

ELECTION 2024 PREDICTION

As the political landscape in Pakistan moves toward the 2024 general elections, different phases have been highlighted using a systematic, data-driven approach. This revolutionary approach combines historical data analysis with advanced modeling techniques and semantic extraction from various sources to provide in-depth insights into electoral Trends.

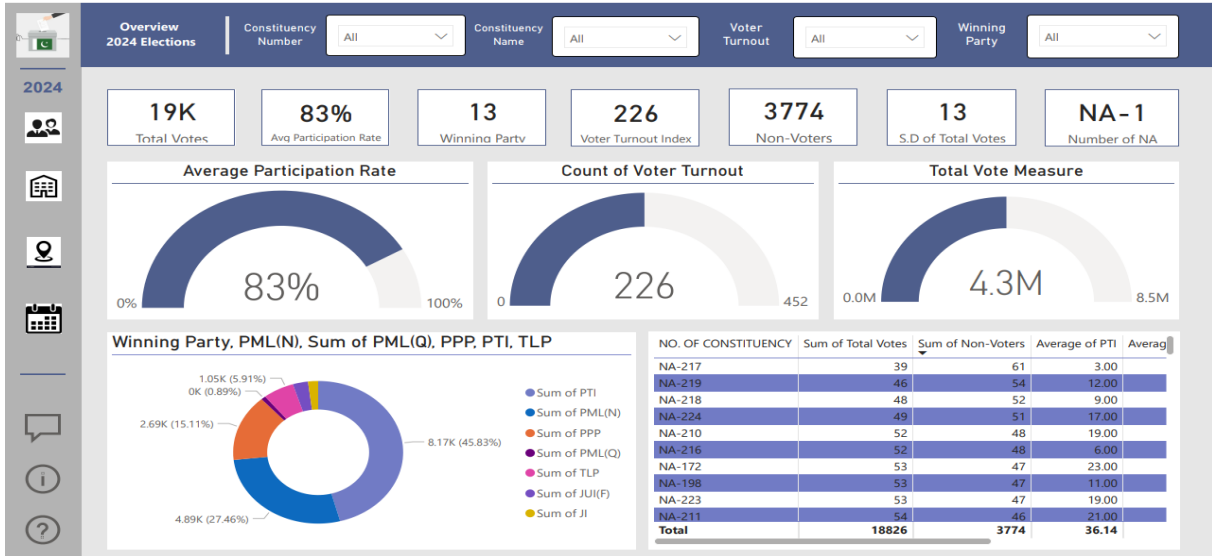
Phases of Electoral Analysis



Phase 1: Data Collection

- **Source:** Official Website of Election Commission of Pakistan (ECP).
- **Years Included:** 2002, 2008, 2013, 2018, and 2024.
- **Activities:**
 - Collecting comprehensive election data from the specified years.
 - Extracting relevant information such as candidate details, constituency results, and voter turnout.
 - Ensuring data accuracy and completeness from the official ECP source.

• Statistical Data Analysis:



The initial experiments with LSTM models yielded promising results but struggled to predict multiple winners in the same electoral district. The research team continued to explore alternative classification models such as KNN, decision tree, random forest, AdaBoost, extreme gradient, and bagging classifier. The game-changer came with the introduction of Logistic regression, which incorporated transfer learning and delivered high-quality predictions for the upcoming 2024 election.

Phase 2: Data Preprocessing

- **Objective:** Preparing and organizing collected data for analysis.
- **Activities:**
 - Cleaning and filtering data to remove inconsistencies.
 - Handling missing or incomplete data.
 - Standardizing formats for consistency.
 - Performing data normalization according to the Constituency name and number.
 - Creating a structured dataset ready for analysis.

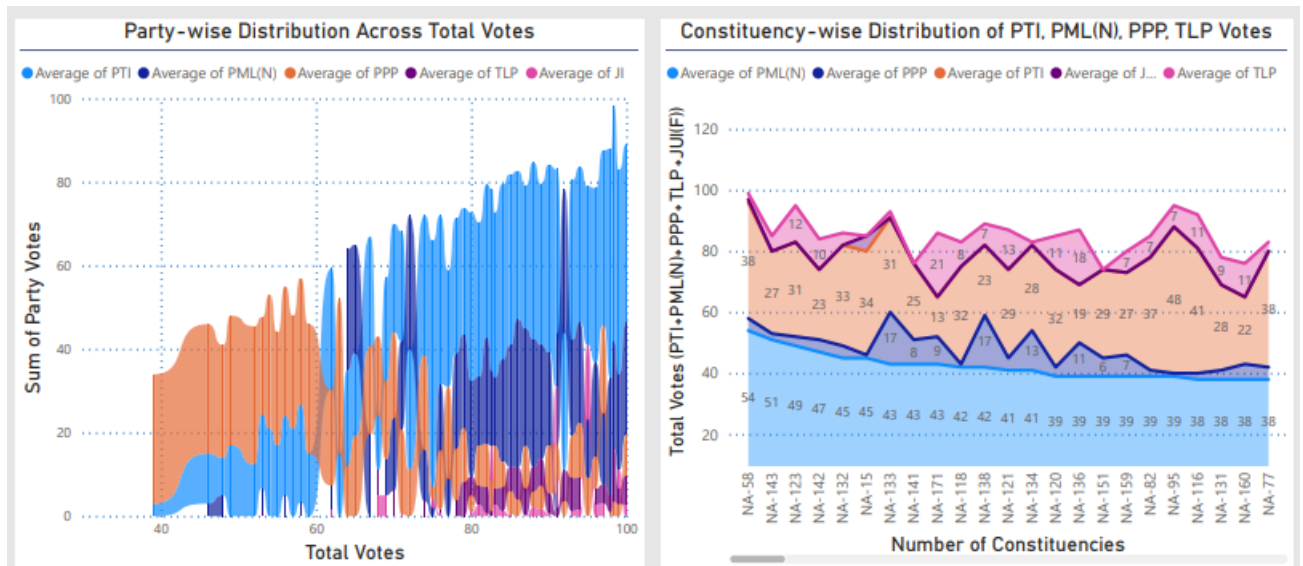
A	B	C	D	E	F
NO. OF CONSTITUENCY	NAME OF CONSTITUENCY	NAME OF PROVINCE	POPULATION	Party	Candidates
NA-1	Chitral Upper-cum-Chitral Lower	Khyber Pakhtunkhwa	515,935	PPP	Fazil Rabbhi
NA-1	Chitral Upper-cum-Chitral Lower	Khyber Pakhtunkhwa	515,935	JUI(F)	Muhammad Talha Mahmood
NA-1	Chitral Upper-cum-Chitral Lower	Khyber Pakhtunkhwa	515,935	ANP	Khadiza Bibi
NA-1	Chitral Upper-cum-Chitral Lower	Khyber Pakhtunkhwa	515,935	PMLN	Iftikhar uddin
NA-1	Chitral Upper-cum-Chitral Lower	Khyber Pakhtunkhwa	515,935	PTI	Abdul Latif
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	PTI	Dr. Anjad
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	PPP	Haider Ali Khan
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	PMLN	Amin Mujum
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	ANP	Muhammad Ayub Khan
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	JI	Nawaz Iqbal
NA-2	SWAT-1	Khyber Pakhtunkhwa	883,636	JUI(F)	Abdul Ghafoor
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	PTI	Saleem ur Rehman
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	PPP	Shakiray Amiroob
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	PMLN	Muhammad Nisar Khan
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	ANP	Shir Baz Khan
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	JI	Sahib Zada Tariq Ullah
NA-3	SWAT-2	Khyber Pakhtunkhwa	867,243	JUI(F)	Kaiser Khan
NA-4	SWAT-3	Khyber Pakhtunkhwa	936,506	PTI	Schahd Sultan
NA-4	SWAT-3	Khyber Pakhtunkhwa	936,506	PPP	Kamal Khan
NA-4	SWAT-3	Khyber Pakhtunkhwa	936,506	ANP	Muhammad Saleem Khan
NA-4	SWAT-3	Khyber Pakhtunkhwa	936,506	Jamiat Ulama-e-Islam (F)	Rahim Ullah
NA-4	SWAT-3	Khyber Pakhtunkhwa	936,506	Pakistan Tahreek Insaaf Parliamentarian	Mehmood Khan
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	PTI	Sahibzada Sibghatullah Virk
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	PPP	Najam Uddin Khan
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	PMLN	Muhammad Nisar Khan
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	ANP	Bahadar Khan
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	Jamiat Ulama-e-Islam (F)	Muhammad Nabi
NA-5	Upper Dir	Khyber Pakhtunkhwa	1,083,566	Jamaat-e-Islami Pakistan	Sahib Zada Tariq Ullah

Verification of Dataset:

- **Link for Verification: Election Commission of Pakistan (ECP) Website**
- **Purpose:**
 - Allowing stakeholders to verify and cross-reference the collected election data.
 - Ensuring transparency and credibility in the data collection and normalization process.
 - Facilitating external validation to enhance the reliability of the dataset.

Phase 3: Probability Analysis

Semantic information from credible news sources such as Suno News, Geo News, Samaa News, ARY News, insights from Gallup Survey, and IPOR. Twitter social media trends were carefully extracted via web scraping. Election 2024 data, which is essential for the prediction model, came directly from ECP Form 33.



There are 144 seats in different regions of Punjab. The candidate popularity positions party-wise are shown below:

1	REGION	PROVINCE	PTI	PMLLN	PPP	TLP	JI	IPP	IND	NON VOTING
2	RAWALPINDI	PUNJAB	41%	36%	5%	4%	1%	4%	3%	6%
3	ATTOCK	PUNJAB	45%	35%	4%	6%	1%	Number Format		4%
4	JEHLUM	PUNJAB	38%	37%	4%	9%	1%	2%	3%	6%
5	GUJRAT	PUNJAB	60%	35%	1%	1%	1%	1%	1%	8%
6	WAZIRABAD	PUNJAB	36%	35%	3%	5%	2%	4%	6%	9%
7	HAFIZABAD	PUNJAB	40%	37%	8%	2%	1%	4%	5%	3%
8	M.B.DIN	PUNJAB	38%	40%	4%	8%	2%	3%	2%	3%
9	SIALKOT	PUNJAB	37%	37%	5%	4%	3%	5%	3%	6%
10	NAROWAL	PUNJAB	35%	40%	2%	5%	2%	4%	2%	10%
11	GUJRANWALA	PUNJAB	39%	36%	5%	3%	2%	3%	3%	9%
12	SARGODHA	PUNJAB	41%	38%	3%	4%	2%	2%	5%	5%
13	MIANWALI	PUNJAB	63%	28%	2%	2%	1%	1%	2%	1%
14	BHAKKAR	PUNJAB	45%	33%	8%	4%	1%	2%	3%	4%
15	CHINIOT	PUNJAB	35%	38%	7%	6%	2%	3%	4%	5%
16	FAISLABAD	PUNJAB	44%	40%	2%	1%	1%	4%	2%	6%
17	TOBATAKSINGH	PUNJAB	43%	35%	6%	8%	2%	3%	1%	2%
18	NANKANA SAB	PUNJAB	41%	42%	7%	4%	1%	1%	1%	3%
19	SHEIKHPURA	PUNJAB	34%	37%	5%	9%	2%	1%	2%	10%
20	LAHORE	PUNJAB	47%	42%	2%	3%	1%	2%	0%	3%
21	KASURE	PUNJAB	35%	46%	5%	5%	3%	1%	2%	3%
22	OKARA	PUNJAB	36%	35%	5%	9%	2%	1%	3%	9%
23	PAK PATTAN	PUNJAB	37%	37%	5%	7%	1%	9%	1%	3%
24	SAHIWAL	PUNJAB	43%	39%	5%	4%	1%	5%	1%	2%
25	KHANEWAL	PUNJAB	35%	36%	5%	2%	15%	1%	2%	4%
26	MULTAN	PUNJAB	36%	33%	19%	2%	2%	3%	3%	2%
27	LODHRAN	PUNJAB	38%	37%	4%	1%	1%	17%	1%	1%
28	VEHARI	PUNJAB	32%	31%	7%	1%	3%	15%	2%	9%
29	BAHAWAL NAGAR	PUNJAB	35%	31%	10%	8%	2%	9%	2%	3%
30	BAHAWAL PUR	PUNJAB	35%	34%	8%	7%	1%	7%	2%	6%
31	RAHIMYAR KHAN	PUNJAB	33%	34%	7%	3%	3%	9%	4%	7%
32	KOT ADDU, LAYYAH, TUNSA	PUNJAB	33%	35%	9%	5%	5%	7%	3%	3%
33	DG KHAN	PUNJAB	37%	33%	9%	7%	4%	5%	3%	2%
34	RAJANPUR	PUNJAB	46%	29%	9%	3%	3%	5%	2%	3%
35	JACOBABAB	PUNJAB	48%	33%	10%	1%	2%	2%	2%	2%

There are 61 seats in different regions of Sindh. The candidate popularity positions party-wise are shown below:

REGION	PROVINCE	PTI	PMLLN	PPP	MQM	GDA	TLP	IND	NON VOTING
Shikarpur	Sindh	26%	11%	41%	7%	9%	0%	3%	3%
Larkana	Sindh	18%	19%	39%	9%	10%	0%	2%	3%
Kamber Shahadkot	Sindh	11%	0%	53%	8%	19%	0%	2%	7%
Ghotki	Sindh	13%	0%	48%	4%	21%	0%	5%	9%
Sukkar	Sindh	Number Format	2%	42%	9%	13%	0%	3%	6%
Khanpur	Sindh	25%	6%	43%	12%	7%	0%	4%	3%
Naushahro feroze	Sindh	13%	6%	51%	7%	10%	0%	2%	11%
Benzirabad	Sindh	19%	9%	47%	9%	10%	0%	1%	5%
Sanghar	Sindh	20%	6%	46%	7%	9%	0%	2%	10%
Mirpurkhas,Umarkot	Sindh	20%	7%	47%	8%	14%	0%	1%	3%
Tharparkur,Matiari	Sindh	19%	0%	44%	9%	23%	0%	1%	4%
Hyderabad	Sindh	19%	0%	41%	27%	8%	0%	4%	1%
Thatta,Tando Muhammad Khan,Sujawal,yamashiro	Sindh	17%	0%	47%	17%	5%	0%	2%	12%
Karachi, Malir	Sindh	21%	6%	30%	27%	5%	9%	0%	2%

There are 45 seats in different regions of KPK. The candidate positions party-wise are shown below:

A	B	C	D	E	F	G	H	I
REGION	PROVINCE	PTI	PMLLN	PPP	JI	JUIF	ANP	IND
Chitral	KPK	47%	25%	2%	8%	5%	10%	1%
Swat	KPK	58%	7%	3%	19%	5%	8%	0%
Lower-Upper-Dir	KPK	48%	14%	4%	13%	15%	6%	0%
Bajaur, Malakand, banu, shangla	KPK	51%	11%	6%	9%	13%	10%	0%
Mansehra, abbotabad	KPK	39%	29%	8%	6%	9%	9%	0%
Haripur, Swabi, Mardan, charsada, Mohmand, khyber	KPK	46%	22%	1%	7%	15%	9%	0%
peshwar, khot, orakazi, kussam, karak	KPK	49%	18%	2%	10%	12%	9%	0%
North waziristan, Lakki marwat, waziristan	KPK	41%	11%	3%	8%	24%	13%	0%
Dera Al khan	KPK	44%	25%	4%	10%	14%	3%	0%

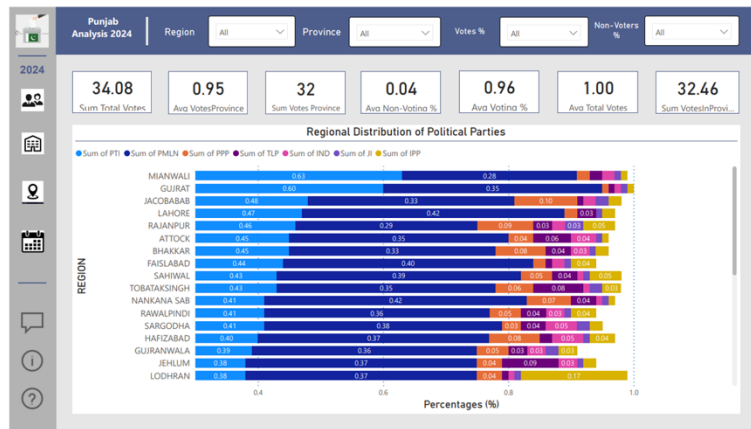
There are 16 seats in different regions of Balochistan.

Phase 4: Modeling

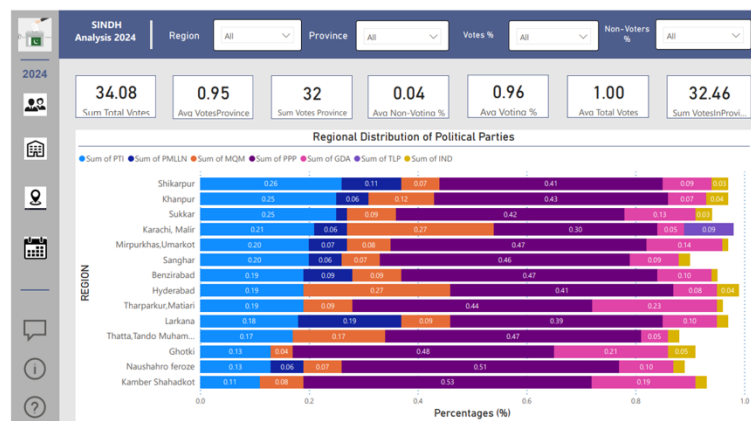
Our Model Produces the following results

1. Party Position Constituency wise.
2. Win Probability Constituency Wise
3. Overall Comparison Provision wise and Region Wise.

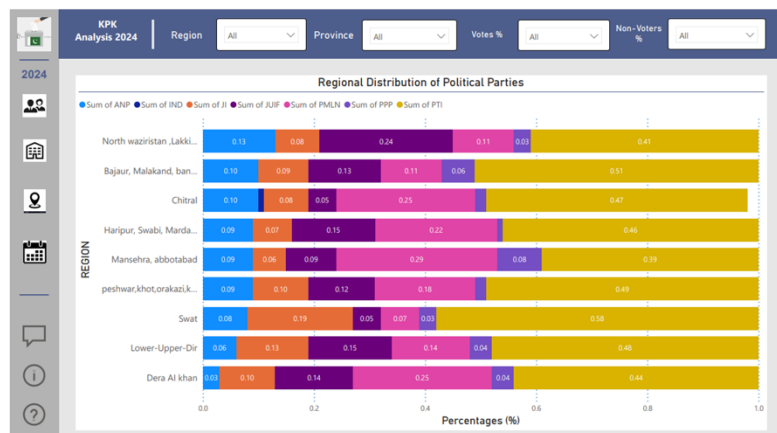
Overall Electoral Analysis of Punjab Province



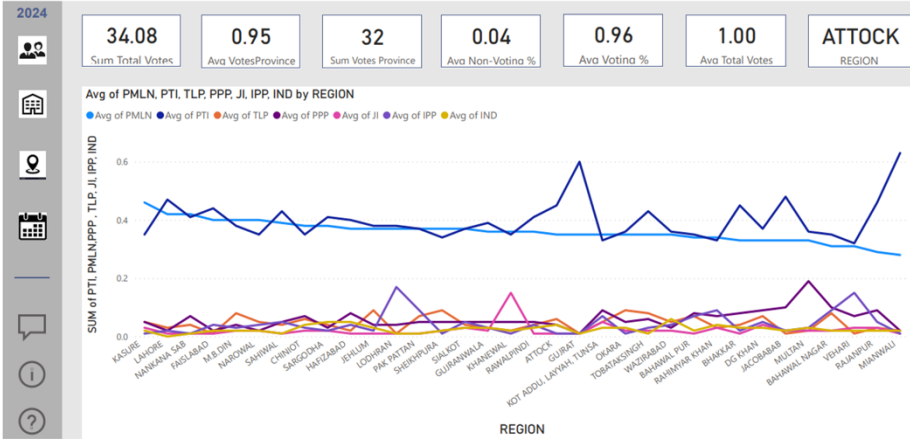
Overall Electoral Analysis of Sindh Province



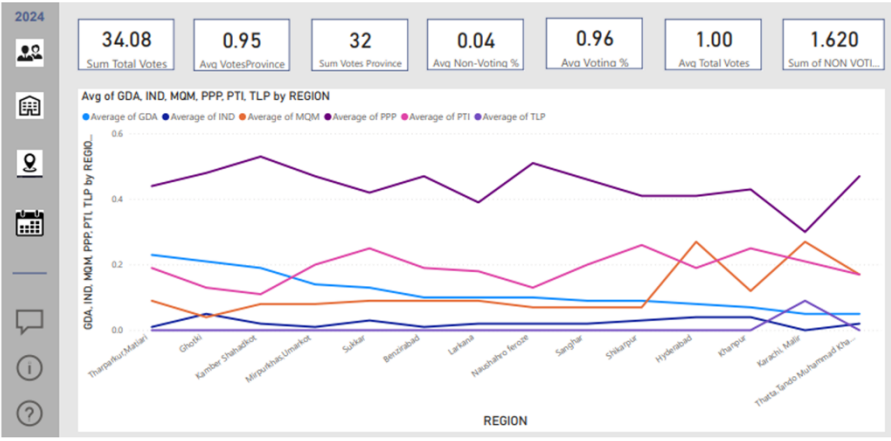
Overall Electoral Analysis of KPK Province



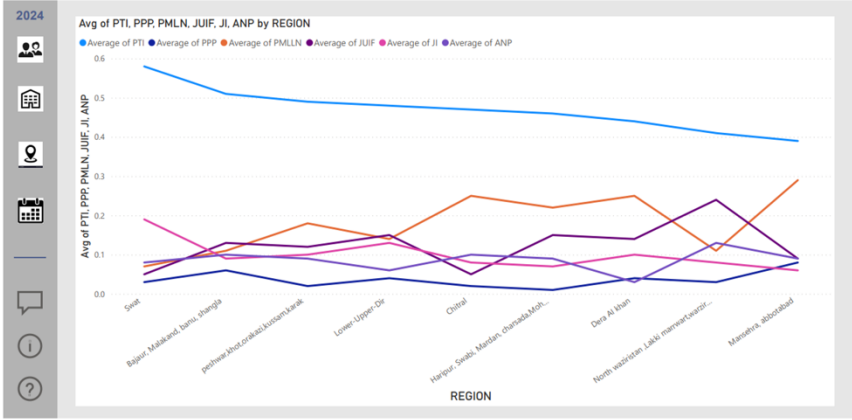
Average Regional Electoral Analysis of Punjab Province



Average Regional Electoral Analysis of Sindh Province



Average Regional Electoral Analysis of KPK Province



Key Predictions:

- **Punjab:** No single party is predicted to secure a clear majority.
- **Sindh:** PPP is anticipated to secure a clear majority.
- **KPK:** PTI is projected to maintain a strong lead.

Phase 5: Comparison with Others Survey

- **Objective:** Evaluating the predictive model against external surveys and analyses.
- **Activities:**
 - Comparing model predictions with results from other reputable surveys.
 - Analyzing discrepancies and understanding potential biases.
 - Validating the model's accuracy through comparison with diverse sources.
 - Identifying areas of agreement and divergence among different analyses.

A comprehensive prediction for the 2024 election. To validate our predictions, the results are compared with The Gallup Survey and IPOR which are presented in the table below:

Province	Party	Gallup Survey	IPOR	Our Prediction
Punjab	PTI	34%	35%	40%
	PML(N)	32%	45%	36%
Sindh	PPP	42%	43%	46%
	PTI	19%	17%	19%
	TLP	3%	5%	5%
KPK	PTI	35%	44%	48%
	PML(N)	9%	17%	18%
	ANP	7%	7%	6%
Balochistan	-	-	-	-

