**Farmers Insurance Analysis** 

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**Problem Statement:** 

The PMFBY scheme provides farmers with financial security. We will analyse its effectiveness

using structured data analysis. We will use SQL queries to extract key insights on premiums,

claims, and farmer demographics. The challenge is to process multi-year data efficiently,

identify trends, and generate reports that help stakeholders assess the scheme's impact.

Tasks:

You need to perform the following steps for successfully completing this

assignment:

1) Data Loading

2) Filtering Data (WHERE)

3) Apply Aggregation (GROUP BY)

4) Sorting Data (ORDER BY)

5) String Functions

6) Joins

7) Subqueries

8) Advanced SQL Functions (Window Functions)

9) Data Integrity (Constraints, Foreign Keys)

**Dataset:** 

The dataset used in this analysis is sourced from the National Data and Analytics Platform

(NDAP), which hosts a wide range of government data. Specifically, the data pertains to the

Pradhan Mantri Fasal Bima Yojana (PMFBY), a crop insurance scheme. It includes details such

as the number of insurance units, premiums paid by farmers, contributions from state and

central governments, sum insured, as well as demographic attributes like the gender and

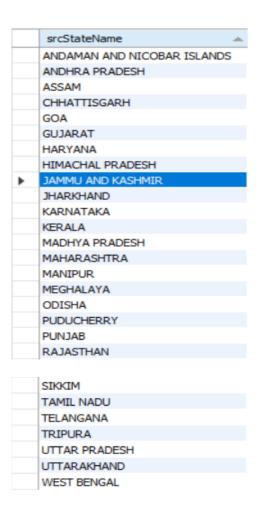
category of the farmers. The PMFBY scheme is designed to offer financial protection to

farmers against crop losses resulting from natural disasters, pest attacks, or diseases.

Field	Туре	Null	Key	Default	Extra
rowID	int	NO	PRI	NULL	
srcYear	int	YES		NULL	
srcStateName	varchar(255)	YES		NULL	
srcDistrictName	varchar(255)	YES		NULL	
InsuranceUnits	int	YES		NULL	
TotalFarmersCovered	int	YES		NULL	
ApplicationsLoaneeFarmers	int	YES		NULL	
ApplicationsNonLoaneeFarmers	int	YES		NULL	
InsuredLandArea	float	YES		NULL	
FarmersPremiumAmount	float	YES		NULL	
StatePremiumAmount	float	YES		NULL	
GOVPremiumAmount	float	YES		NULL	
GrossPremiumAmountToBePaid	float	YES		NULL	
SumInsured	float	YES		NULL	
PercentageMaleFarmersCovered	float	YES		NULL	
PercentageFemaleFarmersCov	float	YES		NULL	
PercentageOthersCovered	float	YES		NULL	
PercentageSCFarmersCovered	float	YES		NULL	
PercentageSTFarmersCovered	float	YES		NULL	
PercentageOBCFarmersCovered	float	YES		NULL	
PercentageGeneralFarmersCo	float	YES		NULL	
PercentageMarginalFarmers	float	YES		NULL	
PercentageSmallFarmers	float	YES		NULL	
PercentageOtherFarmers	float	YES		NULL	
YearCode	int	YES		NULL	
Year_	varchar(255)	YES		NULL	
	,				
Country	varchar(255)	YES		NULL	
StateCode	int	YES		NULL	
DistrictCode	int	YES		NULL	
TotalPopulation	int	YES		NULL	
TotalPopulationUrban	int	YES		NULL	
				NULL	
TotalPopulationRural	Int	YES			
TotalPopulationRural TotalPopulationMale	int	YES		NULL	
TotalPopulationMale	int	YES		NULL	
TotalPopulationMale TotalPopulationMaleUrban	int int	YES YES			
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural	int int int	YES YES YES		NULL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale	int int int int	YES YES YES YES		NULL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban	int int int int int	YES YES YES YES YES		NULL NULL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban TotalPopulationFemaleRural	int int int int int int int	YES YES YES YES YES YES YES		NULL NULL NULL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban TotalPopulationFemaleRural NumberOfHouseholds	int int int int int int int int	YES YES YES YES YES YES YES YES		NULL NULL NULL NULL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban TotalPopulationFemaleRural NumberOfHouseholds NumberOfHouseholdsUrban	int	YES		NOLL NOLL NOLL NOLL NOLL NOLL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban TotalPopulationFemaleRural NumberOfHouseholds NumberOfHouseholdsUrban NumberOfHouseholdsRural	int	YES		NOLL NOLL NOLL NOLL NOLL NOLL	
TotalPopulationMale TotalPopulationMaleUrban TotalPopulationMaleRural TotalPopulationFemale TotalPopulationFemaleUrban TotalPopulationFemaleRural NumberOfHouseholds NumberOfHouseholdsUrban	int	YES		NOLL NOLL NOLL NOLL NOLL NOLL	

## Performance Analysis / Insights / Results:

The analysis includes data from 27 Indian states participating in the PMFBY scheme.



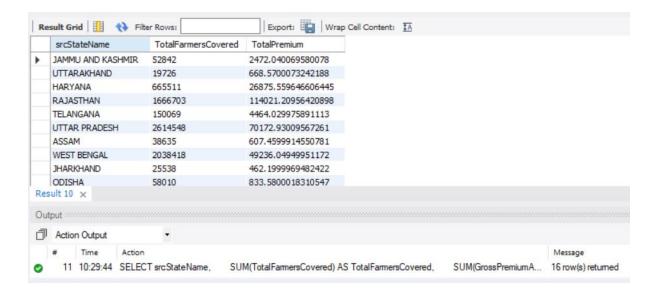
- Madhya Pradesh has the highest number of farmers covered, followed by
   Maharashtra.
- Punjab shows the lowest farmer coverage among all states.

srcStateName	TotalFarmersCovered	TotalSumInsured
MADHYA PRADESH	9097992	8388561.648635864
MAHARASHTRA	8884773	3979362.9376866817
UTTAR PRADESH	7135648	3248725.1967037786
RAJASTHAN	6814358	5358933.851975739
TAMIL NADU	3921868	2999722.9312981367
ODISHA	2544665	1356864.0728126587
HARYANA	2060741	2252538.4811367095
WEST BENGAL	2054414	842893.1048812866
CHHATTISGARH	1816123	1098681.305376947
ANDHRA PRADESH	1810317	1631182.105102539
ASSAM	1563609	801554.9232140183
KARNATAKA	697101	3.017999990734097
TELANGANA	407890	355353.36138916016
TRIPURA	350733	48555.039628982544
HIMACHAL PRADE.	268368	30744.95197084546
JAMMU AND KASH.	126687	71154.90966796875
JHARKHAND	115997	49250.799642562866
UTTARAKHAND	107217	47019.862647265196
KERALA	19711	16469.798140458763
PUDUCHERRY	11747	14826.837139904499
MANIPUR	4681	3432.3461450338364
SIKKIM	2379	393.0649064797908
MEGHALAYA	651	342.94000148773193
GUJARAT	405	119.00289852358401
ANDAMAN AND NI.	359	195.35999369621277
GOA	79	35.76369971036911
PUNJAB	36	96.42010091075645

• In Himachal Pradesh, **Kangra** district had a rural population of over 1 million consistently from 2018 to 2021.

	srcYear	srcStateName	srcDistrictName	InsuranceUnits	TotalFarmersCovered	ApplicationsLoaneeFarmers	ApplicationsNonLoaneeFarmers	InsuredLandArea	FarmersPremiumAmour
•	2018	HIMACHAL PRADESH	Kangra	34	30868	31638	101	11.4	51.27
	2019	HIMACHAL PRADESH	Kangra	34	34564	35348	641	13.36	60.13
	2020	HIMACHAL PRADESH	Kangra	34	32453	33380	160	12.09	72.53
	2021	HIMACHAL PRADESH	Kangra	2	11	11	0	0	0.0203
	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- Ujjain district (Madhya Pradesh) recorded the highest total premium amount (~3273.09), while Hugli (West Bengal) ranked second (~2777.03).
- In Karnataka, most districts report zero farmer premium contributions, except for Davangere, Kolar, Mandya, and Hassan, where premiums were slightly above zero.
- In 2018, 16 states had insured land areas exceeding 5 hectares.



 The highest average insured land area was recorded in 2020, while 2018 showed the lowest.

	srcYear	AverageInsuredLandArea
•	2018	37.878552367563046
	2019	38.264534640478175
	2020	80.33767358140678
	2021	38.54617980123473

- **Bid district (Maharashtra)** had the **highest number of farmers covered** (1,430,532) where insurance units were greater than 0.
- Latur district (Maharashtra) ranked second with 1,184,066 farmers covered.

	srcDistrictName	TotalFarmersCovered
•	Bid	1430532
	Latur	1184066
	Nanded	739712
	Osmanabad	700623
	Jalna	666086
	Ujjain	630787
	Solapur	563903
	Rajgarh	557778
	Dewas	549528
	Parbhani	544741
	Sehore	529484

 Kodagu and Dakshina Kannada (Karnataka) had zero farmers covered, despite having non-zero insurance units. In these two districts, farmer coverage is nearly negligible, even though insurance units are greater than zero.

srcDistrictName	TotalFarmersCovered
Thanjavur II	4
Thiruvarur II	4
Bathinda	2
Kheda	1
DakshinaKannada	0
Kodagu	0

 Thane district (Maharashtra) had the highest total population in 2020, followed by Jaipur (Rajasthan).

	srcDistrictName	TotalPopulation
▶ Thane		8070032
	Jaipur	6626178
	Allahabad	5954391
	Azamgarh	4613913
	Lucknow	4589838

- Grouped data by state and district shows Karnataka and Uttar Pradesh reporting the
  lowest farmer premium amounts (as low as 0.0002 and 0.0003). Coverage Ratio is
  nothing but how well Total population is covered for that particular state with respect
  to farmers in that state.
- The coverage ratio (farmers covered vs total population) was highest in Chhattisgarh for 2020.
- Tripura ranked 2nd and 3rd in coverage ratio for the years 2020 and 2021 respectively.

	srcStateName	srcYear	TotalFarmersCovered	TotalPopulation	CoverageRatio
•	CHHATTISGARH	2021	1269118	25545198	0.0497
	TRIPURA	2020	172048	3673917	0.0468
	TRIPURA	2021	170345	3673917	0.0464

- There are **60 districts** whose names begin with the letter **'B'** and **193 districts** that end with **'pur'** across India.
- Bid (Maharashtra) had the highest Farmers' Premium Amount, exceeding ₹20 crores, and also the highest Sum Insured.

	srcStateName	srcDistrictName	Year_	TotalPopulation	HighestFarmersPremium
•	MAHARASHTRA	Bid	Calendar Year (Jan - Dec), 2019	2583421	7244.42
	HARYANA	Sirsa	Calendar Year (Jan - Dec), 2020	1295189	5805.97
	MAHARASHTRA	Latur	Calendar Year (Jan - Dec), 2019	2454196	4860.57
	HARYANA	Hisar	Calendar Year (Jan - Dec), 2020	1743931	4672.9

 Maharashtra has the highest SumInsured amount with the highest FarmersPremiumAmount.

	srcStateName	SumInsured
•	MAHARASHTRA	275019

## **Conclusion:**

- Punjab recorded the lowest number of farmers enrolled under PMFBY, indicating either low awareness or limited reliance on agriculture in the region.
- Maharashtra's Bid district had the highest number of farmers covered, showing strong engagement with the scheme in that area.
- Higher premium amounts in some districts may suggest frequent crop failures,
   possibly due to local climate challenges or natural disasters.
- Certain high-risk districts showed little to no insurance uptake, highlighting the need for better awareness and outreach among farmers.
- From 2018 to 2020, there was a steady increase in average insured land area, reflecting improved understanding and adoption of the scheme.
- Districts like Kodagu and Dakshina Kannada had minimal or no farmer coverage, which may be due to limited farming activity.
- There is a clear opportunity to expand the scheme in underrepresented areas through farmer education and a simplified enrolment process.
- Increasing insurance coverage in densely populated states is essential to support food production and protect farmers from financial losses.