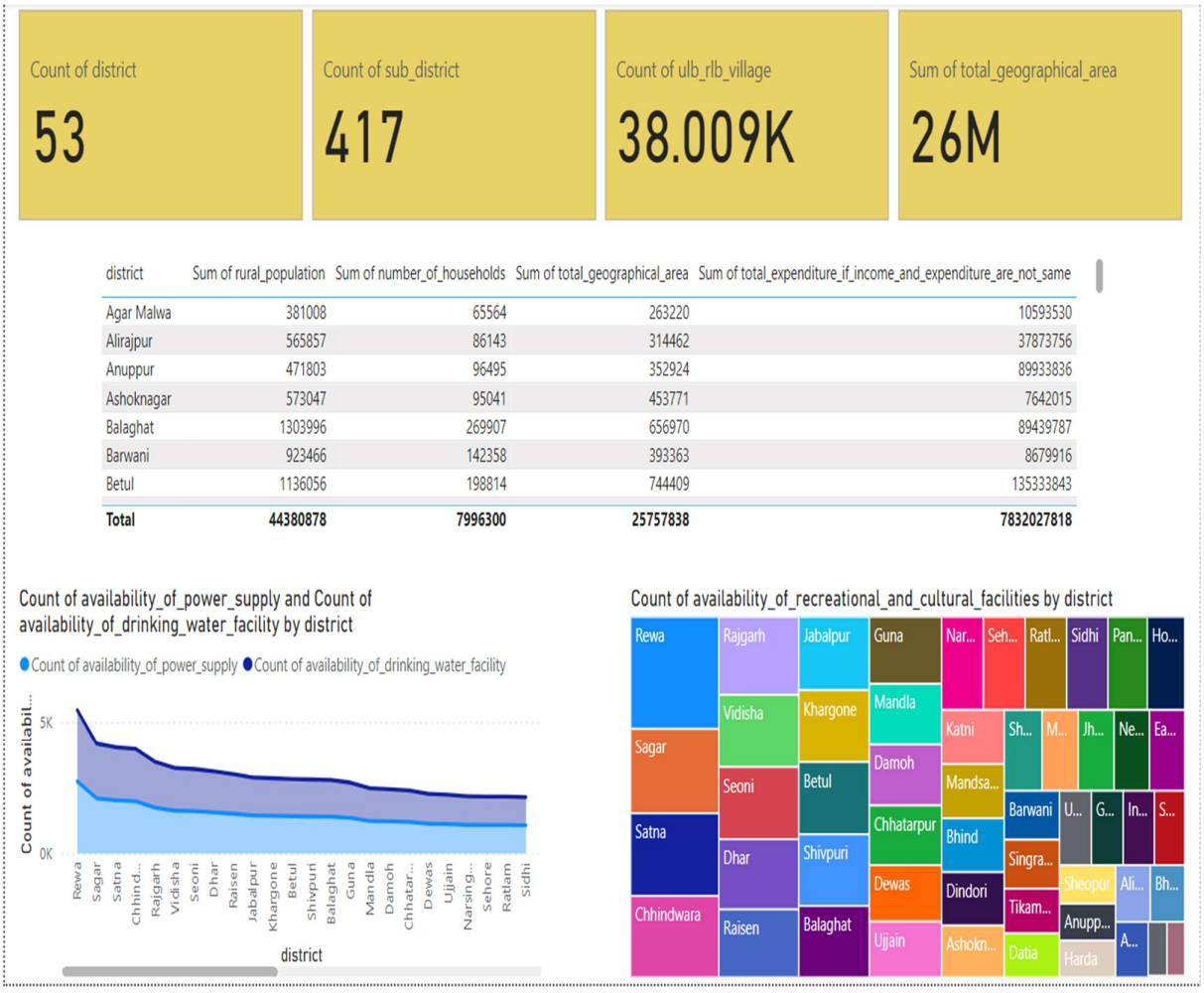
A)

a. Made card visuals to get a summarized overview of the number of districts, sun-districts and villages in India. Also the sum of total geographical area is also shown.

b. Used table to depict the sum of different entities, like rural population, number of households, etc.

c. Used stacked area chart to depict the trends of power supply and drinking water facility in different districts of Madhya Pradesh.

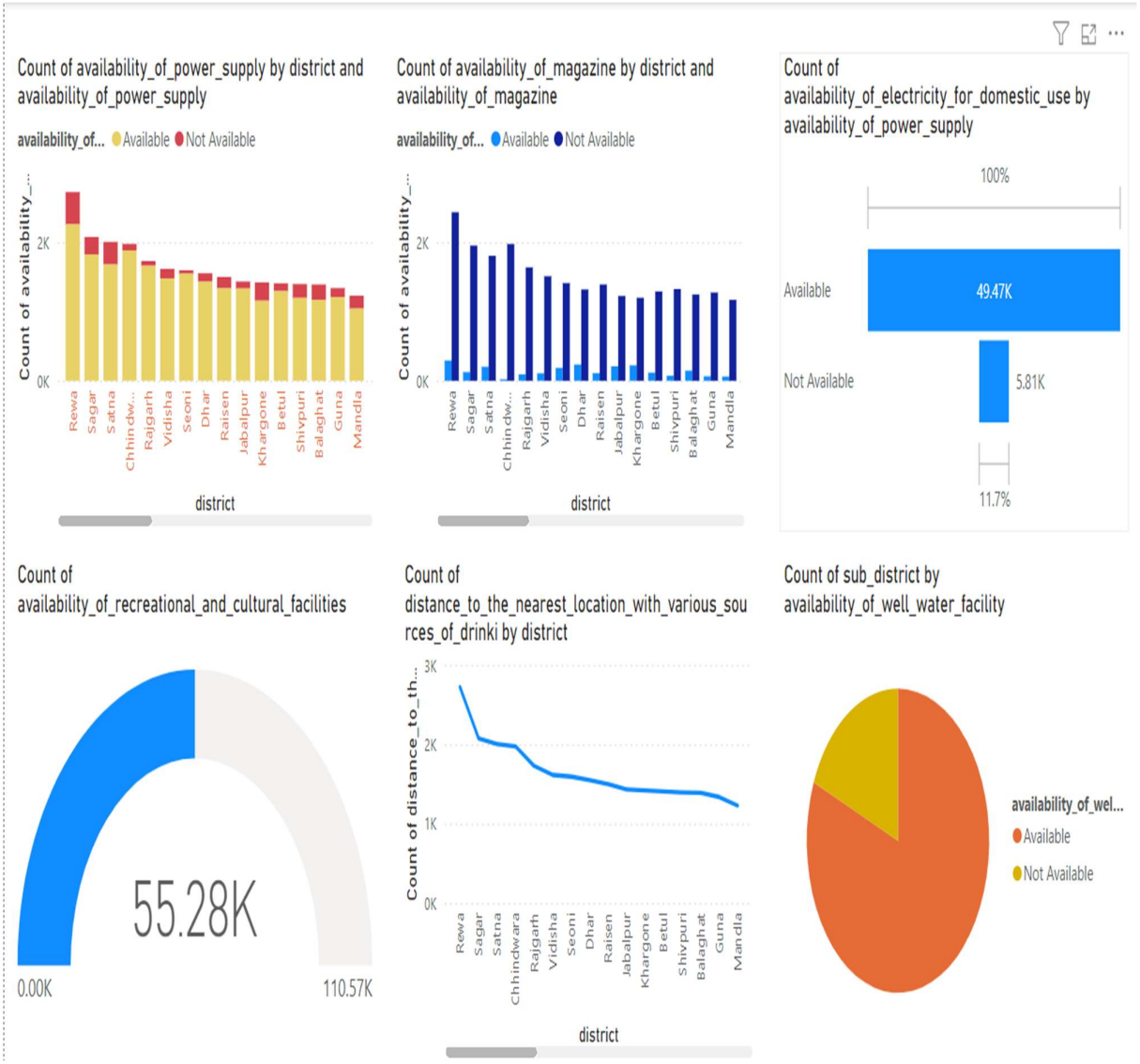
d. Used tree-map to show the availability of recreational and cultural facilities by district.



district	Sum of rural_population	Sum of number_of_households	Sum of total_geographical_area	Sum of total_expenditure_if_income_and_expenditure_are_not_same
Agar Malwa	381008	65564	263220	10593530
Alirajpur	565857	86143	314462	37873756
Anuppur	471803	96495	352924	89933836
Ashoknagar	573047	95041	453771	7642015
Balaghat	1303996	269907	656970	89439787
Barwani	923466	142358	393363	8679916
Betul	1136056	198814	744409	135333843
Total	**44380878**	**7996300**	**25757838**	**7832027818**

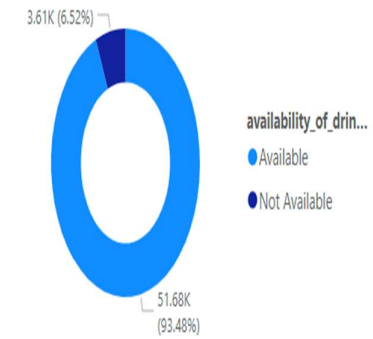
B)

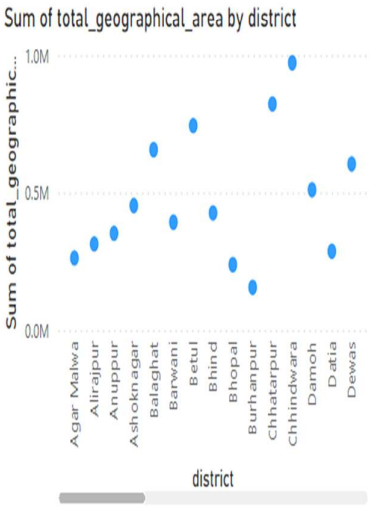
a. Stacked column chart is used to show the availability of power supply by district.
b. Clustered column chart is used to depict the availability of magazine by district.
c. Funnel chart is used to show the availability & not-availability of power supply for domestic use.
d. Gauge chart is used the depict the availability of recreational and cultural facilities in Madhya Pradesh.
e. Line chart is used to depict the distance to the nearest location with sources of drinking water by district.
f. Pie chart is used to depict the sun-district availability of well water facility.



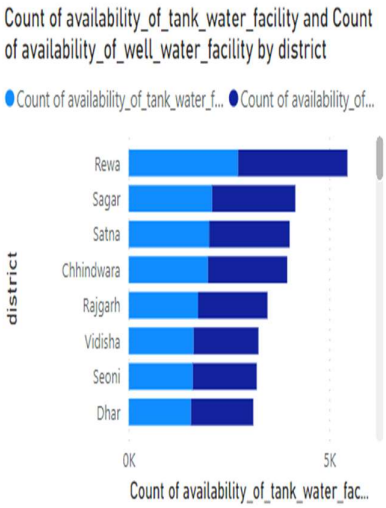
C)

a. Donut chart is used to show the availability and non-availablity of drinking water facility among states.
b. Tree-Map is used to show the count of number of houselods by district.
c. Scatter chart is used to display the sum of total geographical area by district.
d. Matrix chart is used to show the nearest town from a village.
e. Stacked bar chart is used to show the count of availability of tank water and well water by district.



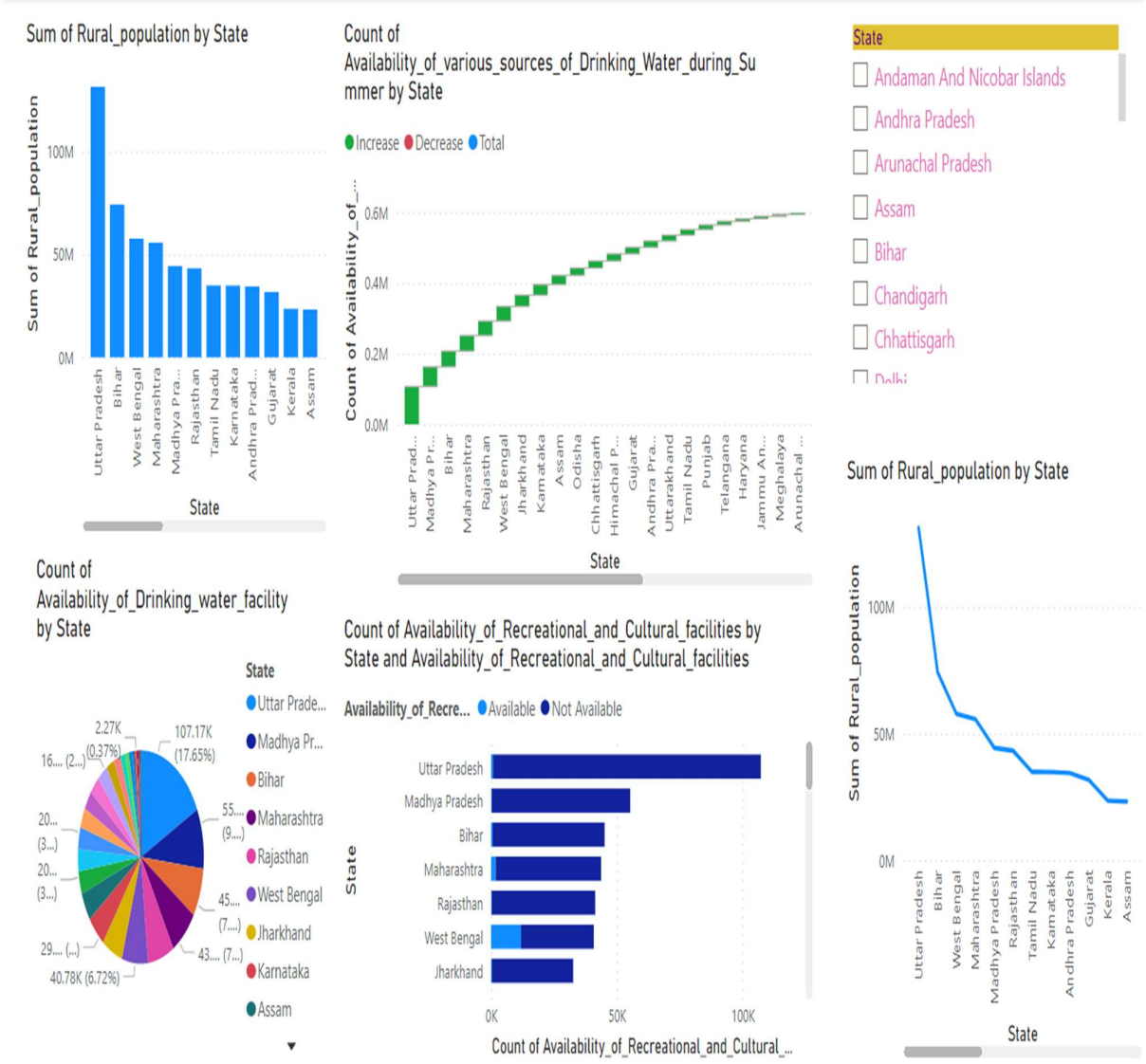


ulb_rlb_village	First nearest_town_name_of_village
(Ghorera)Dhorera	JOURA
Aabu Ghati	Not Available
Aabu Khedi	PITHAMPUR
Aadupura	Not Available
Aakli	SHAMGARH
Aakli Diwan	SHAMGARH
Aaklishivdas	SHAMGARH
Aaksi	MUNGAOLI
Aakya	DEWAS
Aakyajassa	MAHIDPUR
Aal	Not Available
Aali	ALIRAJPUR
Total	**BAMORA**



D)

a. Clustered column chart is used to depict the sum of rural population by various states of India.
b. Waterfall chart depicts the availability of various sources of drinking water during summer by various states of India.
c. Slicer is used to filter out the wanted options from all the provided options.
d. Pie chart depicts the availability of drinking water facility by various states of India.
e. Stacked bar chart depicts the availability and non-availability of cultural and recreational facilities by various states of India.
f. Line chart is used to depict the sum of total rural population by various states of India.



Summary/Conclusion

From the analysis, we can conclude that:

1. “Rewa” district of Madhya Pradesh is the most developed one amongst all the other districts in case of water facility, power supply, and every aspect taken in account for.
2. Availability of recreational and cultural facilities in the state are nominal, and can be improved more for the better development of the state.
3. There are some unknown districts in Madhya Pradesh , which are not developed at all, and needs special attention.
4. Around 94% of the area of Madya Pradesh has the facility of water & power supply.
5. When we talk about the states of India, we can analyze that Utter Pradesh has the highest population ratio.
6. Also, Karnataka has the highest availability of water supply amongst all the other states.