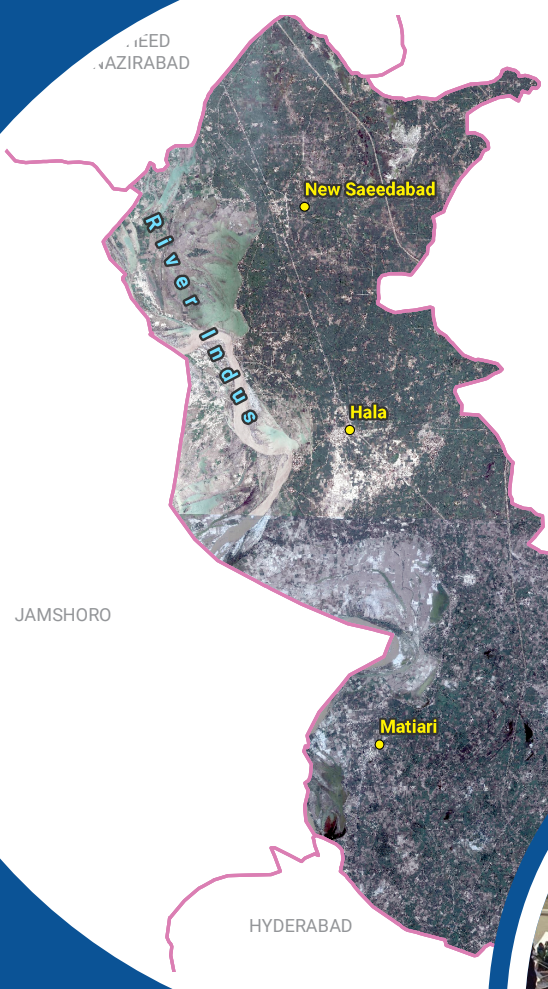
SINDH HAZARD AND RISK ATLAS

2022

DISTRICT

MATIARI



DEVELOPED BY

PDMA SINDH

THROUGH

SUPARCO

WITH THE SUPPORT OF

THE WORLD BANK
IBRD • IDA

ACKNOWLEDGEMENTS

SUPARCO, the National Space Agency of Pakistan, appreciates the management of PDMA Sindh for envisioning this highly important subject in disaster management and disaster risk reduction. The products of this study are likely to pave the way for disaster risk management in the province on modern lines.

SUPARCO acknowledge and extend special thanks to different departments, which rightly shared the integral data required for this study and made this scientific endeavor possible. In this regard, the efforts of Irrigation Department GoS, Pakistan Bureau of Statistics (PBS), National Disaster Management Authority (NDMA), Board of Revenue GoS, Health Department GoS, Education and Literacy Department GoS and Energy Department GoS are highly valuable.

SUPARCO also extend special thanks to Project Director and Project Coordinator, Sindh Resilience Project (SRP-PDMA) for their valuable inputs and necessary support required during execution of different activities of the project. Moreover the contribution, review and inputs of Dr Sayed Sanaullah Shah (Risk Assessment Expert SRP) are highly significant and commendable.

DEVELOPED BY
PDMA SINDH

THROUGH
SUPARCO

WITH THE SUPPORT OF
THE WORLD BANK
IBRD • IDA

- - Disclaimer - -

The Sindh Hazard and Risk Atlas, the product of "Multi-Hazard Vulnerability Risk Assessment (MHVRA) Study" developed for Provincial Disaster Management Authority (PDMA) Sindh under Sindh Resilience Project (PDMA Component) by Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) is based on satellite imagery, data and information obtained from concerned departments and verifiable online sources. Every effort have been made to make this study and database free of errors, however, PDMA Sindh or SUPARCO are not liable for any discrepancy in data obtained from various departments. For hazard and risk assessment, recommended subject specific models have been used and results are based on model outputs. The atlas or any part of it is not to be used for legal or litigation matters and commercial use. However, the information contained in the atlas or any part of the atlas can be used without prior permission of PDMA Sindh with proper citation and acknowledgements.

FOREWORD

Pakistan is ranked among top ten countries which are likely to be affected by climate change (German Watch, 2020). The Sindh province is exposed to a number of adverse natural events and has experienced a wide range of disasters. The indicative natural hazards include floods, cyclones, droughts, earthquakes, heatwaves and tsunami. As the population and asset base of Sindh has increased, so its economic exposure to natural disasters has also increased, therefore damages and losses resulting from natural disasters in Sindh have exceeded multi-million. Different studies suggest that changing climate scenarios are likely to exacerbate existing natural hazards manifesting in raised temperatures, frequent and intensified rains and spells of drought.

The effective management of disaster risks is therefore, increasingly important for development of resilience against natural disasters in the Province. The Government of Sindh is taking timely actions for preparation against disasters to ensure efficient management of risks. The Sindh Resilience Project (SRP) funded by World Bank is an important milestone in disaster management of the Province. SRP aims to strengthen the capacities and resilience of PDMA, DDMAs and communities to proactively manage the disasters. Various vital activities have been initiated by PDMA, Sindh for enhanced coping capacity. The Multi Hazard Vulnerability Risk Assessment (MHVRA) is one of such activities and foundation for disaster risk management and risk reduction. The overall spectrum of disaster management is supposed to be based on results of MHVRA. The results of MHVRA and Informed Disaster Management Plans are planned to be hosted on Disaster Management Information System (DMIS) accessible to planners, decision makers, communities at disaster risk, academia and researchers and general masses at large. The completion of MHVRA and availability of DMIS will embark a new paradigm in disaster management of the Province.

It is pleasure for both PDMA and SUPARCO to publish Sindh Hazard and Risk Atlas for District Sujawal. The Atlas will be circulated among concerned quarters especially at grass root level, i.e., DDMA. It is anticipated that this Atlas will serve strategic, operational and tactical requirements for disaster management. Both institutions are determined to achieve the desired objectives of this initiative and will continue cooperation and collaboration for research and development in disaster management which will ultimately benefit the province at large.

EXECUTIVE SUMMARY

The disaster resilience is contemporary concept implied and reinforced around the world to mitigate the effects of natural hazards. The disaster is nexus of interaction between natural hazards and human ecosystem. It is believed that natural hazard itself does not cause loss or damage rather it is poor human settings which convert hazards into disasters. The resilience is a modern practice in disaster management which proactively engage all strata of society to consider disaster risk reduction at planning stage of every single human development. In a true sense, to achieve the resilience against natural disasters it is utmost important to know nature and intensity of natural hazards in conjunction with human population and ecosystem. The hazard and risk information base are fundamental for disaster risk reduction in particular and disaster management in general.

PDMA, Sindh with the technical assistance of SUPARCO has developed Multi Hazard Vulnerability and Risk Assessment (MHVRA), Disaster Management Information System (DMIS) and MHVRA Informed Disaster Management Plans to feed wide range of disaster management activities in the province.

Though, the outcomes of MHVRA are planned to be hosted on DMIS which will be publicly available on web, however, in order to facilitate District Disaster Management Authorities (DDMAs) the key findings of MHVRA at Union Council (UC) and subsequently at District and Provincial level have been prepared in an Atlas format for achieving operational requirements. These district atlases for entire province are planned to be prepared and produced for subsequent distribution among the concerned quarters.

The development of MHVRA and atlases is based on diversified information sources including Satellite Remote Sensing (SRS), Digital Elevation Model (DEM) and pertinent information collected from concerned departments. The Atlas depicts landuse / landcover, critical infrastructure and facilities, hazard, exposure, vulnerability and risk maps of cyclone and storm surge, drought, earthquake, flood, heatwave and tsunami along with Disaster Management Plans at UC level.

It is anticipated that, in future all strategic, operational and tactical planning concerning to district level disaster management shall be based on these atlases. The DDMAs are encouraged to align disaster management and disaster risk reduction interventions and initiatives referring to risk profiles of UCs / Districts.

DATA, SOURCES AND PROCESSING

DATA	SOURCES
Satellite Imagery	SPOT 6/7 1.5 meter resolution – 2019/2020
Digital Elevation Model (DEM)	SPOT Stereo 5 meters
Land use / Land cover	Satellite Imagery
Elements at risk (Road, Irrigation, Railways, Petrol Pumps, Power Plants, Education, Health, Industries, and other features)	Satellite imagery and concerned departments
Administrative Boundaries	Board of Revenue, Government of Sindh
Geological Map	Geological Survey of Pakistan (GSP)
Historical Cyclone Tracks	World Meteorological Organization and National Oceanic and Atmospheric Administration (NOAA)
Bathymetry	Pakistan Navy Hydrographic Department and The General Bathymetric Chart of the Oceans (GEBCO)
River Discharge Data	Indus River System Authority (IRSA)
Temperature Data	NASA GMAO MERRA-2 and GEOS 5.12.4 FP-IT
Rainfall Data	Climate Hazard Group InfraRed Precipitation with station data (CHIRPs)
Demographic Data	Pakistan Bureau of Statistics (PBS) and Bureau of Statistics, Government of Sindh
Historical Earthquake and Flood Data	National Disaster Management Authority (NDMA)
Irrigation Network	Sindh Irrigation Department

METHODOLOGY FLOW CHART

SOFTWARE AND MODELS

	SOFTWARE / MODEL	OUTPUTS
	HEC-RAS	Flood hazard maps
	GeoCLAW	Tsunami hazard maps
	OpenQuake	Earthquake hazard maps
	R-Studio	Heatwave hazard maps
	QGIS	Exposure, vulnerability and risk maps
	ArcGIS	Exposure, vulnerability and risk maps
	ERDAS Imagine	Enhanced satellite imagery
	ENVI	Enhanced satellite imagery
	E-Cognition	Land cover classification
TCRM	**TCRM**	Cyclone
	CAPRA GIS	Storm surge maps

TABLE OF CONTENTS

ACKNOWLEDGEMENTS iii

FOREWORD iv

EXECUTIVE SUMMARY v

DATA SOURCES AND PROCESSING vi

DISTRICT MATIARI

- DISTRICT AT A GLANCE 3
- SATELLITE IMAGERY 5
- DIGITAL ELEVATION MODEL 5
- LAND USE / LAND COVER 6
- CRITICAL INFRASTRUCTURE 6
- TRANSPORTATION NETWORK 7
- IRRIGATION AND DRAINAGE 7
- GEOLOGICAL MAP 8
- POPULATION DENSITY 8
- PAST FLOOD EXTENTS 9
- PAST EARTHQUAKE EVENTS 9
- PAST CYCLONE TRACKS 10
- HAZARD VULNERABILITY AND RISK 11

INDEX MAP 28

HAZARD AND RISK ASSESSENT 29

UC BAU KHAN PATHAN 31

UC BHALIDINO KAKA 41

UC BHANOTH 51

UC BHITSHAH 63

UC FAQEER NOOH HOTHYAI 73

UC HALA OLD 83

UC HALA-2 95

UC KARAM KHAN NIZAMANI 107

UC MATIARI 119

UC ODEROLAL STATION 131

UC ODEROLAL VILLAGE 141

UC SAEED ABAD 151

UC SEKHAT 163

UC SHAH MIR RAHU 175

UC TAJPUR 187

UC ZERPIR 197

MULTI-HAZARD RISK AT UC LEVEL 206

DISTRICT MATIARI
AT A GLANCE

GEOGRAPHY

District area in Sq Km	1,517
Coordinates	25° 26′ 56″ N to 25° 55′ 40″ N 68° 14′ 19″ E to 68° 35′ 44″ E
Surrounding districts	Sanghar in East Jamshoro in West Shaheed Benazirabad in North Hyderabad and Tando Allahyar in South
Climate conditions	Hot & Semi-Arid
Coldest and hottest months	January May

Seasonal temperature	Max. Mean Temp. (°C)	Min. Mean Temp. (°C)
Spring (March and April)	38.42	20.62
Dry Summer (May and June)	43.74	27.52
Wet Summer (July to September)	39.81	26.97
Autumn (October and November)	35.60	19.39
Winter (December to February)	27.56	11.30

Average annual rainfall	115.72 mm/yr
Physiographic features	Indus River in West

DEMOGRAPHY

1998	Urban	Rural
494,244	99,860	394,384

2017	Urban	Rural
770,040	182,669	587,371

Average annual growth rate 1998 - 2017: 2.36 %

No. of household (2017): 143,023

Ratio of males per 100 females as on 2017: 106

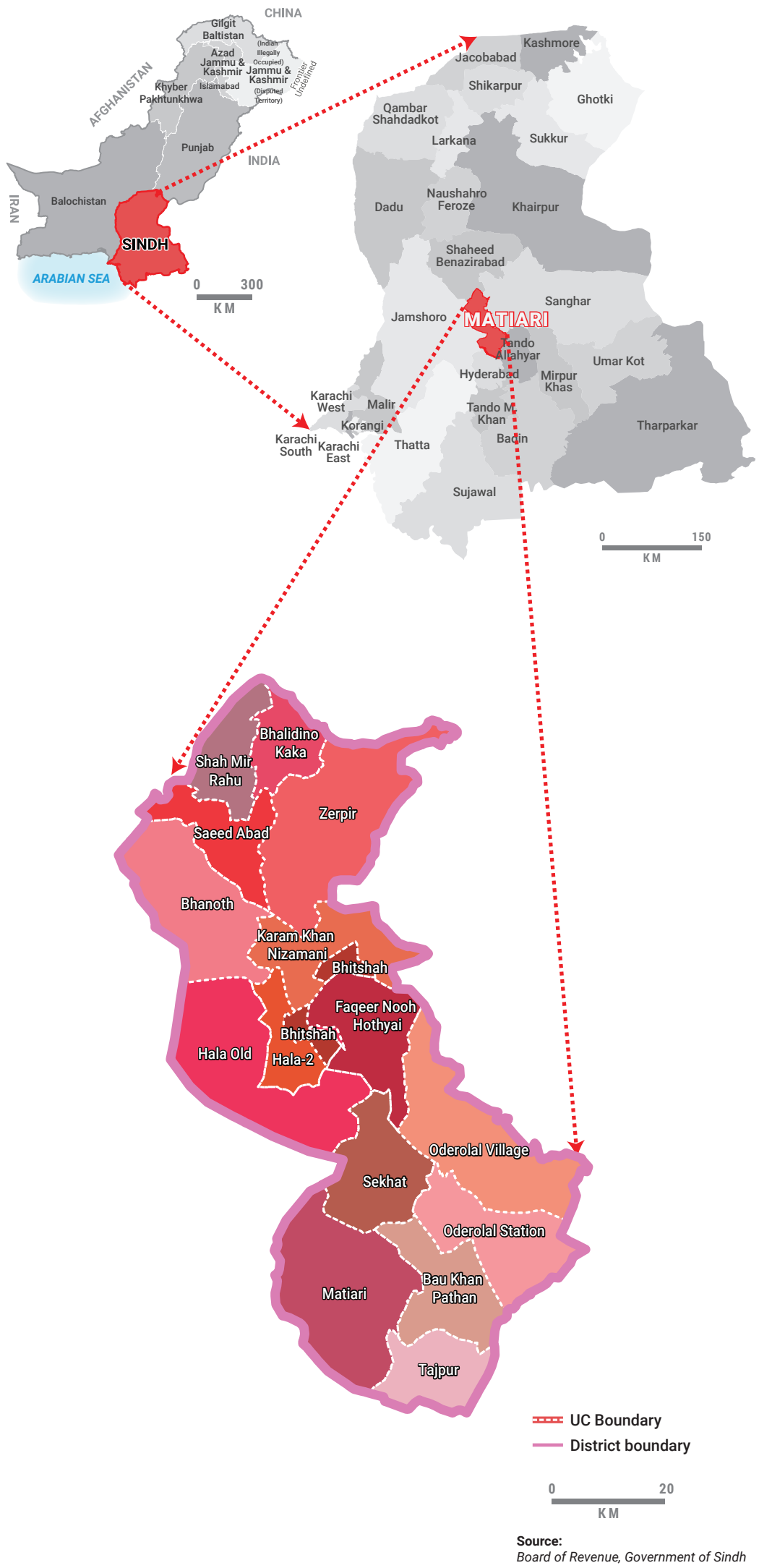
ECONOMY

Main employment sources:

COTTAGE

AGRICULTURE

LOCATION OF
DISTRICT MATIARI



Source:
Board of Revenue, Government of Sindh

Major Crops
Production in M.tons (2016-17)

Wheat	Cotton	Sugercane
158,204	42,053,410	890,036

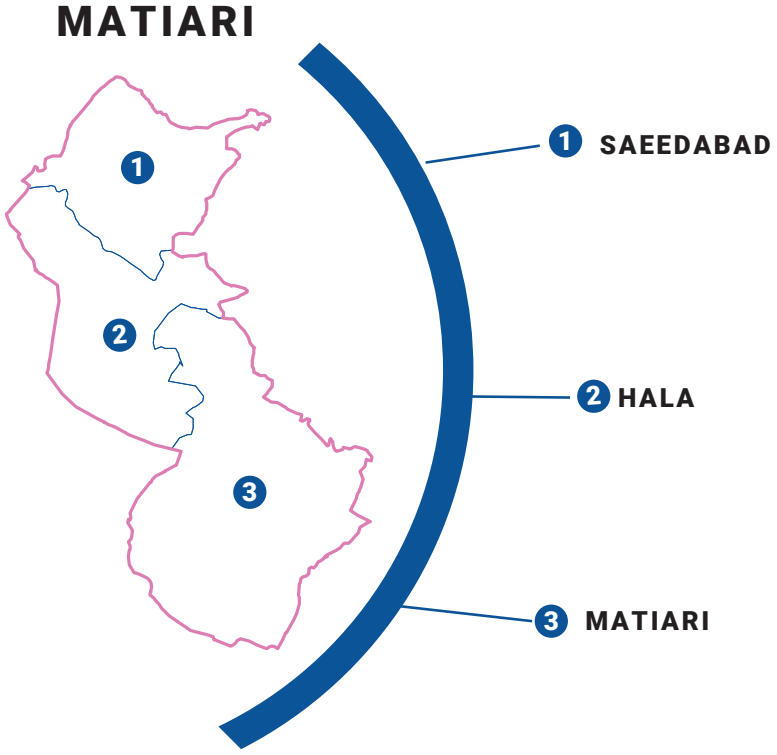
Minor Crops
Production in M.tons (2016-17)

Bajra	Jowar	Maize	Rapeseed/ Mustard	Gram
370	426	532	791	567

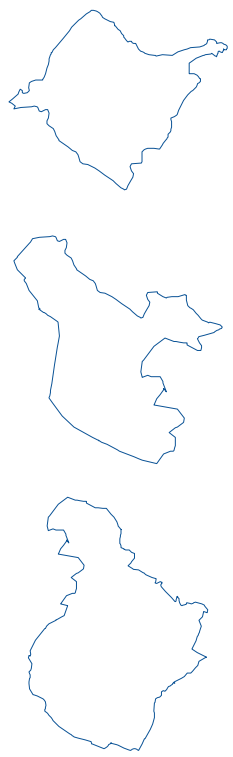
ADMINISTRATIVE SYSTEM

DISTRICT

MATIARI



TALUKA



UNION COUNCILS

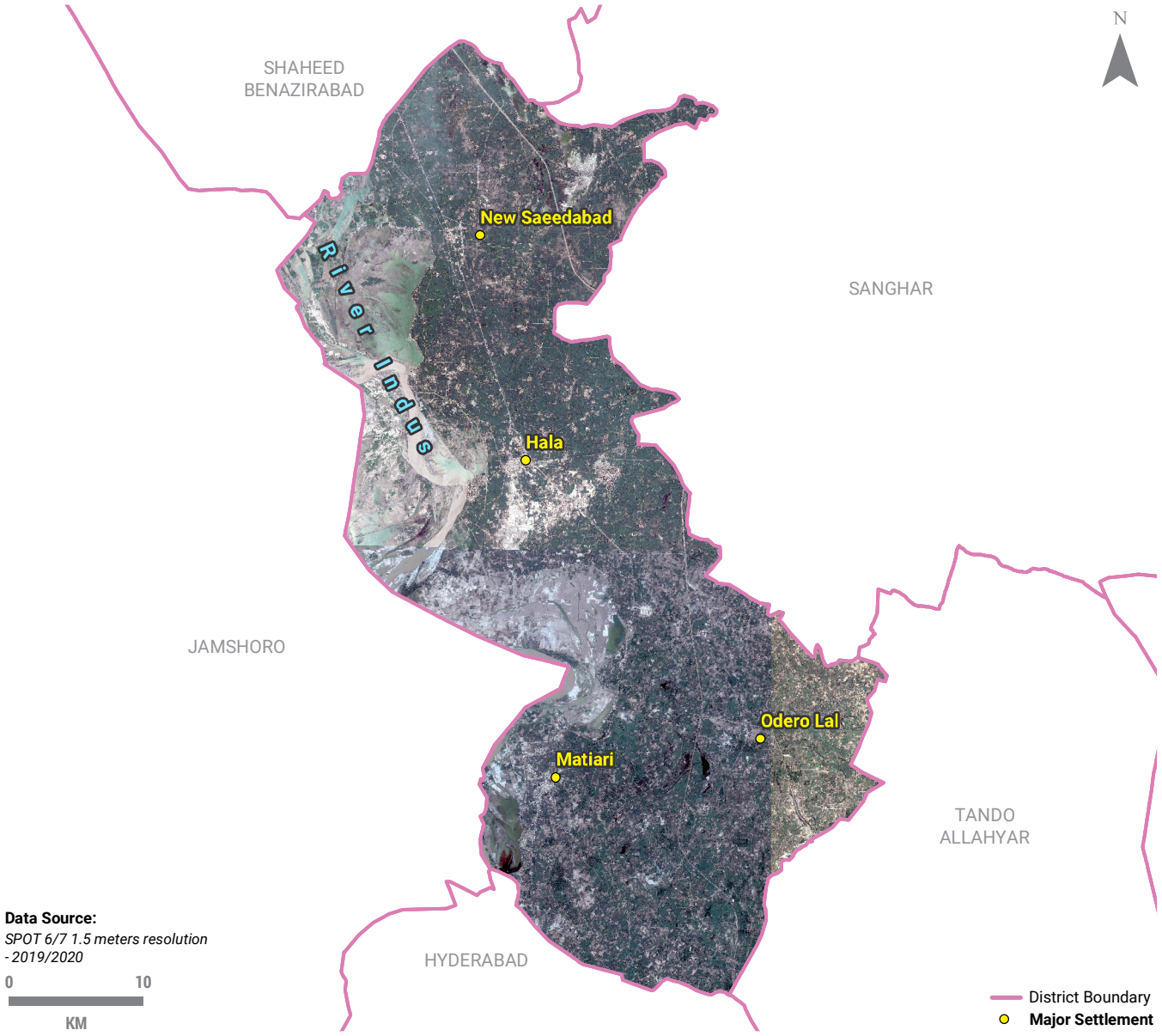
1. BAU KHAN PATHAN
2. BHALIDINO KAKA
3. BHANOTH
4. BHITSHAH
5. FAQEER NOOH HOTHYAI
6. HALA OLD
7. HALA-2
8. KARAM KHAN NIZAMANI
9. MATIARI
10. ODEROLAL STATION
11. ODEROLAL VILLAGE
12. SAEED ABAD
13. SEKHAT
14. SHAH MIR RAHU
15. TAJPUR
16. ZERPIR

DISASTER PROFILE[1]

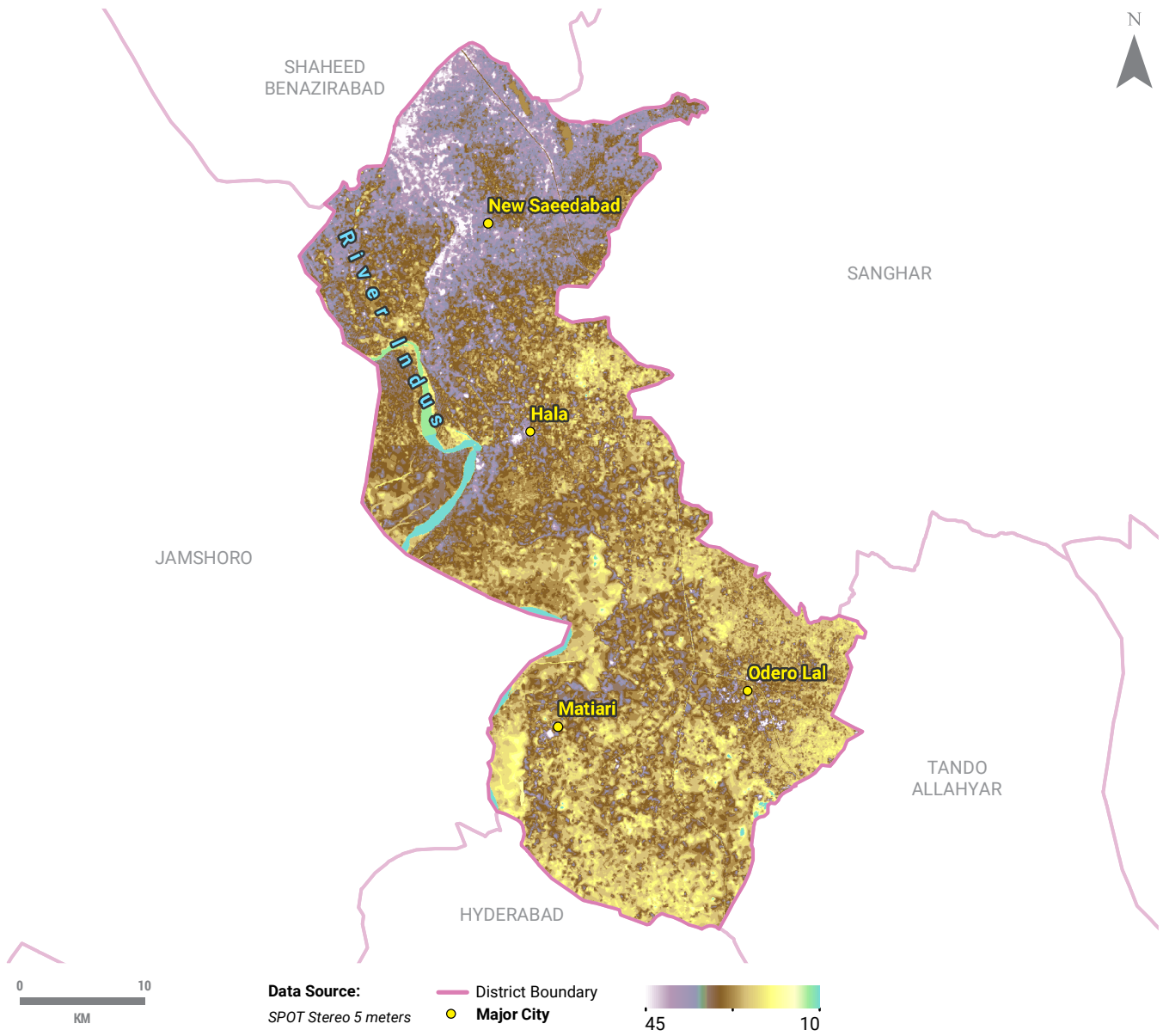
Hazard	Frequency	Severity	Years
Riverine Floods	Monsoon	Medium	2010, 2011
Heavy Rains	Monsoon	High	2011, 2012
Earthquake	Rare	Low	2013

[1] *Source: Organizational Capacity Assesment and Development of Capacity Enhancement Plan, 2017-18*
[2] *http://www.alhasan.com/system/files/skim-magazine/PESA-DP-Jamshoro-Sindh.pdf*

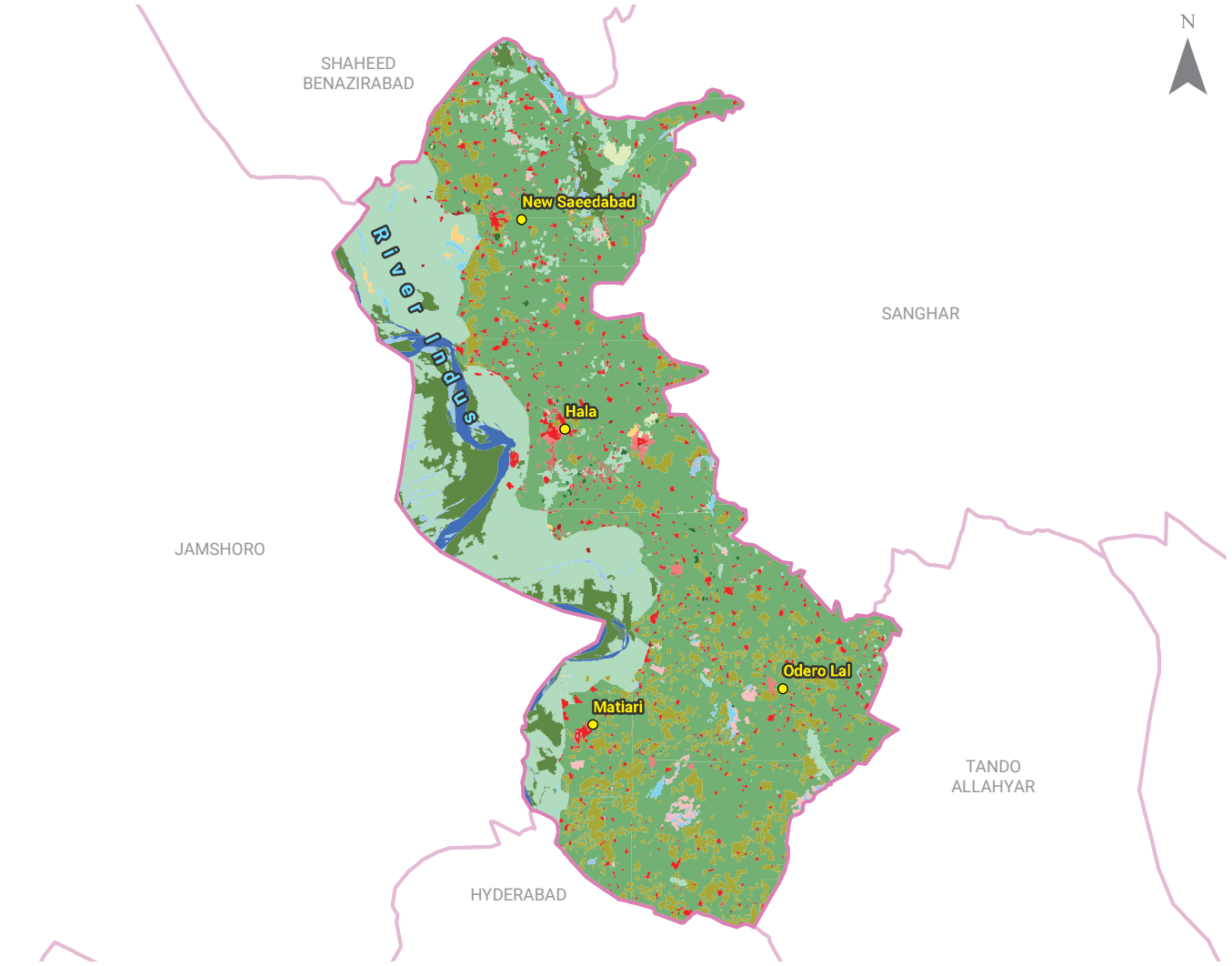
SATELLITE IMAGERY



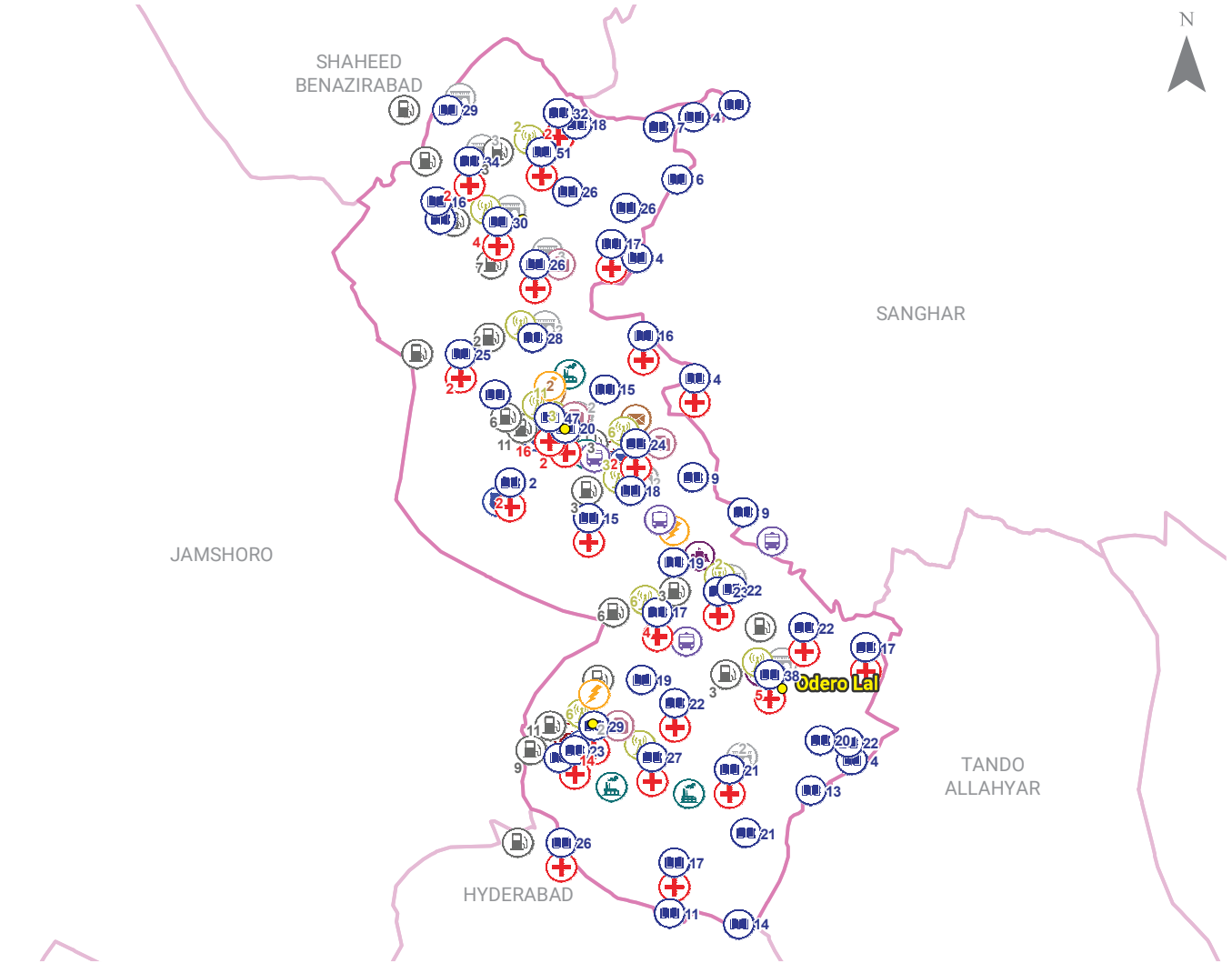
DIGITAL ELEVATION MODEL



LAND USE / LAND COVER



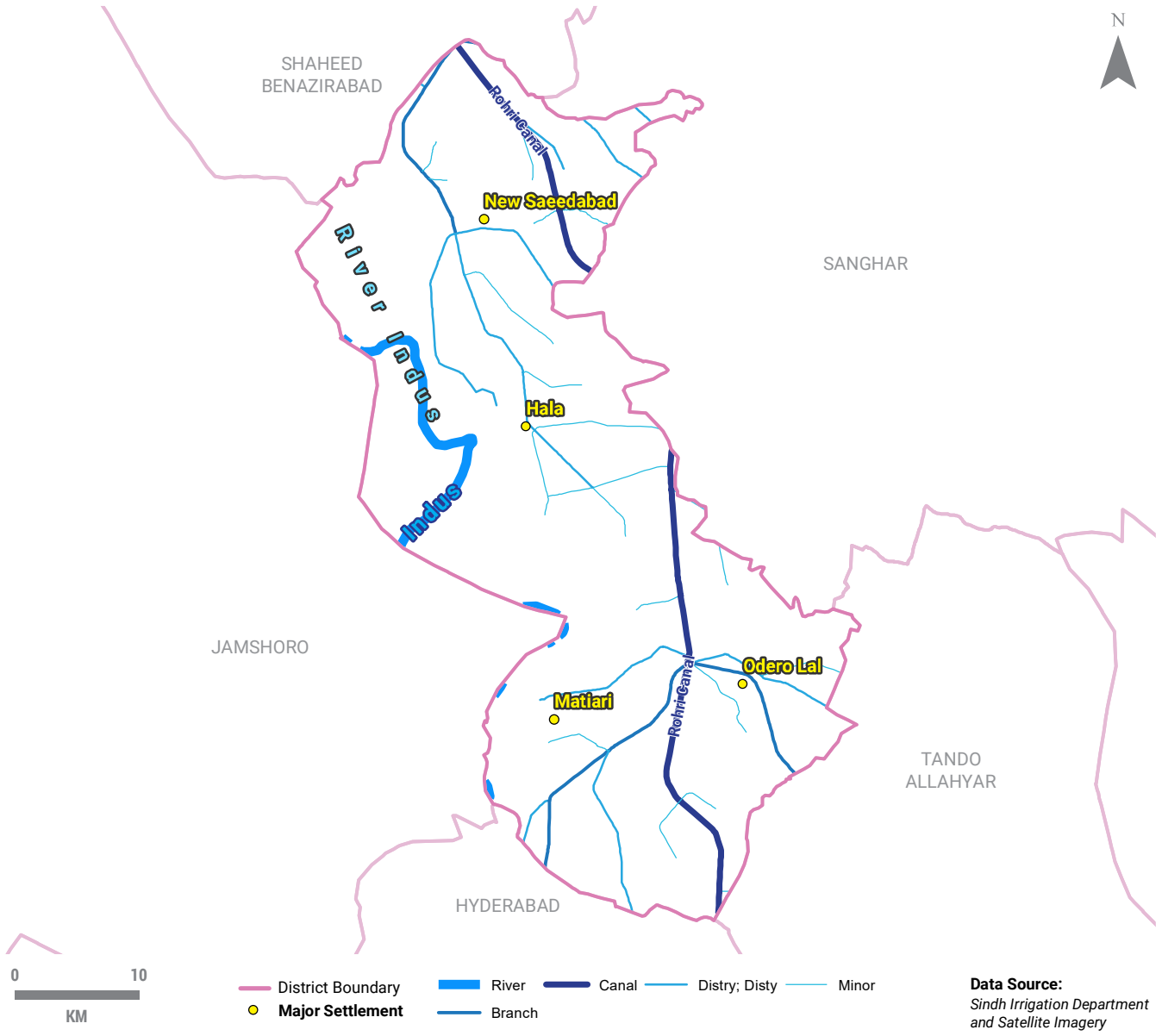
CRITICAL INFRASTRUCTURE



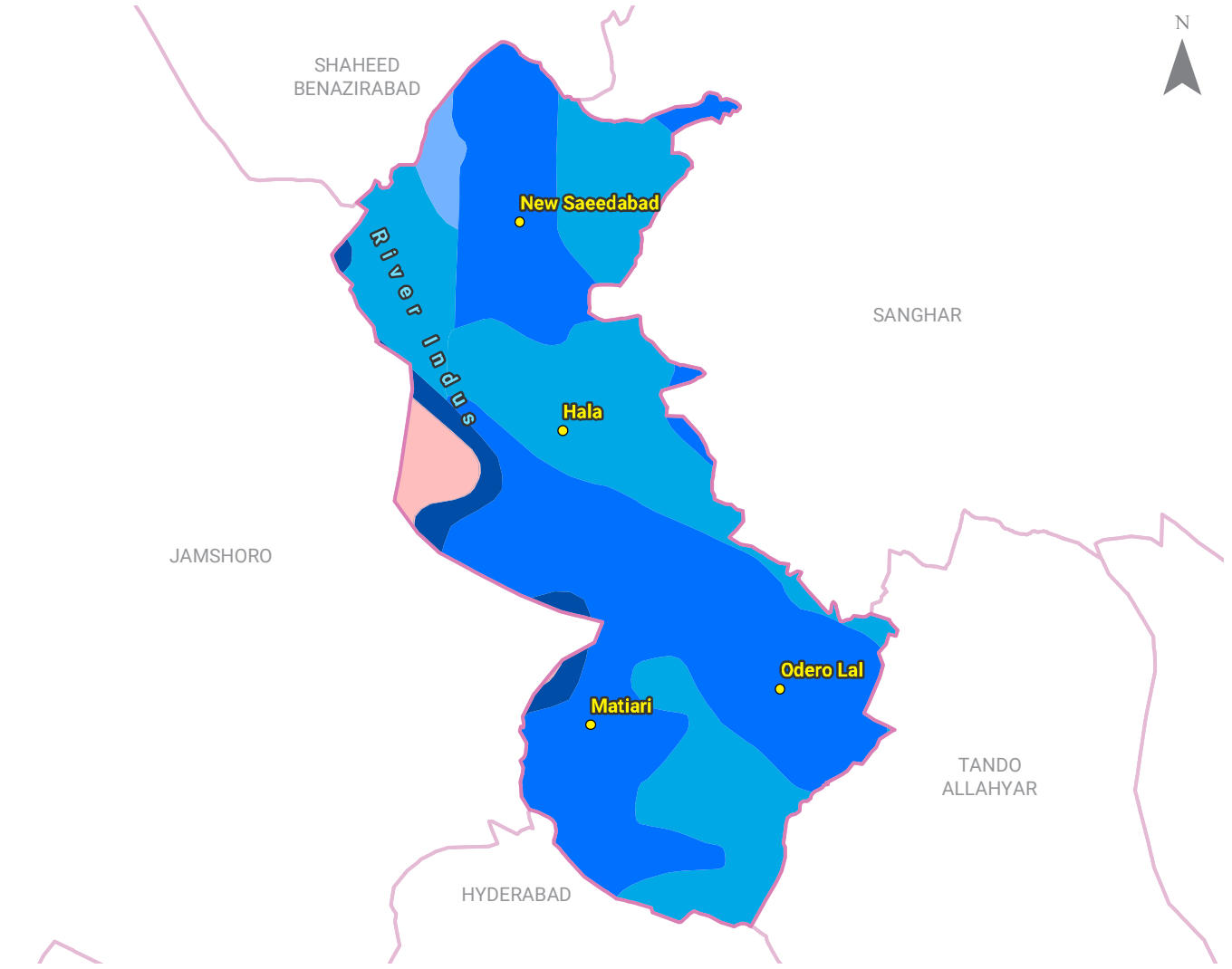
Note: No. of features in cluster is shown beside icon

TRANSPORTATION NETWORK

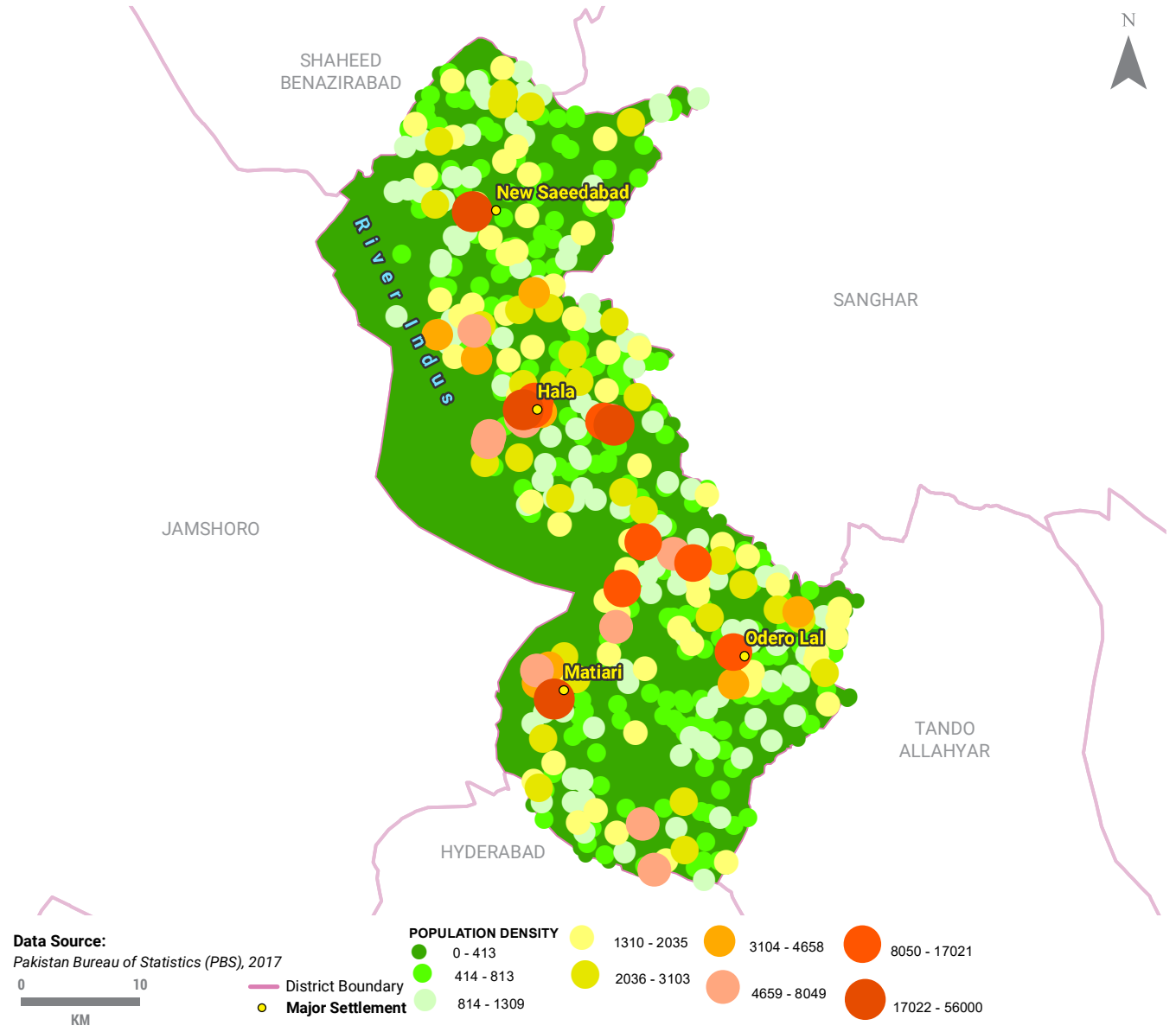
IRRIGATION AND DRAINAGE



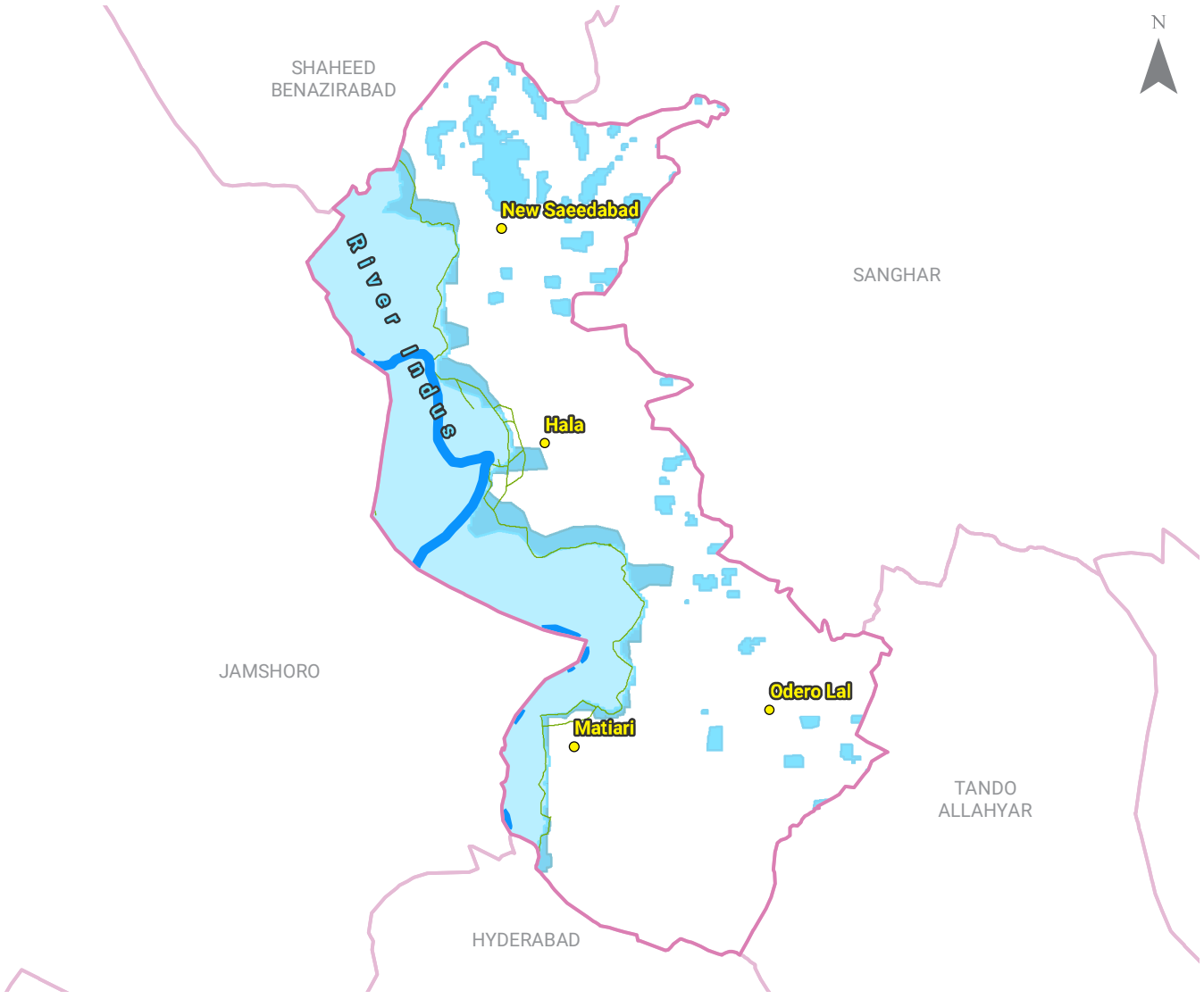
GEOLOGICAL MAP



POPULATION DENSITY

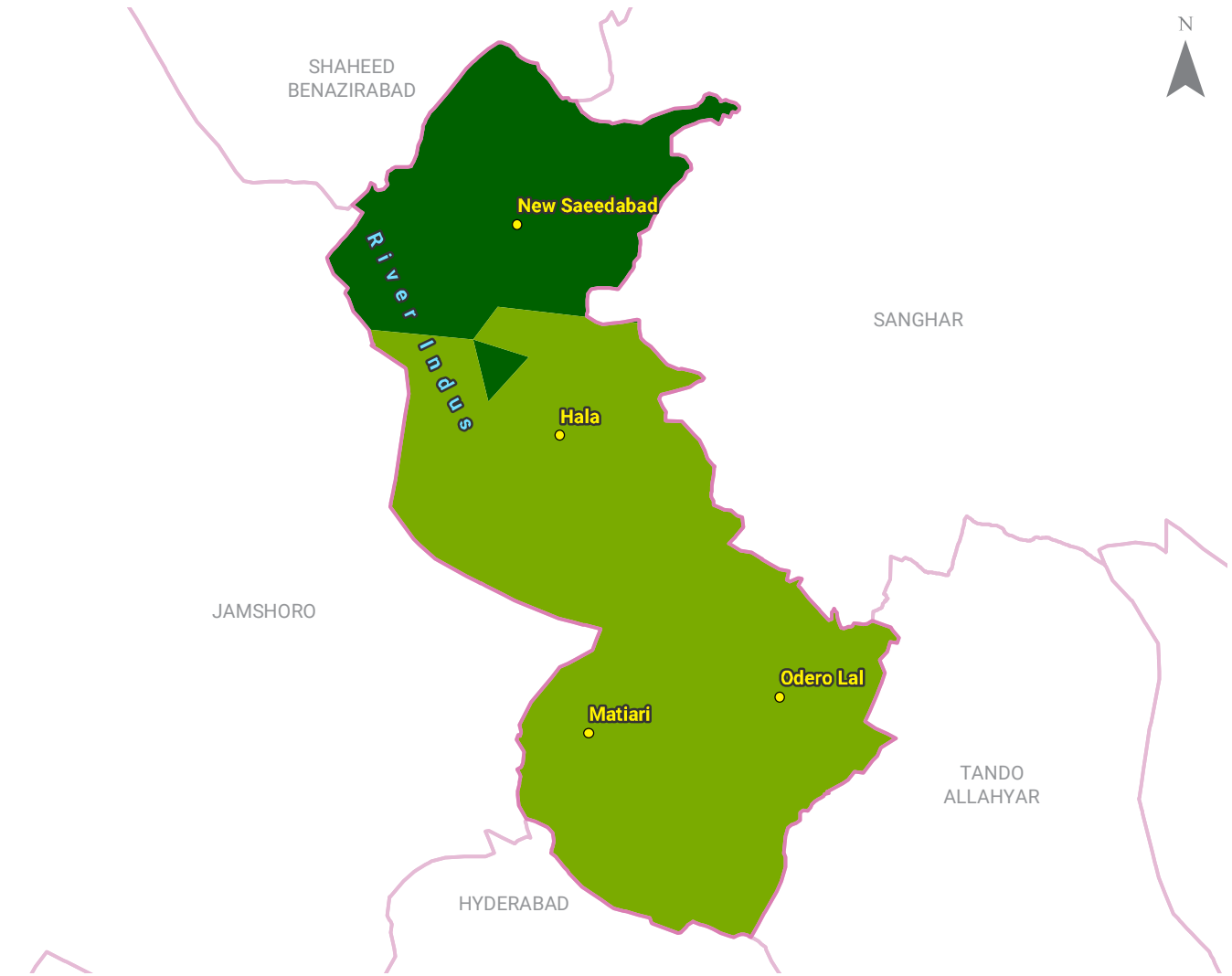


HISTORICAL FLOOD EXTENTS



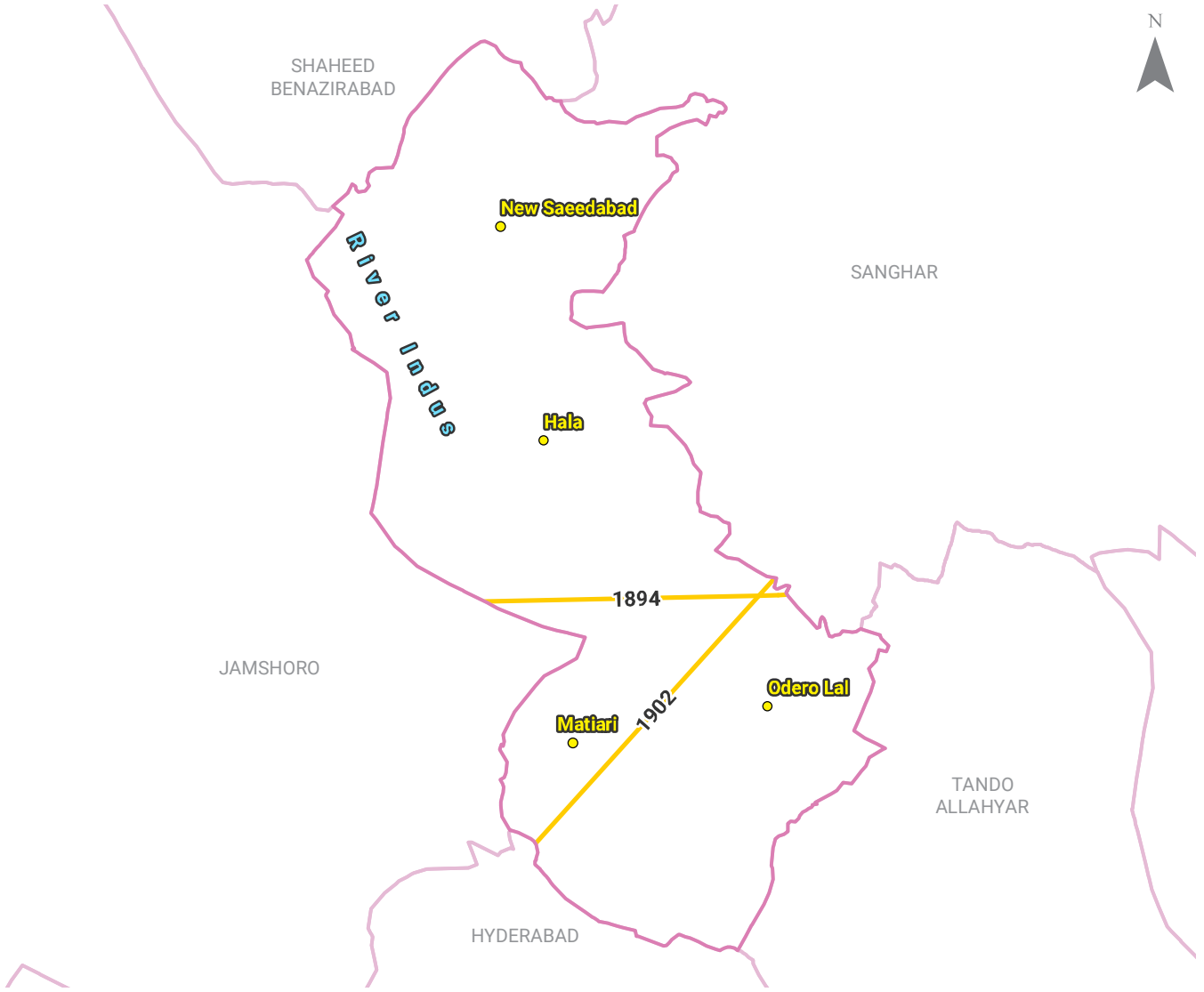
Data Source:
National Disaster Management Authority (NDMA)

HISTORICAL EARTHQUAKE EVENTS



Data Source:
United States Geological Survey (USGS)

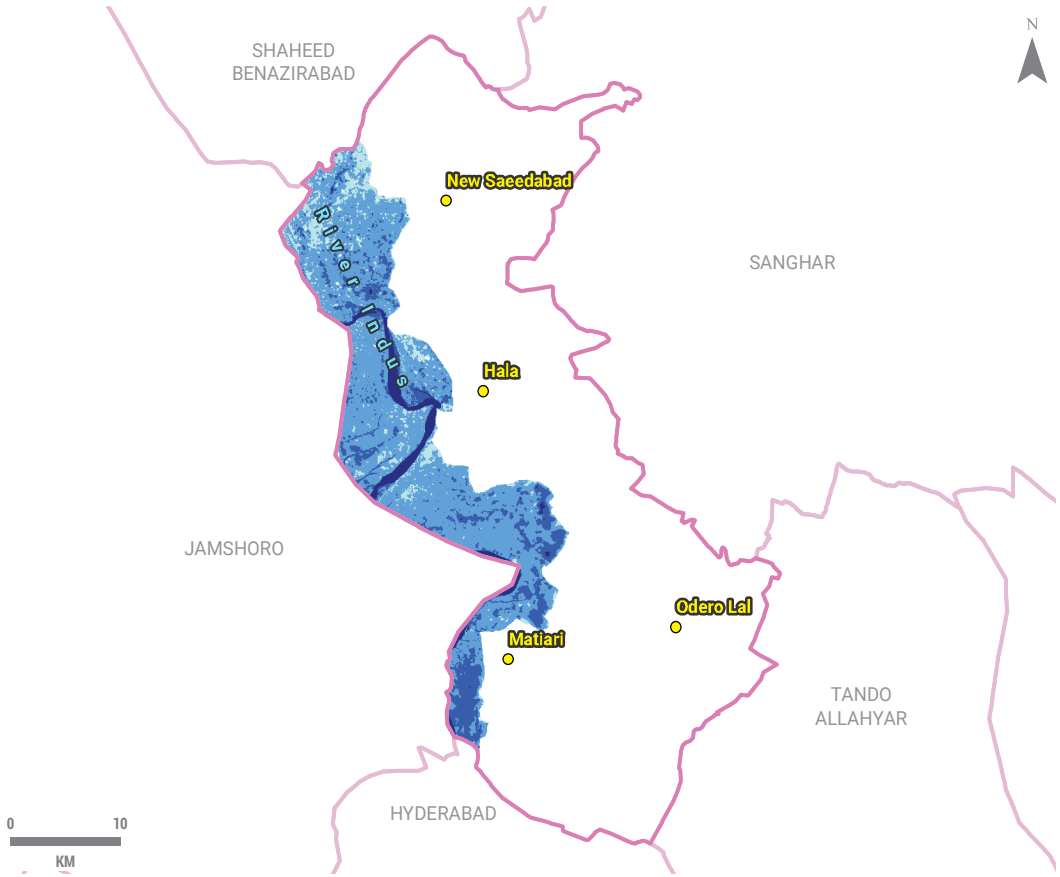
HISTORICAL CYCLONE TRACKS



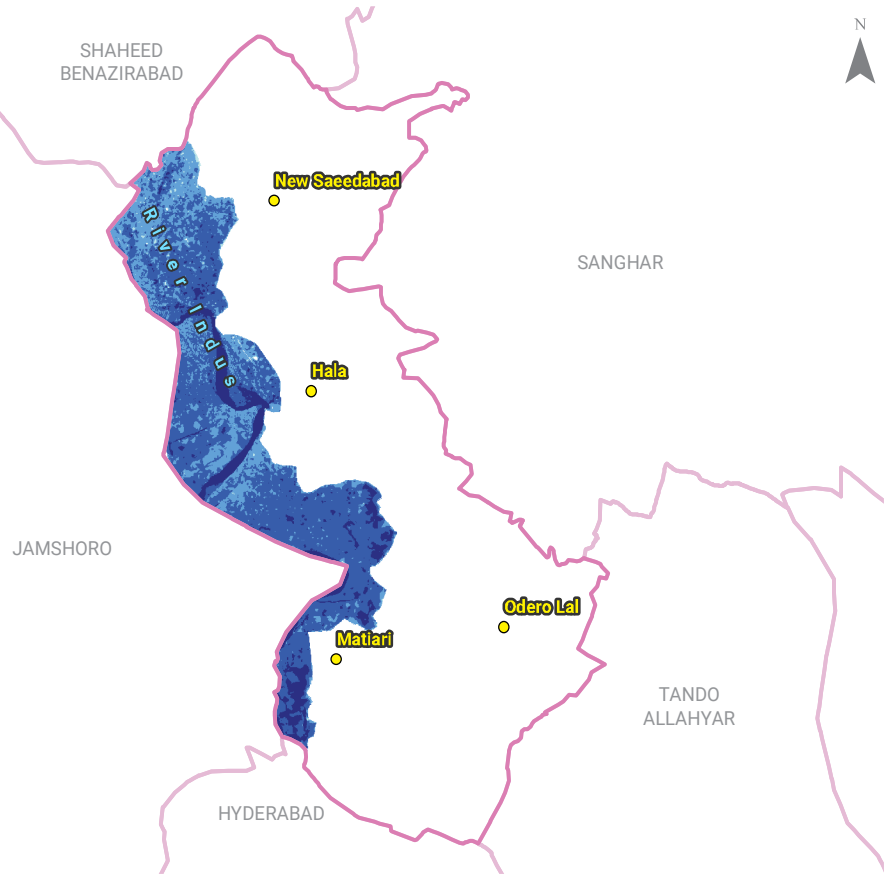
HAZARD, VULNERABILITY AND RISK

FLOOD

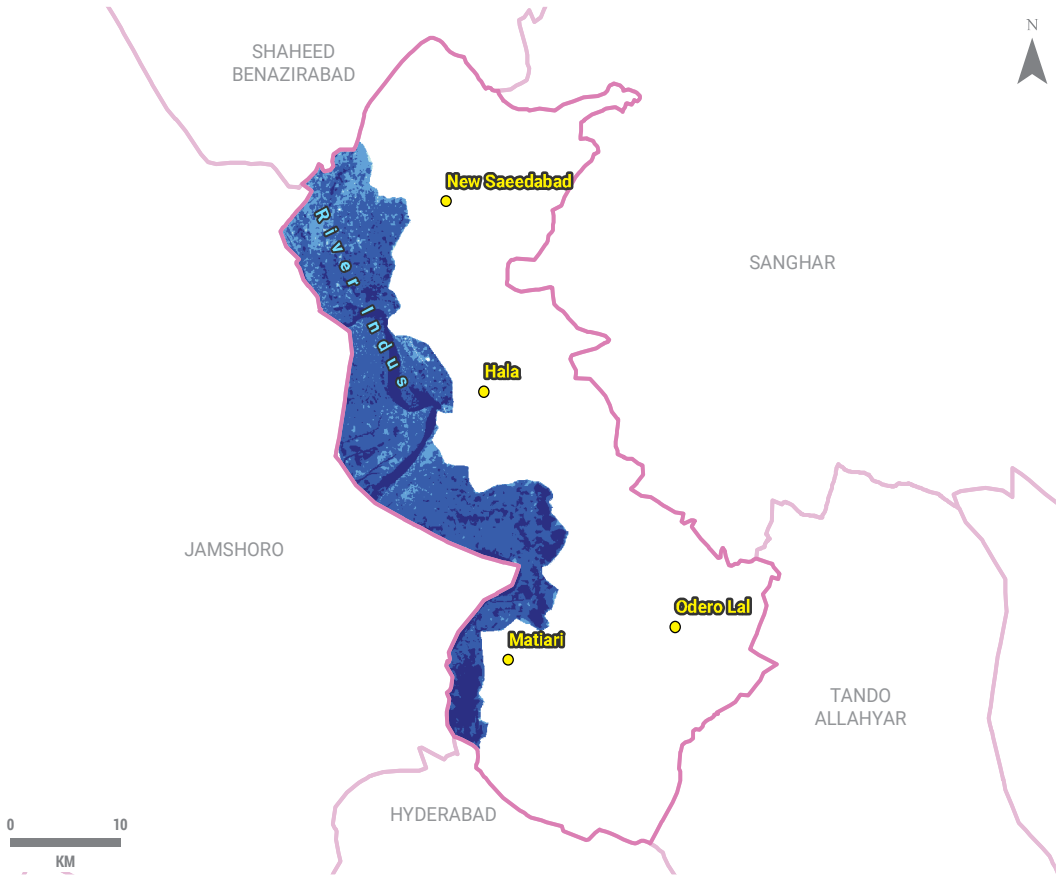
HAZARD 05 YEARS



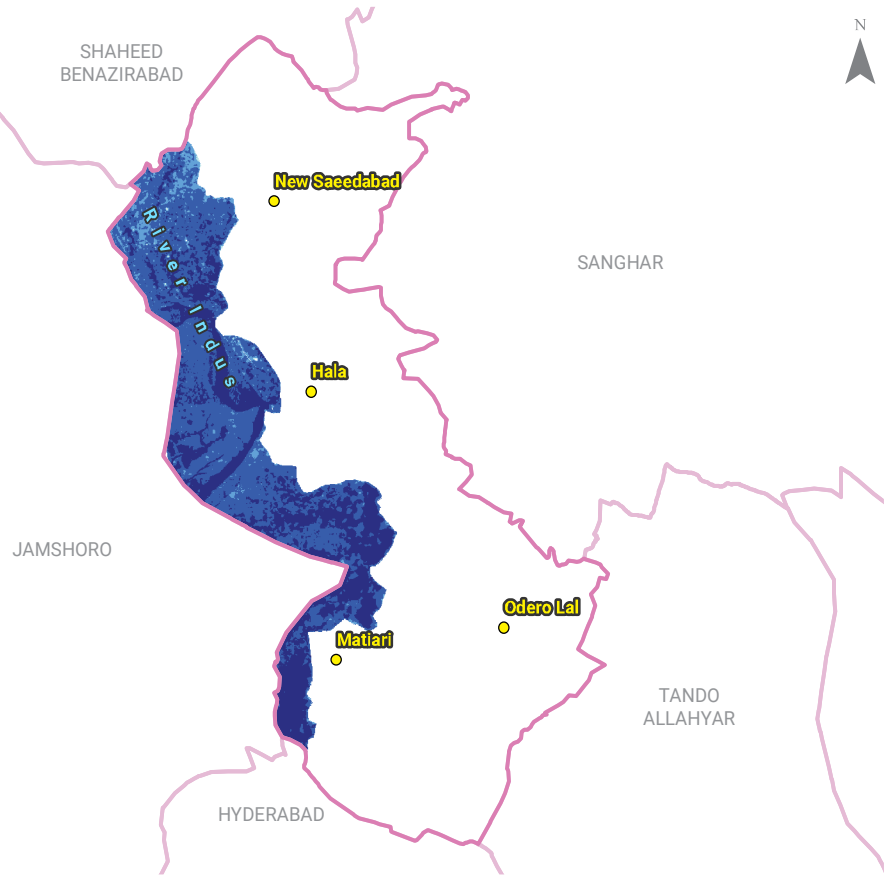
HAZARD 25 YEARS



HAZARD 50 YEARS



HAZARD 100 YEARS

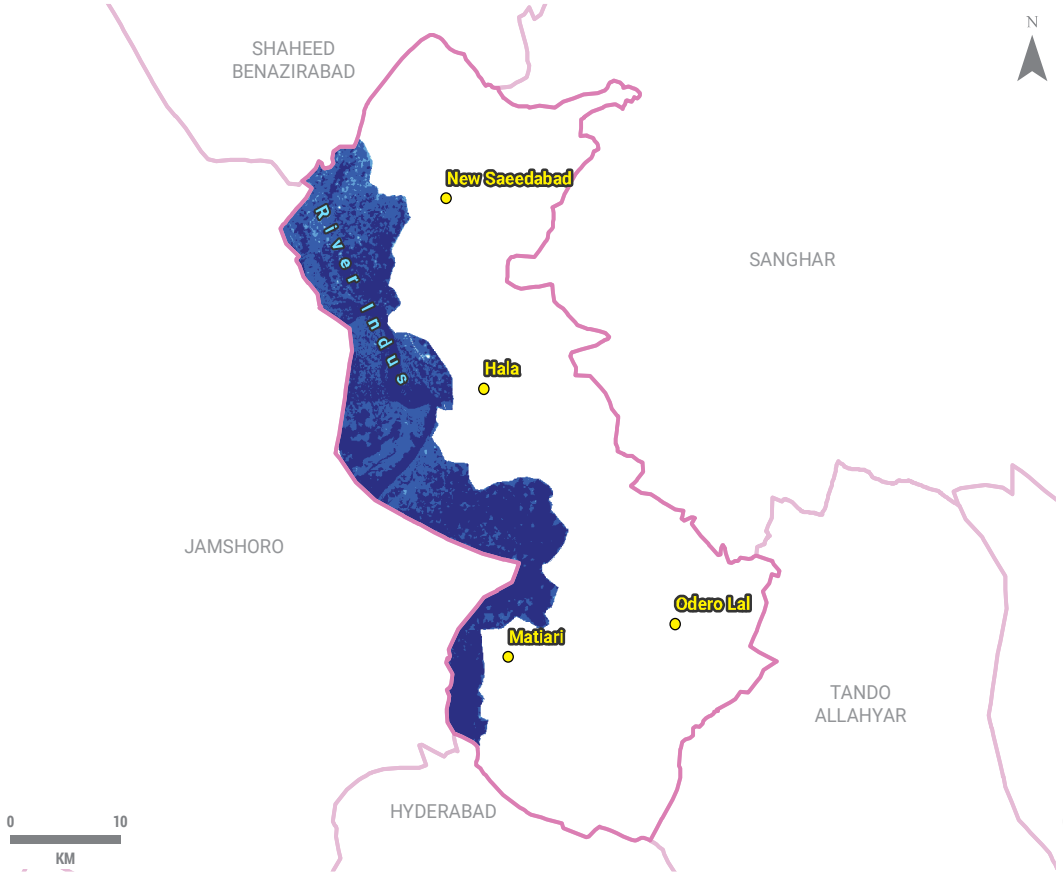


HAZARD

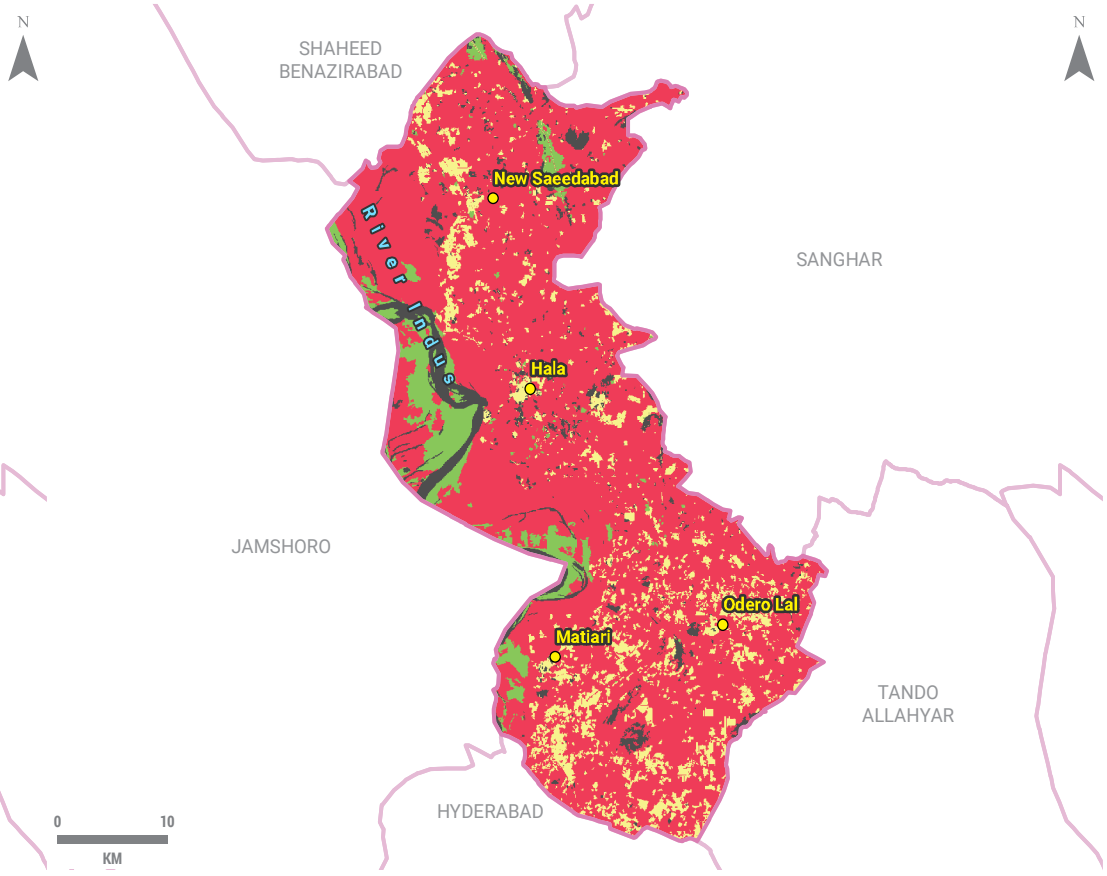
Low | Medium | High | Very High

FLOOD

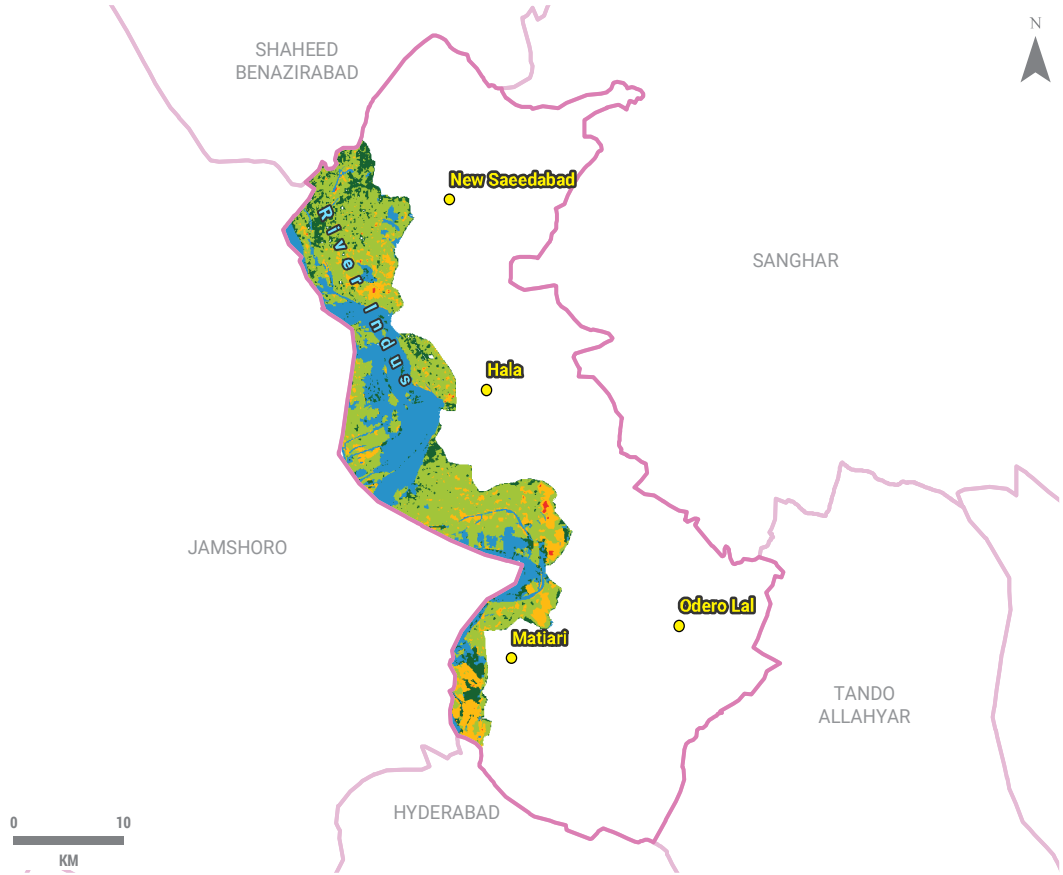
HAZARD 250 YEARS



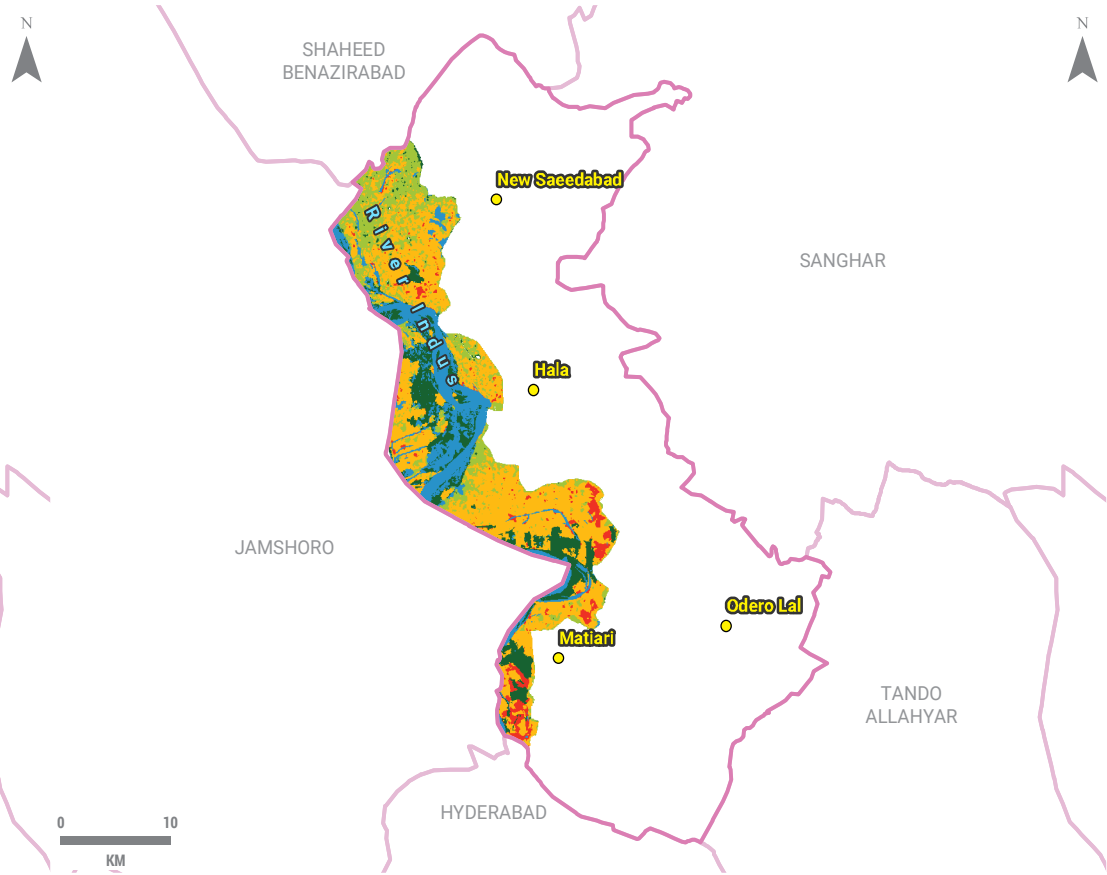
VULNERABILITY



RISK 05 YEARS



RISK 25 YEARS



HAZARD

Low | Medium | High | Very High

VULNERABILITY

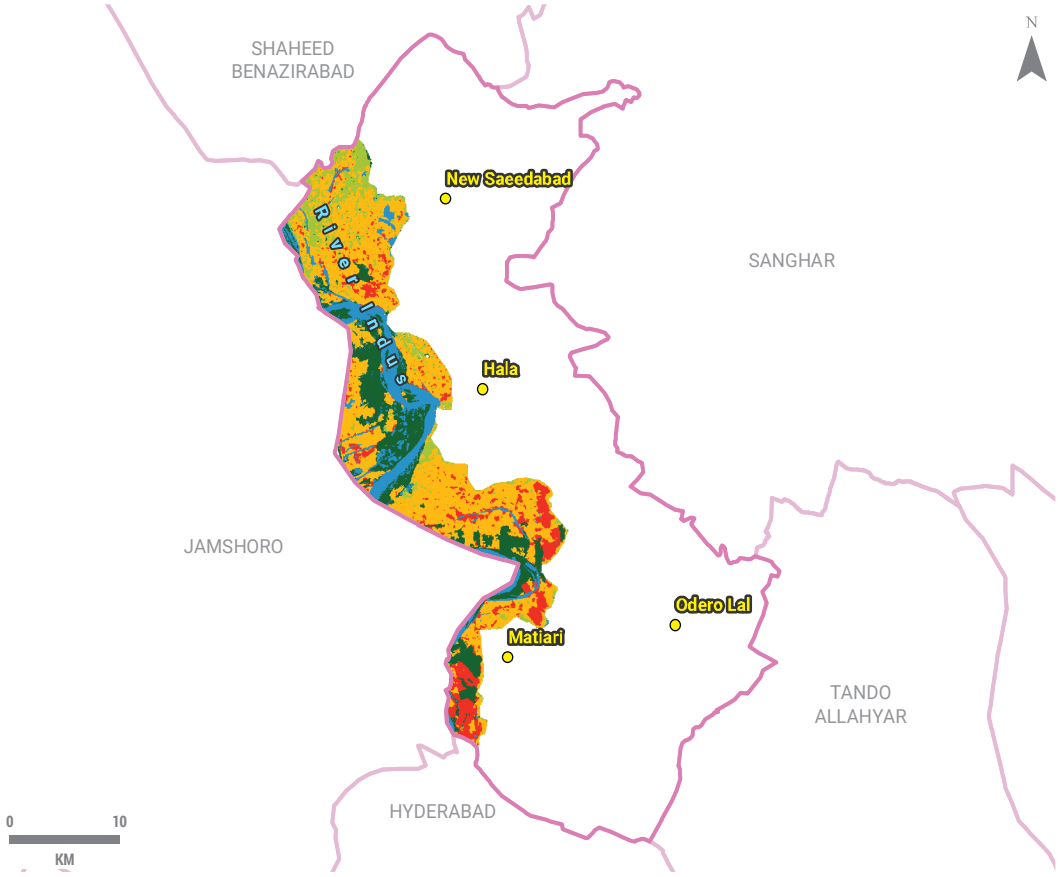
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

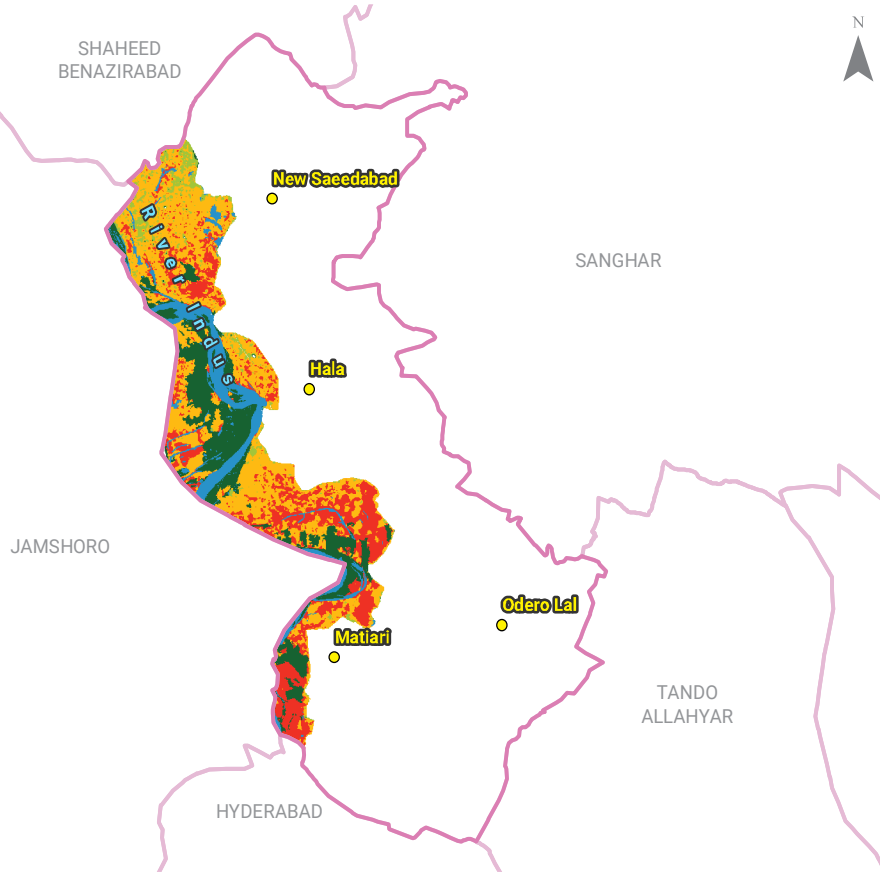
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

FLOOD

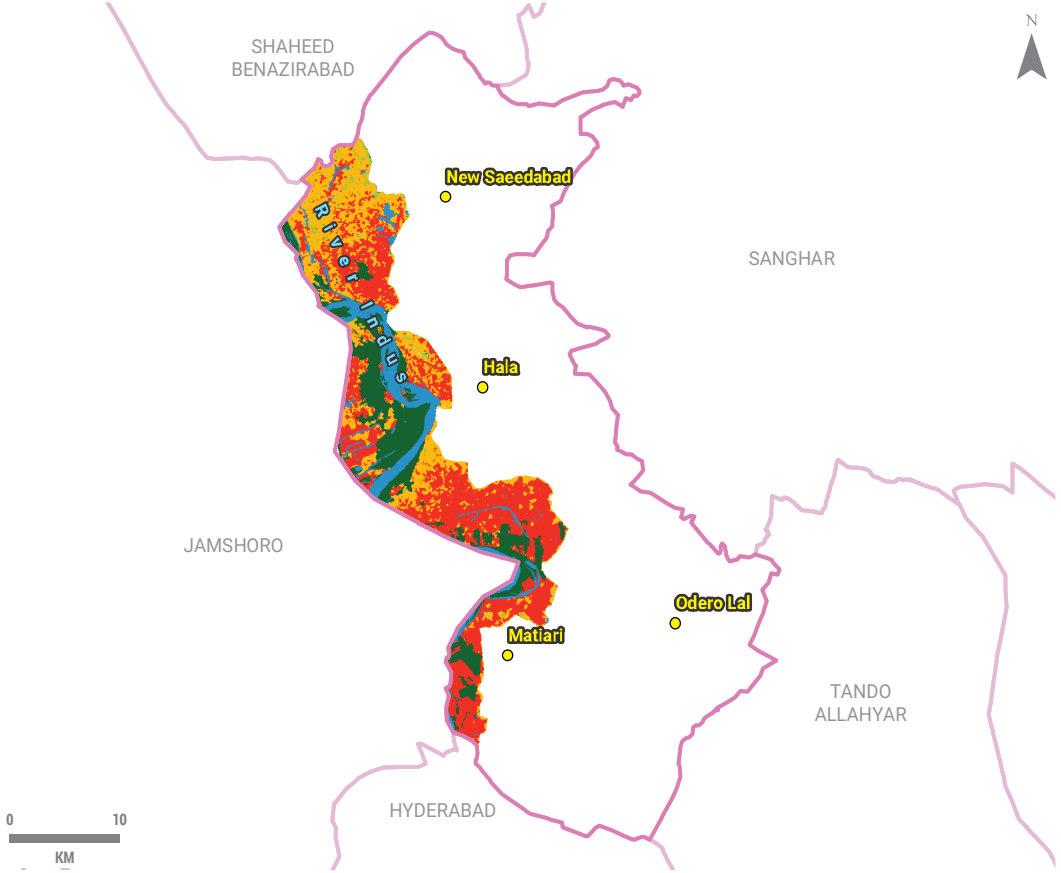
RISK 50 YEARS



RISK 100 YEARS



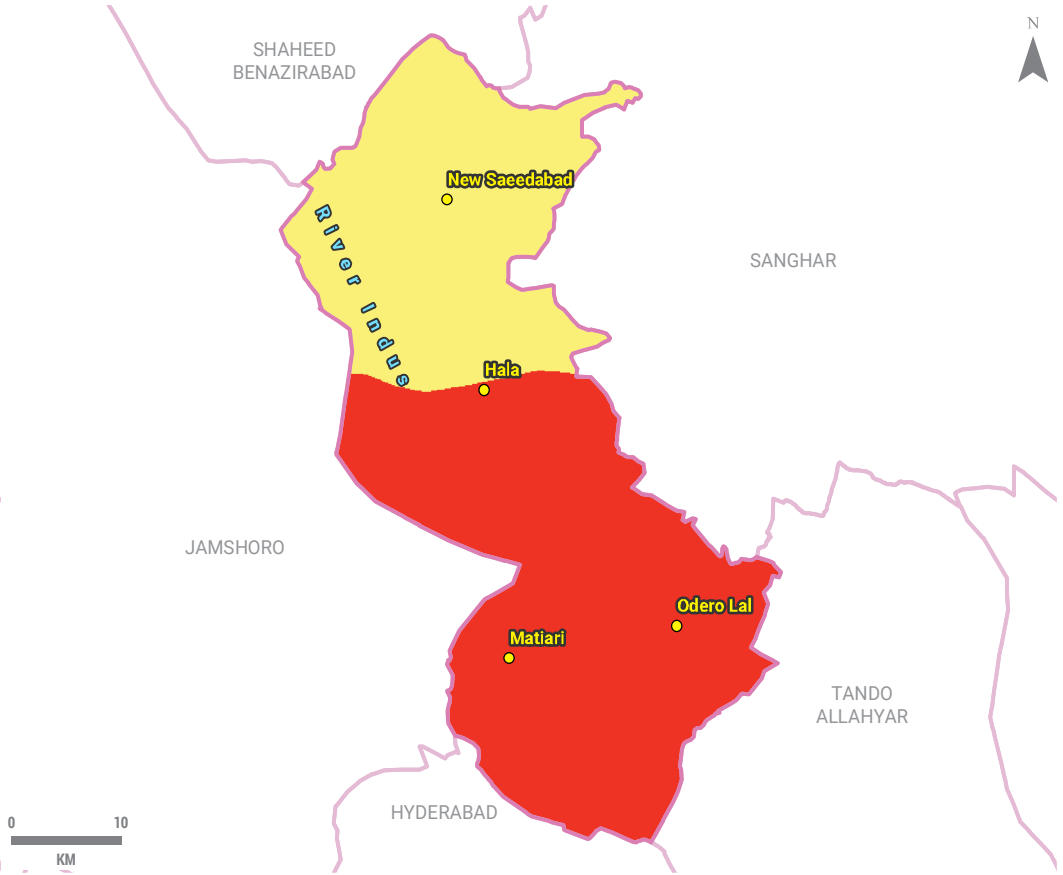
RISK 250 YEARS



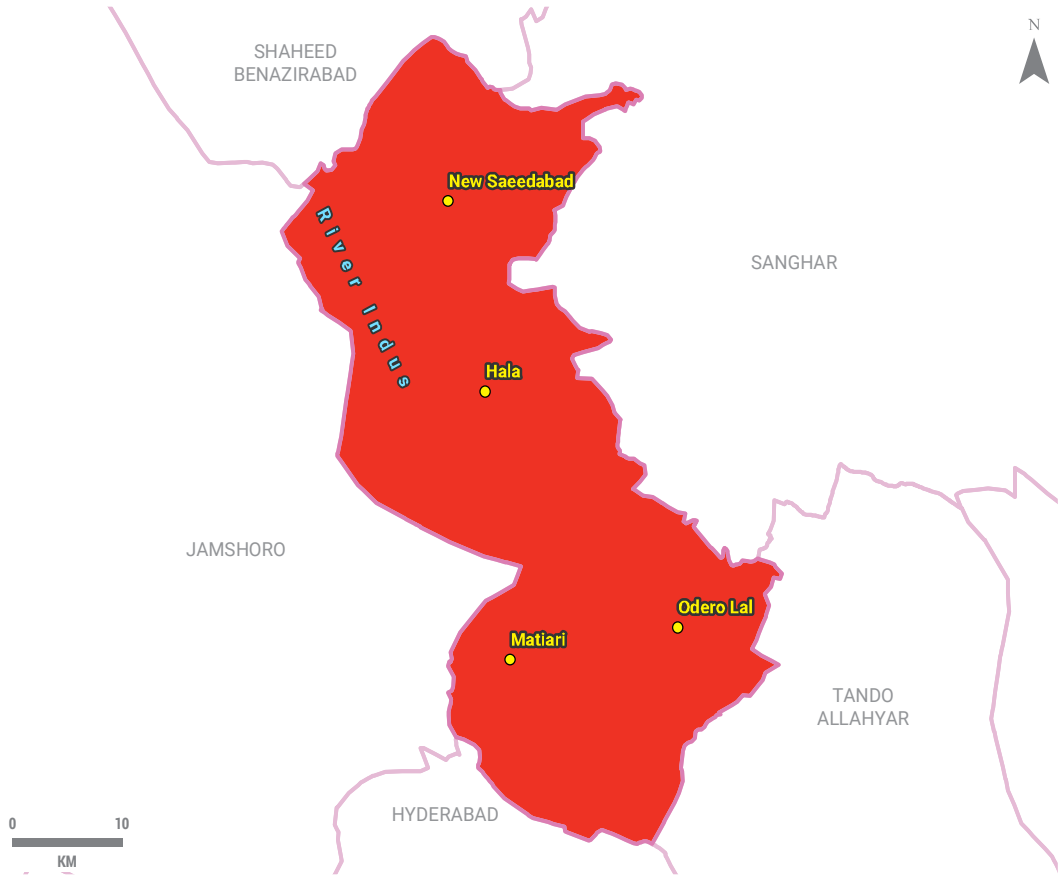
METEOROLOGICAL DROUGHT

HAZARD 05 YEARS

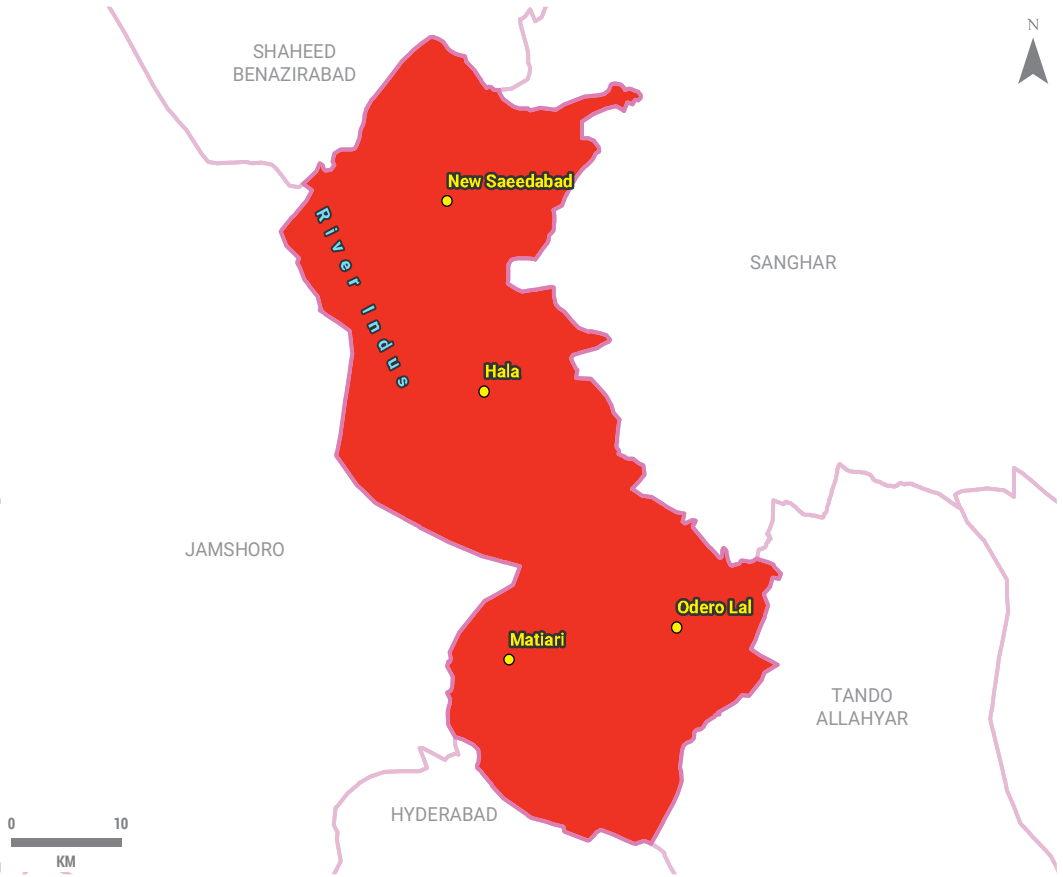
HAZARD 10 YEARS



HAZARD 25 YEARS



HAZARD 50 YEARS

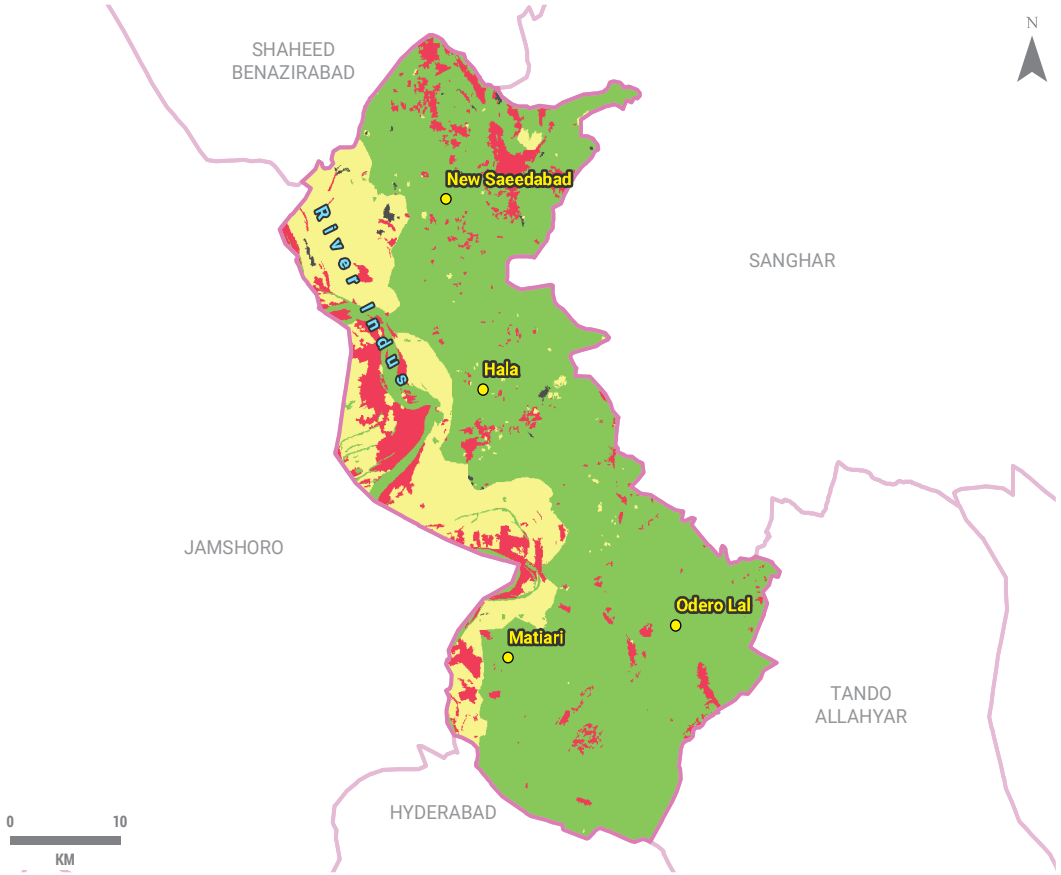


HAZARD

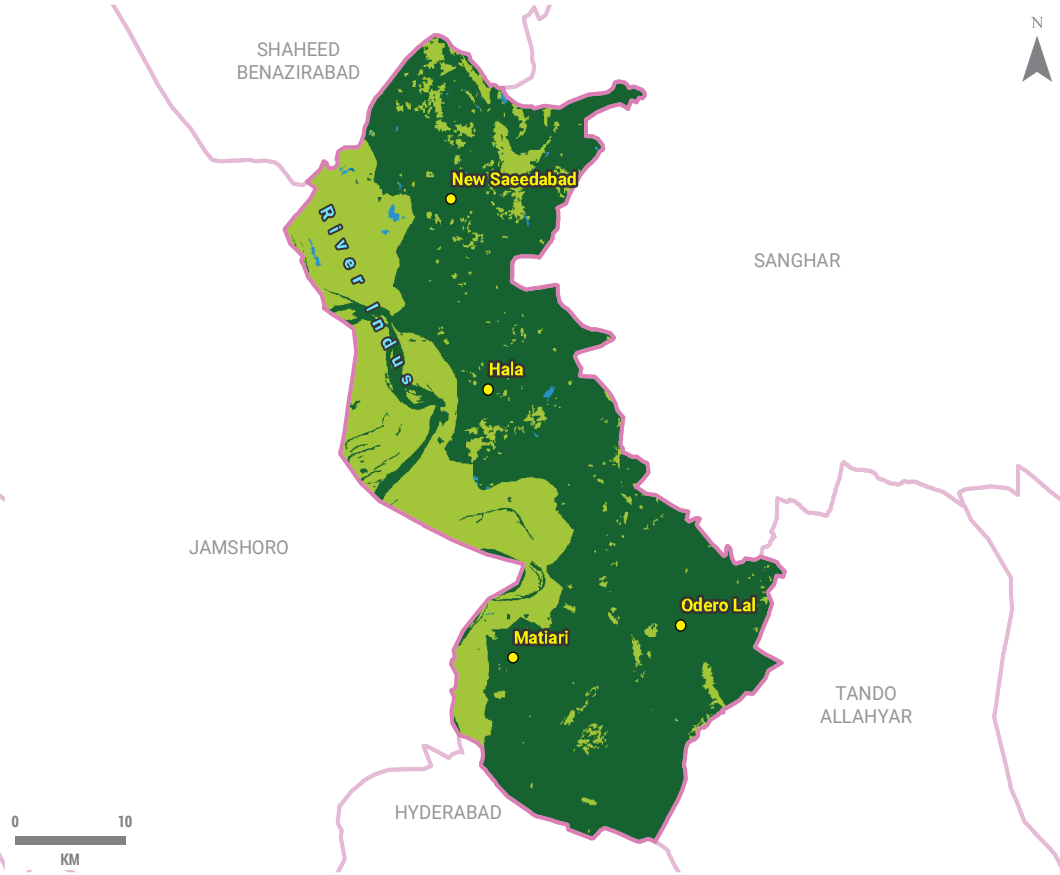
No Hazard | Mild | Moderate | Severe | Extreme

METEOROLOGICAL DROUGHT

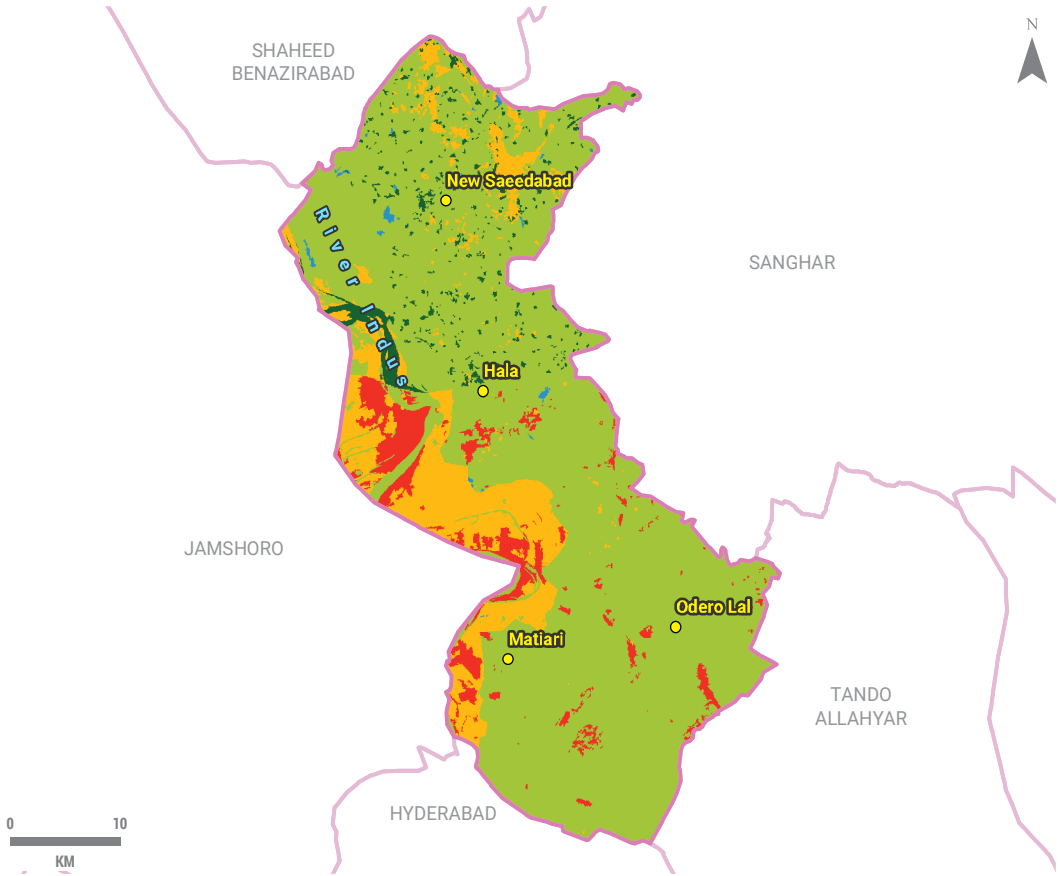
VULNERABILITY



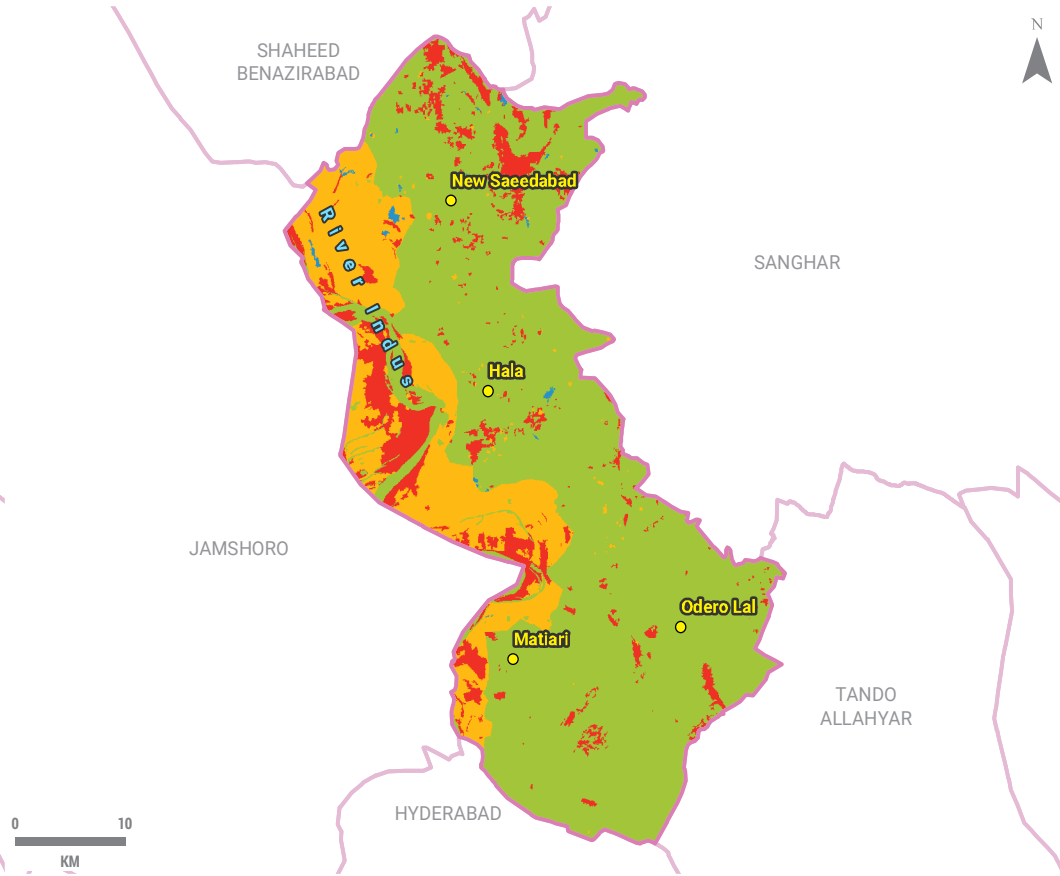
RISK 05 YEARS



RISK 10 YEARS



RISK 25 YEARS



VULNERABILITY

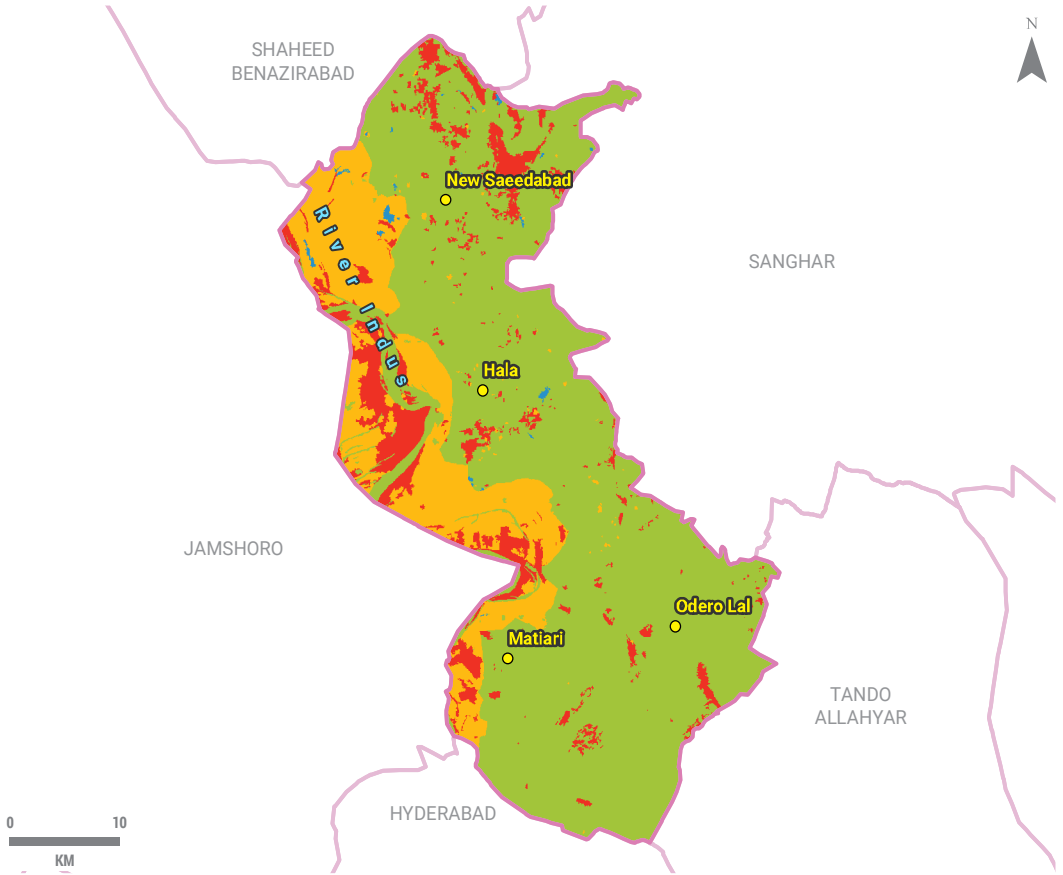
None	Low	Medium	High
0 - 25	*26 - 50*	*51 - 75*	*76 - 100*

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

METEOROLOGICAL DROUGHT

RISK 50 YEARS

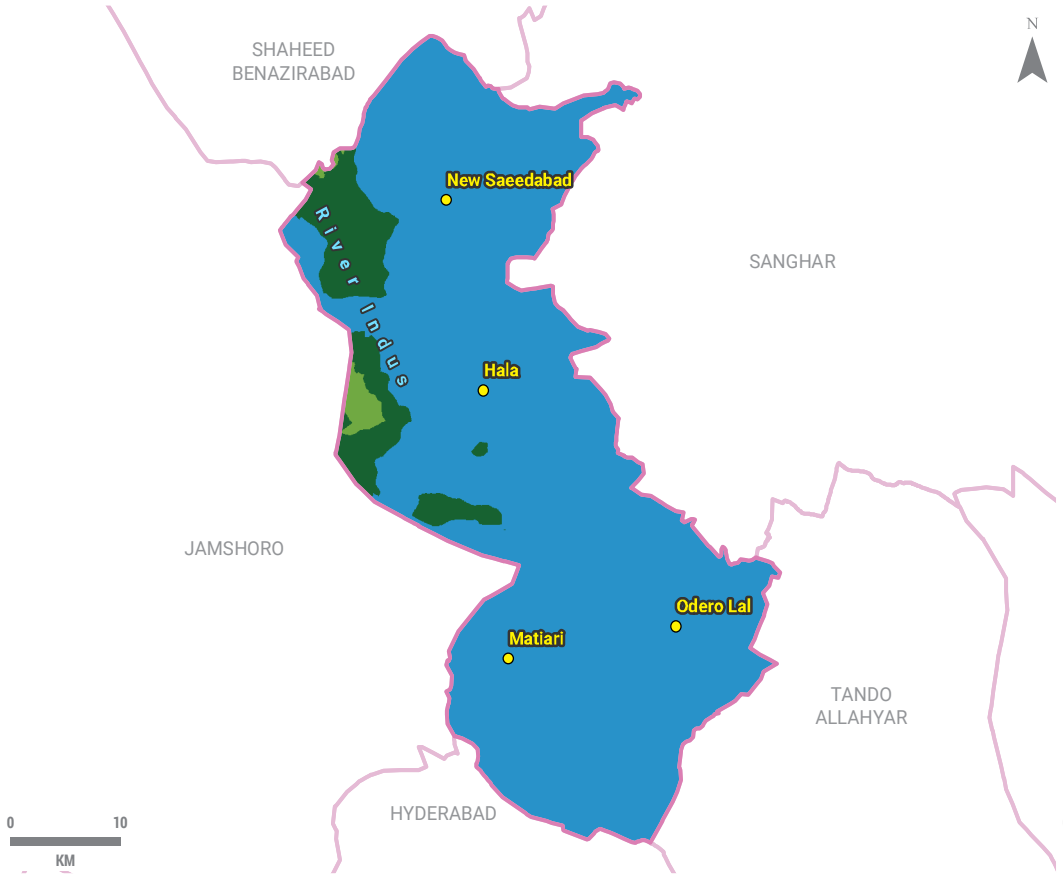


RISK

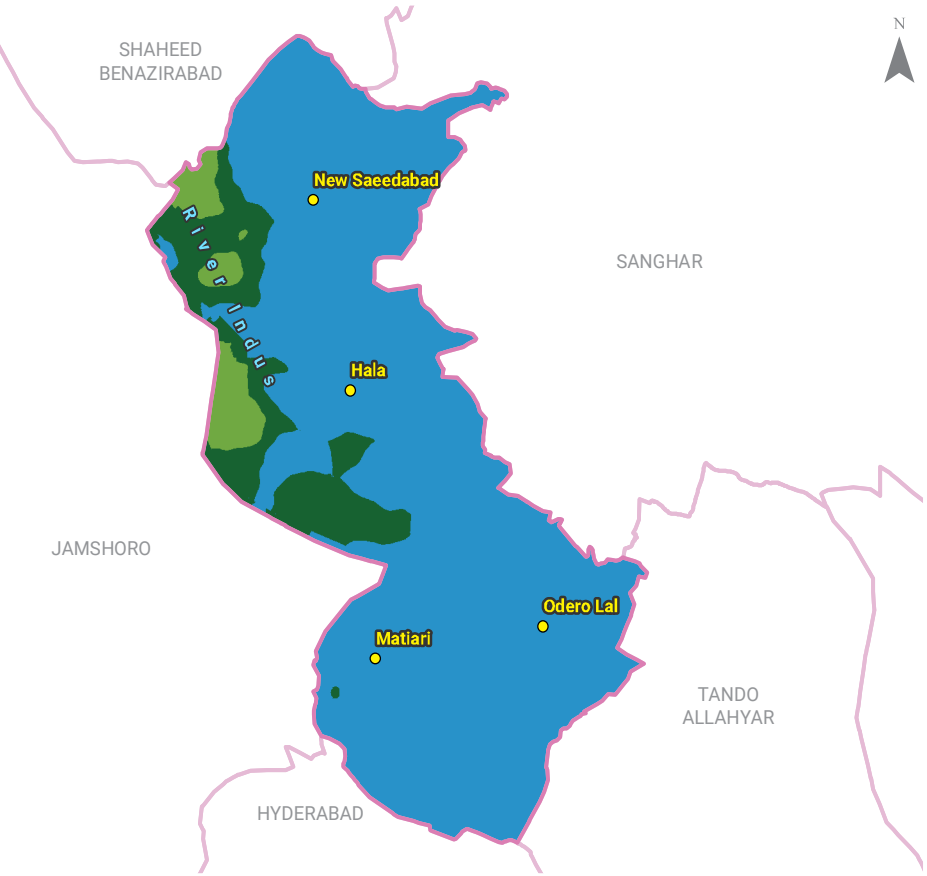
Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

AGRICULTURAL DROUGHT

HAZARD 05 YEARS



HAZARD 10 YEARS

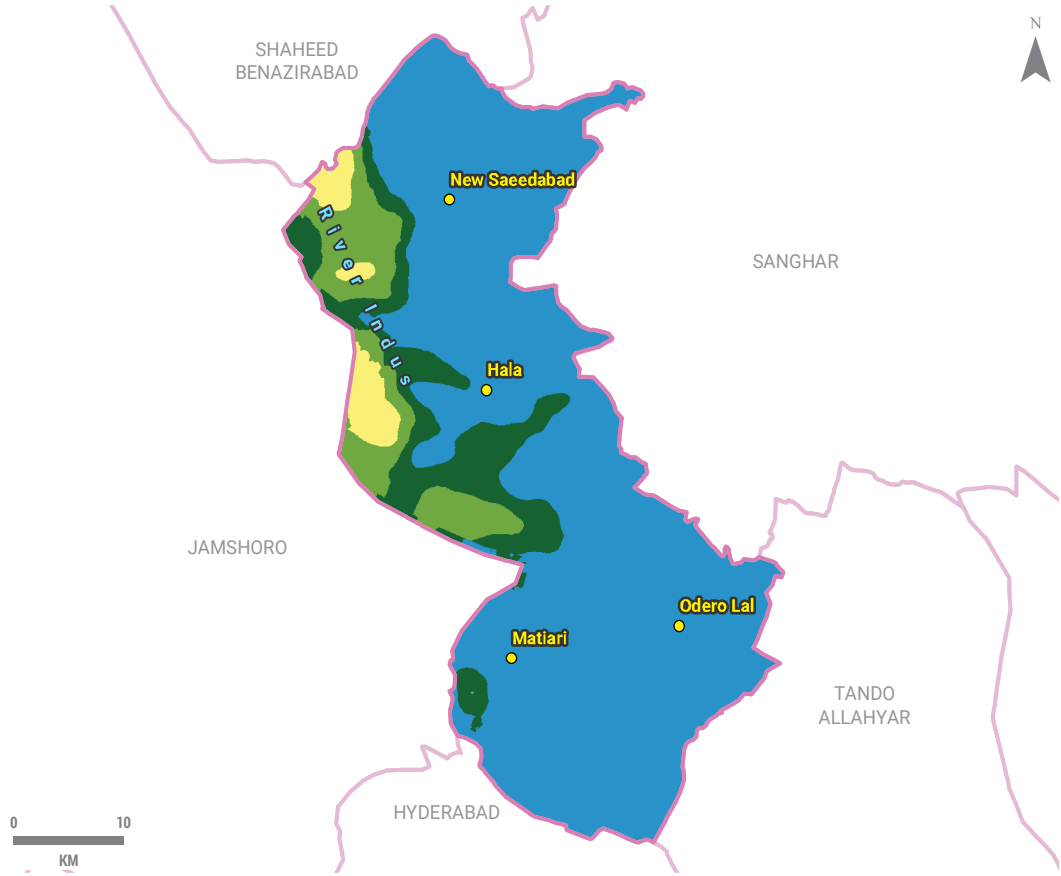


HAZARD

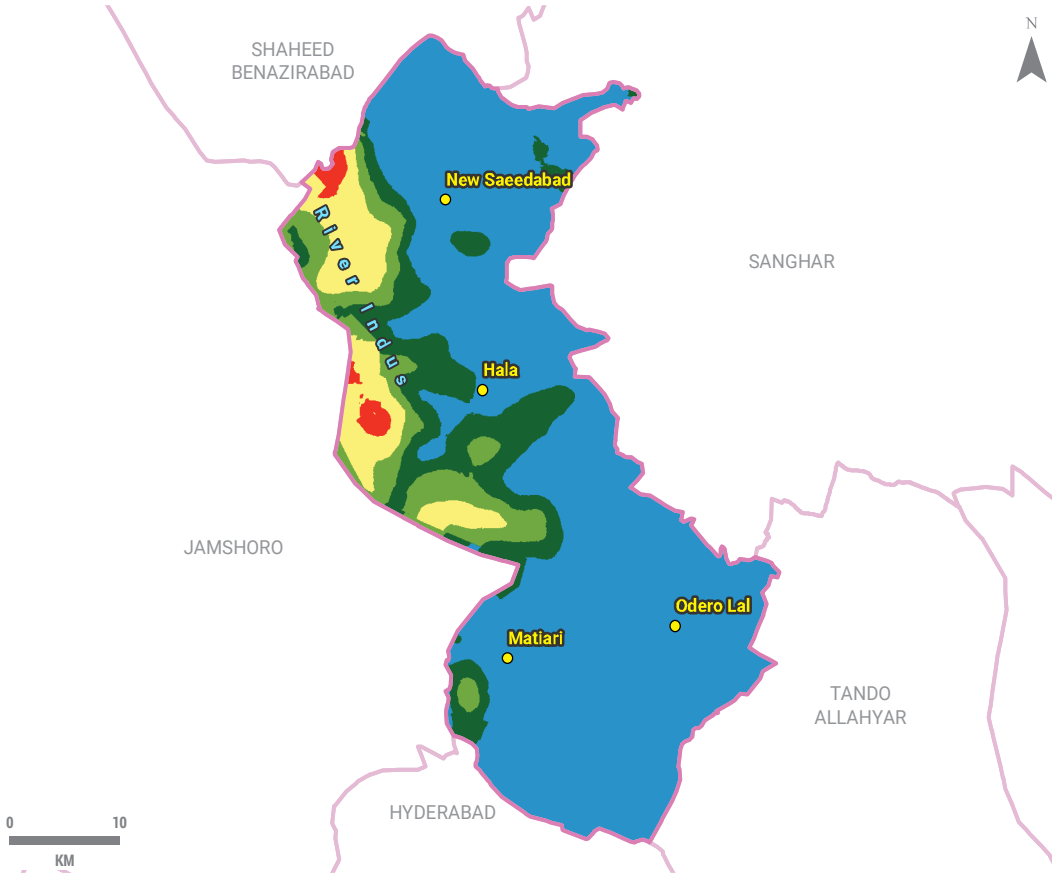
No Hazard	Mild	Moderate	Severe	Extreme

AGRICULTURAL DROUGHT

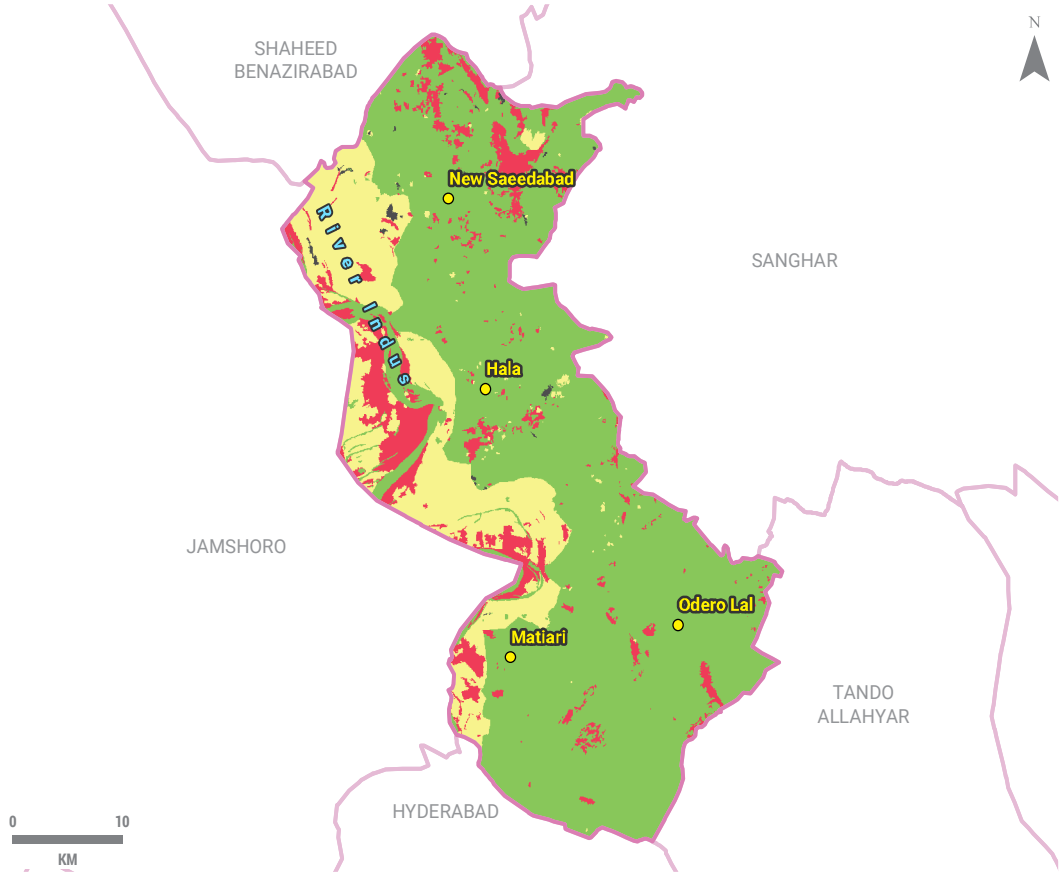
HAZARD 25 YEARS



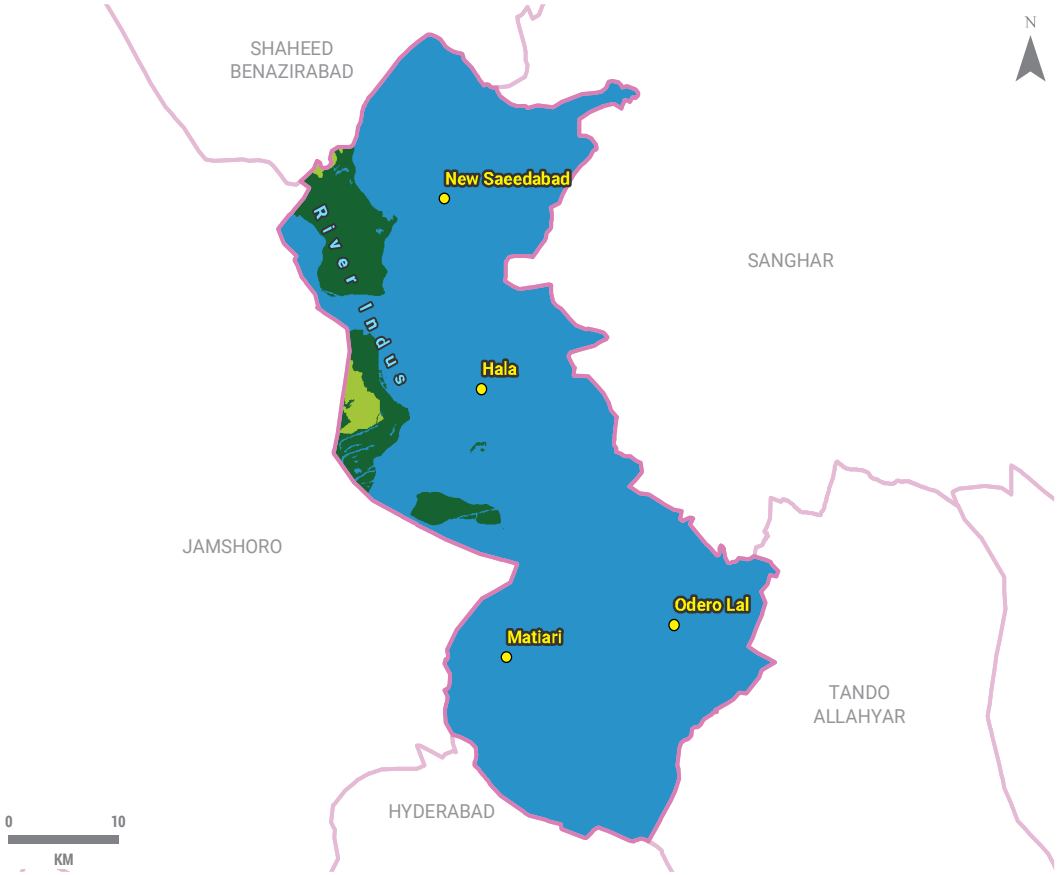
HAZARD 50 YEARS



VULNERABILITY



RISK 05 YEARS



HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

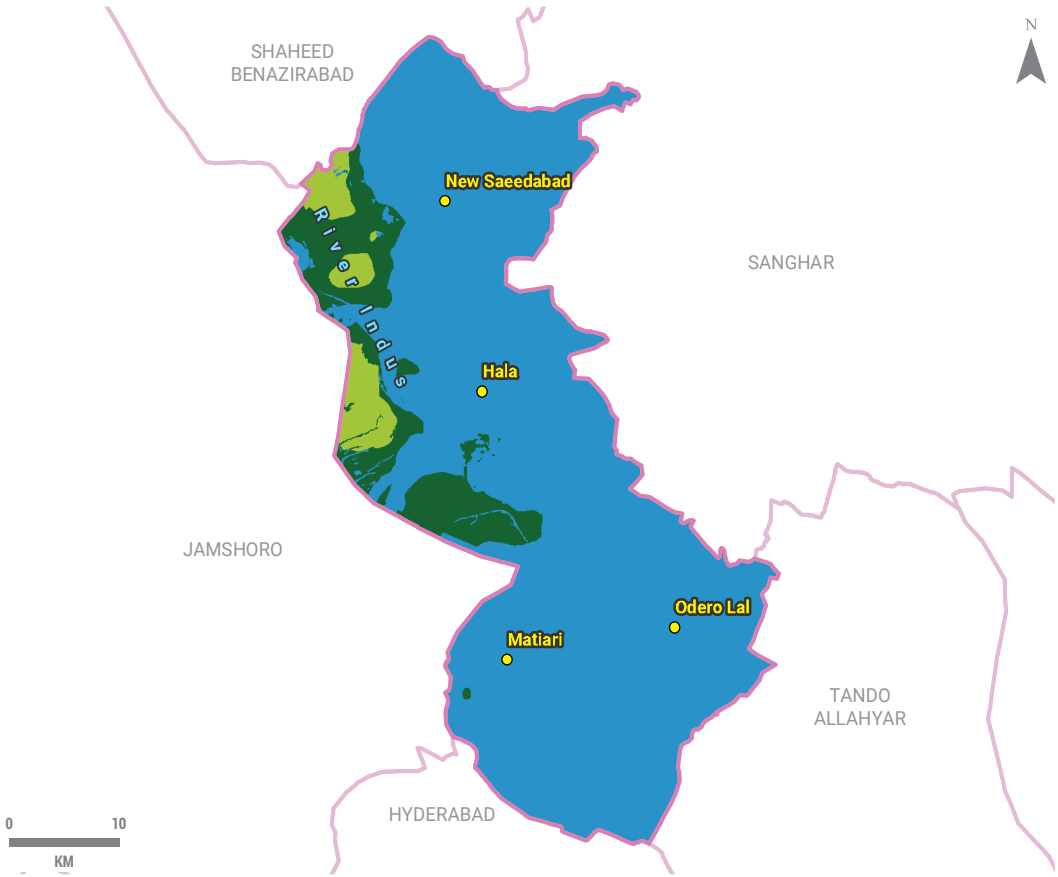
- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

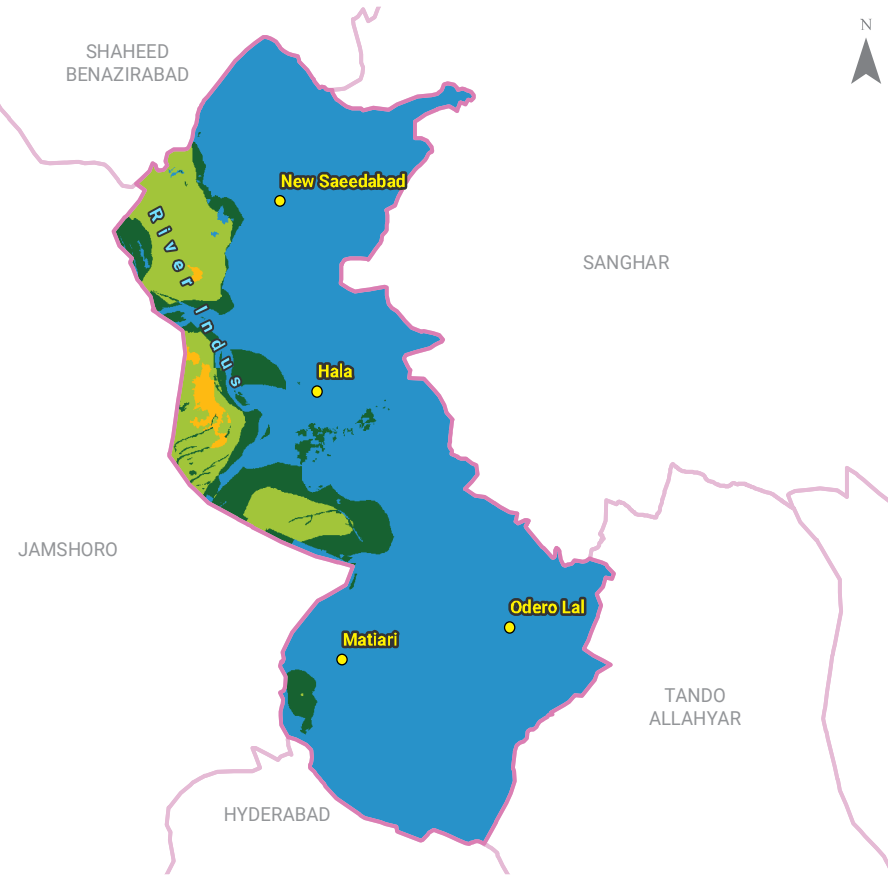
- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

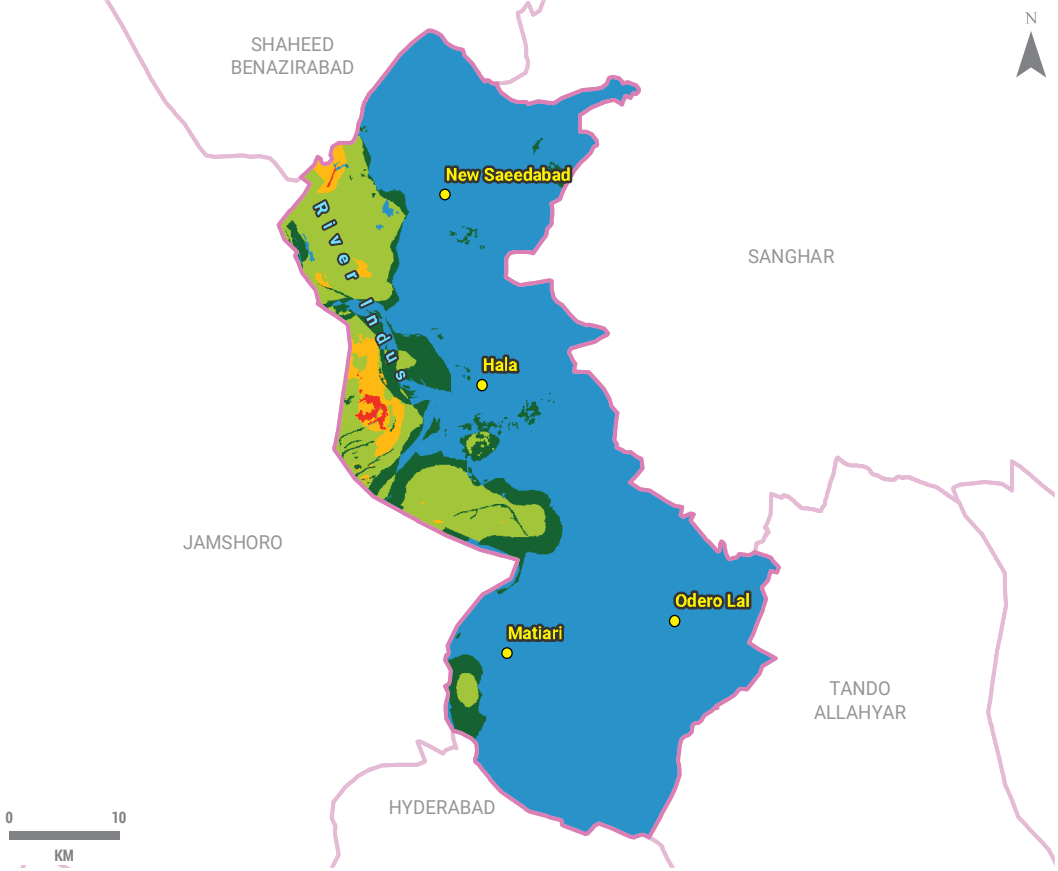
RISK 10 YEARS



RISK 25 YEARS



RISK 50 YEARS



RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

HEATWAVE

HAZARD 05 YEARS

HAZARD 10 YEARS

HAZARD 25 YEARS

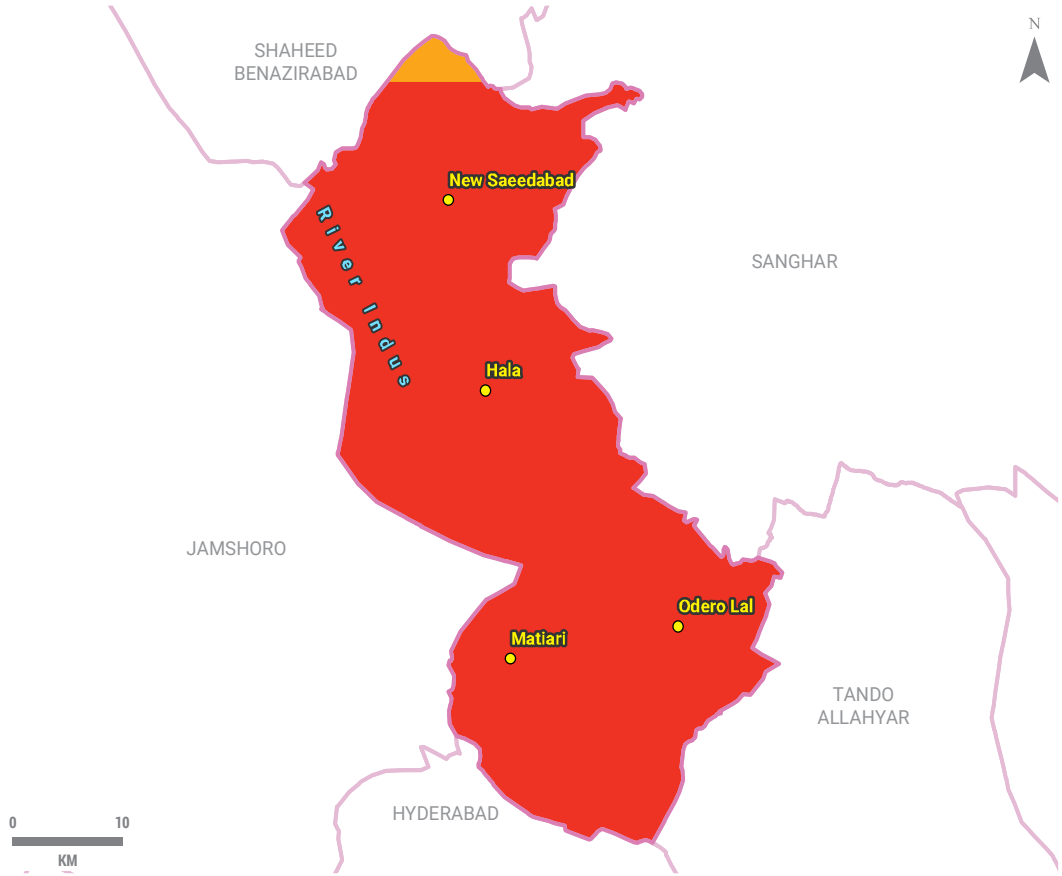
HAZARD 50 YEARS

HAZARD

Normal | Moderate | High | Severe | Extreme

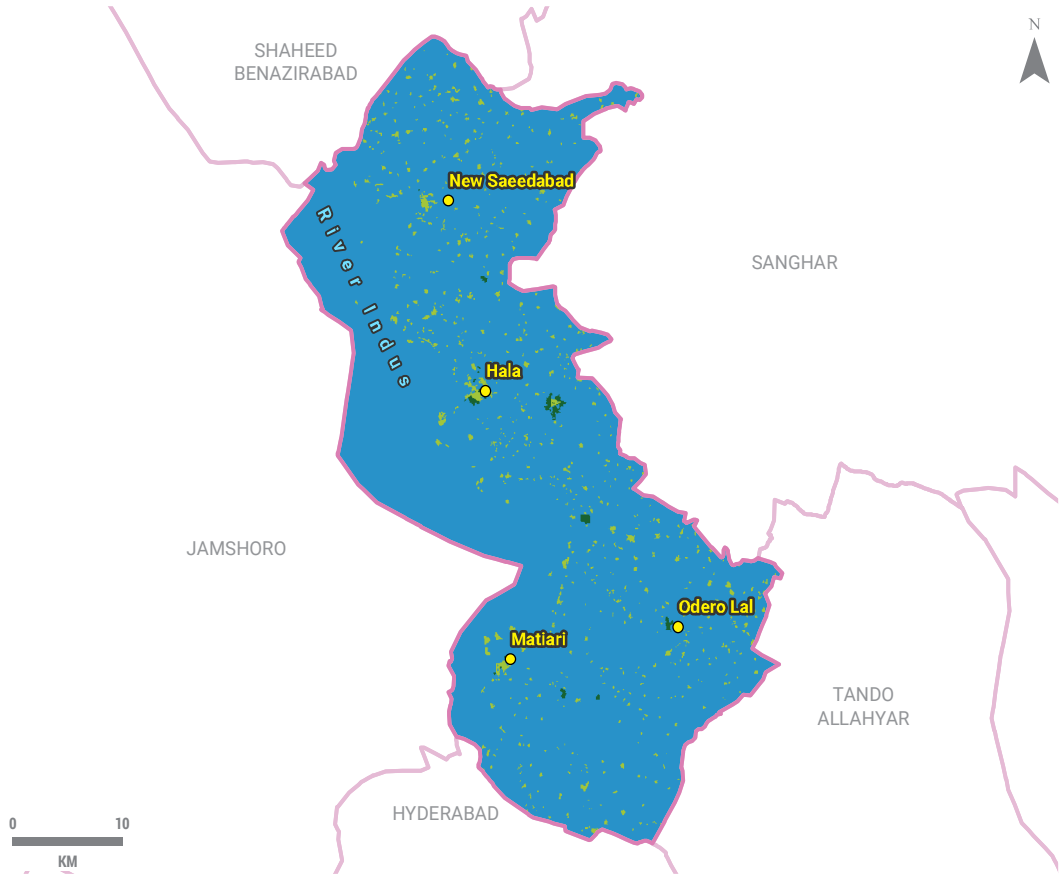
HEATWAVE

HAZARD 100 YEARS

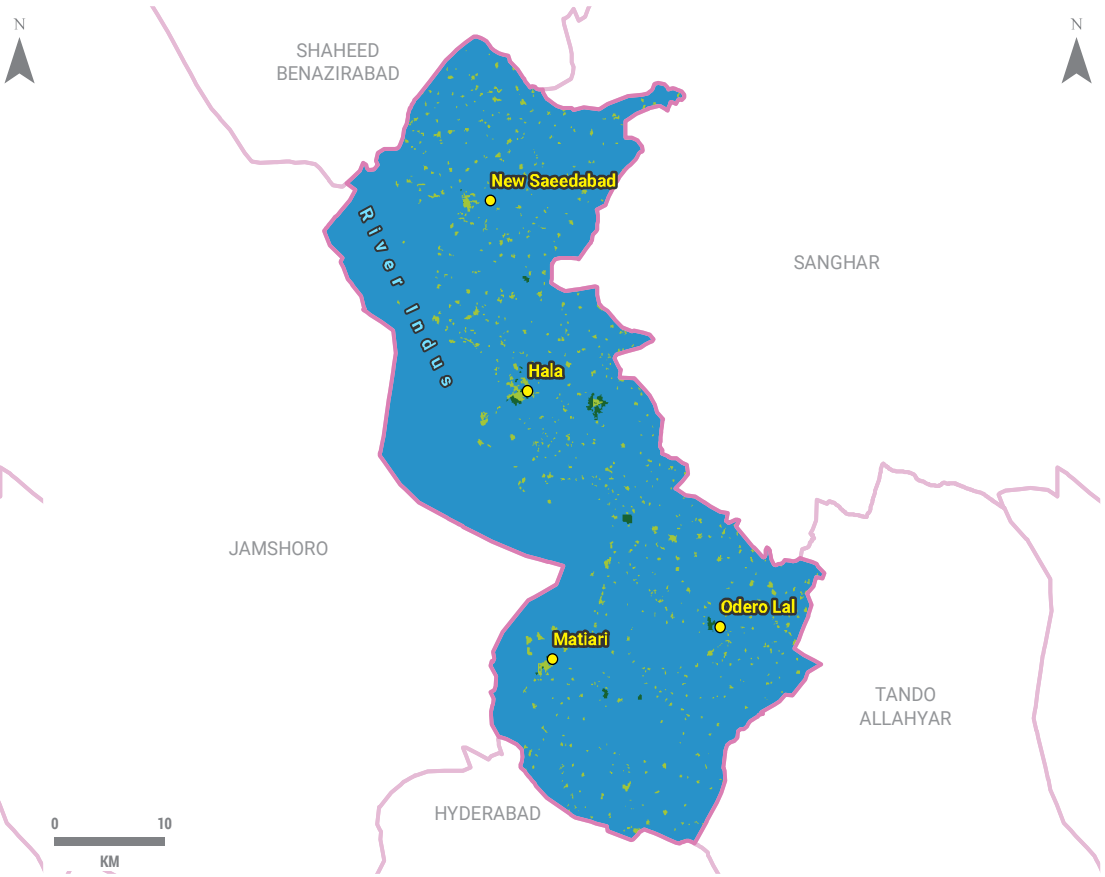


VULNERABILITY

RISK 05 YEARS



RISK 10 YEARS



HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

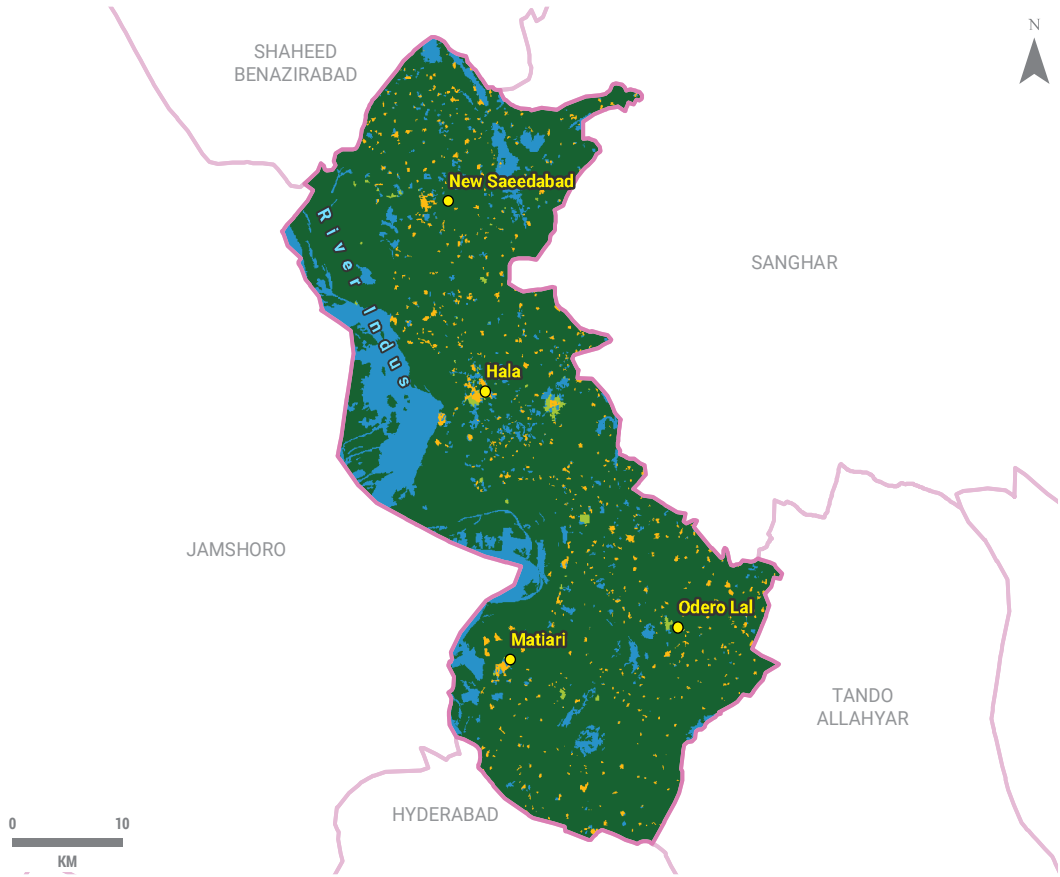
- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

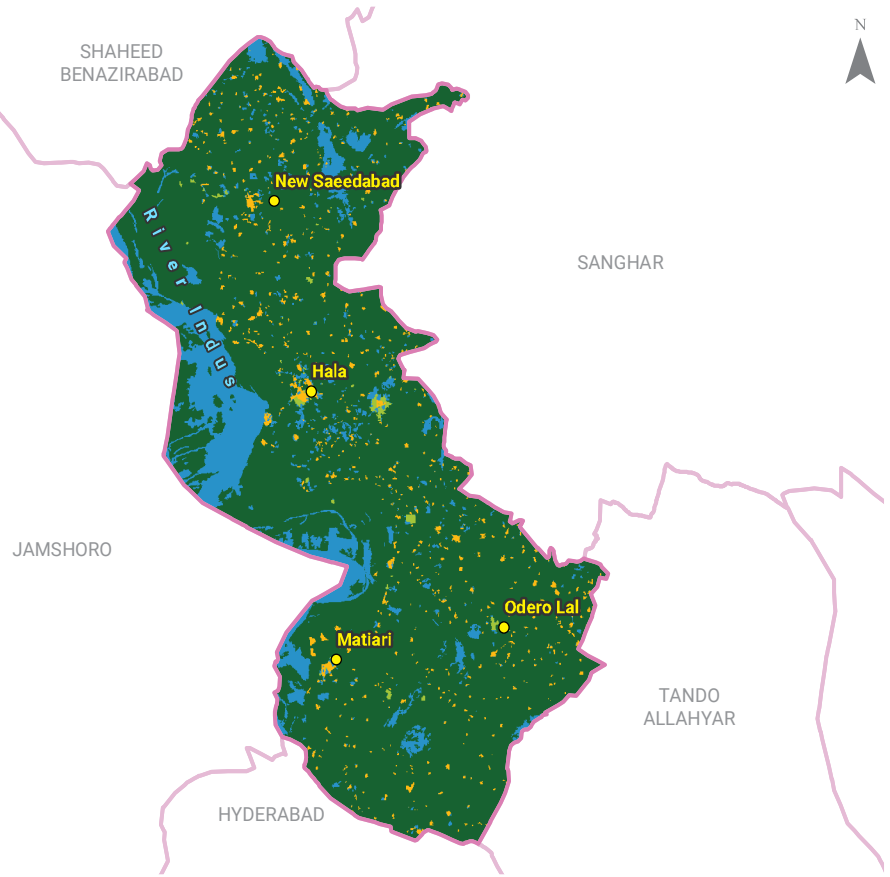
- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

RISK 25 YEARS



RISK 50 YEARS



RISK 100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

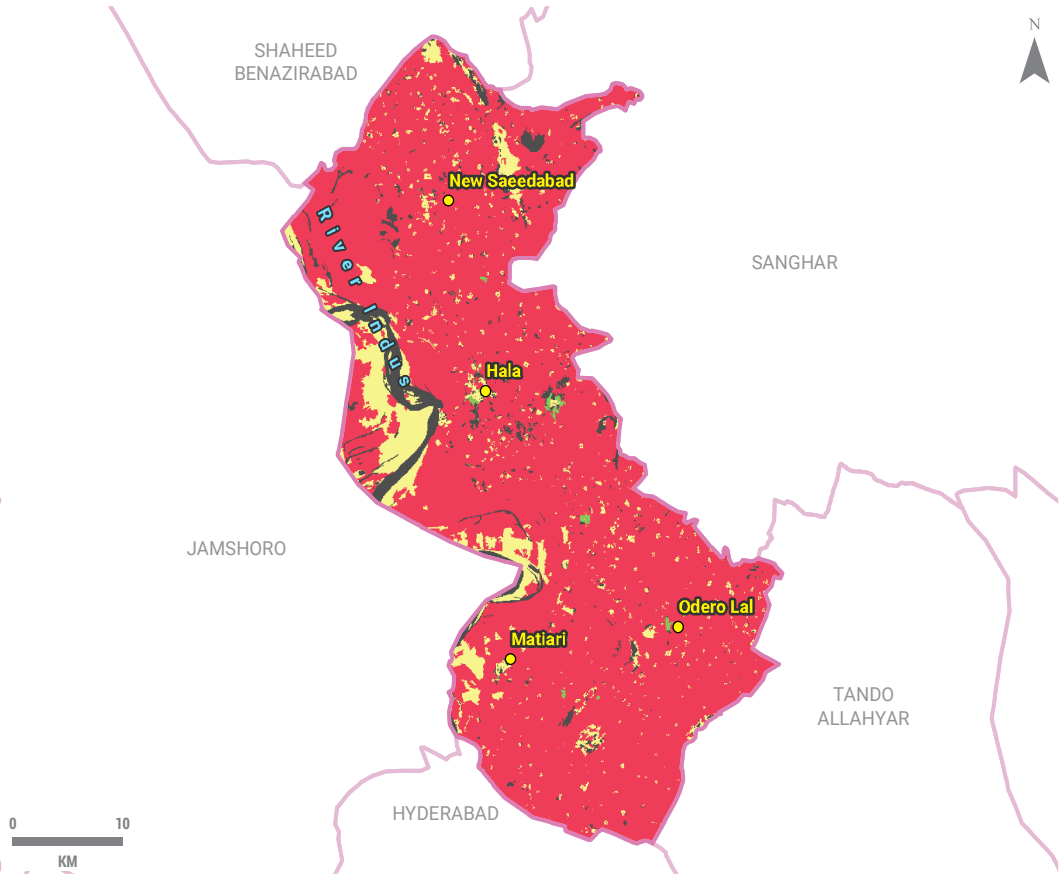
CYCLONE

HAZARD 25 YEARS

HAZARD 100 YEARS

HAZARD 500 YEARS

VULNERABILITY



HAZARD

- Calm Wind
- Tropical Depression
- Tropical Storm
- Cat-1 TC
- Cat-2 TC
- Cat-3 TC
- Cat-4 TC
- Cat-5 TC

VULNERABILITY

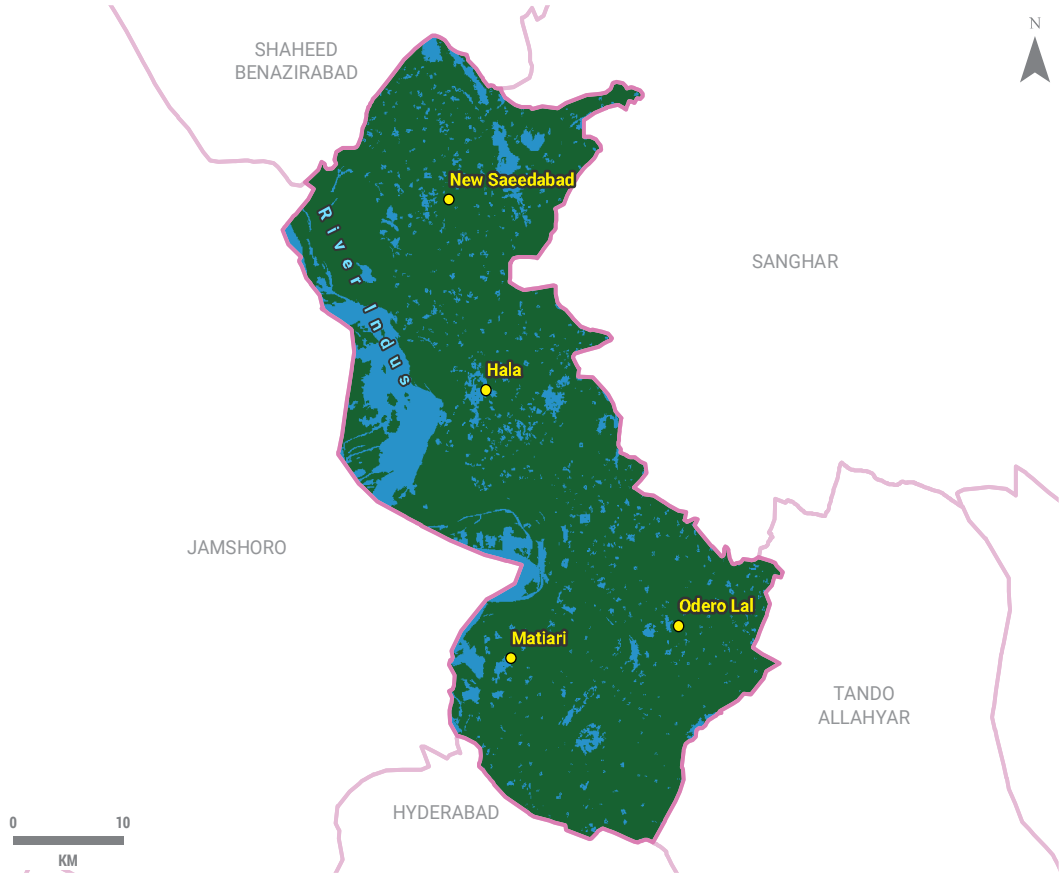
- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

CYCLONE

RISK 25 YEARS

RISK 100 YEARS

RISK 500 YEARS



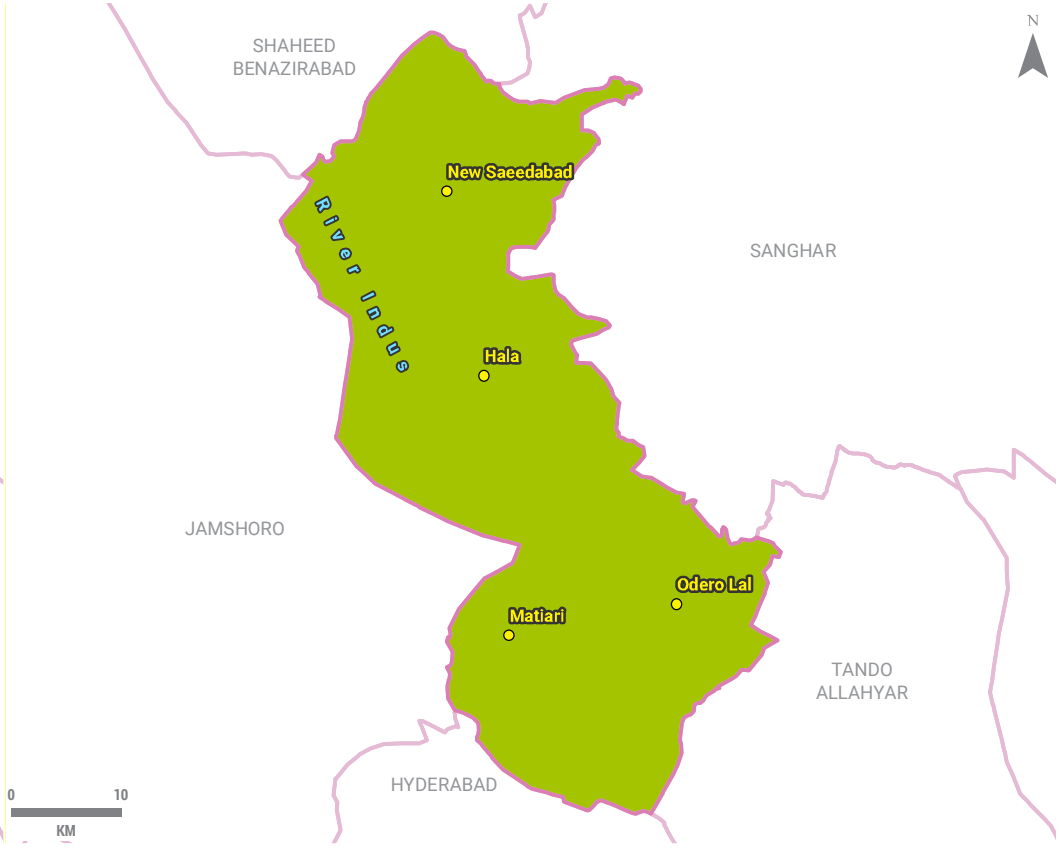
STORM SURGE

There is no hazard / risk of storm surge in this district

EARTHQUAKE

HAZARD 95 YEARS

HAZARD 475 YEARS



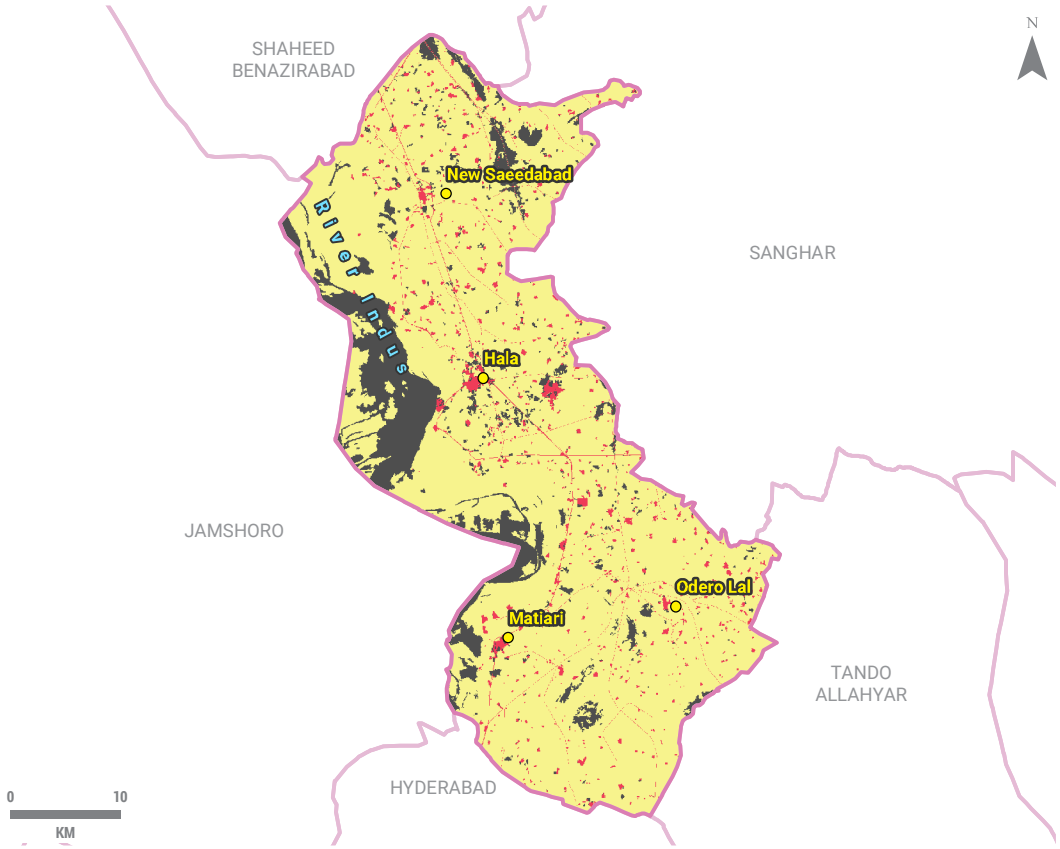
HAZARD 975 YEARS

HAZARD 2475 YEARS

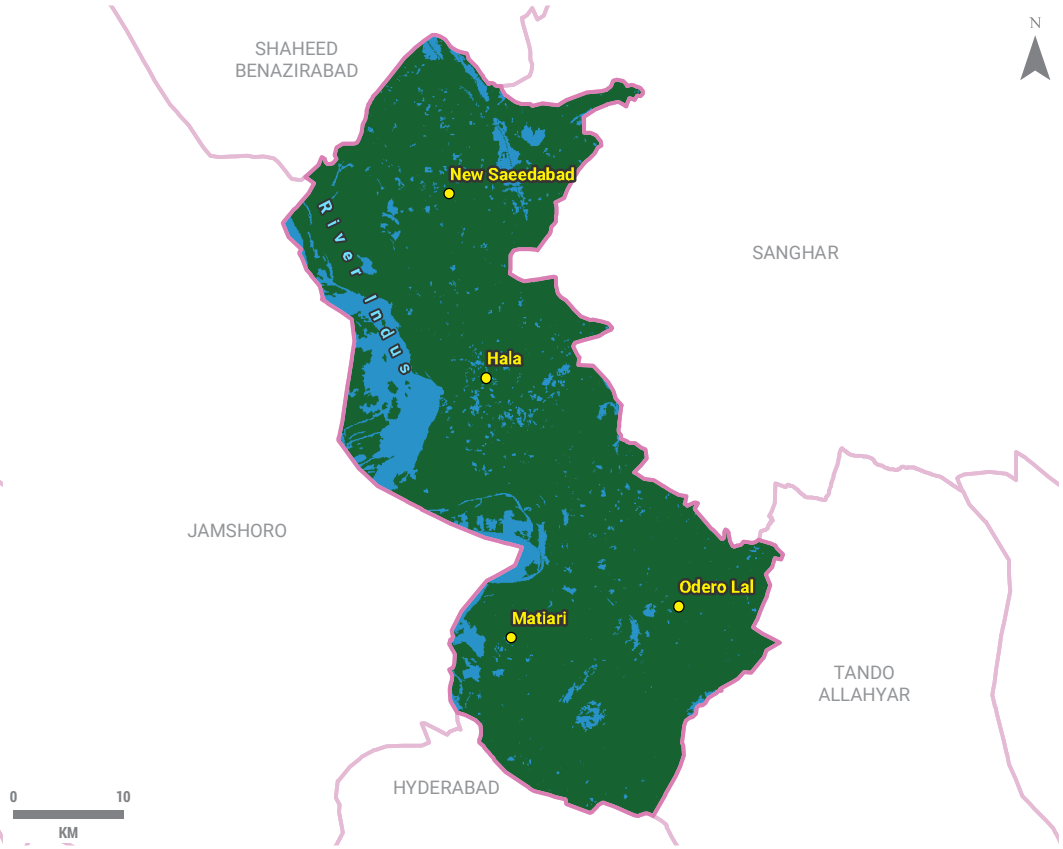
HAZARD ZONE	ZONE 1	ZONE 2A	ZONE 2B	ZONE 3	ZONE 4	ZONE 5	ZONE 6
PGA VALUE (ACCELERATION)	0.05 - 0.08	0.08 - 0.16	0.16 - 0.24	0.24 - 0.32	>0.32 - 0.45	0.45 - 0.50	0.50 - 0.54
POTENTIAL DAMAGE	Very Light	Very Light-Light	Moderate	Moderate	Moderate-Heavy	Moderate-Heavy	Moderate-Heavy

EARTHQUAKE

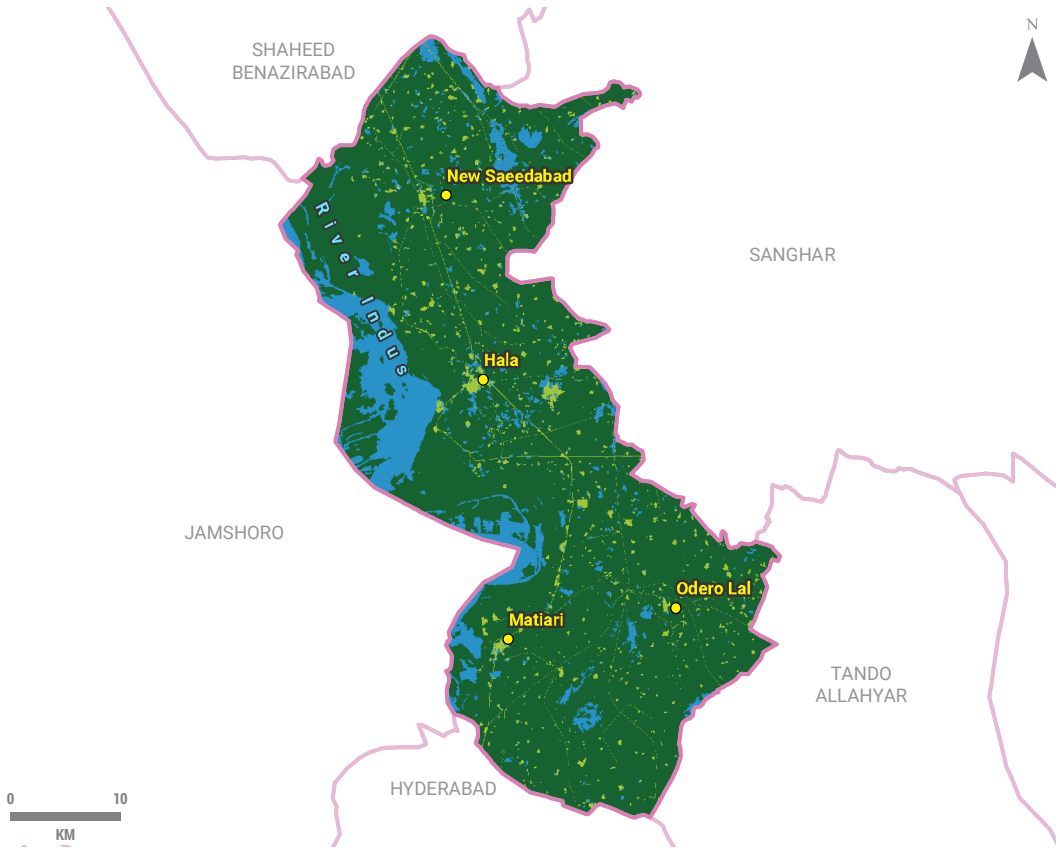
VULNERABILITY



RISK 95 YEARS



RISK 475 YEARS



RISK 975 YEARS

VULNERABILITY

None	Low	Medium	High
0 - 25	*26 - 50*	*51 - 75*	*76 - 100*

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

EARTHQUAKE

RISK 2475 YEARS

RISK

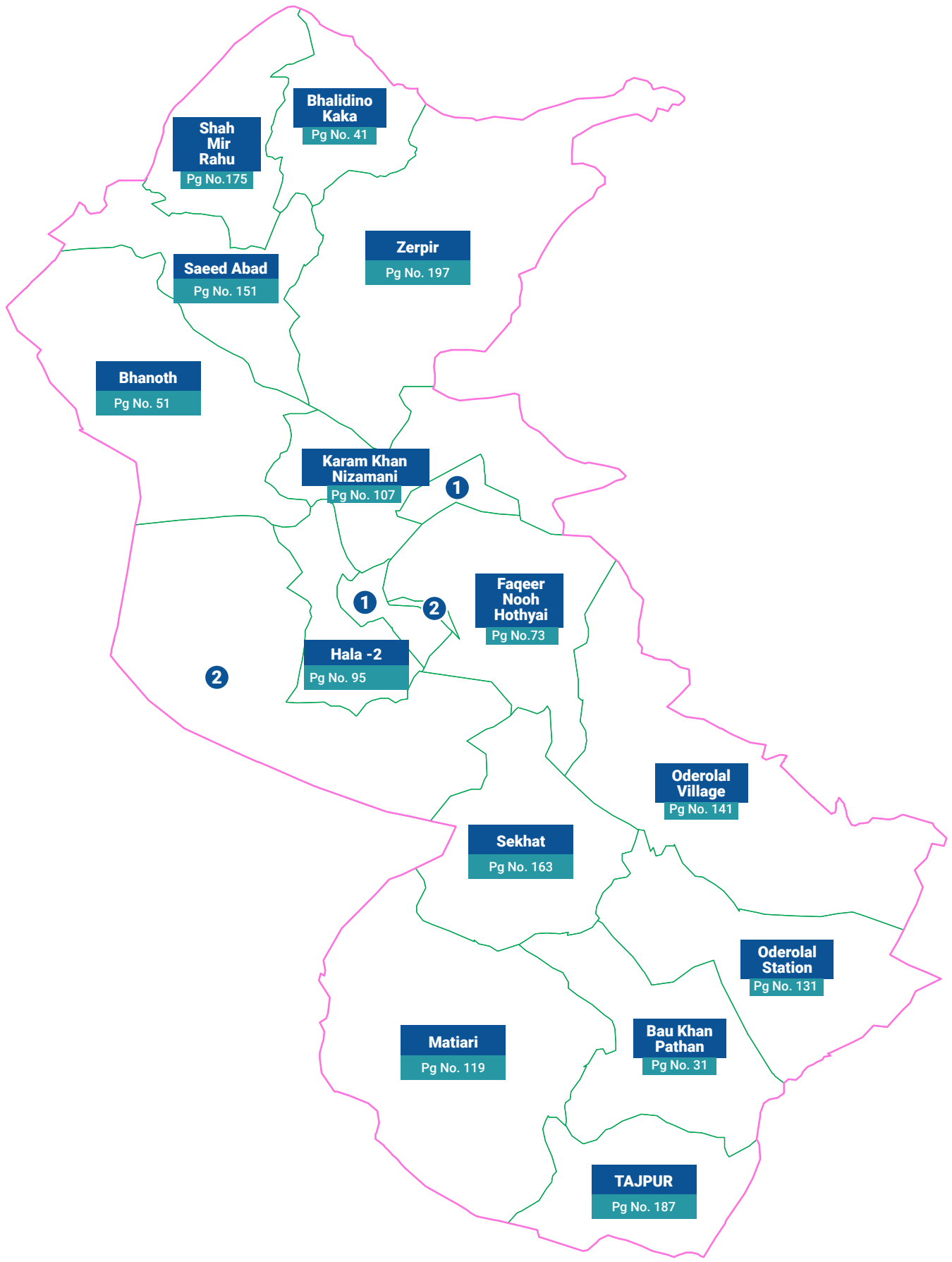
Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

TSUNAMI

There is no hazard / risk of tsunami in this district

INDEX MAP

DISTRICT MATIARI



1 Bhitshah Pg No. 63

2 Hala Old Pg No. 83

UC Boundary

District Boundary

Union Council	Pg. No.
Bau Khan Pathan	31
Bhalidino Kaka	41
Bhanoth	51
Bhitshah	63

Union Council	Pg. No.
Faqeer Nooh Hothyai	73
Hala Old	83
Hala-2	95
Karam Khan Nizamani	107

Union Council	Pg. No.
Matiari	119
Oderolal Station	131
Oderolal Village	141
Saeed Abad	151

Union Council	Pg. No.
Sekhat	163
Shah Mir Rahu	175
Tajpur	187
Zerpir	197

UC WISE HAZARD AND RISK ASSESSMENT

UC - BAU KHAN PATHAN

Union Council area in sq. km **84**

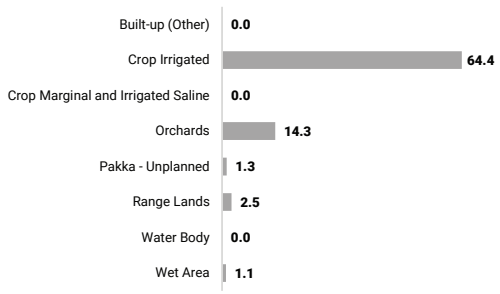
Surrounding UCs / Features
SEKHAT in North
TAJPUR in South
ODEROLAL STATION in East
TANDO ALLAHYAR DISTRICT in South East
MATIARI in West

Population — 2017 approx. **24,188**

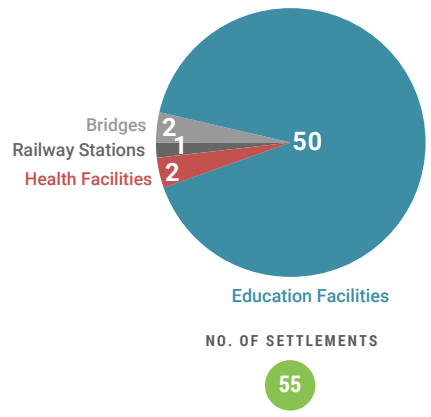
No. of household — 2017 approx. **4,680**

Land Use Land Cover

coverage area in sq.km

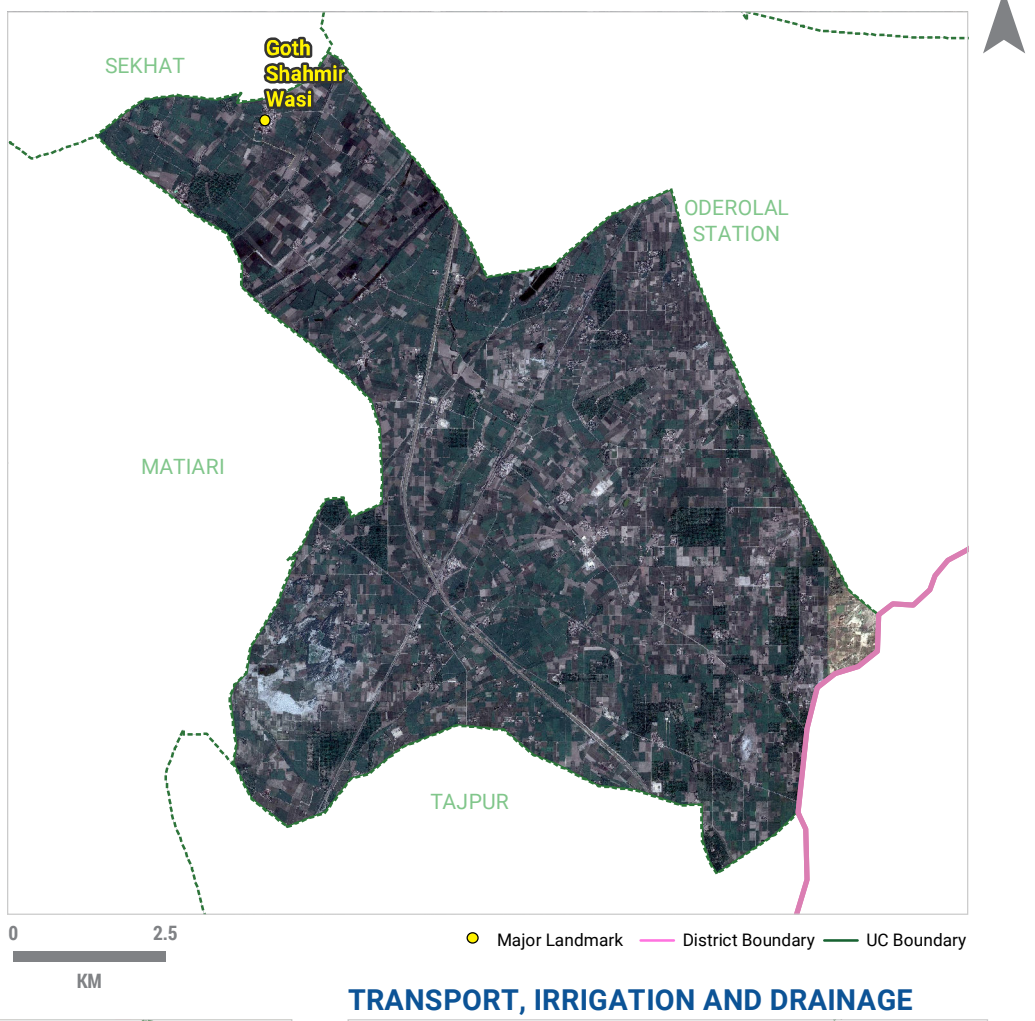


Critical Infrastructure

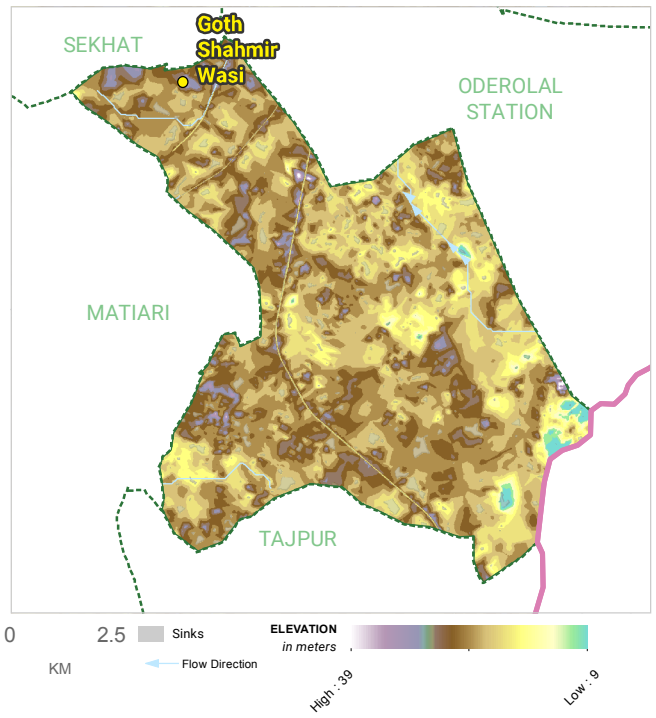


NO. OF SETTLEMENTS
55

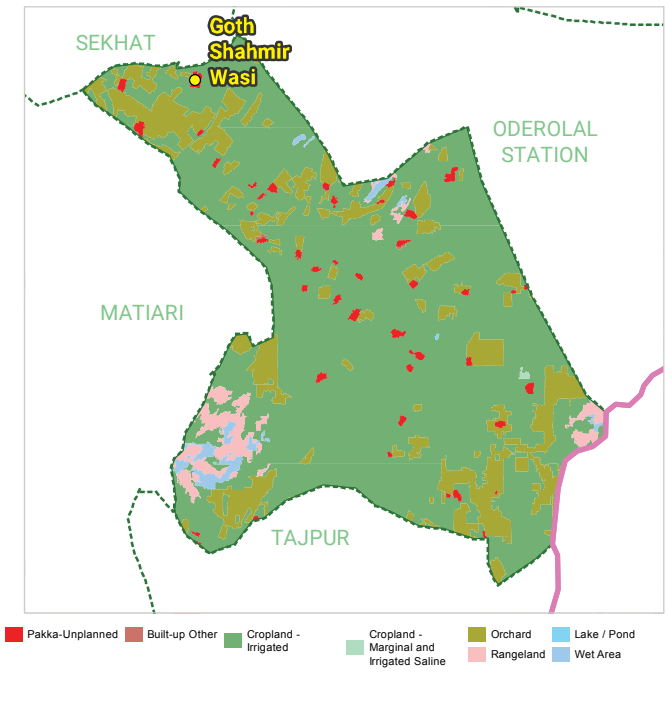
SATELLITE IMAGERY



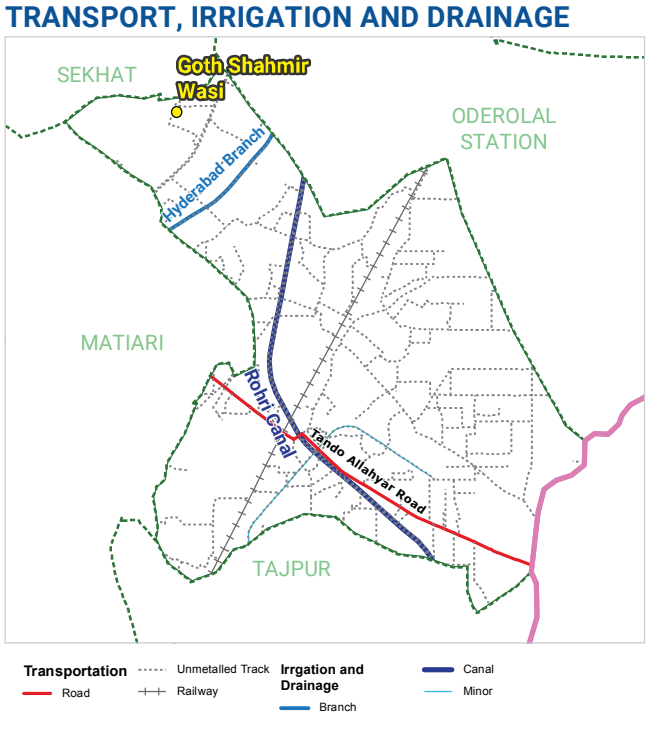
DEM AND FLOW DIRECTION



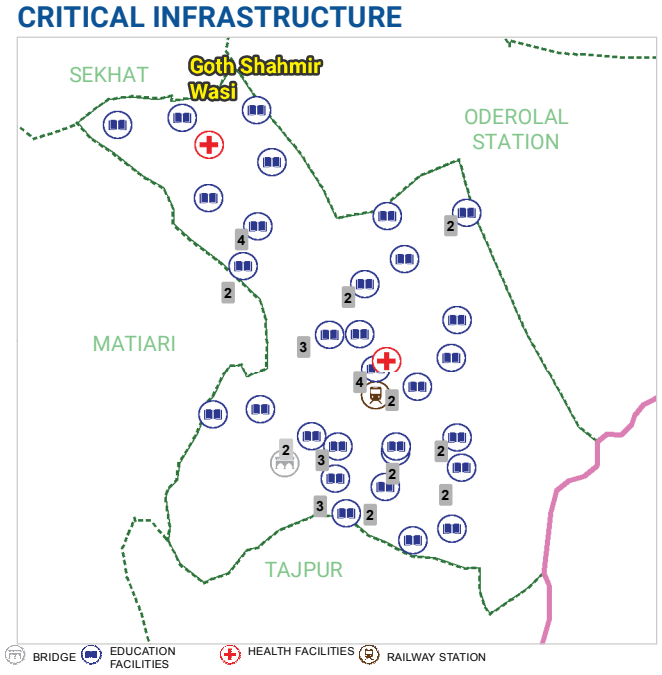
LAND USE / LAND COVER



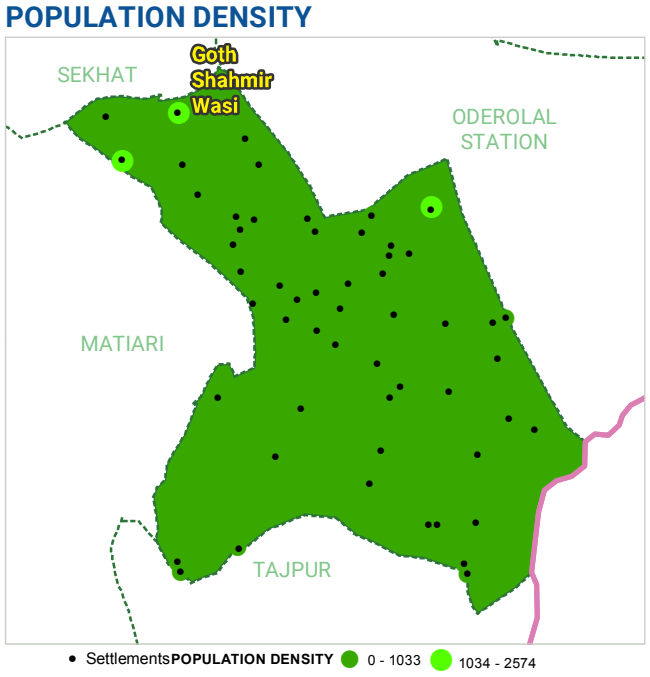
TRANSPORT, IRRIGATION AND DRAINAGE



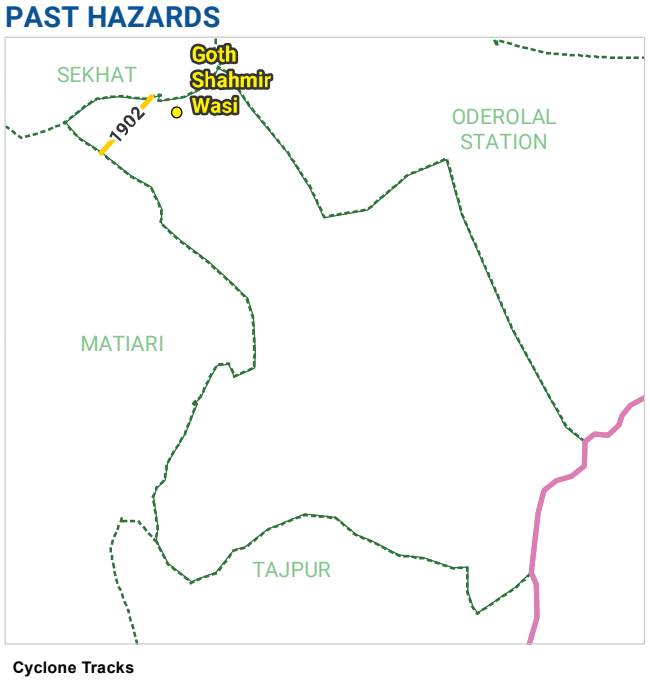
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

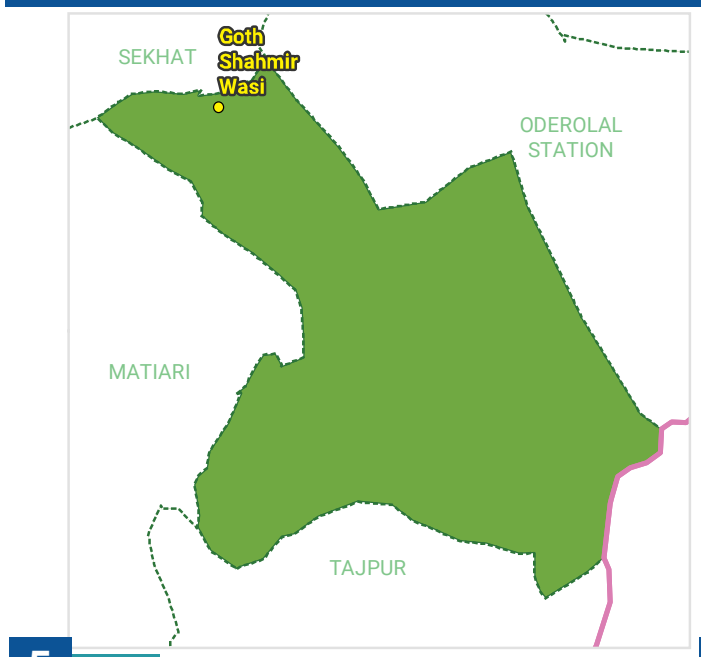


FLOOD

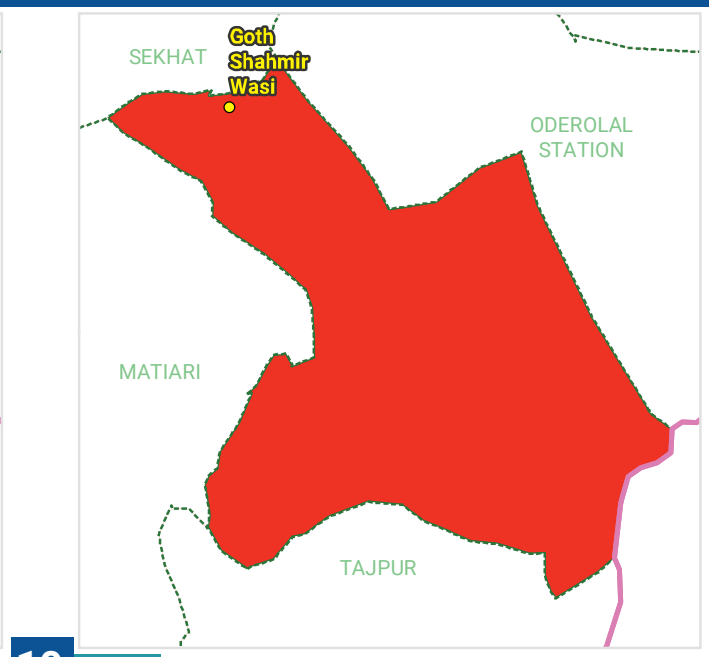
NO HAZARD OF RIVERINE FLOOD IN UC

METEOROLOGICAL DROUGHT

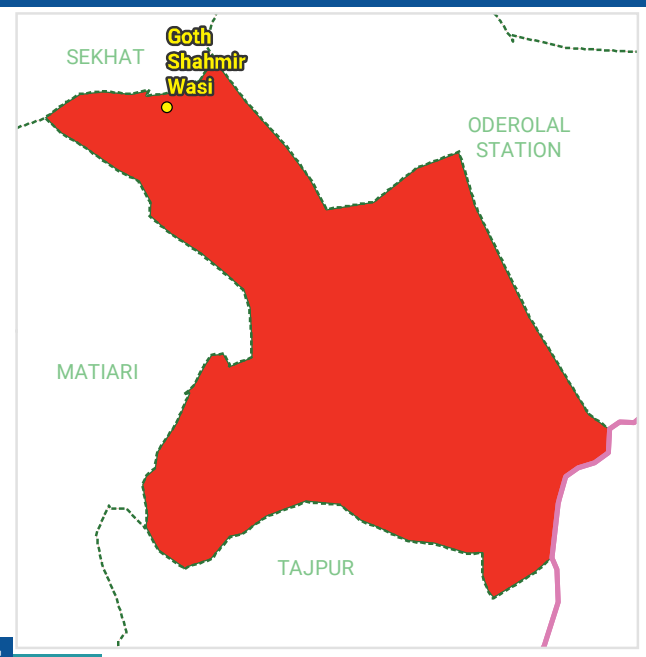
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

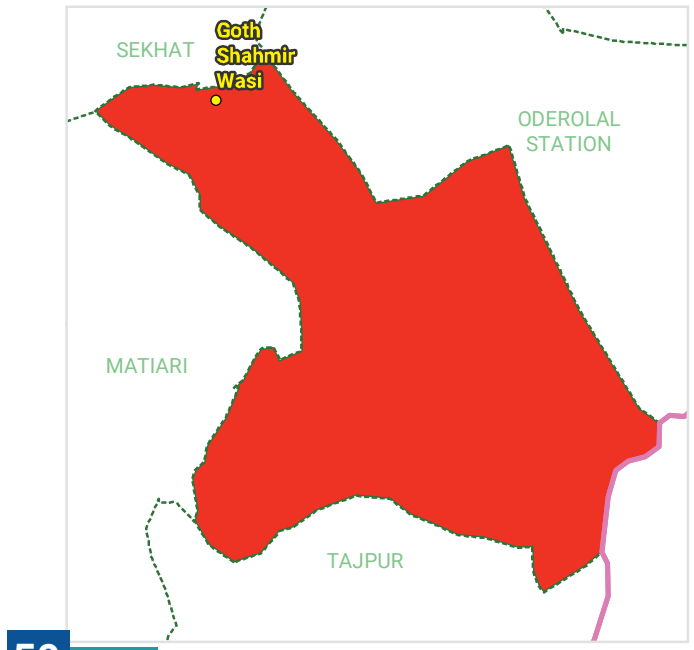


10 YEARS



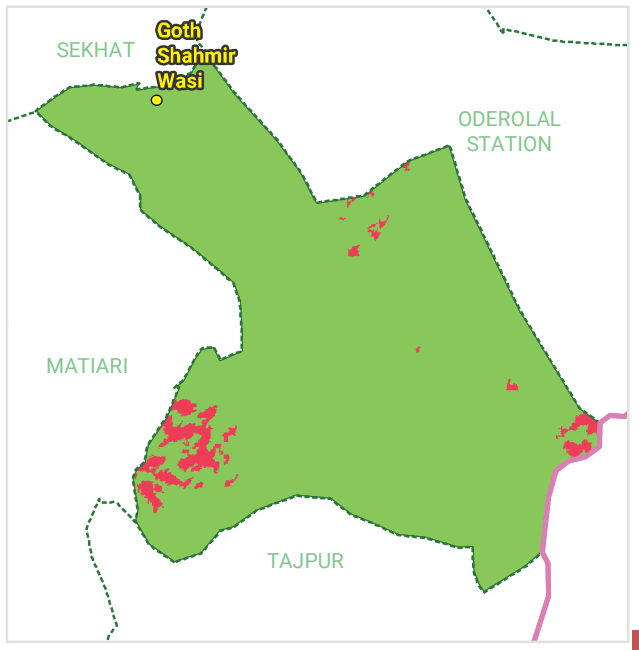
25 YEARS

HAZARD

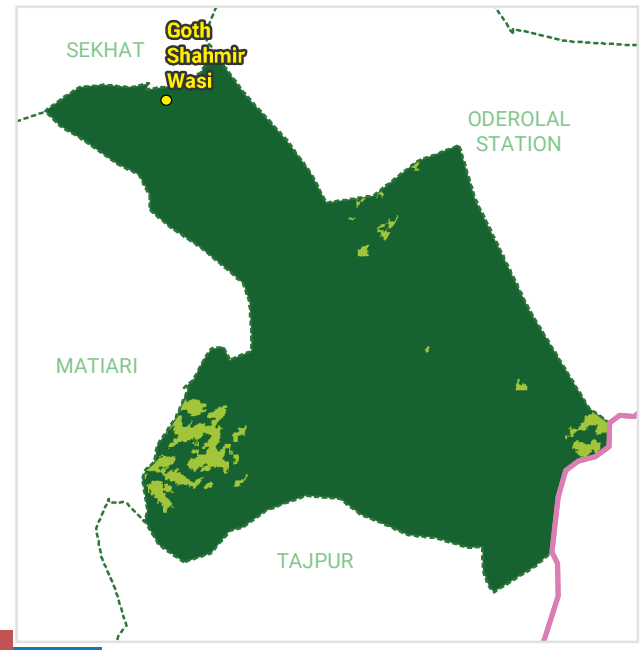


50 YEARS

VULNERABILITY

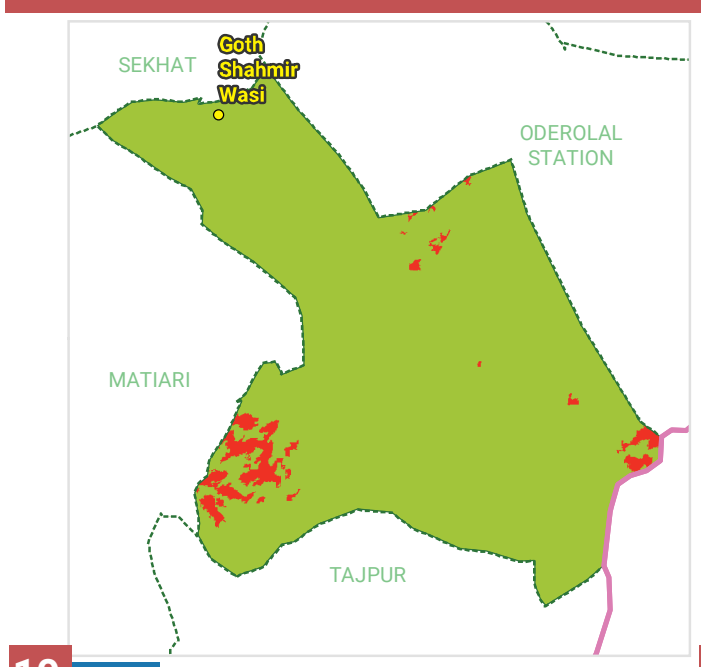


RISK

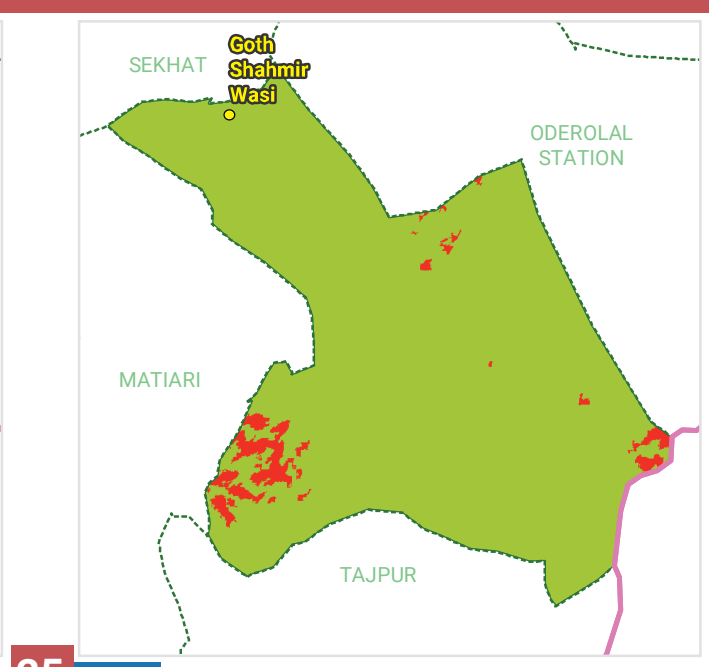


5 YEARS

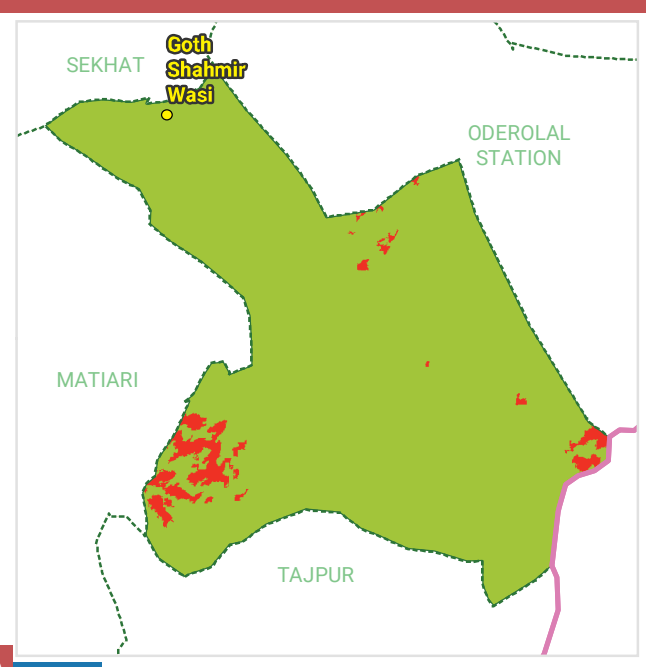
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

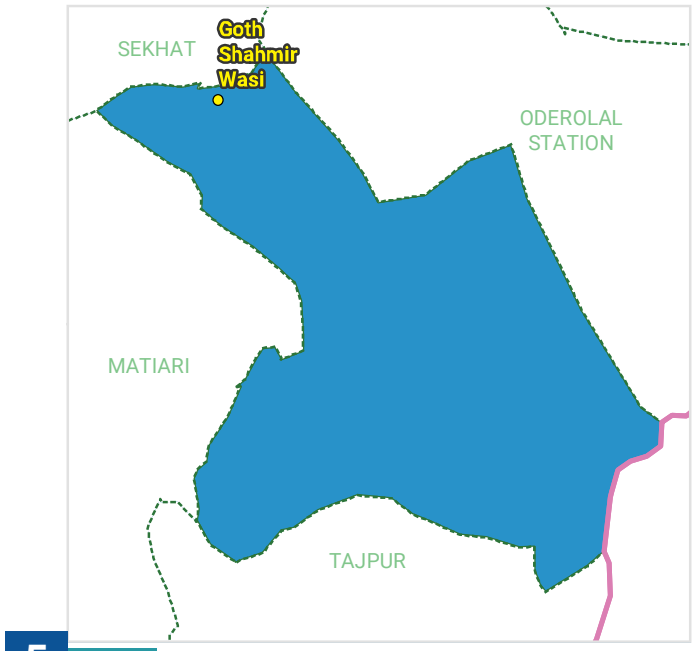
(BASED ON 50 YEARS RETURN PERIOD)

55	4680	24188	78.71	0	0	0	2.54
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

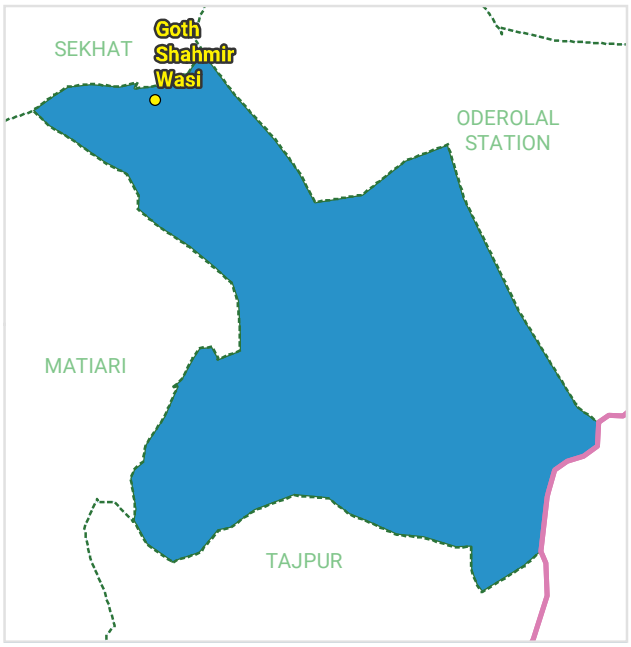
0.01	1.06
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

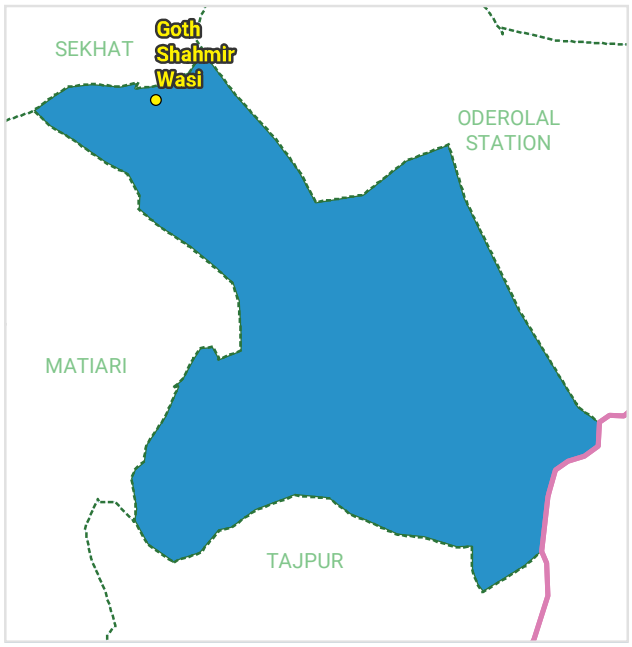
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

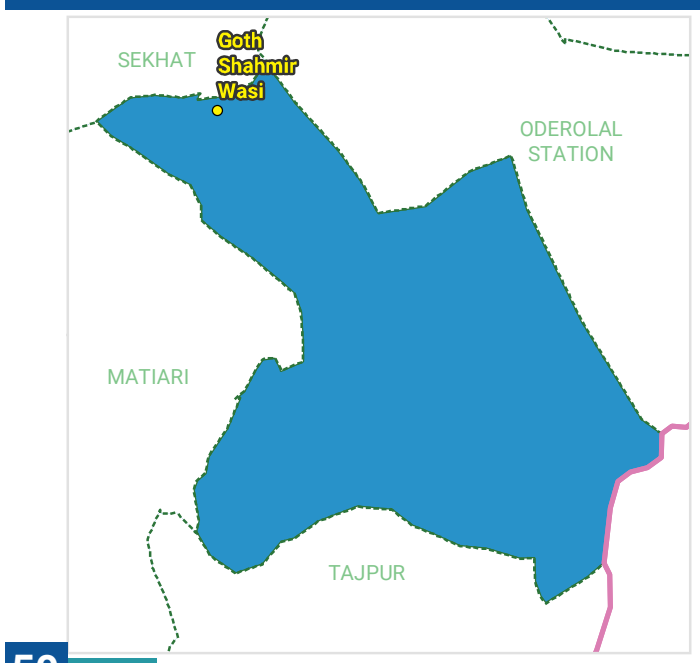


10 YEARS



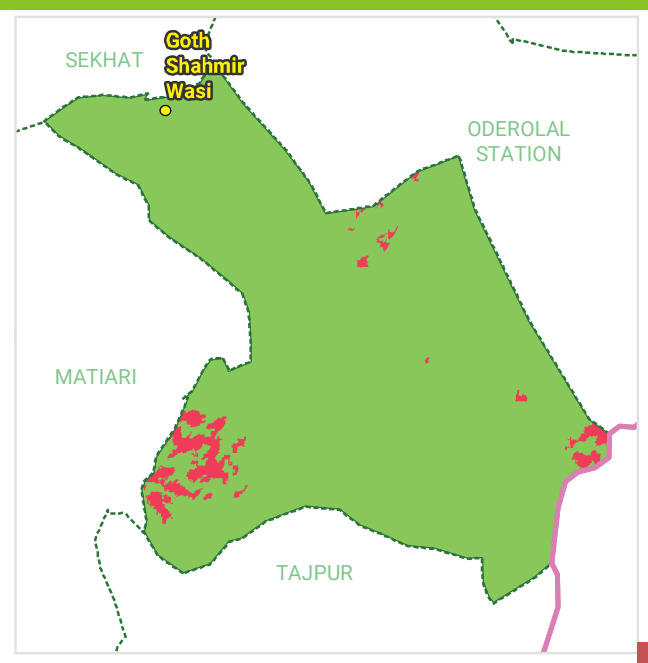
25 YEARS

HAZARD

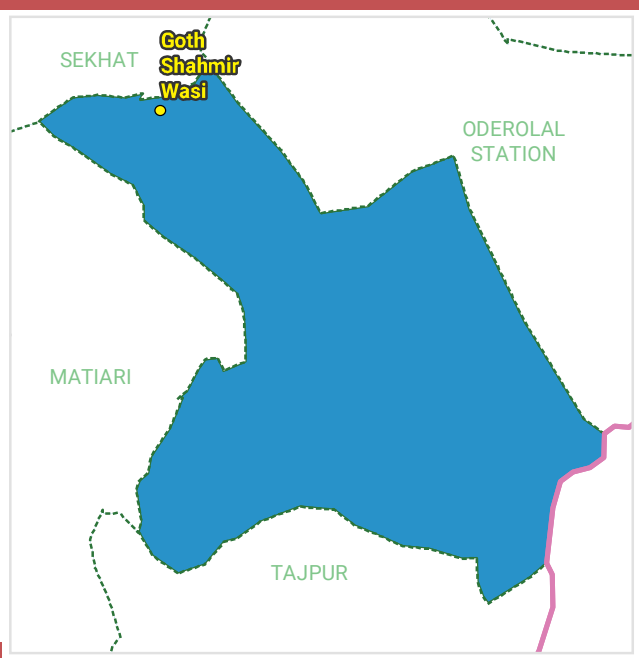


50 YEARS

VULNERABILITY



RISK



5 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

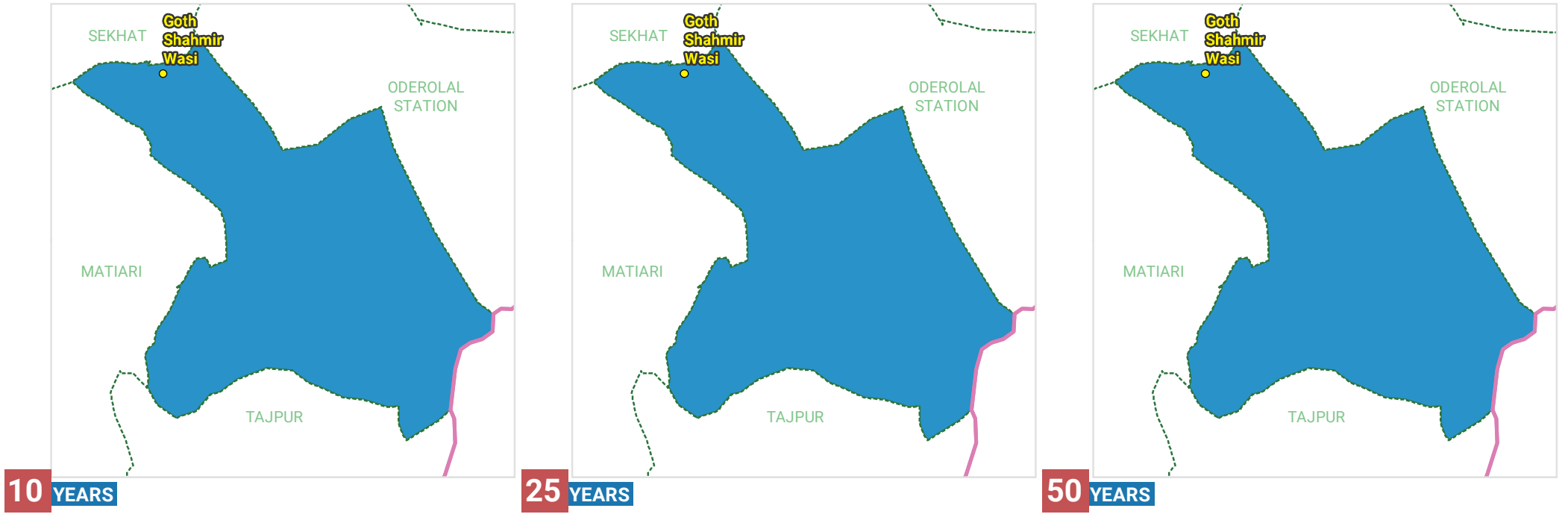
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

RISK AT DIFFERENT RETURN PERIODS



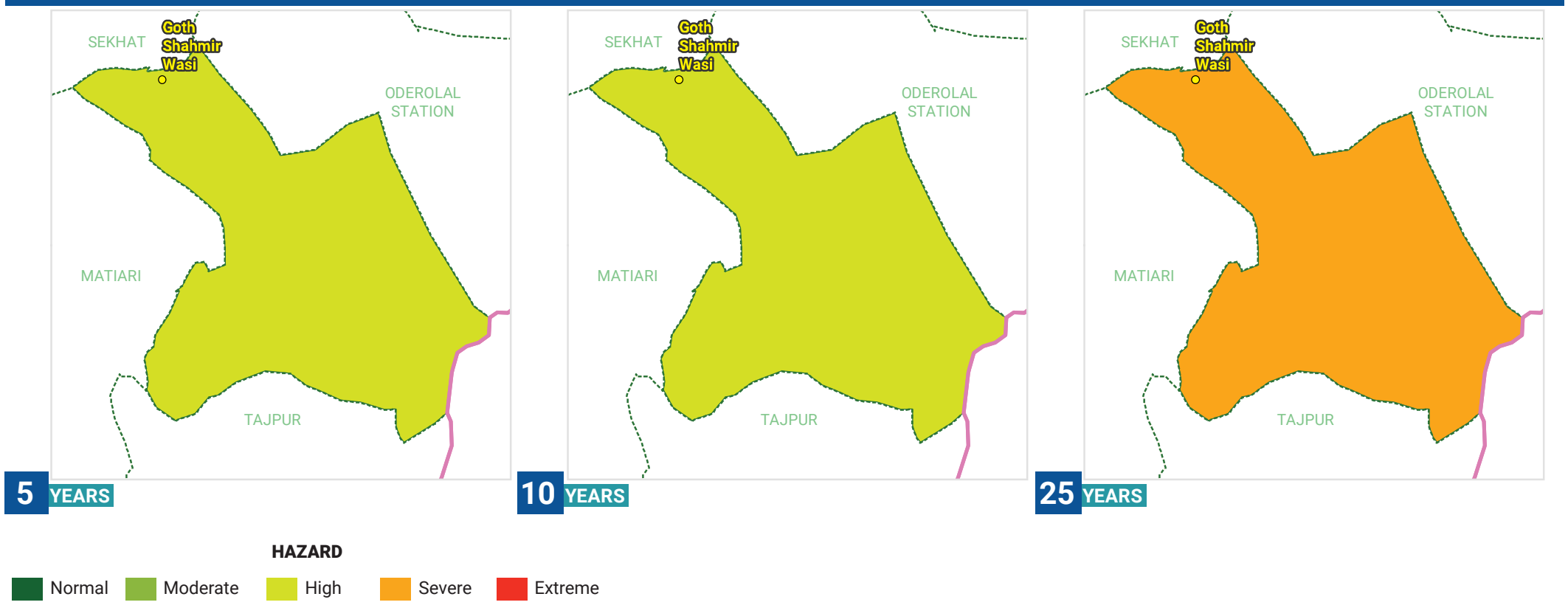
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

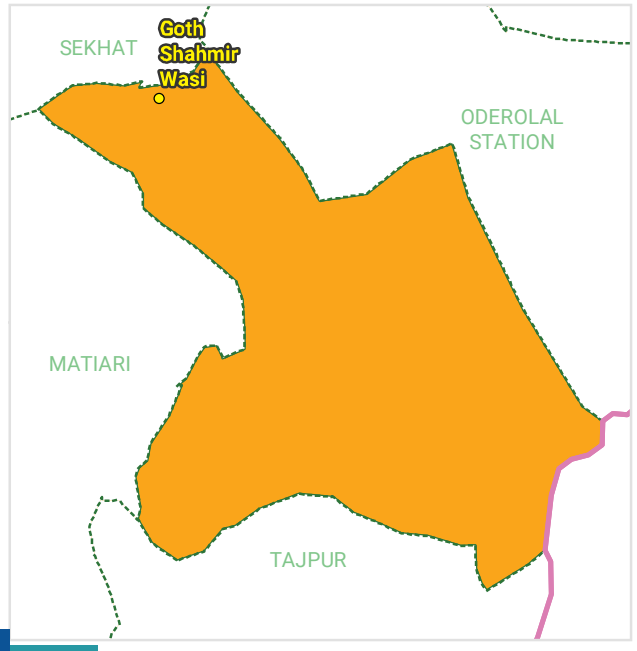
NO ELEMENTS AT RISK FOR AGRICULTURAL DROUGHT

HEATWAVE

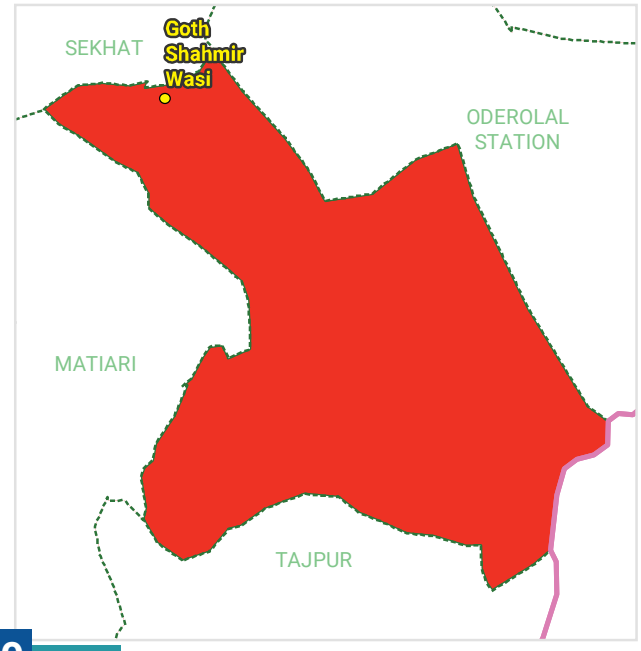
HAZARD AT DIFFERENT RETURN PERIODS



HAZARD AT DIFFERENT RETURN PERIODS

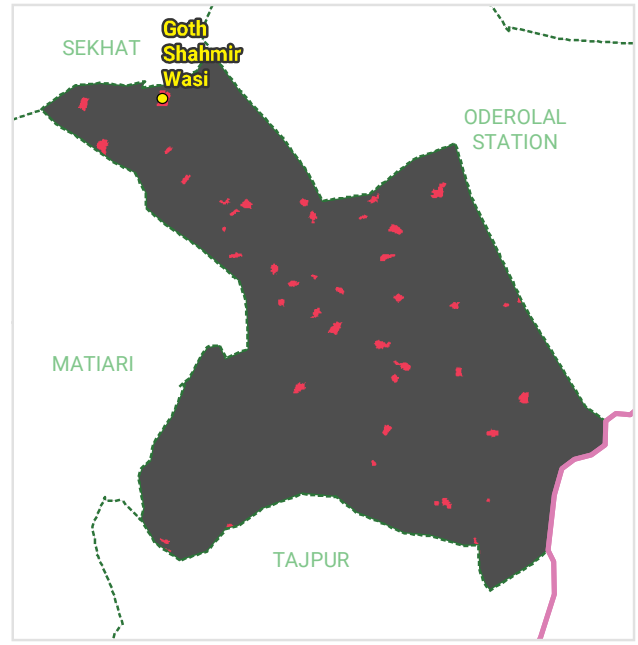


50 YEARS

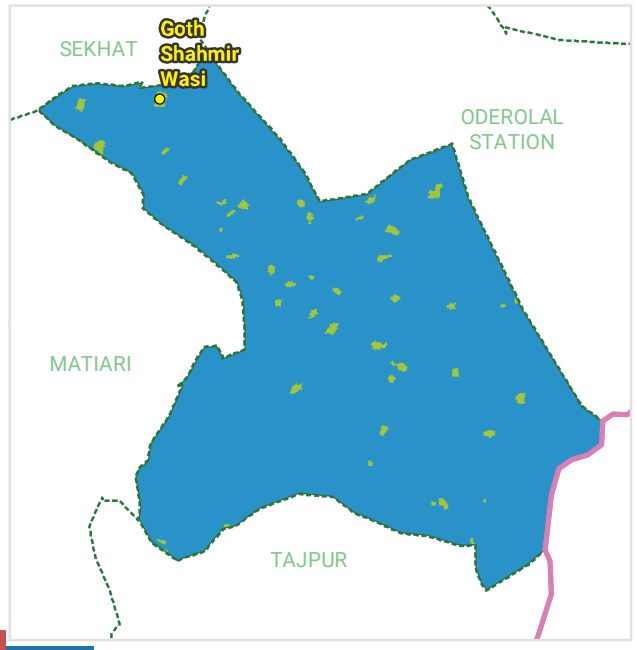


100 YEARS

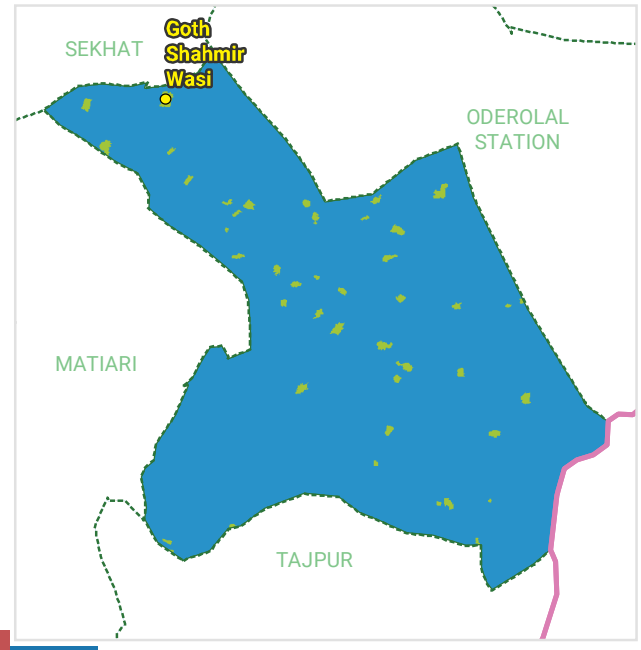
VULNERABILITY



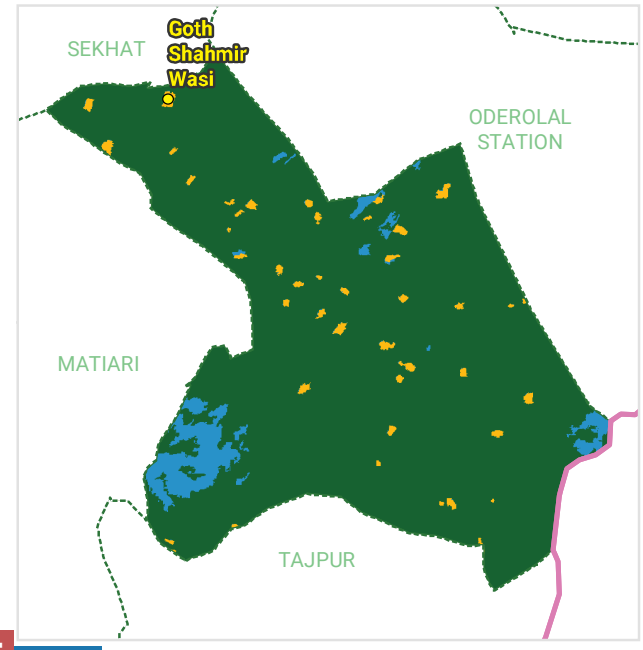
RISK AT DIFFERENT RETURN PERIODS



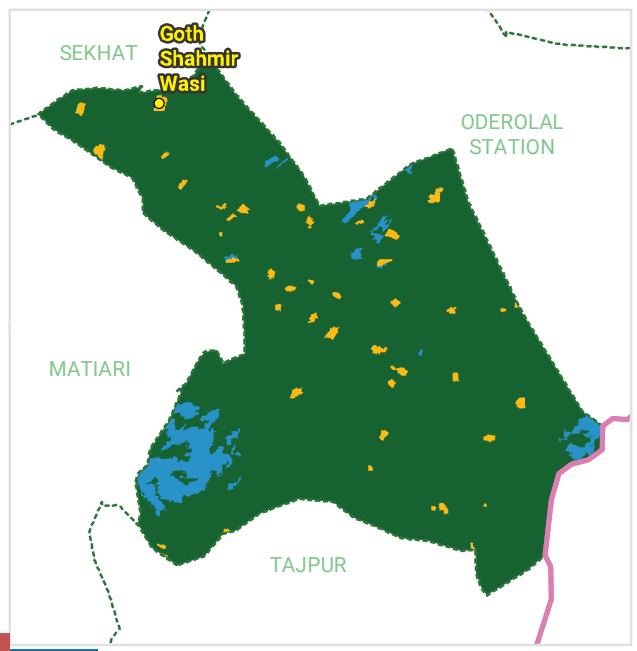
5 YEARS



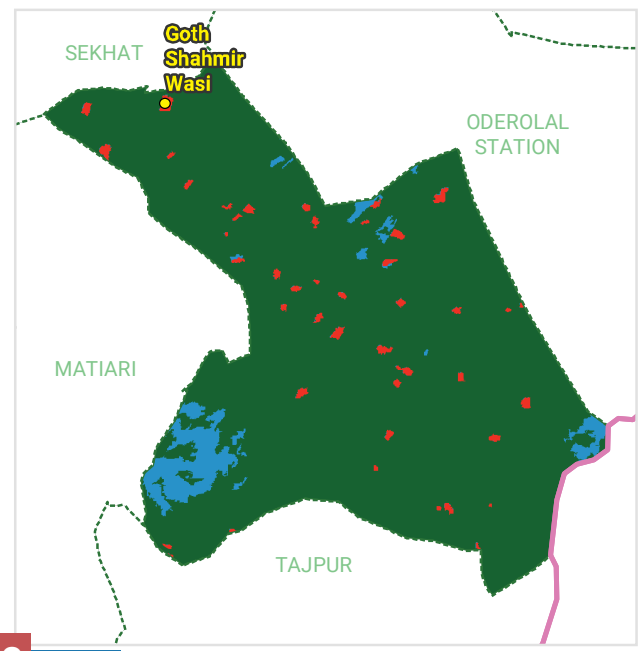
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

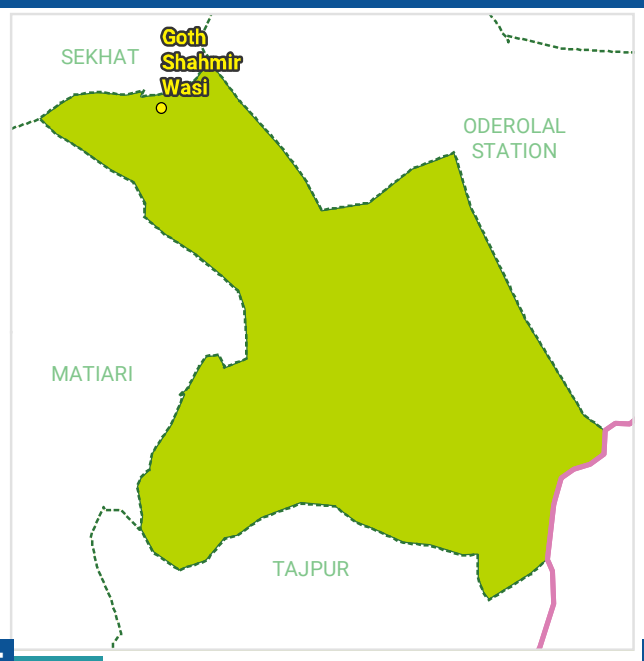
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

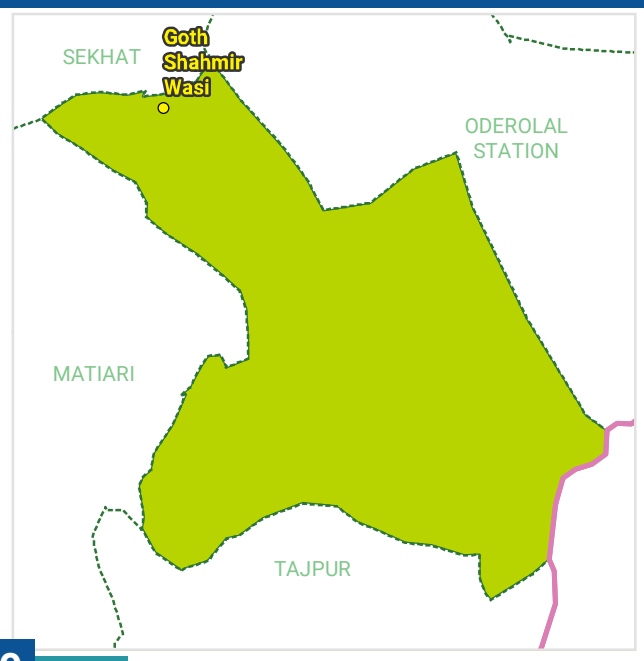
55	4636	23955	78.55	0	0	1.25
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

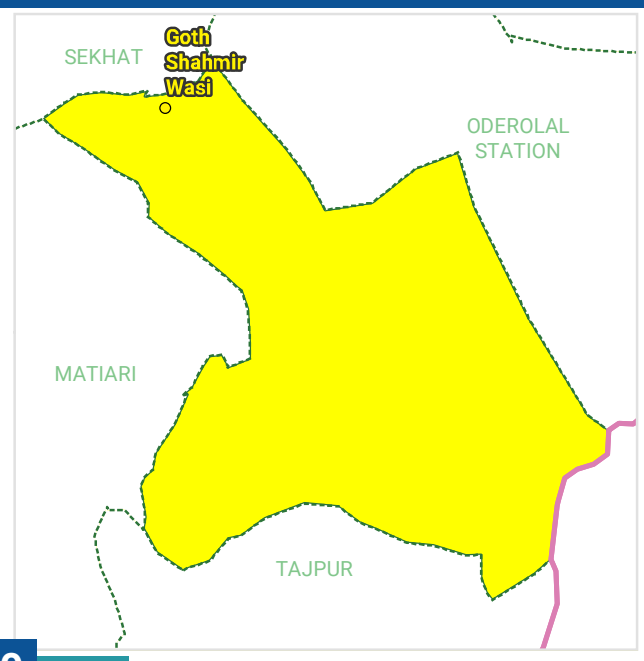
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

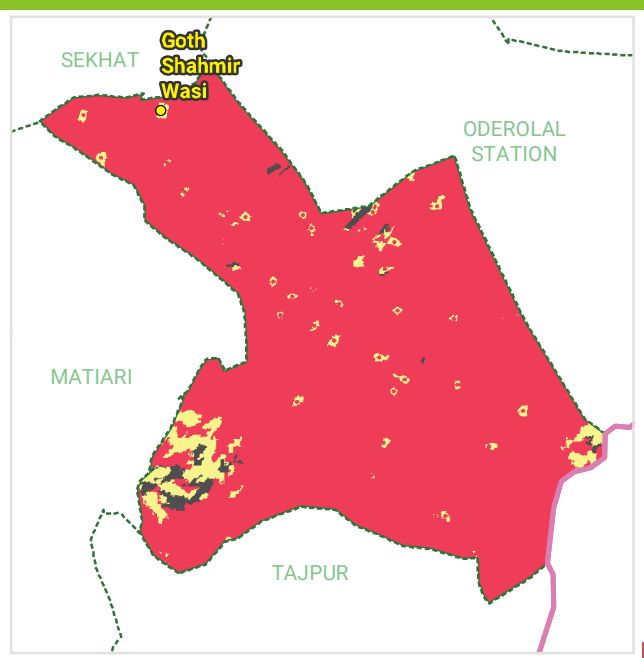


100 YEARS

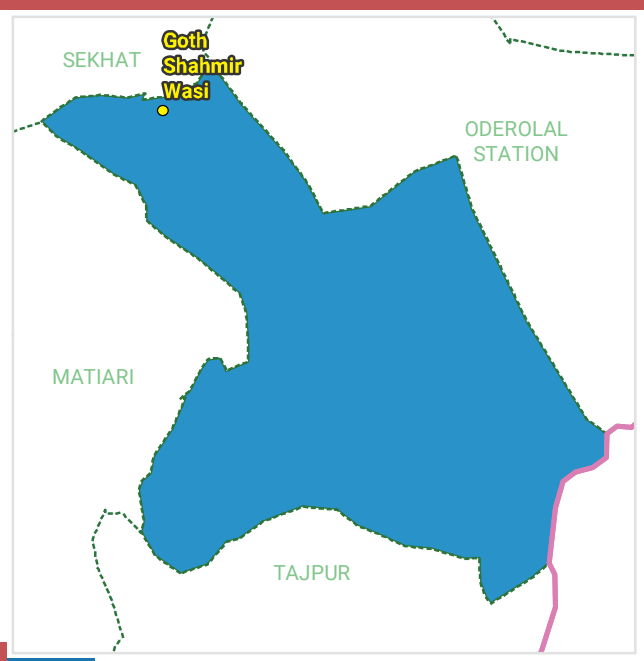


500 YEARS

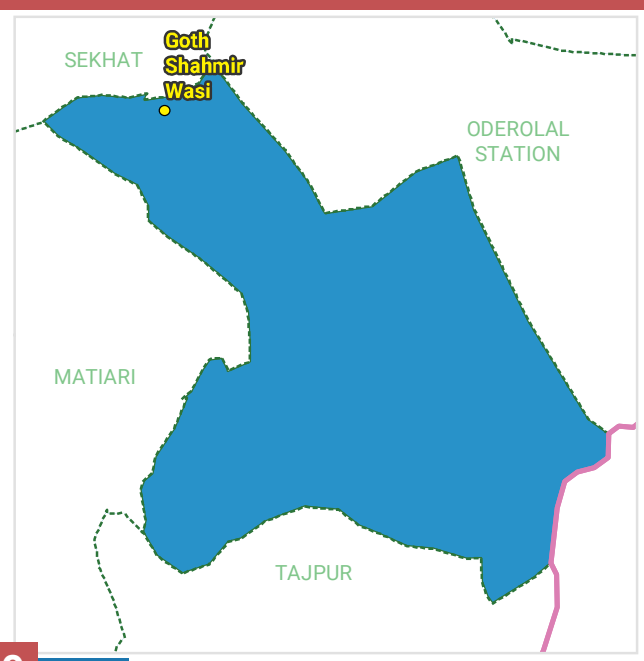
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS



25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

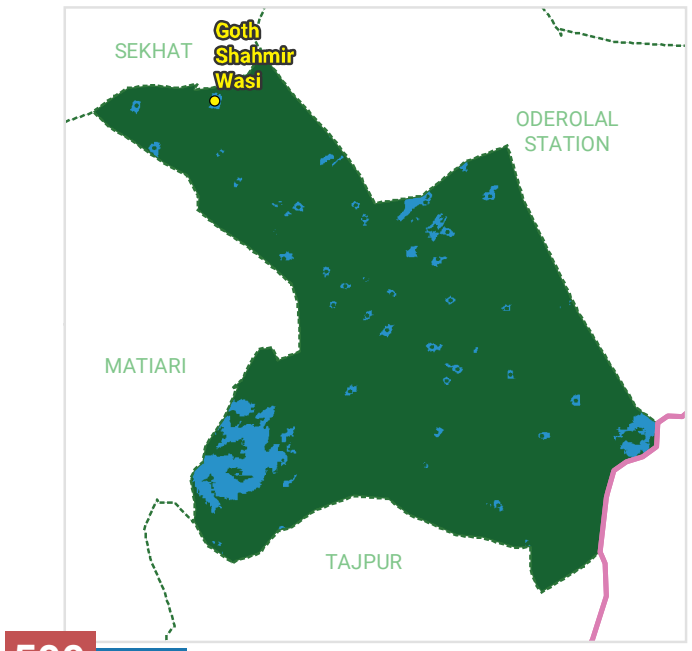
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

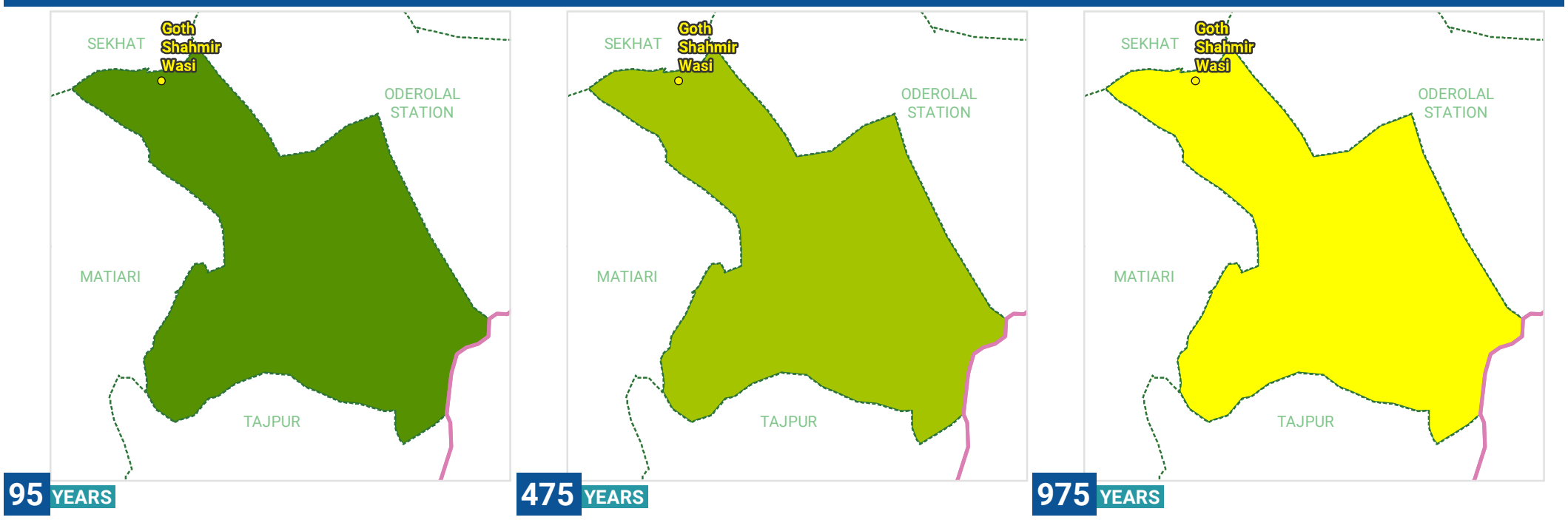
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

NO HAZARD OF STORM SURGE IN UC

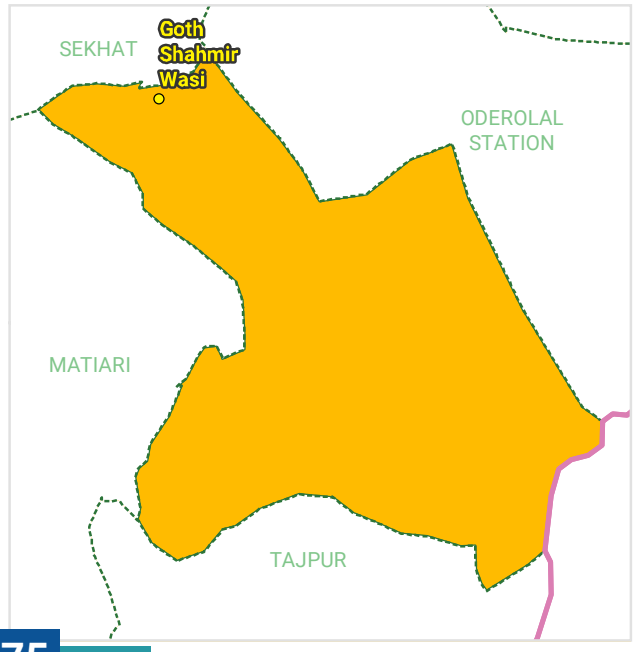
EARTHQUAKE

HAZARD AT DIFFERENT RETURN PERIODS



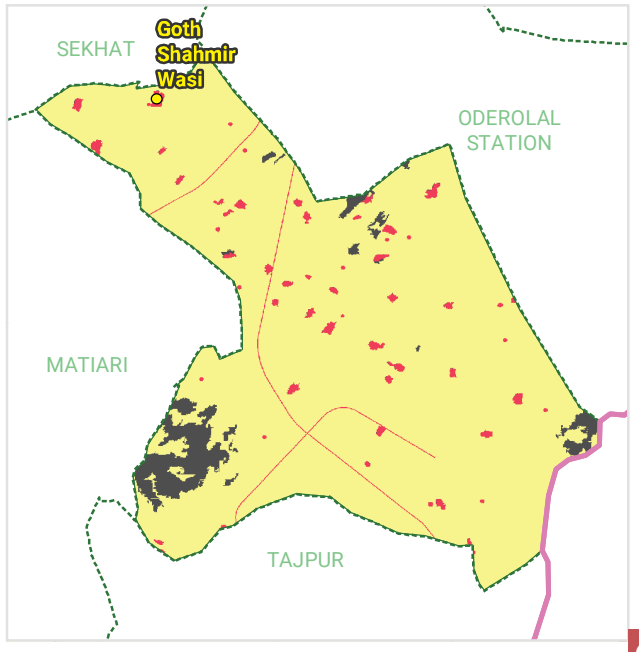
EARTHQUAKE

HAZARD

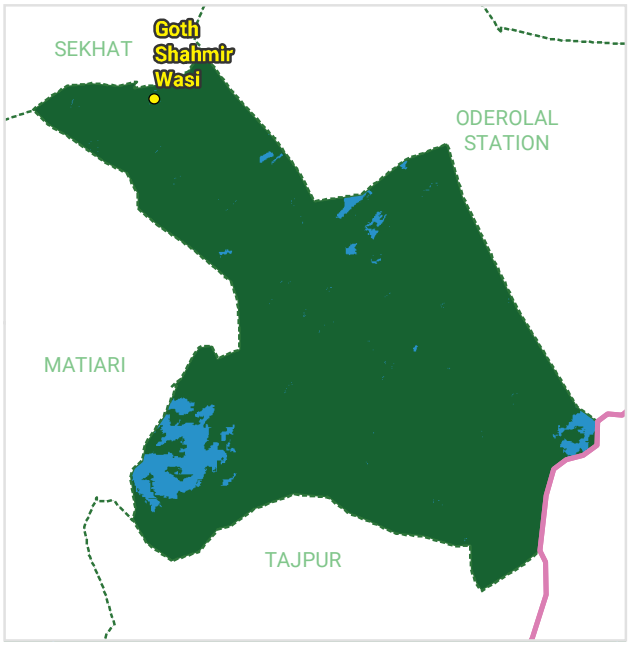


2475 YEARS

VULNERABILITY

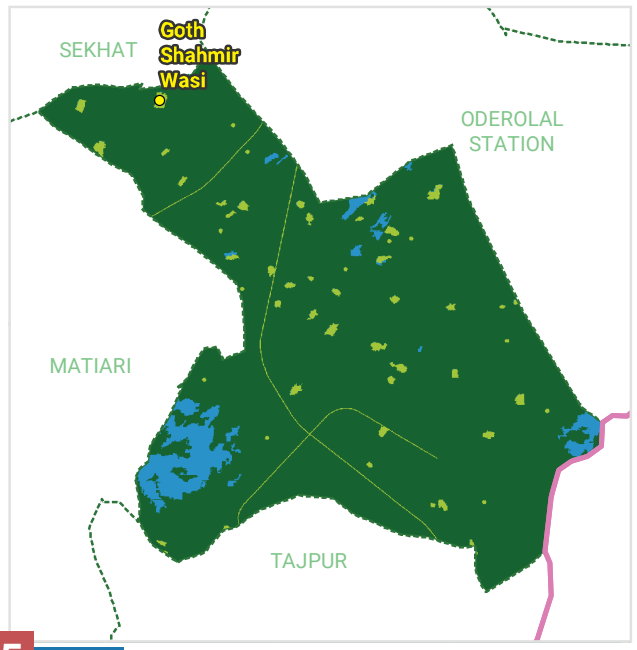


RISK

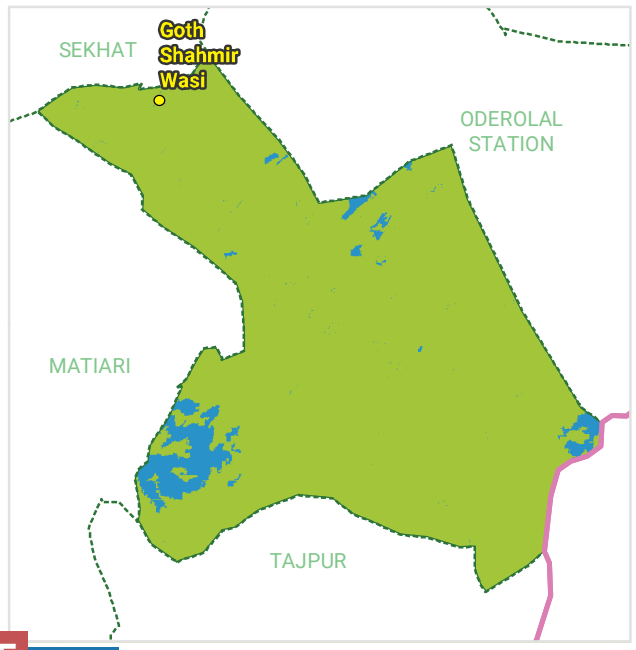


95 YEARS

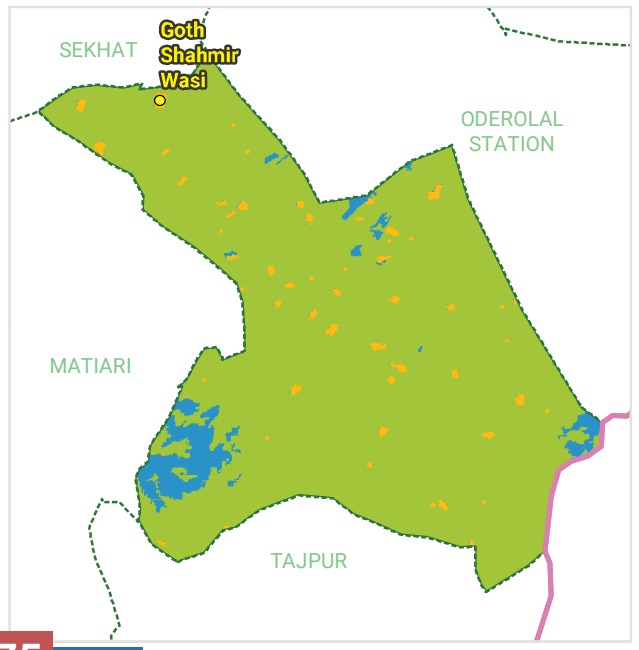
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

55	4611	23835	78.60	0	0	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.24	0.07	190.00	11.40	21.06	0	2	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
50	0	0	0	2	0	0	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	1	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low / Medium	Medium / Extreme	Medium / Extreme	Medium / Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	None	●	●	●
HEATWAVE	Medium	Medium	Low / High	Low / High	Low / Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low / Medium	Medium	Medium / High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - BHALIDINO KAKA

Union Council area in sq. km **49**

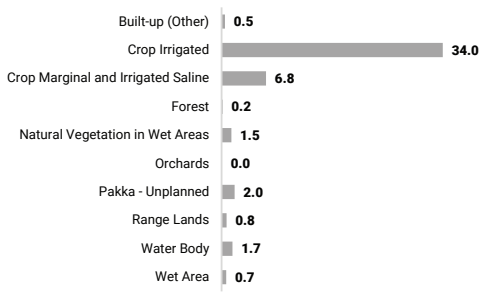
Surrounding UCs / Features
SAEED ABAD in South
ZERPIR in South East
SHAHEED BENAZIRABAD DISTRICT in North
SHAH MIR RAHU in West

Population — 2017 approx. **29,530**

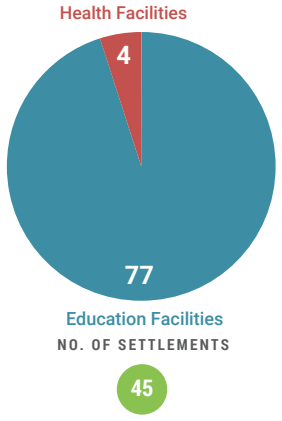
No. of household — 2017 approx. **5,770**

Land Use Land Cover

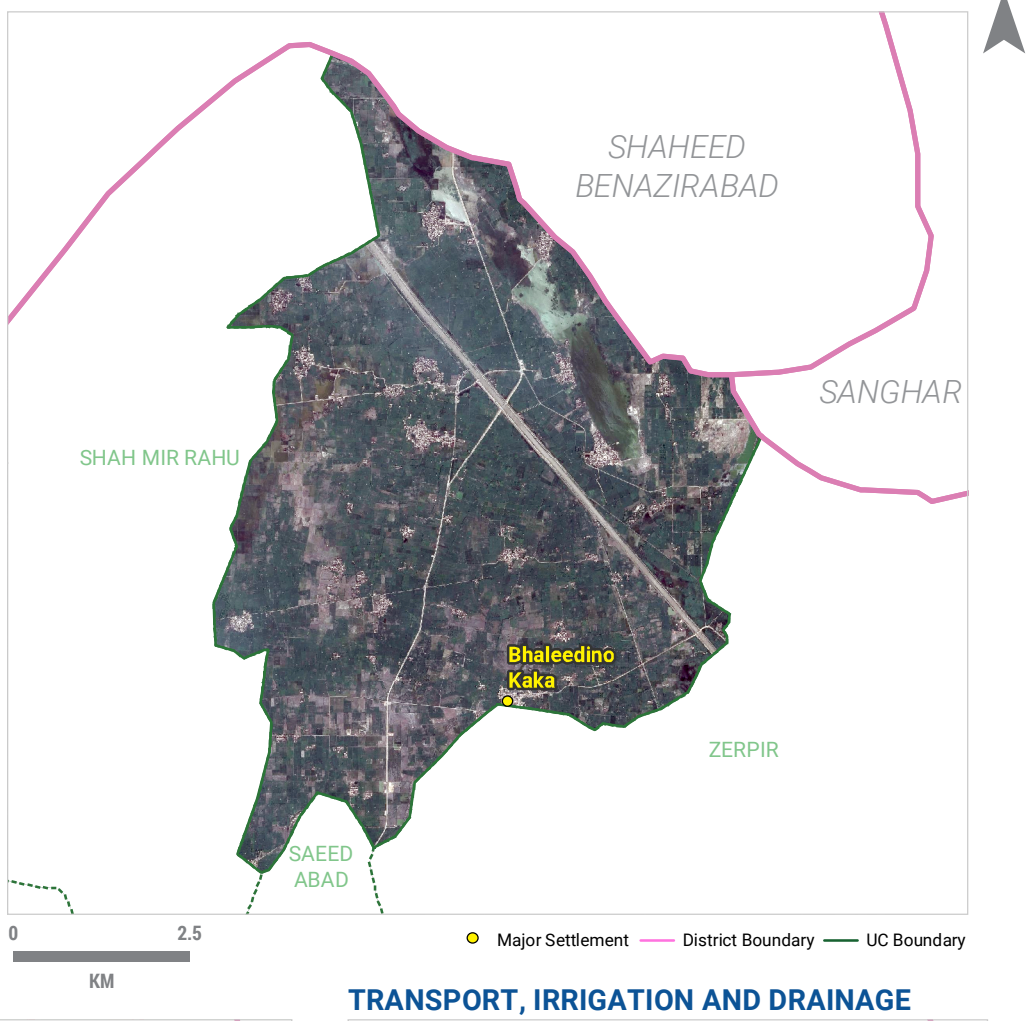
coverage area in sq.km



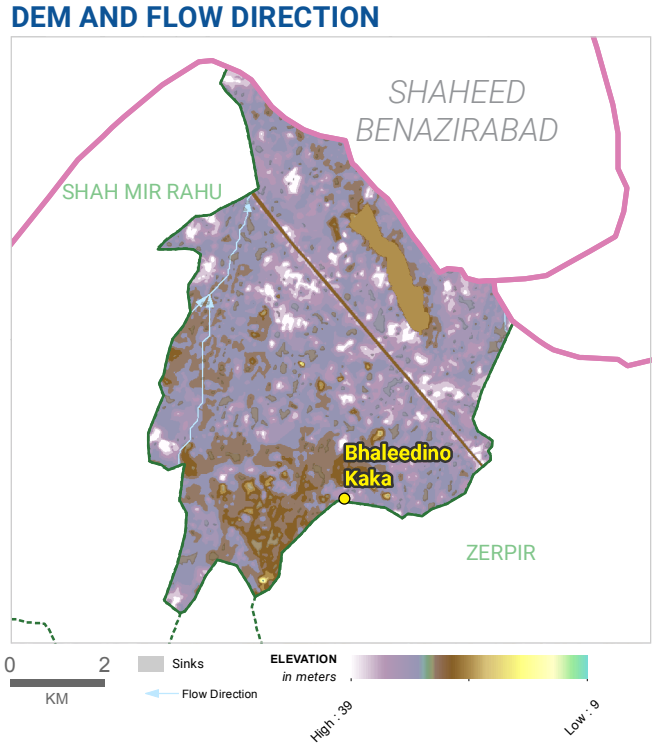
Critical Infrastructure



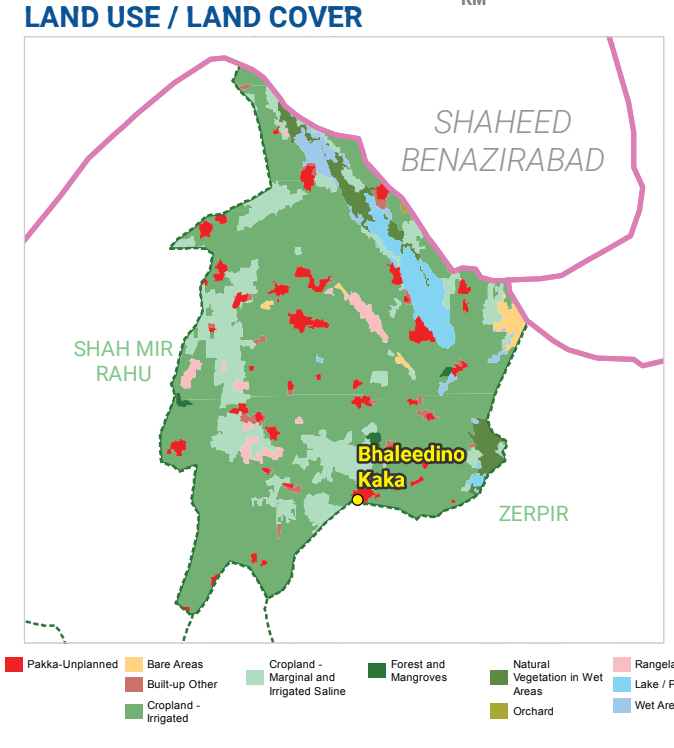
SATELLITE IMAGERY



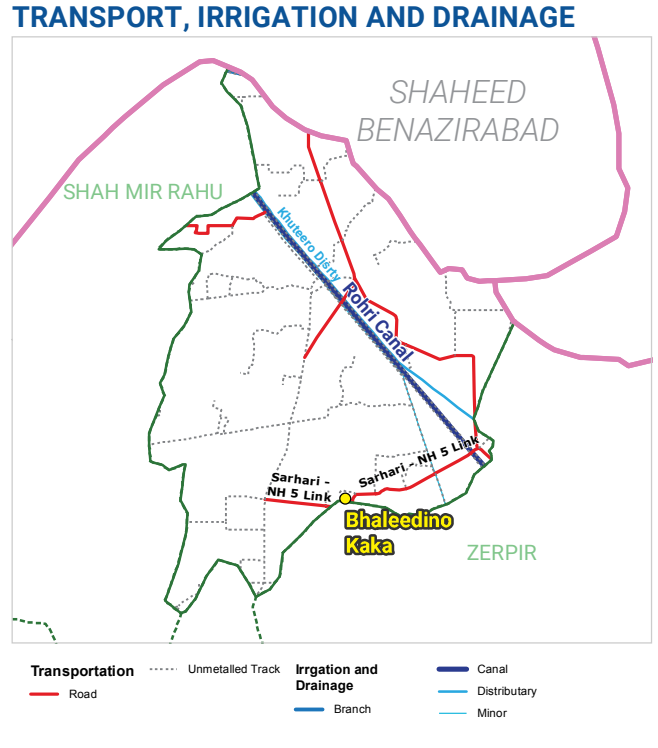
DEM AND FLOW DIRECTION



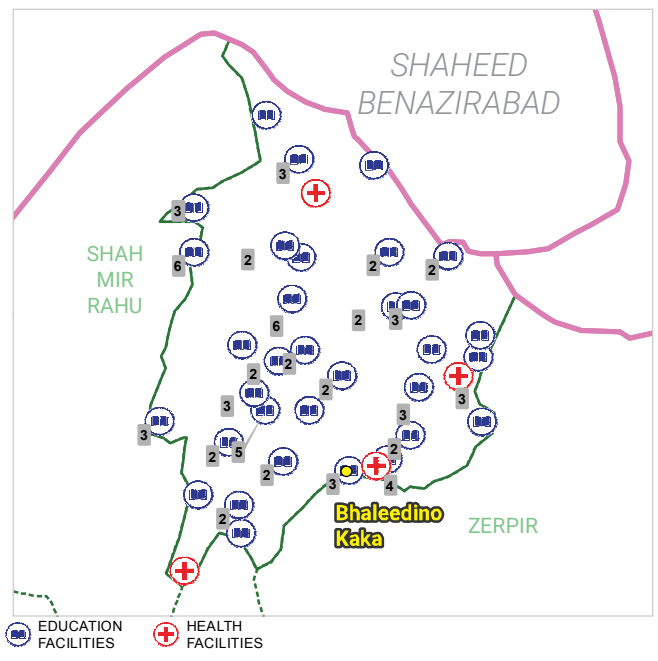
LAND USE / LAND COVER



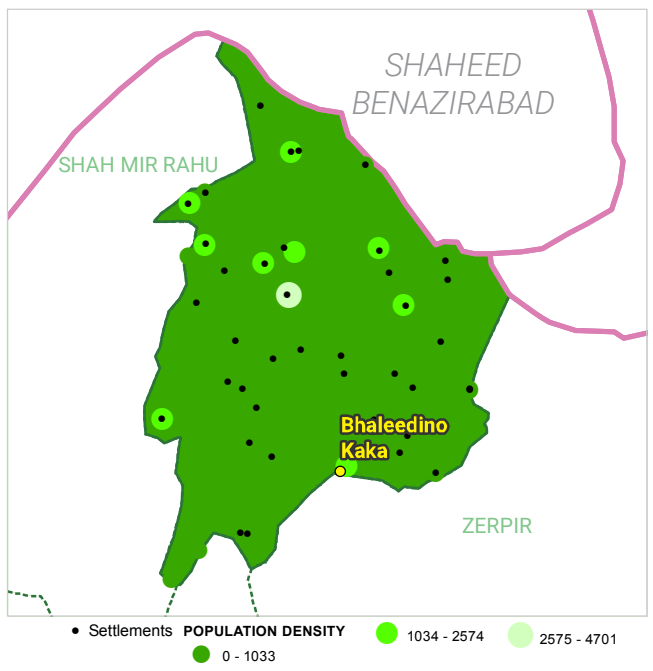
TRANSPORT, IRRIGATION AND DRAINAGE



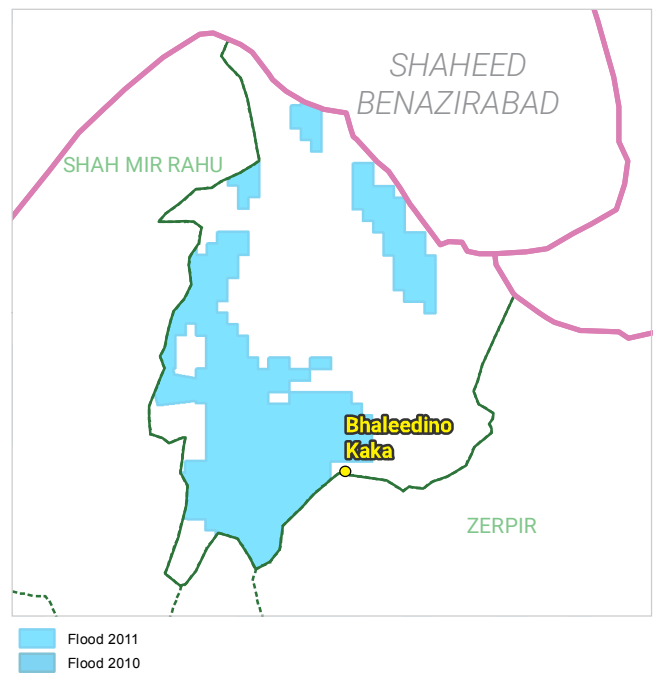
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

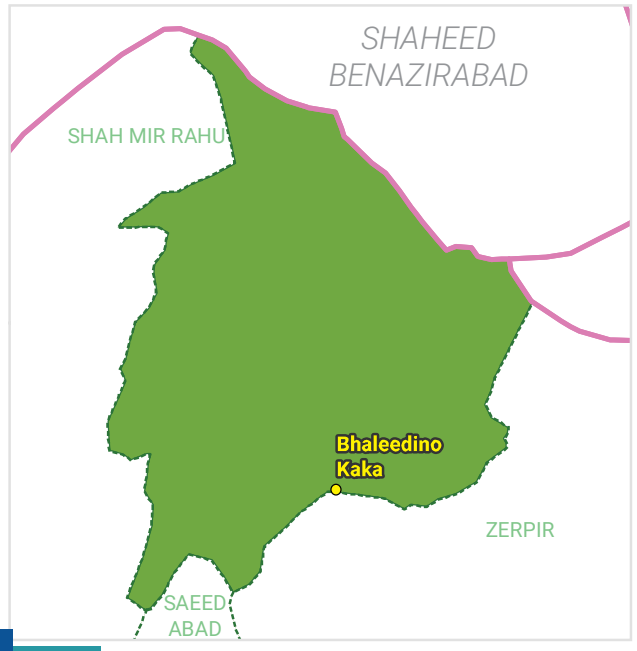


FLOOD

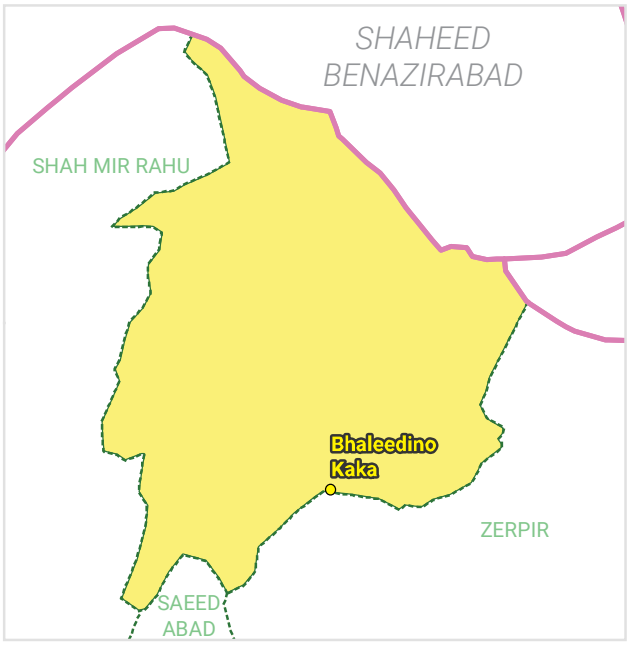
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

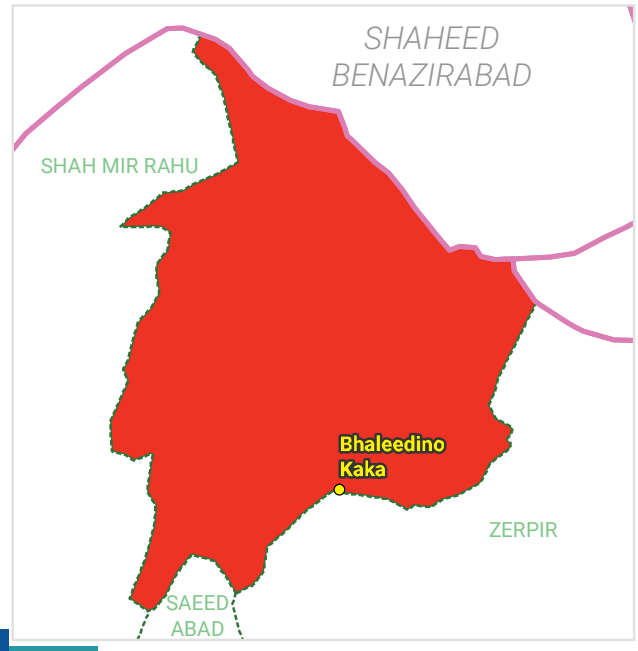
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

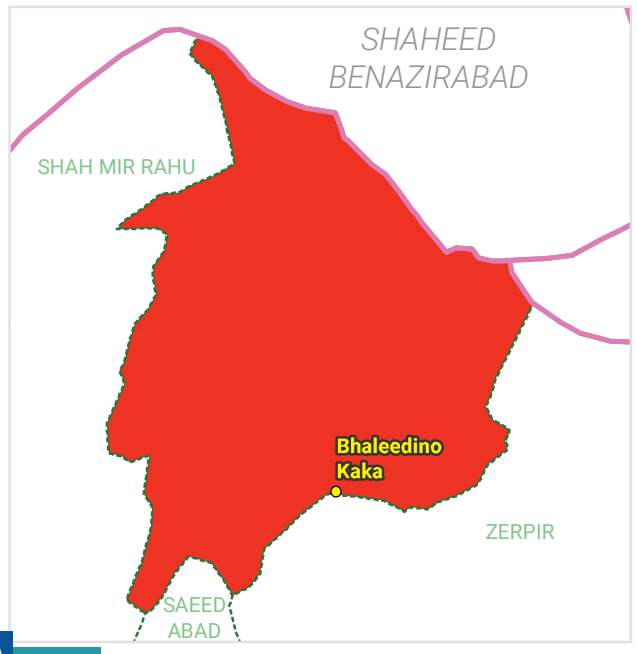


10 YEARS



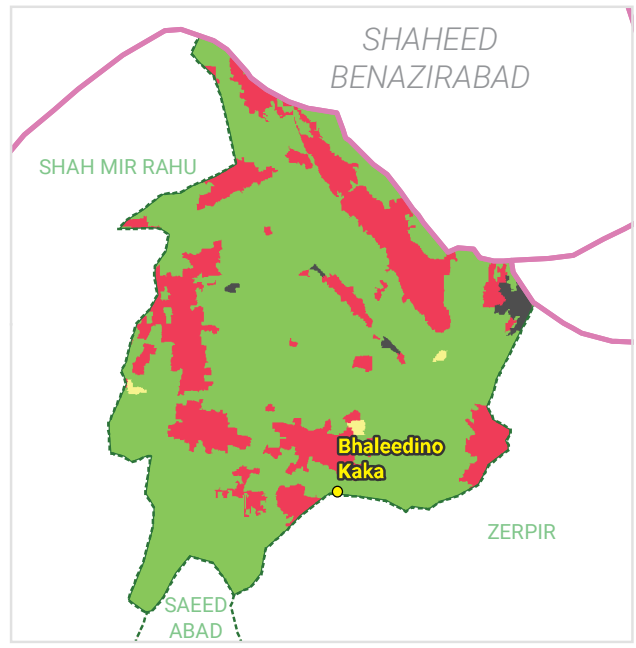
25 YEARS

HAZARD

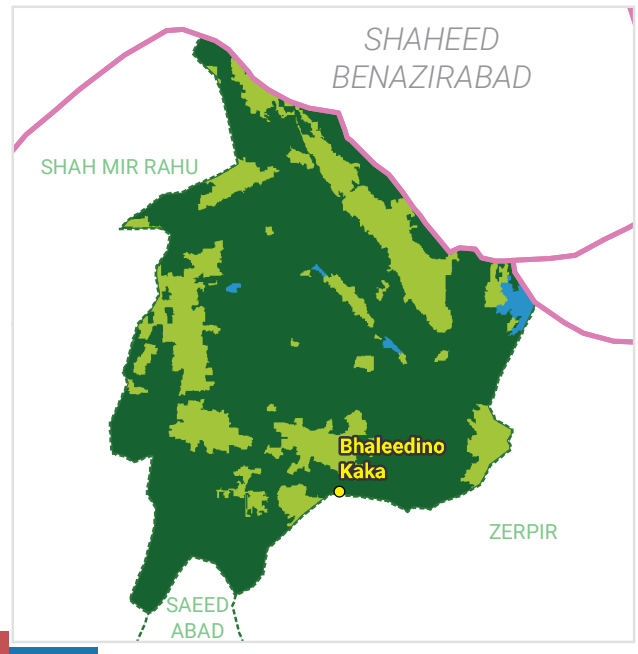


50 YEARS

VULNERABILITY

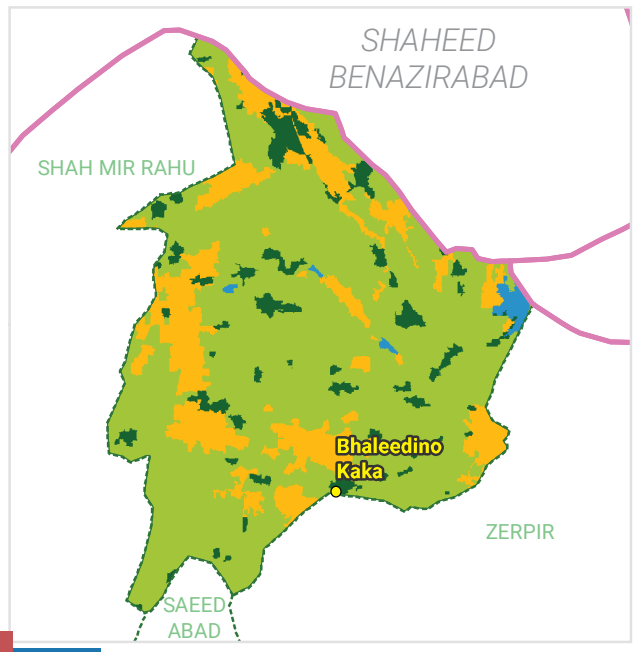


RISK

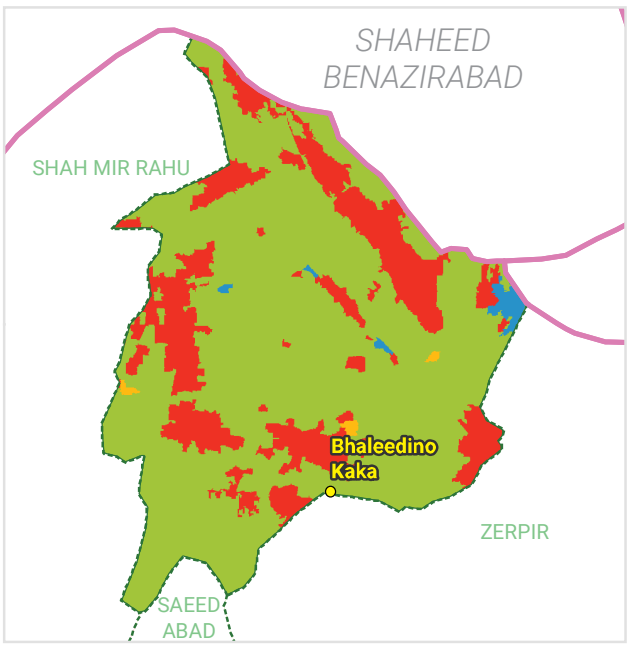


5 YEARS

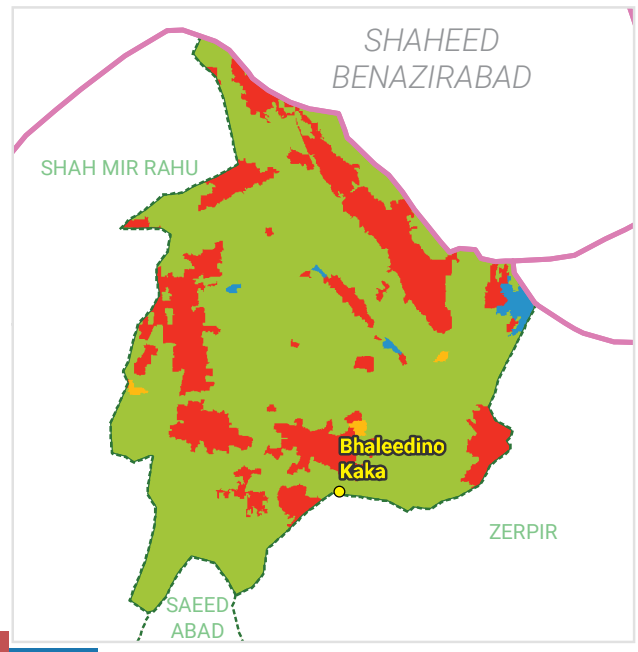
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

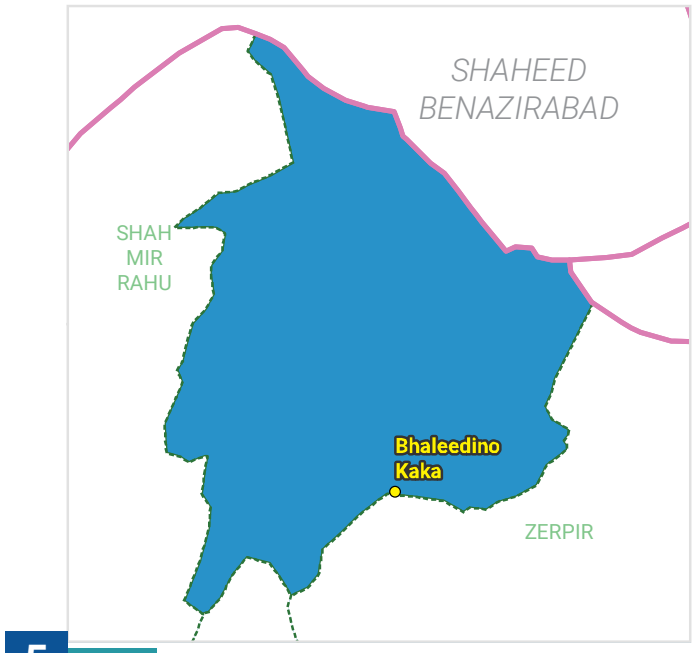
(BASED ON 50 YEARS RETURN PERIOD)

45	5770	29530	40.83	0	0.17	1.50	0.76
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

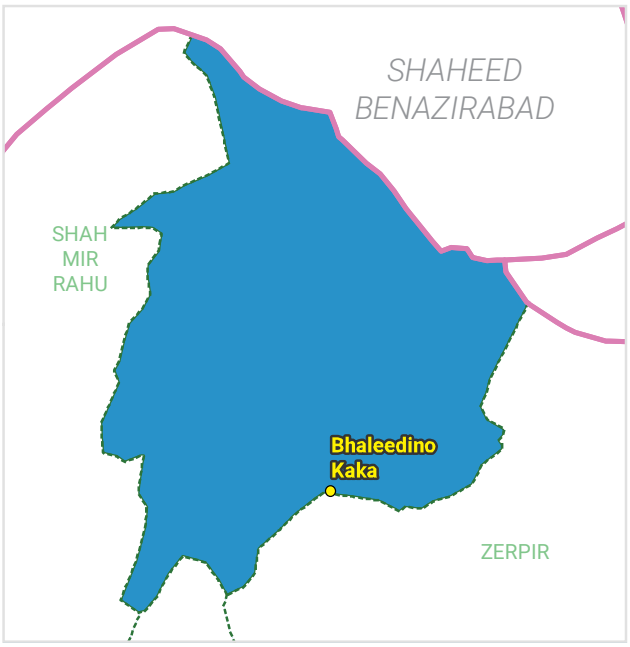
1.67	0.71
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

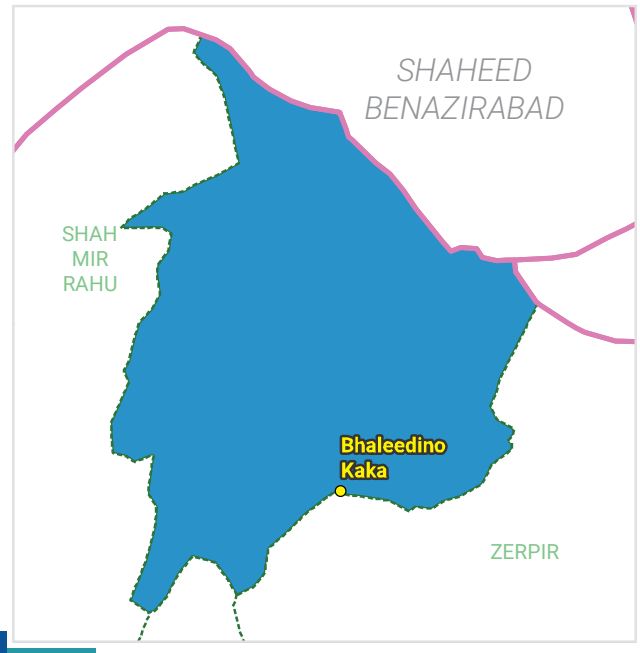
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

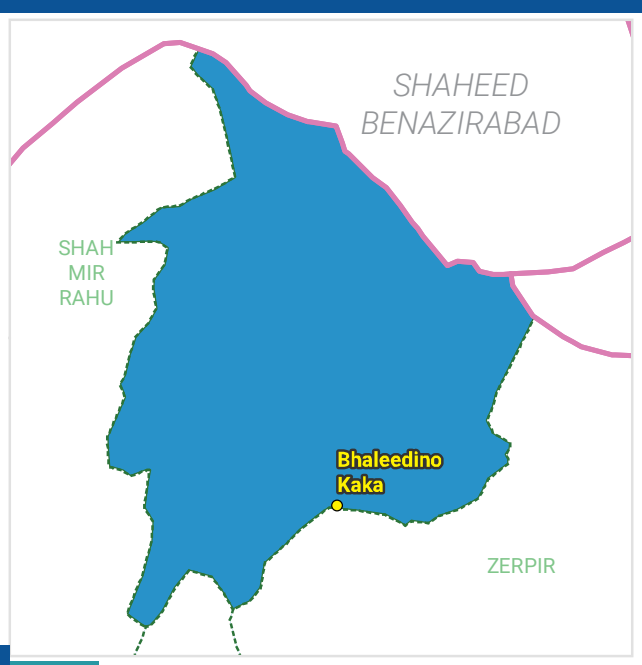


10 YEARS



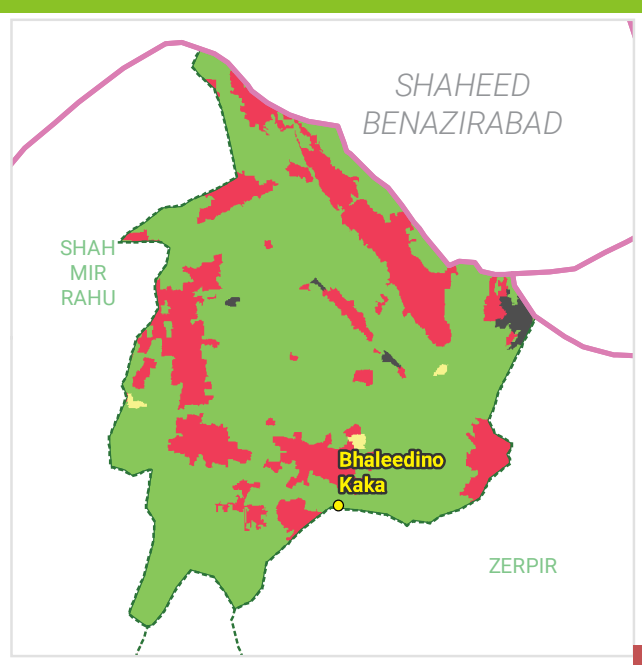
25 YEARS

HAZARD

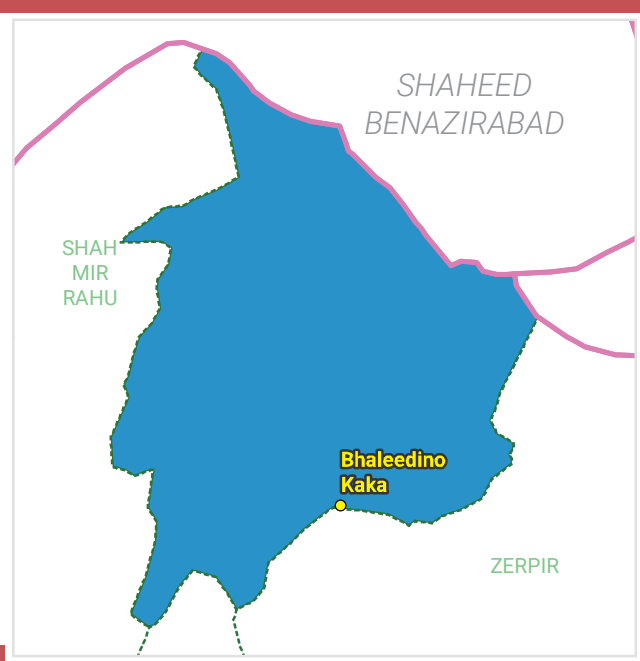


50 YEARS

VULNERABILITY



RISK



5 YEARS

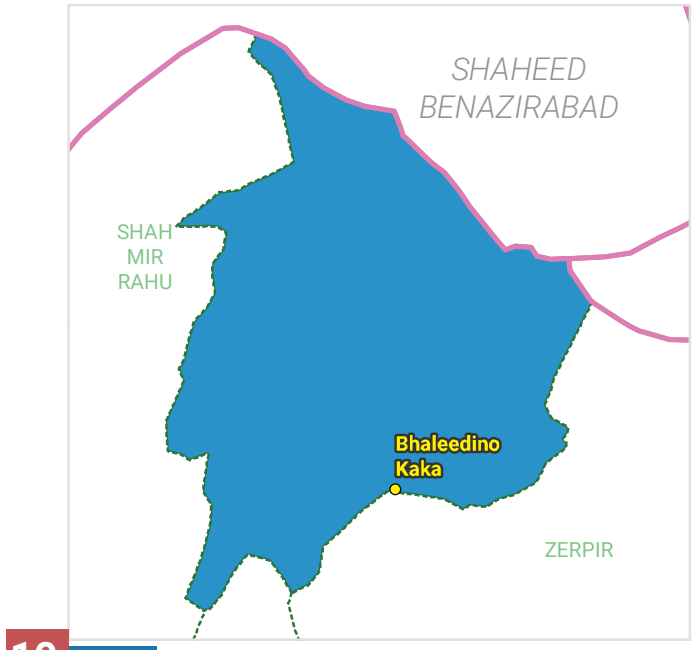
HAZARD
No Hazard, Mild, Moderate, Severe, Extreme

VULNERABILITY
None 0 - 25, Low 26 - 50, Medium 51 - 75, High 76 - 100

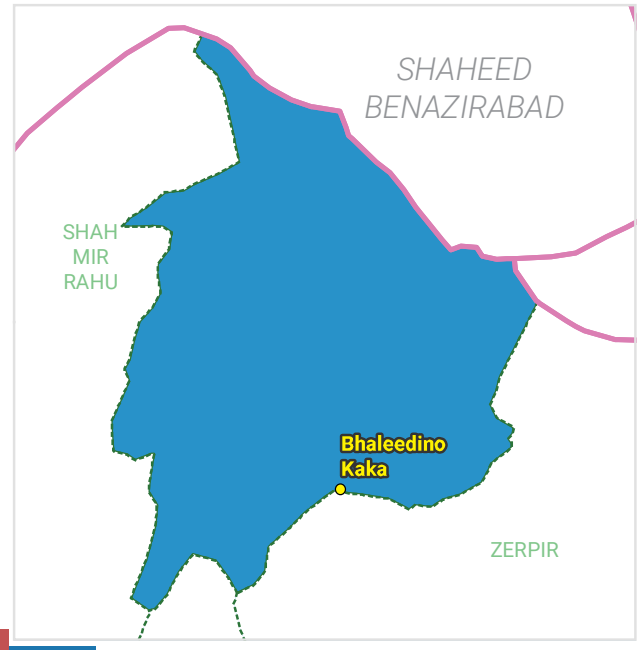
RISK
Very Low 0 - 49, Low 50 - 99, Medium 100 - 199, High 200 - 249, Extreme 250 - 300

AGRICULTURAL DROUGHT

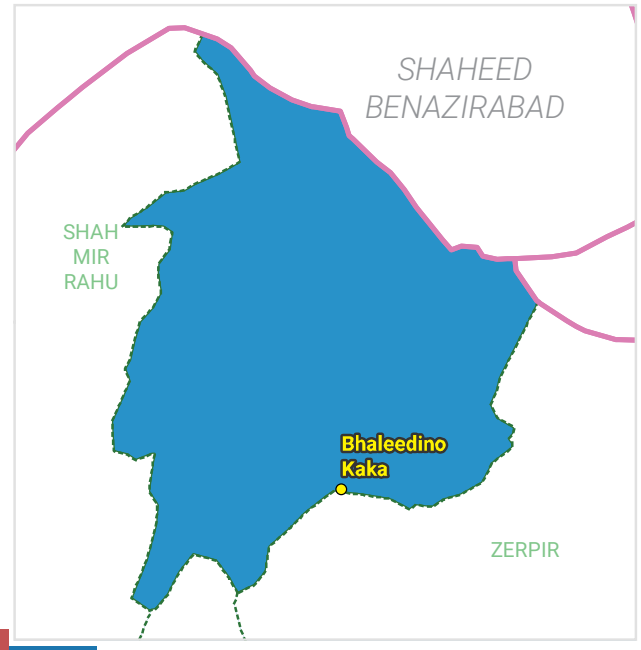
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

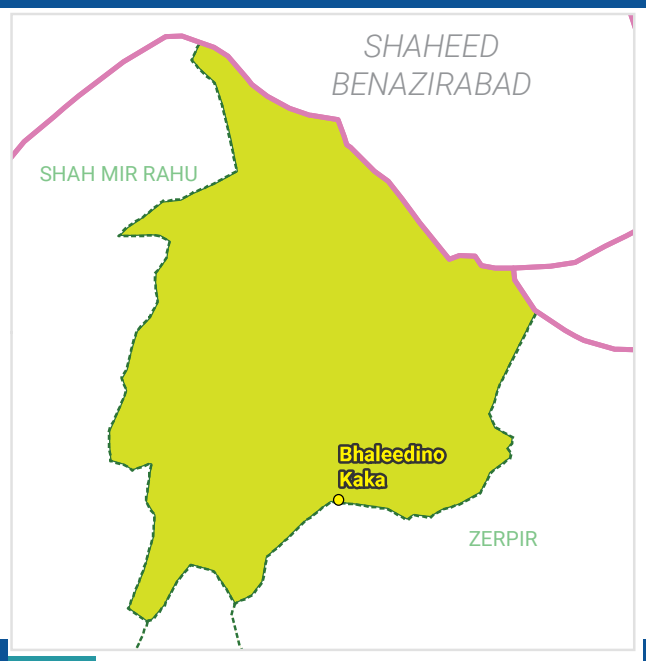
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

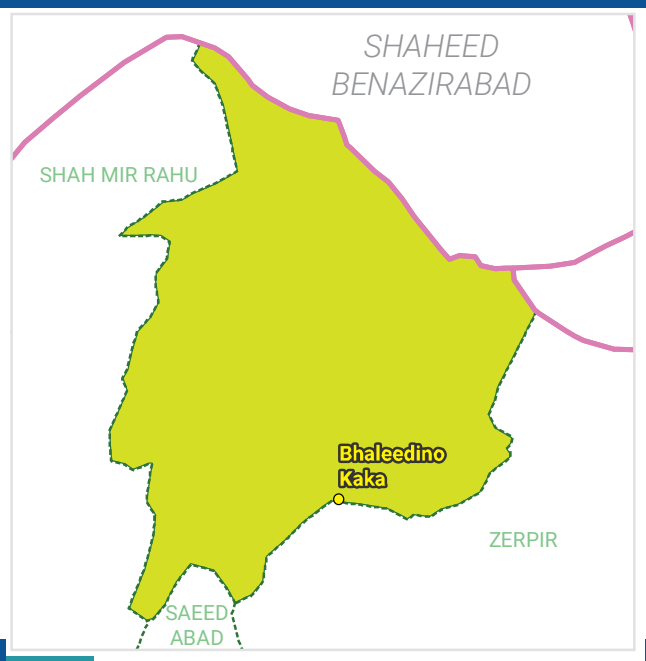
NO ELEMENTS AT RISK FOR AGRICULTURAL DROUGHT

HEATWAVE

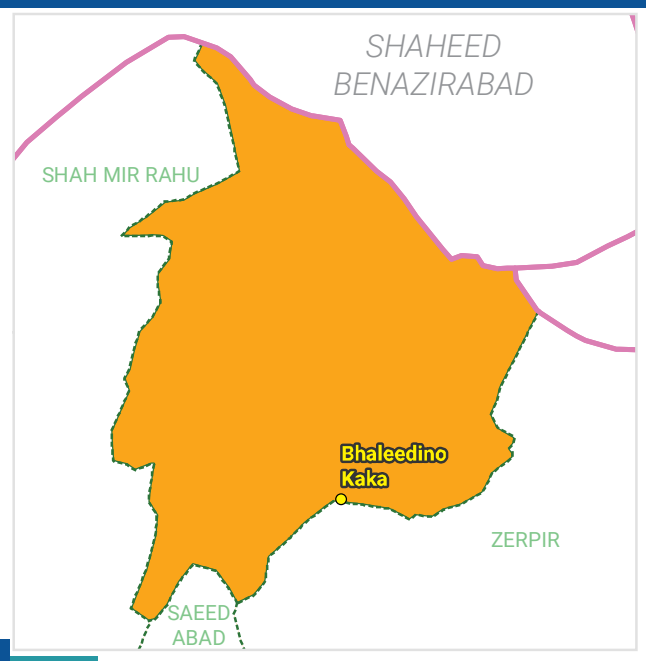
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS



10 YEARS

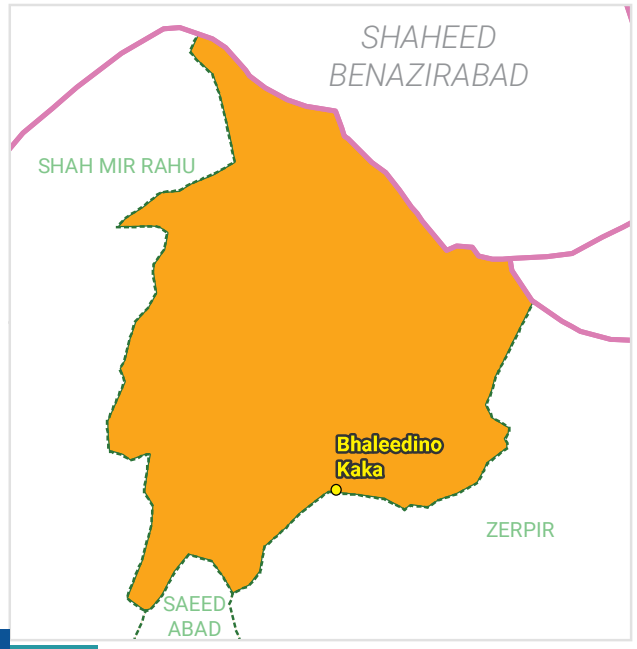


25 YEARS

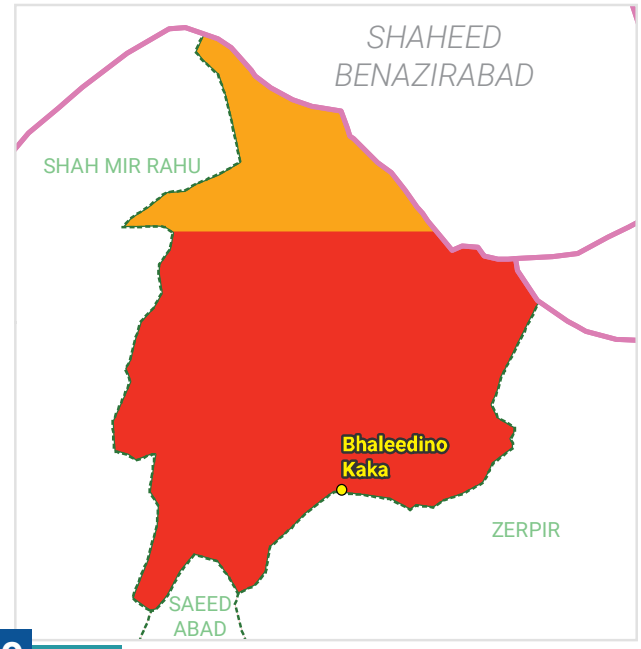
HAZARD

Normal | Moderate | High | Severe | Extreme

HAZARD AT DIFFERENT RETURN PERIODS

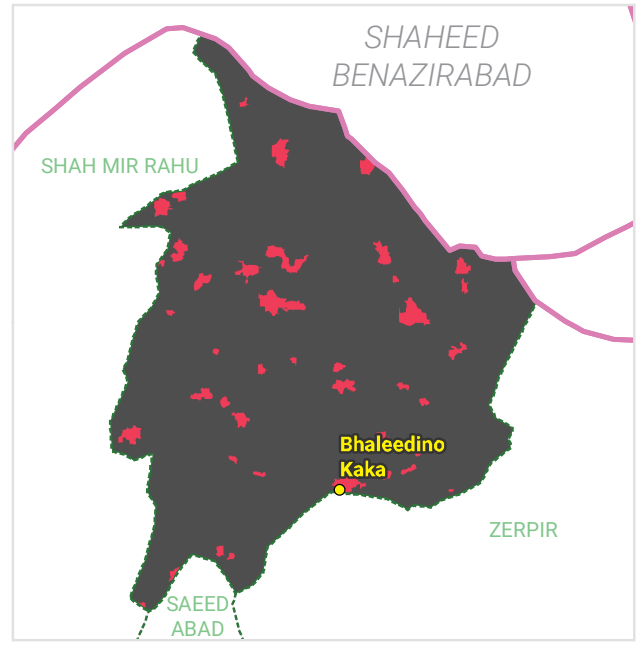


50 YEARS

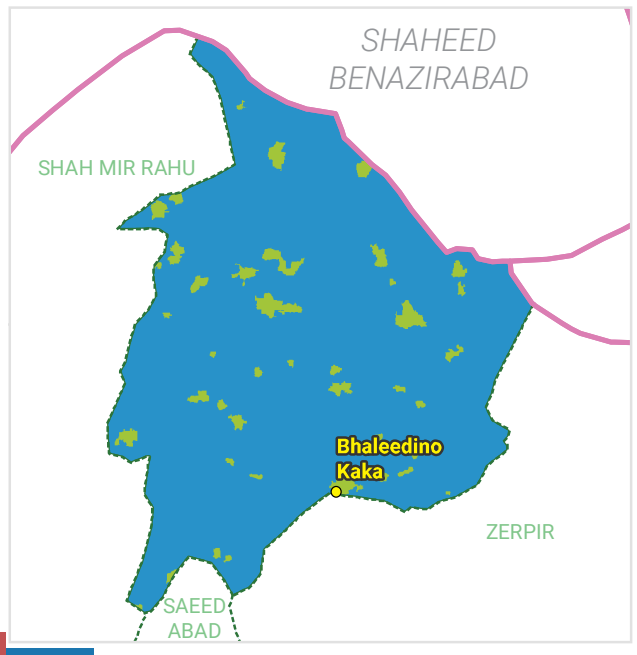


100 YEARS

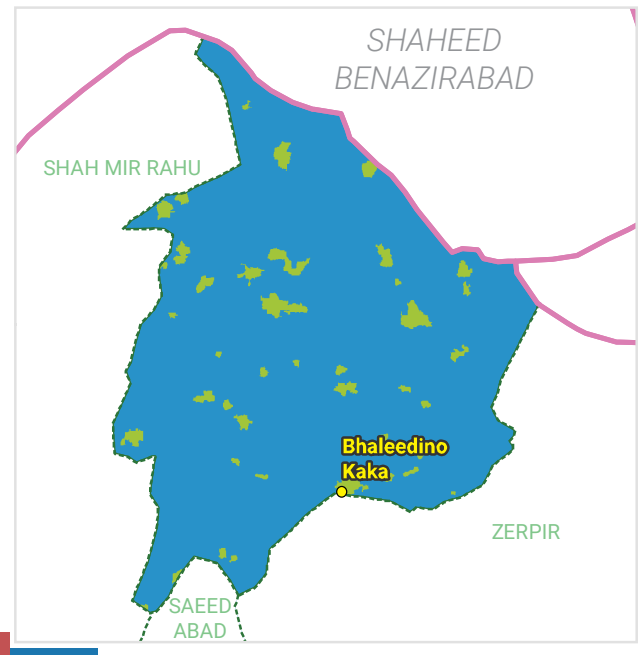
VULNERABILITY



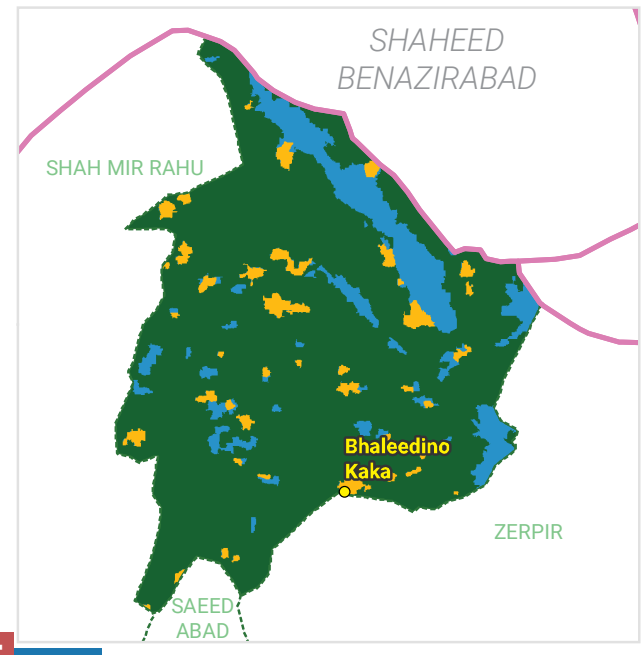
RISK AT DIFFERENT RETURN PERIODS



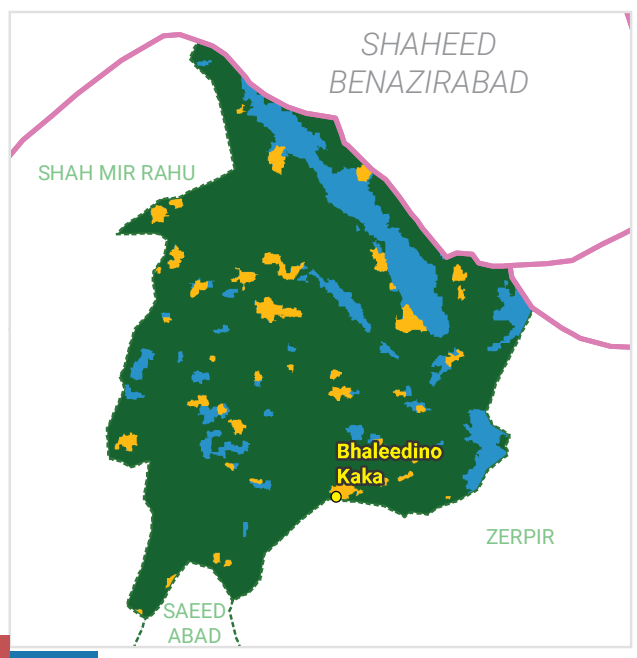
5 YEARS



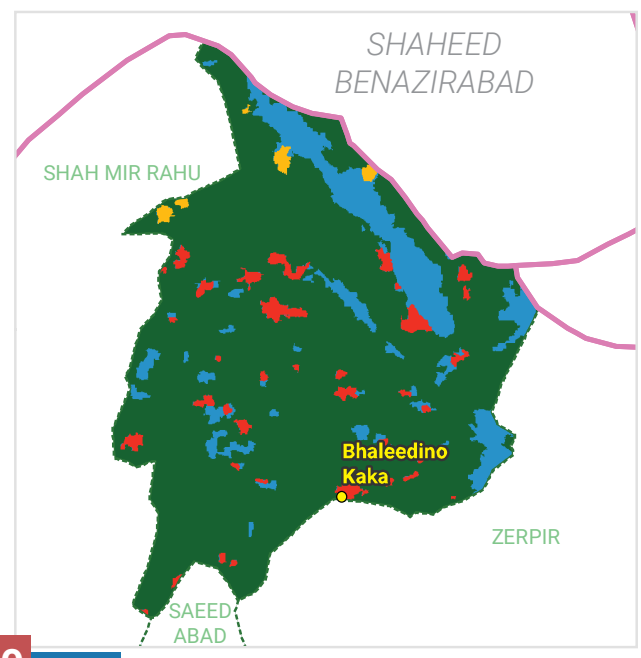
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Moderate
- High
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

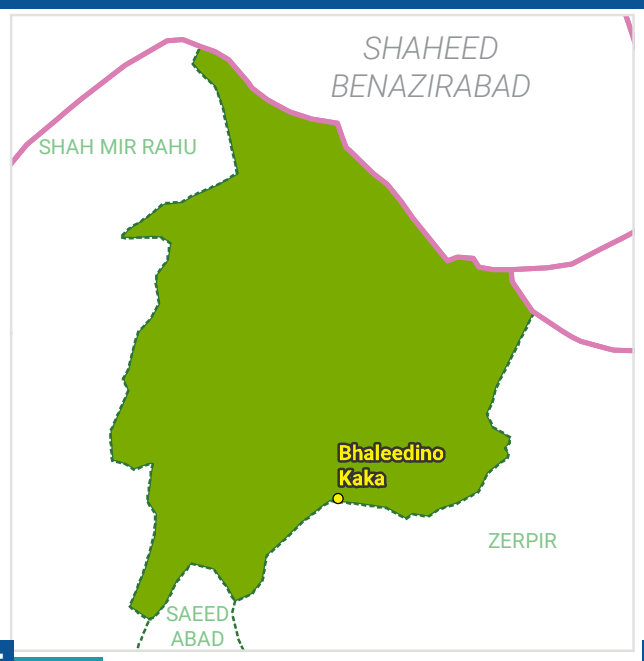
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

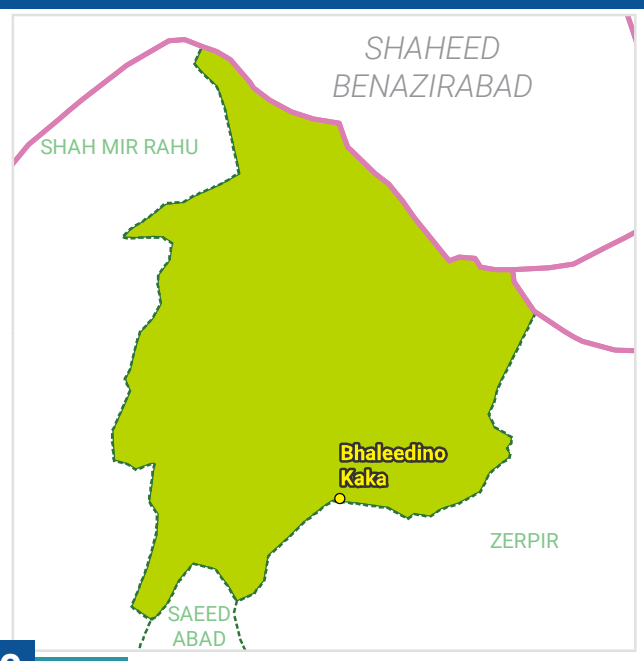
43	5724	29303	40.67	0	0	1.99
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

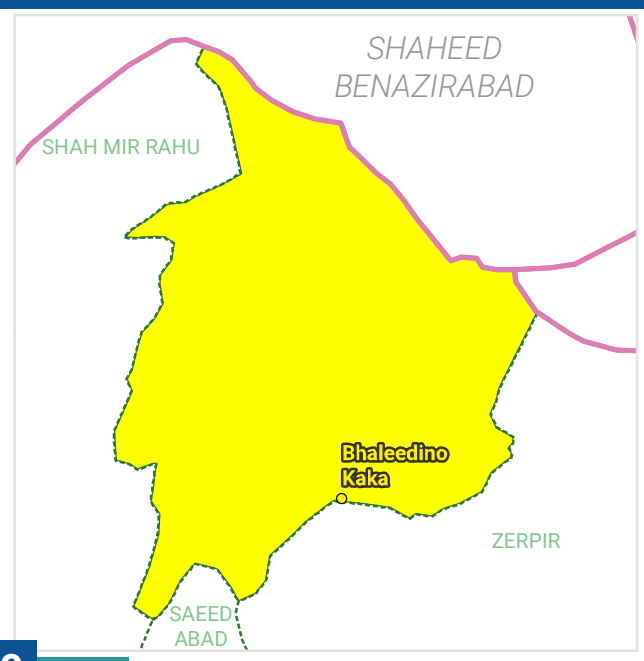
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

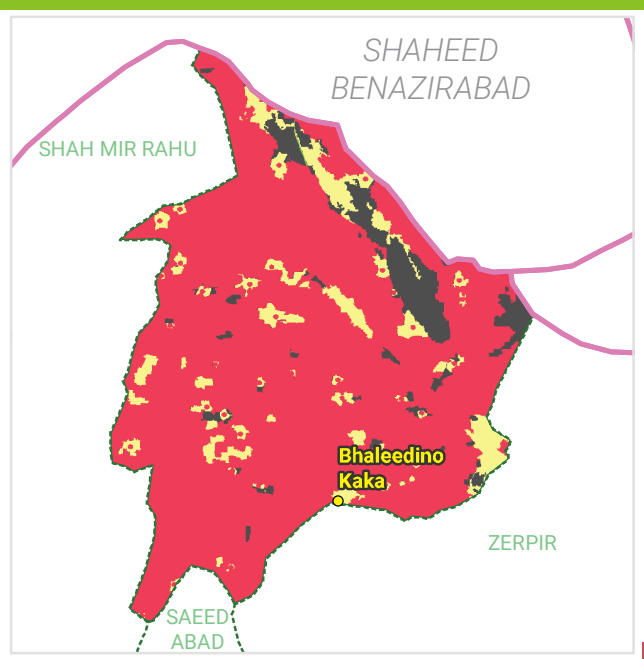


100 YEARS

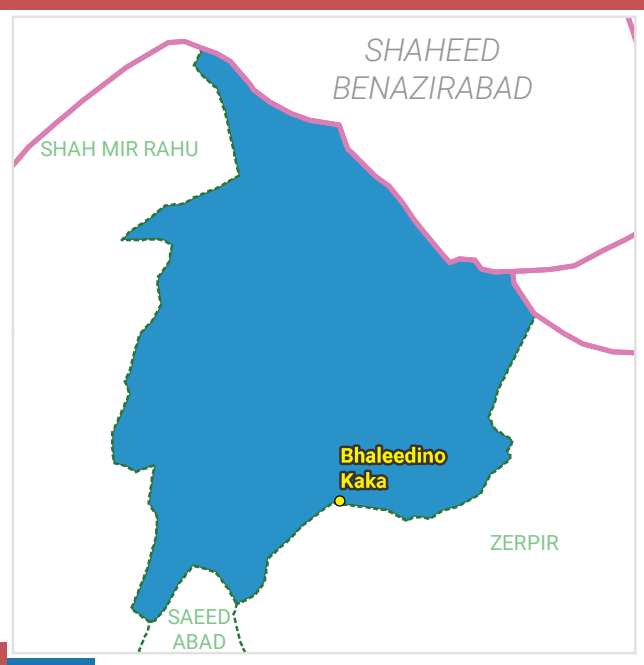


500 YEARS

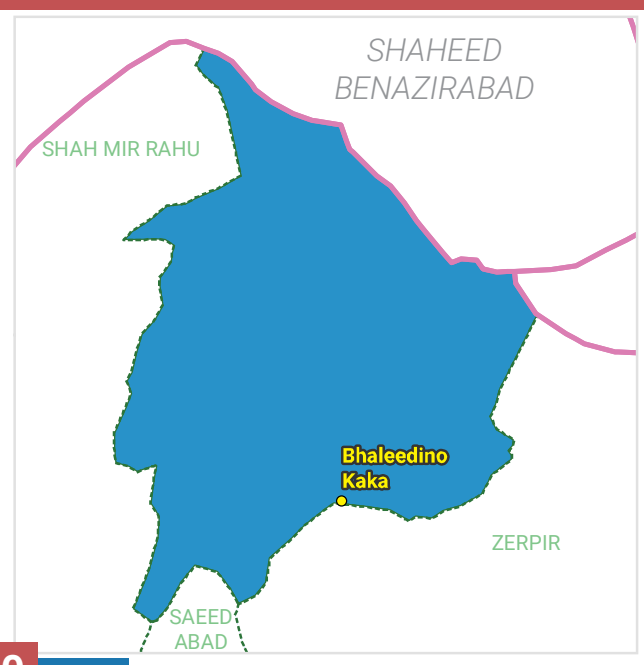
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS



25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

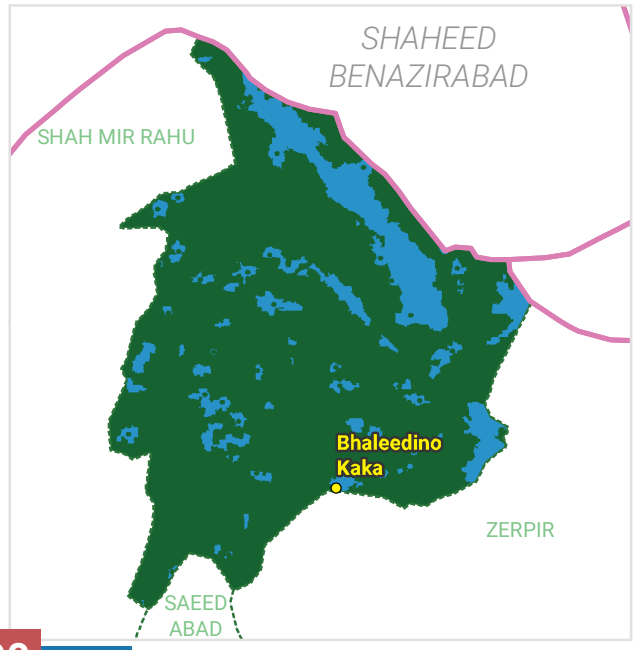
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

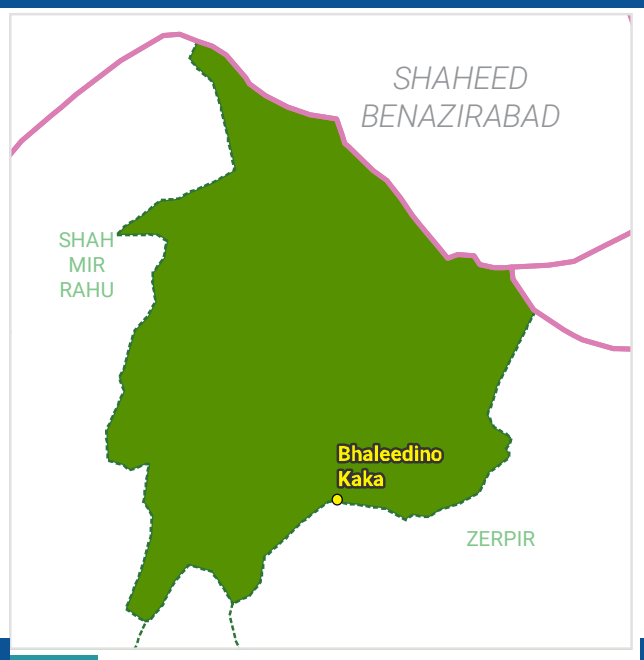
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

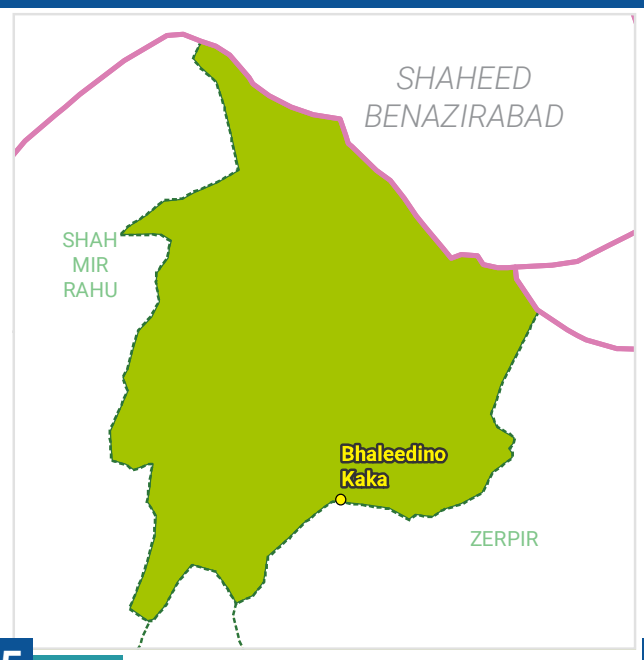
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

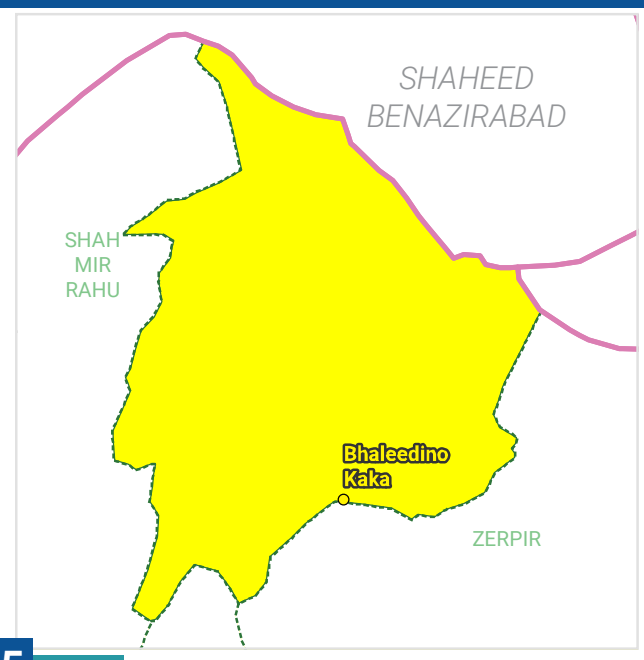
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS



475 YEARS



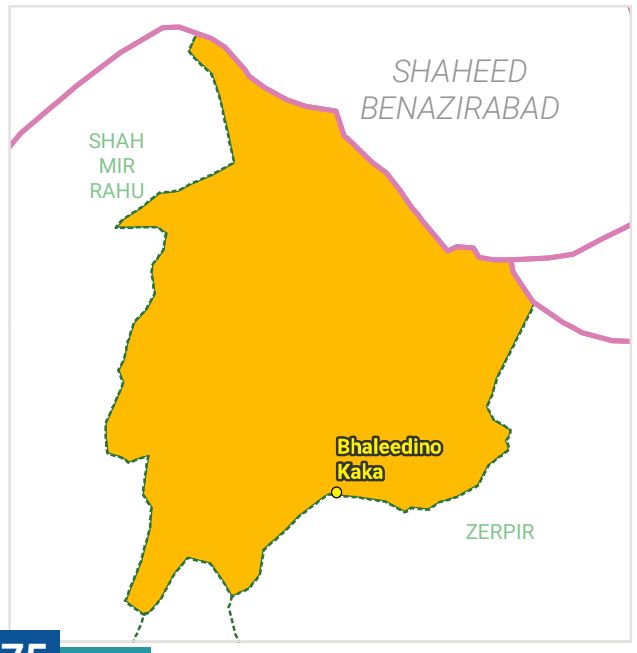
975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

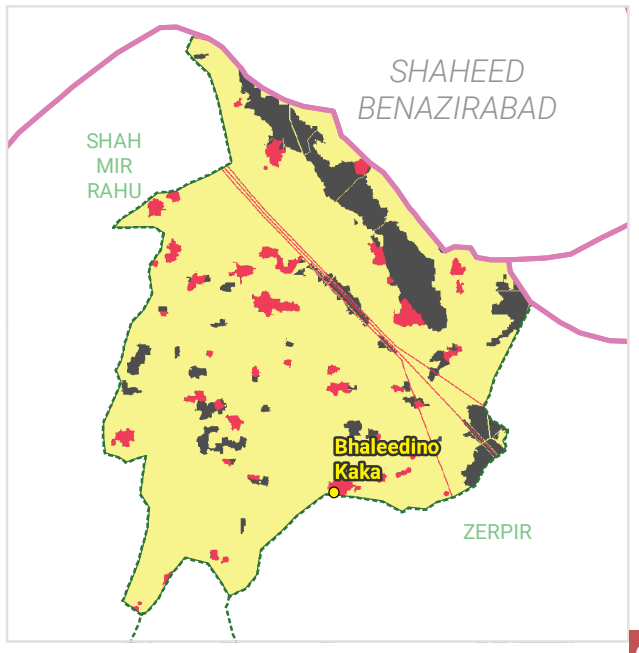
EARTHQUAKE

HAZARD

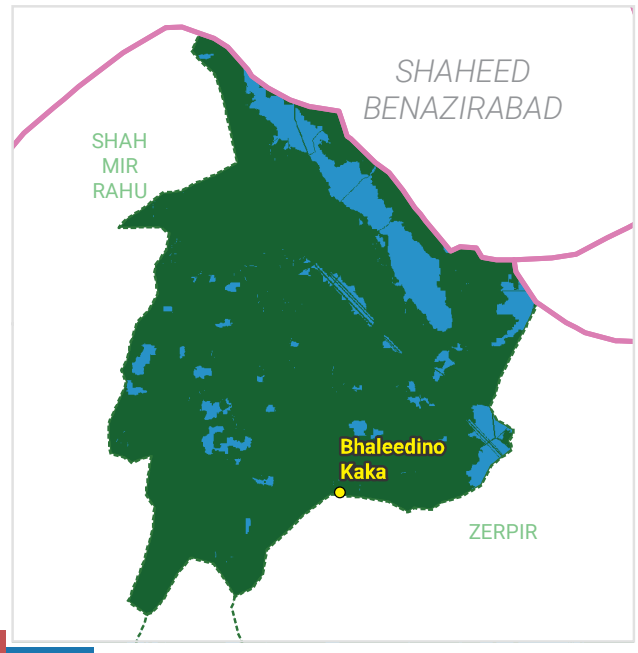


2475 YEARS

VULNERABILITY

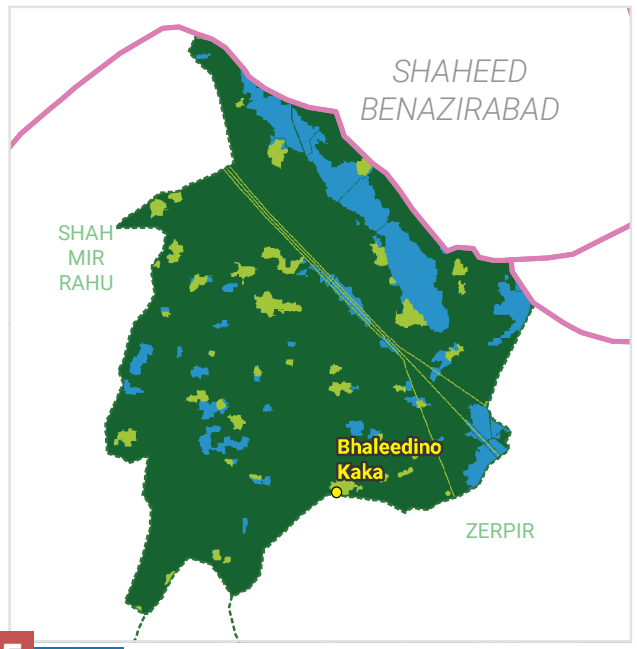


RISK

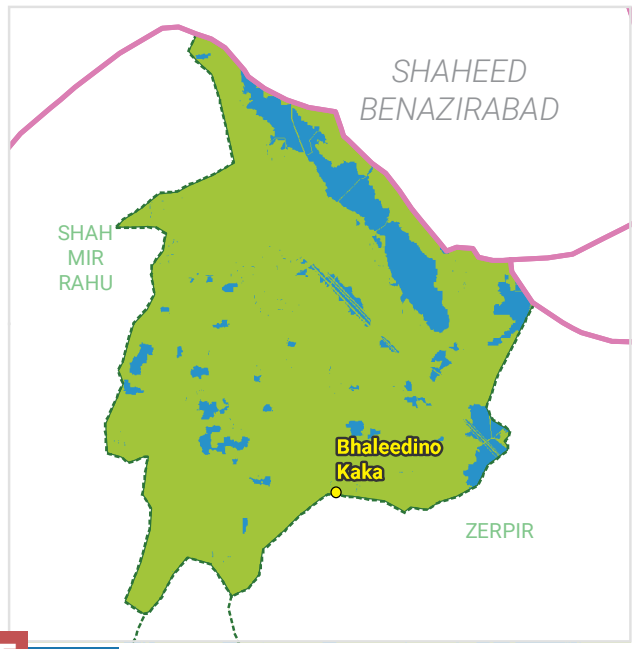


95 YEARS

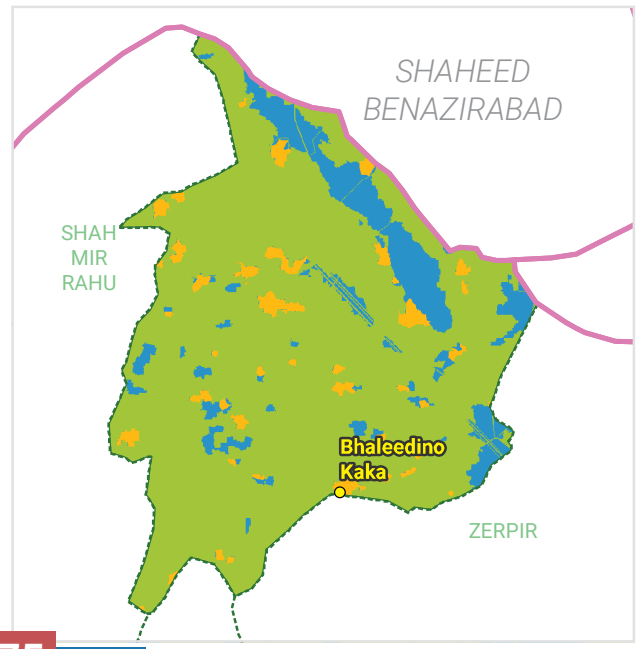
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

45	5703	29186	40.71	0.01	0	0.09	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.99	0.11	87.38	0	22.63	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
77	0	0	0	4	0	0	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low Medium	Low Medium High	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	None	●	●	●
HEATWAVE	Medium	Medium	Low High	Low High	Low High Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - BHANOTH

Union Council area in sq. km **127**

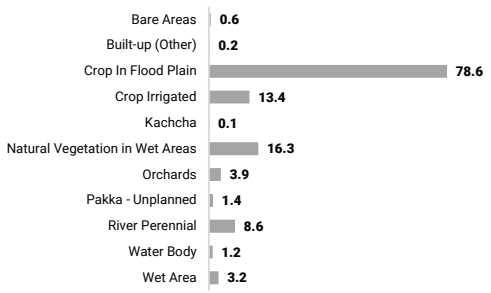
Surrounding UCs / Features
HALA OLD in South
SAEED ABAD in North East
KARAM KHAN NIZAMANI in South East
JAMSHORO DISTRICT in West

Population — 2017 approx. **23,913**

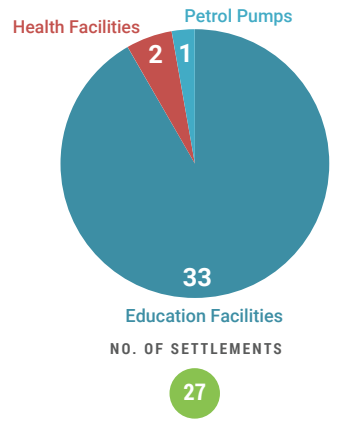
No. of household — 2017 approx. **4,075**

Land Use Land Cover

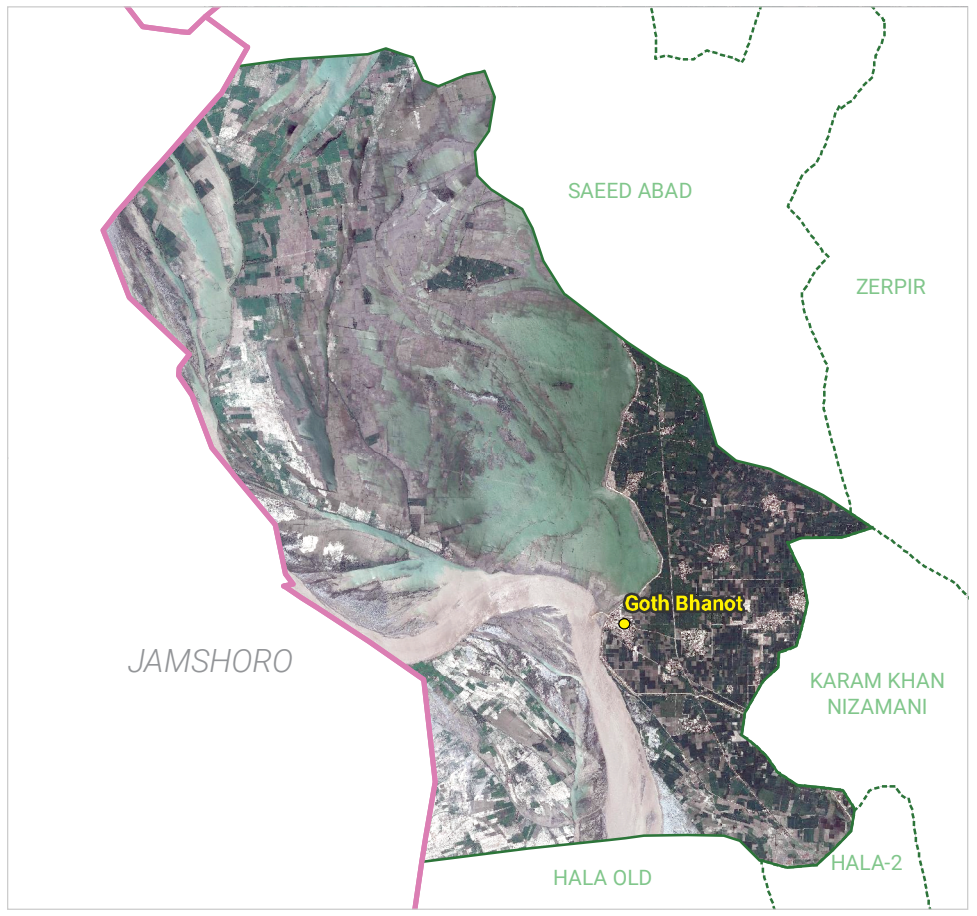
coverage area in sq.km



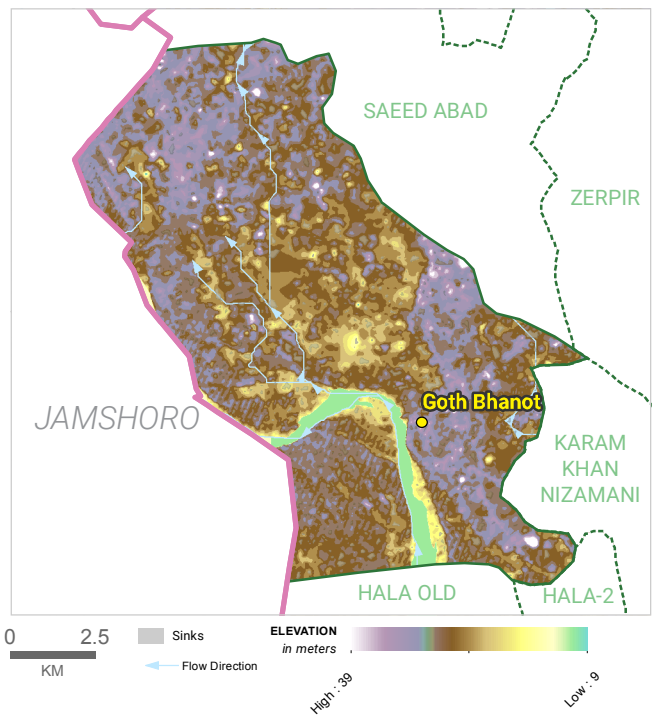
Critical Infrastructure



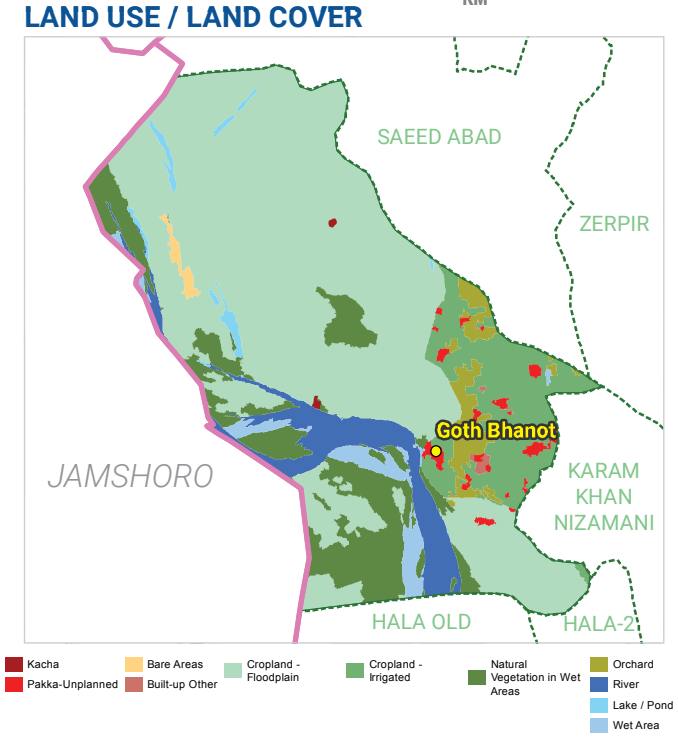
SATELLITE IMAGERY



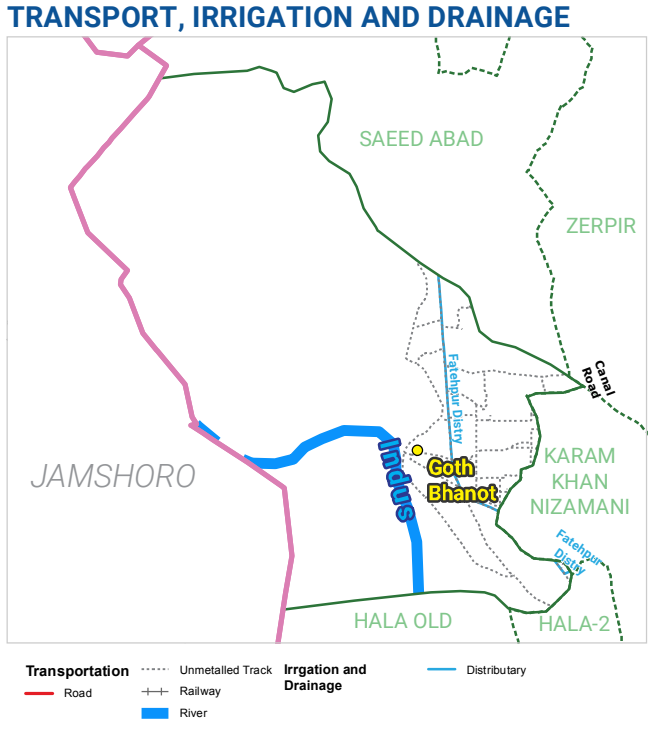
DEM AND FLOW DIRECTION



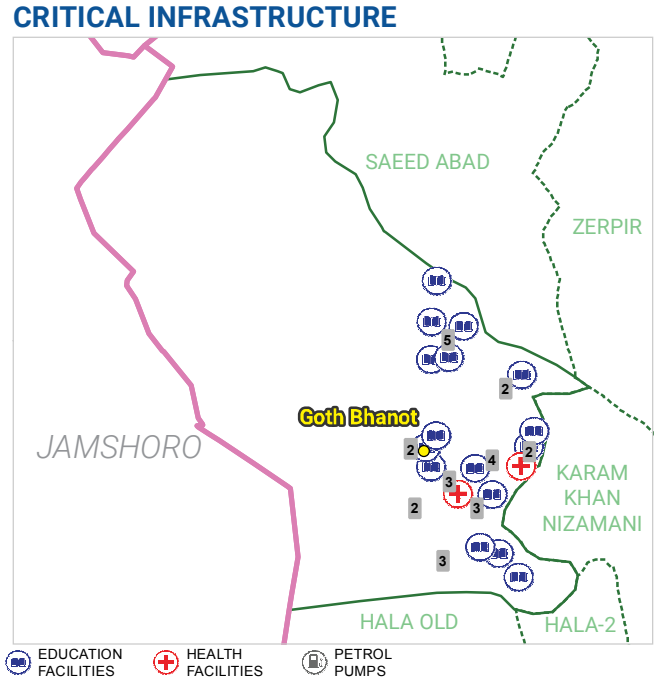
LAND USE / LAND COVER



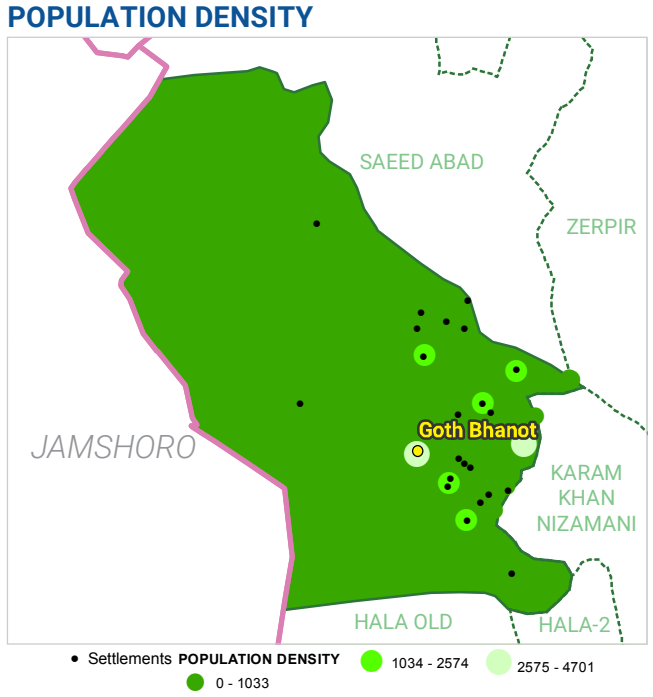
TRANSPORT, IRRIGATION AND DRAINAGE



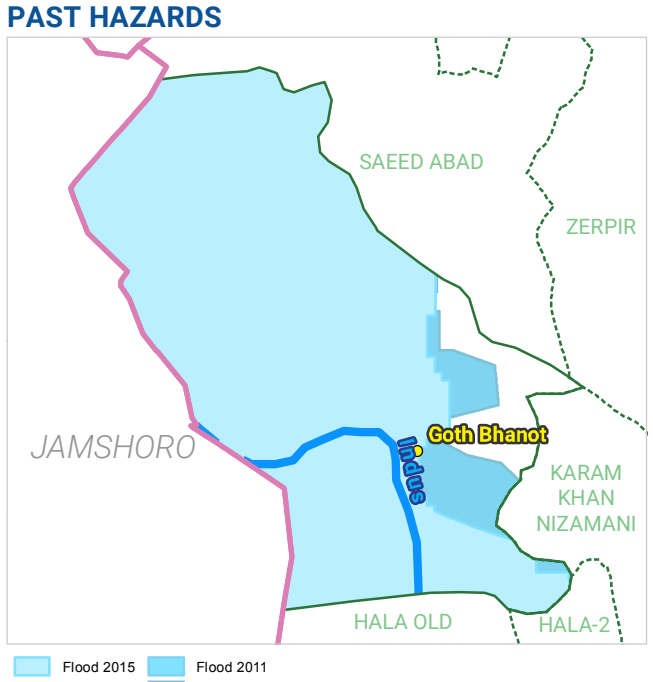
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

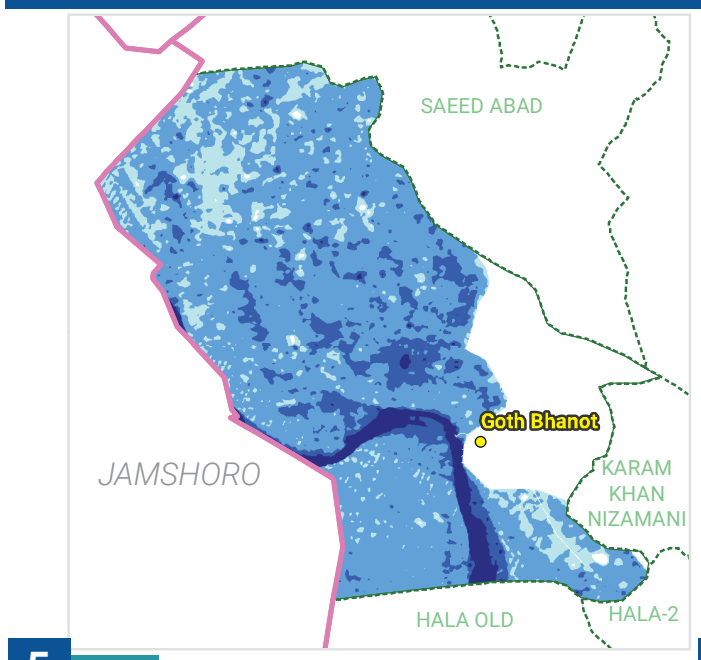


PAST HAZARDS

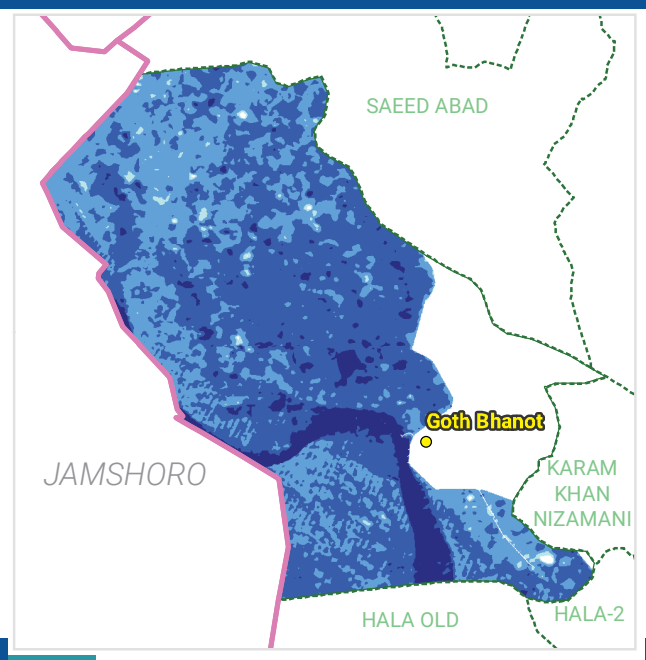


FLOOD

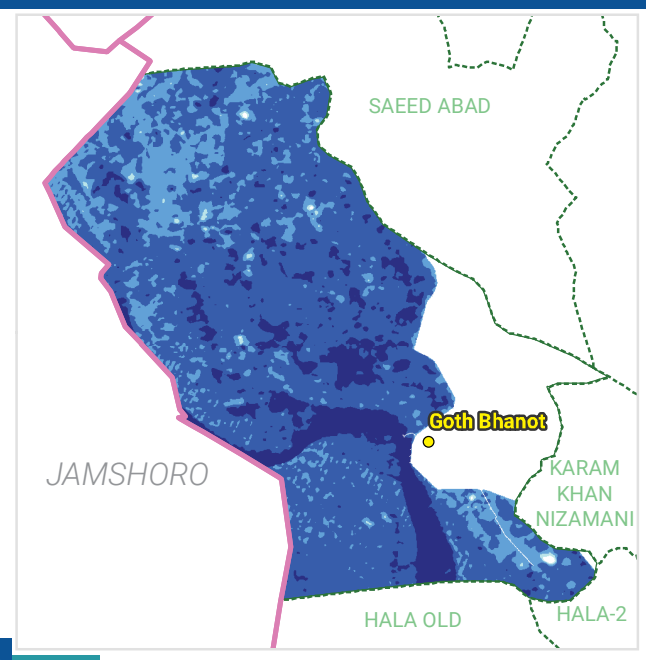
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

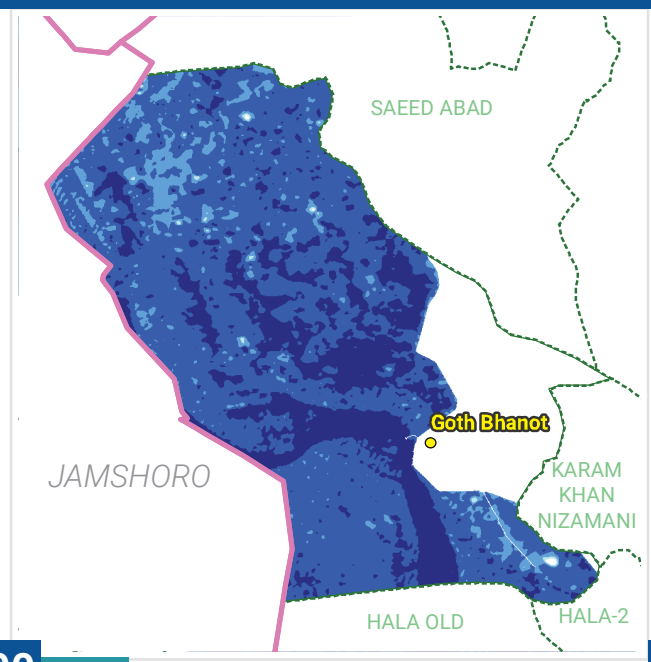


25 YEARS

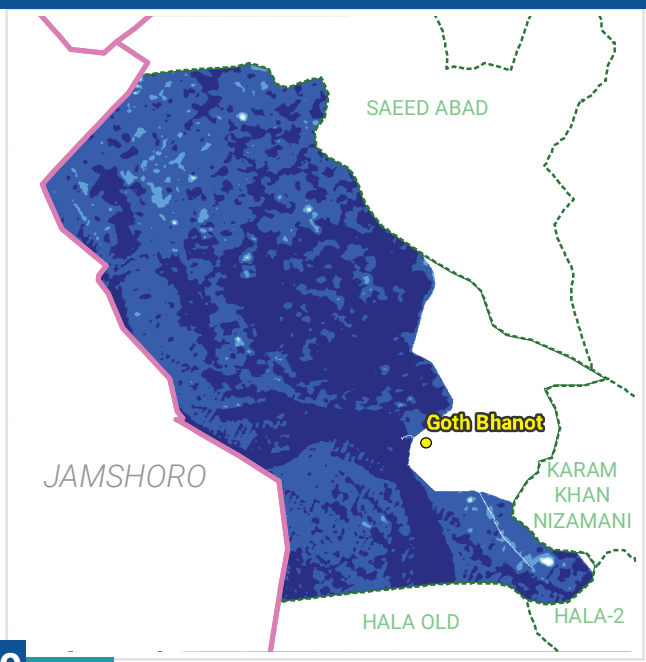


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

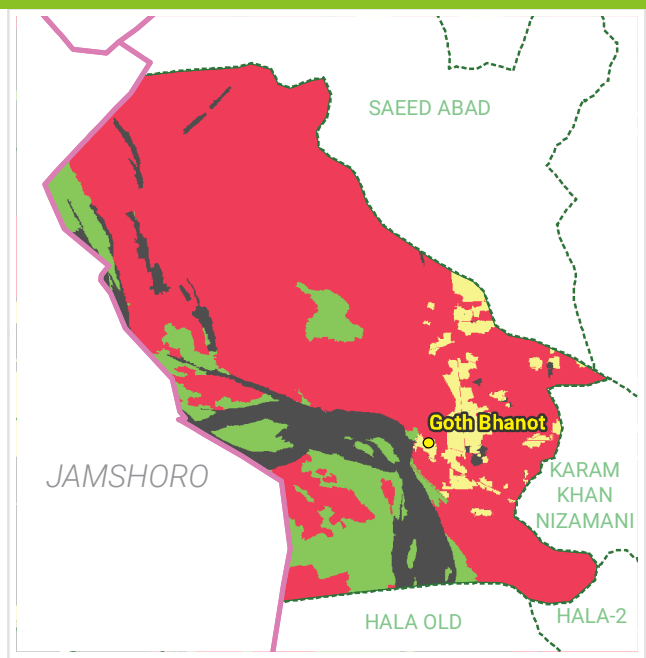


100 YEARS

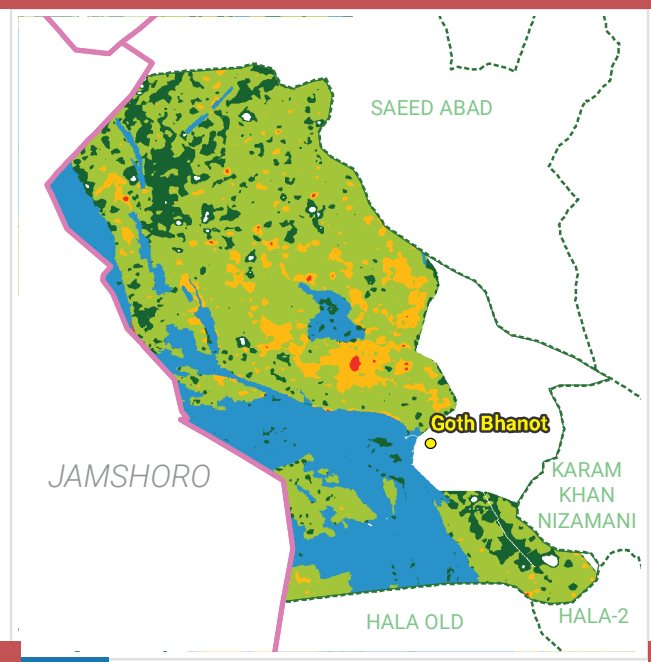


250 YEARS

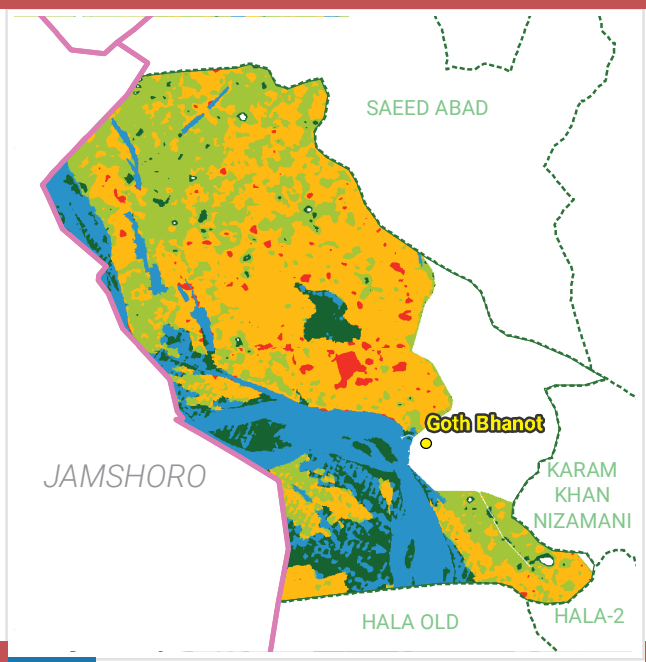
VULNERABILITY



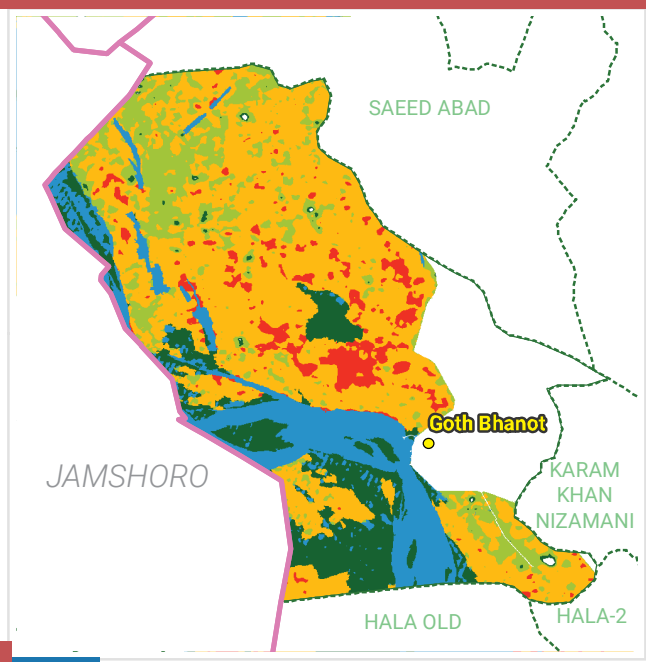
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

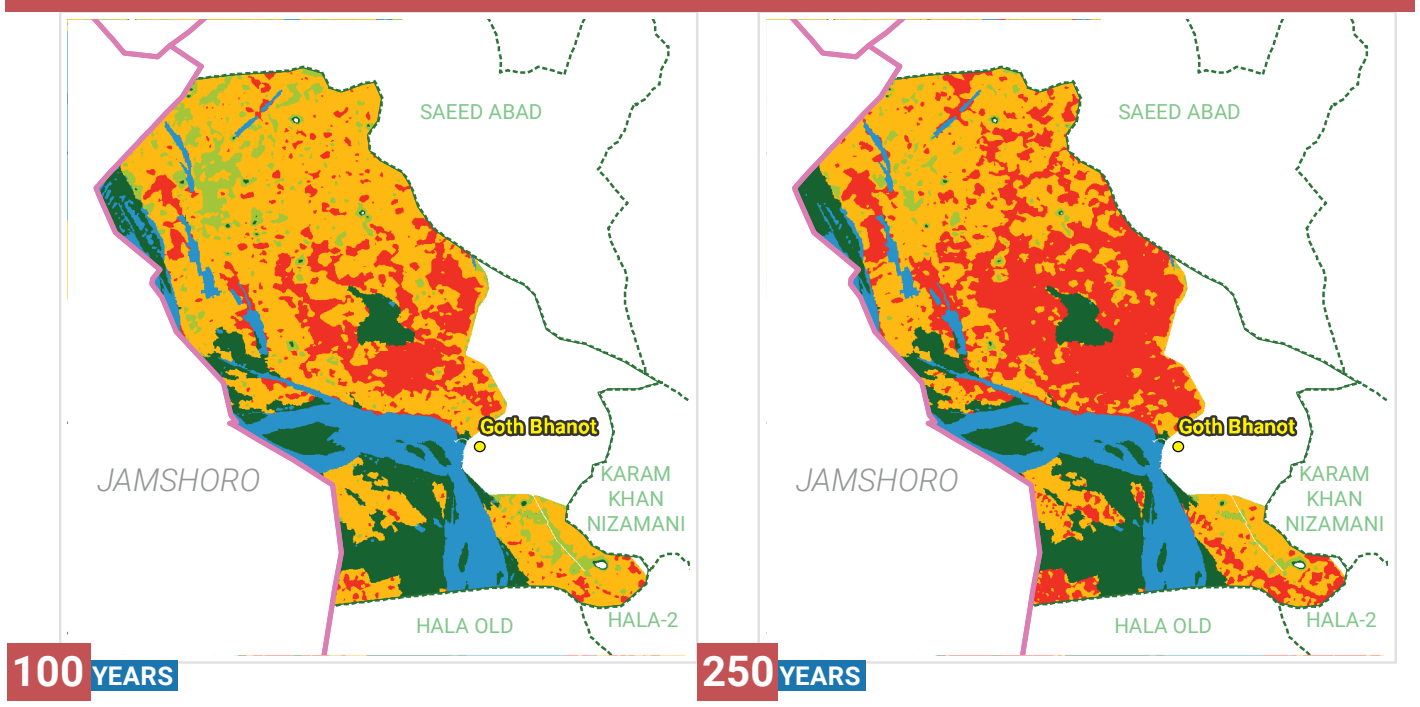
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



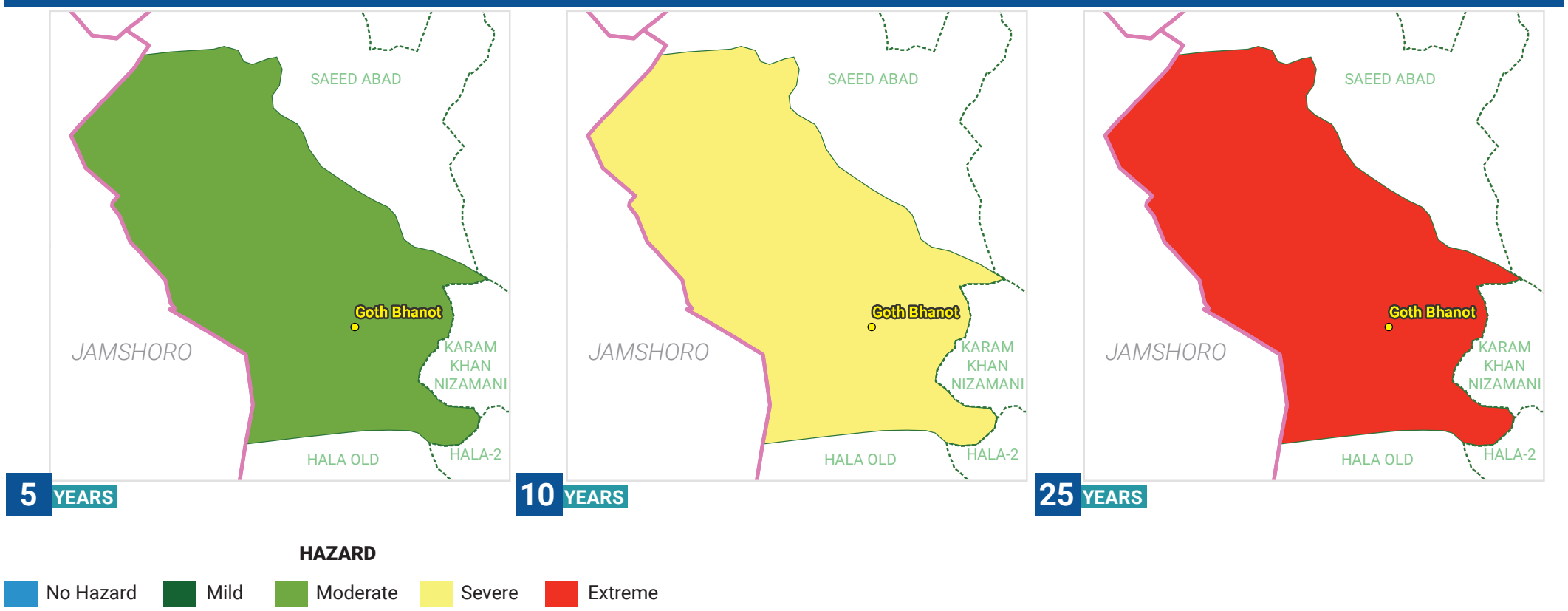
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

4	582	3337	78.17	0	0.11	13.53	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.10	0	5.36	0	0.00	0	0	5
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

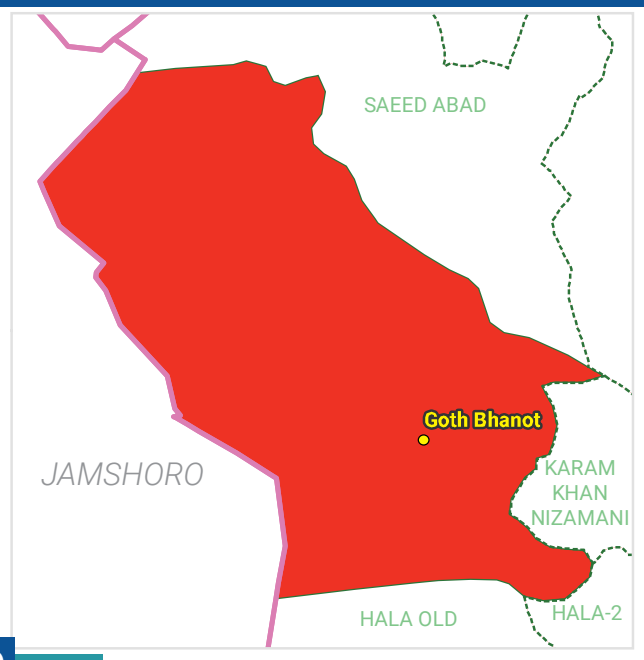
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



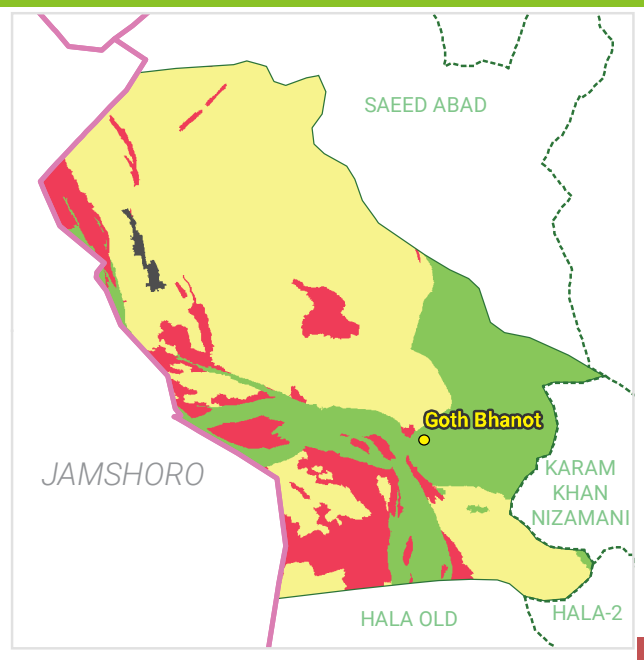
METEOROLOGICAL DROUGHT

HAZARD

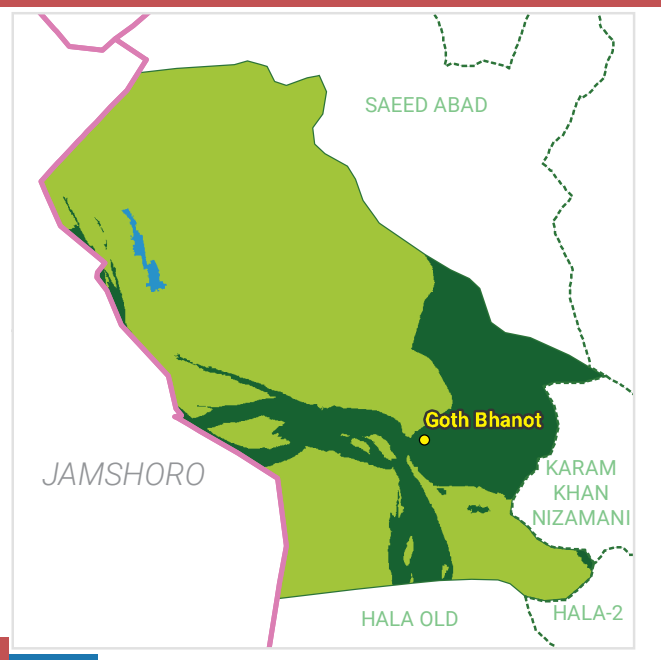


50 YEARS

VULNERABILITY

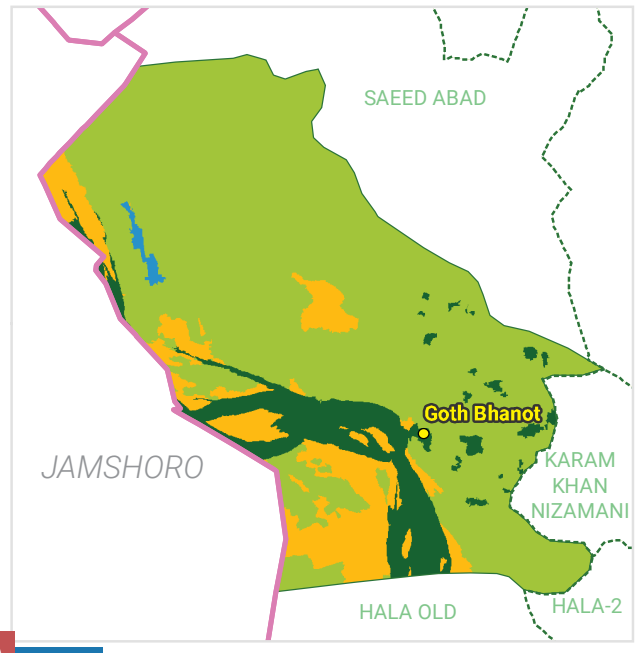


RISK

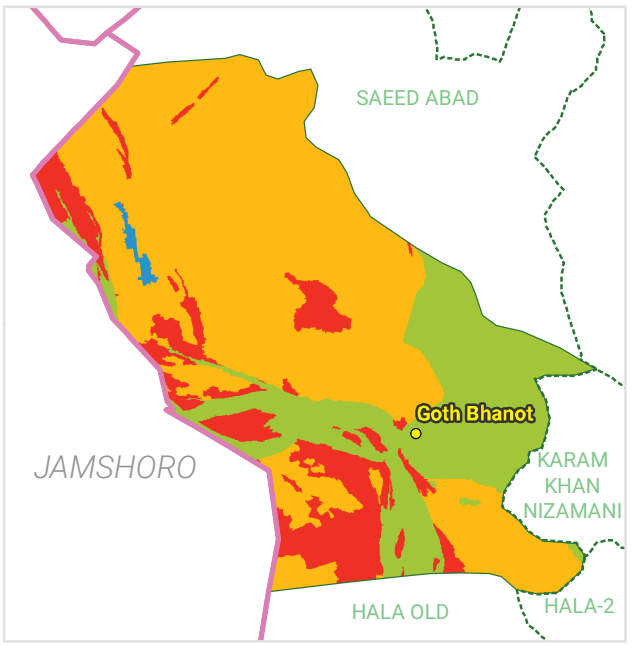


5 YEARS

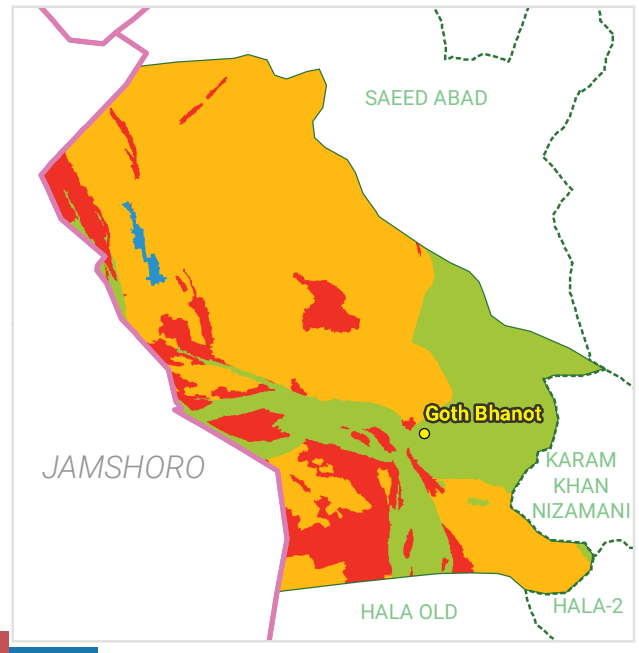
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

ELEMENTS AT RISK

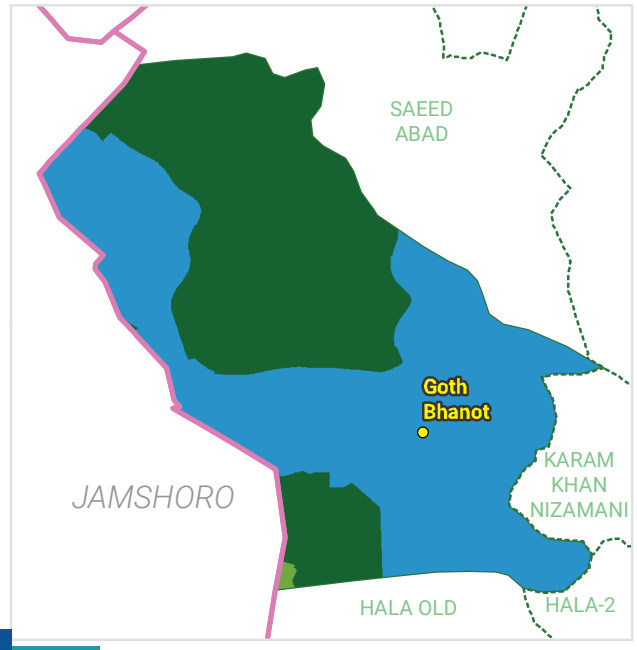
(BASED ON 50 YEARS RETURN PERIOD)

27	4075	23913	95.83	0	0	16.30	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

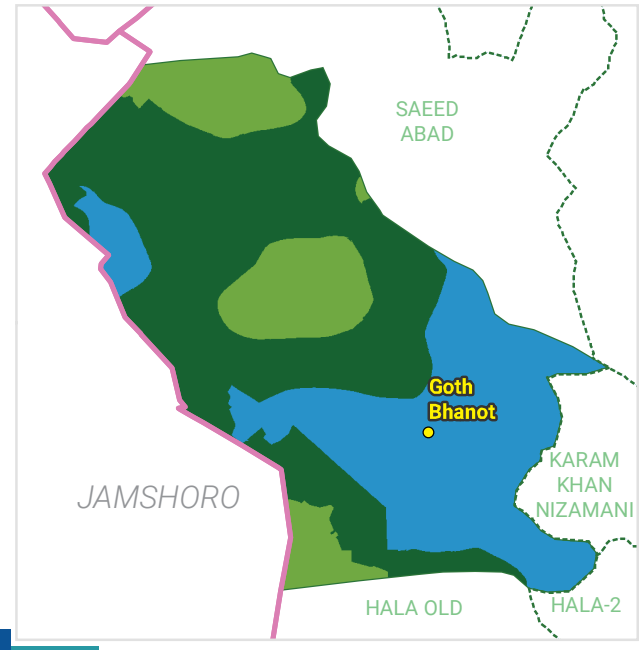
1.22	3.17
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

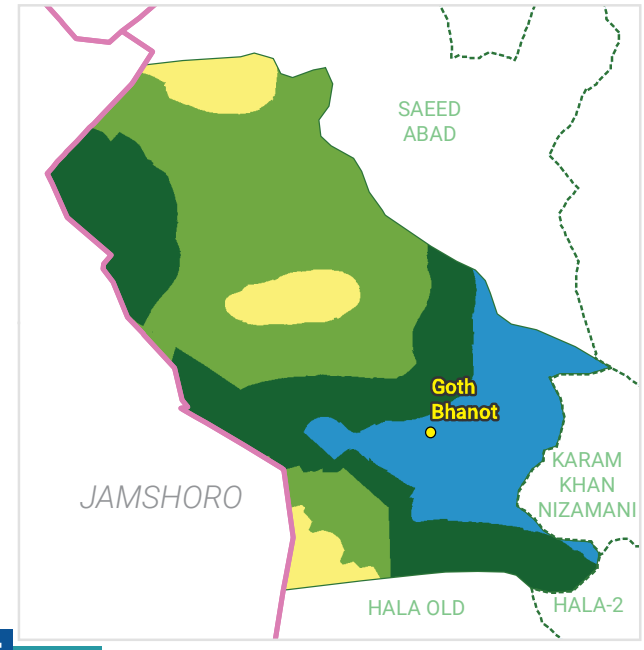
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

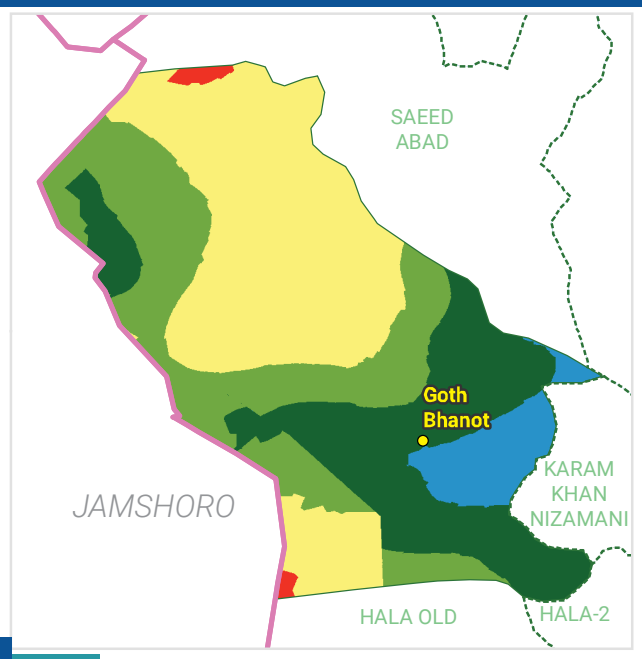


10 YEARS

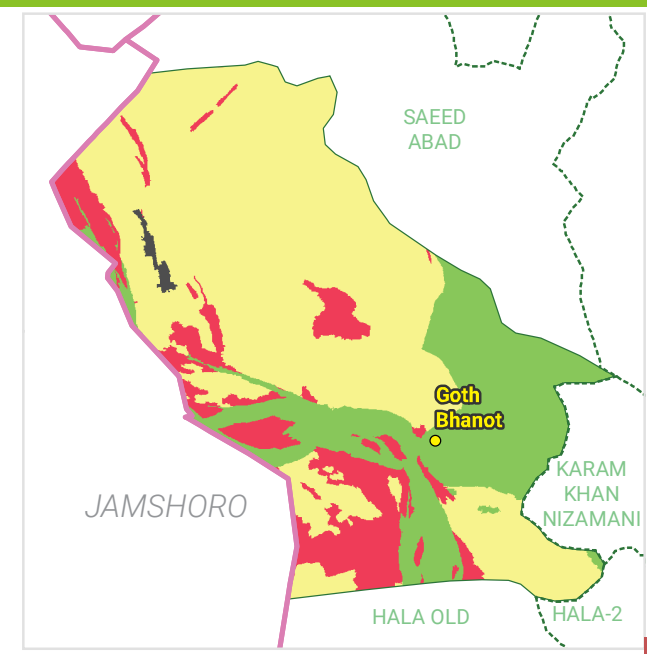


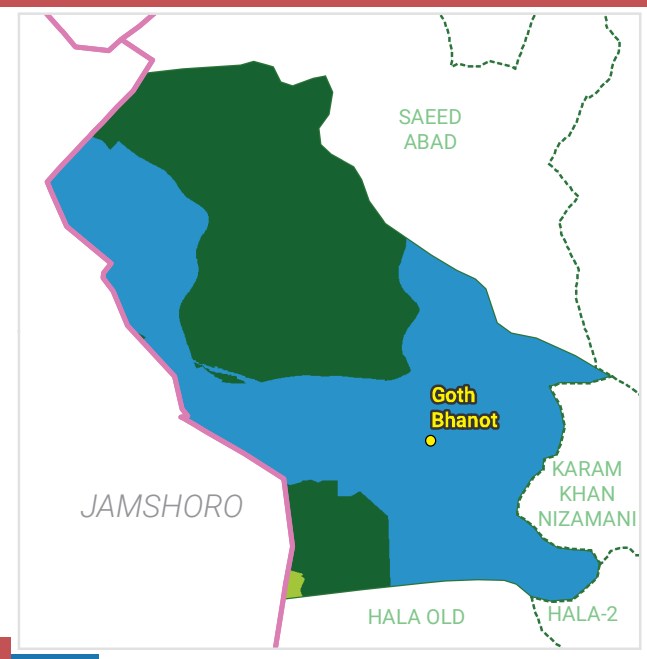
25 YEARS

HAZARD | VULNERABILITY | RISK



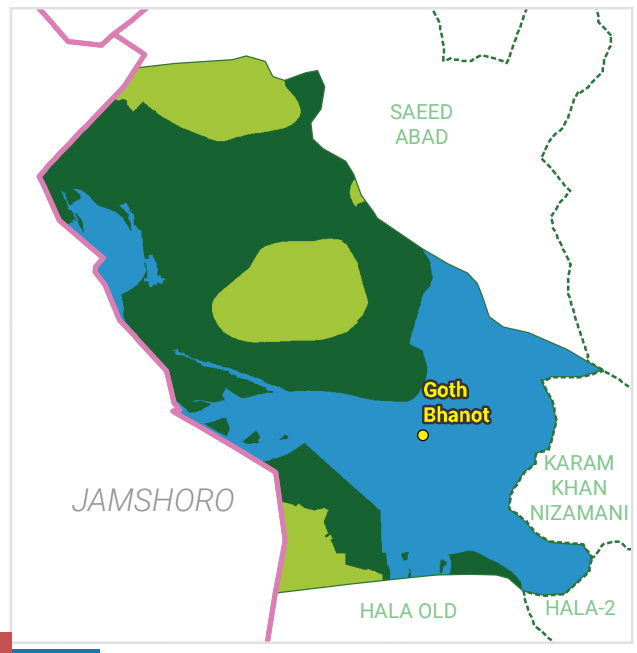
50 YEARS



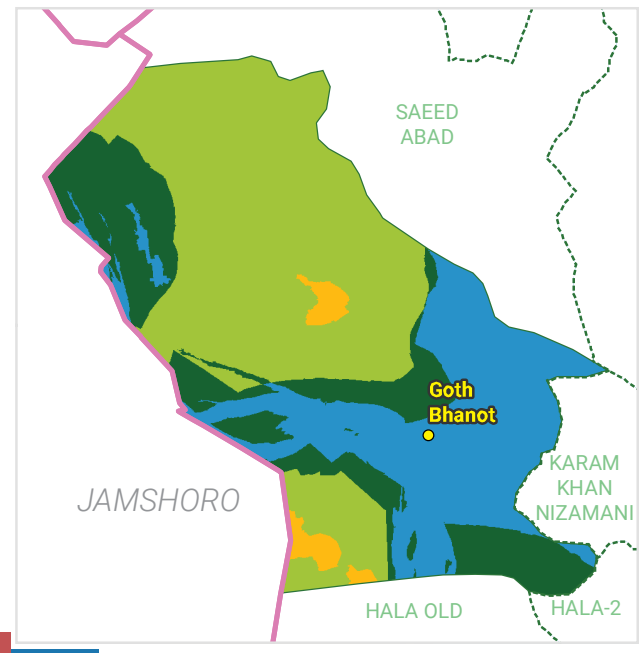


5 YEARS

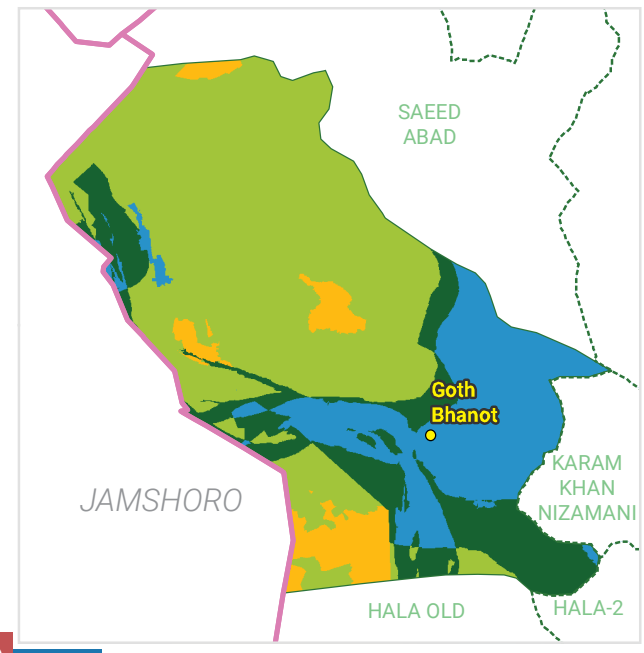
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Severe
- Mild
- Extreme
- Moderate

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

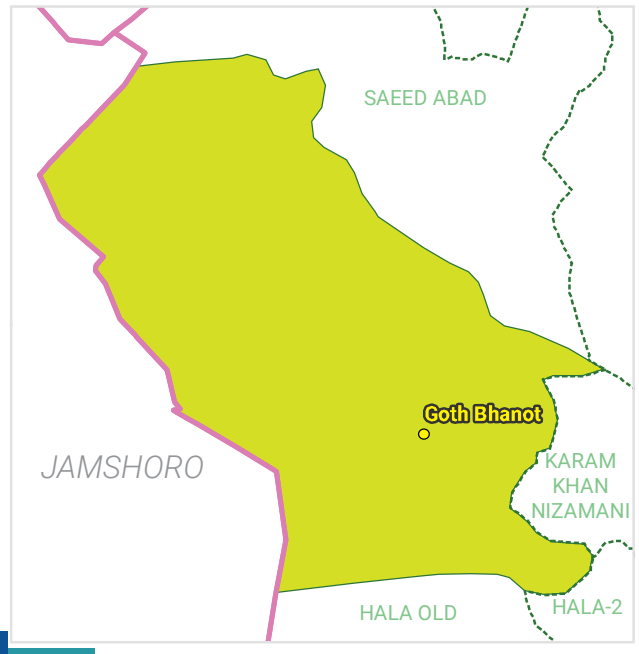
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

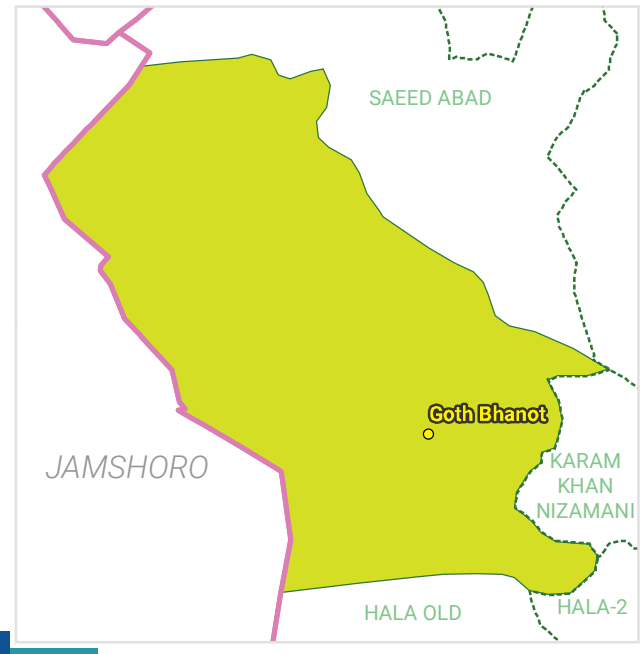
5	563	3221	97.73	0	0	19.97	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)
1.50	1.21						
WATER BODY (SQ. KM)	WET AREA (SQ. KM)						

HEATWAVE

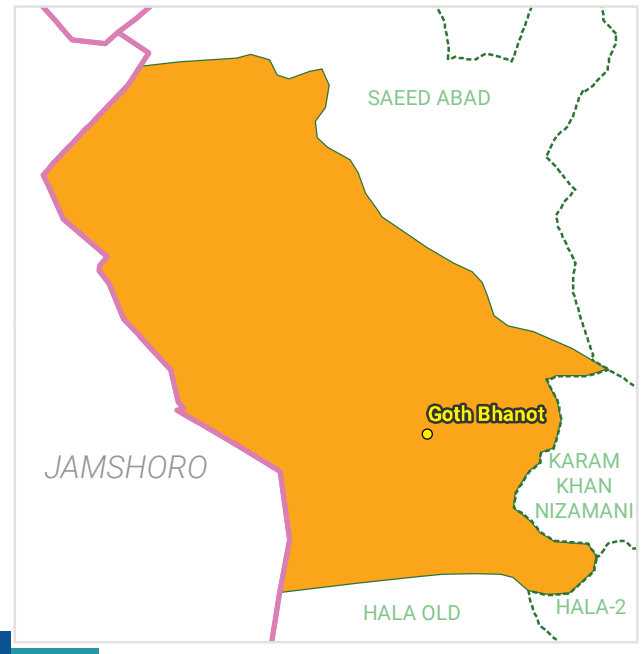
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

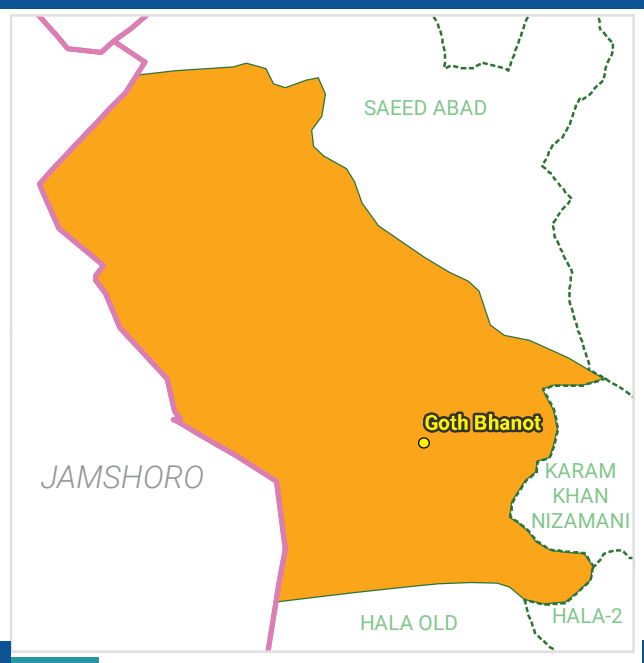


10 YEARS

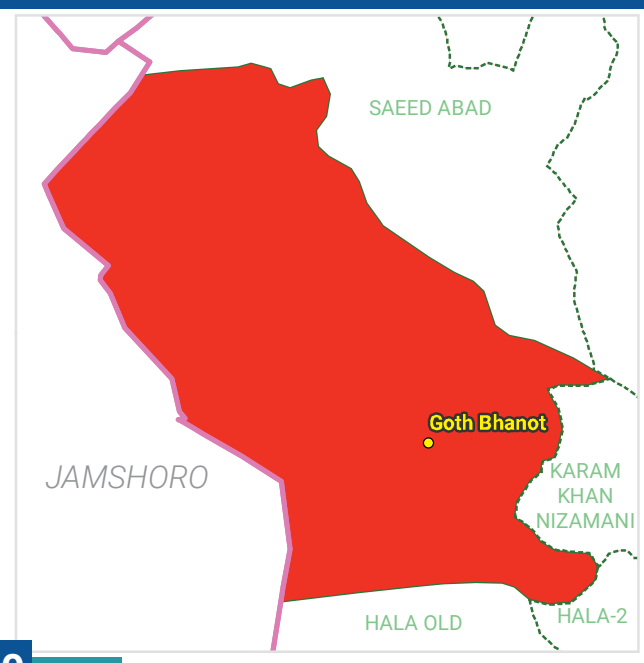


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

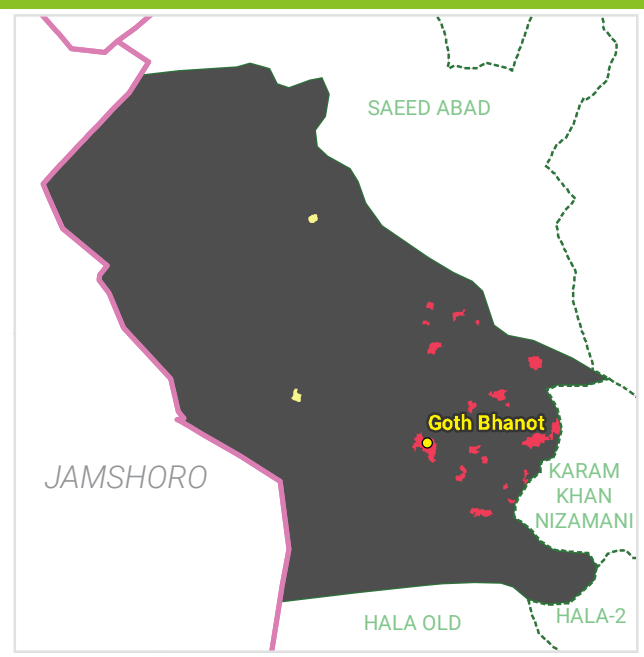


50 YEARS



100 YEARS

VULNERABILITY



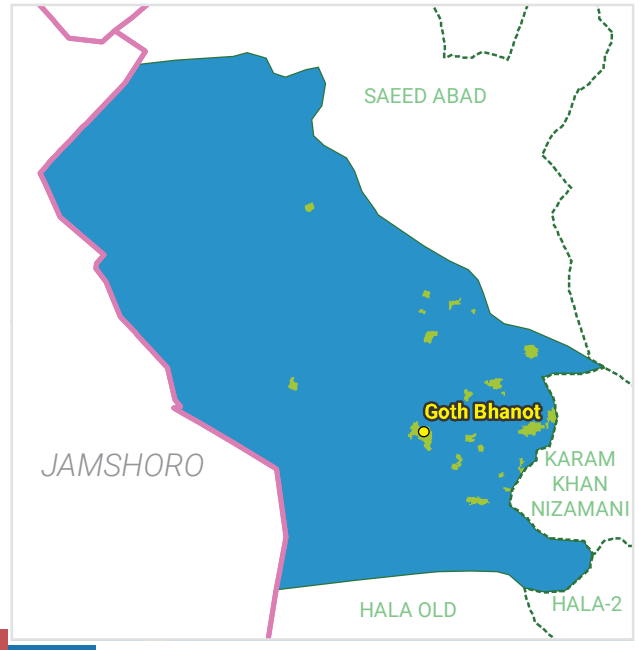
HAZARD

Normal | Moderate | High | Severe | Extreme

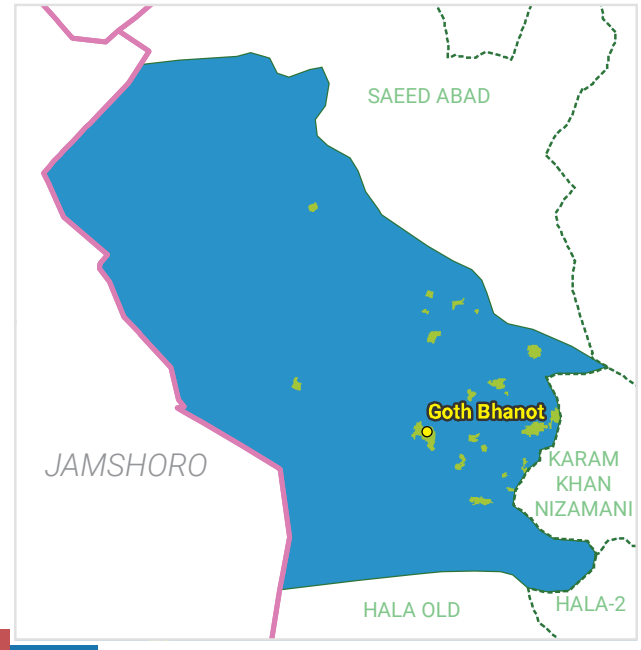
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

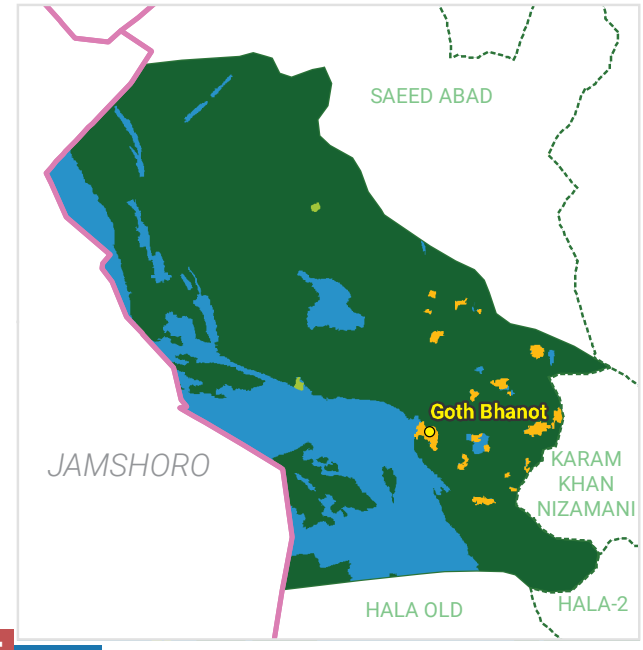
RISK AT DIFFERENT RETURN PERIODS



5 YEARS

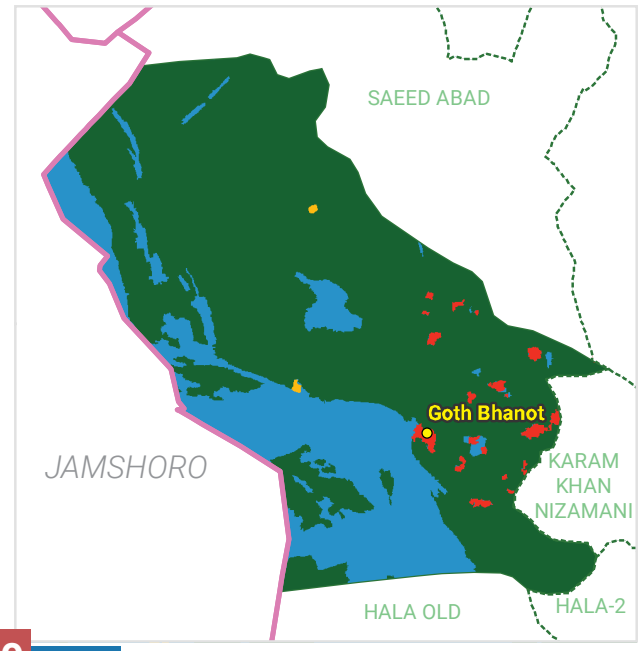


10 YEARS



25 YEARS

50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

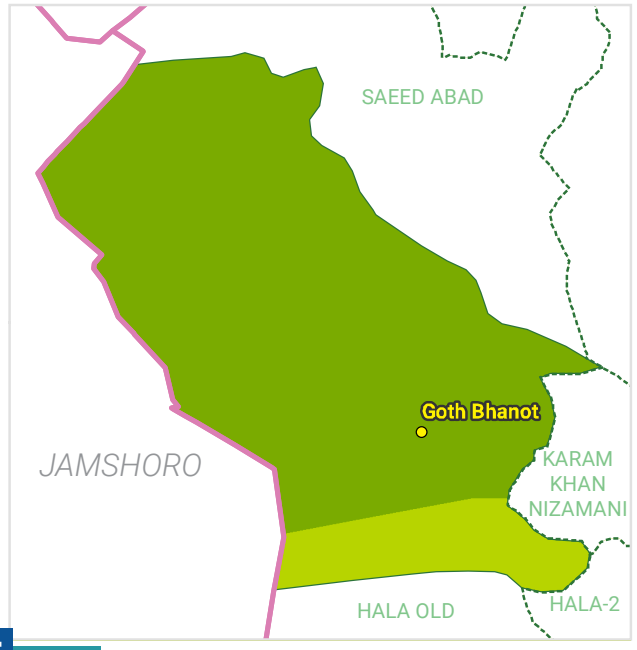
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

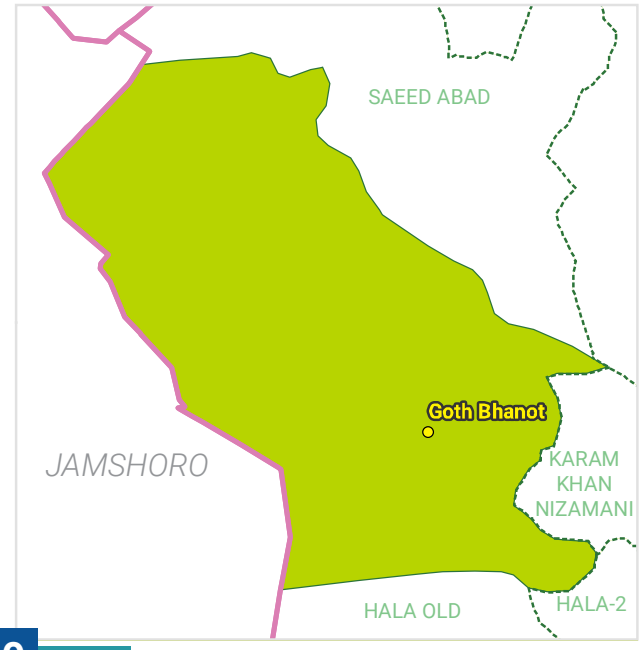
26	4048	23762	95.60	0.11	0	1.36
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

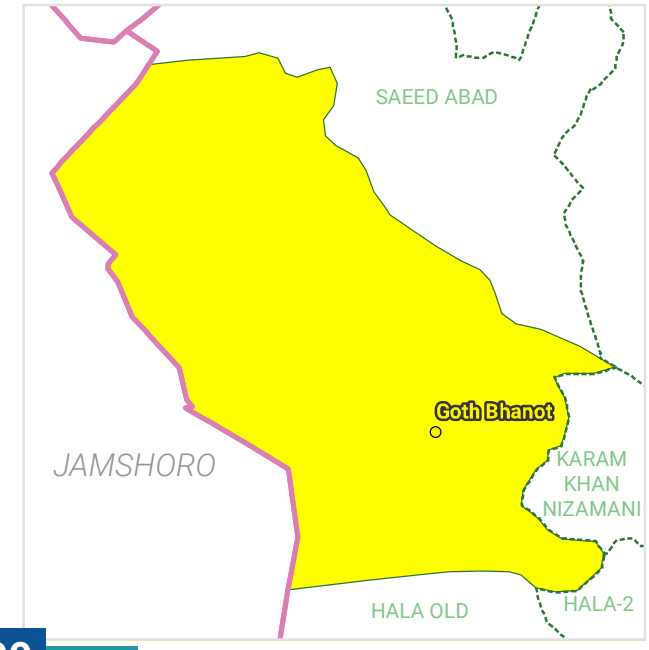
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

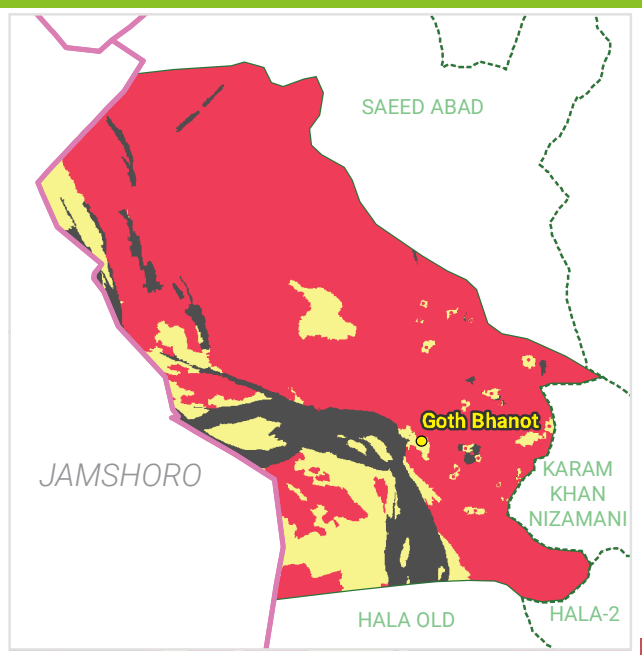


100 YEARS

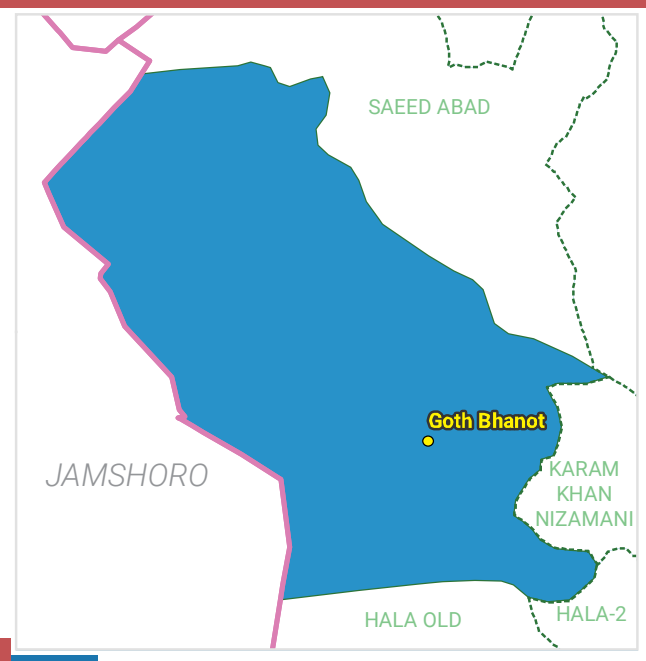


500 YEARS

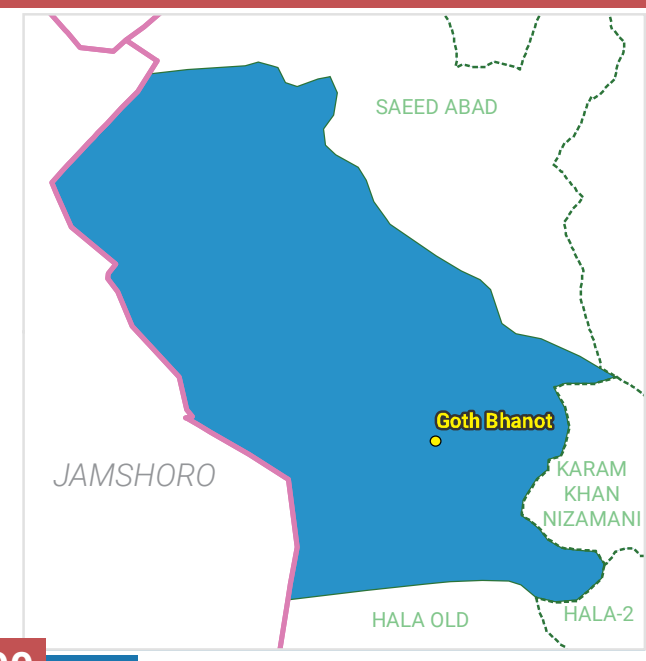
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

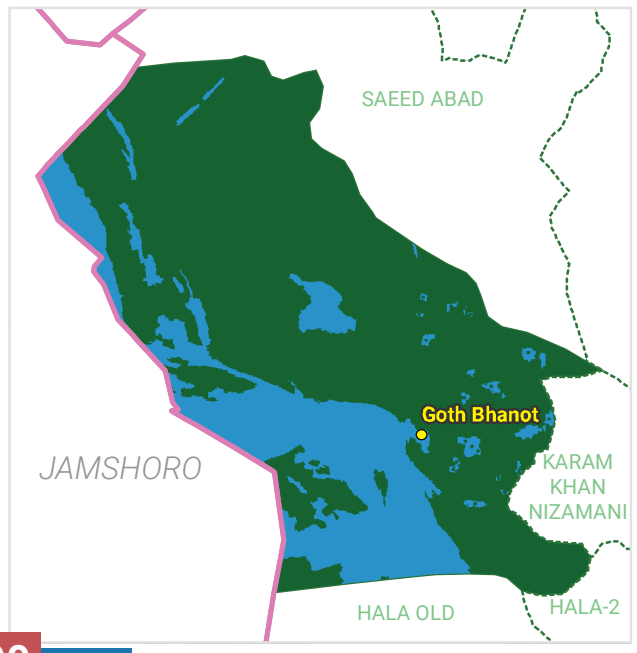


25 YEARS



100 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

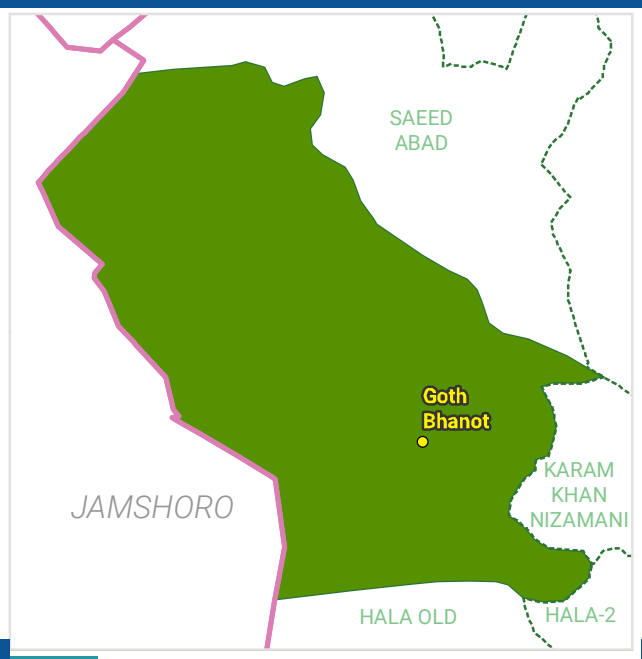
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

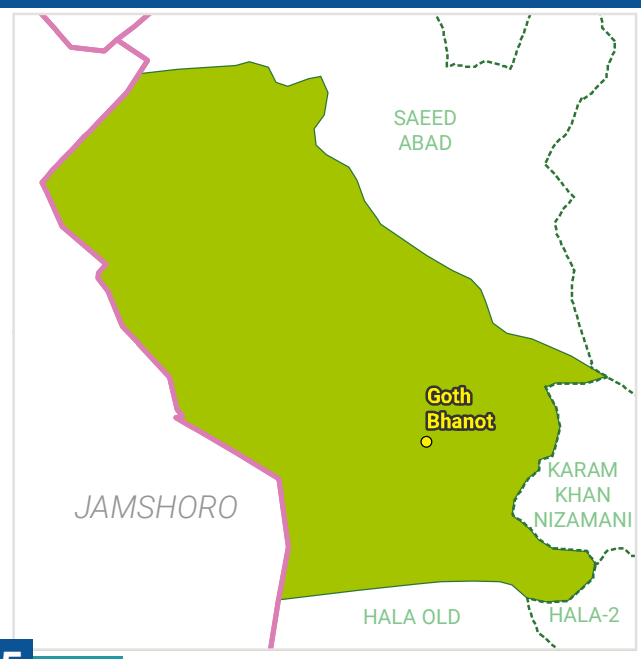
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

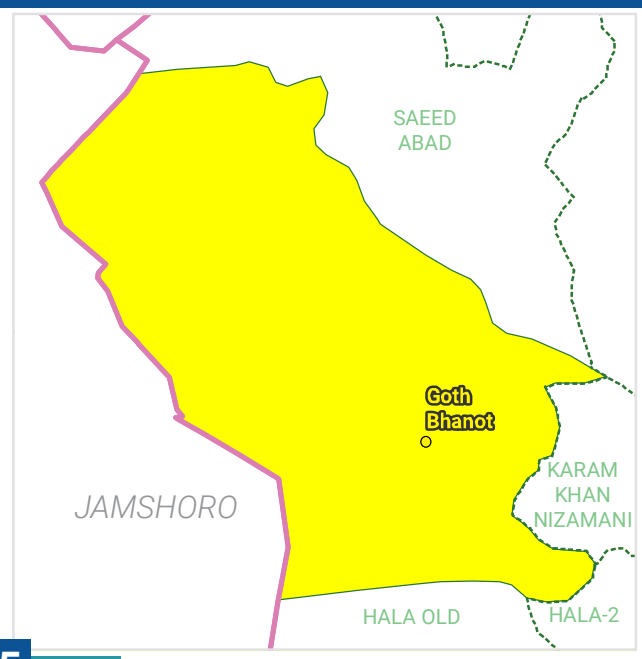
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

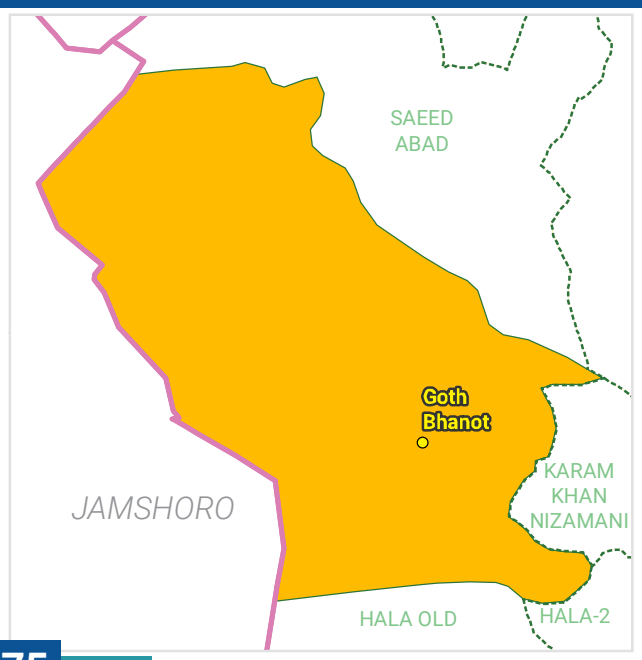


475 YEARS



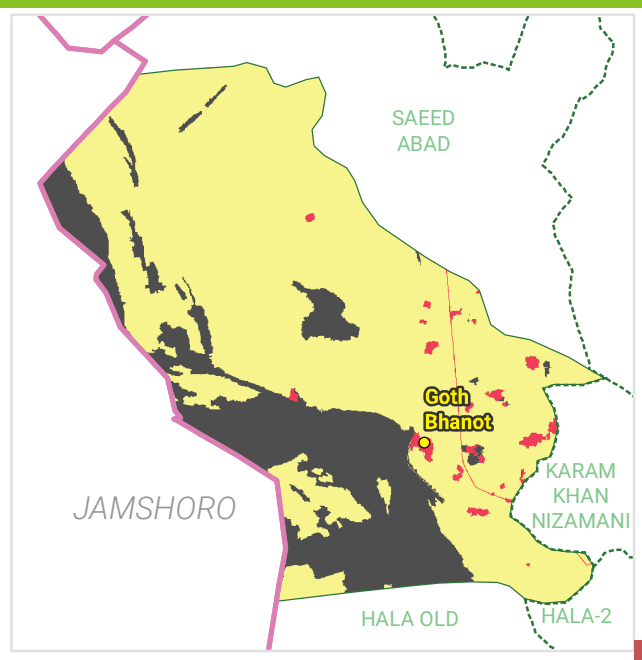
975 YEARS

HAZARD

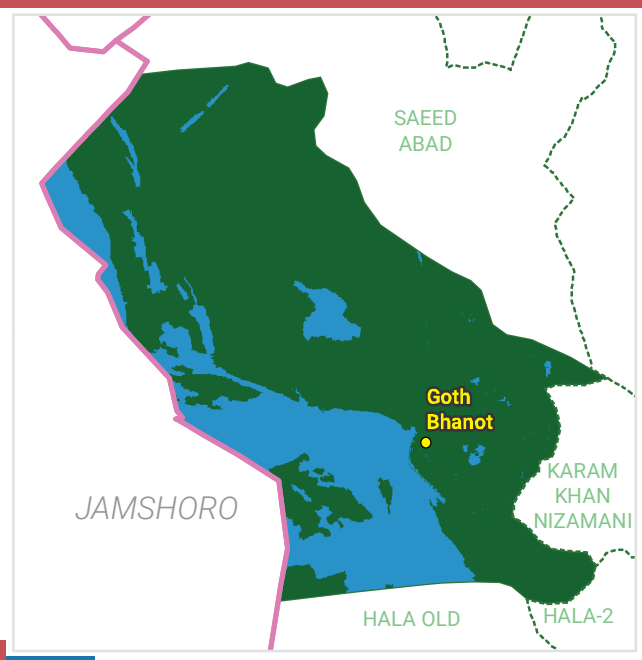


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

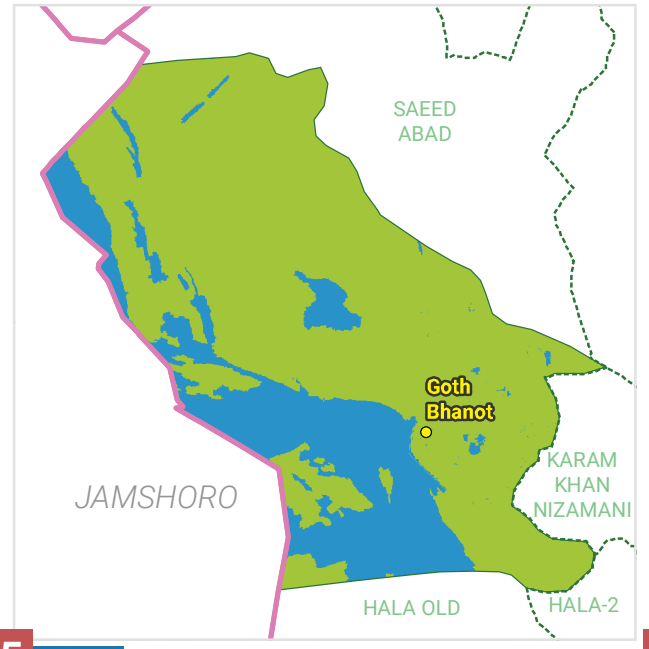
RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

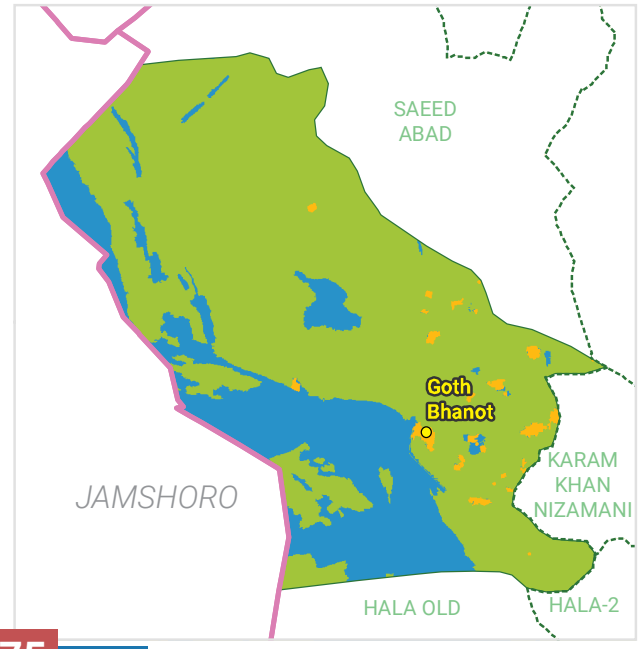
EARTHQUAKE

RISK AT DIFFERENT RETURN PERIODS

475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

27	4037	23680	95.62	0	0.11	0.19	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.35	0	54.28	0	8.35	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
33	0	0	0	2	0	0	1
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low / Medium / High / Extreme	●	Low / Medium / High / Extreme	Low / Medium / High / Extreme	Low / Medium / High / Extreme	Low / Medium / High / Extreme	●
METEOROLOGICAL DROUGHT	Low / Medium	Low / Medium / High	Medium / High / Extreme	Medium / High / Extreme	●	●	●
AGRICULTURAL DROUGHT	Low / Medium	Low / Medium	Low / Medium / High	Low / Medium / High	●	●	●
HEATWAVE	Medium	Medium	Low / Medium / High	Low / Medium / High	Low / High / Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low / Medium	Medium	Medium / High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - BHITSHAH

Union Council area in sq. km **23**

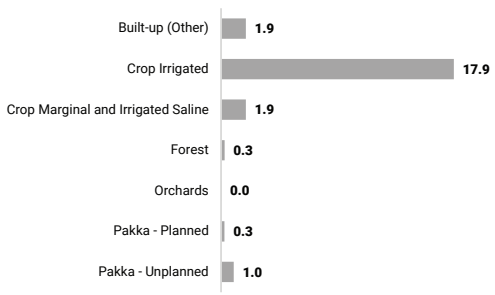
Surrounding UCs / Features
HALA-2 in West
KARAM KHAN NIZAMANI in North
FAQEER NOOH HOTHYAI in East

Population — 2017 approx. **23,361**

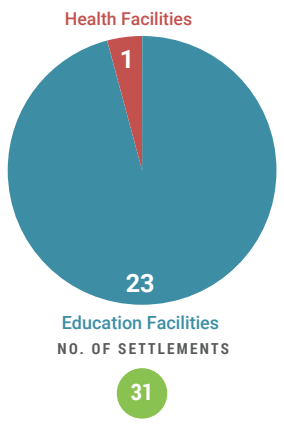
No. of household — 2017 approx. **4,042**

Land Use Land Cover

coverage area in sq.km

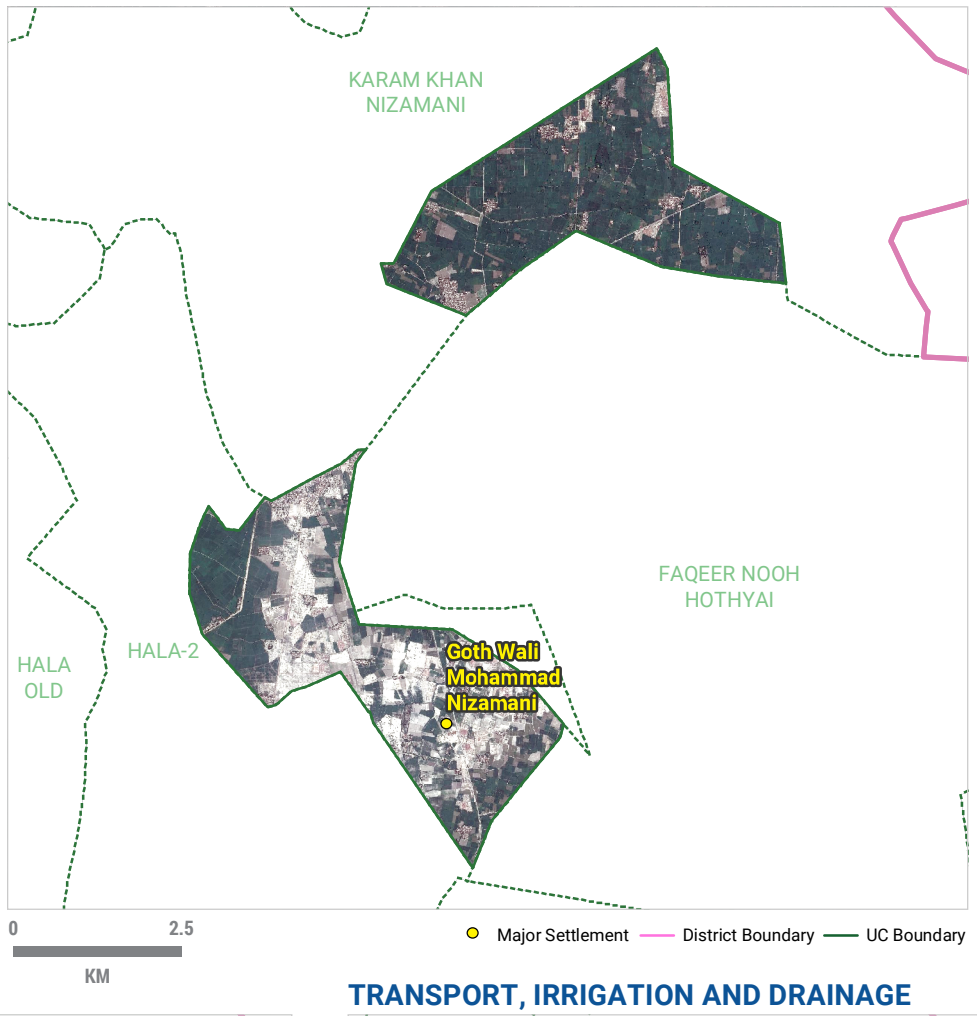


Critical Infrastructure

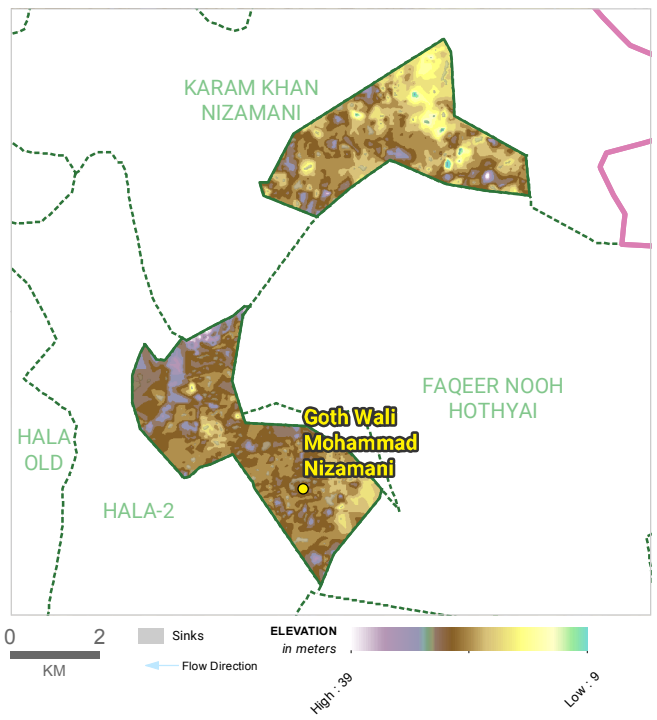


NO. OF SETTLEMENTS
31

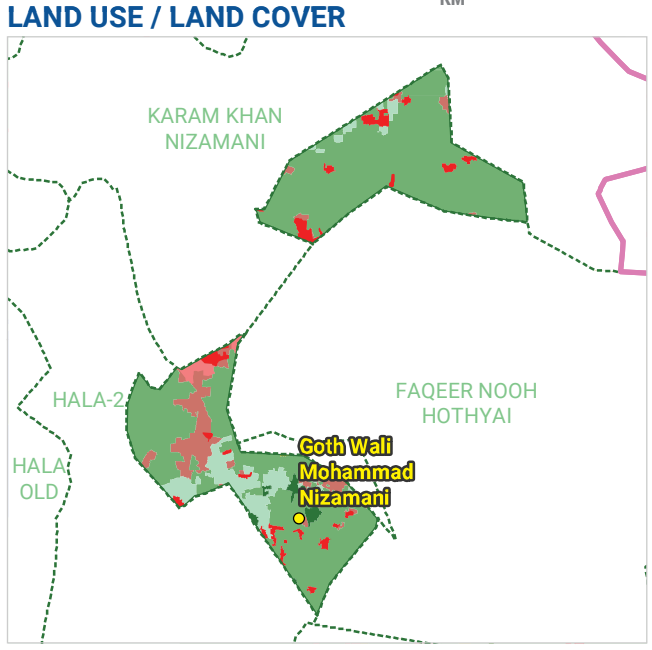
SATELLITE IMAGERY



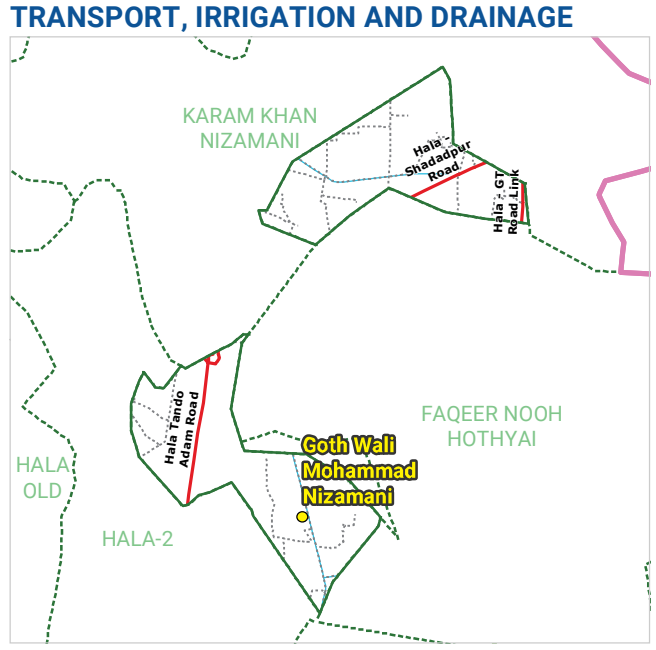
DEM AND FLOW DIRECTION



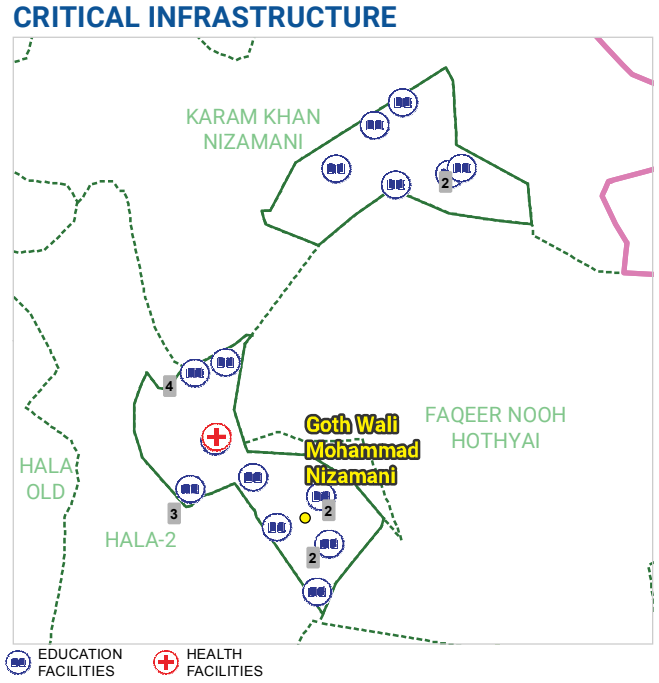
LAND USE / LAND COVER



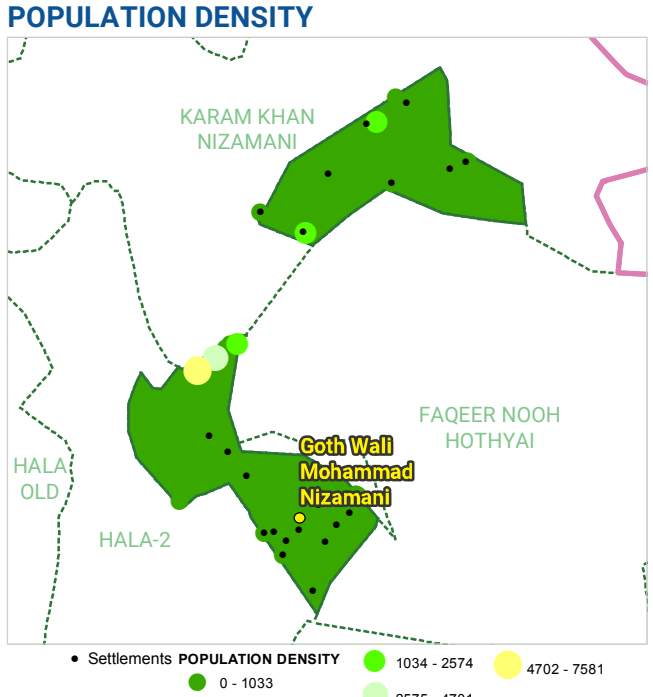
TRANSPORT, IRRIGATION AND DRAINAGE



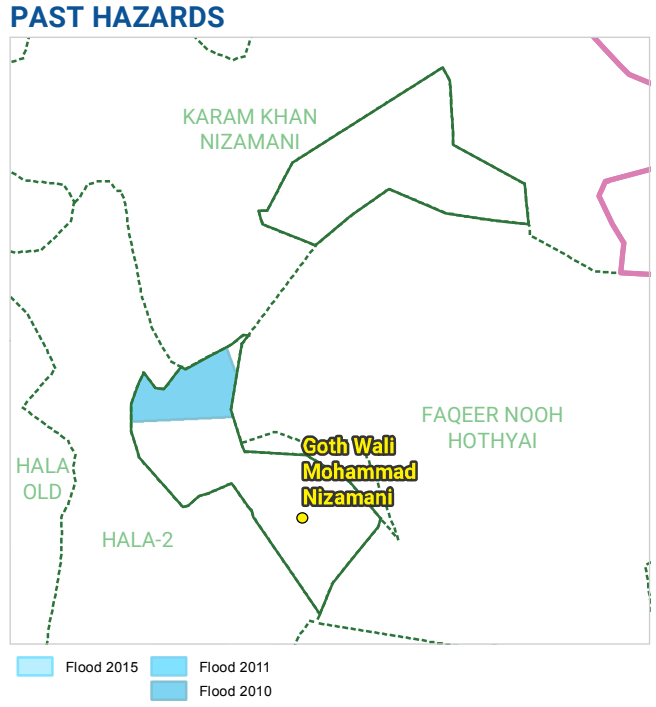
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

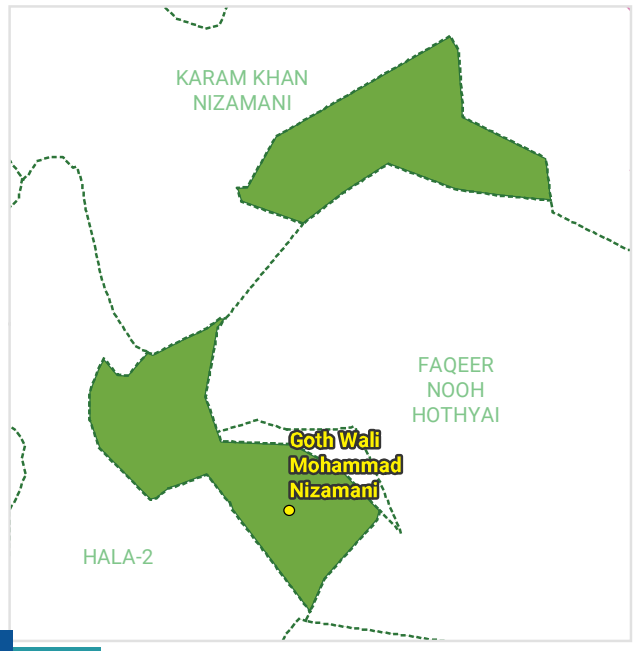


FLOOD

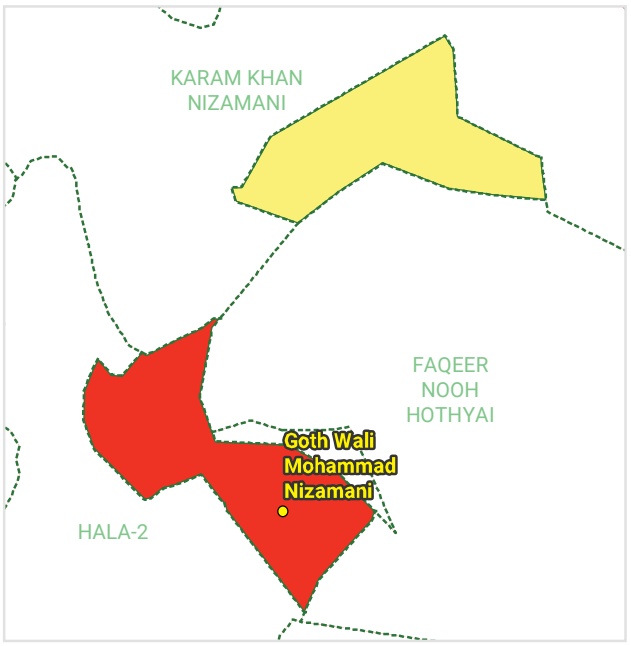
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

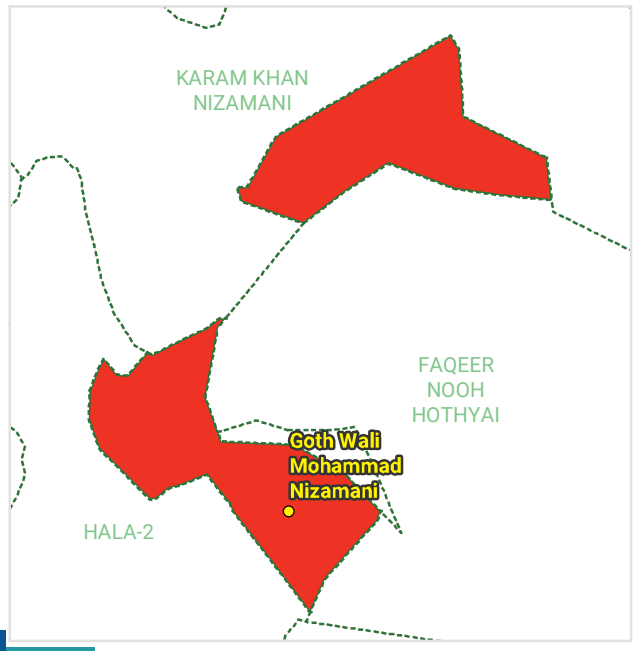
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

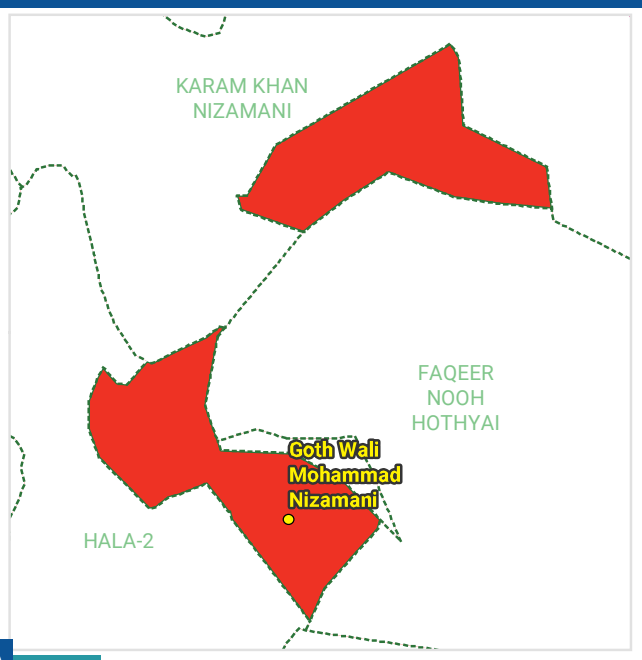


10 YEARS



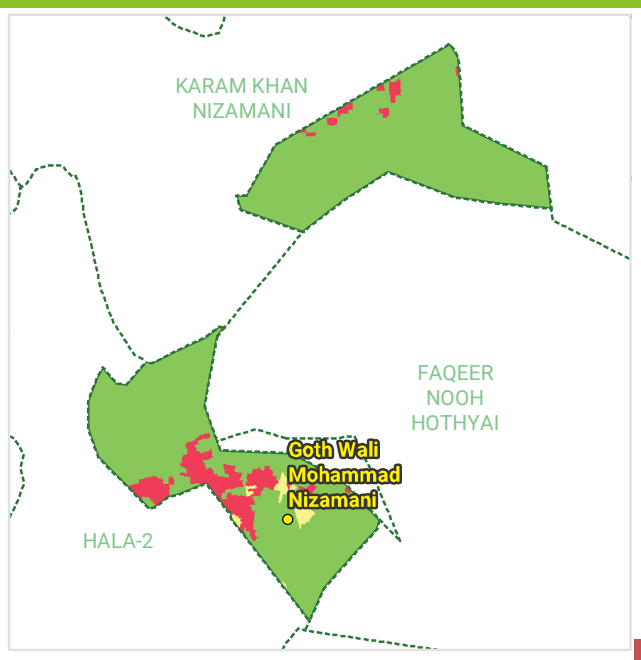
25 YEARS

HAZARD

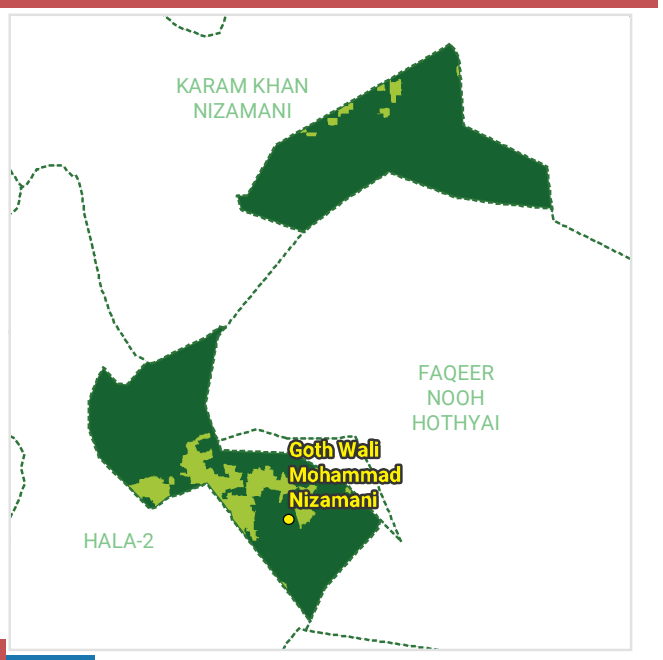


50 YEARS

VULNERABILITY

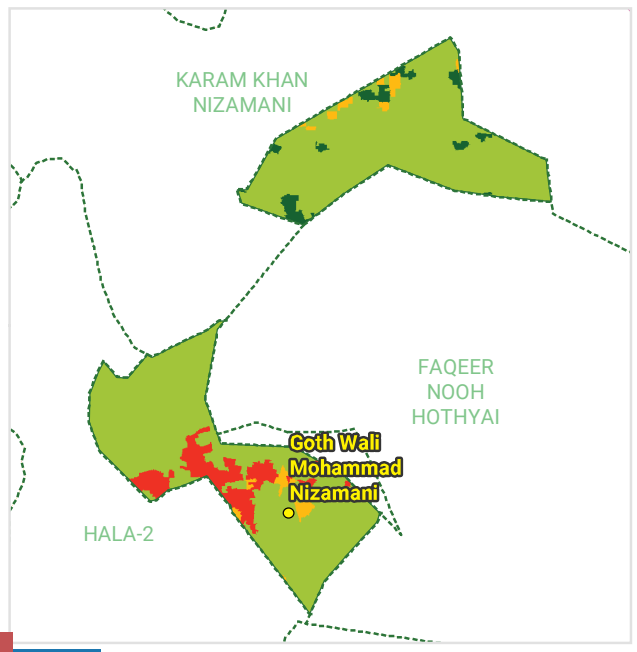


RISK

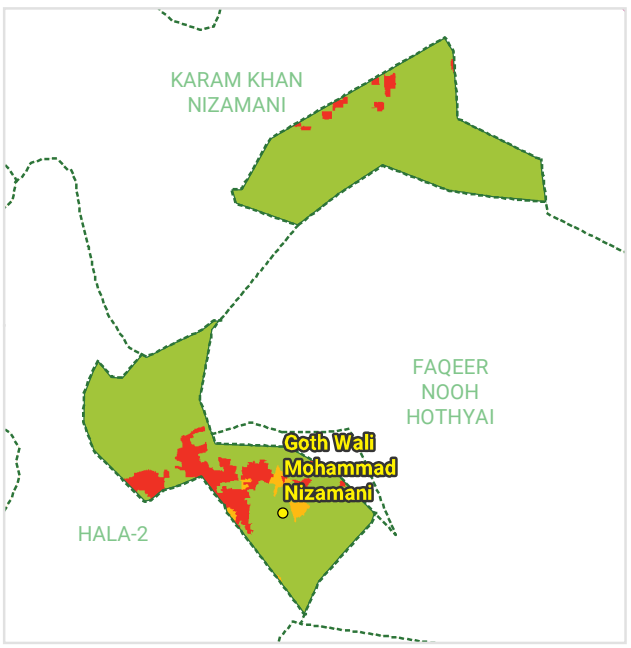


5 YEARS

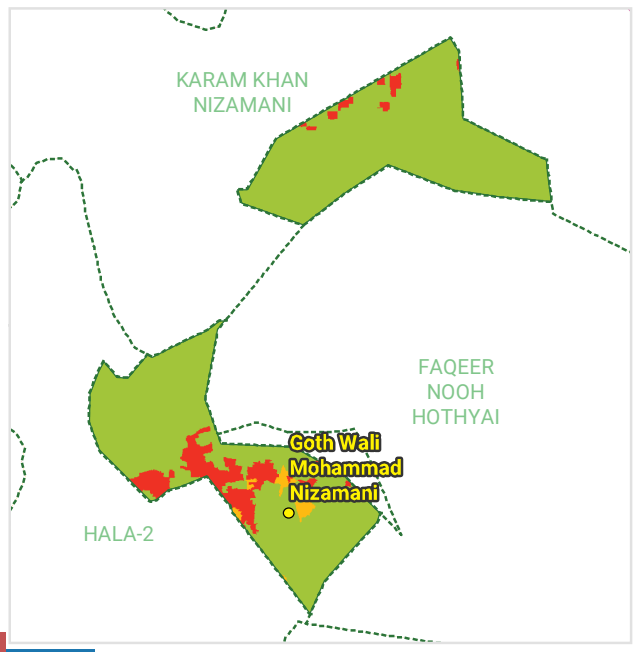
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

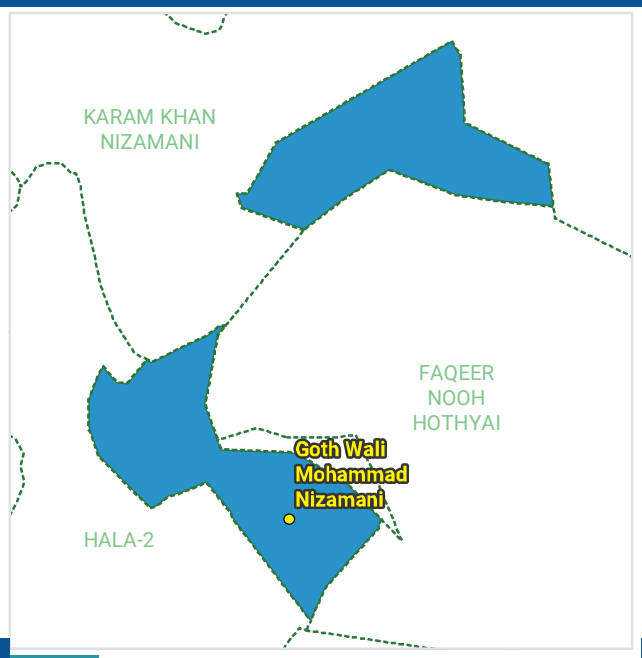
(BASED ON 50 YEARS RETURN PERIOD)

31	4042	23361	19.79	0	0.27	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

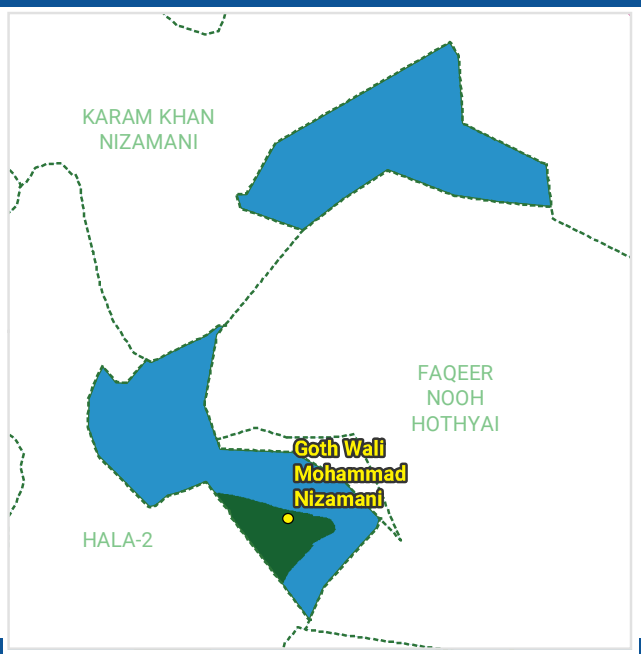
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

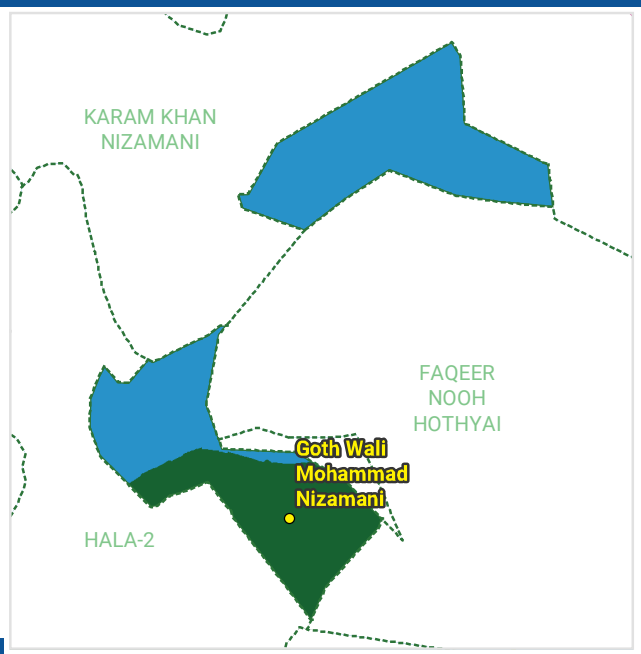
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

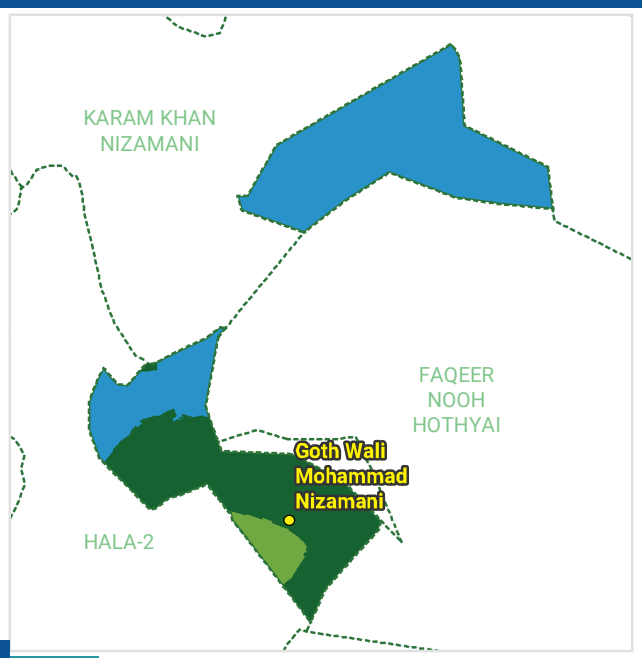


10 YEARS



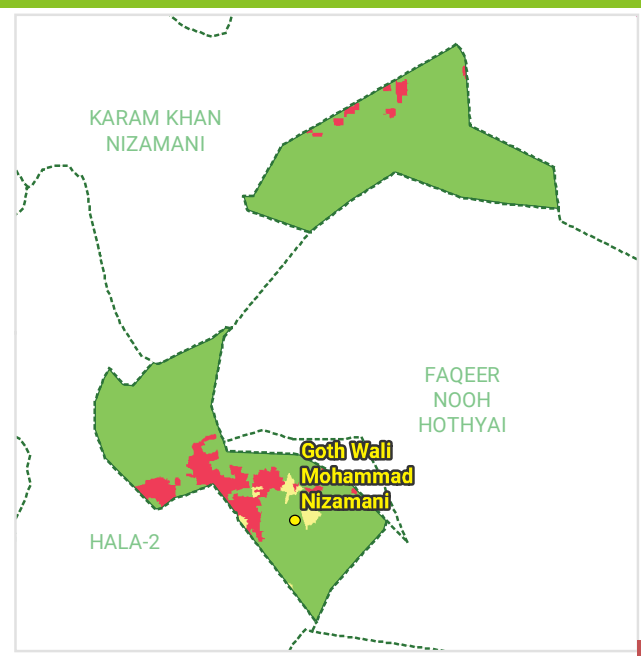
25 YEARS

HAZARD

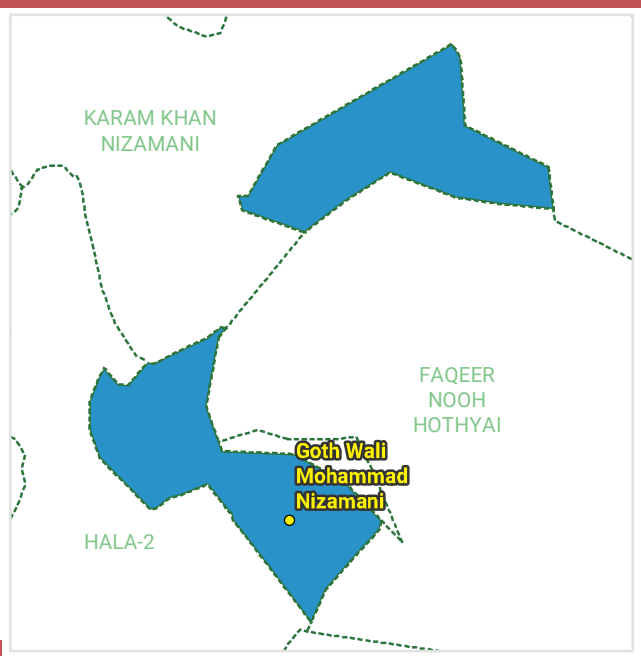


50 YEARS

VULNERABILITY



RISK



5 YEARS

HAZARD

No Hazard, Mild, Moderate, Severe, Extreme

VULNERABILITY

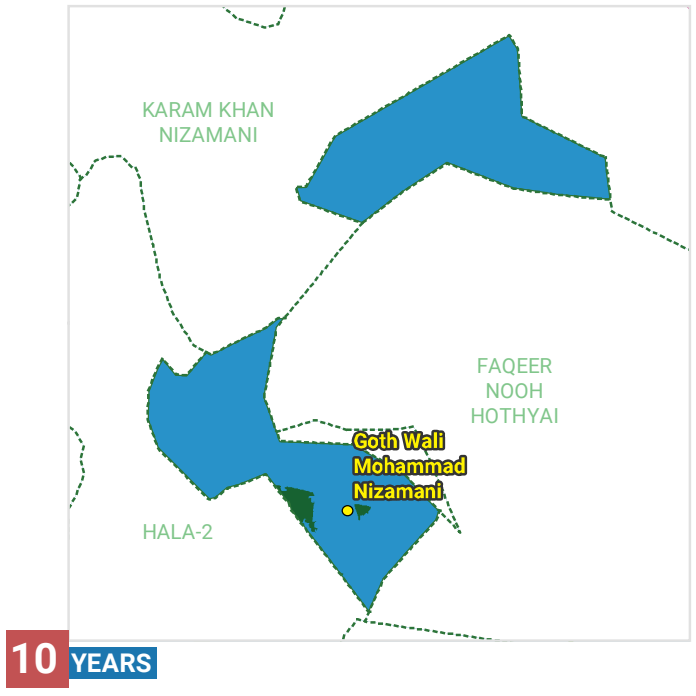
None 0 - 25, Low 26 - 50, Medium 51 - 75, High 76 - 100

RISK

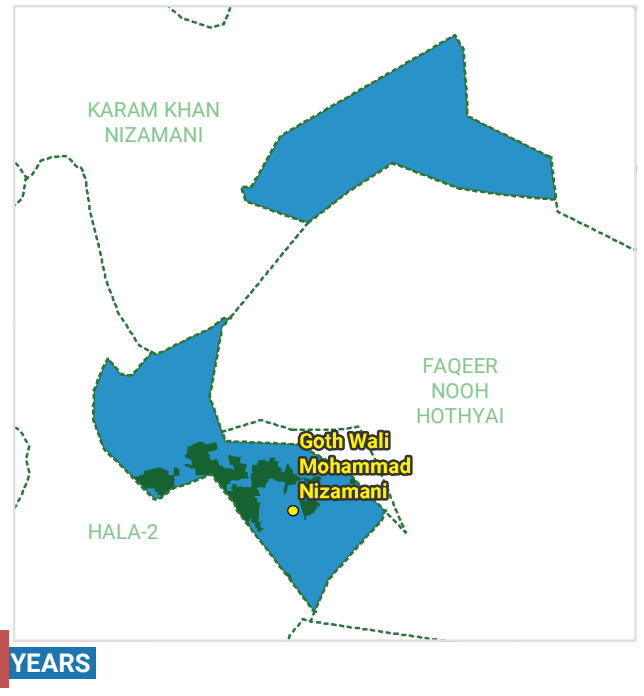
Very Low 0 - 49, Low 50 - 99, Medium 100 - 199, High 200 - 249, Extreme 250 - 300

AGRICULTURAL DROUGHT

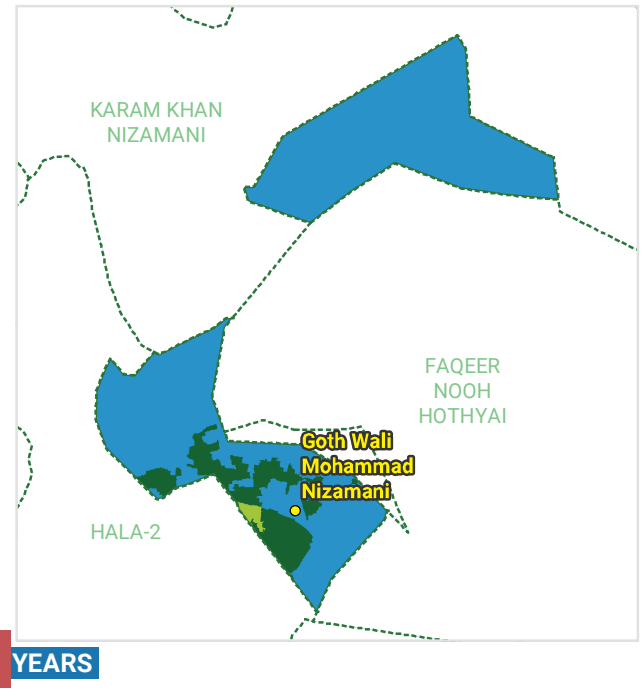
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

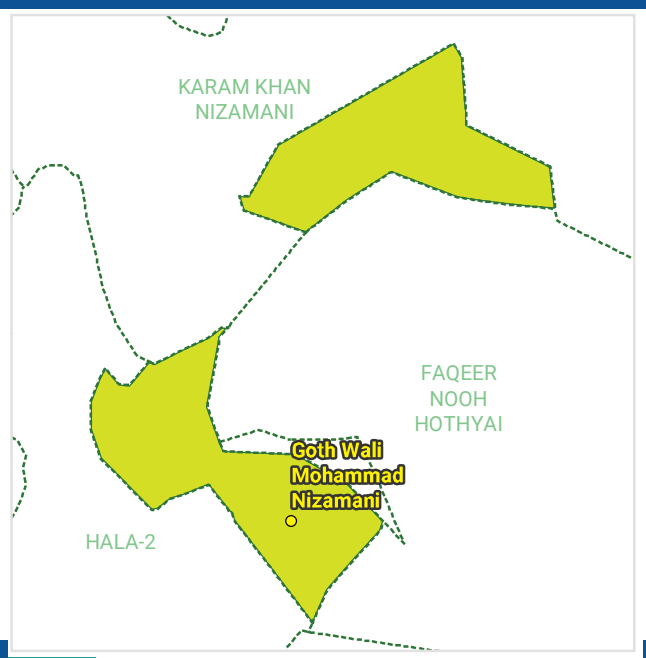
(BASED ON 50 YEARS RETURN PERIOD)

5	389	2305	2.96	0	0.33	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

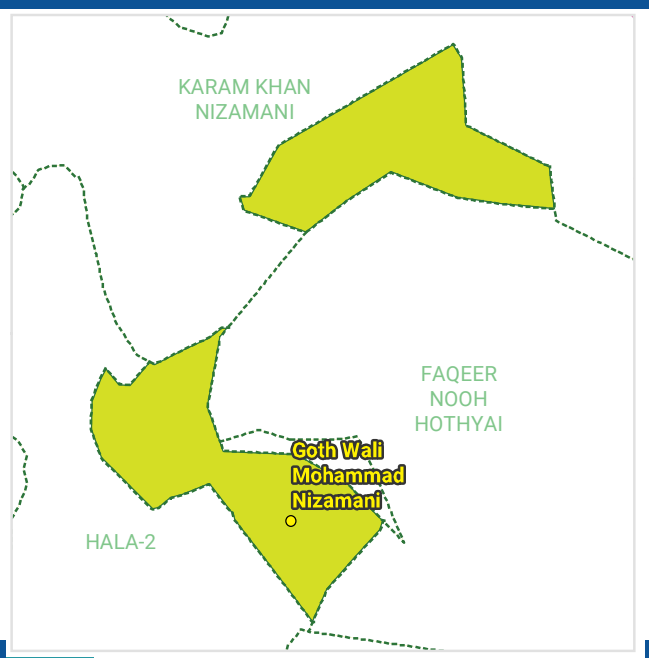
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

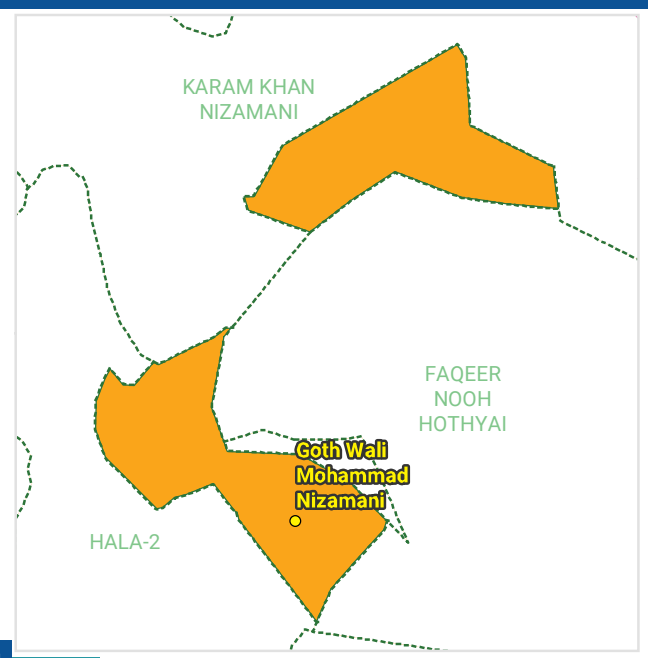
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS



10 YEARS



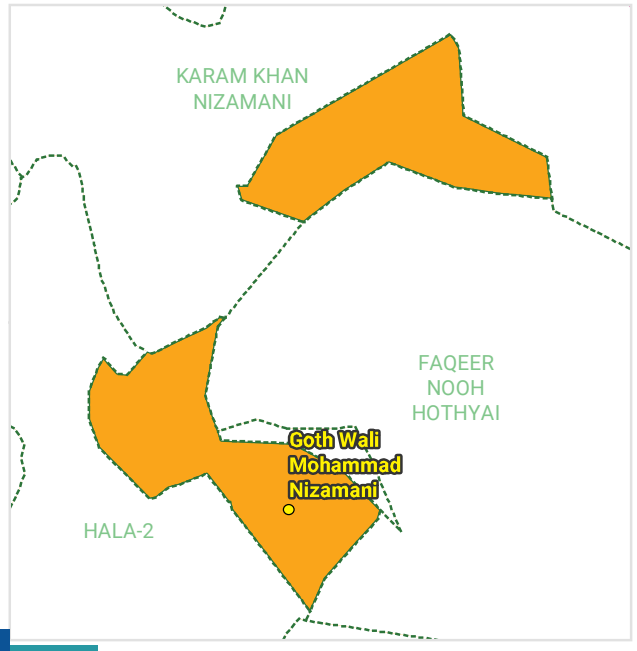
25 YEARS

HAZARD

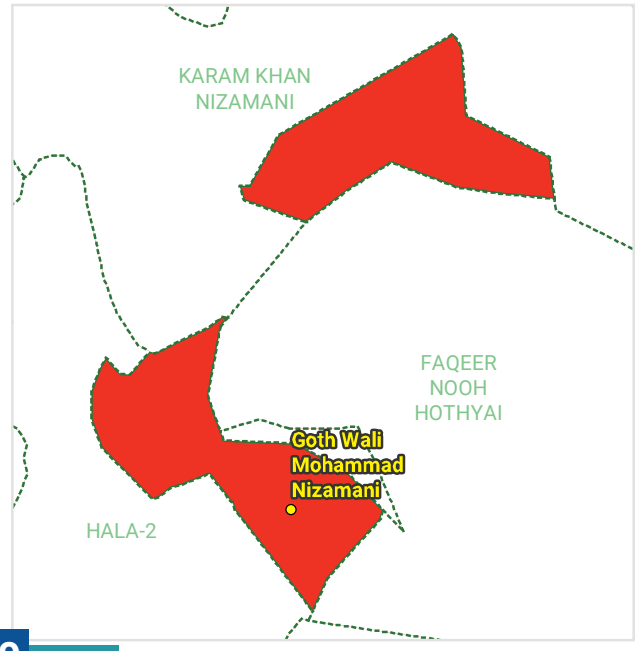
Normal	Moderate	High	Severe	Extreme

HAZARD AT DIFFERENT RETURN PERIODS

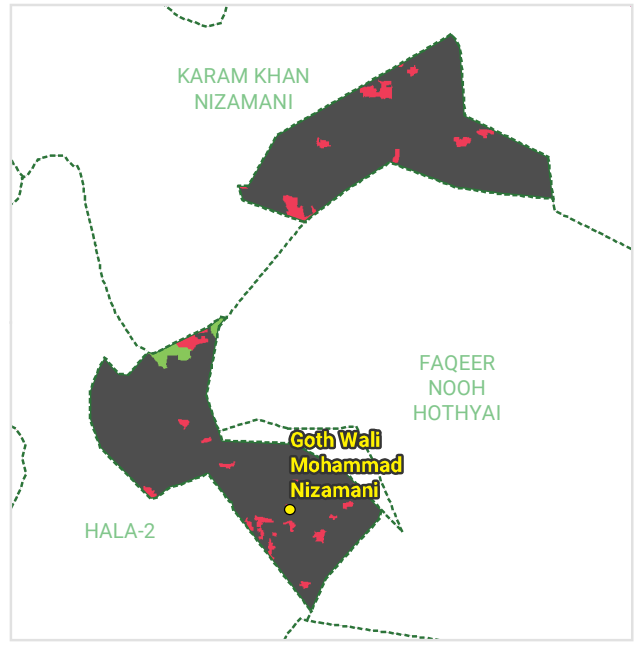
VULNERABILITY



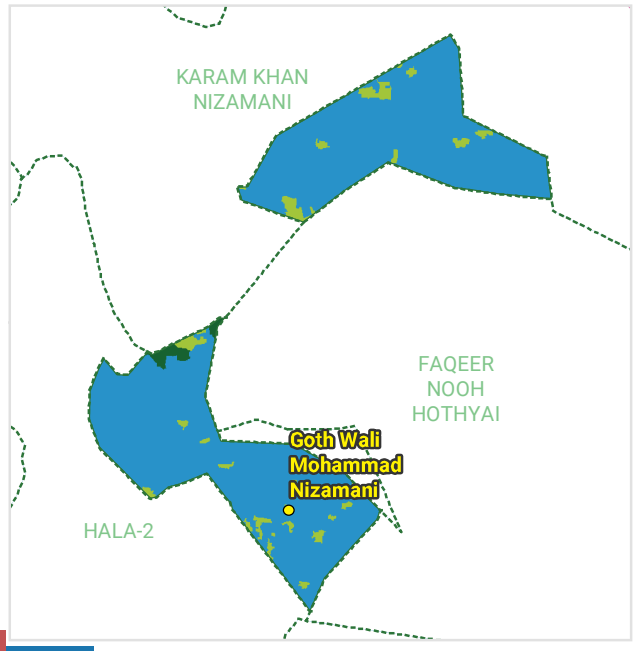
50 YEARS



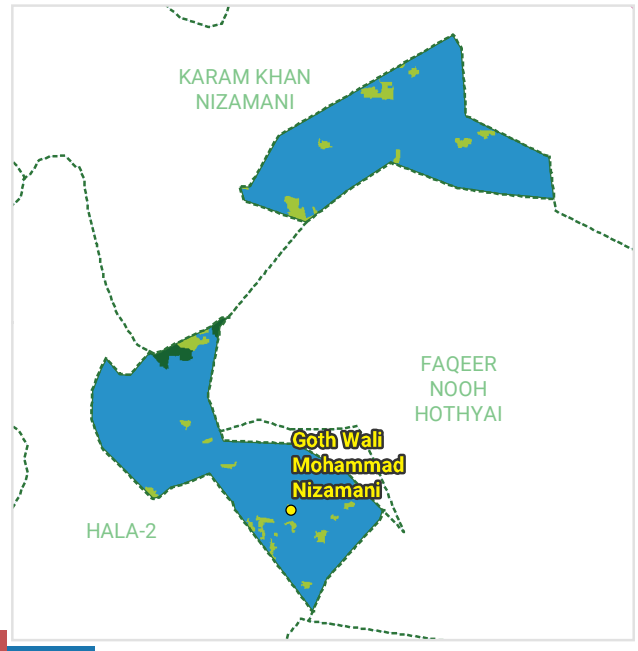
100 YEARS



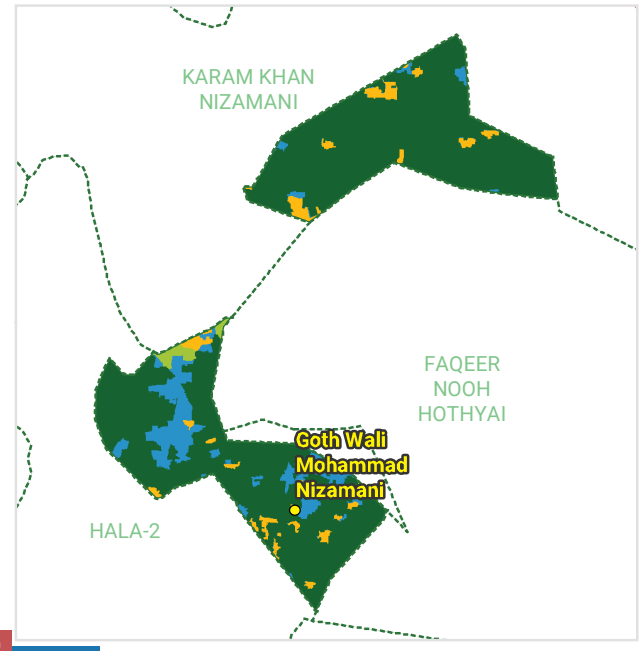
RISK AT DIFFERENT RETURN PERIODS



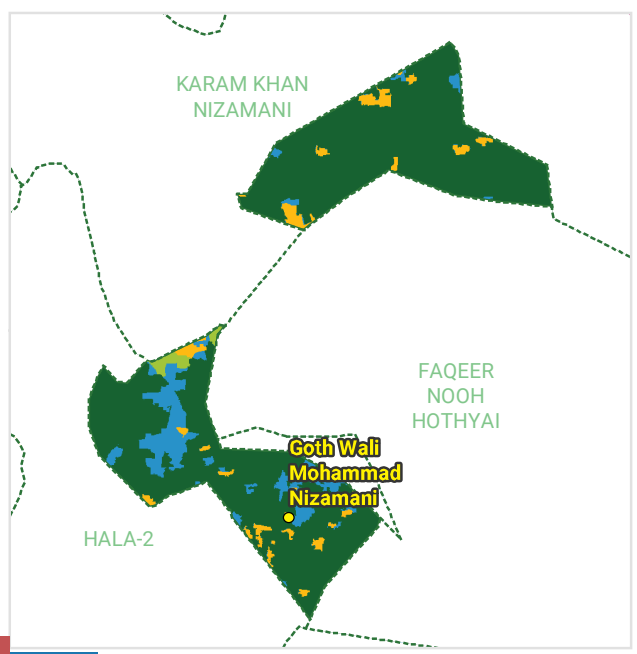
5 YEARS



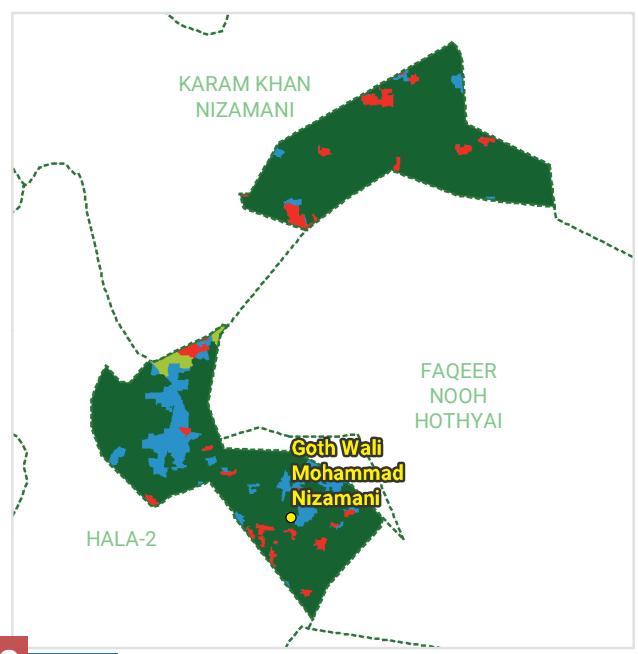
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

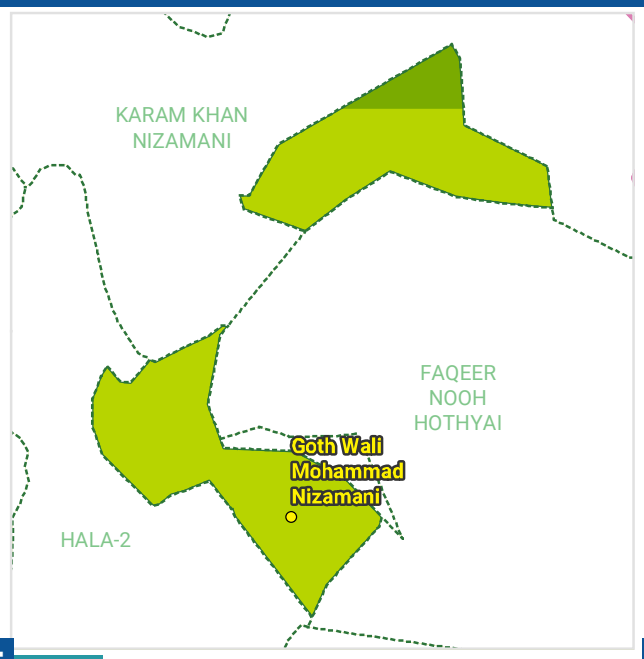
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

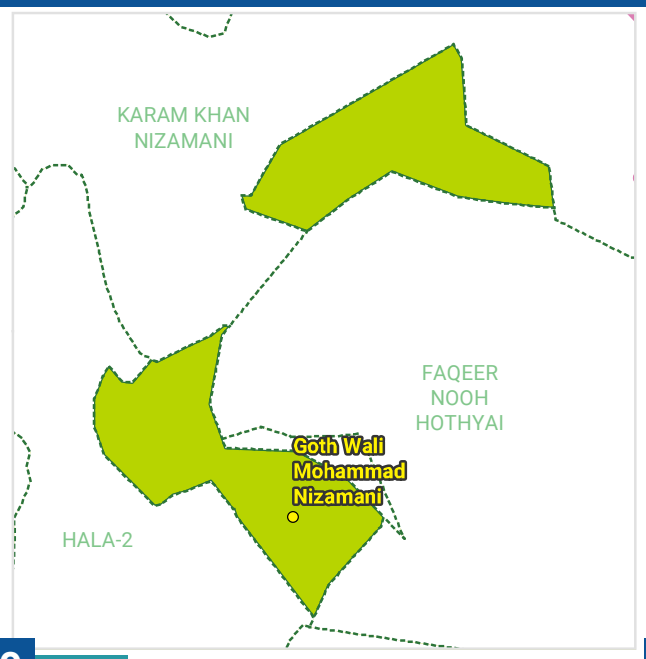
31	4008	23158	19.71	0	0.26	0.97
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

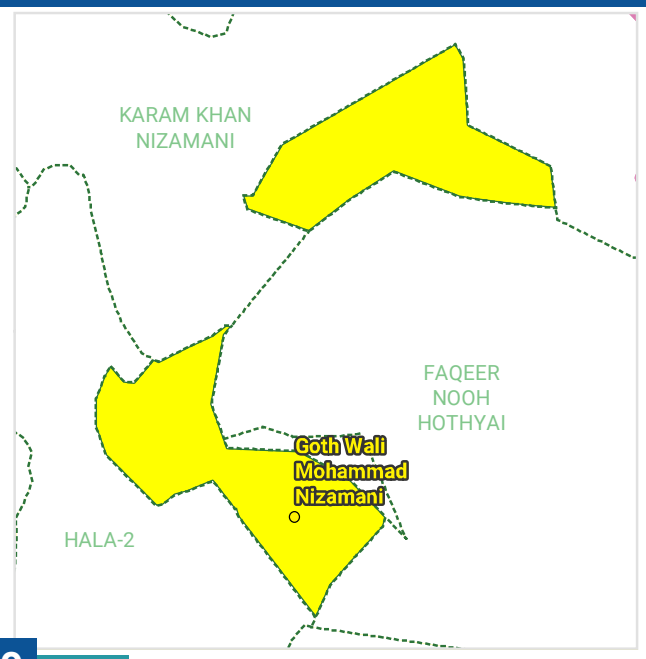
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

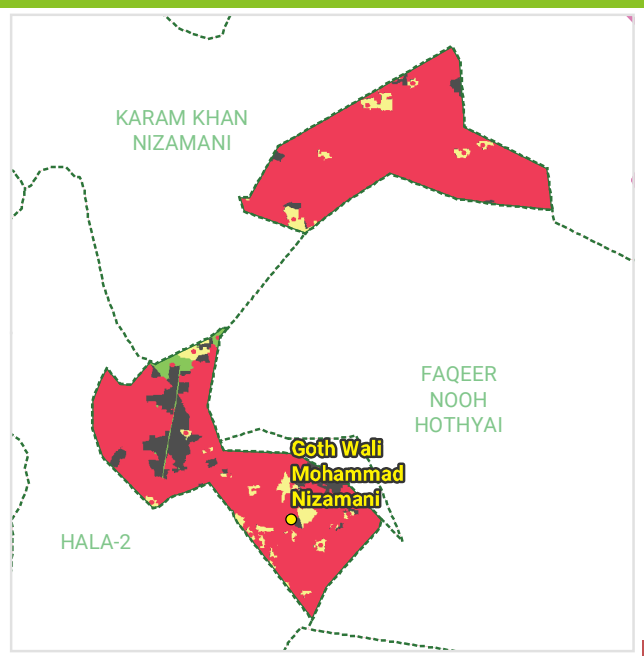


100 YEARS

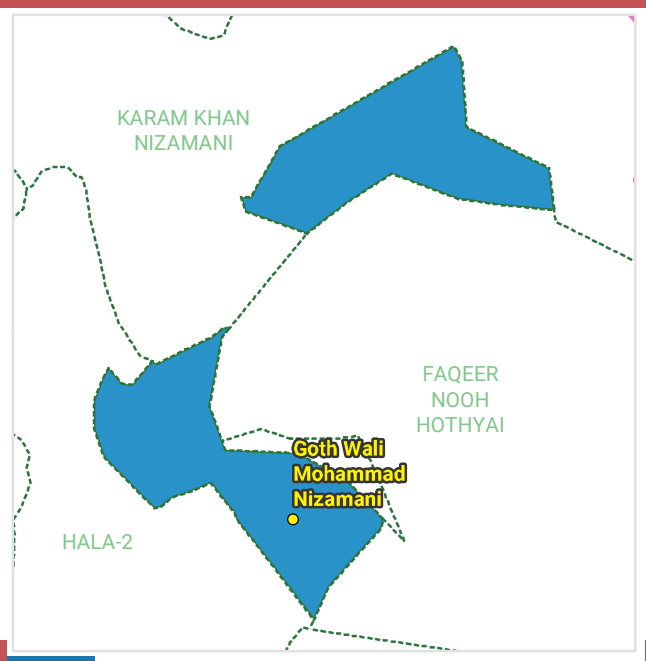


500 YEARS

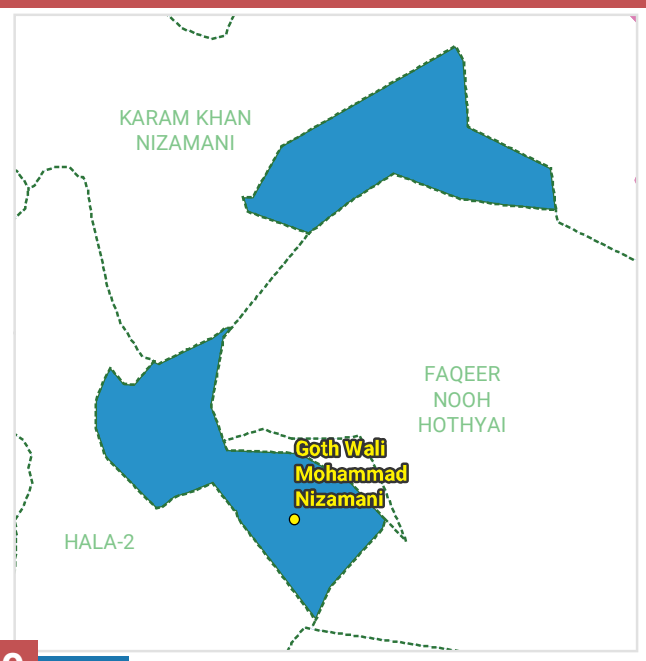
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS



25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

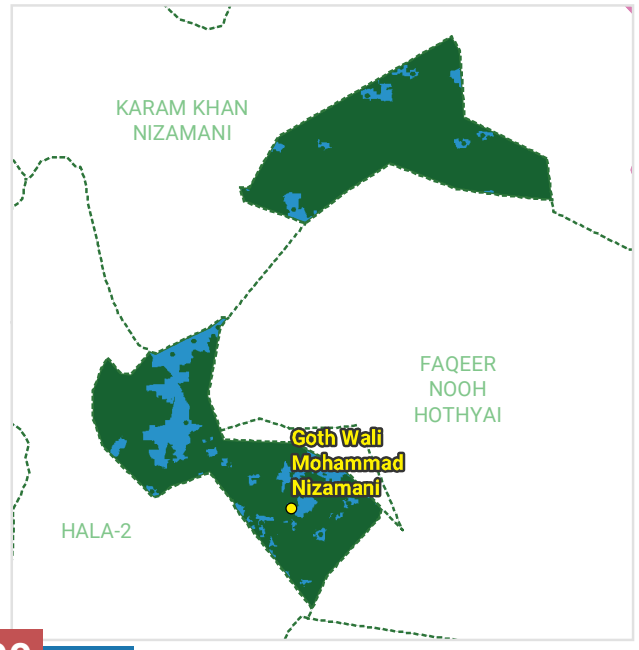
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

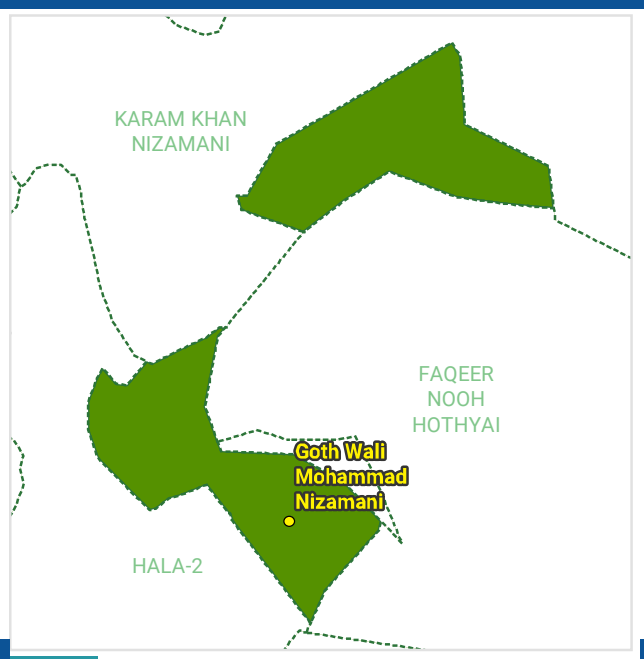
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

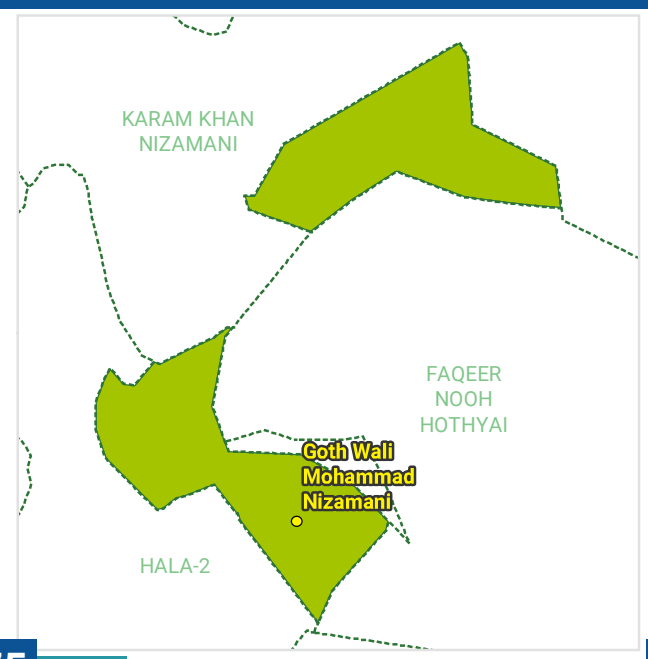
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

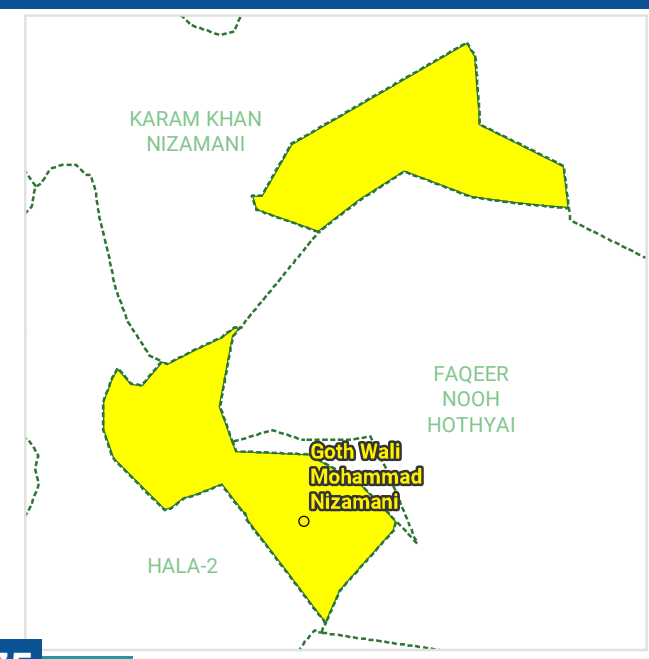
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS



475 YEARS



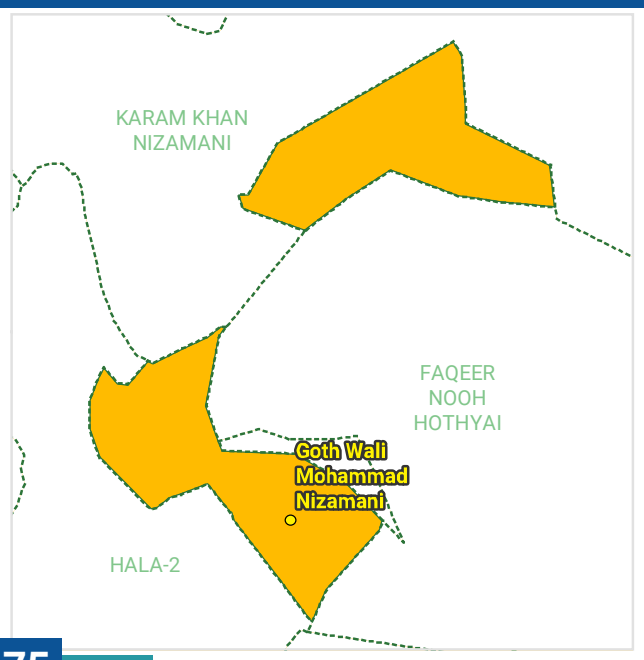
975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

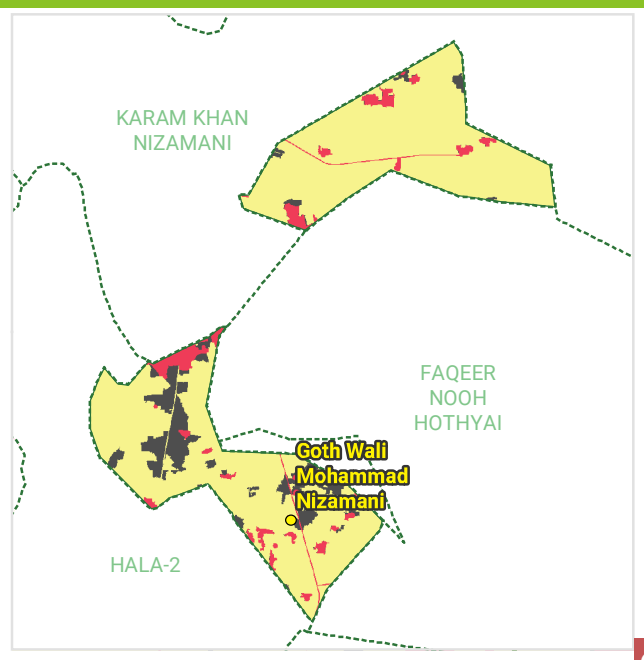
EARTHQUAKE

HAZARD

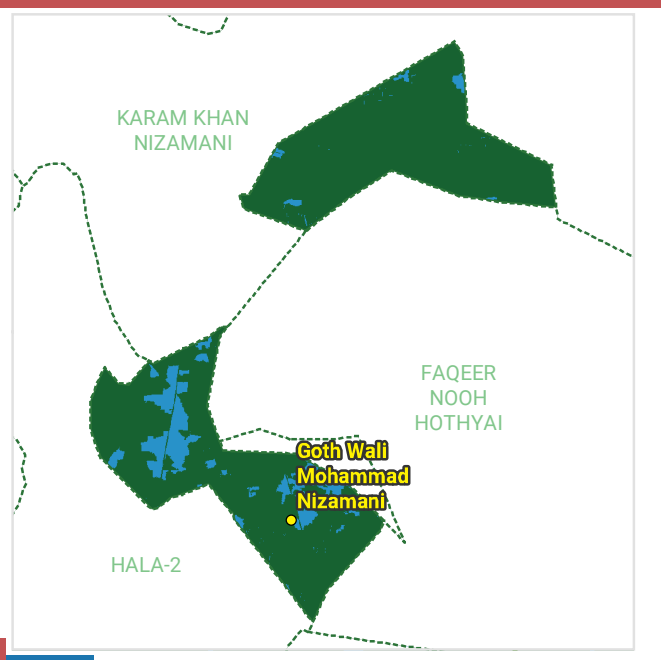


2475 YEARS

VULNERABILITY

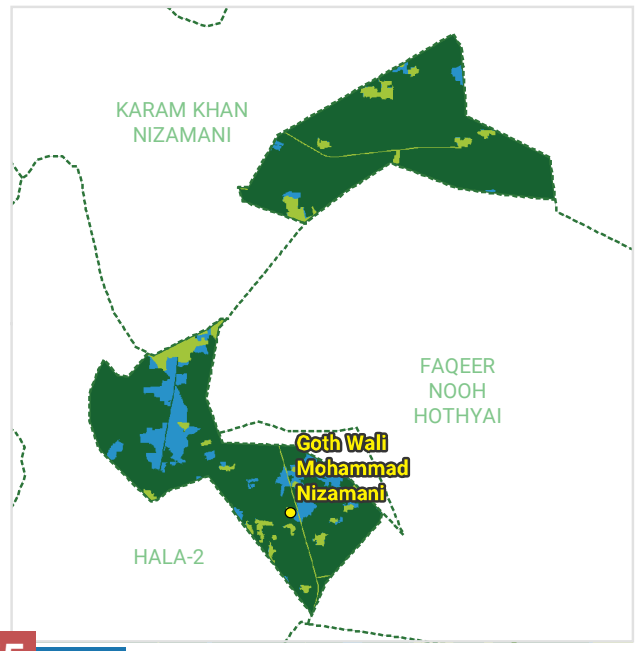


RISK

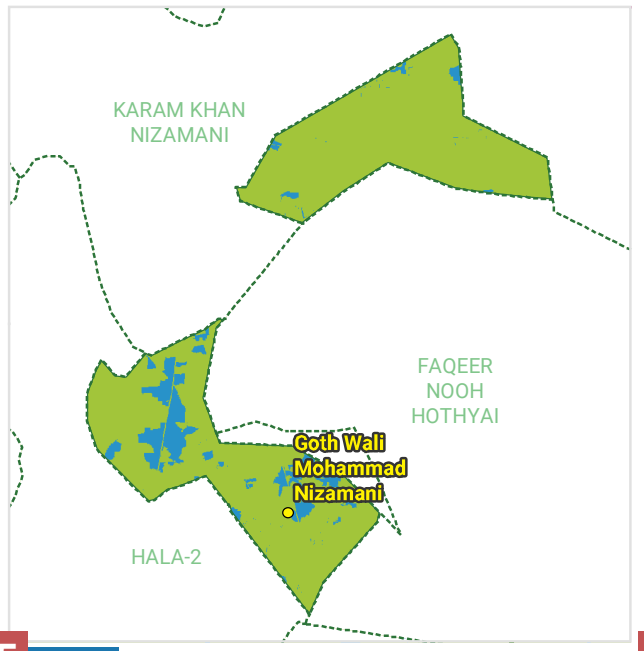


95 YEARS

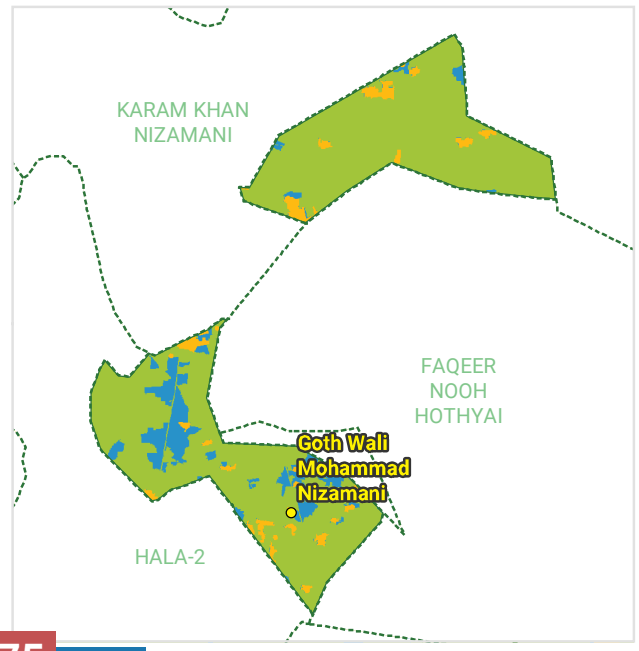
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

31	4003	23124	19.73	0.02	0	0	0.26
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.96	0	39.76	0	7.48	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
23	0	0	0	1	0	0	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low Medium	Low Medium High Extreme	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	None	Low	Low	Low Medium	●	●	●
HEATWAVE	Low Medium	Low Medium	Low Medium High	Low Medium High	Low Medium Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

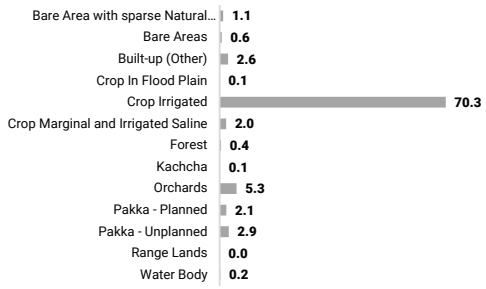
Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - FAQIR NOOH HOTHYAI

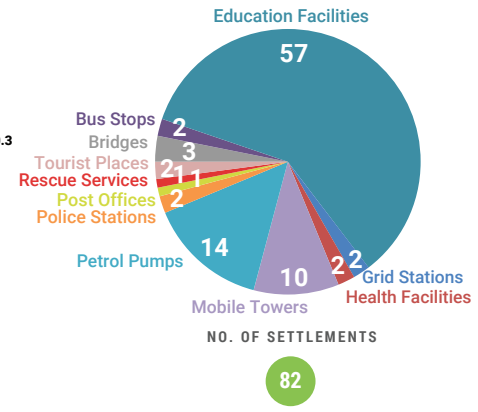
Union Council area in sq. km	87
Surrounding UCs / Features	**BHITSHAH** in North **ODEROLAL VILLAGE** in East **SEKHAT** in South **HALA OLD** in South West **SANGHAR DISTRICT** in North East
Population	2017 approx. 97,539
No. of household	2017 approx. 17,067

Land Use Land Cover

coverage area in sq.km



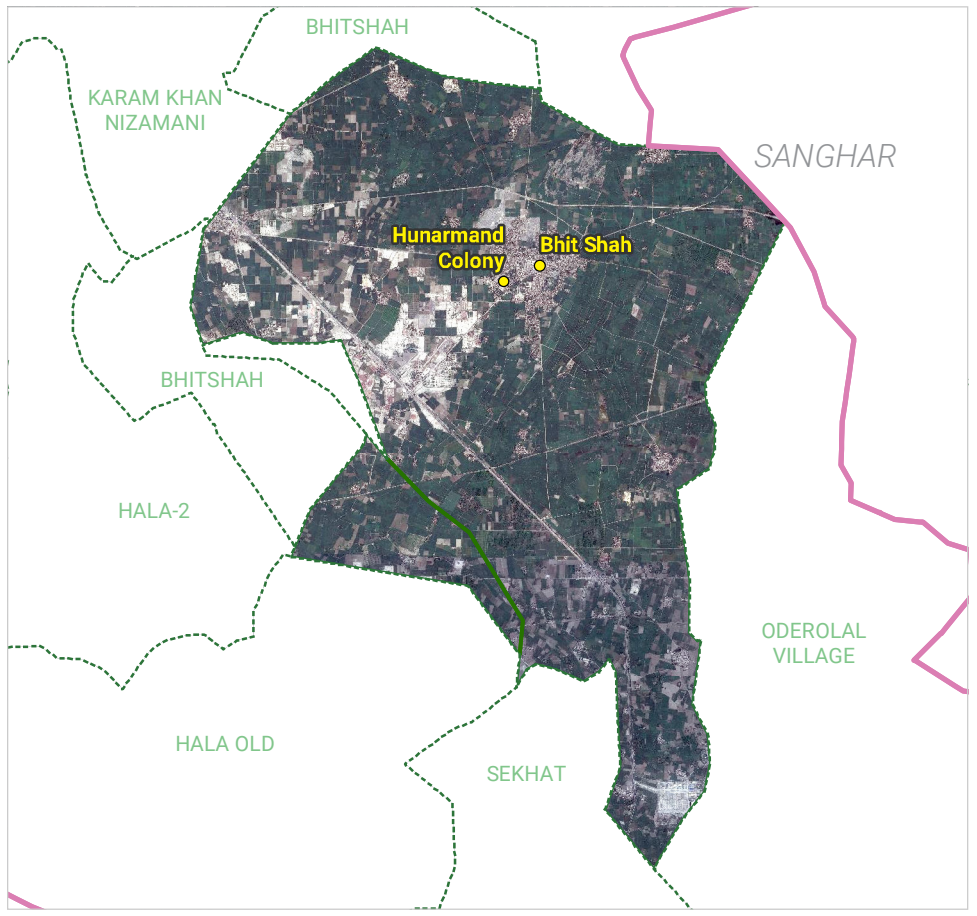
Critical Infrastructure



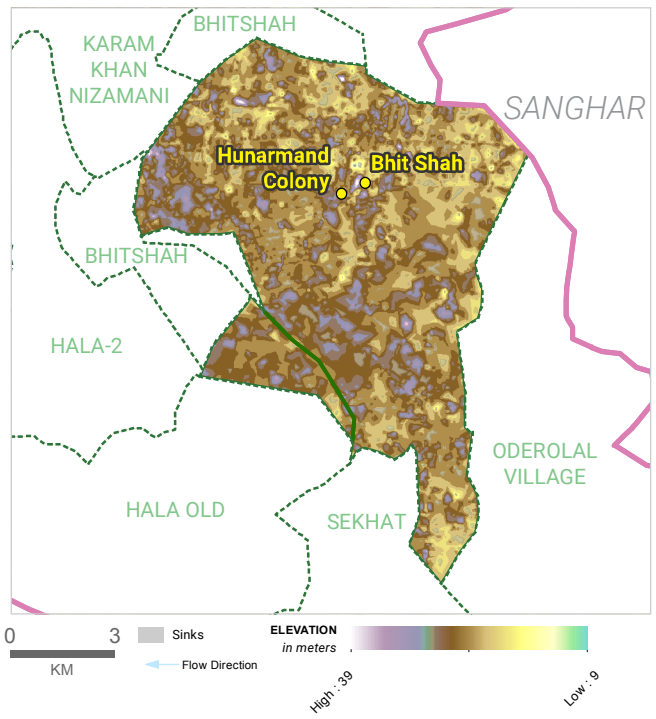
NO. OF SETTLEMENTS

82

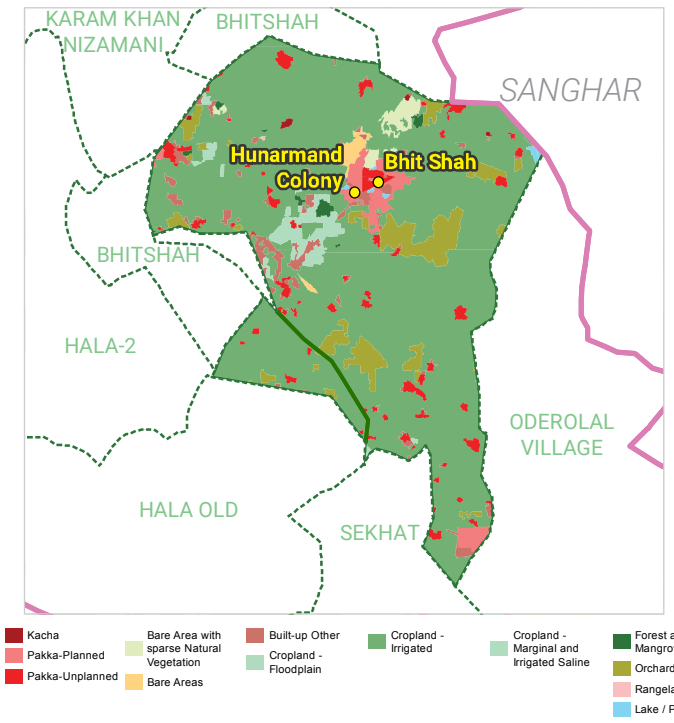
SATELLITE IMAGERY



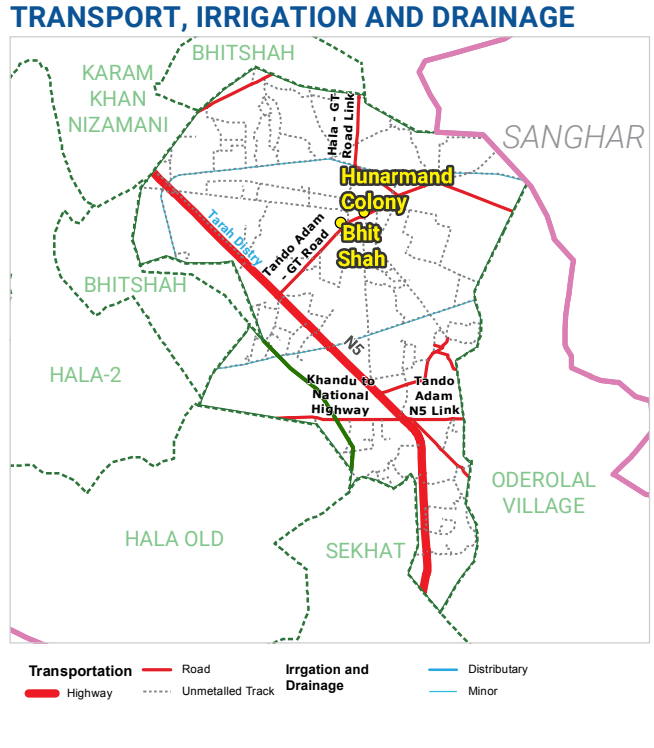
DEM AND FLOW DIRECTION



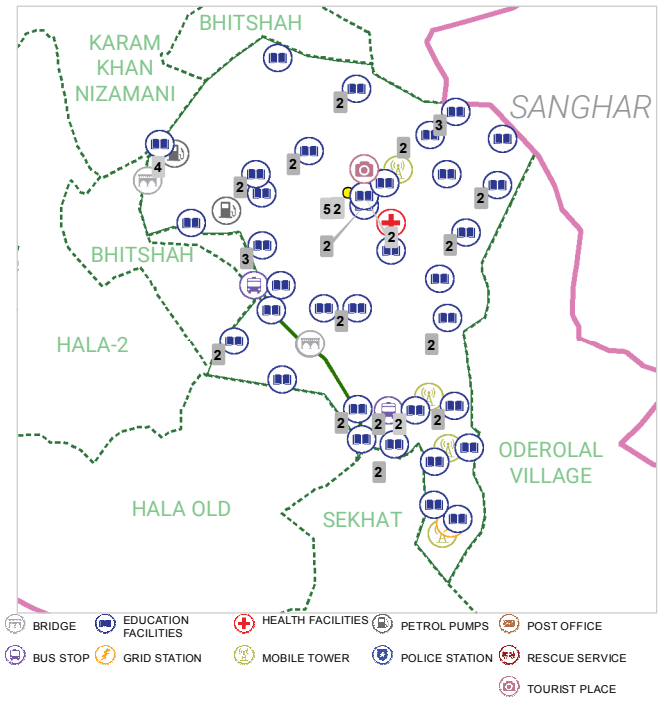
LAND USE / LAND COVER



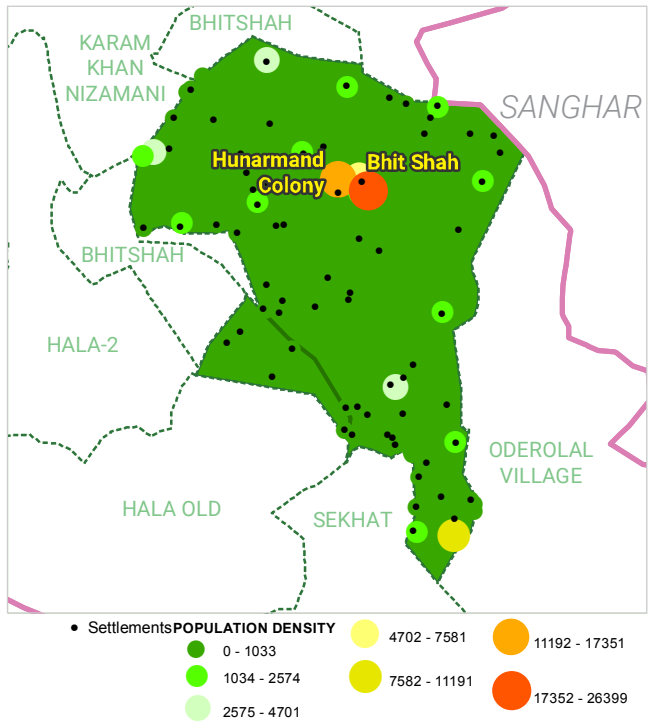
TRANSPORT, IRRIGATION AND DRAINAGE



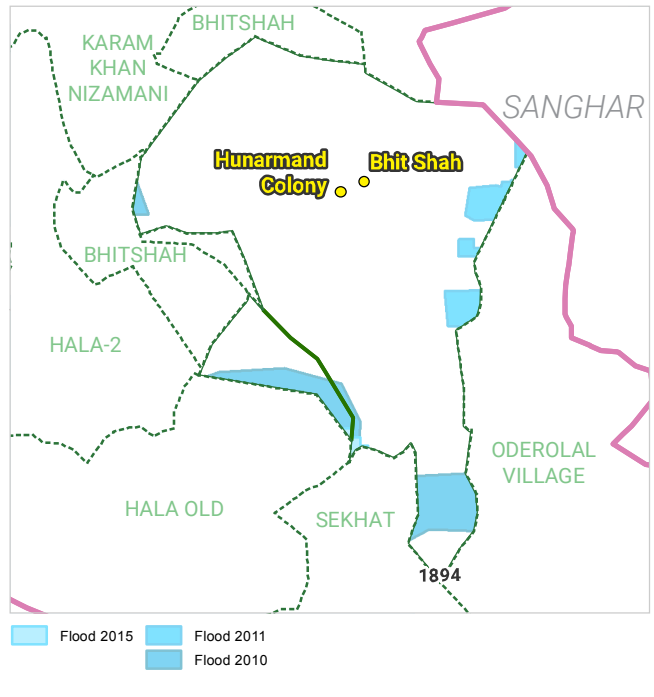
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

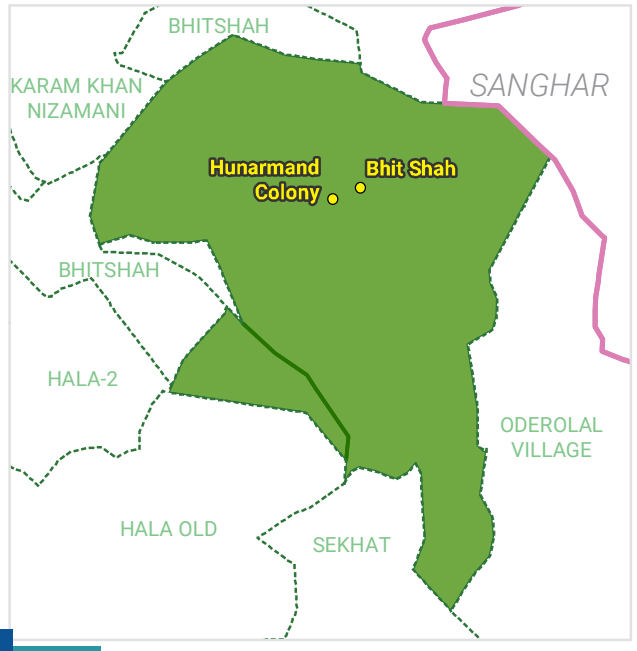


FLOOD

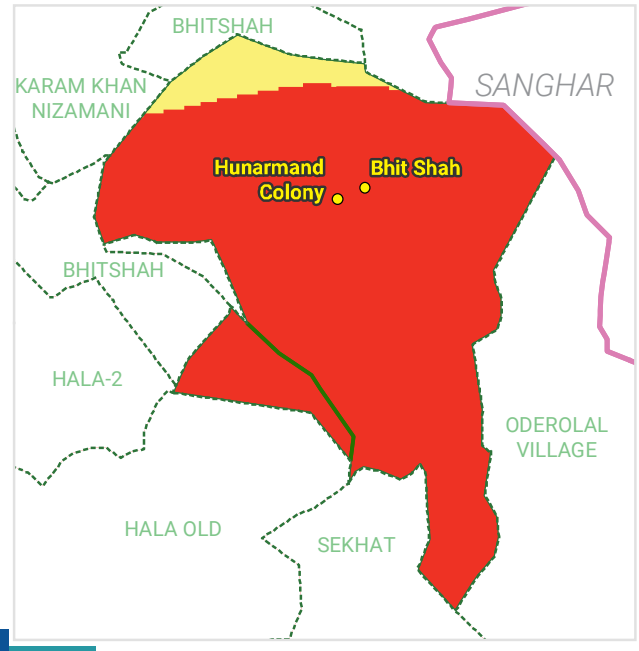
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

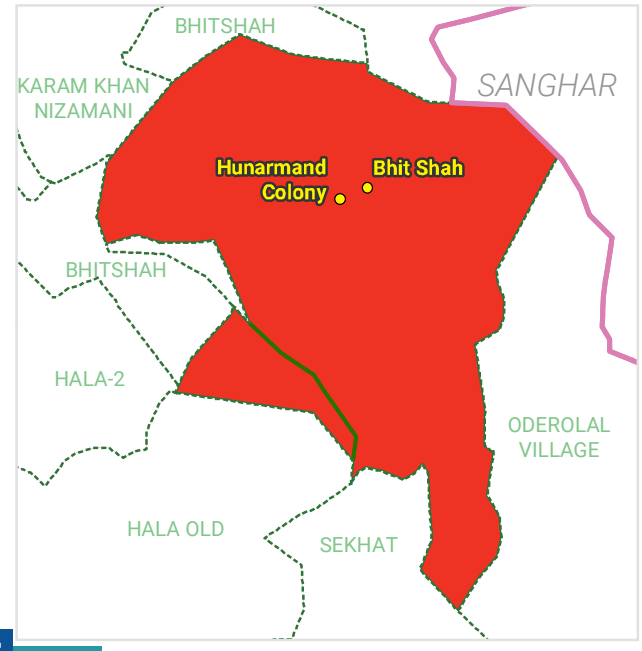
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

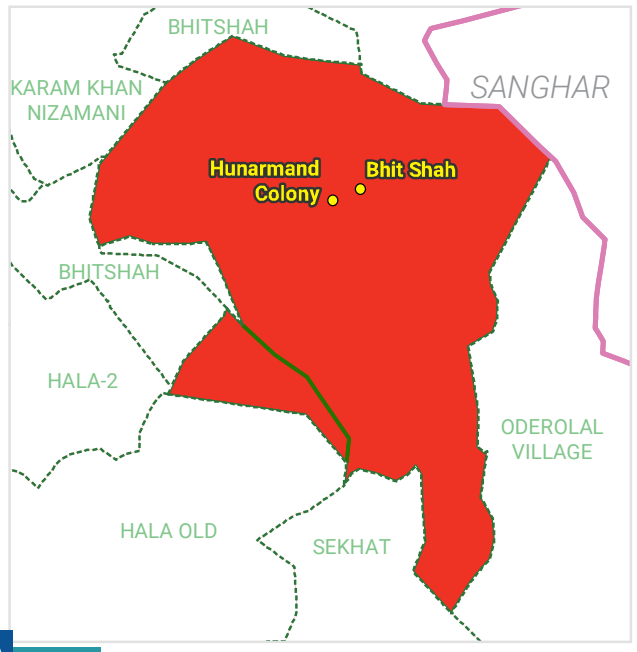


10 YEARS



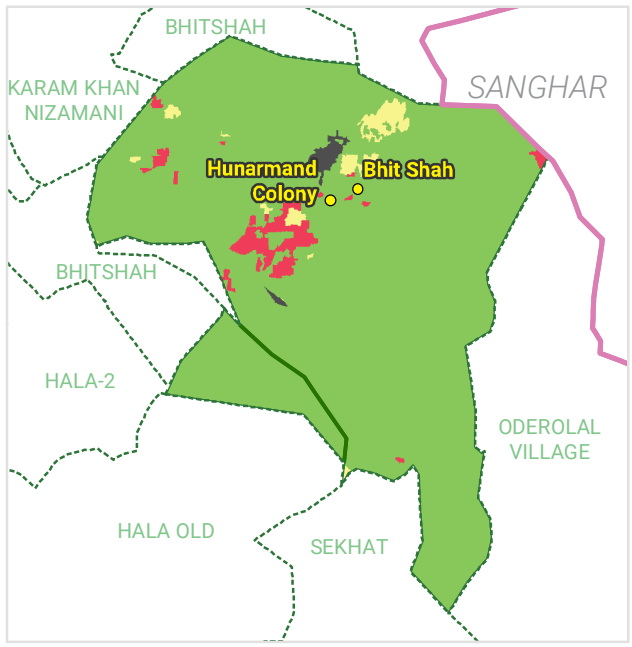
25 YEARS

HAZARD

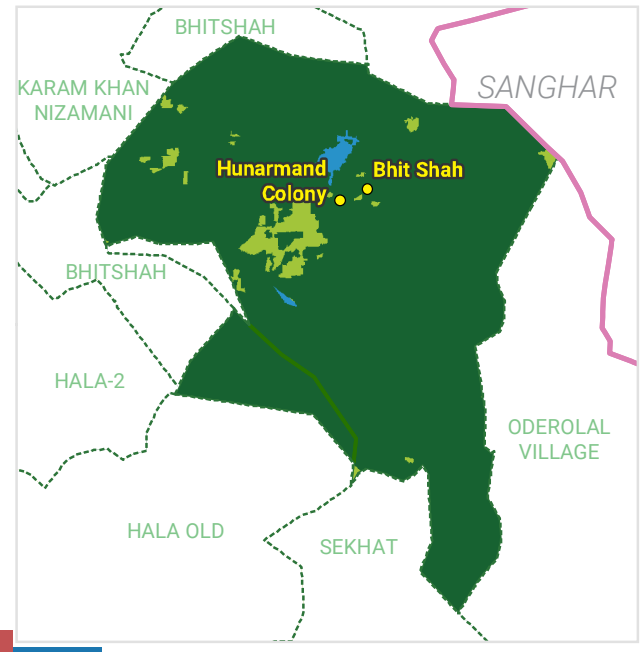


50 YEARS

VULNERABILITY

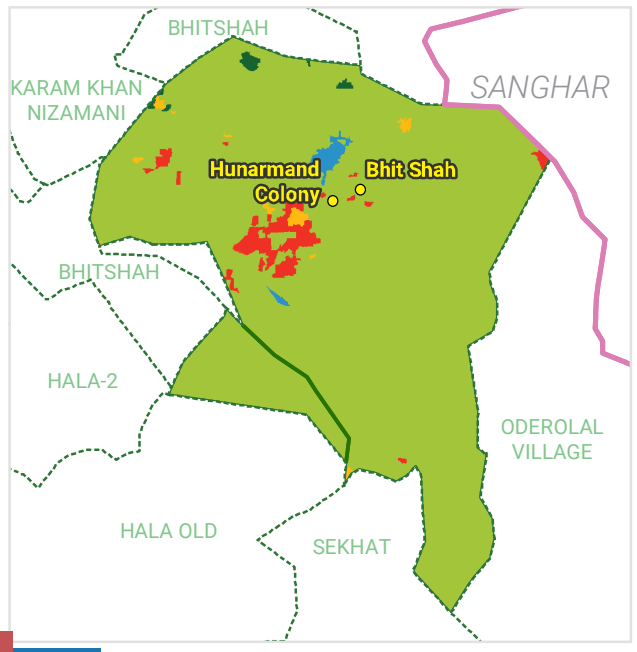


RISK

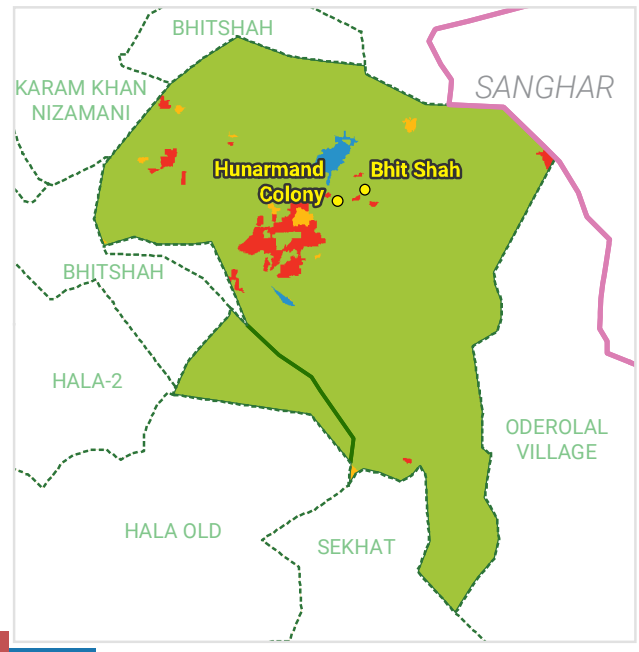


5 YEARS

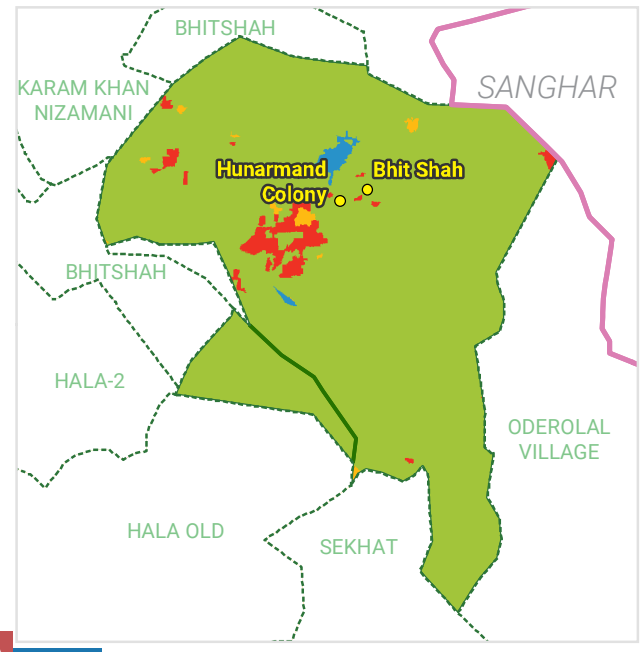
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

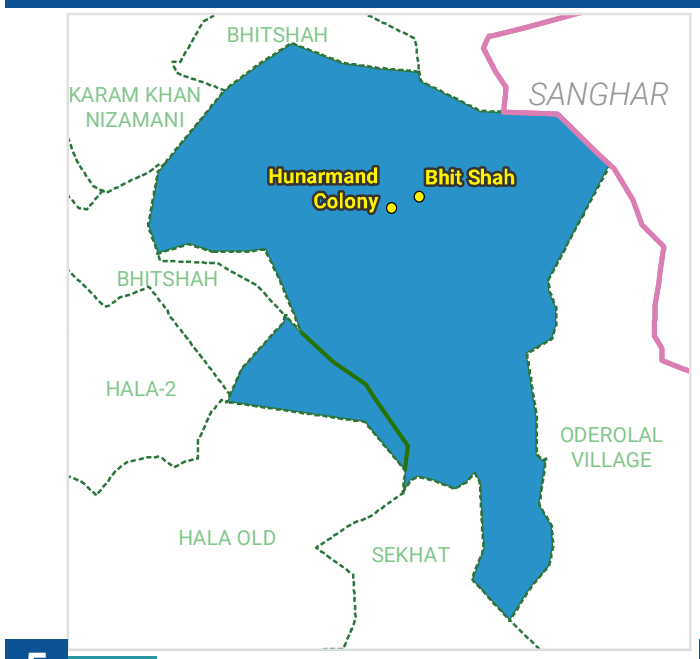
(BASED ON 50 YEARS RETURN PERIOD)

82	17044	97403	77.63	1.12	0.42	0	0.01
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

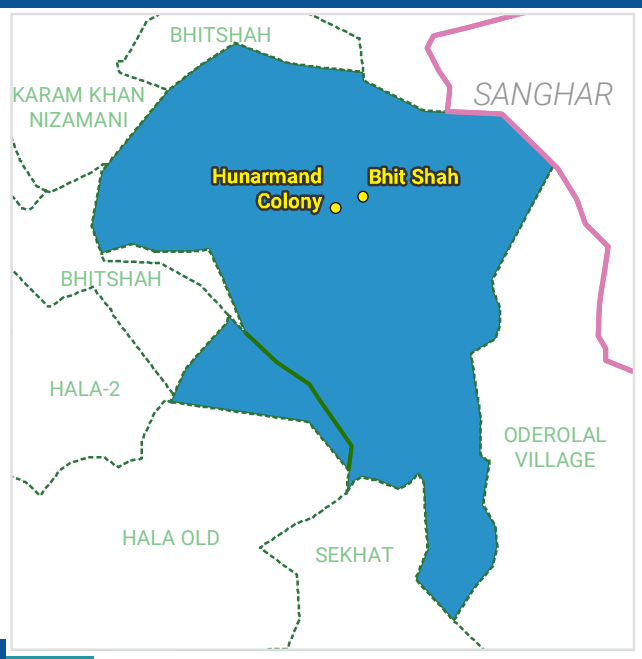
0.21	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

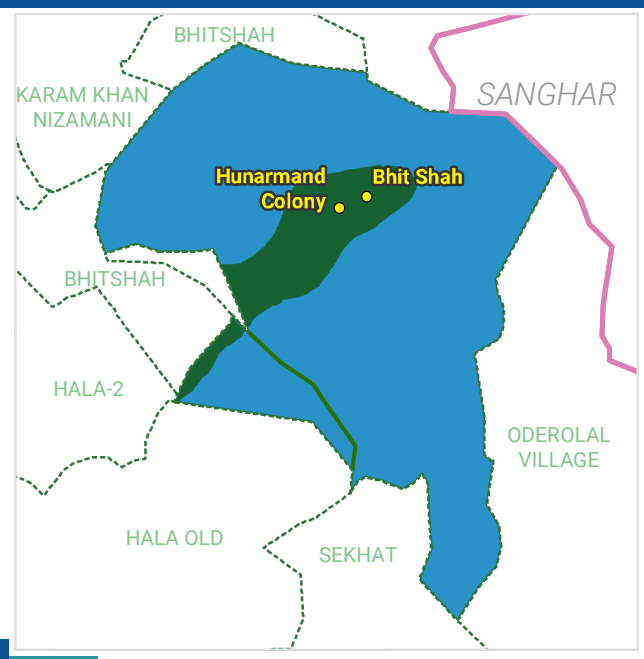
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

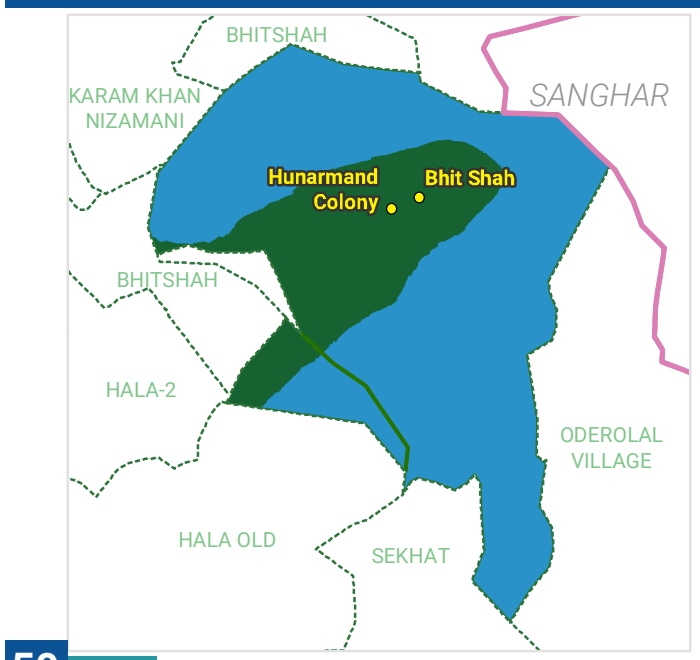


10 YEARS



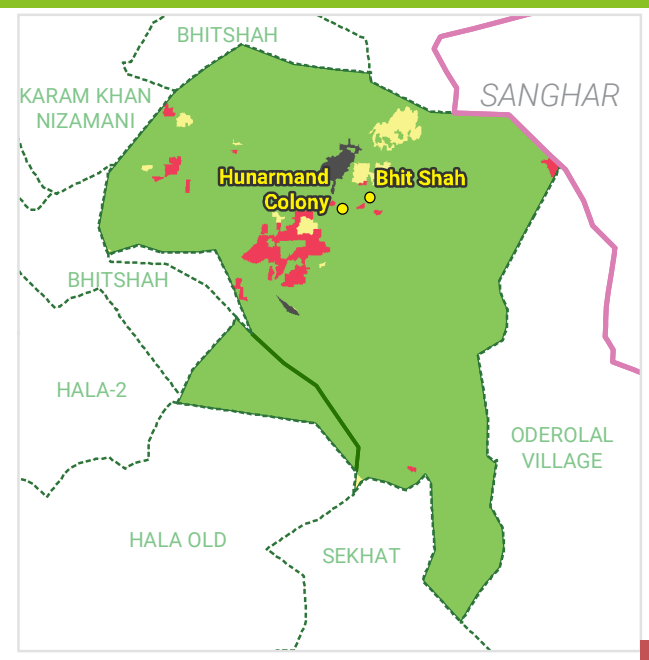
25 YEARS

HAZARD

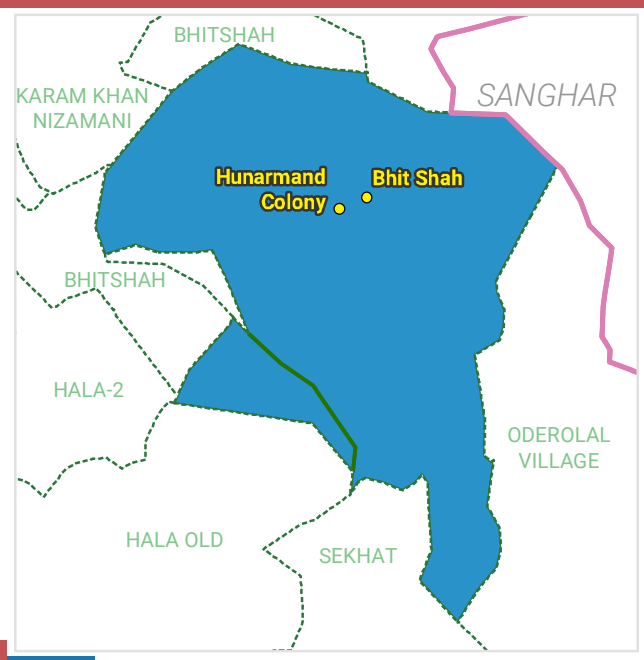


50 YEARS

VULNERABILITY



RISK



5 YEARS

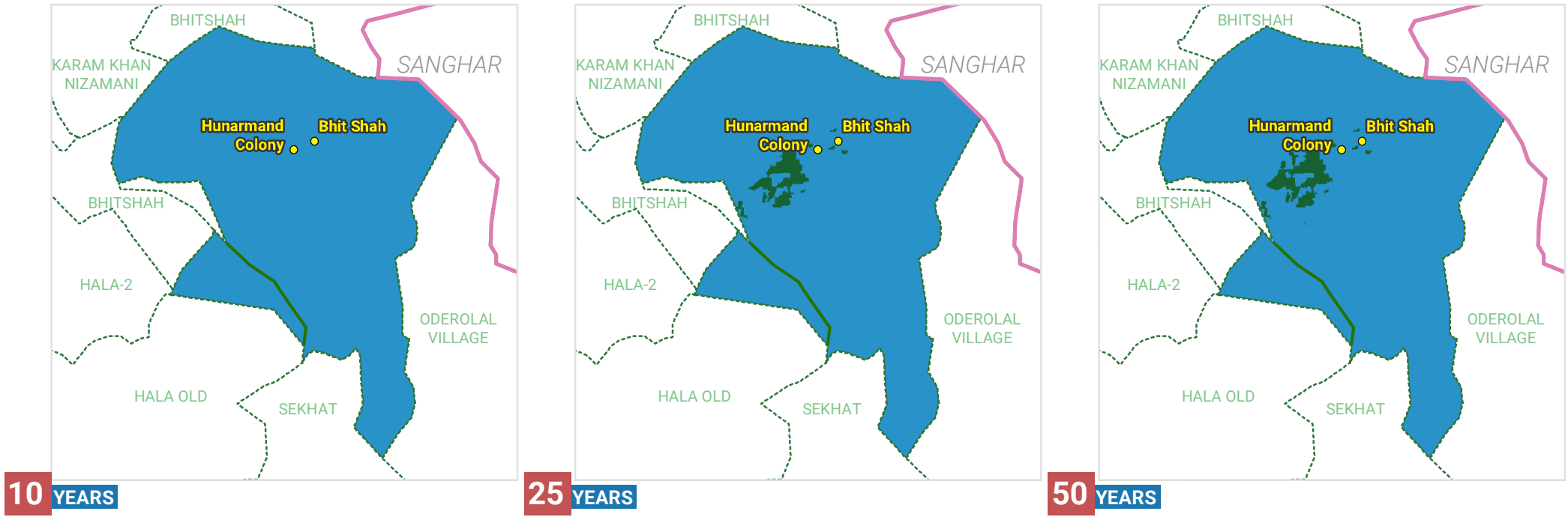
HAZARD
No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

RISK AT DIFFERENT RETURN PERIODS



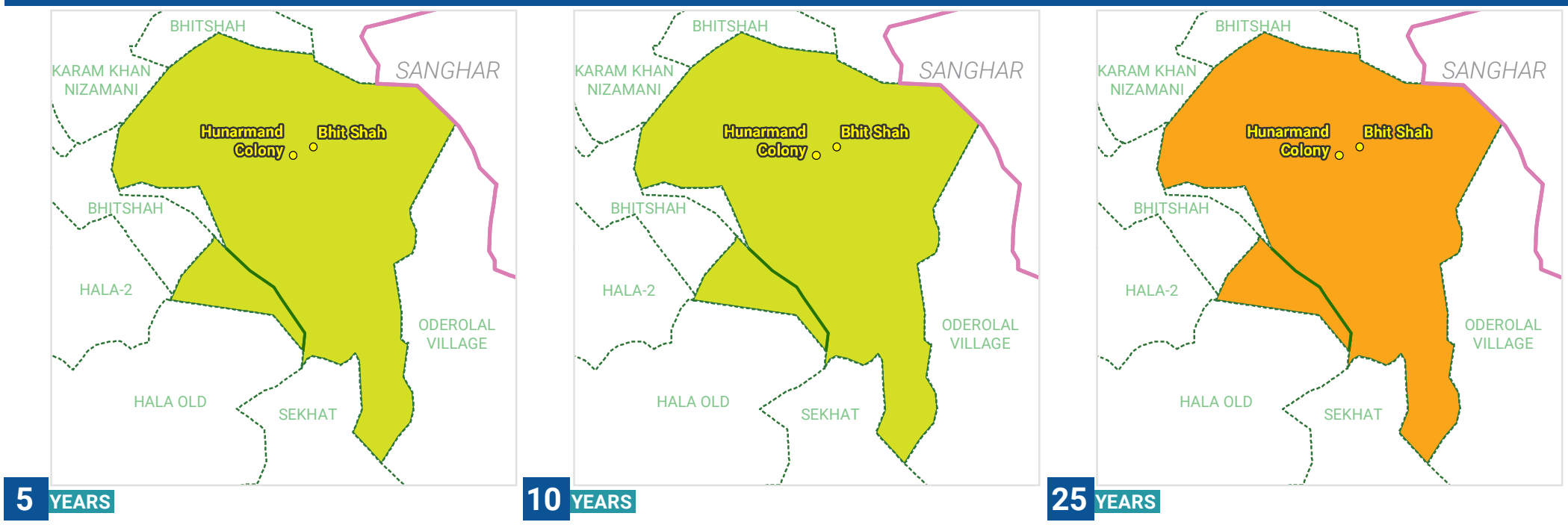
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

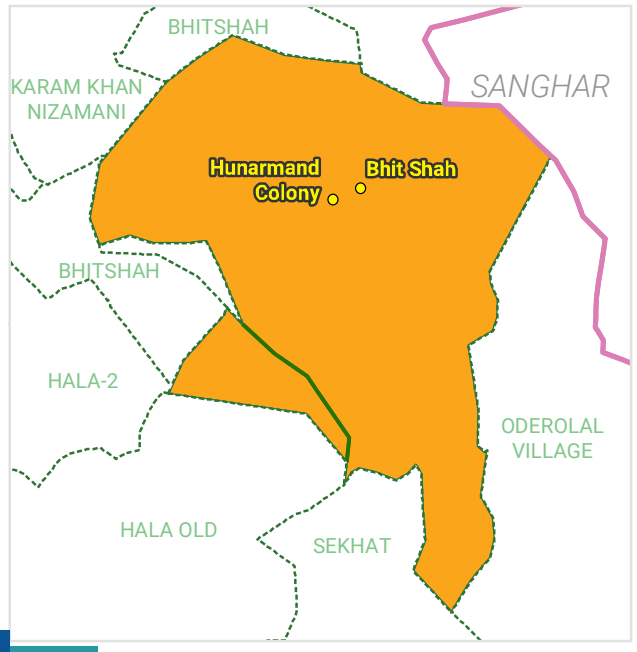
0	17	95	2.13	0.00	0.29	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)
0.09	0						
WATER BODY (SQ. KM)	WET AREA (SQ. KM)						

HEATWAVE

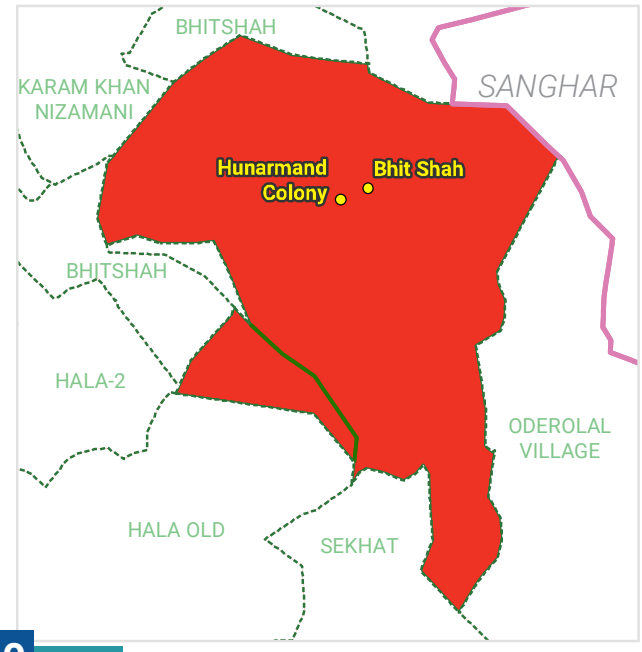
HAZARD AT DIFFERENT RETURN PERIODS



HAZARD AT DIFFERENT RETURN PERIODS

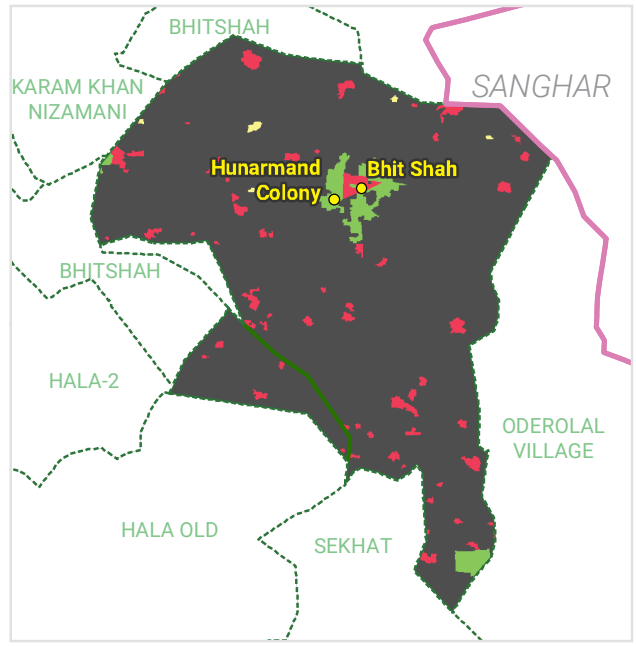


50 YEARS

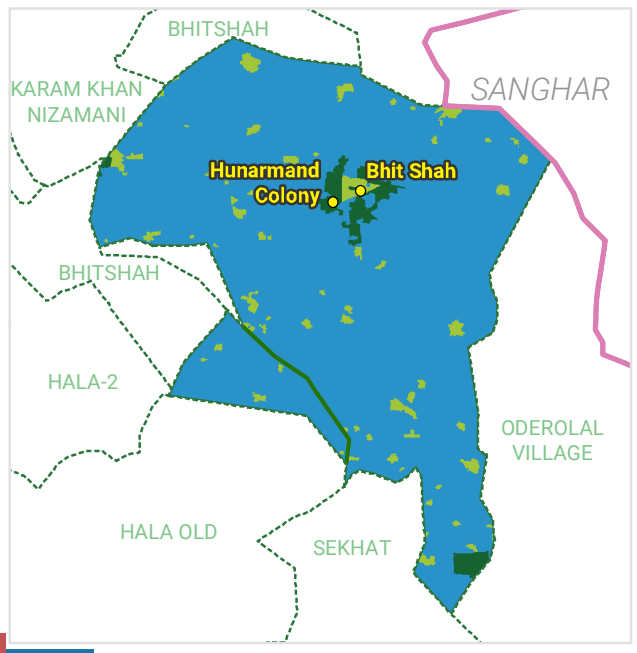


100 YEARS

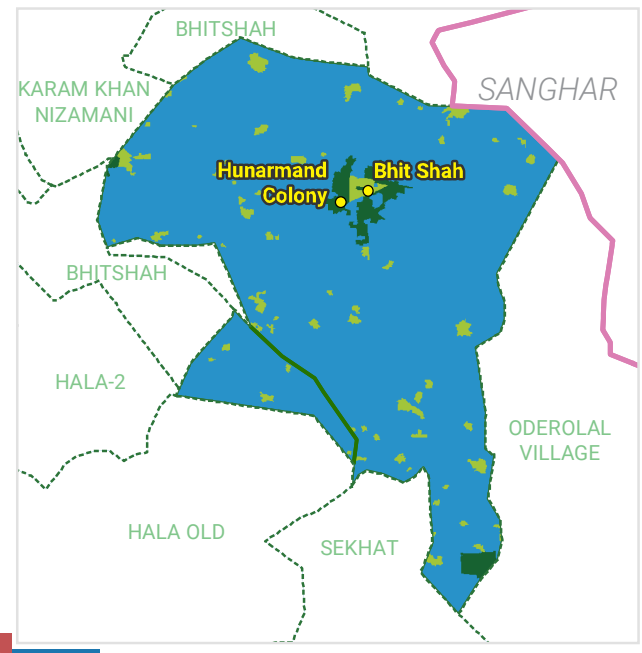
VULNERABILITY



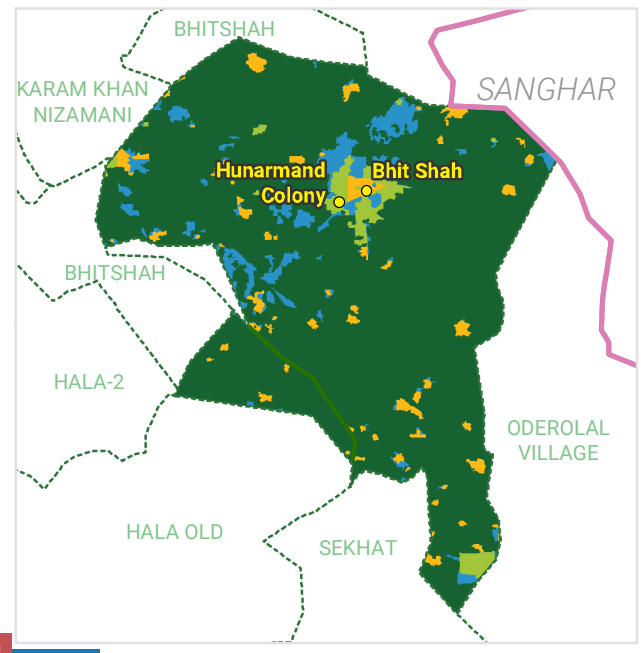
RISK AT DIFFERENT RETURN PERIODS



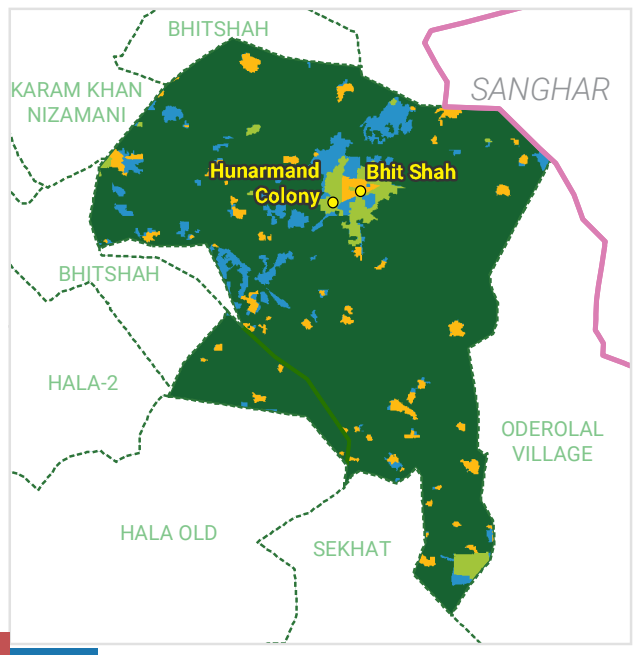
5 YEARS



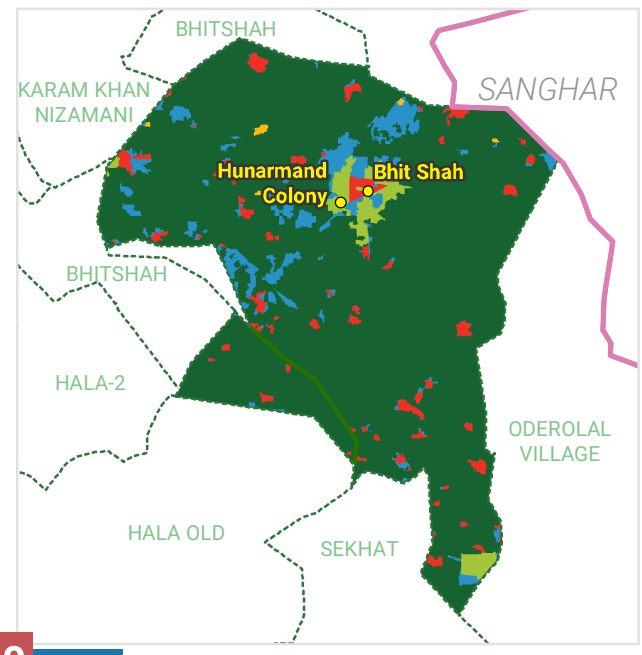
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

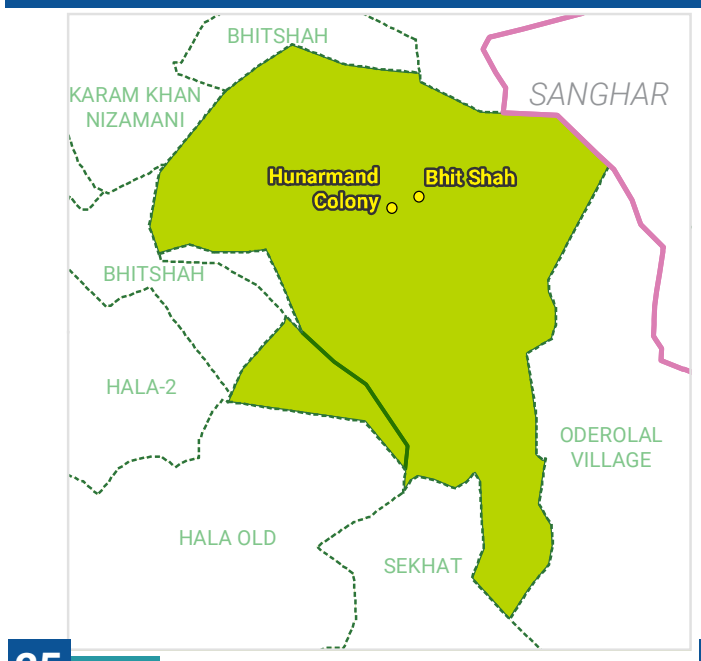
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

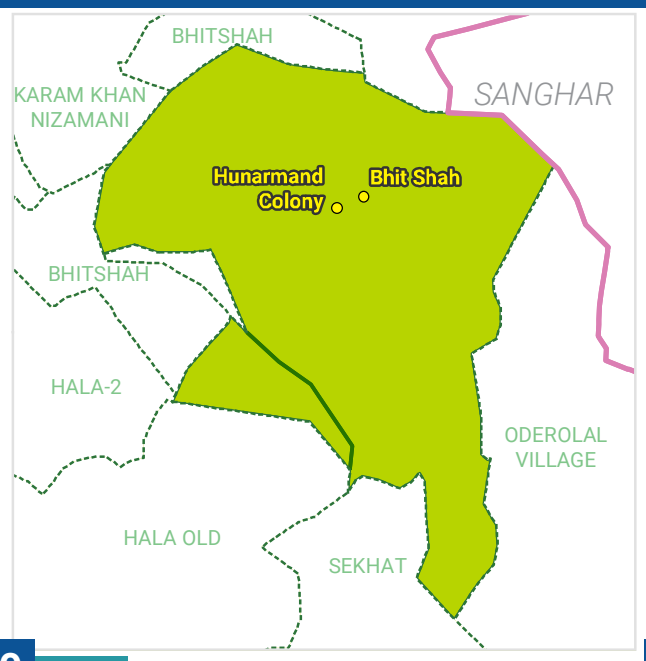
80	16961	96926	77.42	0.12	2.05	2.83
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

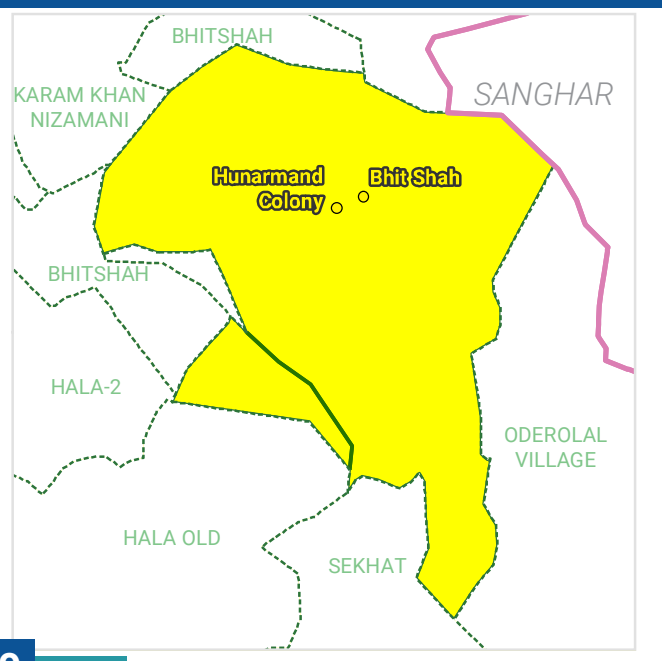
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

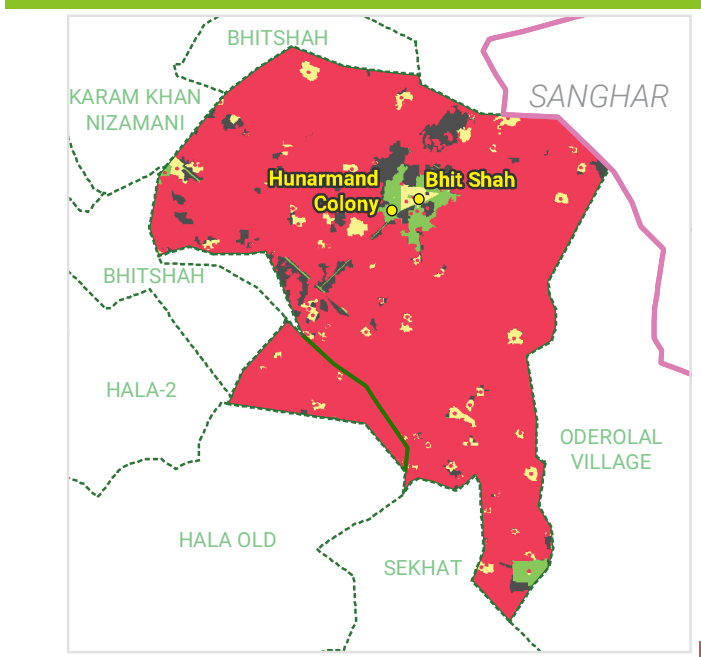


100 YEARS

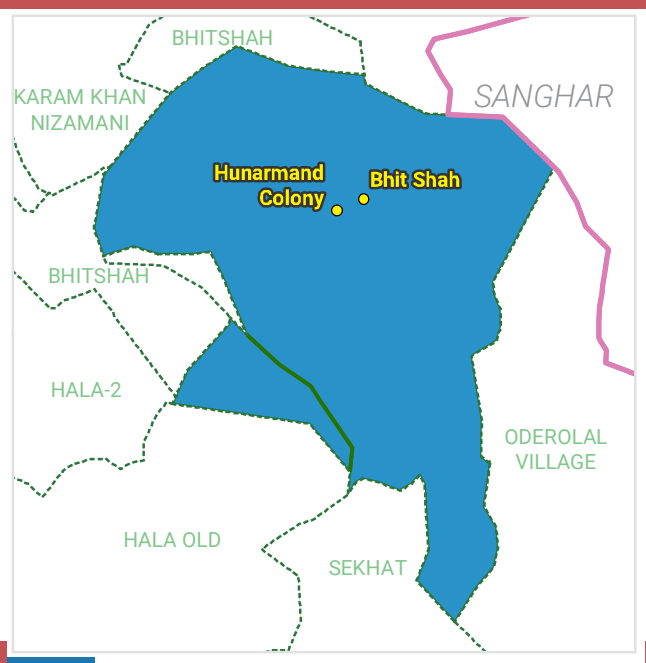


500 YEARS

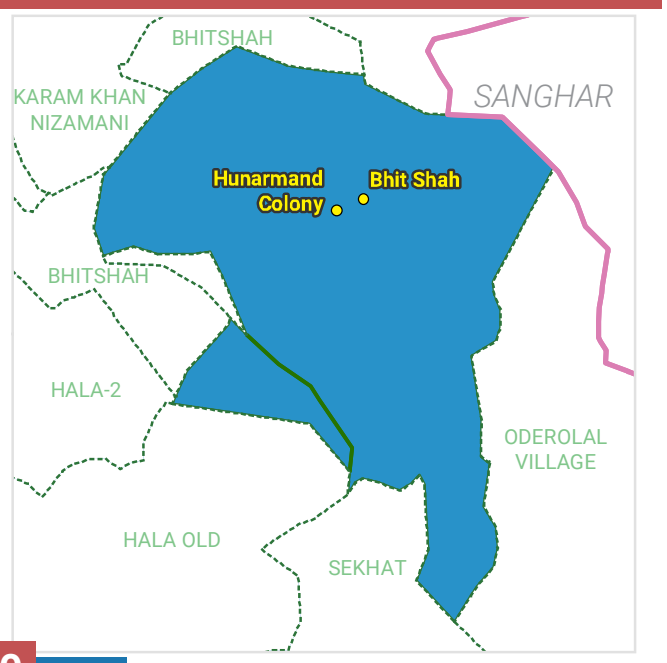
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS



25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

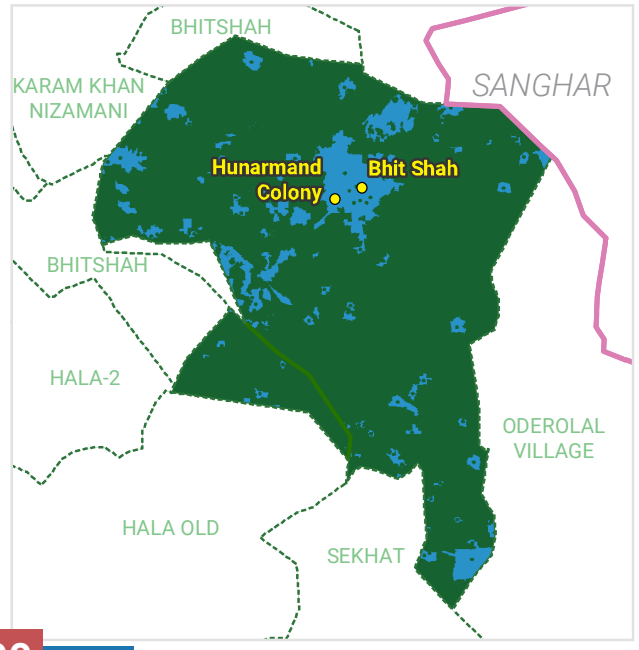
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

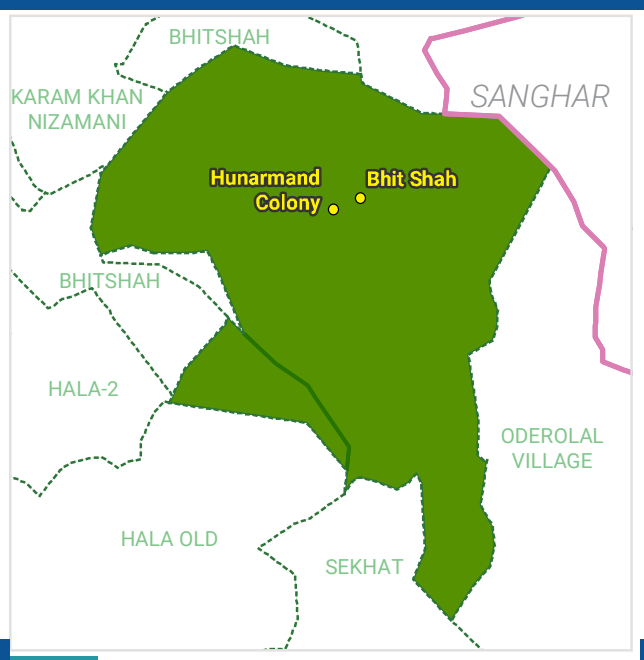
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

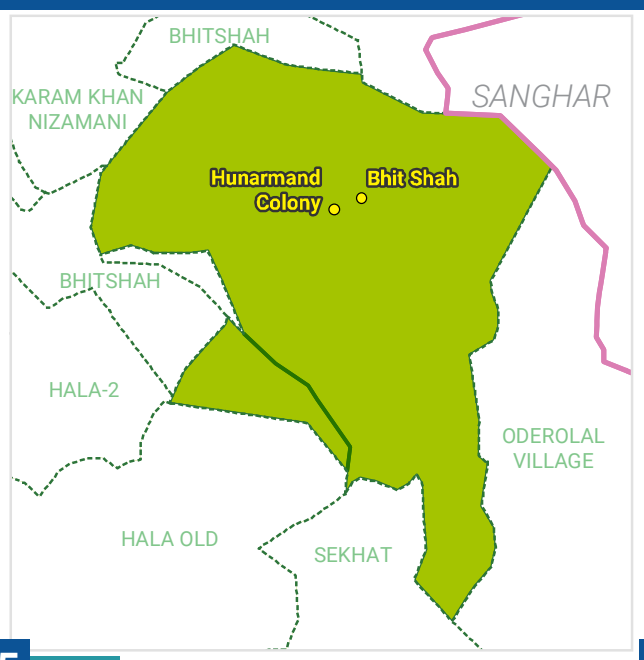
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

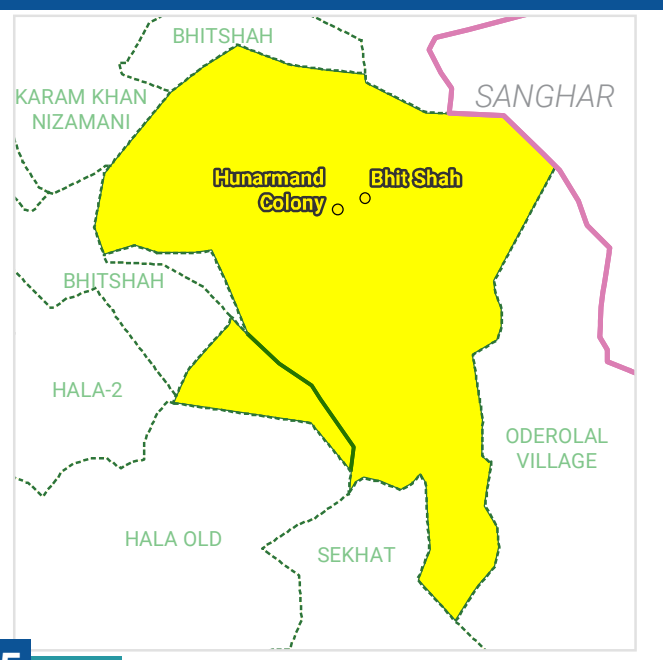
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS



475 YEARS



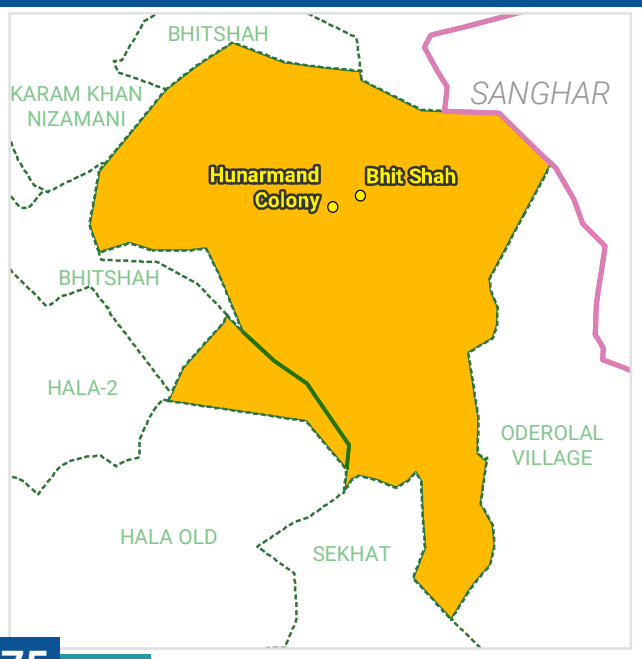
975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

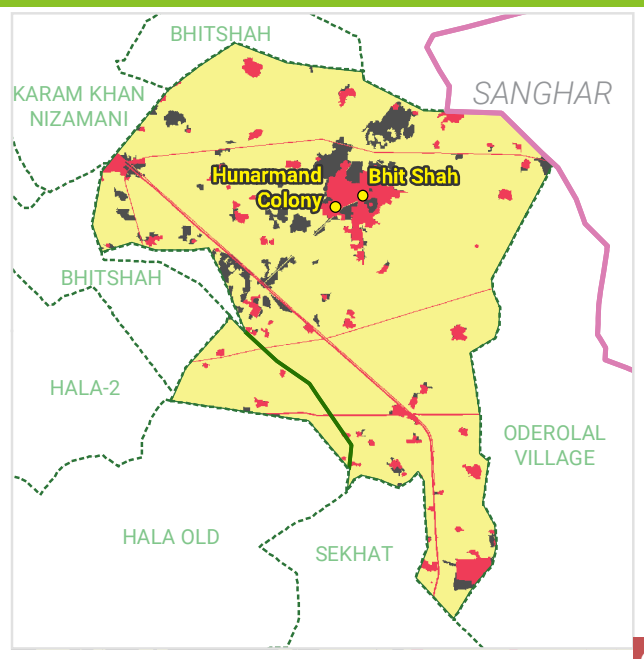
EARTHQUAKE

HAZARD

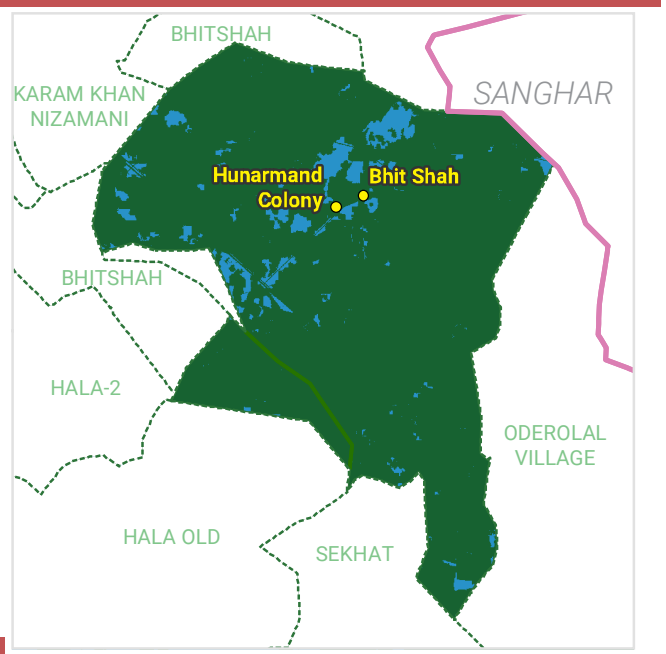


2475 YEARS

VULNERABILITY

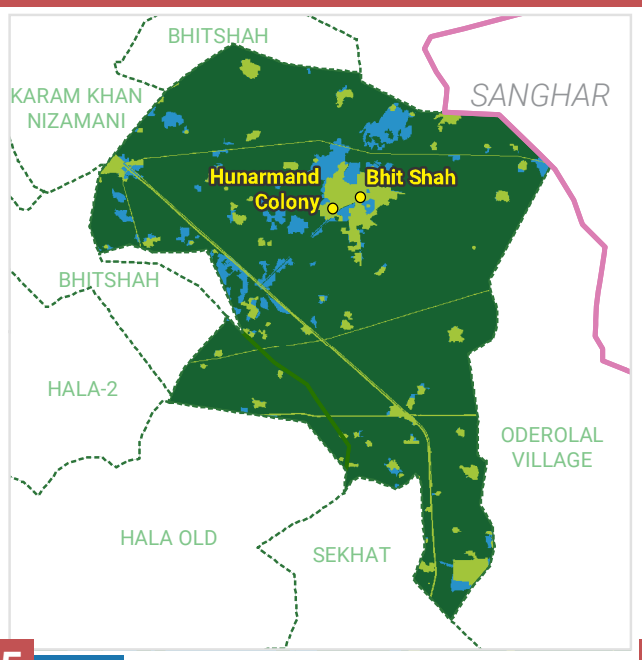


RISK

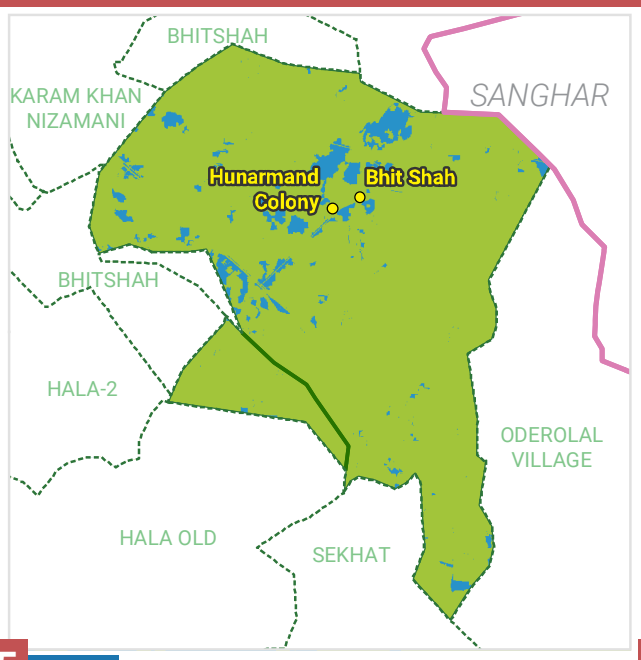


95 YEARS

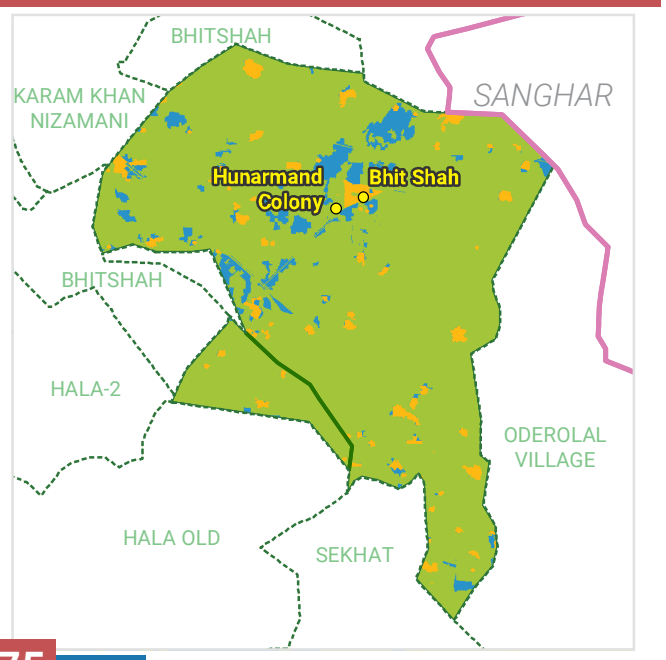
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

82	16933	96776	77.47	0.02	0.12	0	2.05
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
2.83	0.00	183.78	0	32.80	1	3	2
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
57	0	0	1	2	0	10	14
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
2	1	0	0	2	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS: 5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low, Medium	Low, Medium, High, Extreme	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	Low	Low	●	●	●
HEATWAVE	Low, Medium	Low, Medium	Low, Medium, High	Low, Medium, High	Low, Medium, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS: 95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES: 8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

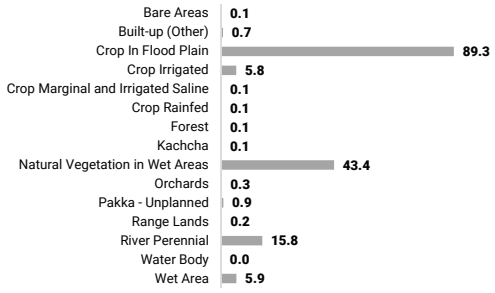
- Low *50-99*
- Medium *100-199*
- High *200-249*
- Extreme *250-300*

UC - HALA OLD

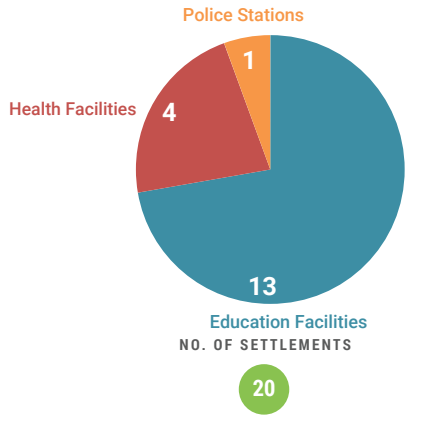
Union Council area in sq. km	163
Surrounding UCs / Features	**BHANOTH** in North **HALA-2** in East **SEKHAT** in South East **JAMSHORO DISTRICT** in West
Population	2017 approx. **17,986**
No. of household	2017 approx. **3,086**

Land Use Land Cover

coverage area in sq.km



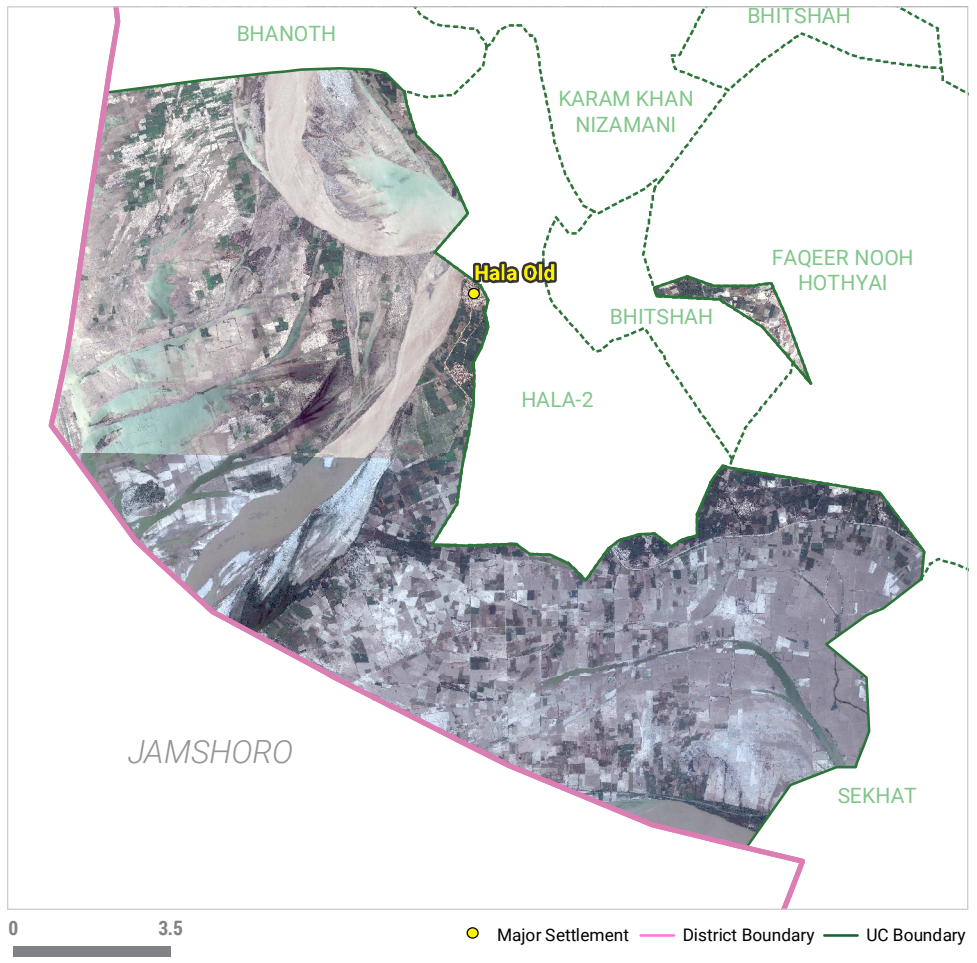
Critical Infrastructure



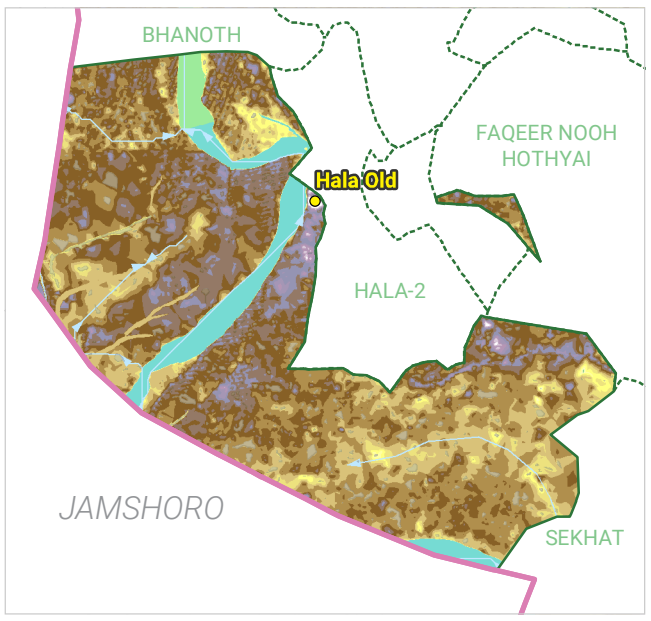
NO. OF SETTLEMENTS

20

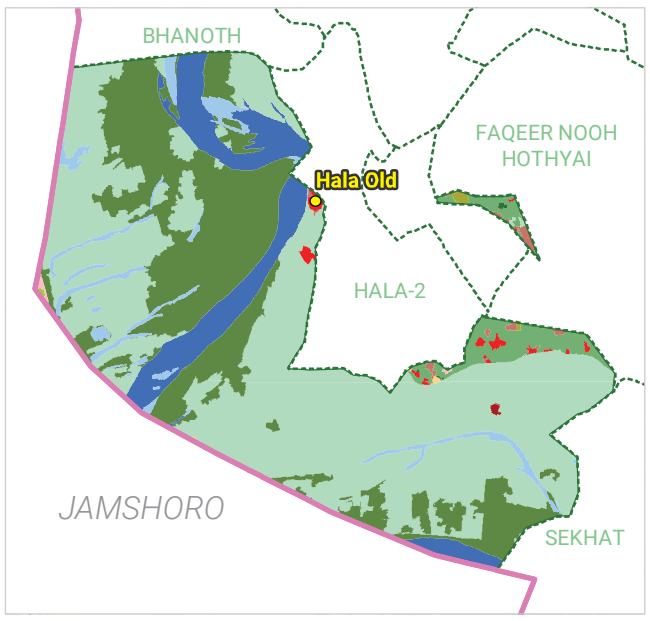
SATELLITE IMAGERY



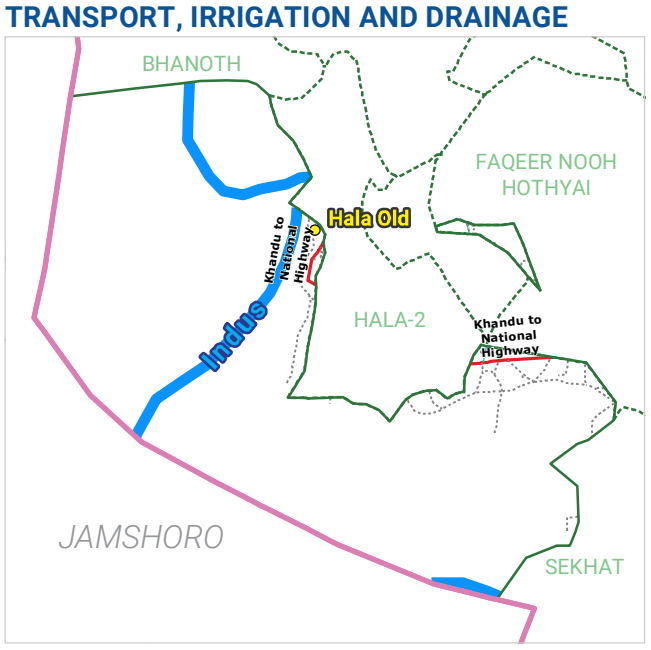
DEM AND FLOW DIRECTION



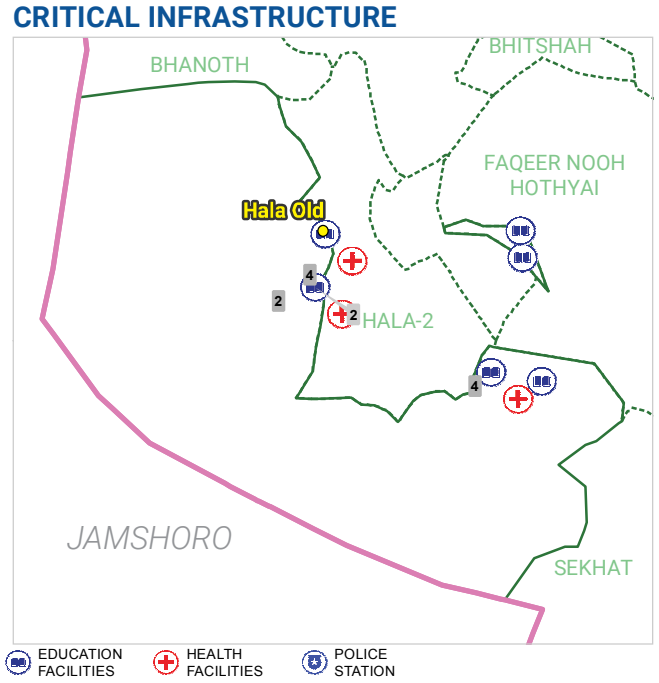
LAND USE / LAND COVER



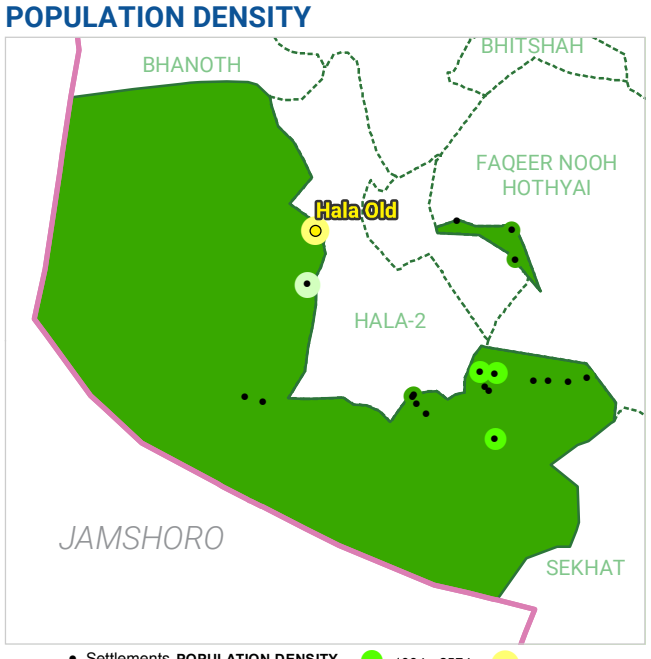
TRANSPORT, IRRIGATION AND DRAINAGE



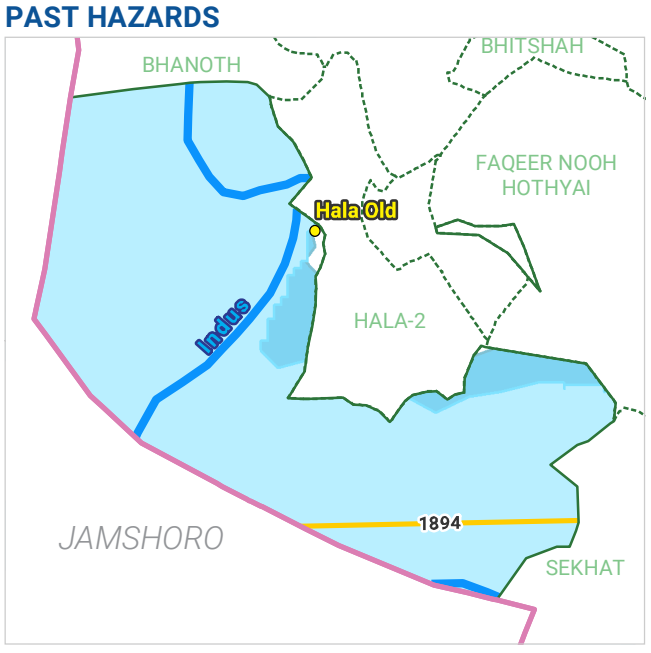
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

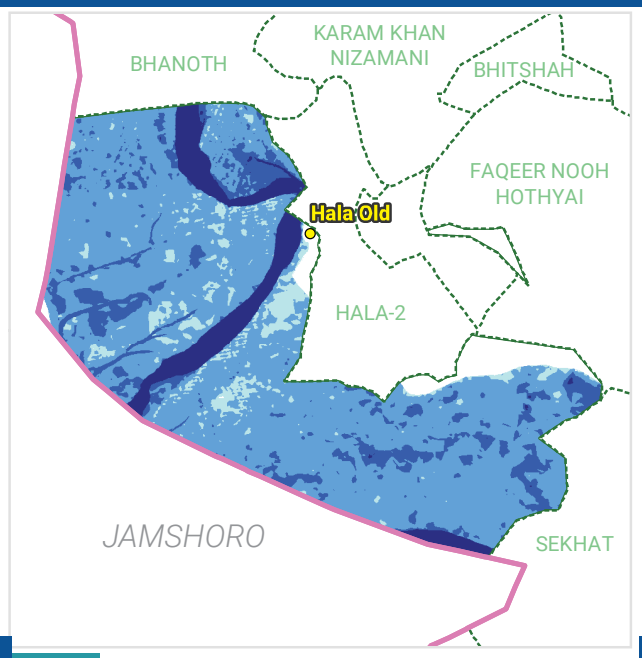


PAST HAZARDS

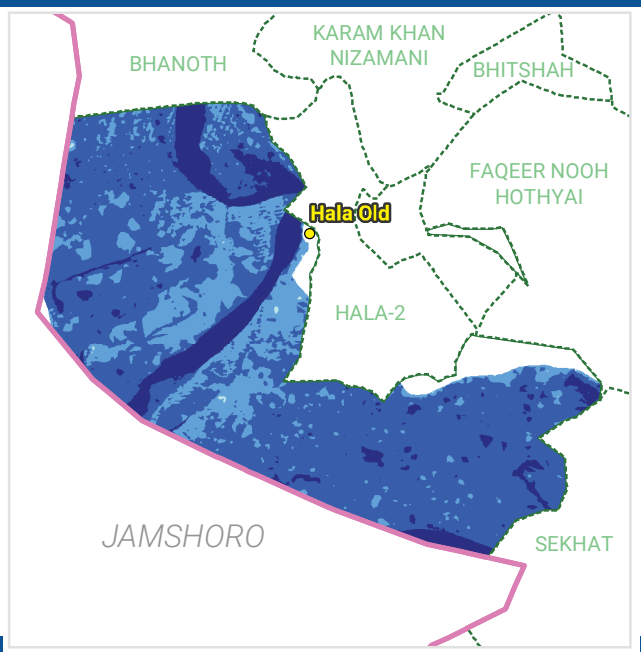


FLOOD

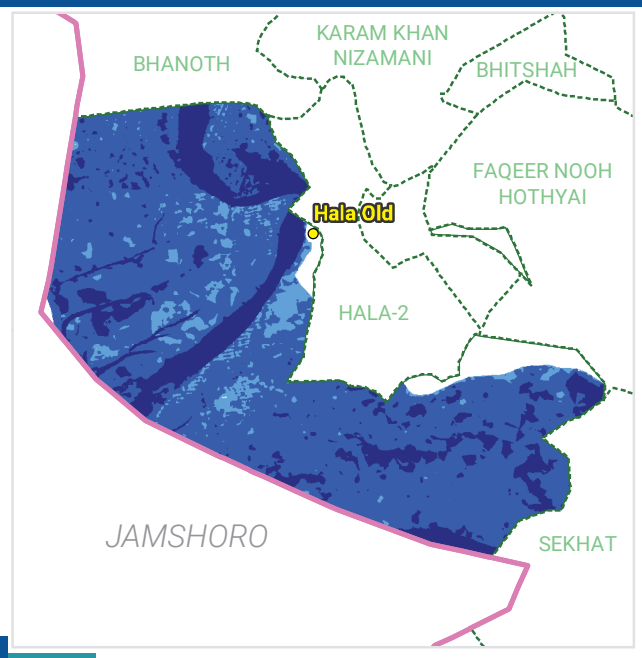
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

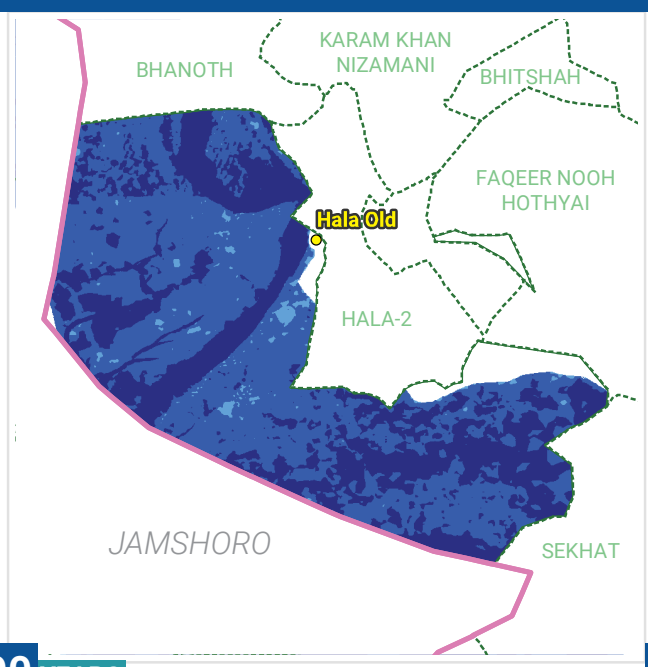


25 YEARS

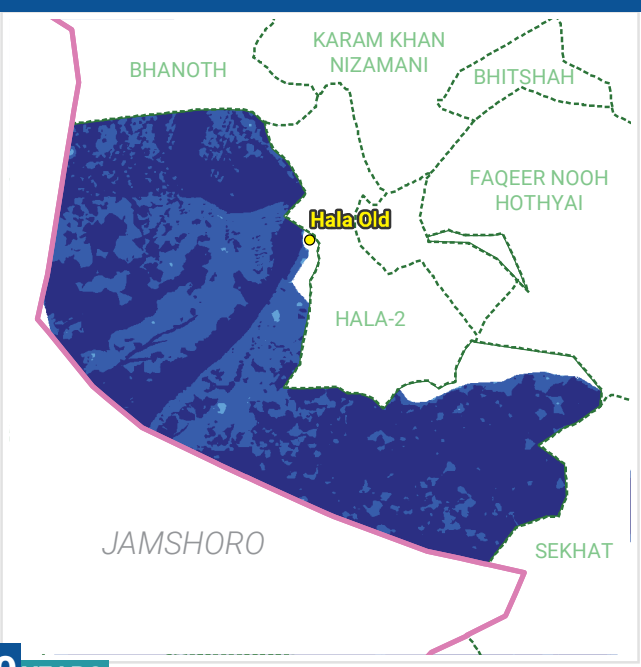


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

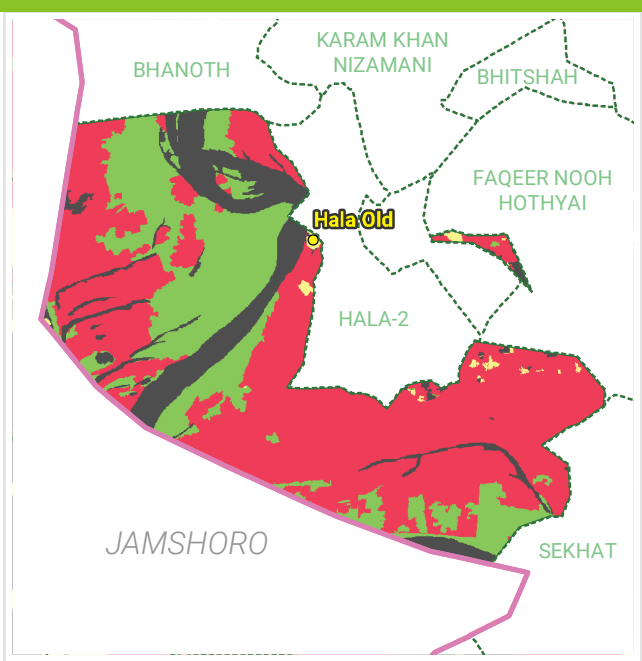


100 YEARS

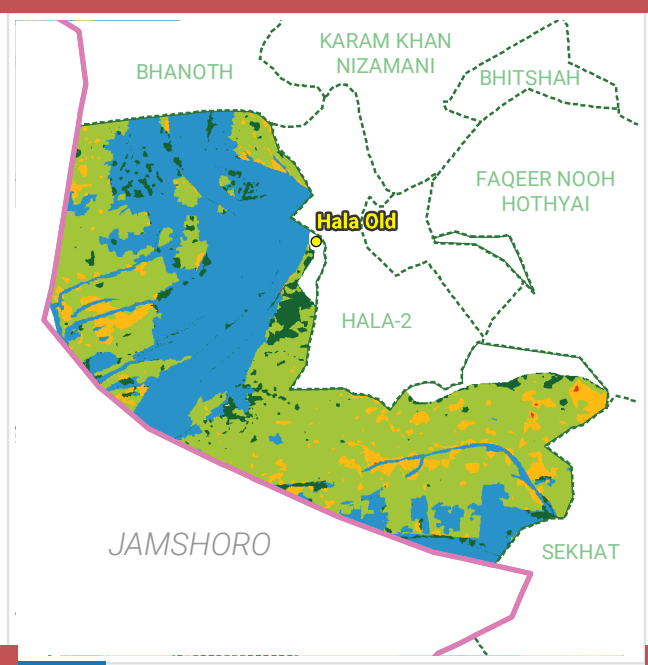


250 YEARS

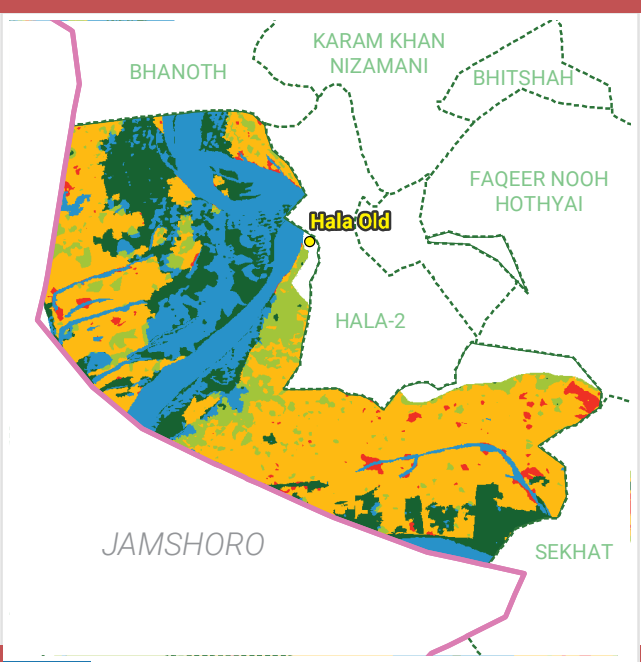
VULNERABILITY



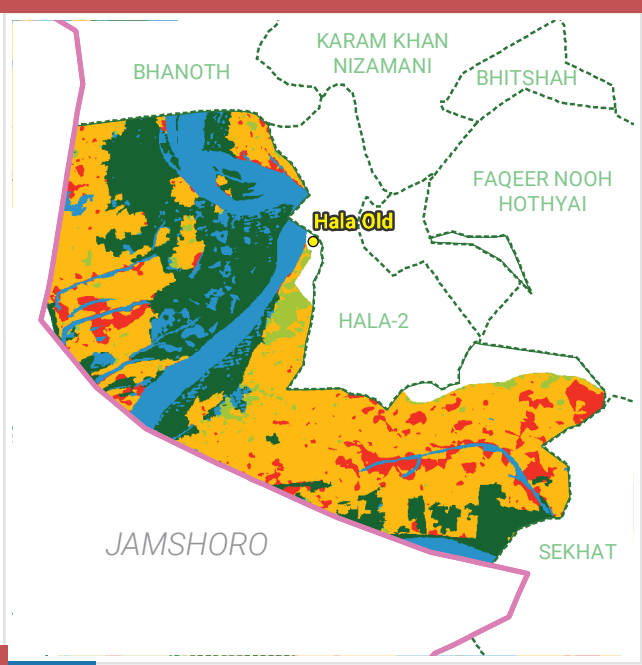
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

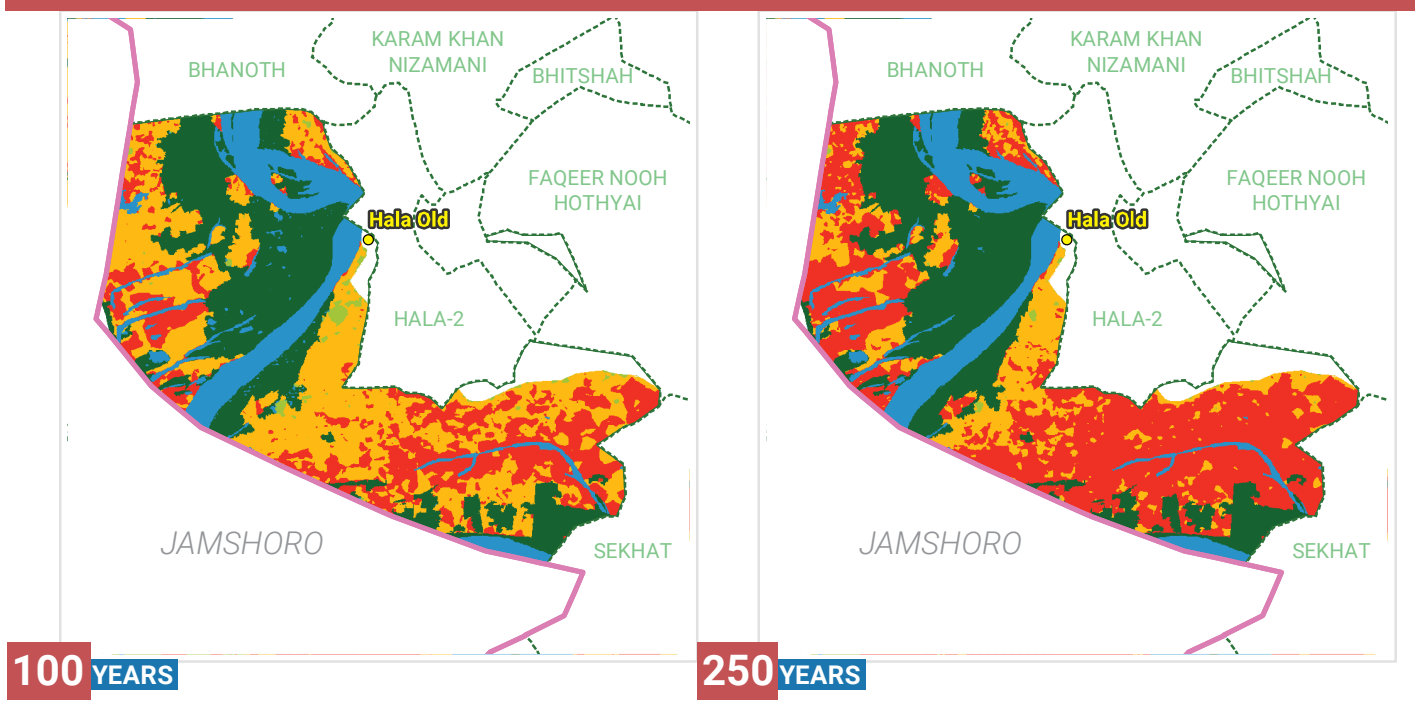
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



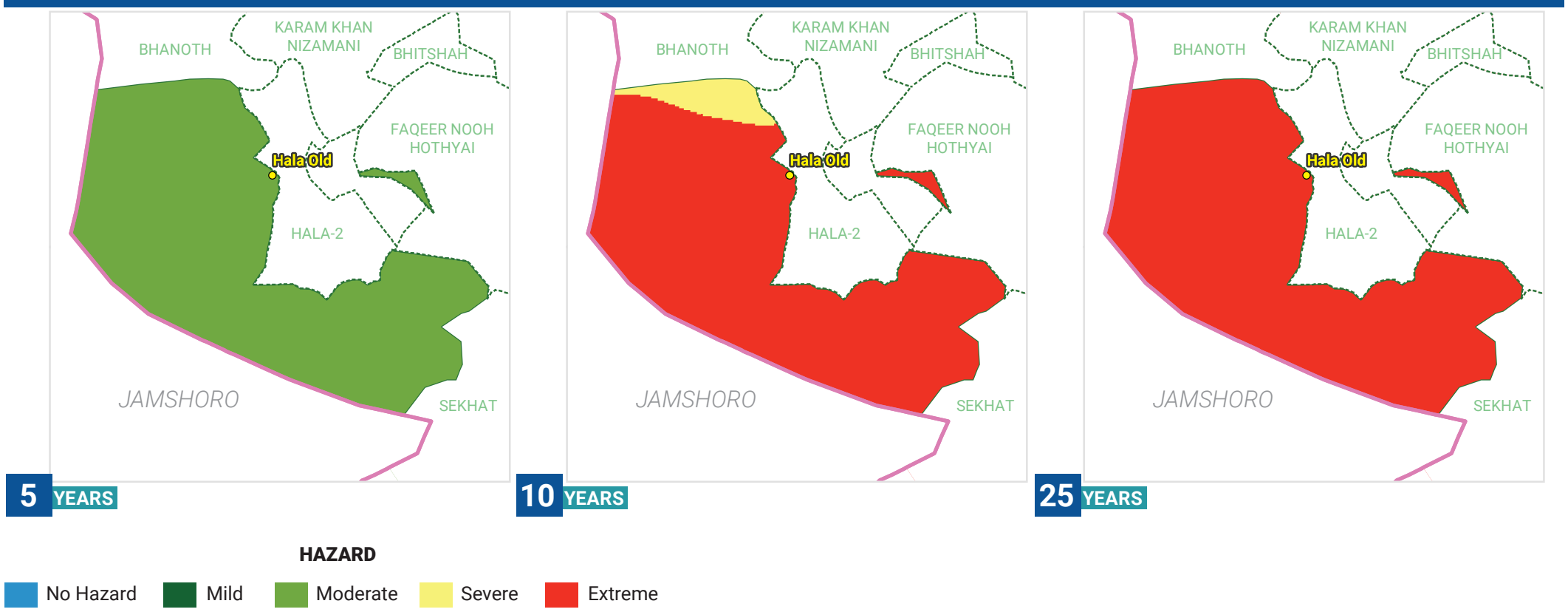
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

3	242	1431	88.28	0	0.09	38.20	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.00	0.00	7.30	0	0	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

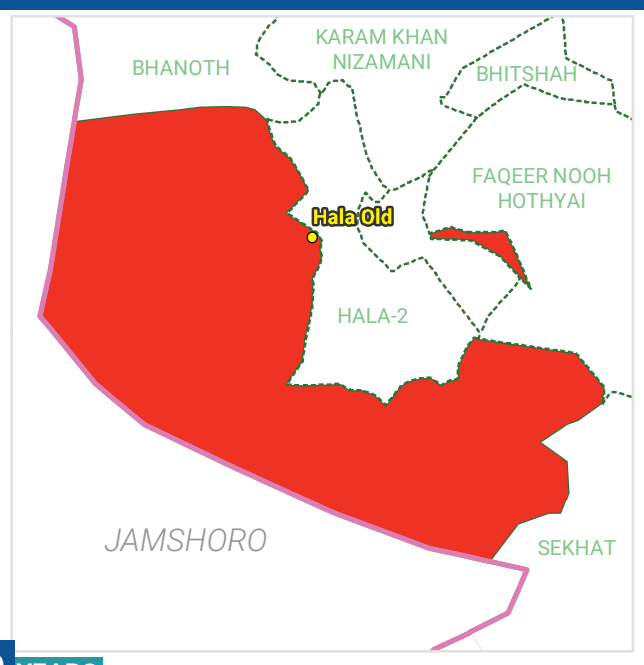
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



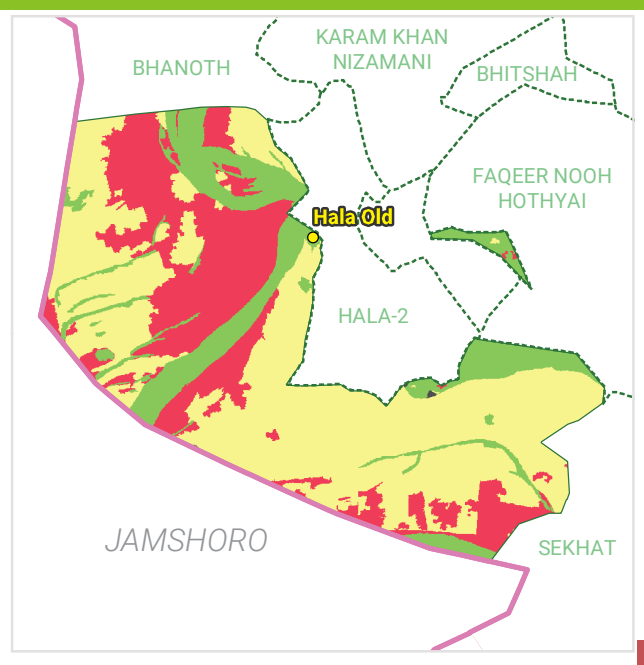
METEOROLOGICAL DROUGHT

HAZARD

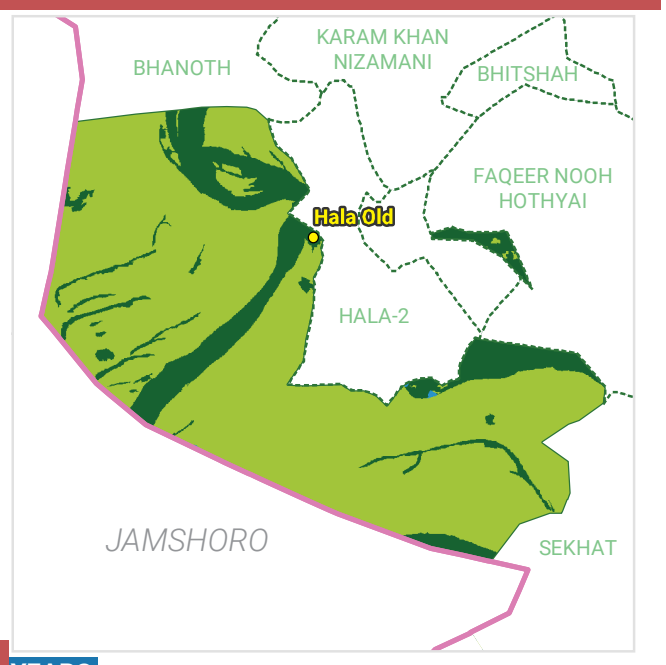


50 YEARS

VULNERABILITY

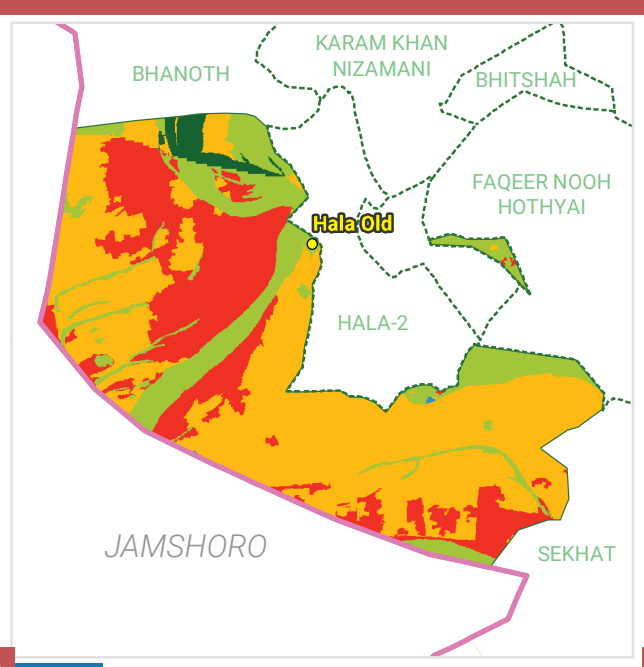


RISK

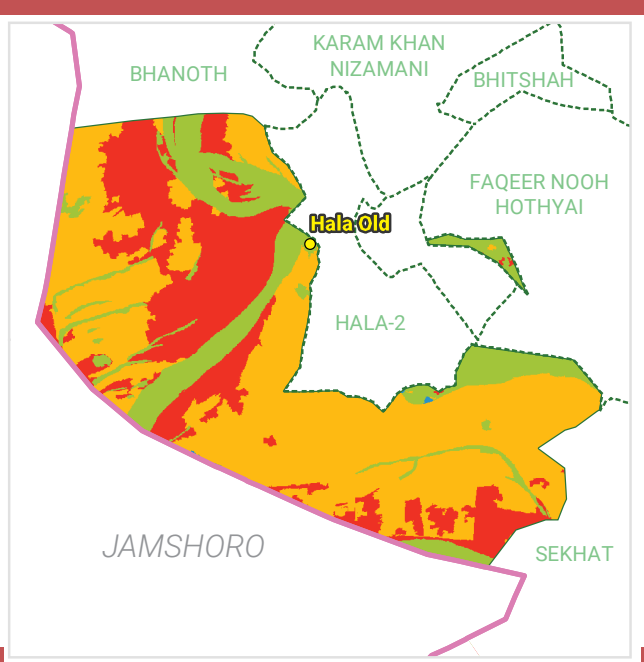


5 YEARS

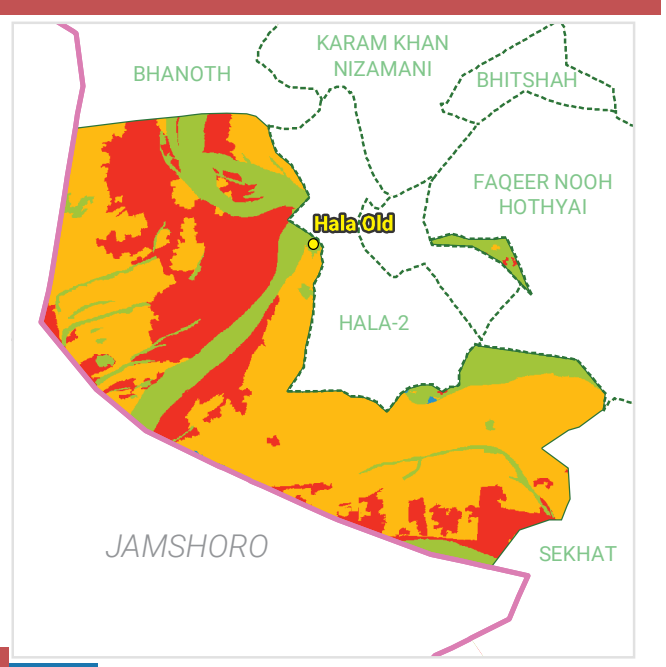
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

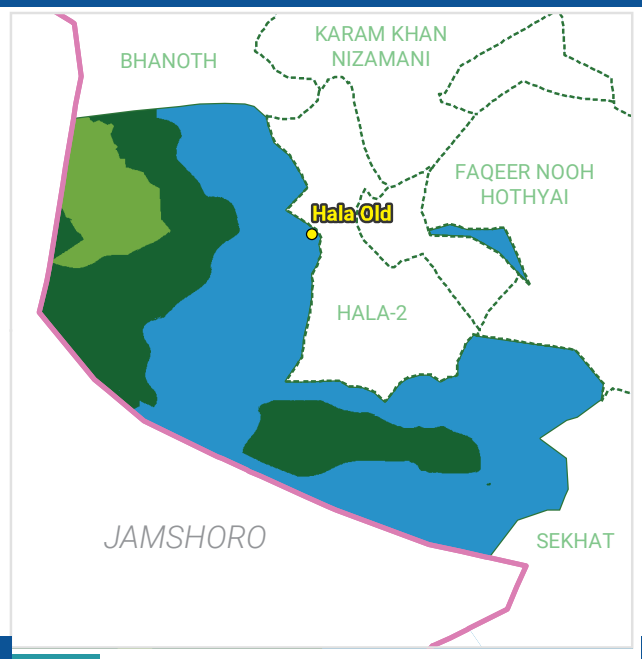
(BASED ON 50 YEARS RETURN PERIOD)

20	3086	17983	95.58	0	0.07	43.38	0.20
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

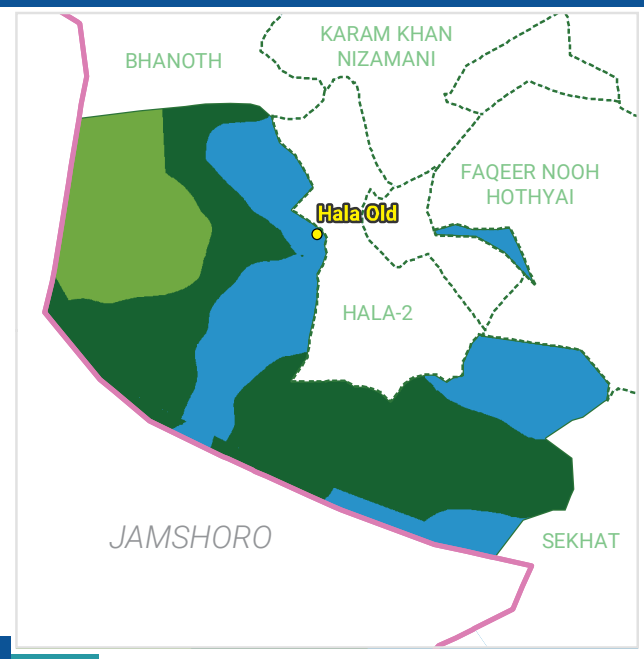
0.03	5.91
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

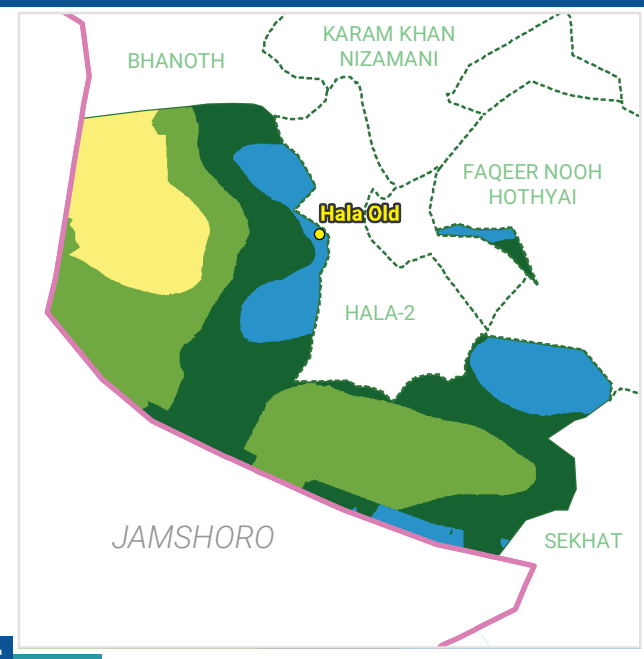
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

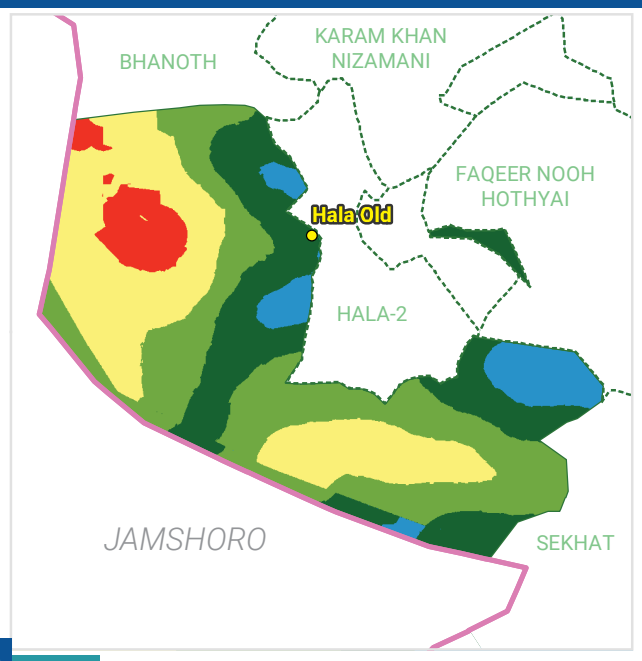


10 YEARS

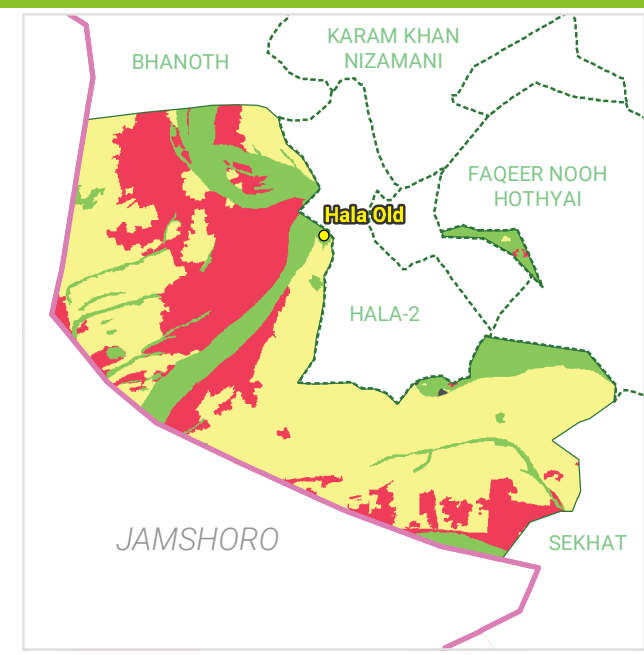


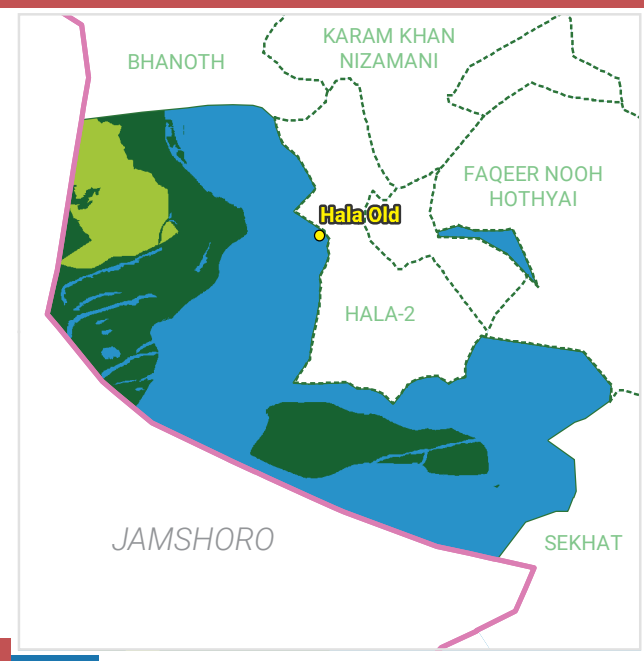
25 YEARS

HAZARD | VULNERABILITY | RISK



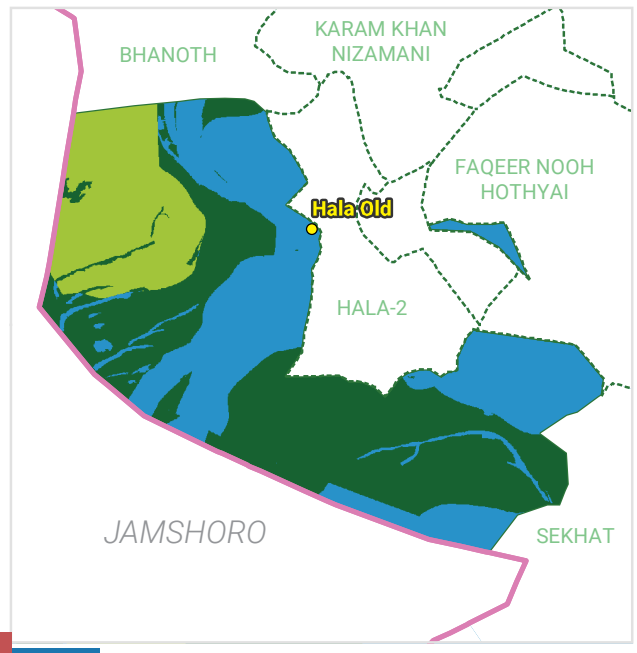
50 YEARS



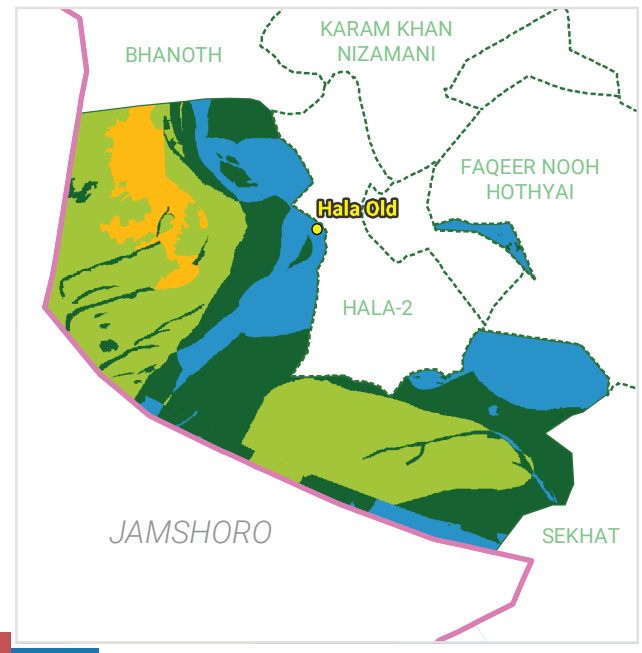


5 YEARS

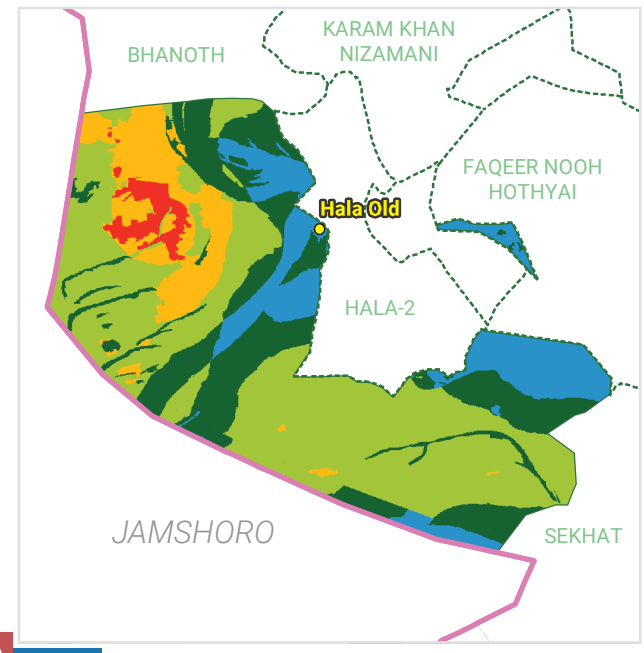
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

ELEMENTS AT RISK

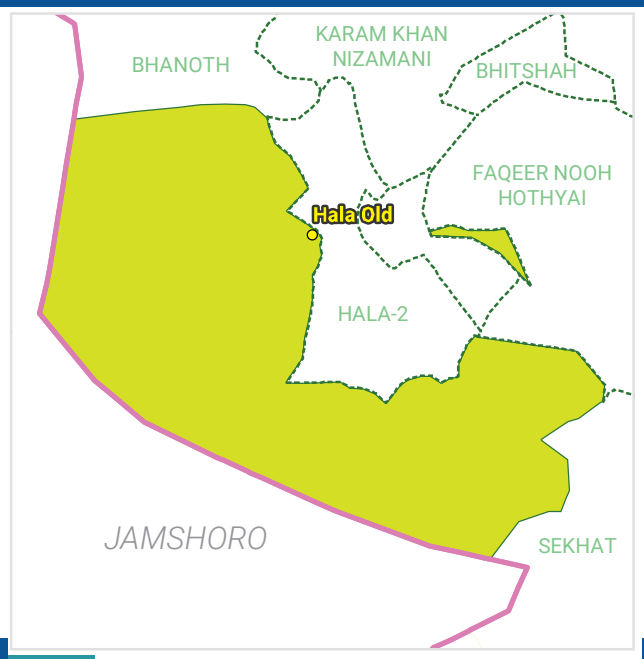
(BASED ON 50 YEARS RETURN PERIOD)

6	233	1376	101.71	0	0.09	52.63	0.25
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

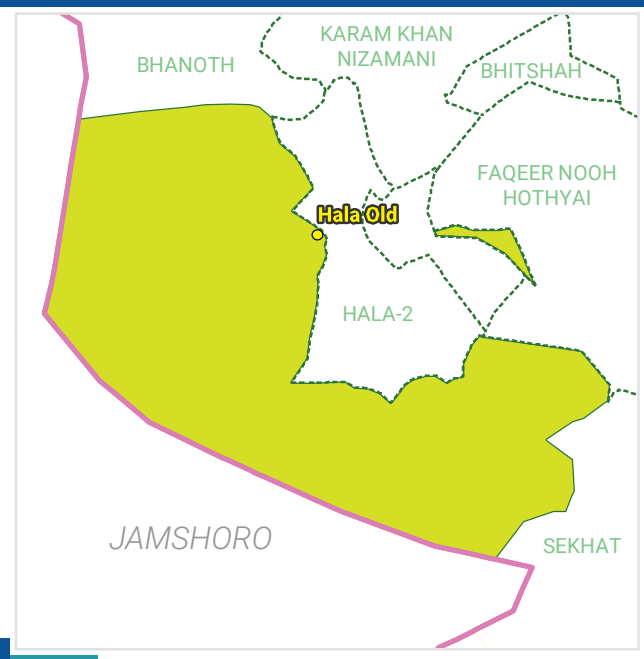
0.03	6.35
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

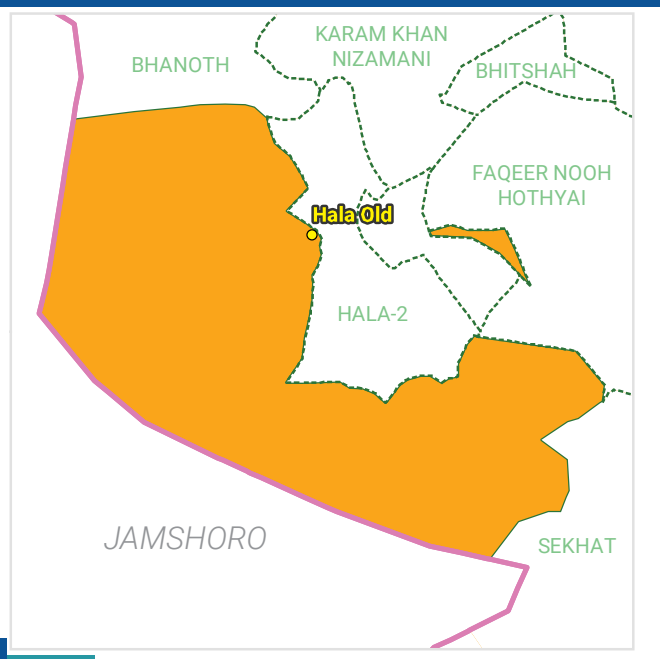
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

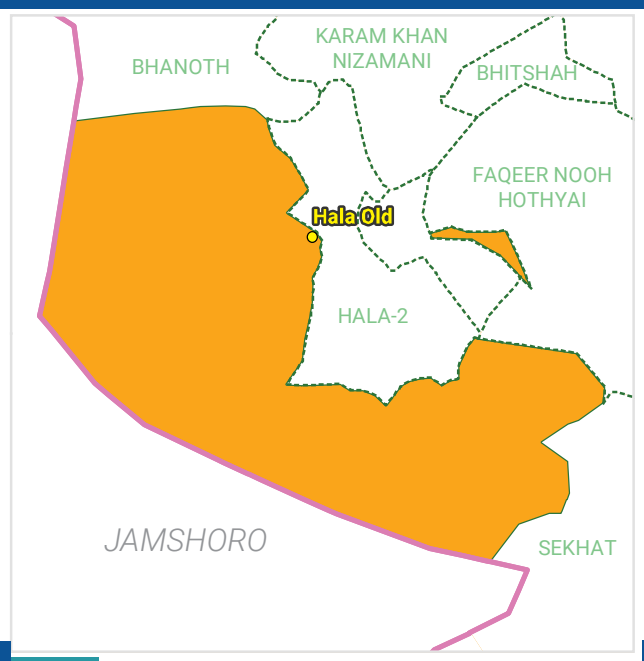


10 YEARS

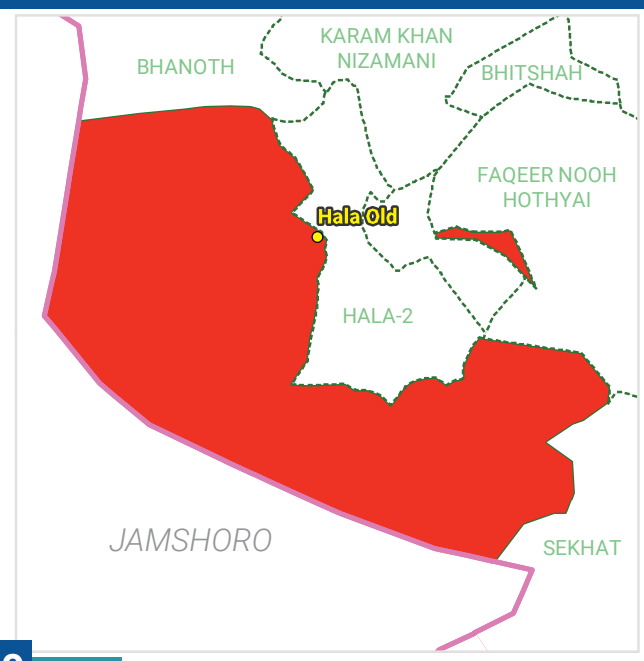


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

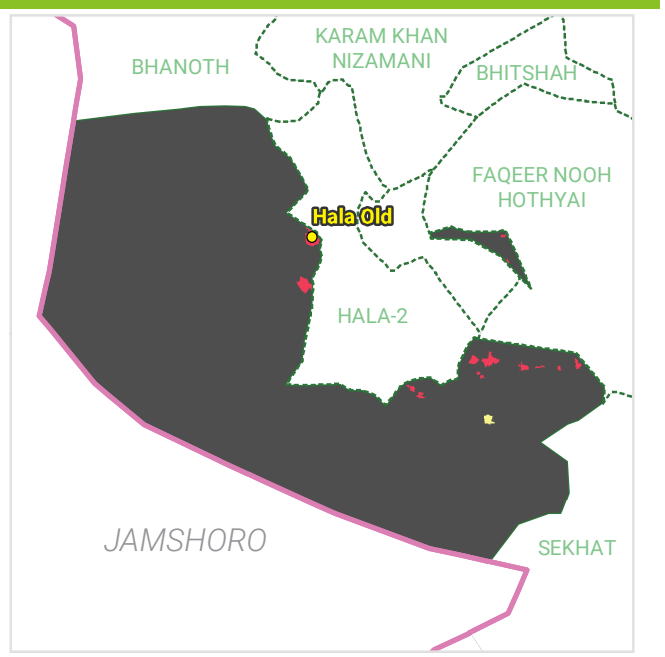


50 YEARS



100 YEARS

VULNERABILITY



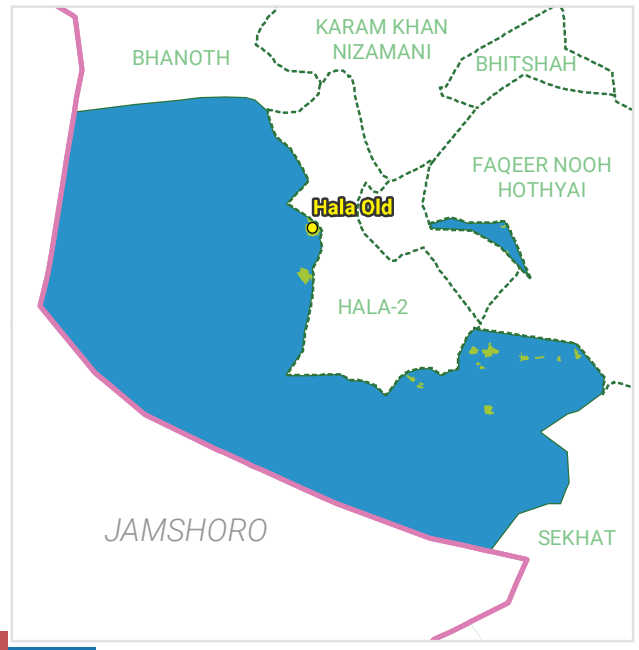
HAZARD

Normal | Moderate | High | Severe | Extreme

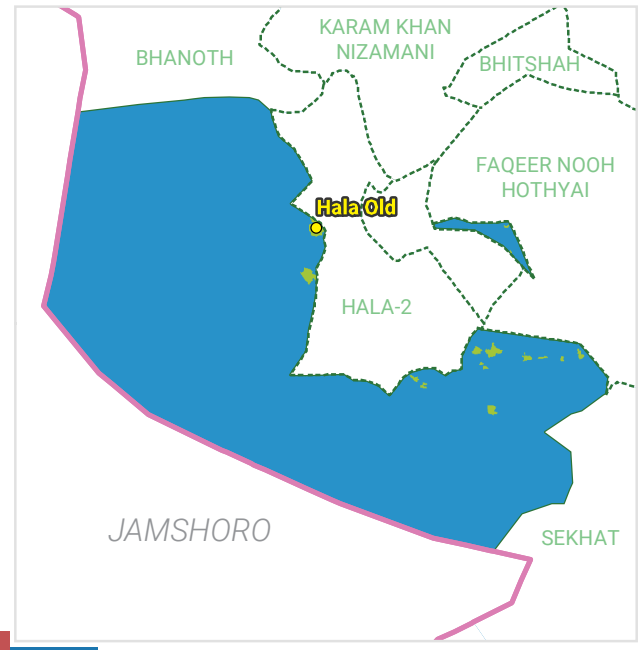
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

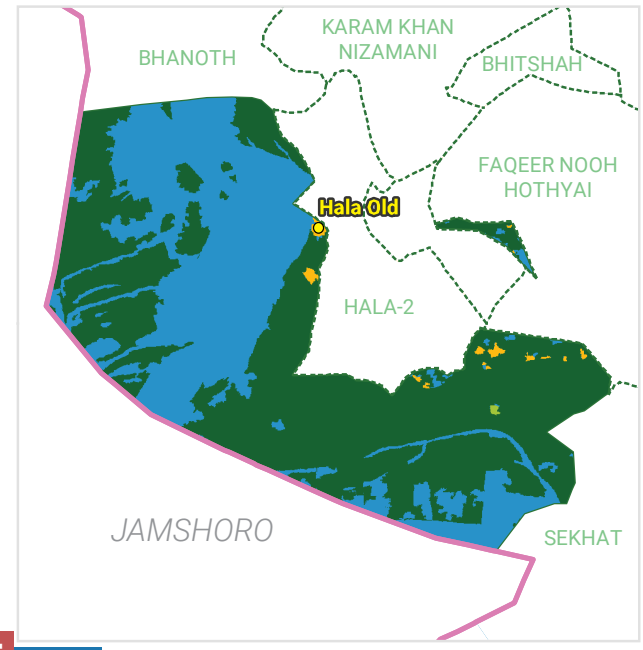
RISK AT DIFFERENT RETURN PERIODS



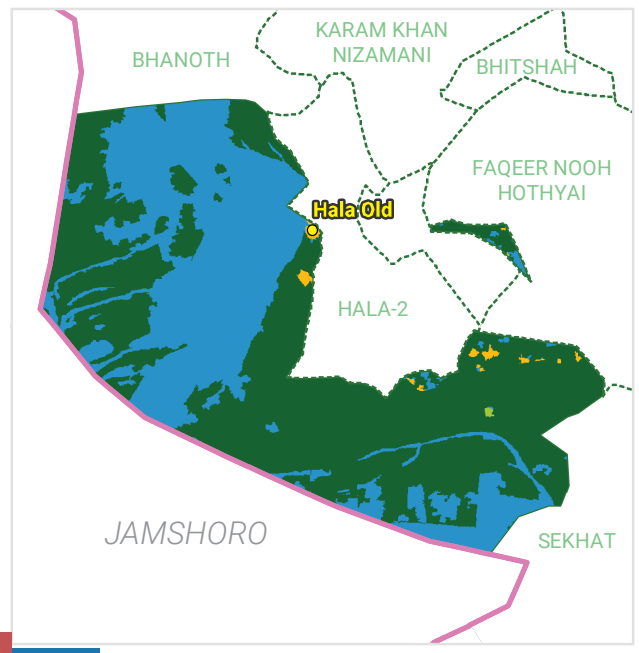
5 YEARS



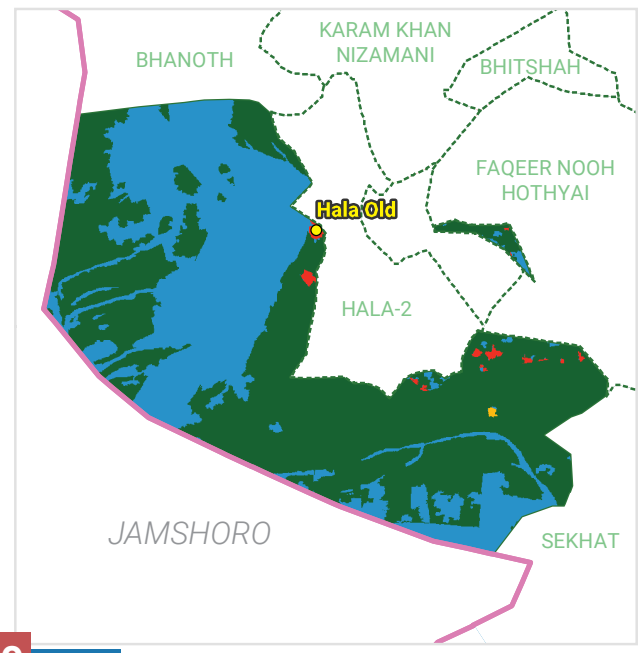
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

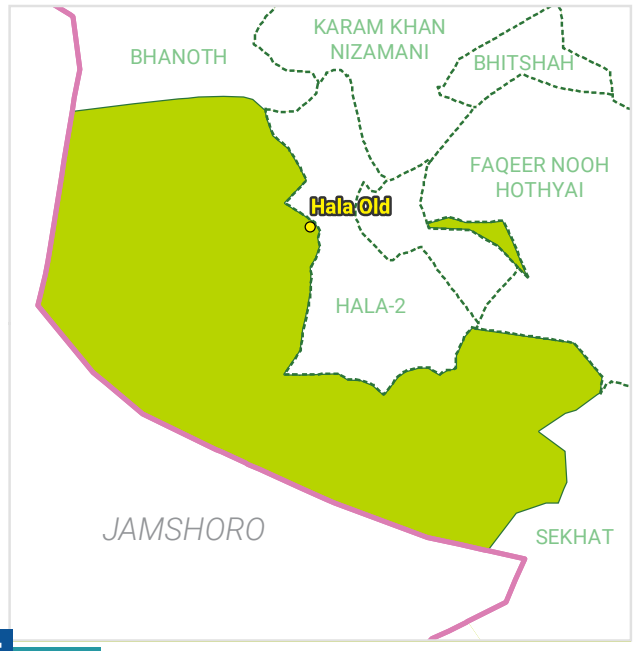
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

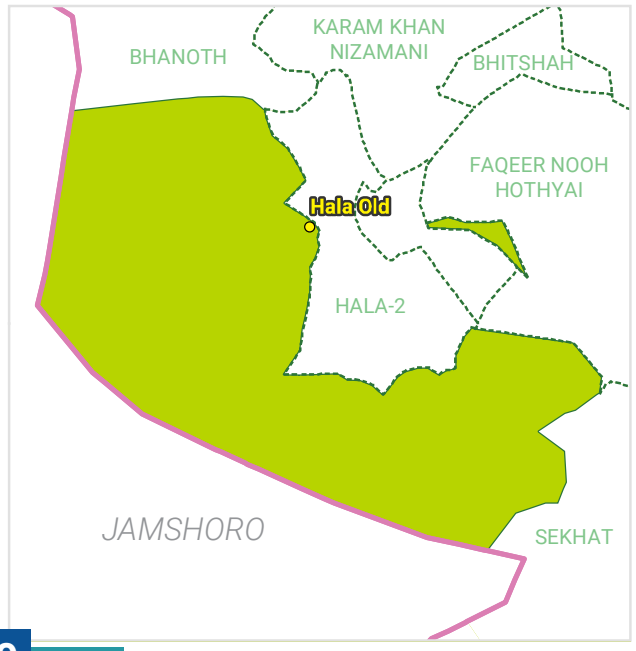
19	3070	17895	95.11	0.09	0	0.90
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

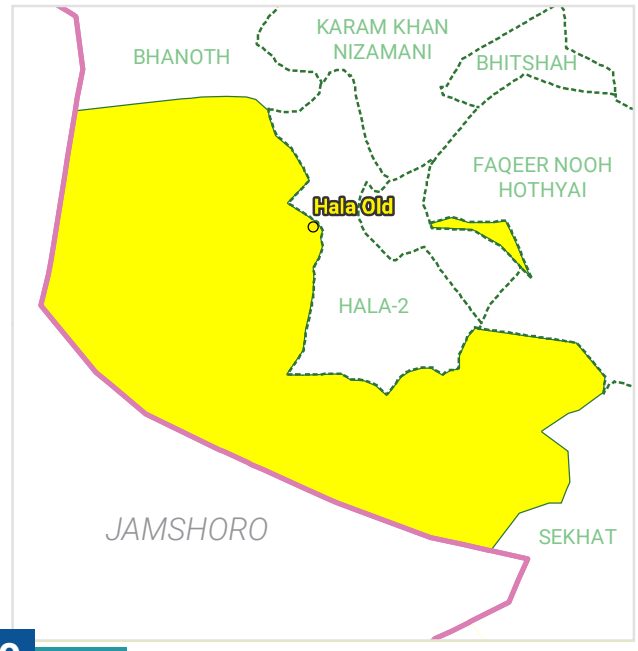
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

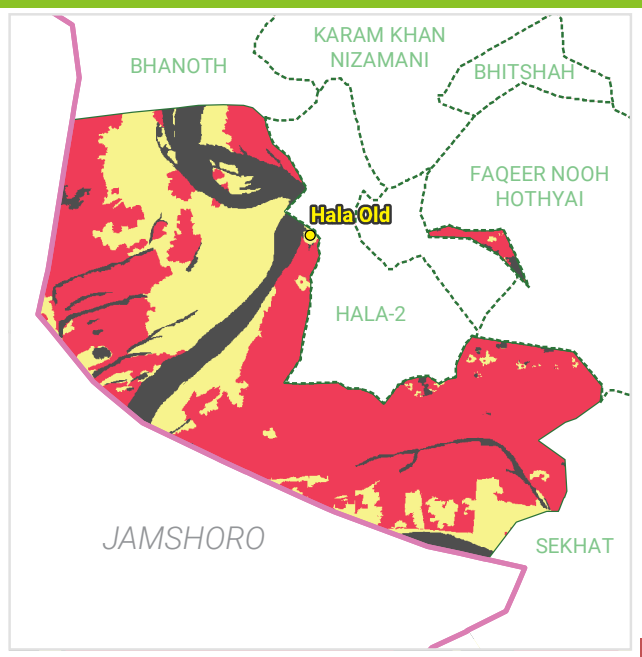


100 YEARS

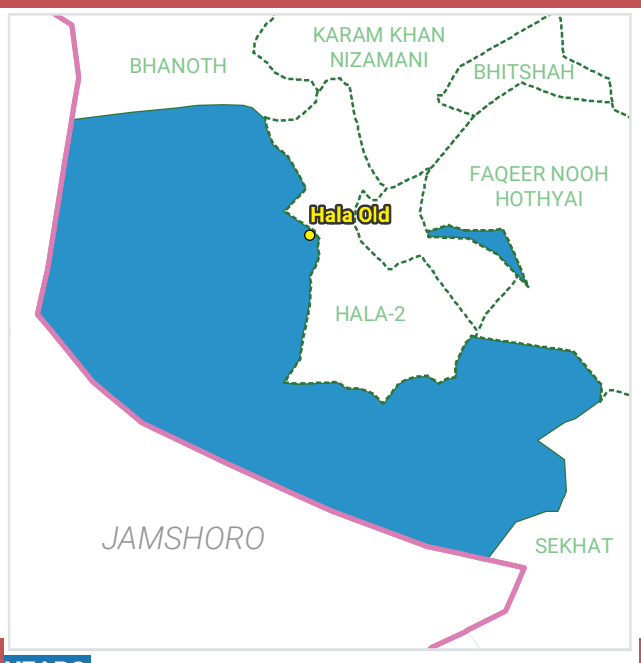


500 YEARS

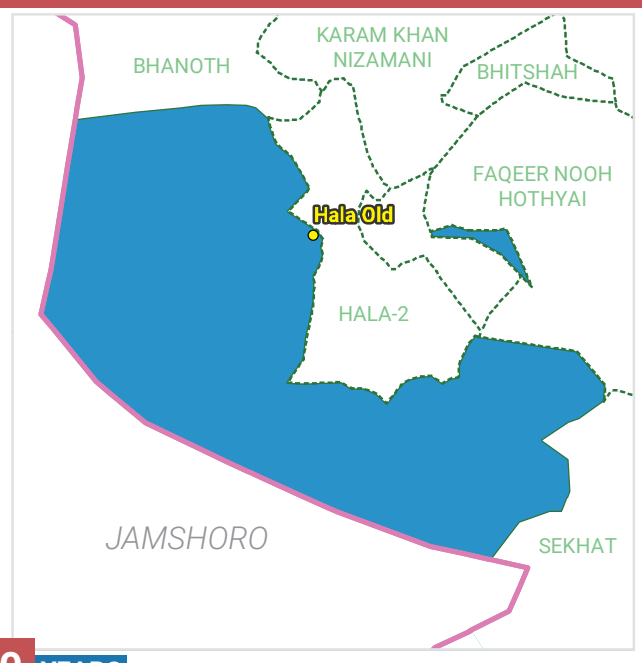
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

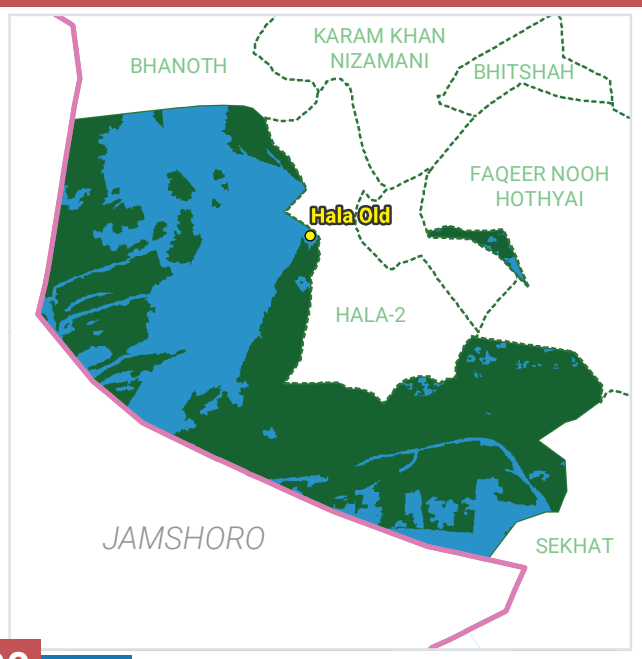


25 YEARS



100 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

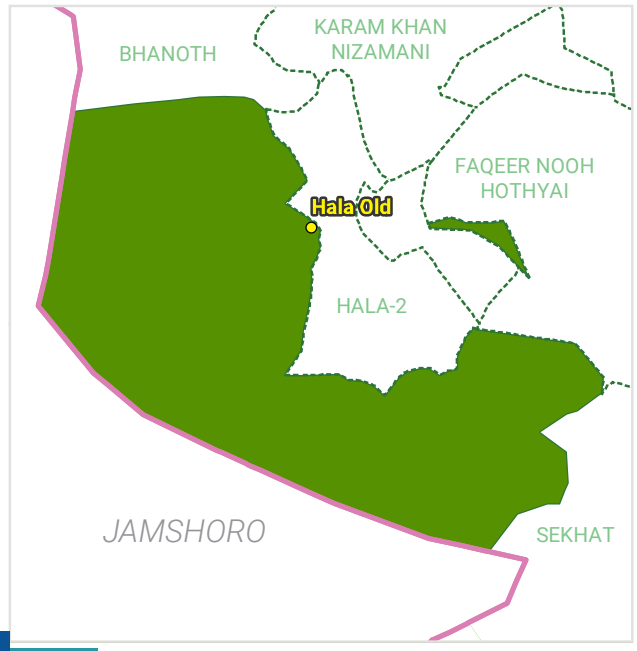
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

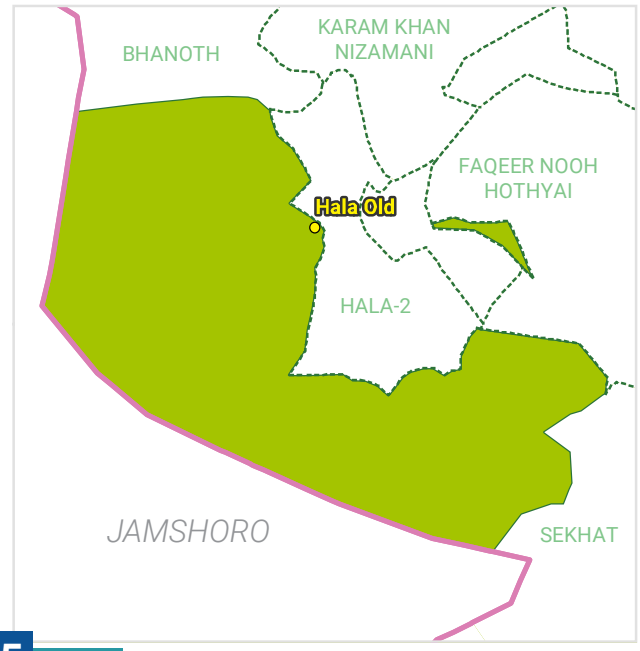
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

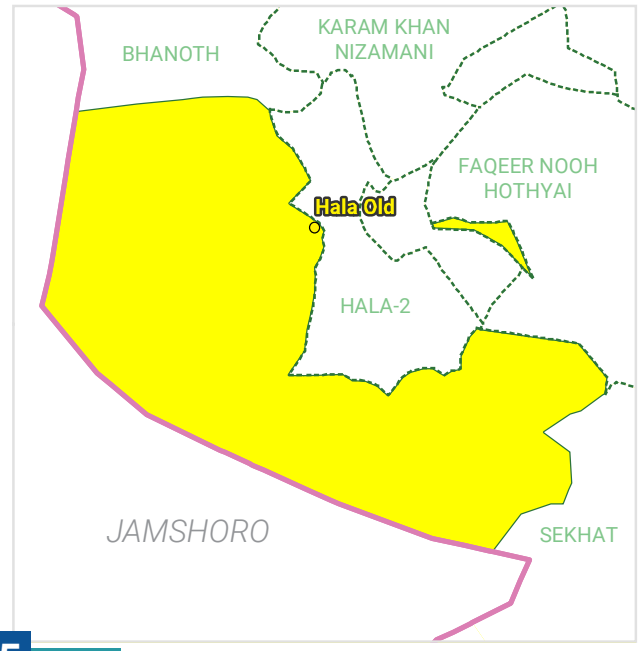
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

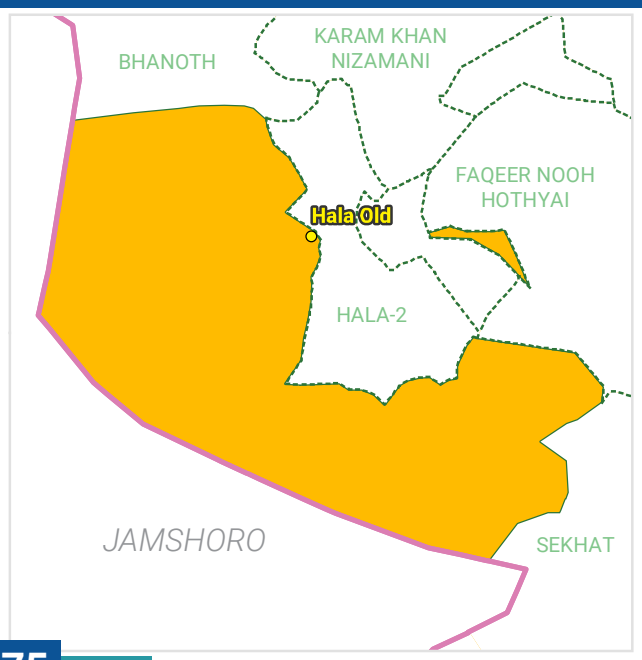


475 YEARS

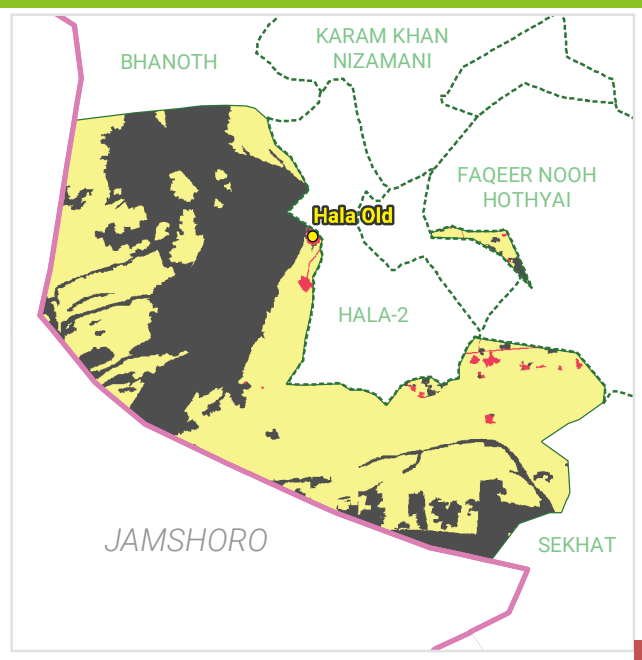


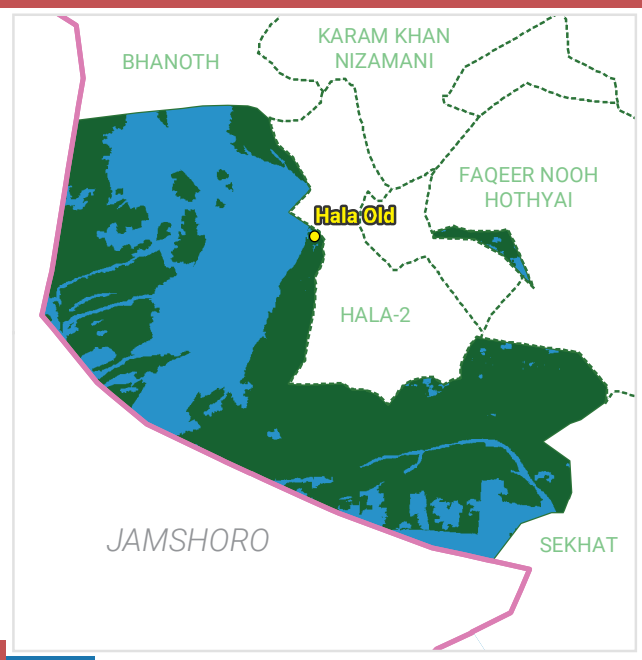
975 YEARS

HAZARD	VULNERABILITY	RISK



2475 YEARS





95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

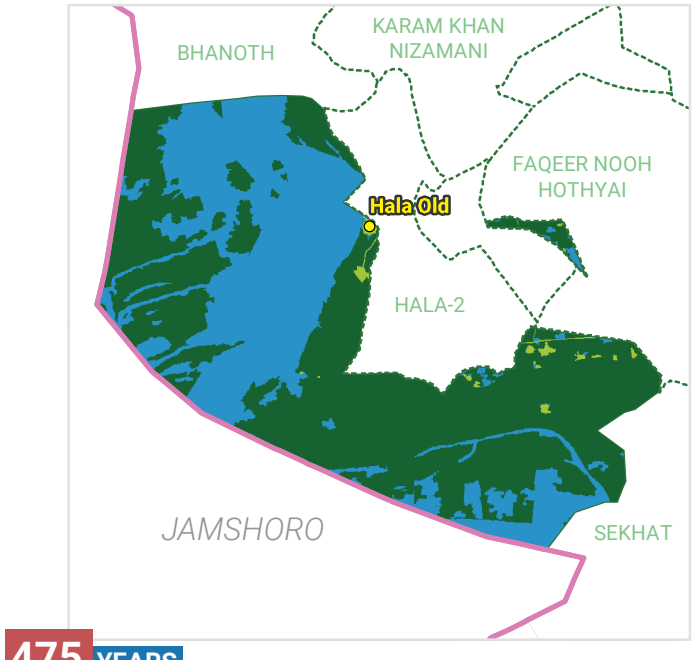
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

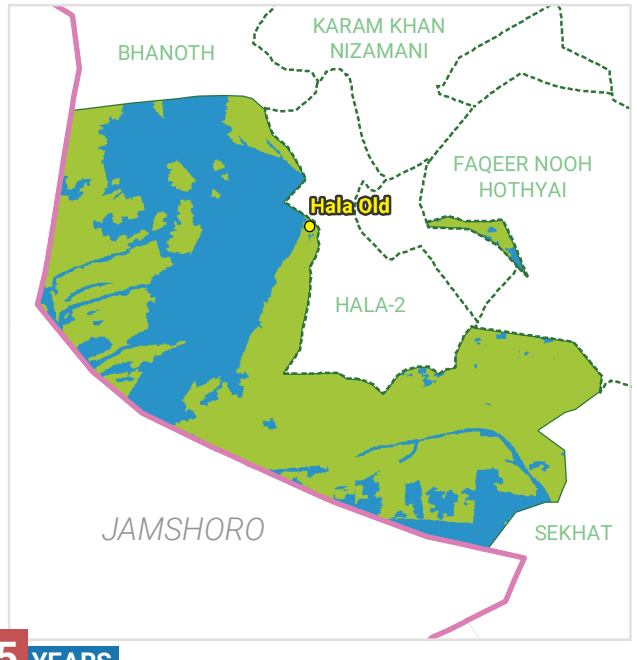
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

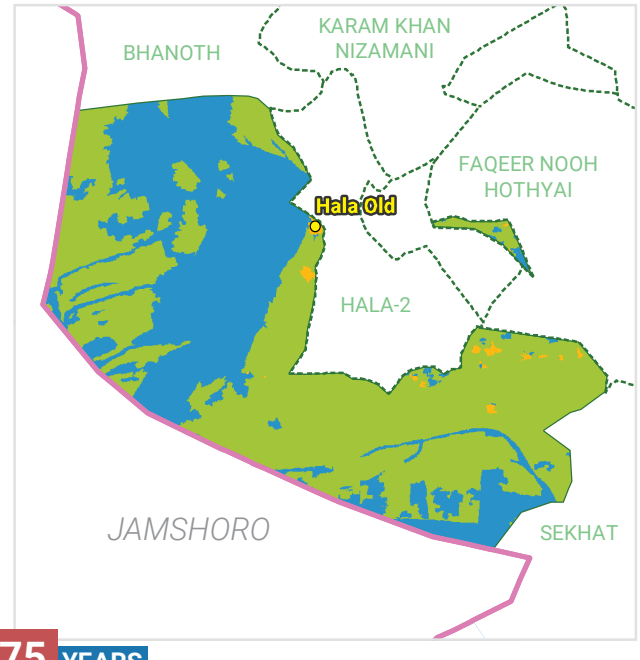
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

20	3063	17850	95.18	0.01	0.09	0.23	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.89	0.00	32.90	0	0.97	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
13	0	0	0	4	0	0	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
1	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low Medium High Extreme	●	Low Medium High Extreme	Low Medium High Extreme	Low Medium High Extreme	Low Medium High Extreme	●
METEOROLOGICAL DROUGHT	Low Medium	Low Medium High Extreme	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	Low Medium	Low Medium	Low Medium High	Low Medium High Extreme	●	●	●
HEATWAVE	Medium	Medium	Low Medium High	Low Medium High	Low High Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - HALA 2

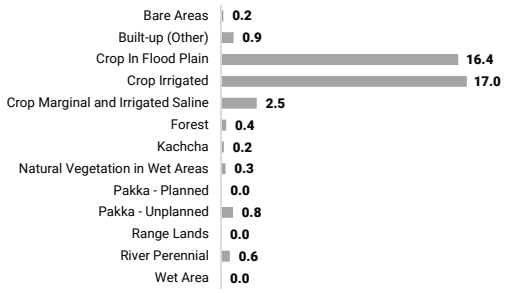
Union Council area in sq. km **39**

Surrounding UCs / Features
BHANOTH in North West
BHITSHAH in East
HALA OLD in West
KARAM KHAN NIZAMANI in North

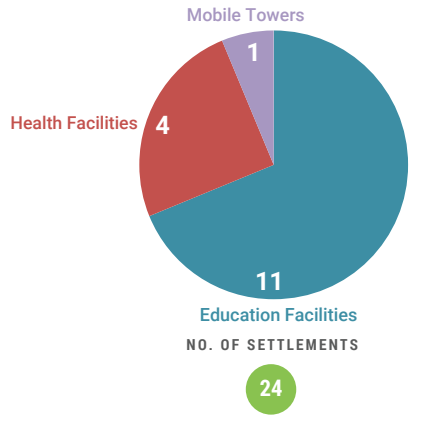
Population	2017 approx.	19,299
No. of household	2017 approx.	3,289

Land Use Land Cover

coverage area in sq.km

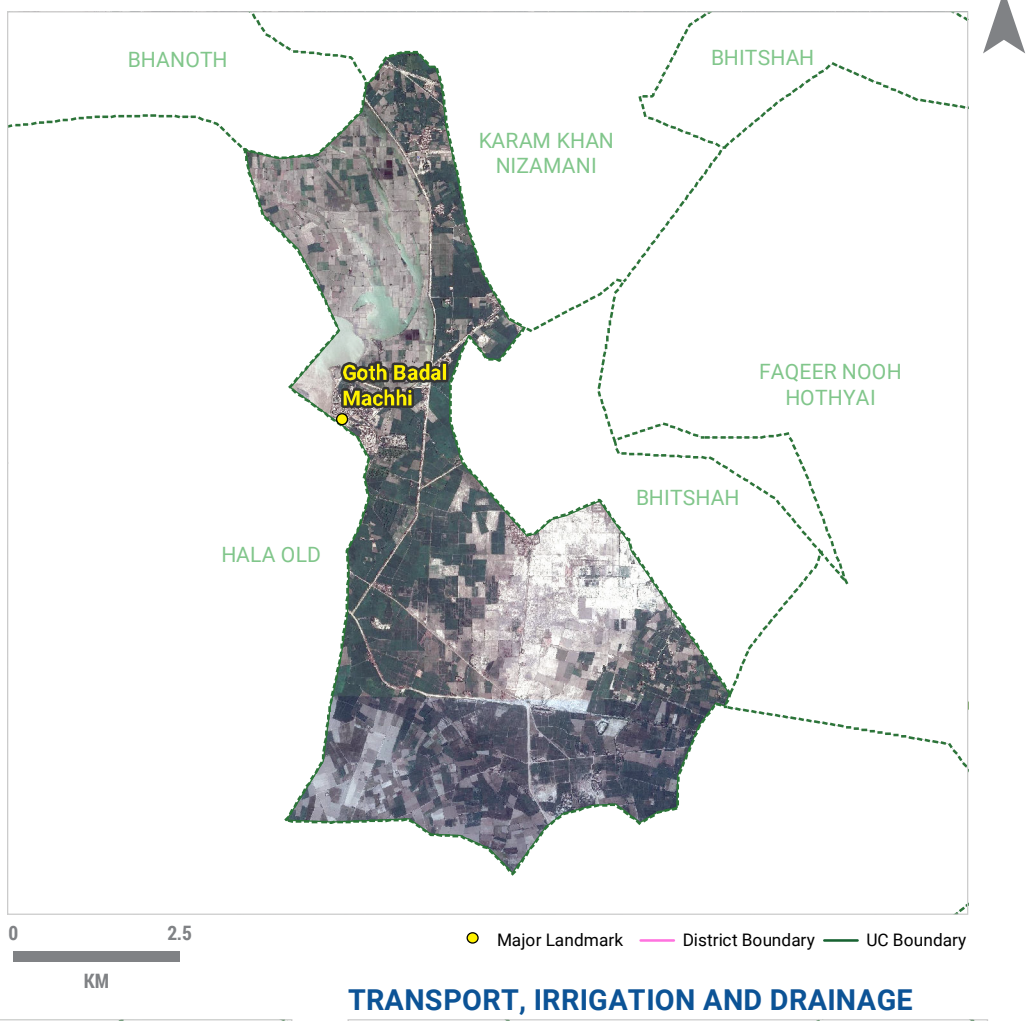


Critical Infrastructure

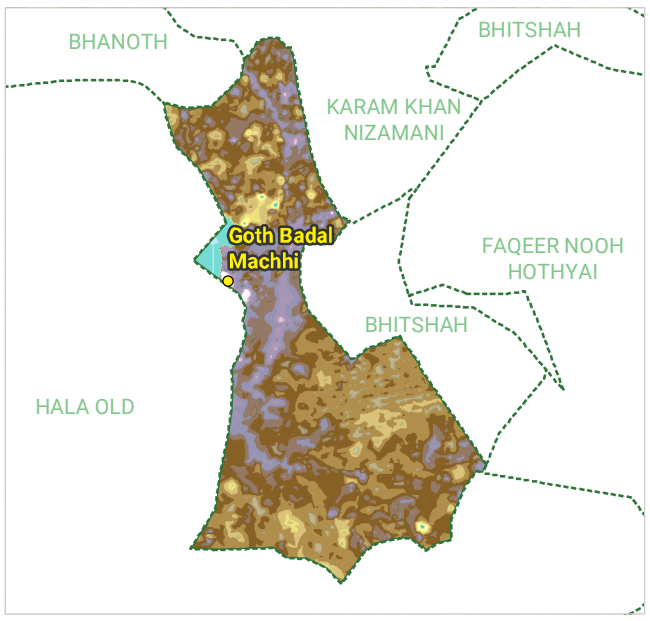


NO. OF SETTLEMENTS
24

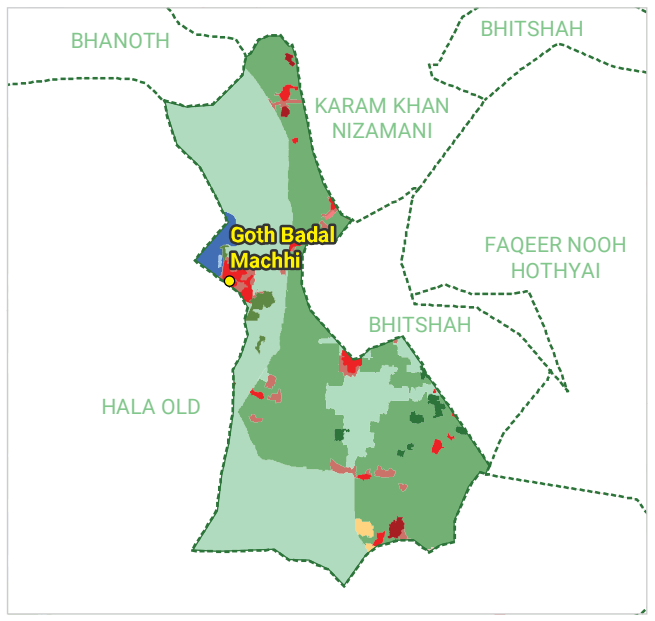
SATELLITE IMAGERY



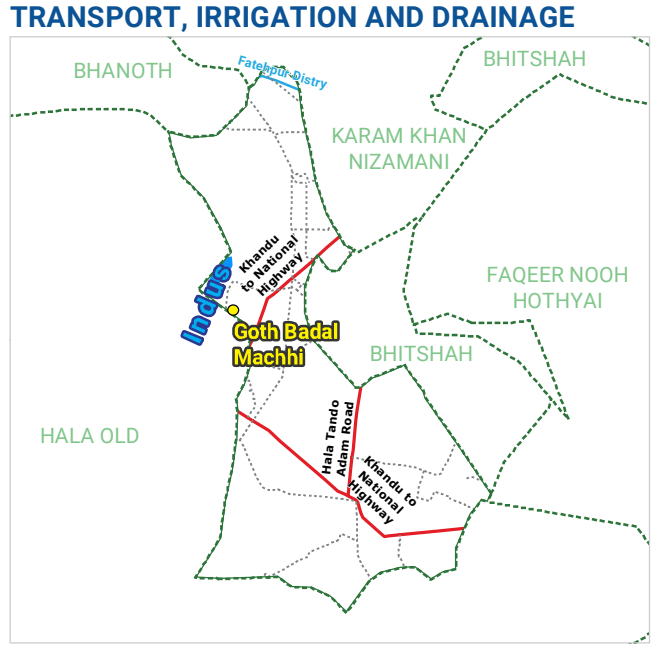
DEM AND FLOW DIRECTION



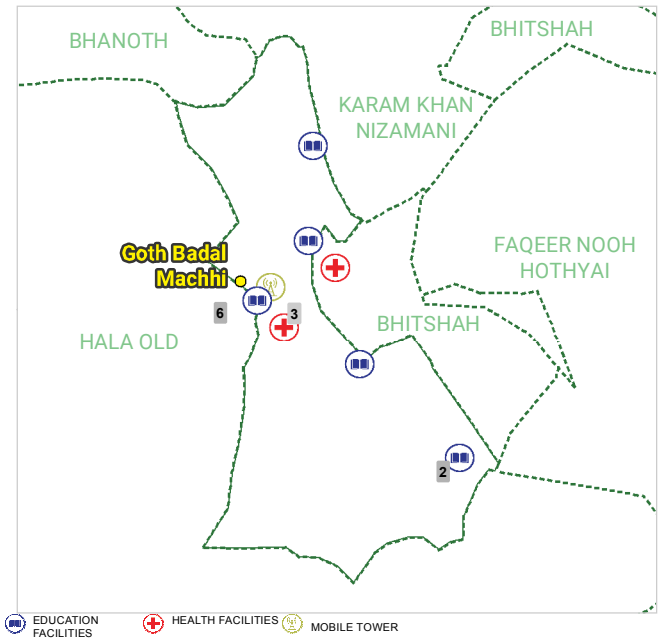
LAND USE / LAND COVER



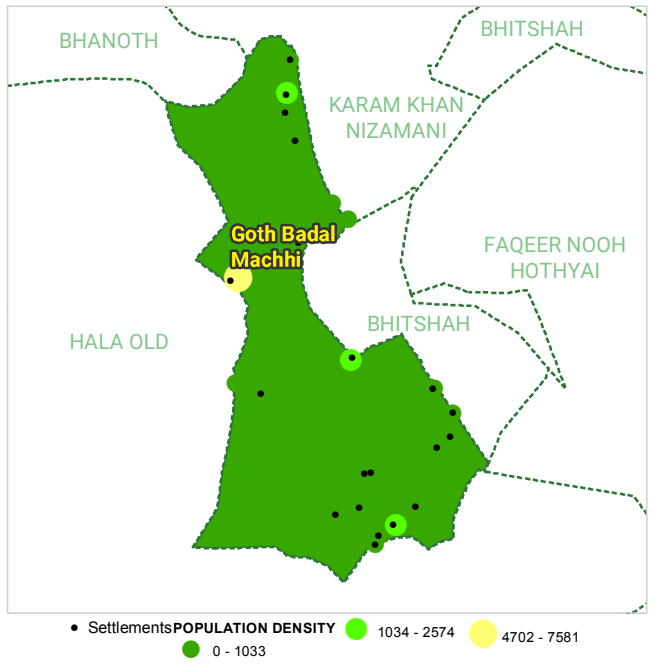
TRANSPORT, IRRIGATION AND DRAINAGE



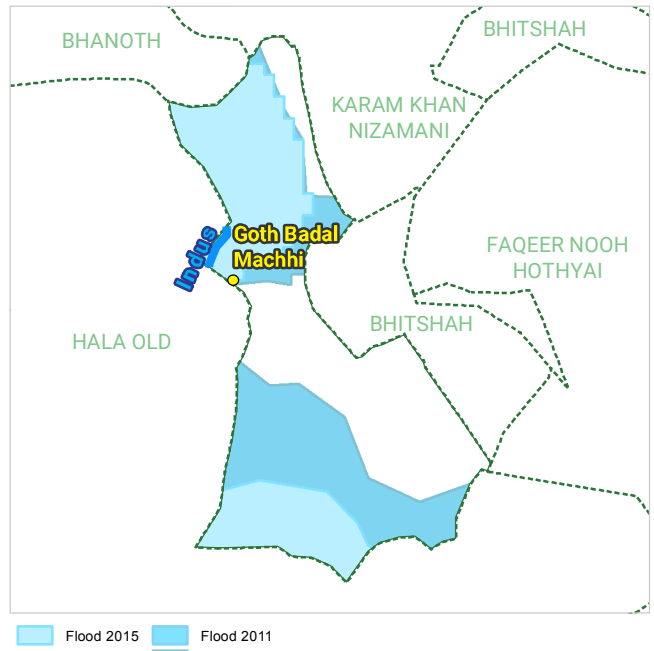
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

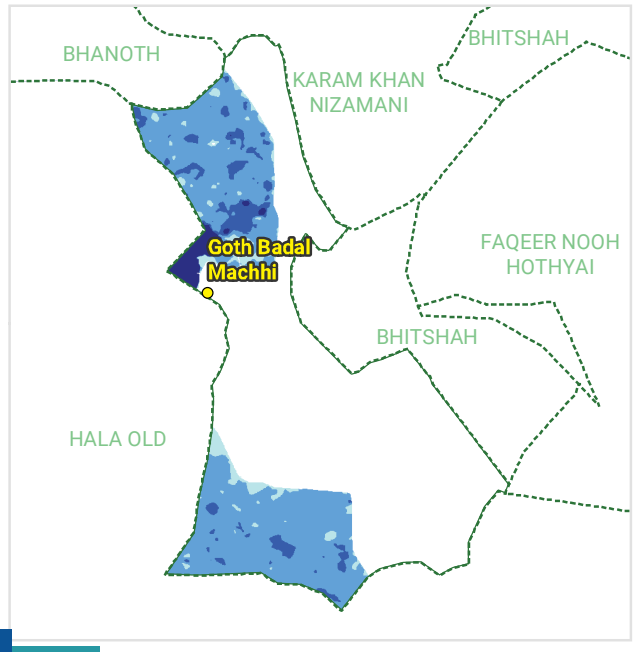


PAST HAZARDS

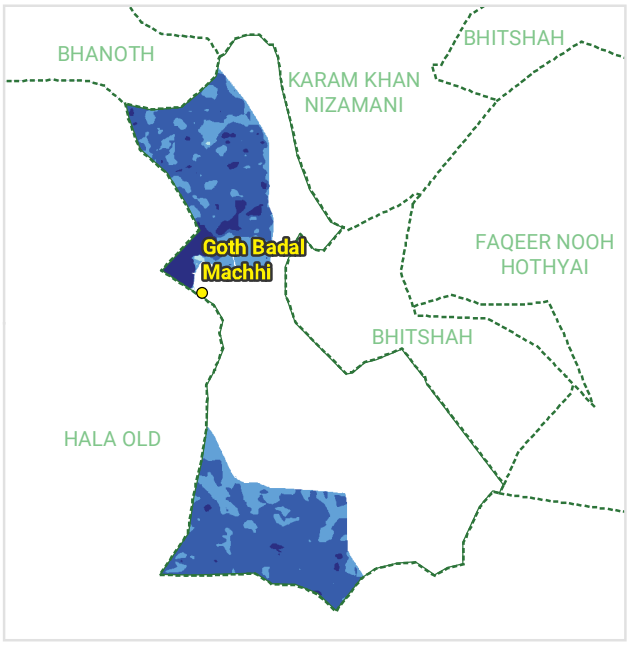


FLOOD

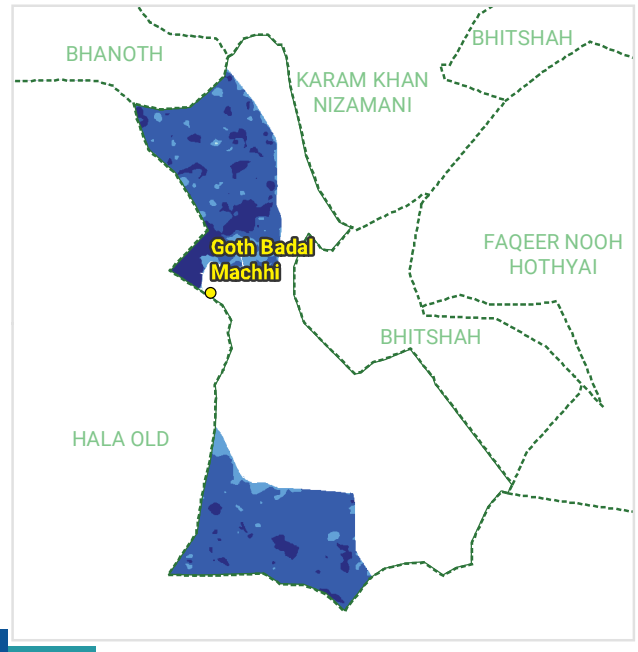
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

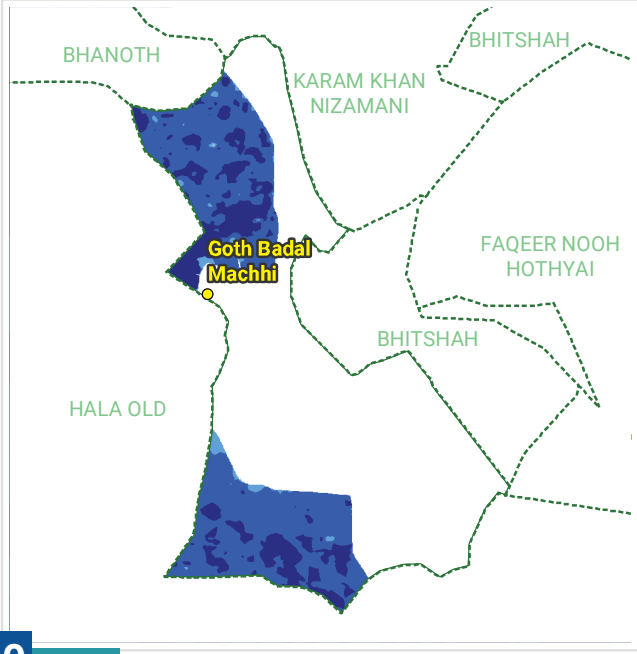


25 YEARS

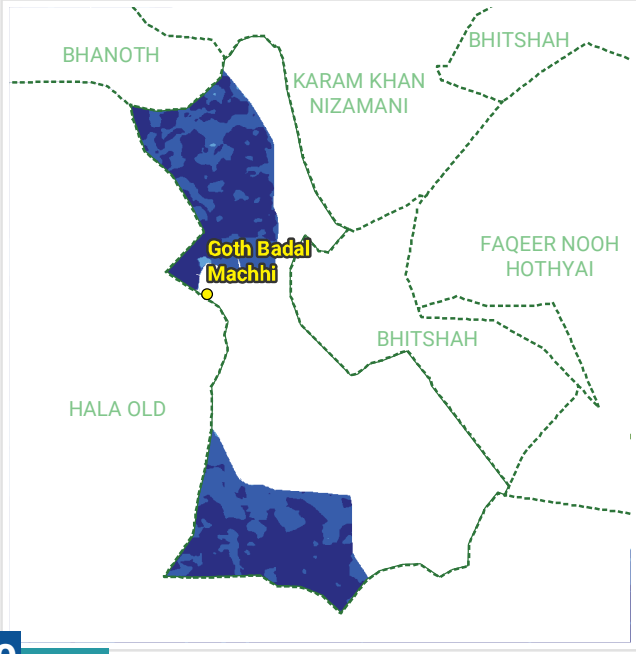


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

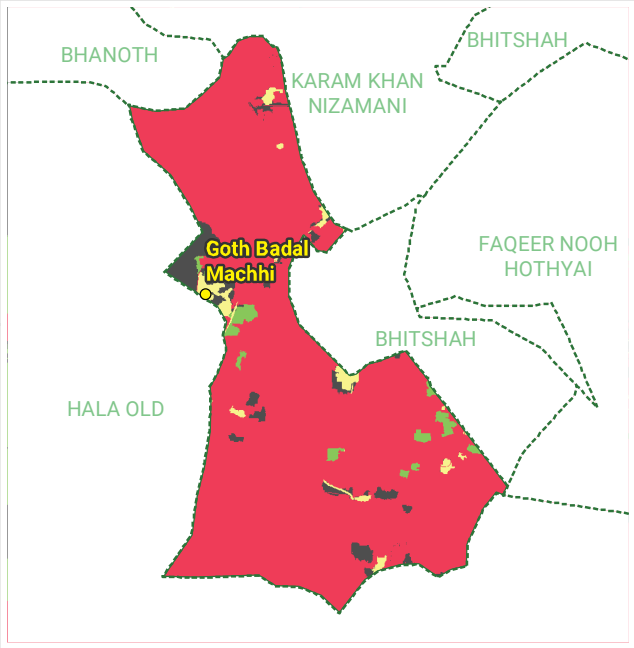


100 YEARS

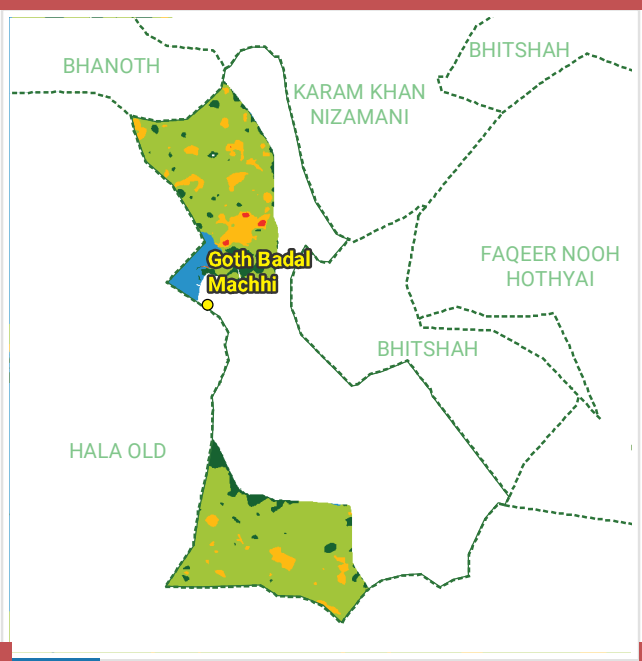


250 YEARS

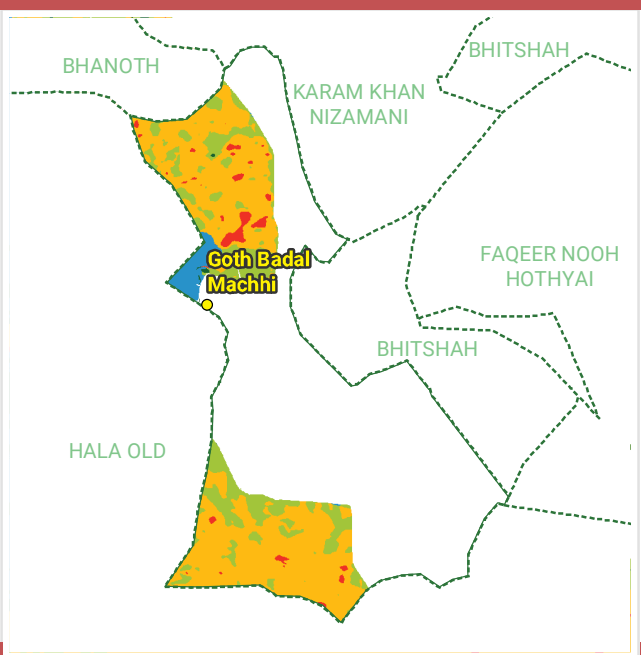
VULNERABILITY



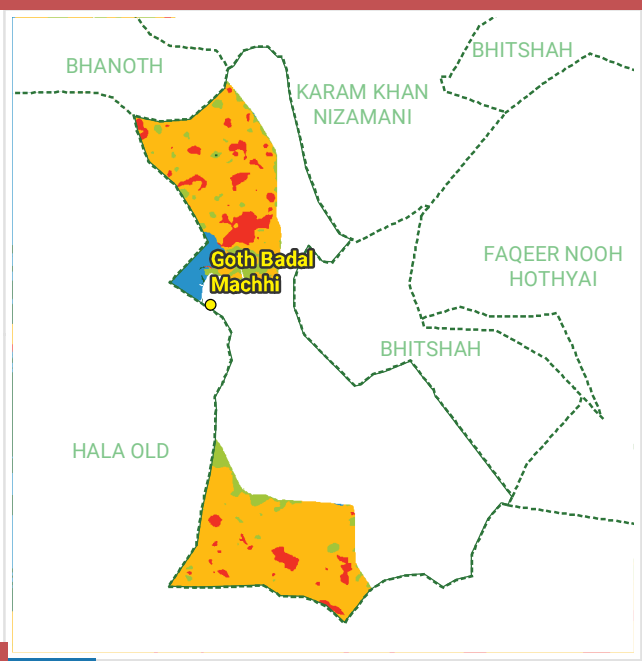
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

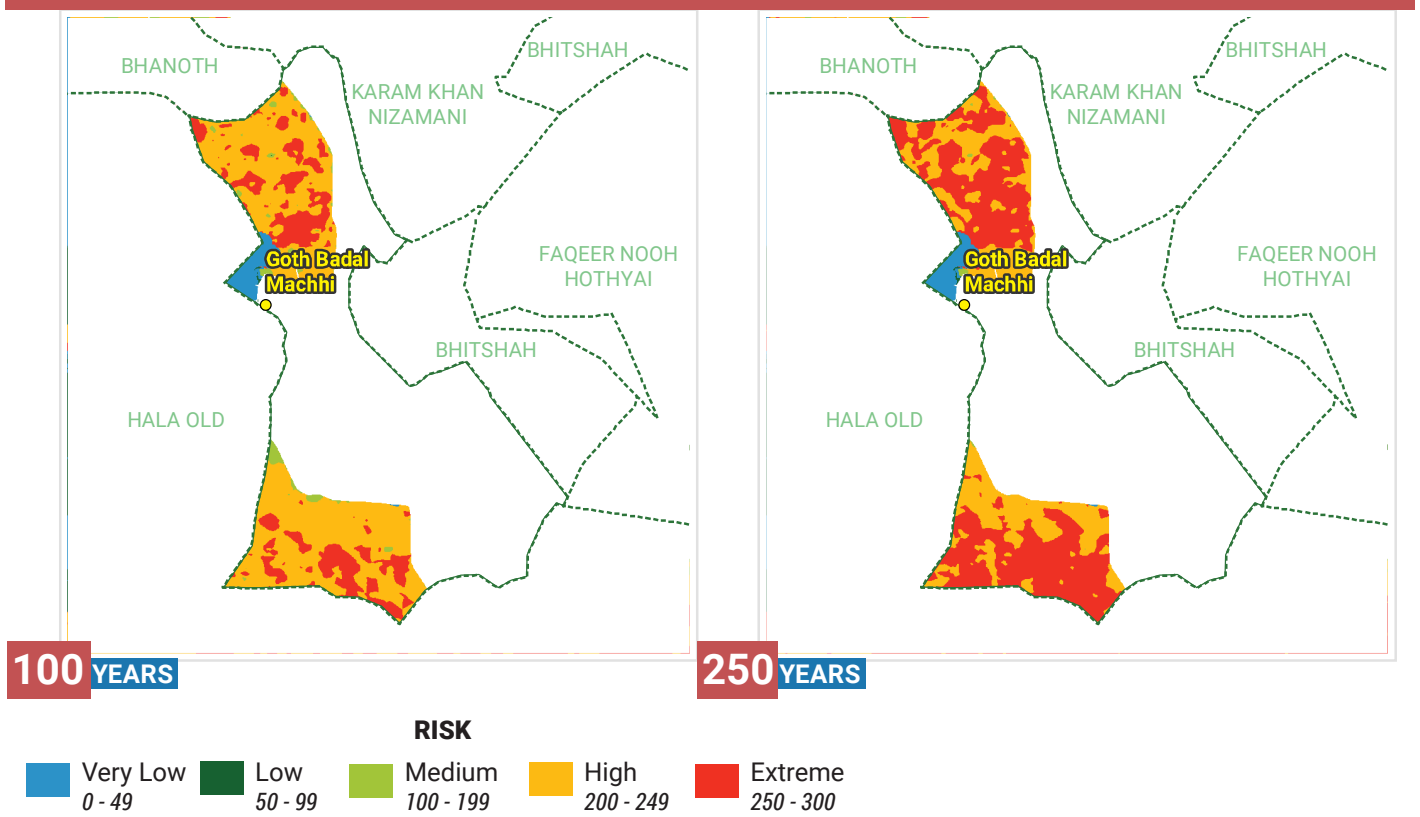
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



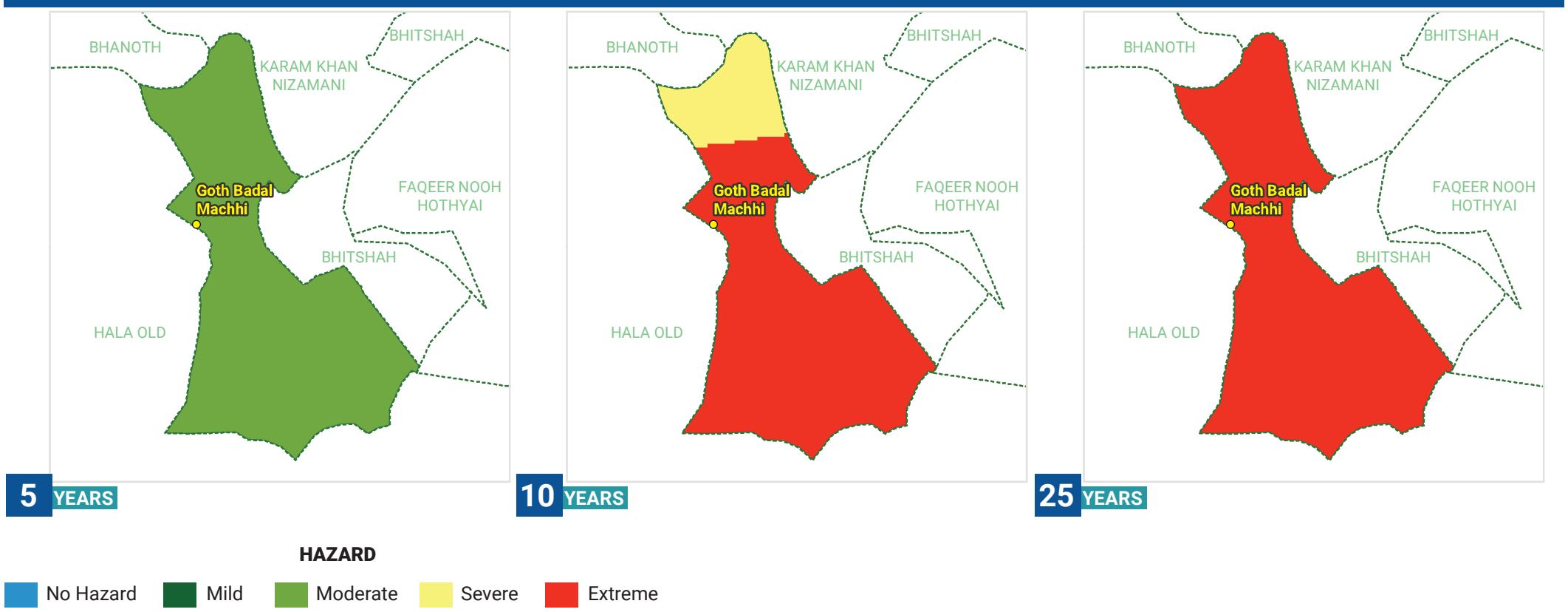
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

1	2	16	14.11	0	0	0.01	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.00	0	4.28	0	0	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

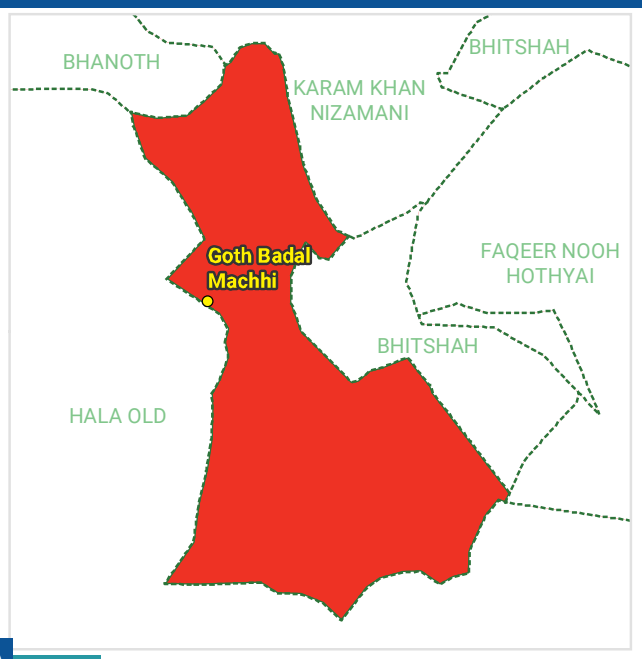
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



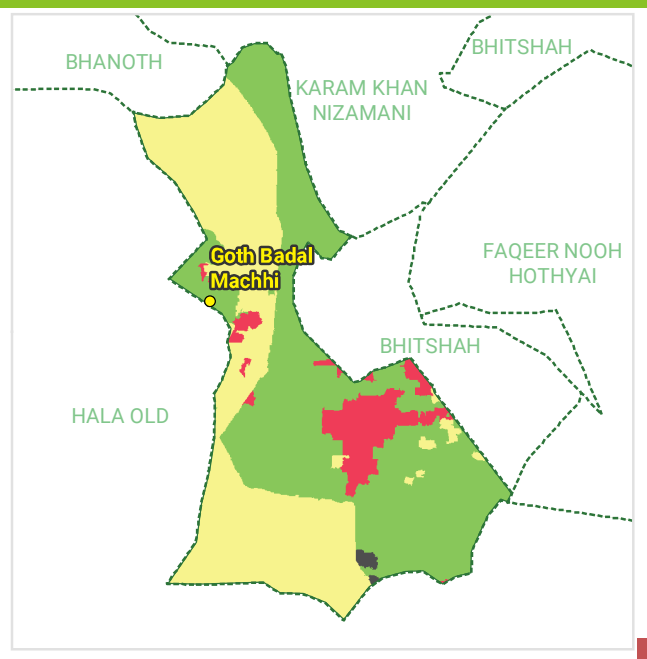
METEOROLOGICAL DROUGHT

HAZARD

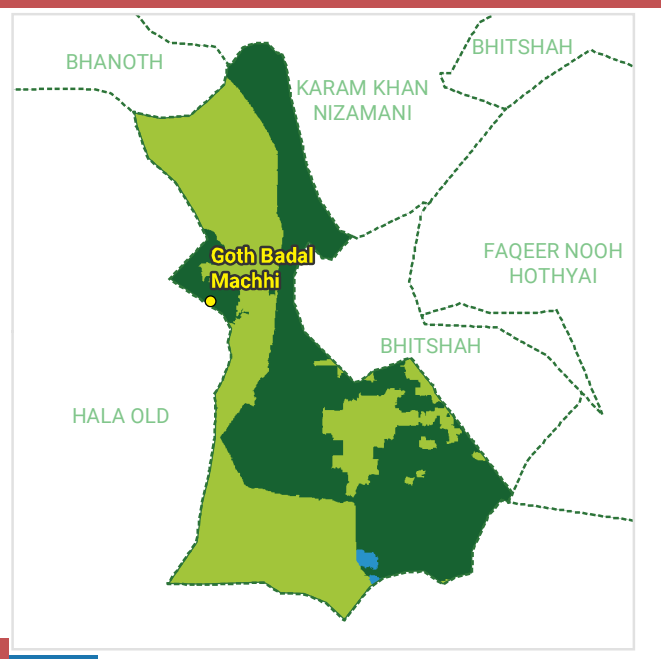


50 YEARS

VULNERABILITY

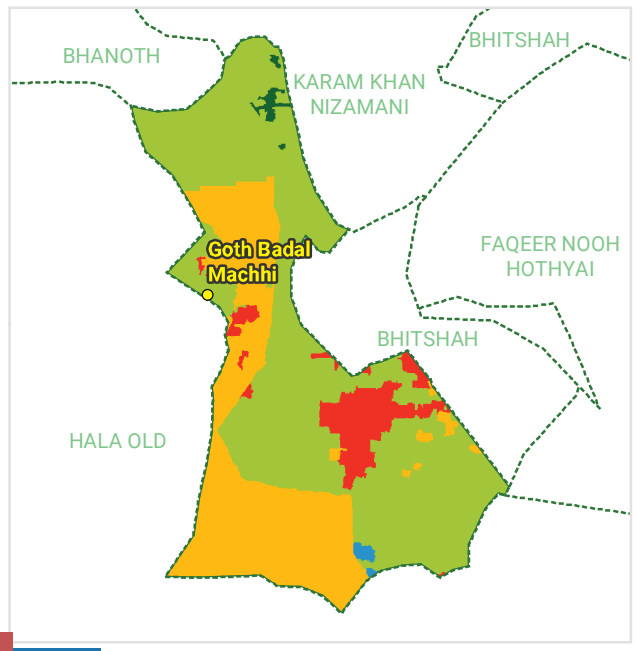


RISK

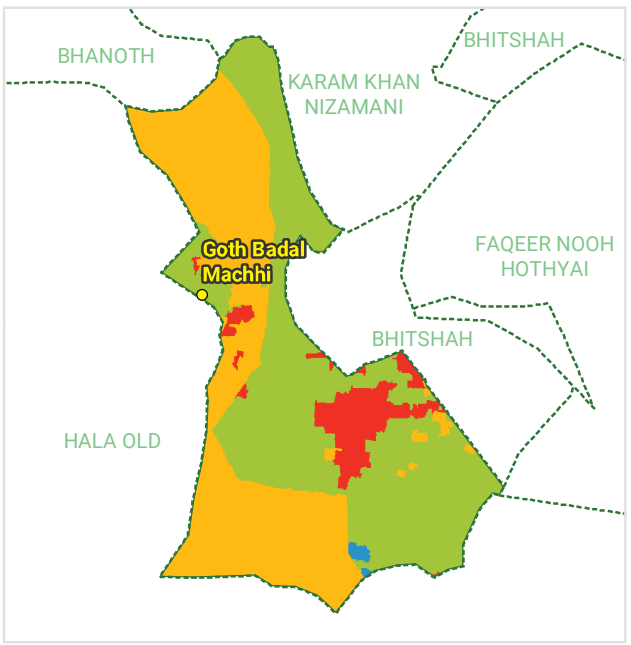


5 YEARS

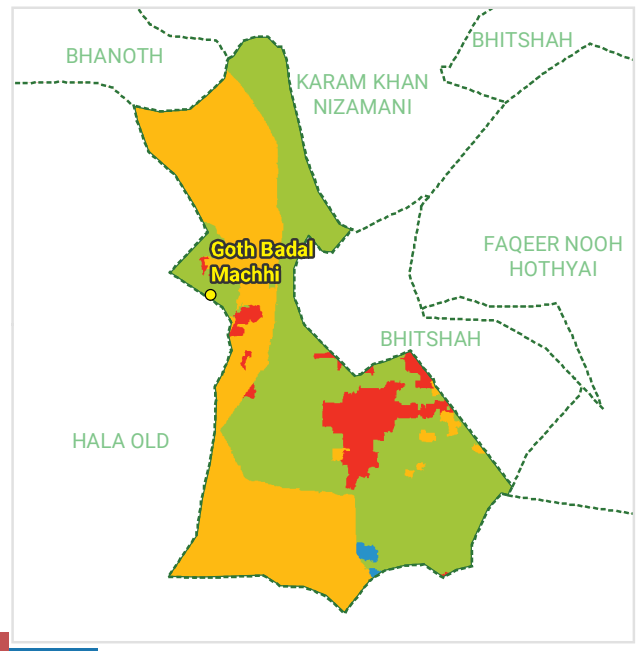
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

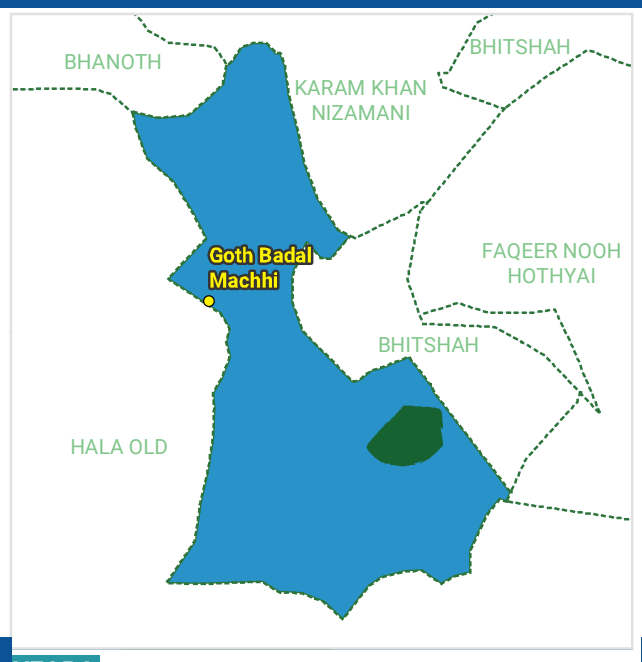
(BASED ON 50 YEARS RETURN PERIOD)

24	3288	19294	35.83	0	0.36	0.31	0.01
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

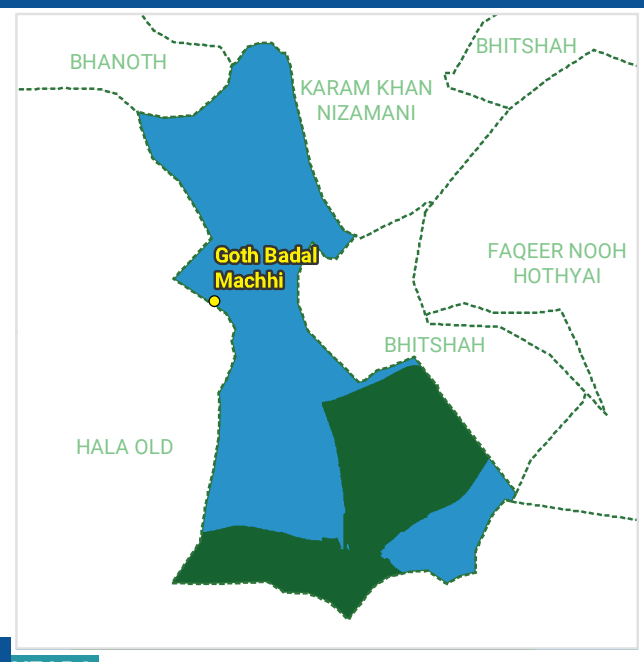
0	0.02
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

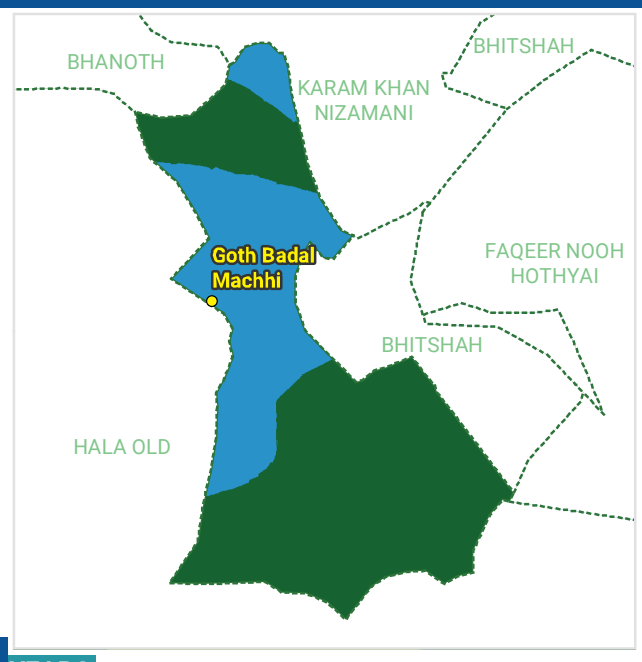
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

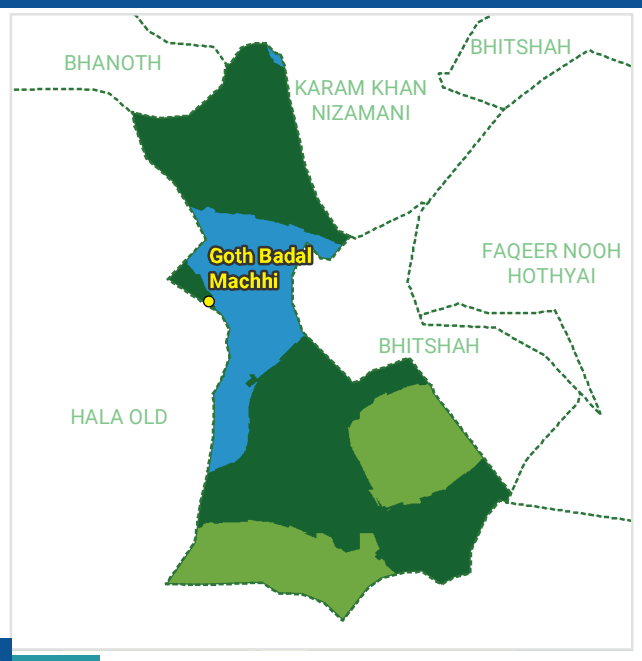


10 YEARS

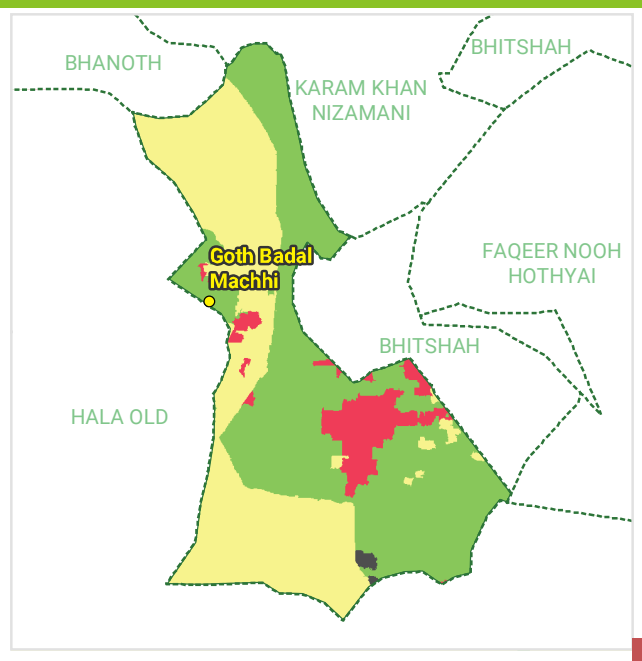


25 YEARS

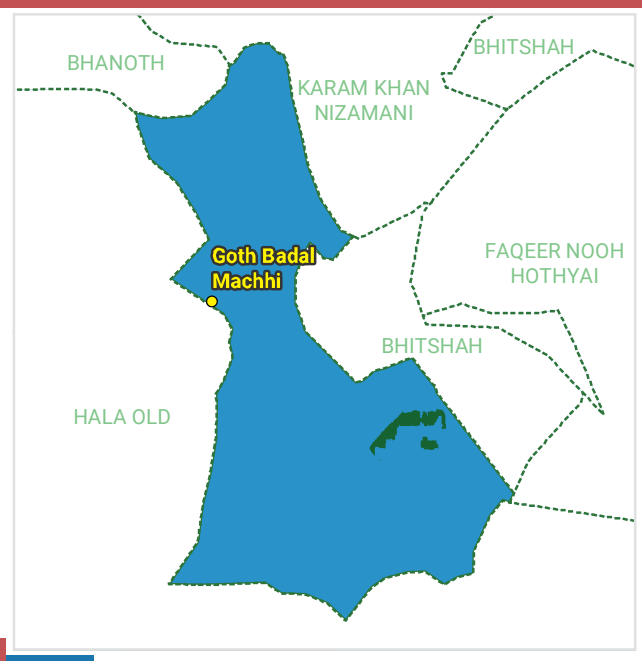
HAZARD | VULNERABILITY | RISK



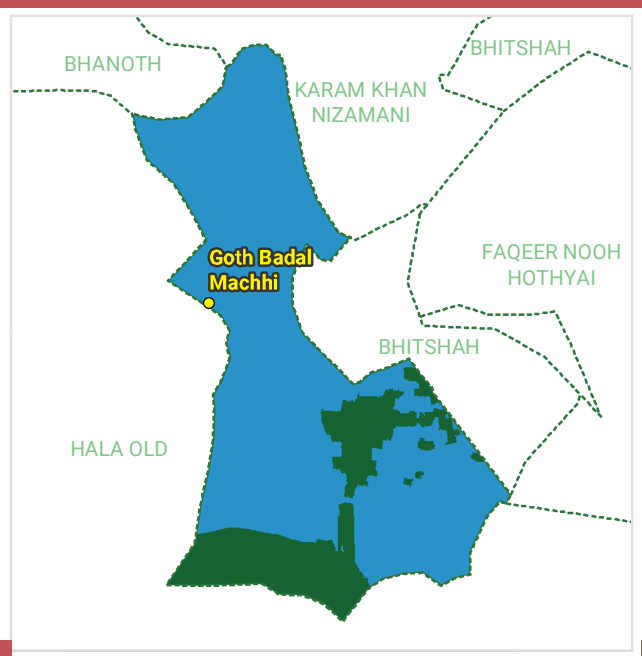
50 YEARS



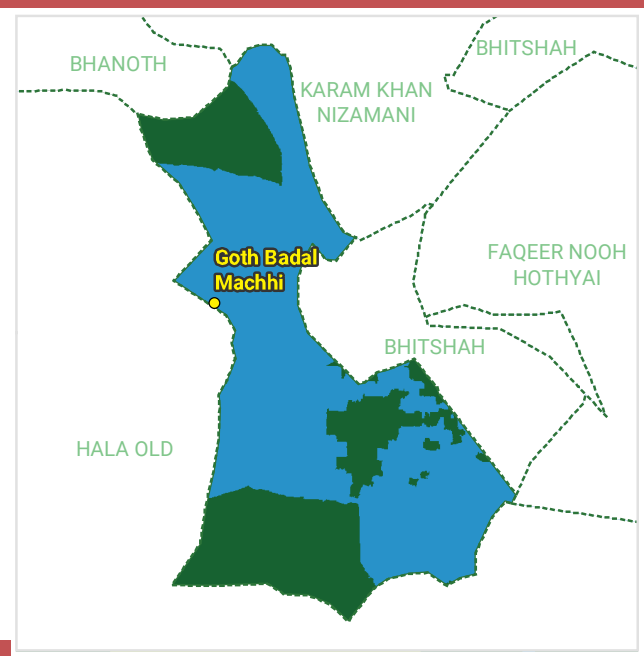
5 YEARS



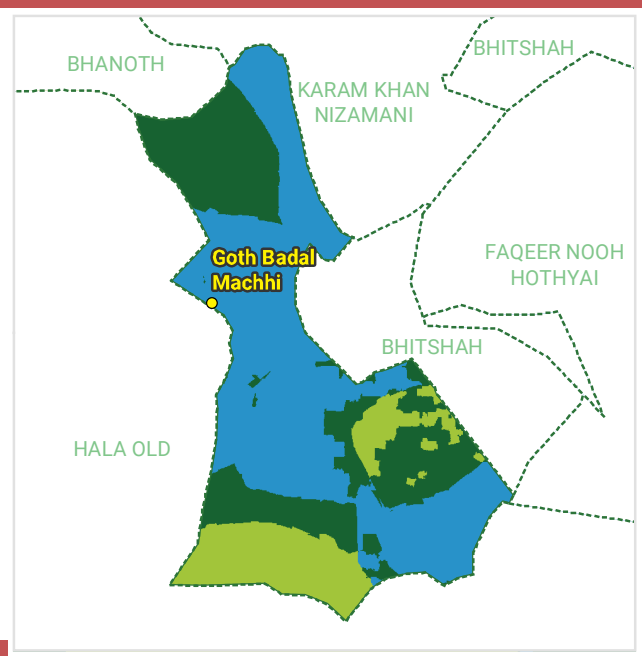
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

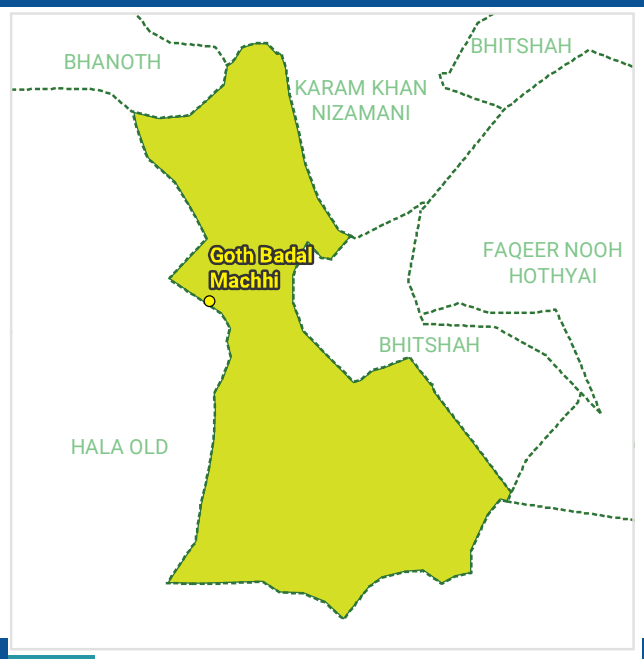
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

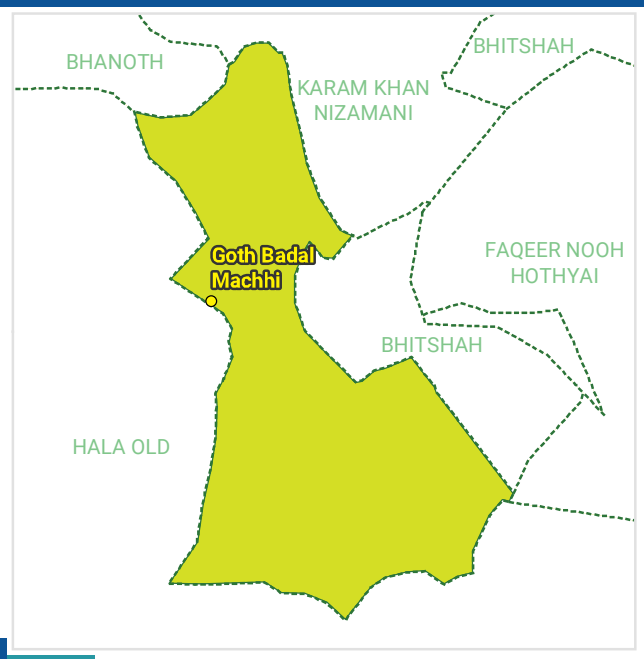
8	351	2076	21.92	0	0.44	0.01	0.01
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)
0	0						
WATER BODY (SQ. KM)	WET AREA (SQ. KM)						

HEATWAVE

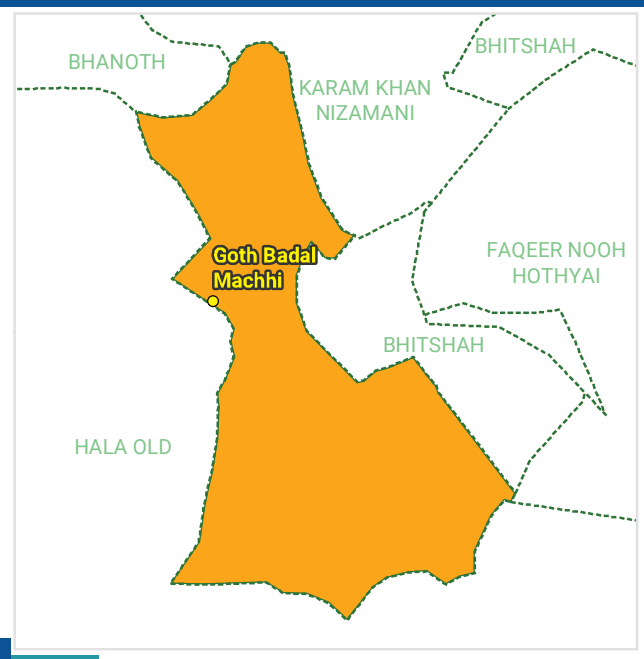
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

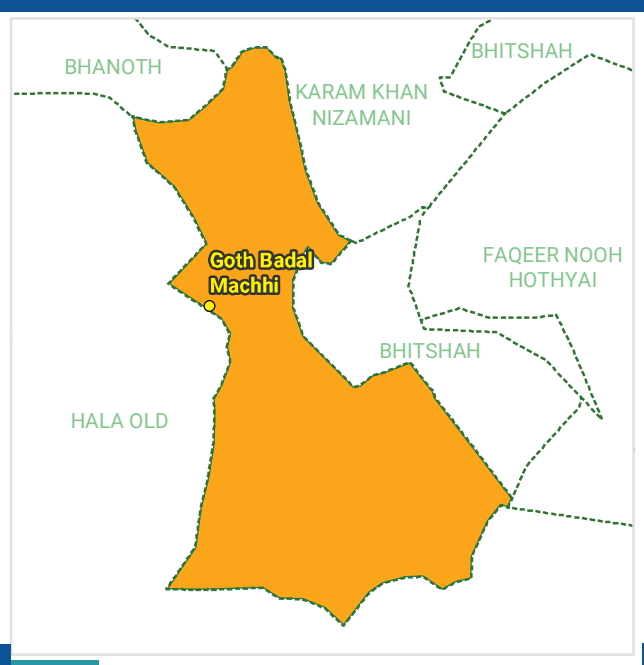


10 YEARS

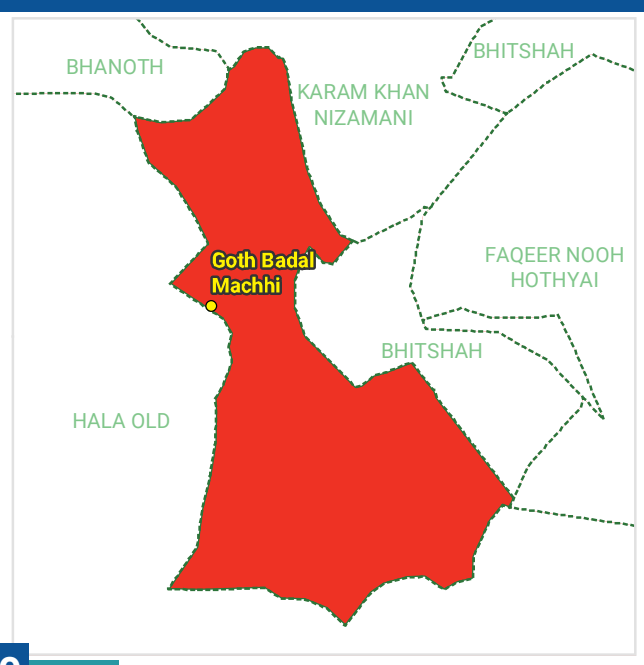


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

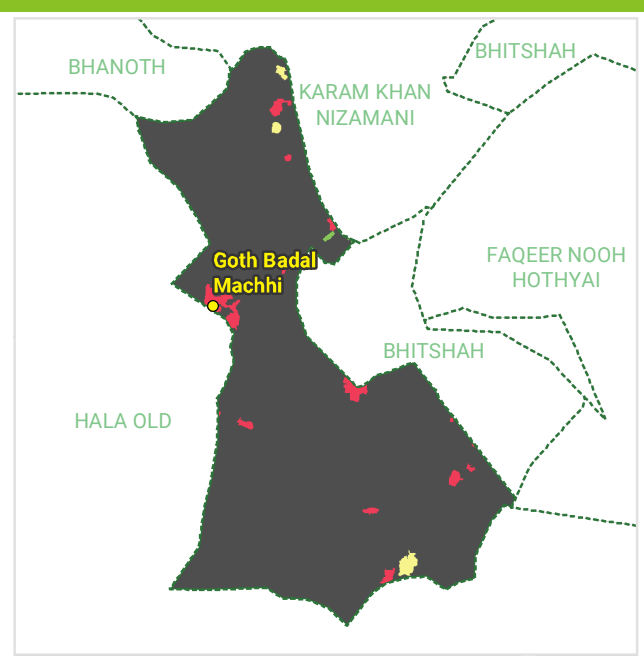


50 YEARS



100 YEARS

VULNERABILITY



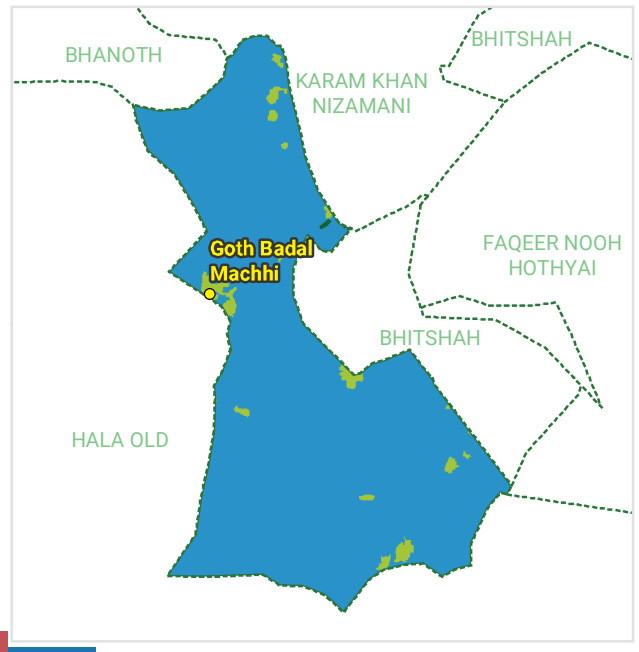
HAZARD

Normal | Moderate | High | Severe | Extreme

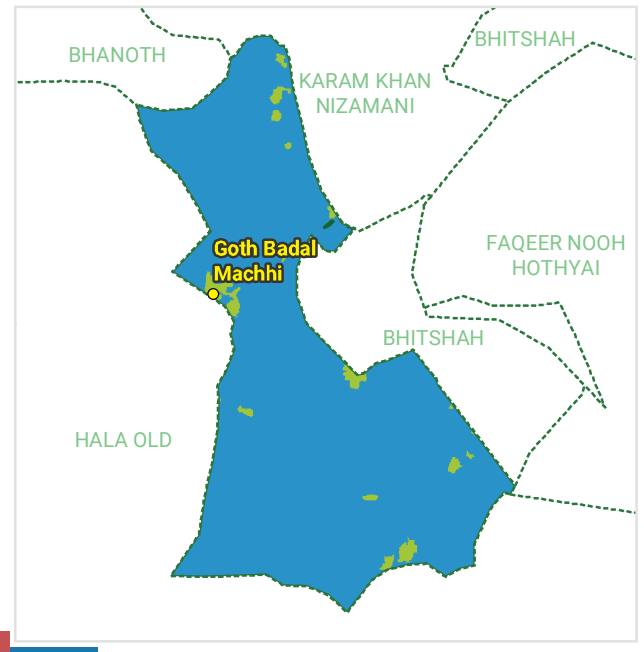
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

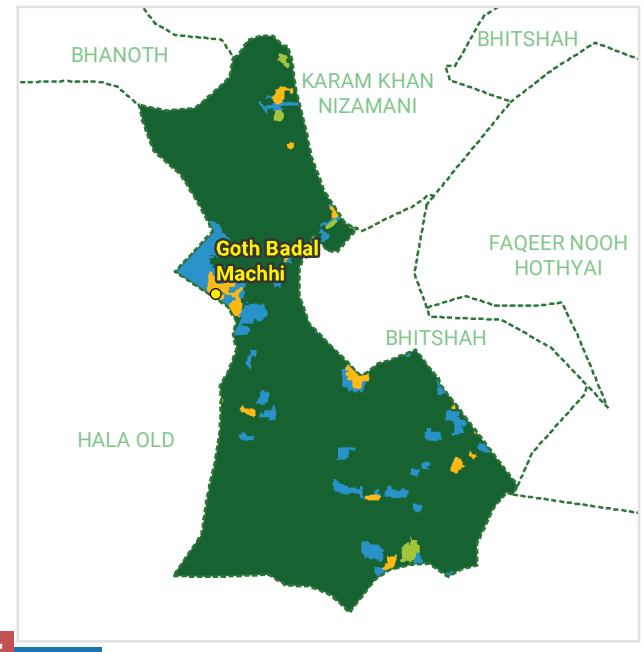
RISK AT DIFFERENT RETURN PERIODS



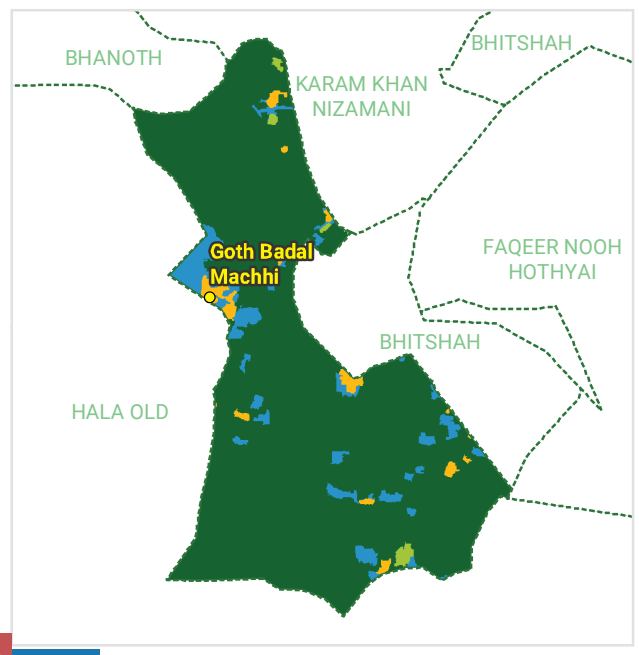
5 YEARS



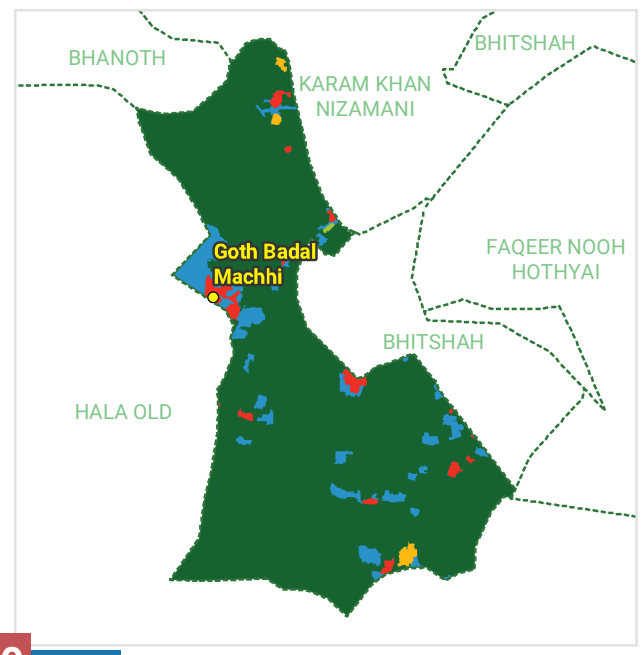
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

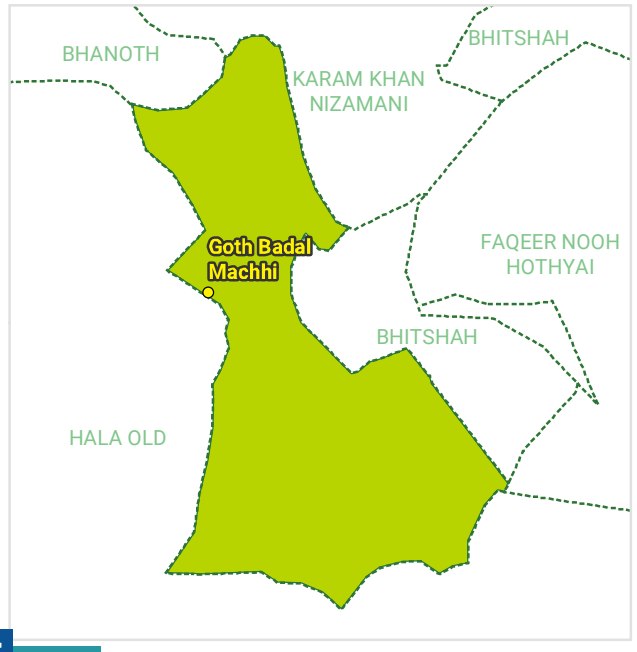
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

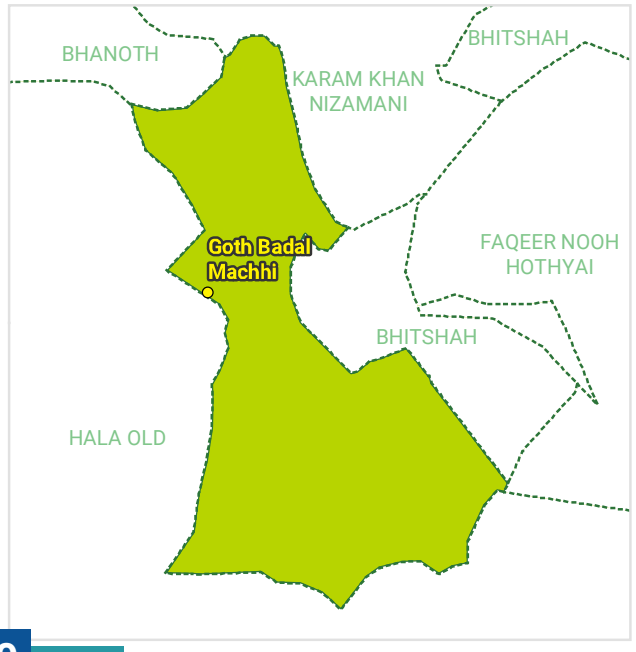
24	3258	19117	35.76	0.19	0.03	0.82
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

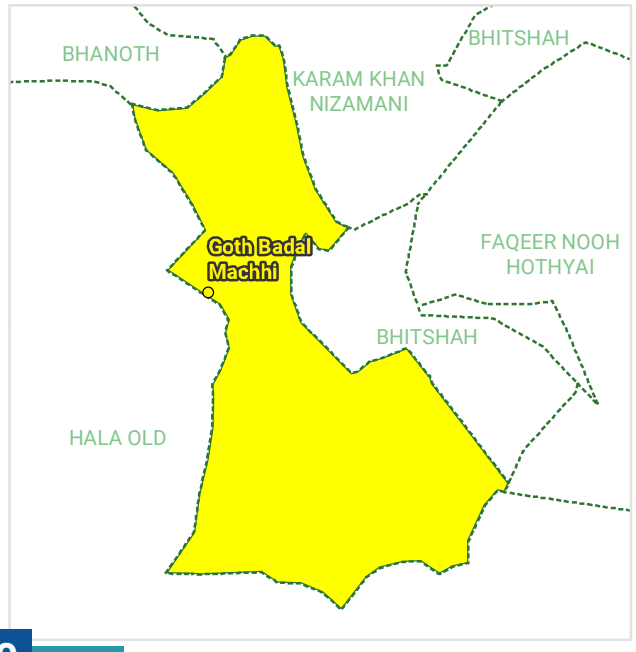
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

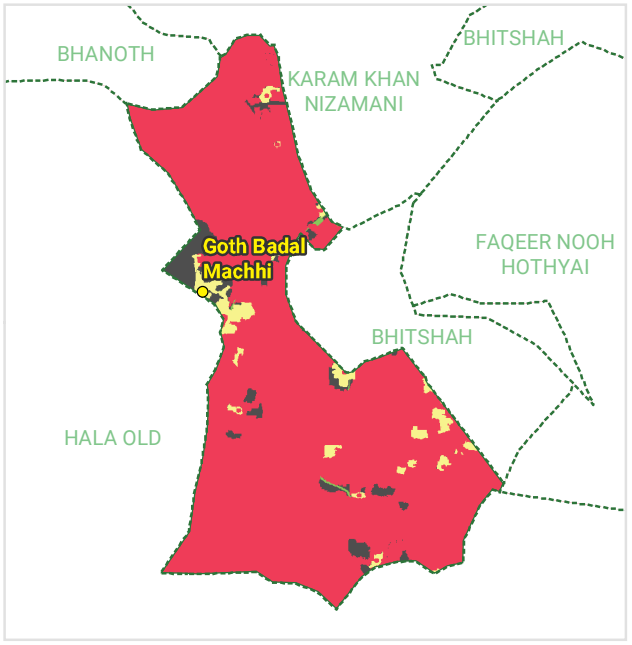


100 YEARS



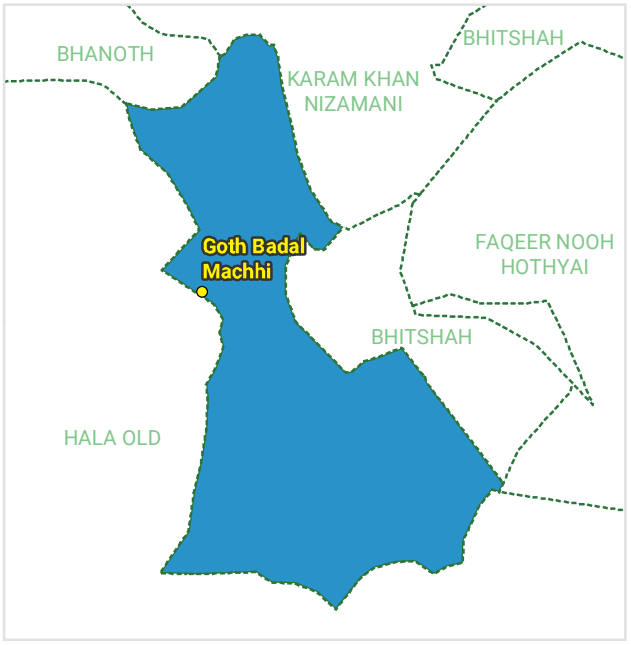
500 YEARS

VULNERABILITY

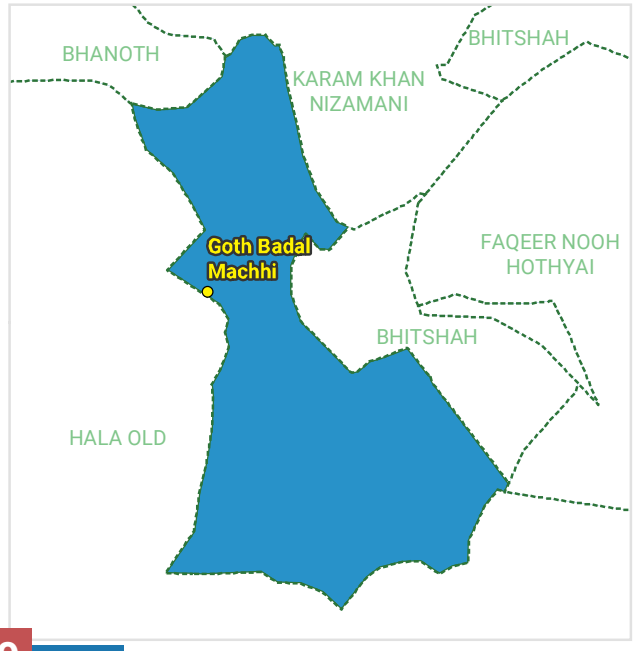


25 YEARS

RISK AT DIFFERENT RETURN PERIODS

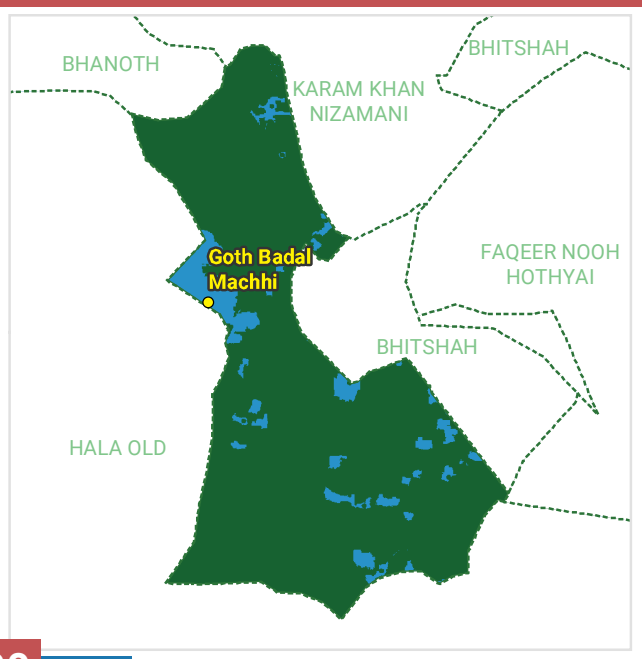


100 YEARS



500 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

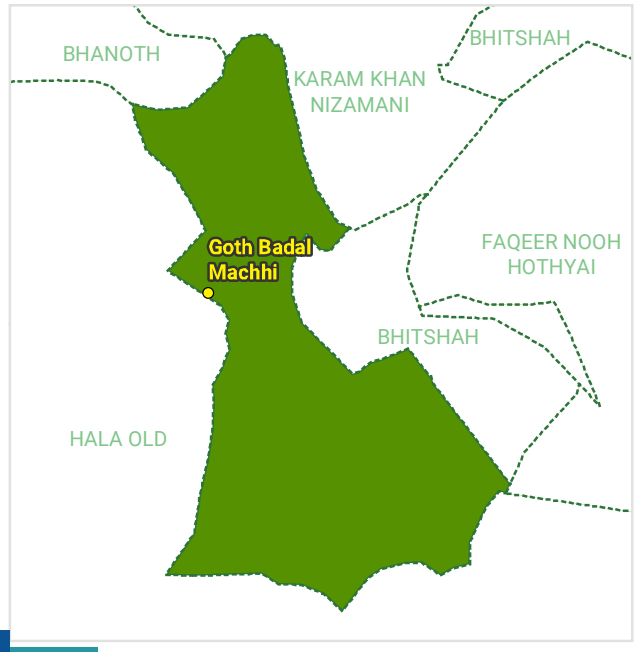
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

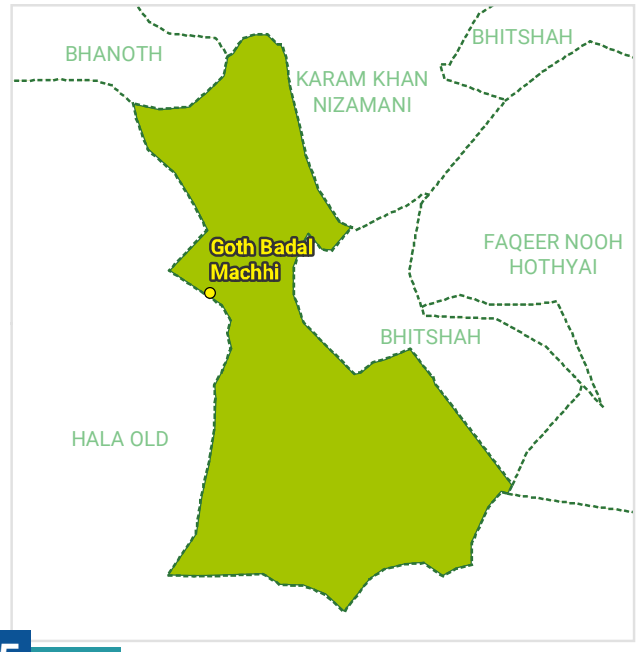
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

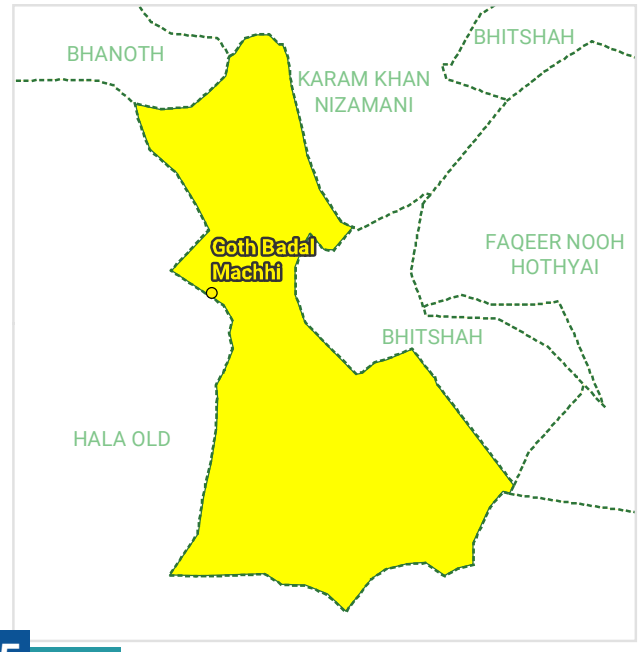
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

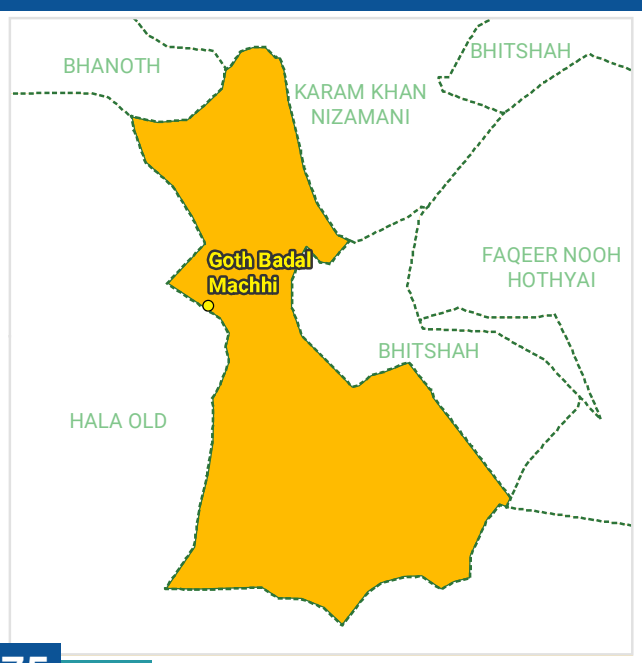


475 YEARS

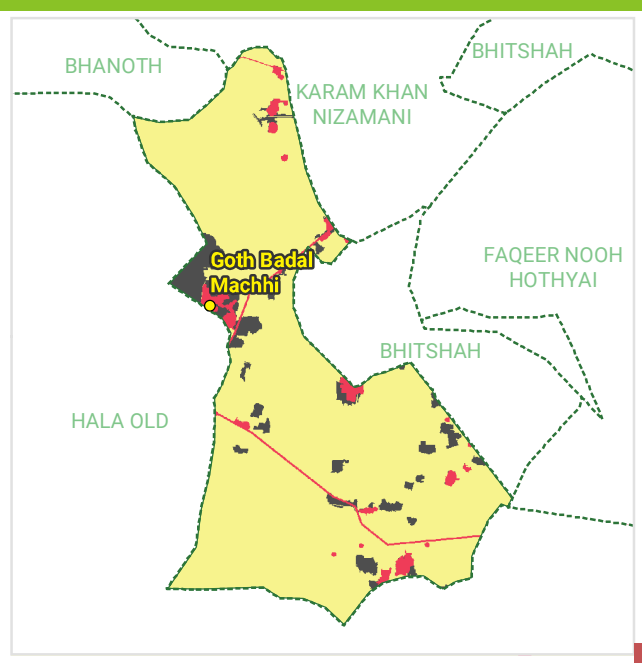


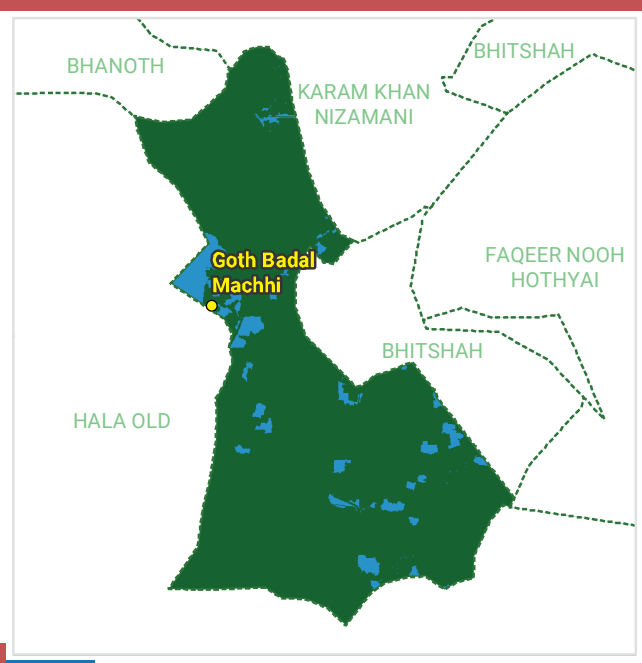
975 YEARS

HAZARD	VULNERABILITY	RISK



2475 YEARS





95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

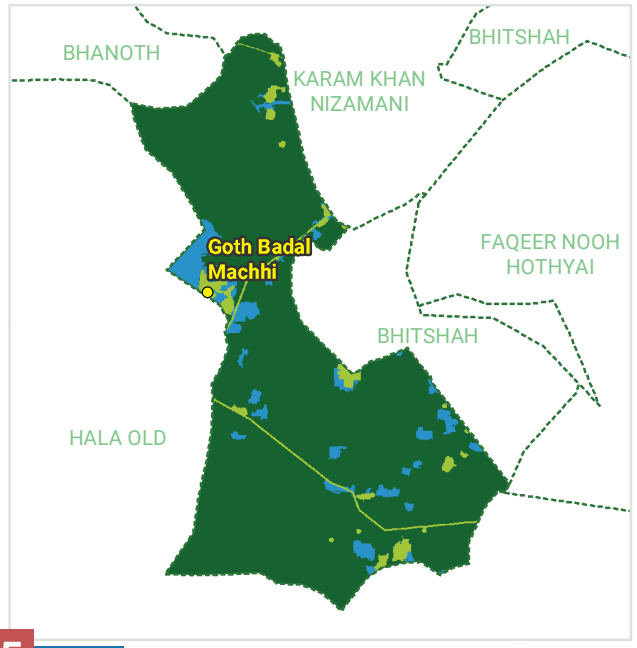
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

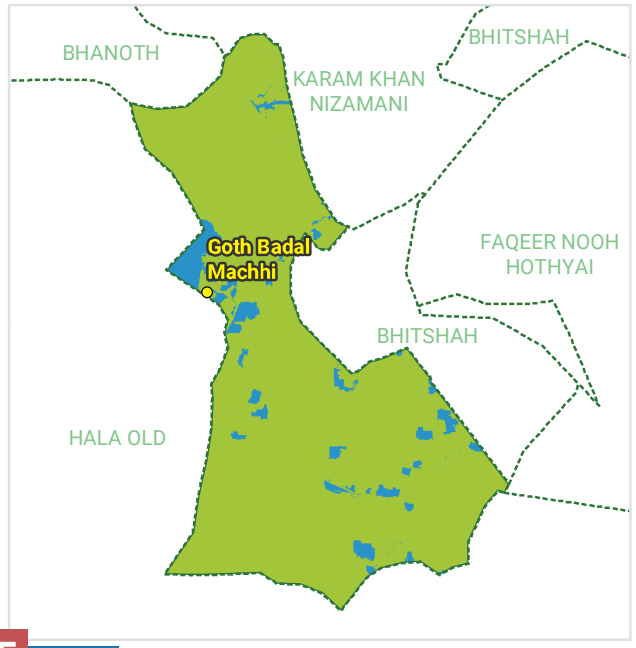
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

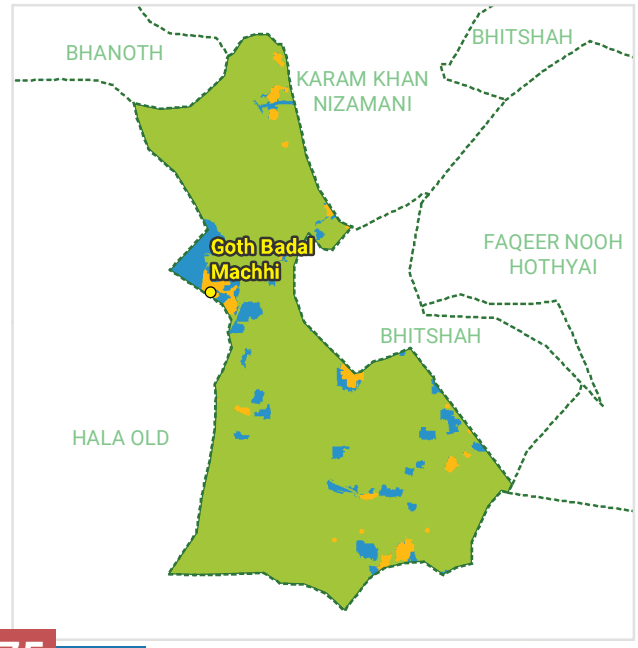
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

24	3254	19096	35.78	0.01	0.19	0.03	0.03
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.82	0.00	47.13	0	1.02	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
11	0	0	0	4	0	1	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low, Medium, High, Extreme	●	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	●
METEOROLOGICAL DROUGHT	Low, Medium	Low, Medium, High, Extreme	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	Low	Low	Low	Low, Medium	●	●	●
HEATWAVE	Low, Medium	Low, Medium	Low, Medium, High	Low, Medium, High	Low, Medium, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

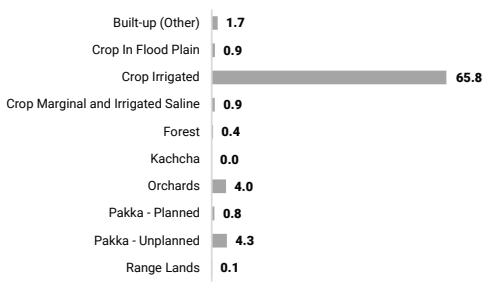
Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - KARAM KHAN NIZAMANI

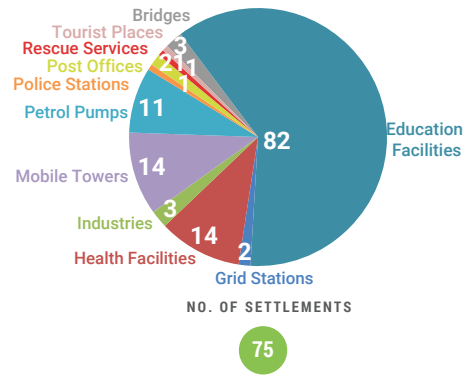
Union Council area in sq. km	79
Surrounding UCs / Features	**ZERPIR** in North **SANGHAR DISTRICT** in East **BHITSHAH** in South **BHANOTH** in West
Population	2017 approx. **96,842**
No. of household	2017 approx. **16,930**

Land Use Land Cover

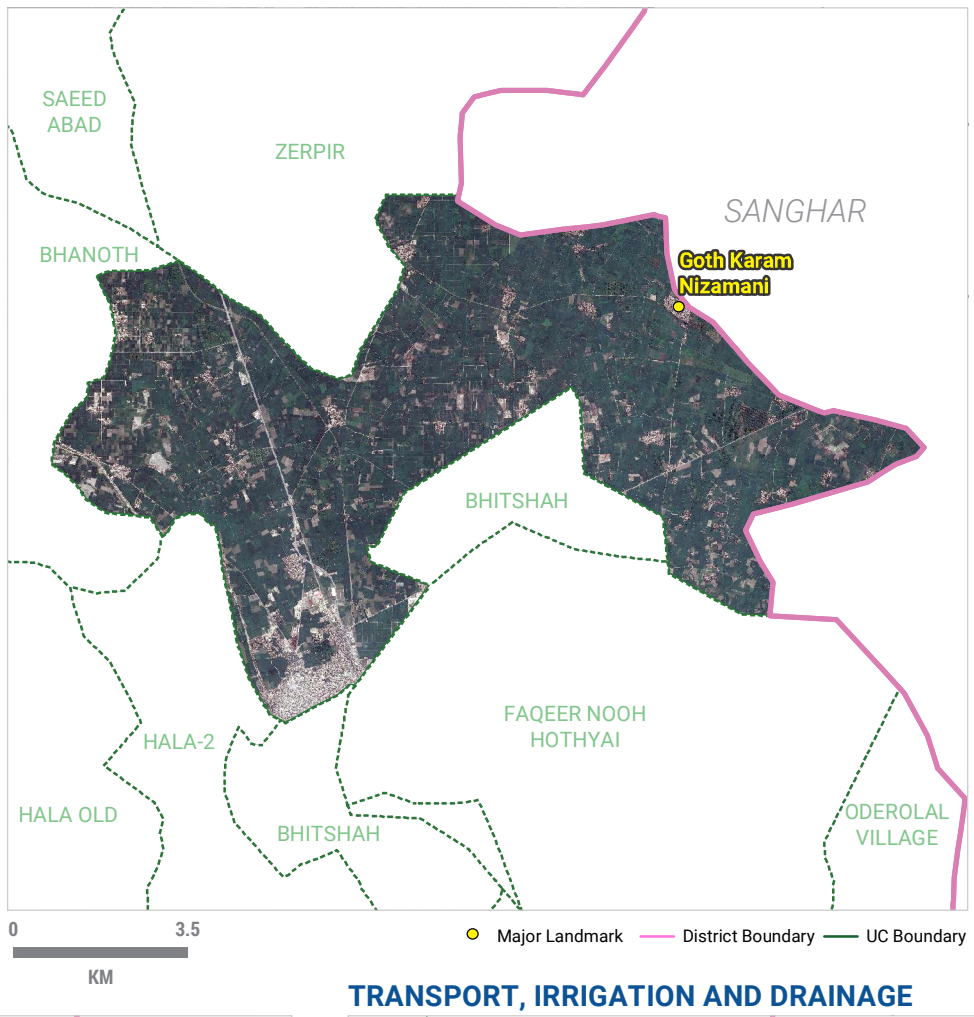
coverage area in sq.km



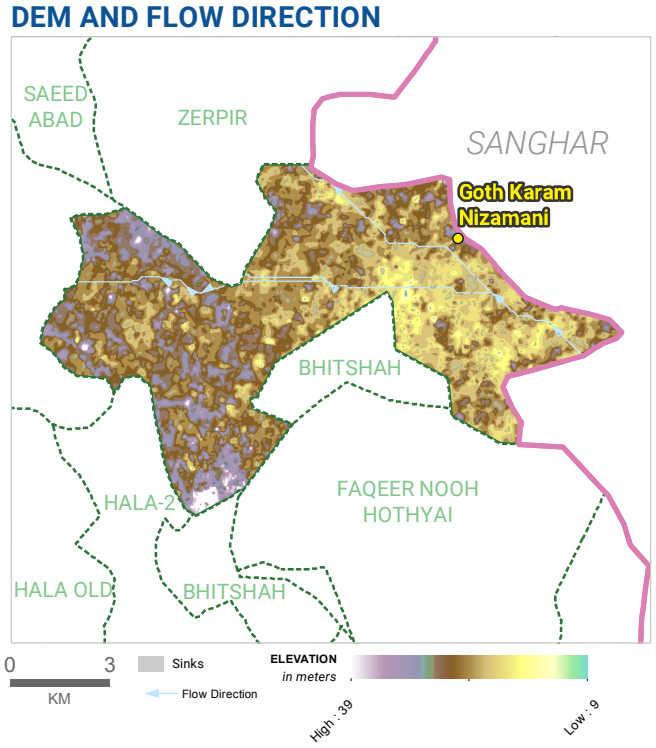
Critical Infrastructure



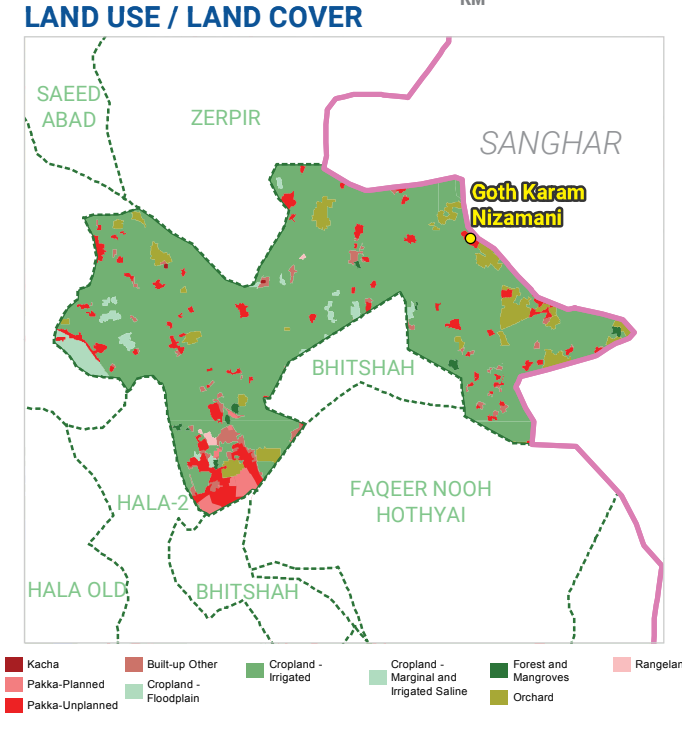
SATELLITE IMAGERY



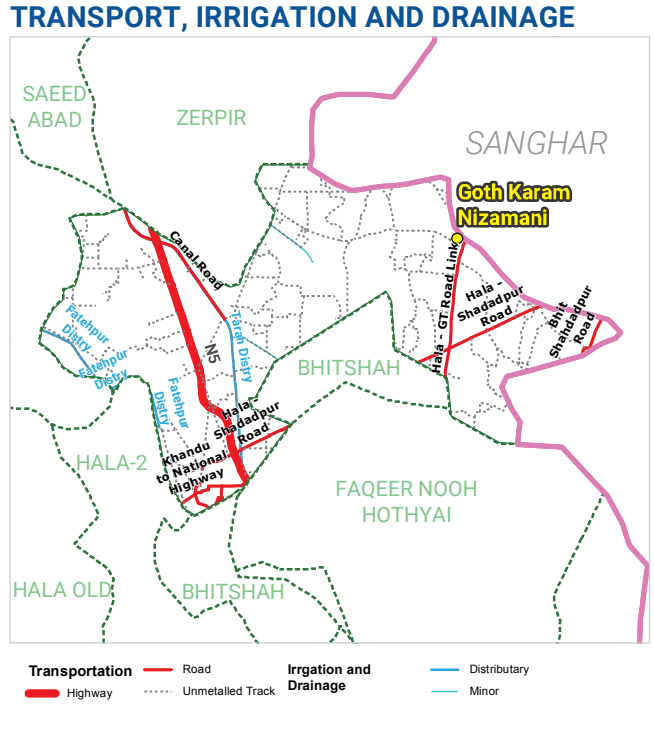
DEM AND FLOW DIRECTION



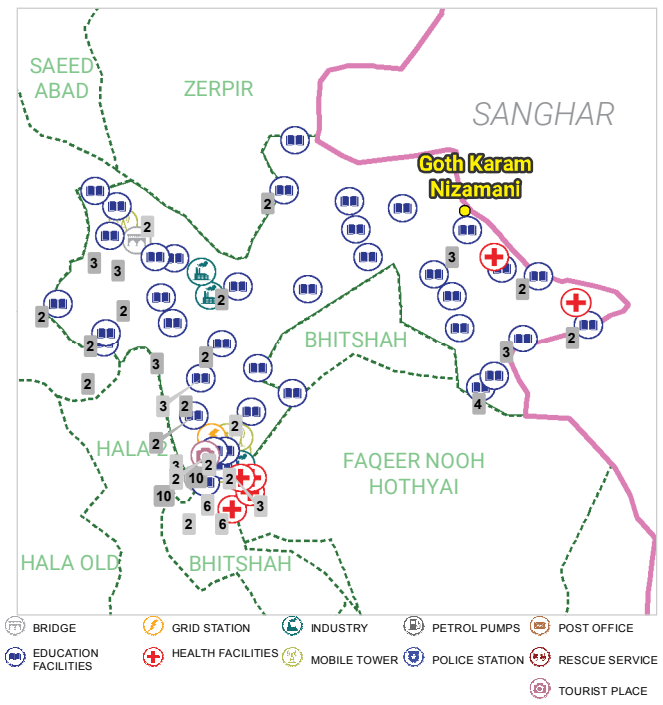
LAND USE / LAND COVER



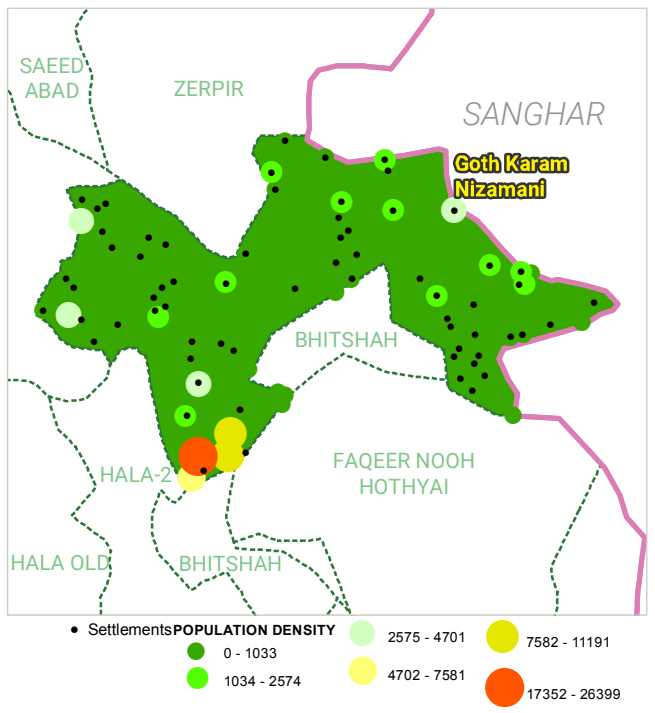
TRANSPORT, IRRIGATION AND DRAINAGE



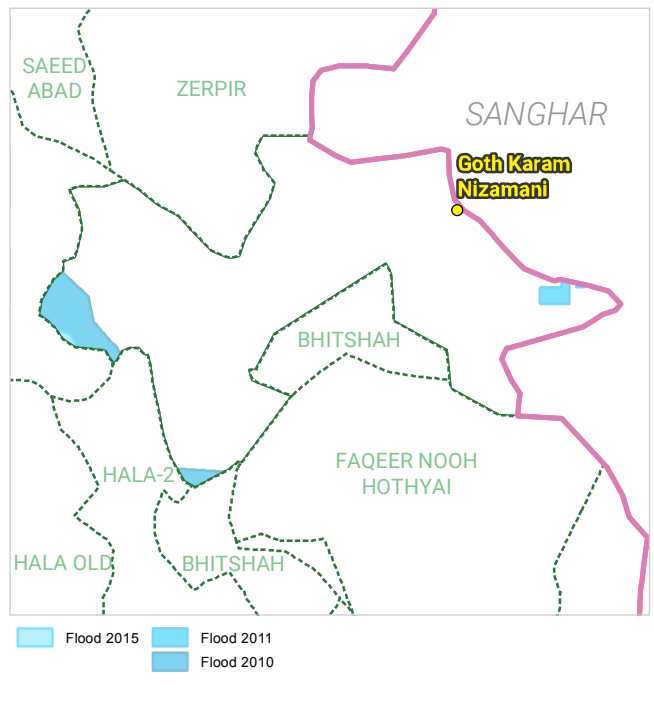
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

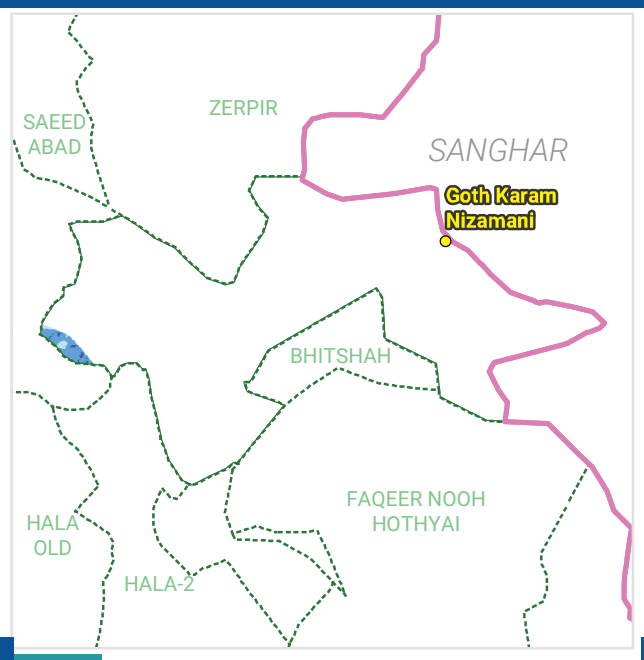


PAST HAZARDS

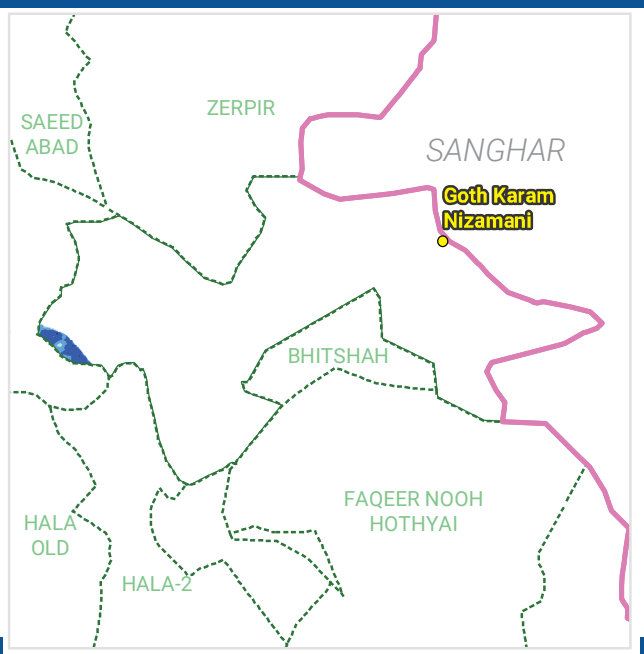


FLOOD

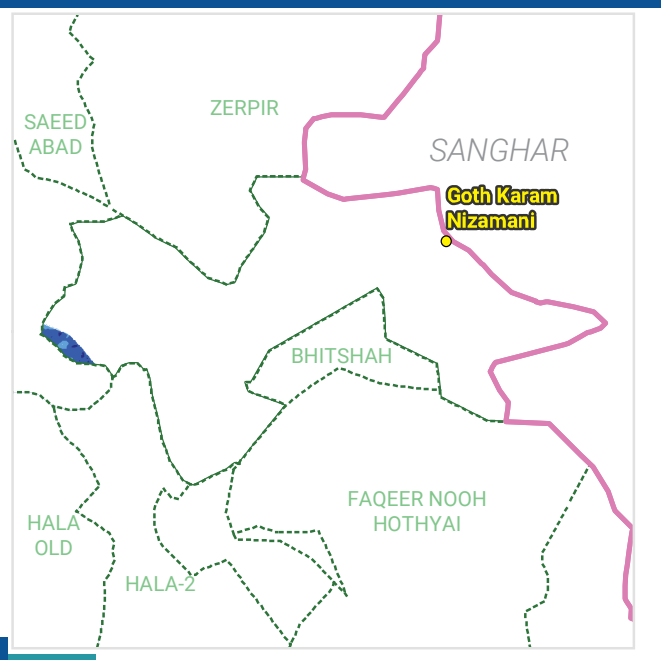
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

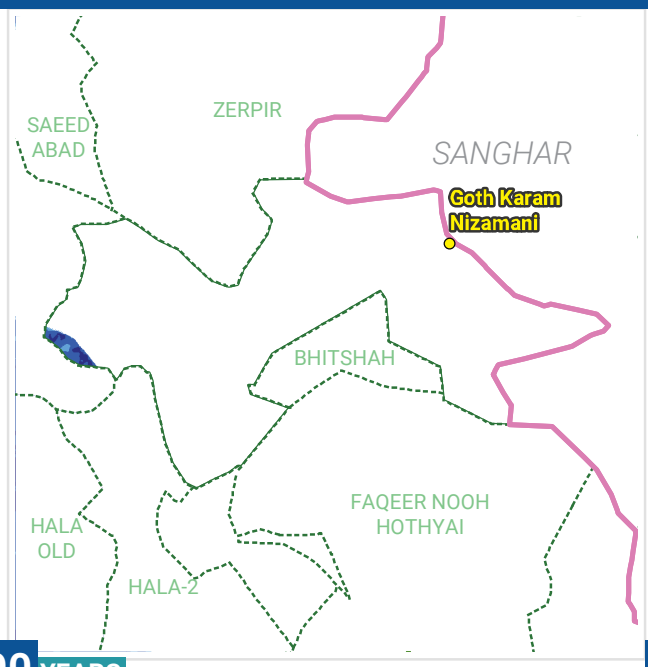


25 YEARS

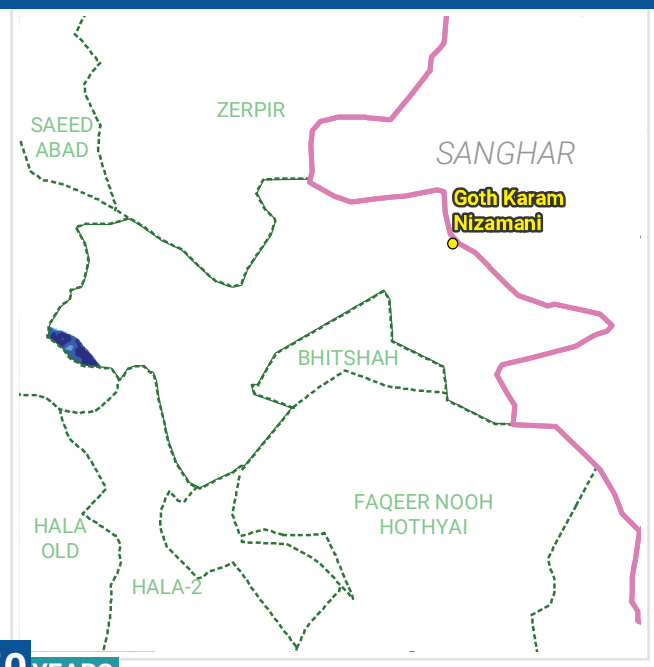


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

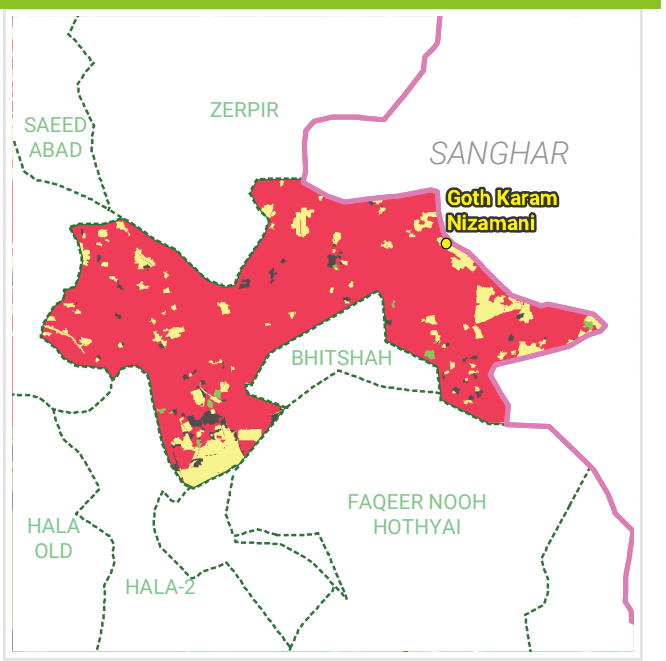


100 YEARS

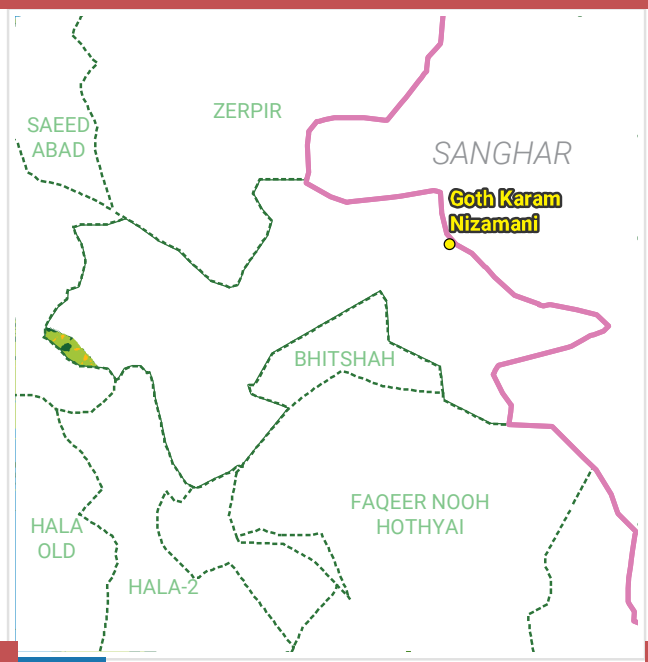


250 YEARS

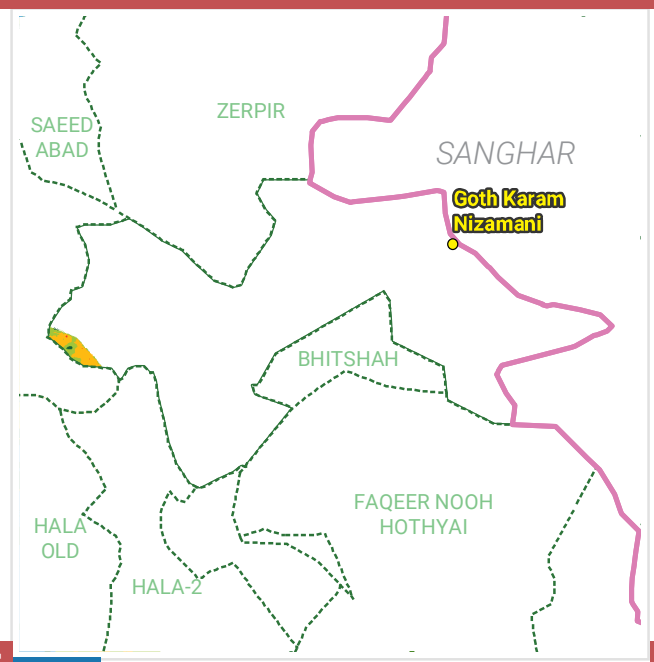
VULNERABILITY



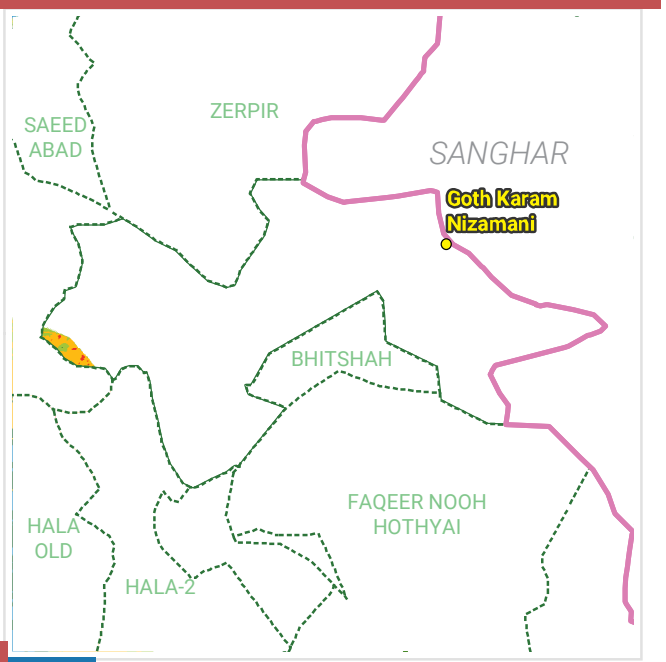
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

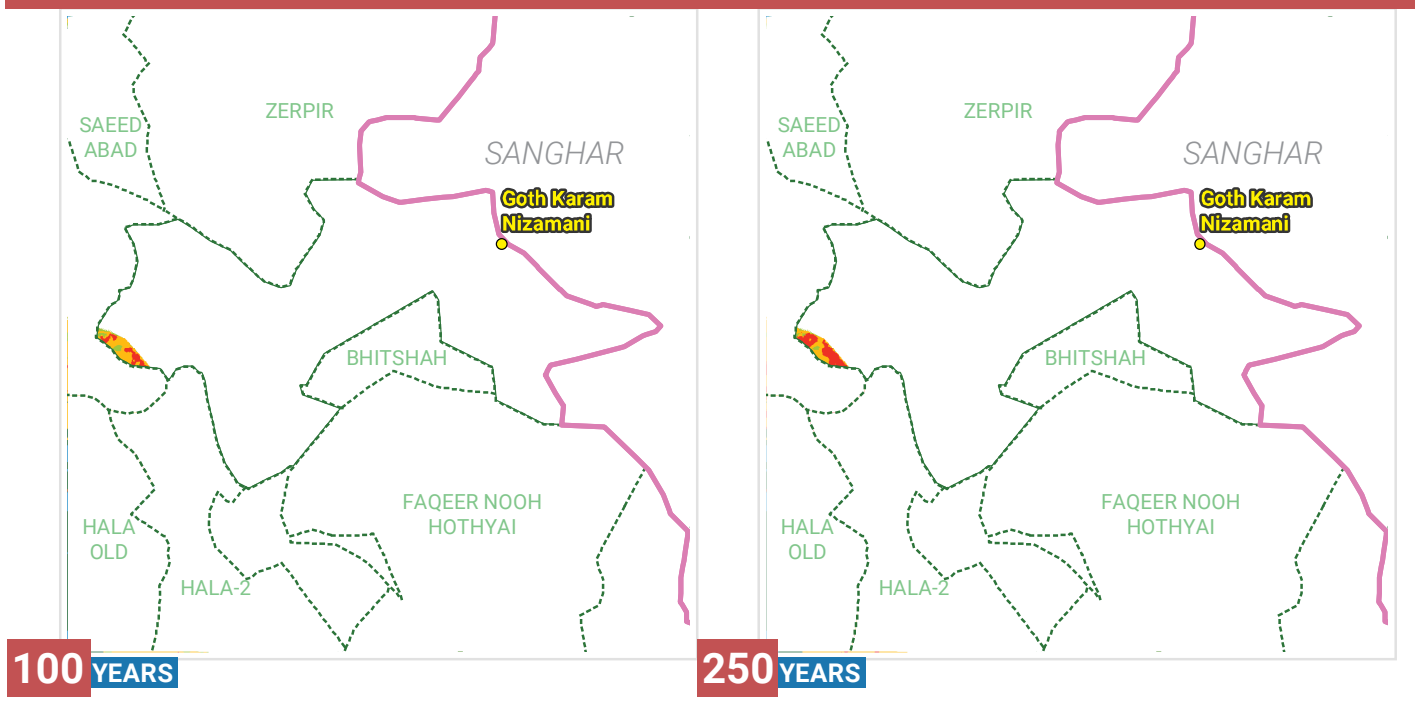
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



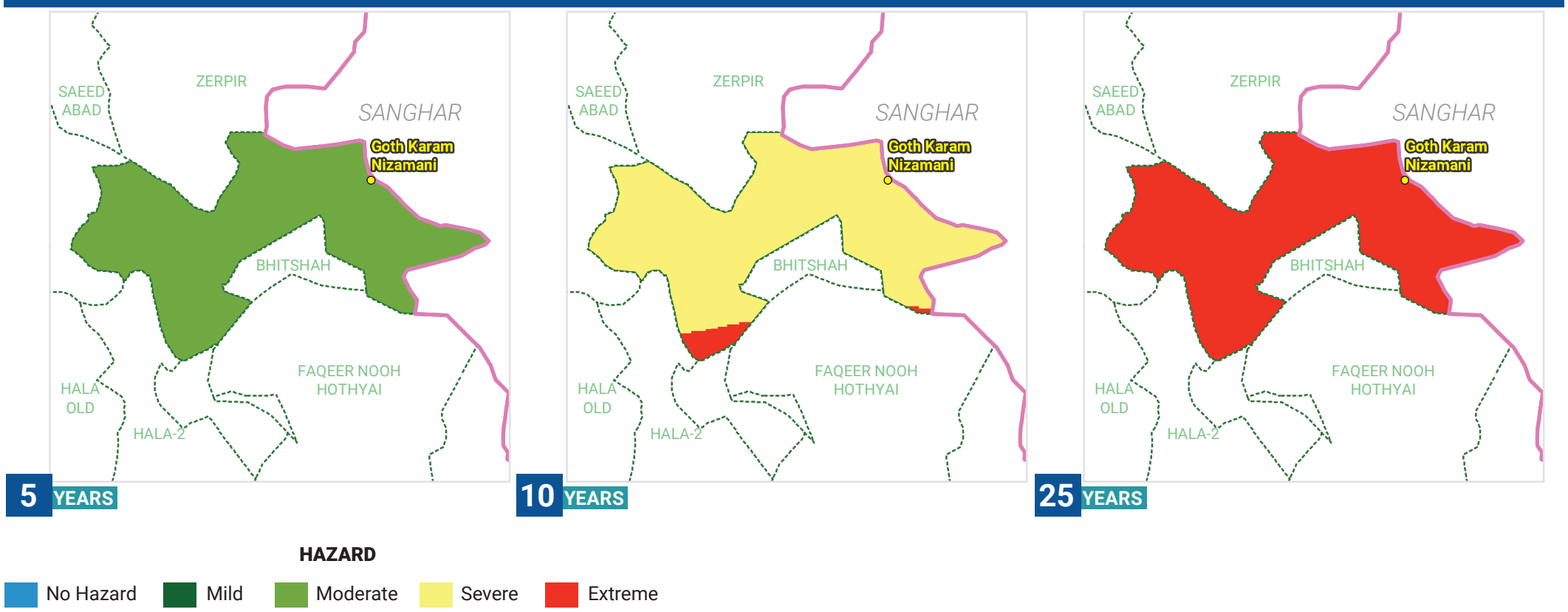
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

1	135	800	0.90	0	0	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.05	0	0.43	0	0.09	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

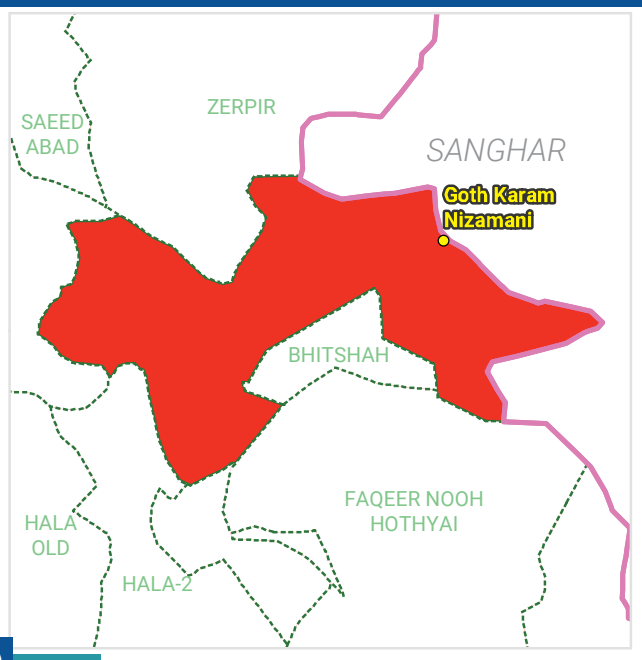
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



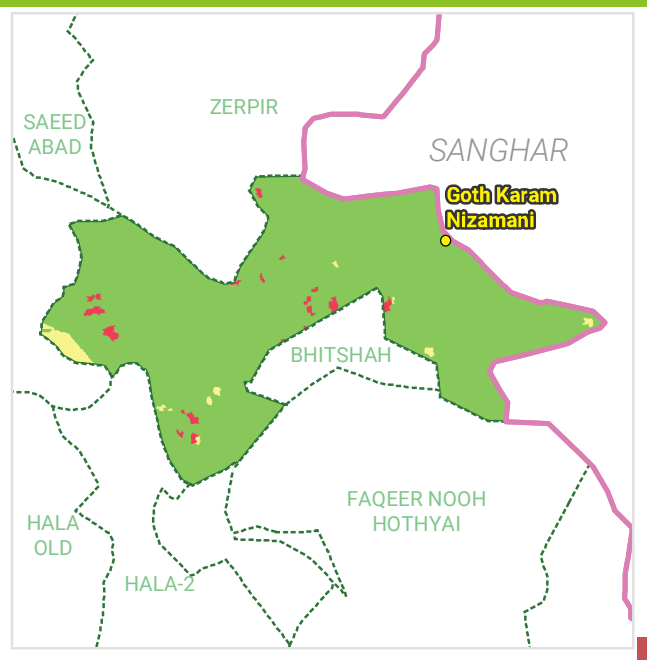
METEOROLOGICAL DROUGHT

HAZARD

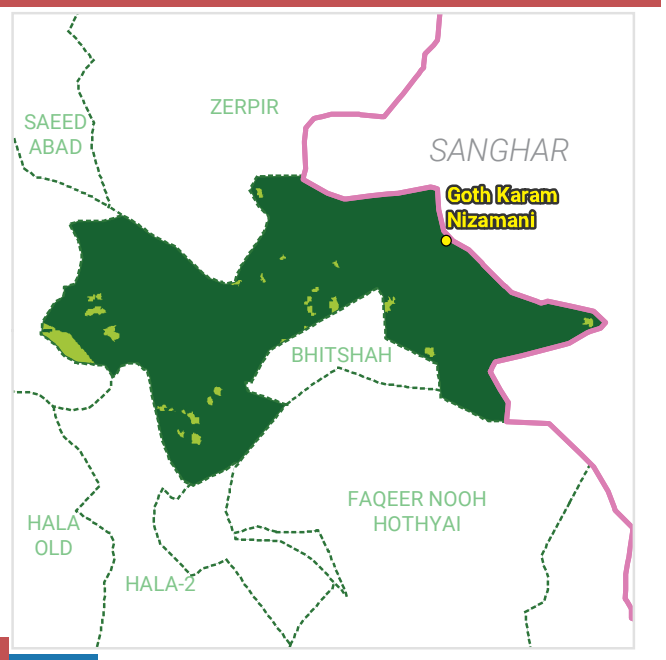


50 YEARS

VULNERABILITY

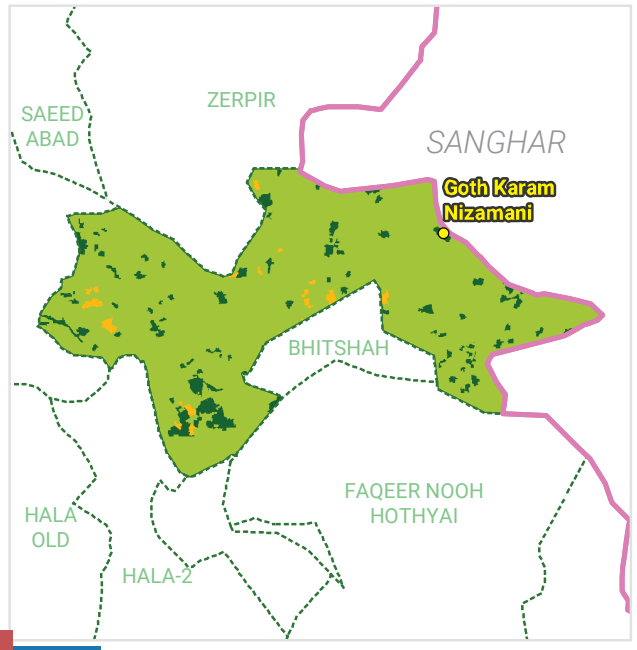


RISK

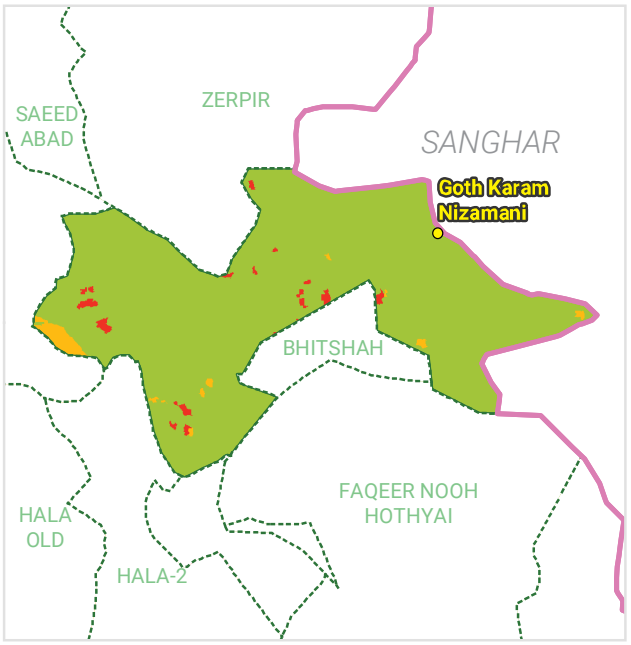


5 YEARS

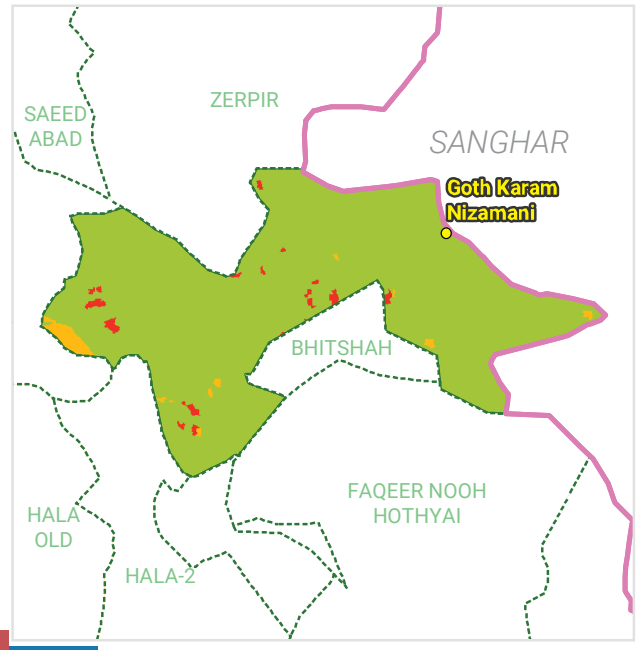
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

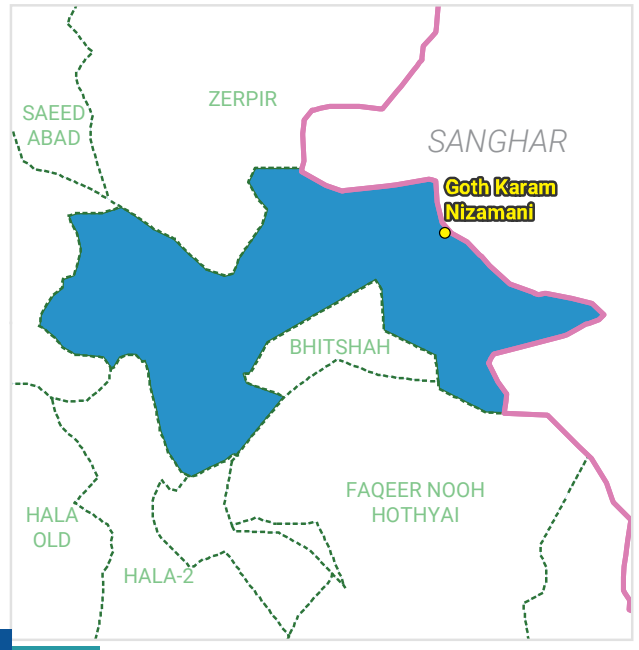
(BASED ON 50 YEARS RETURN PERIOD)

75	16930	96842	71.59	0	0.37	0	0.12
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

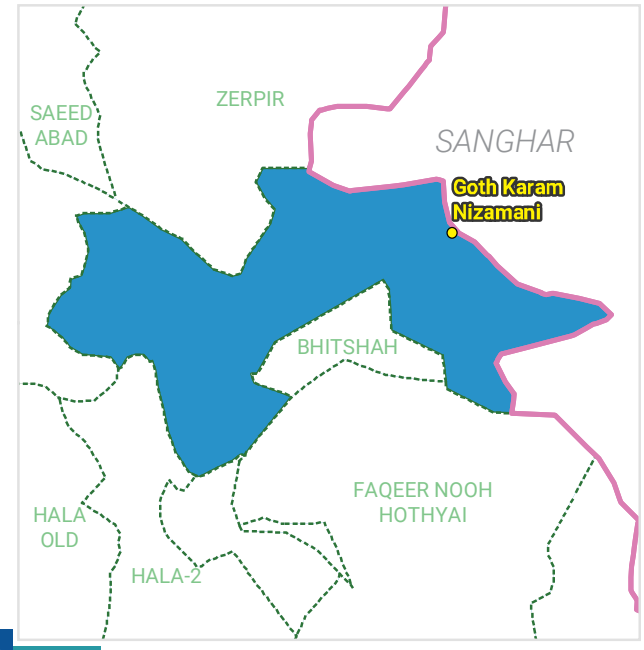
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

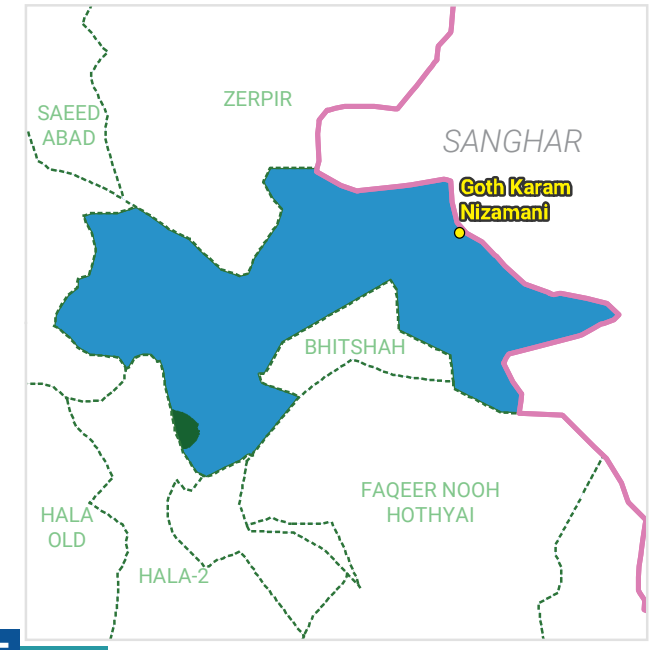
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

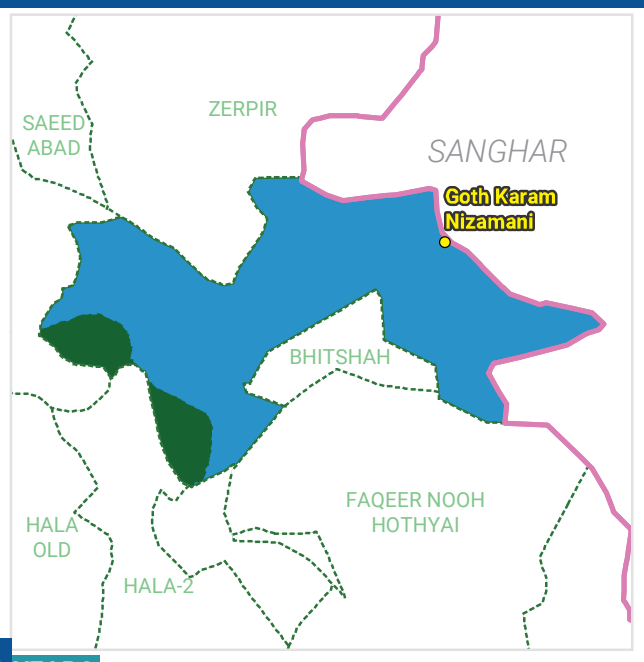


10 YEARS



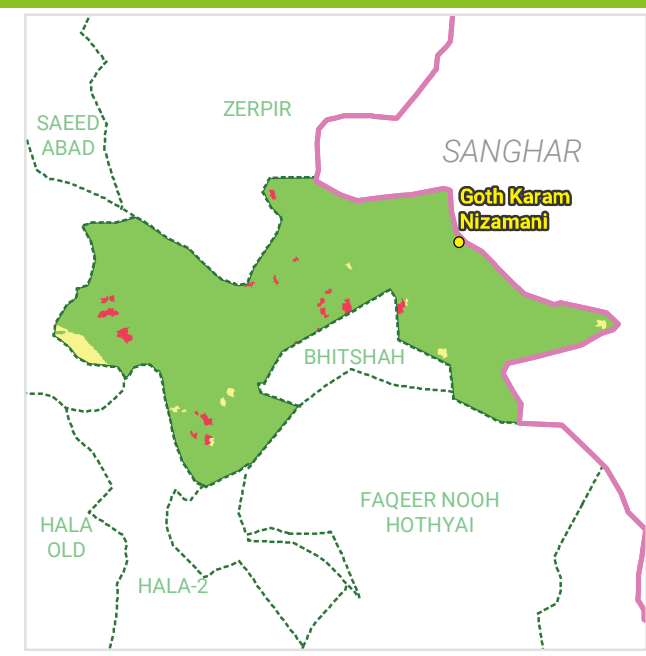
25 YEARS

HAZARD

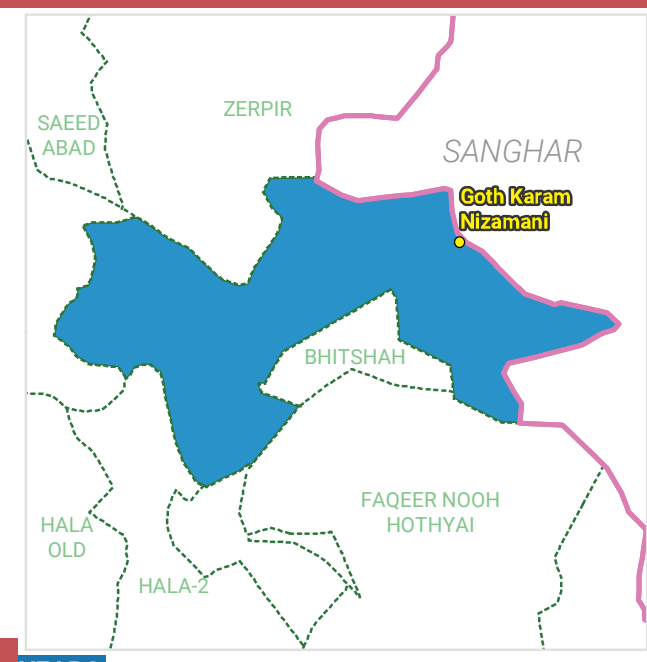


50 YEARS

VULNERABILITY

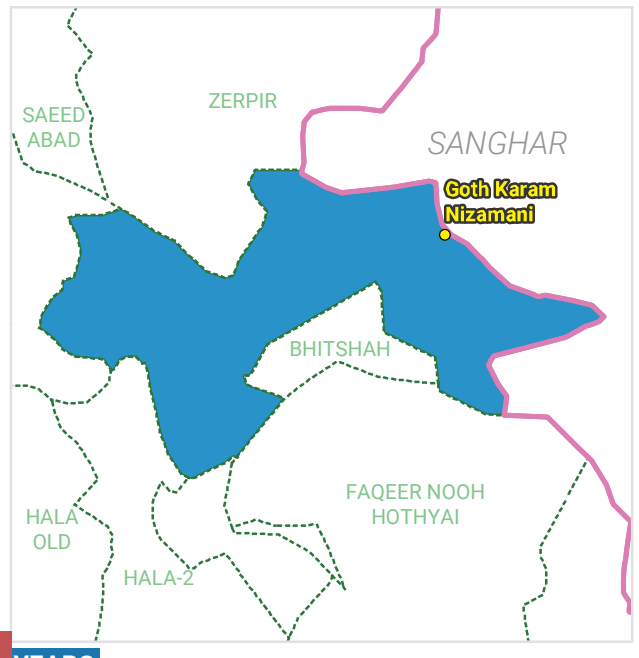


RISK

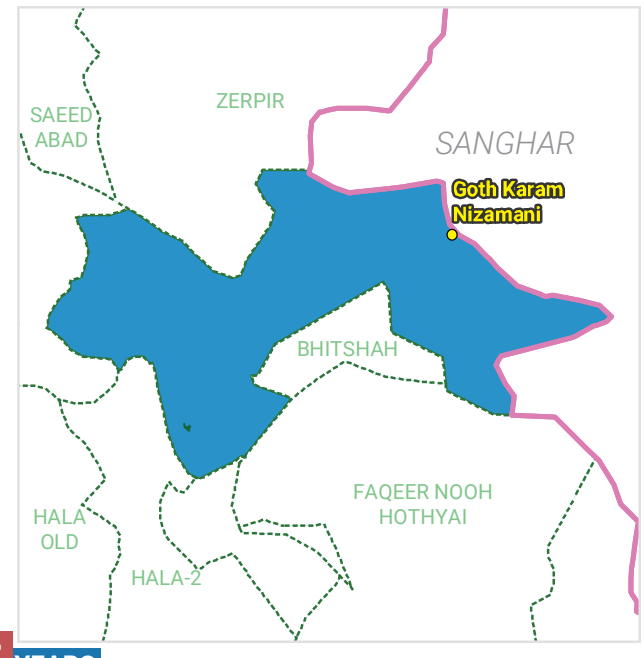


5 YEARS

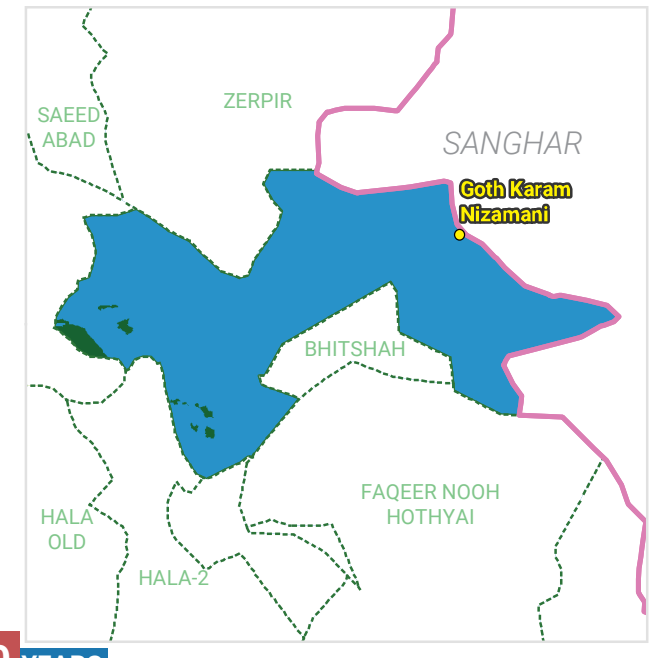
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

ELEMENTS AT RISK

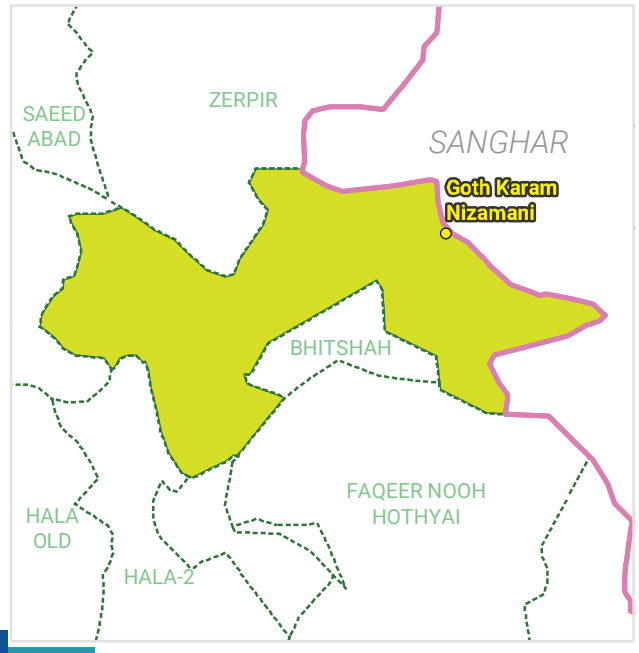
(BASED ON 50 YEARS RETURN PERIOD)

0	15	82	1.46	0	0.10	0	0.13
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

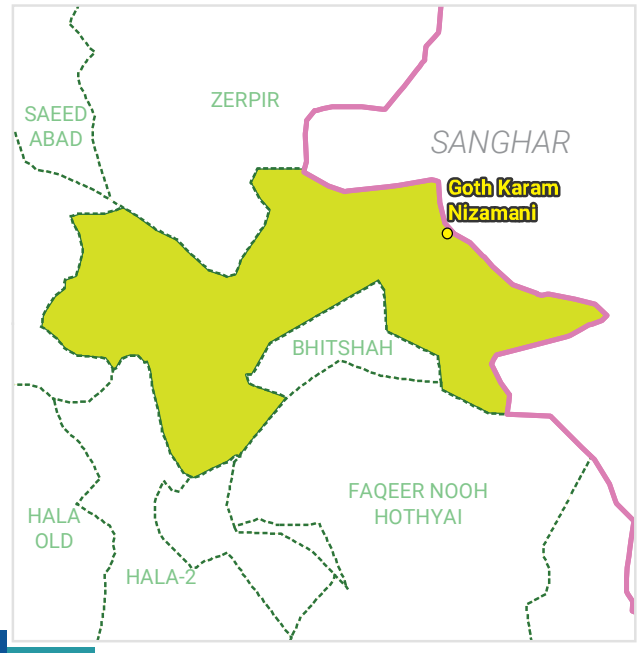
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

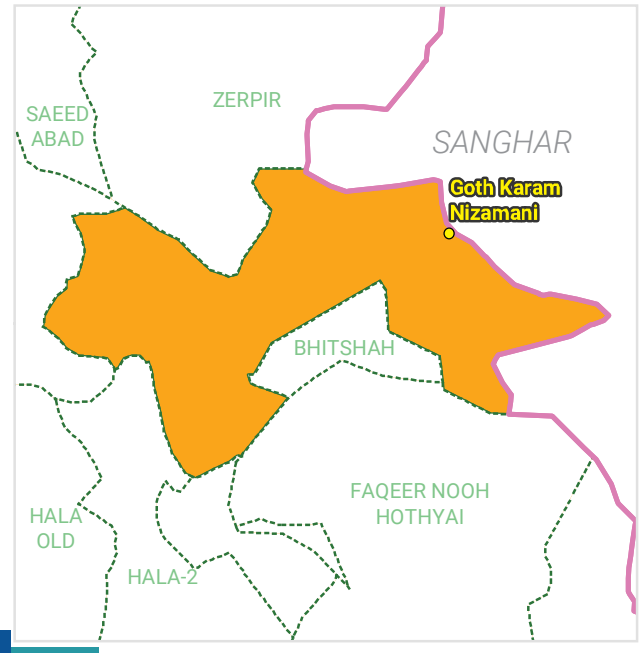
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

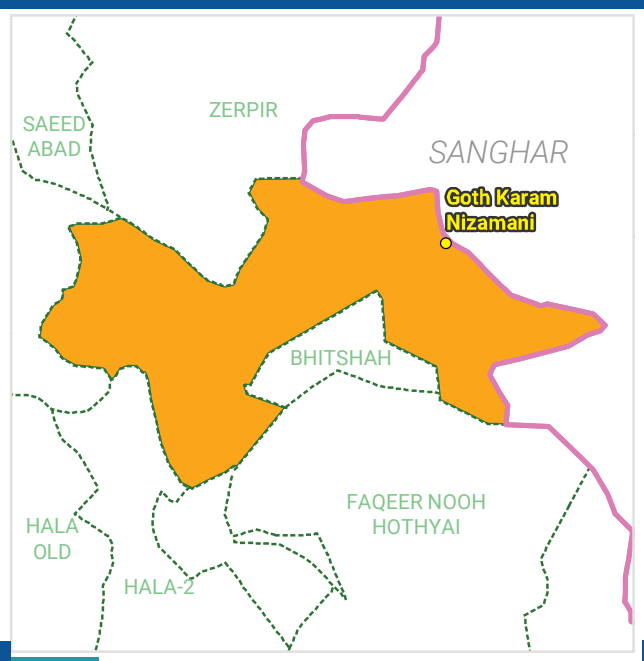


10 YEARS

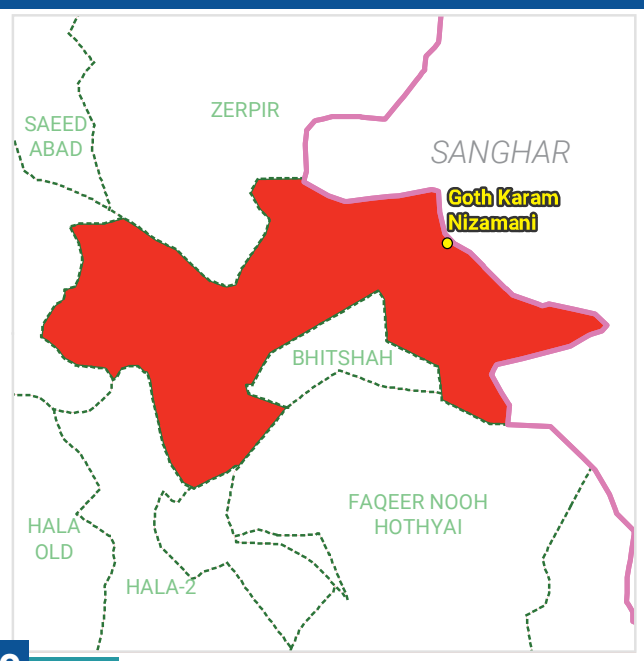


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

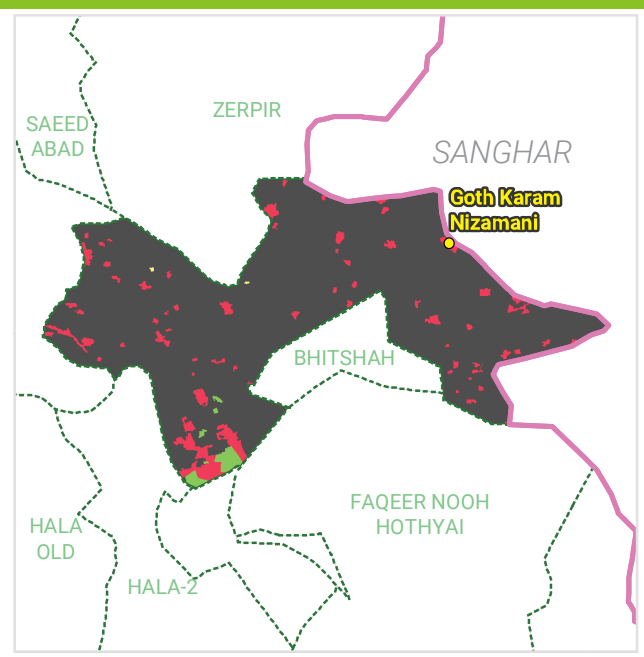


50 YEARS



100 YEARS

VULNERABILITY



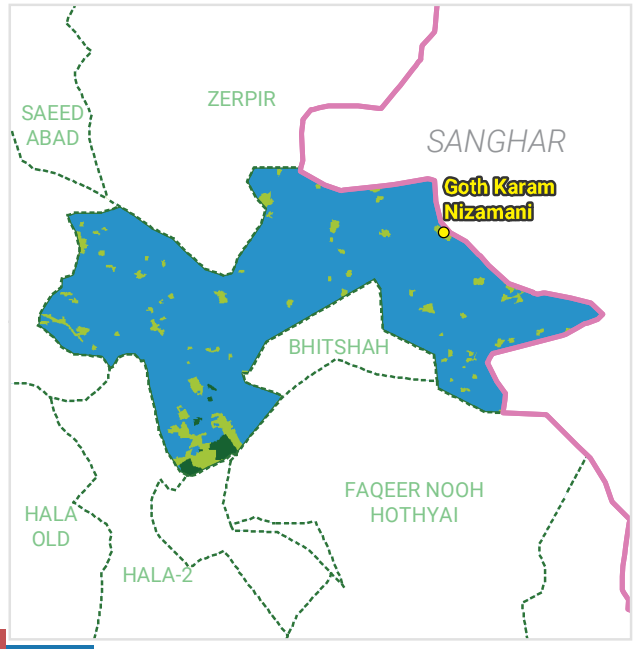
HAZARD

Normal | Moderate | High | Severe | Extreme

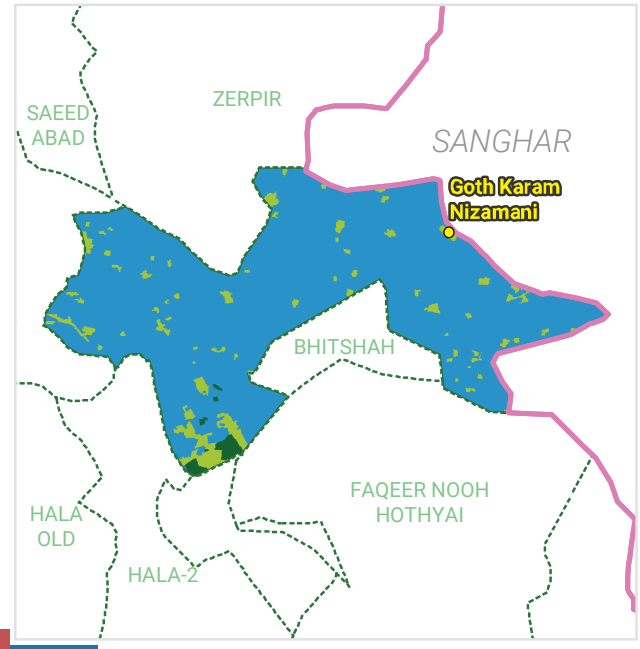
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

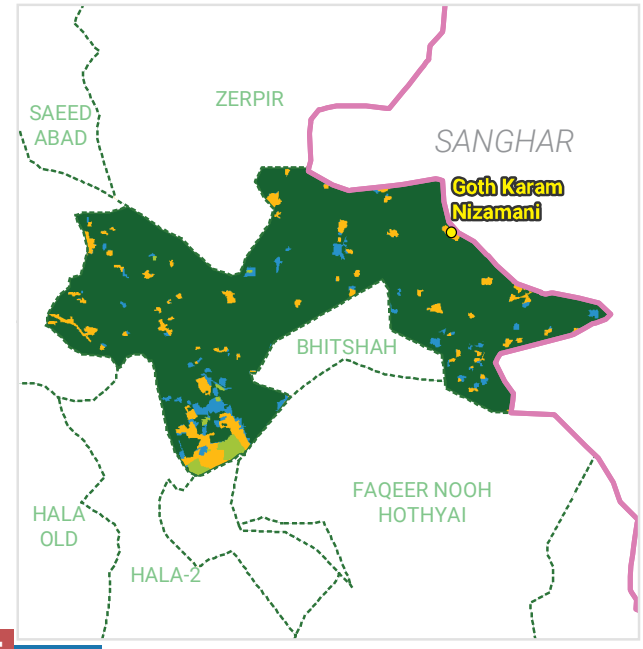
RISK AT DIFFERENT RETURN PERIODS



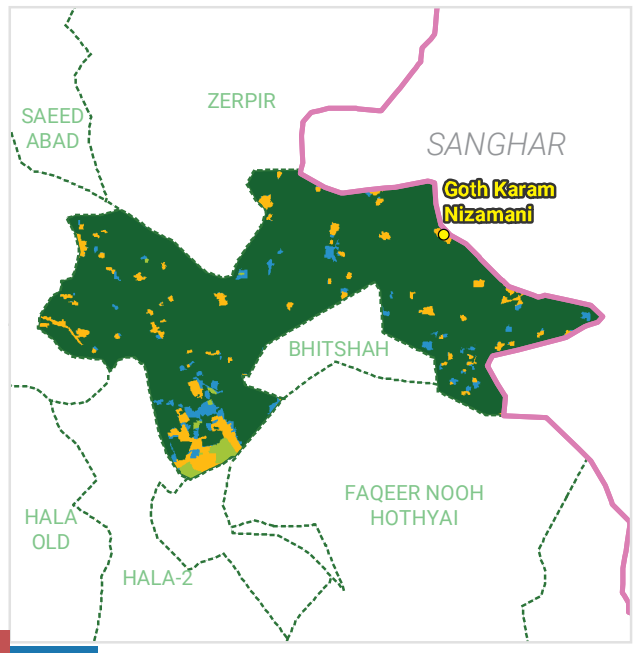
5 YEARS



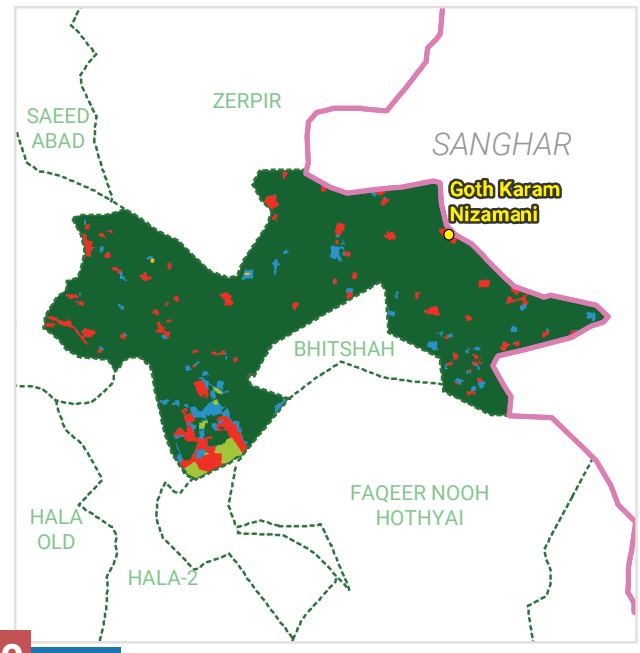
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

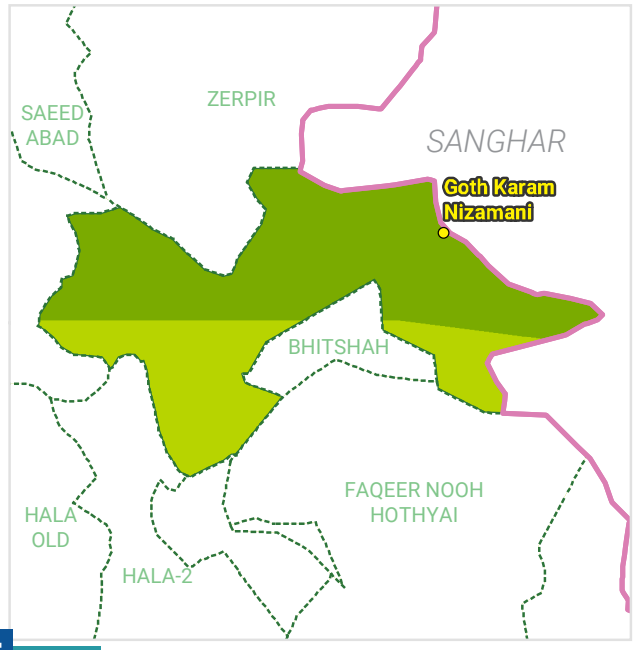
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

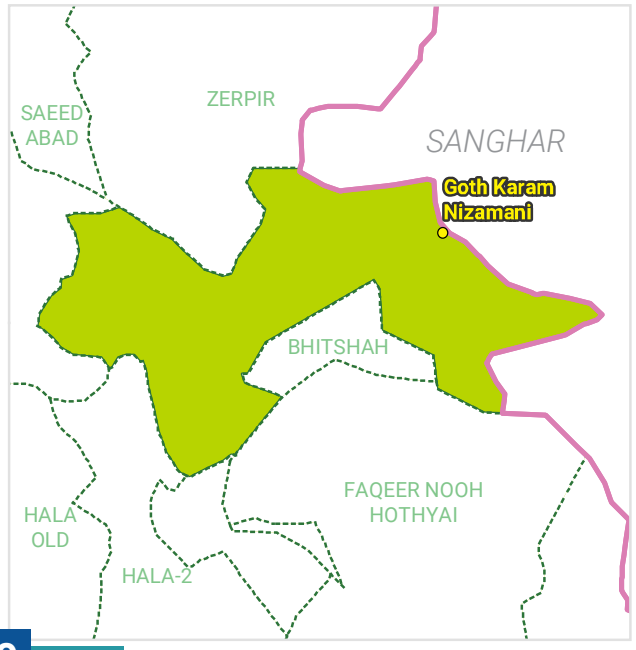
74	16820	96200	71.41	0.03	0.78	4.24
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

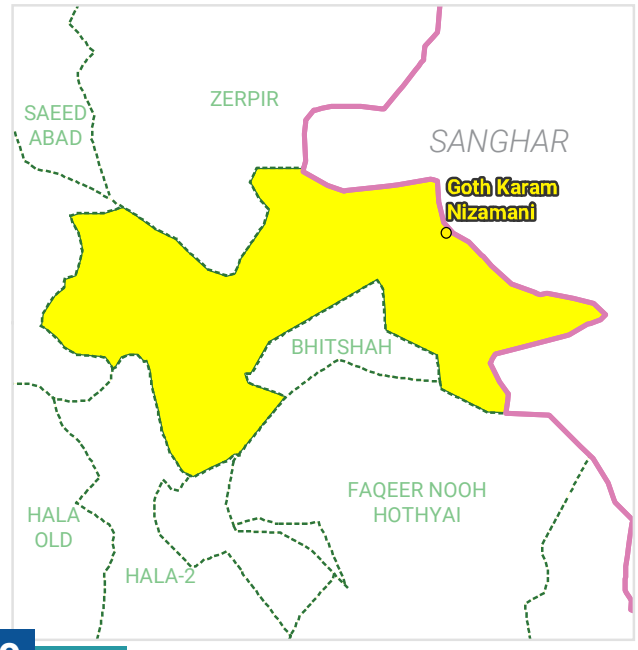
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

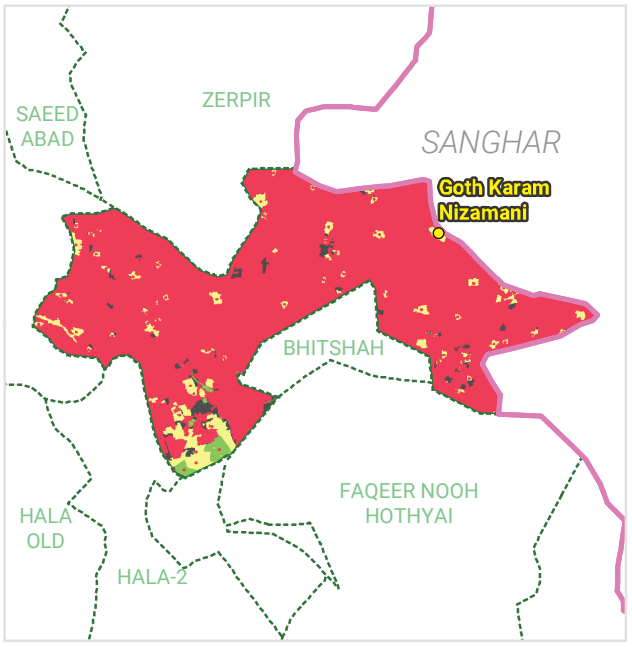


100 YEARS



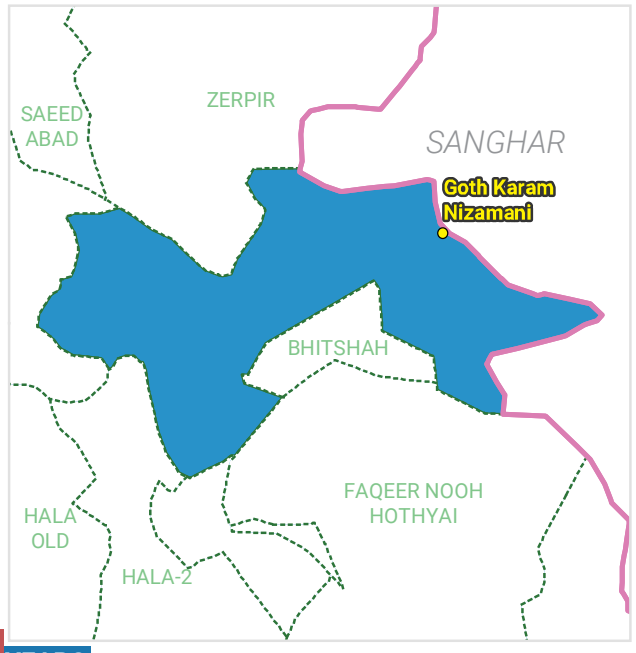
500 YEARS

VULNERABILITY

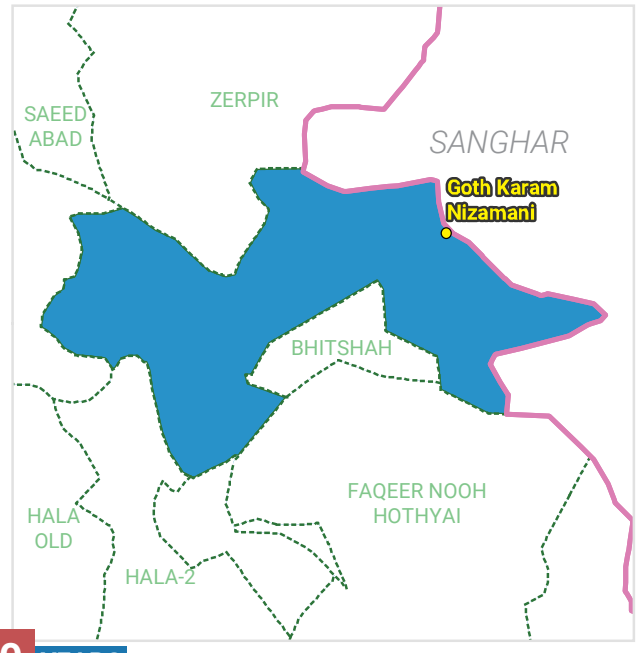


25 YEARS

RISK AT DIFFERENT RETURN PERIODS

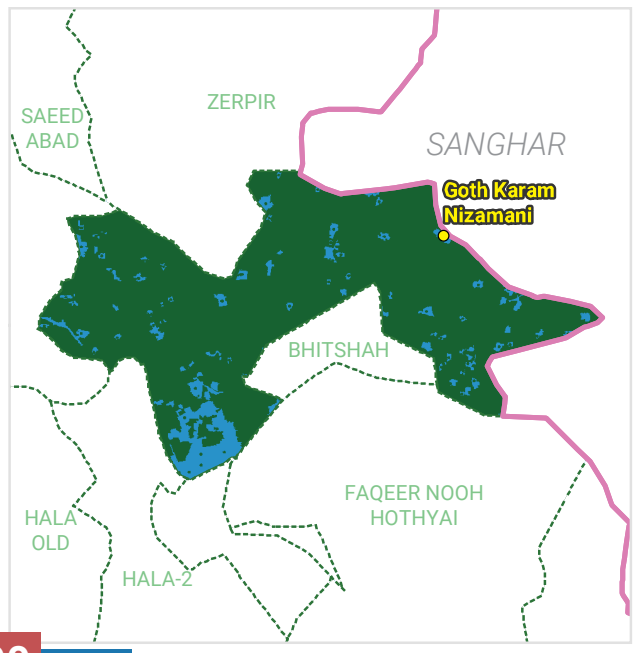


100 YEARS



500 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

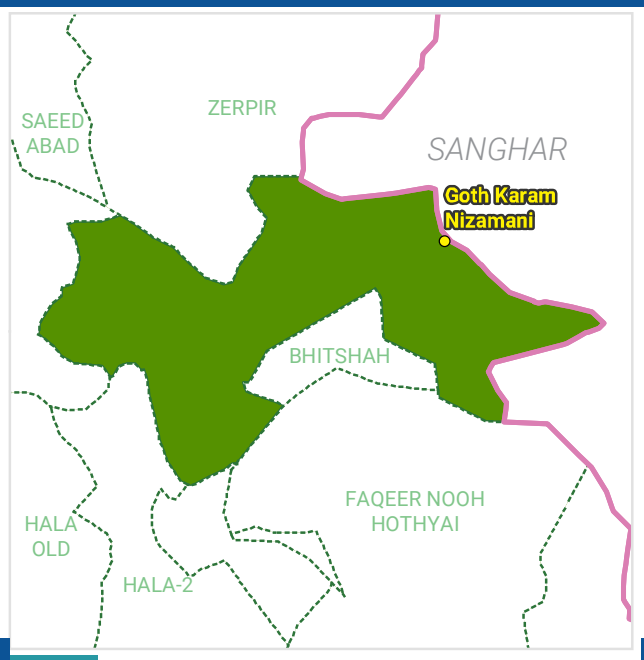
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

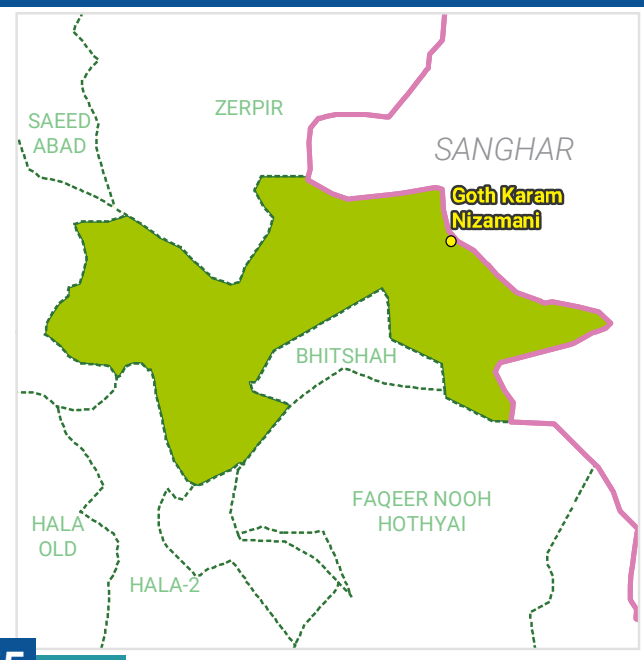
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

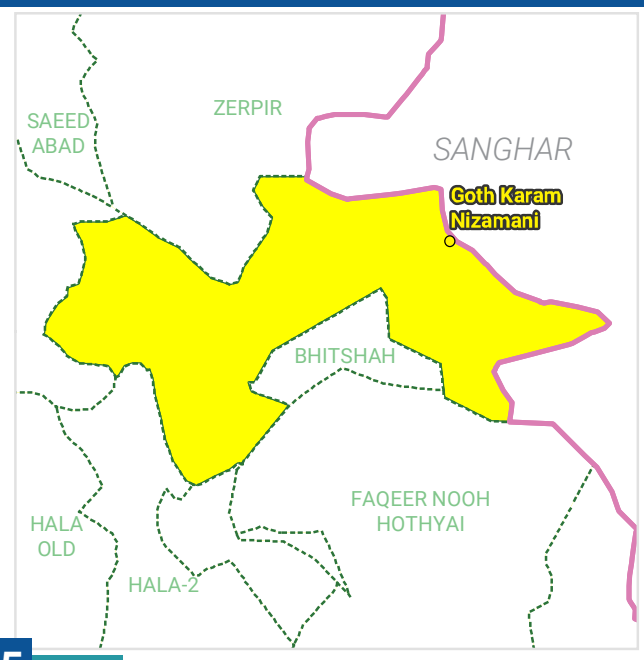
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

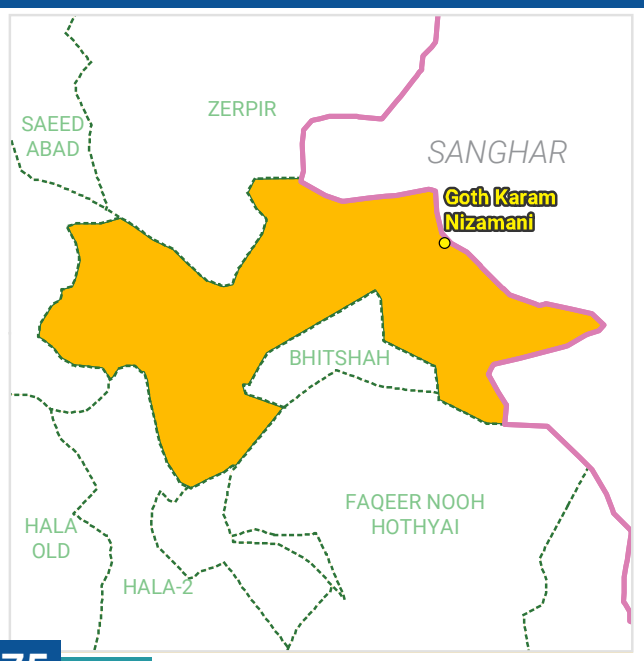


475 YEARS



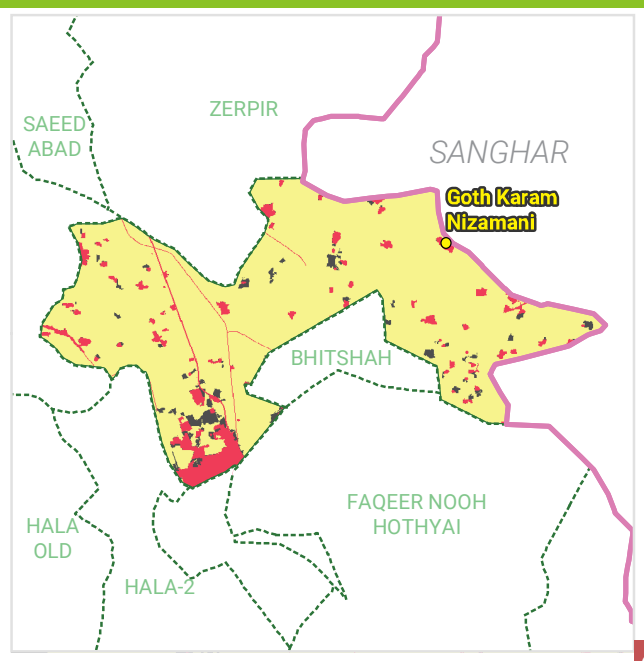
975 YEARS

HAZARD

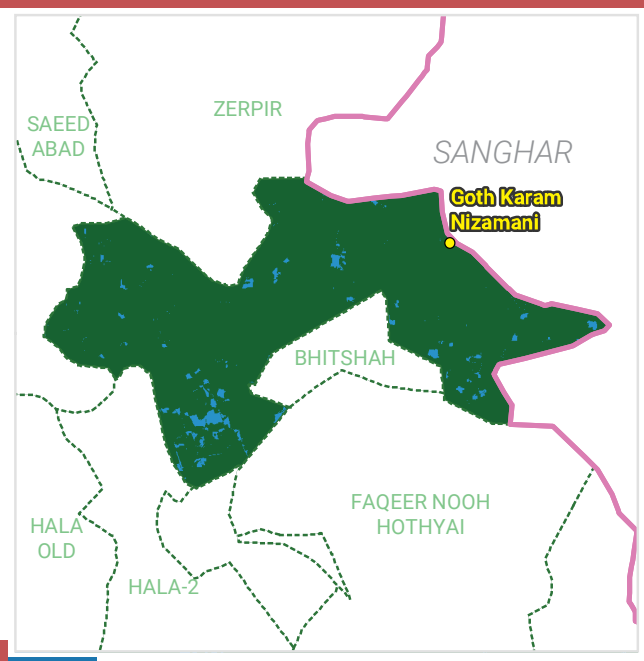


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

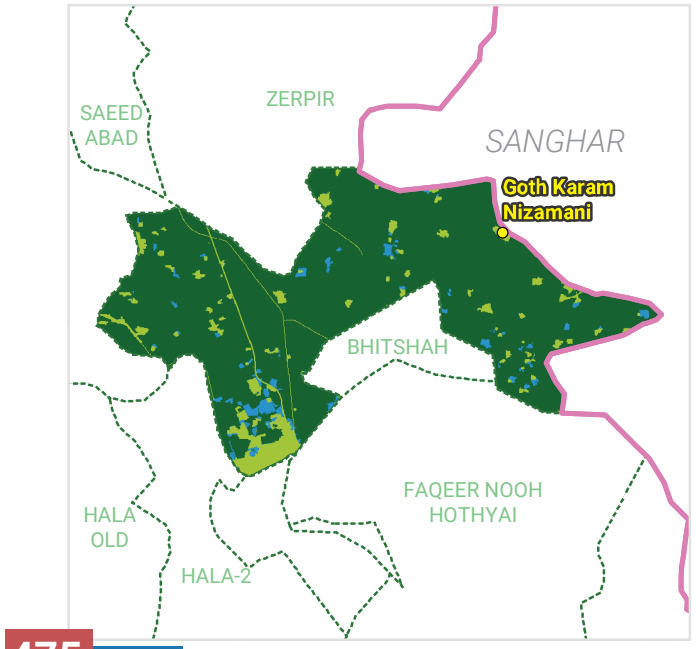
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

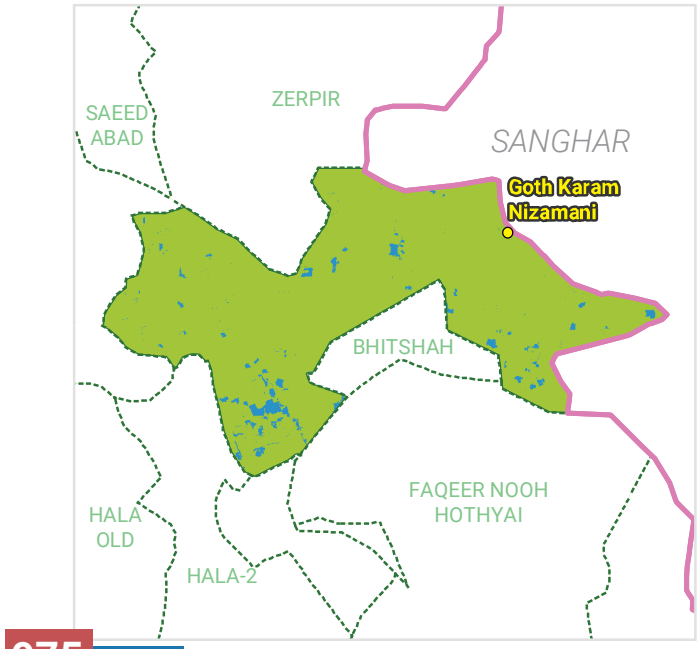
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

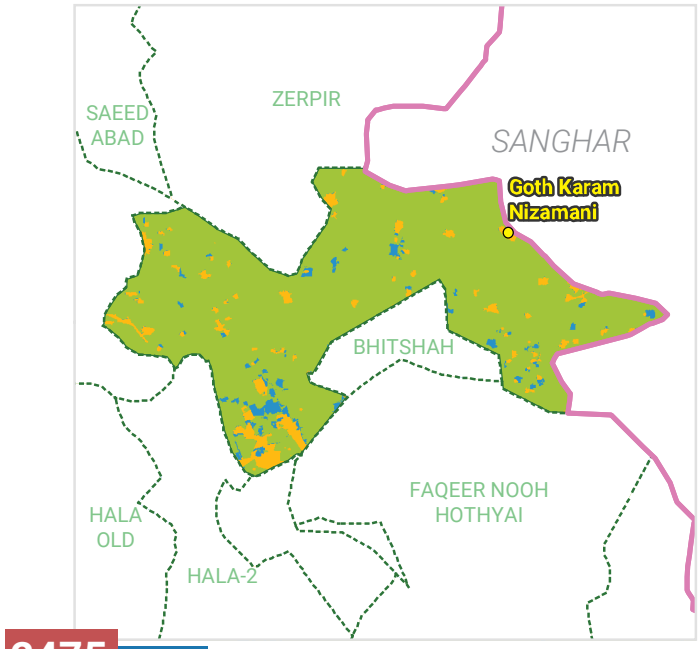
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
75	16791	96051	71.46	0.04	0.03	0	0.79
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
4.23	0.00	168.99	0	16.60	1	3	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
82	0	0	1	14	3	14	11
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		
1	2	0	0	1	0		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low / Medium / High	●	Low / Medium / High / Extreme	Low / Medium / High / Extreme	Medium / High / Extreme	Medium / High / Extreme	●
METEOROLOGICAL DROUGHT	Low / Medium	Low / Medium / High	Medium / High / Extreme	Medium / High / Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	Low	Low	●	●	●
HEATWAVE	Low / Medium	Low / Medium	Low / Medium / High	Low / Medium / High	Low / Medium / High / Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low / Medium	Medium	Medium / High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

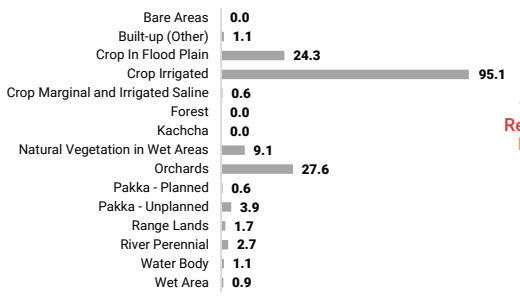
Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - MATIARI

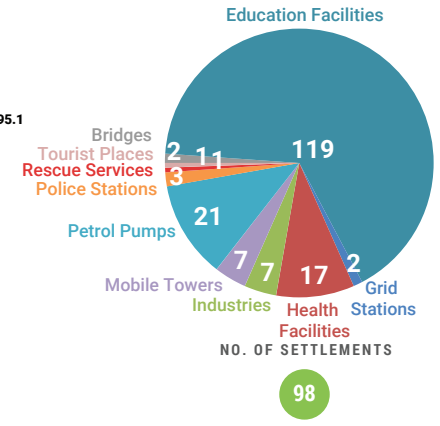
Union Council area in sq. km	168
Surrounding UCs / Features	**SEKHAT** in North East **BAU KHAN PATHAN** in East **TAJPUR** in South East **JAMSHORO DISTRICT** in West **HYDERABAD DISTRICT** in South
Population	2017 approx. **80,040**
No. of household	2017 approx. **15,559**

Land Use Land Cover

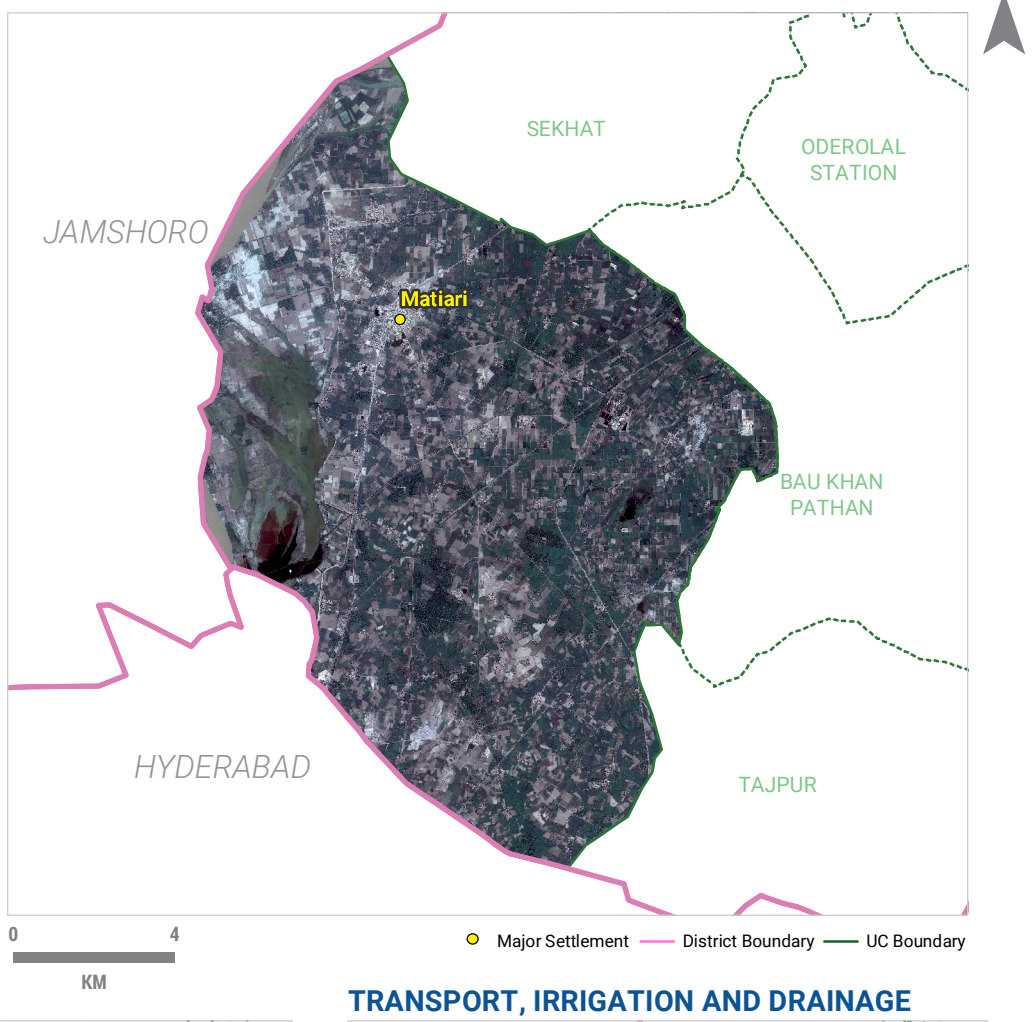
coverage area in sq.km



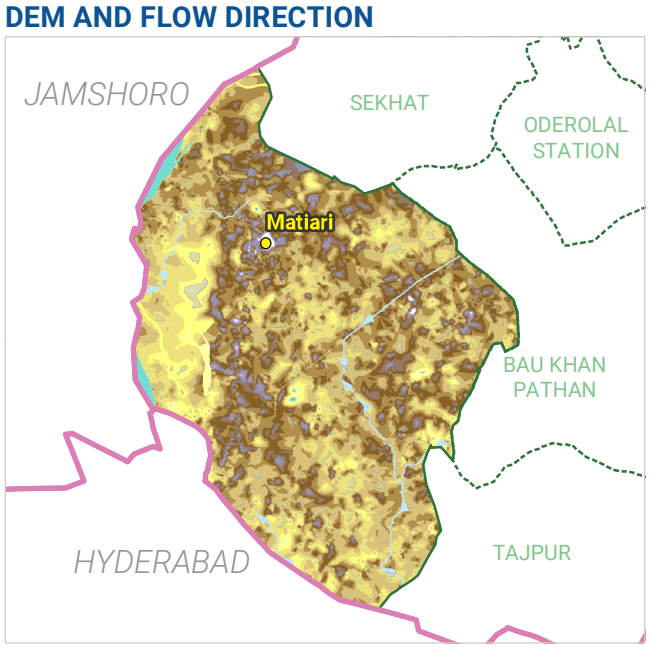
Critical Infrastructure



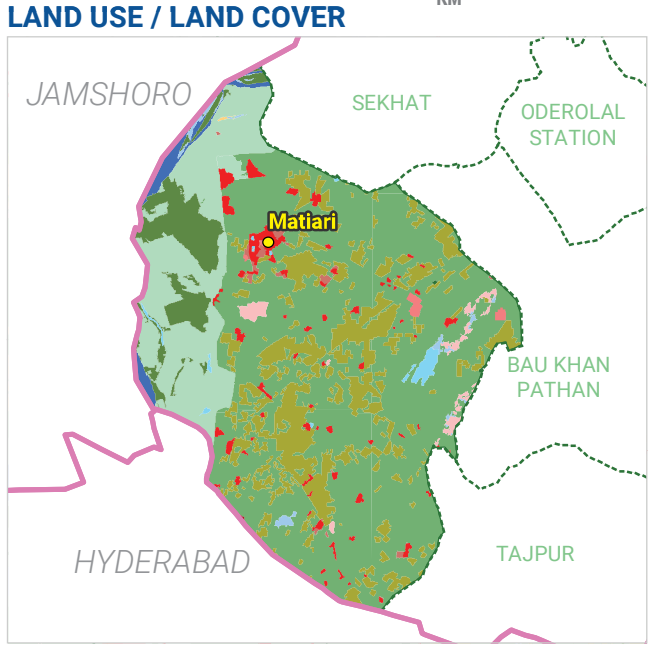
SATELLITE IMAGERY



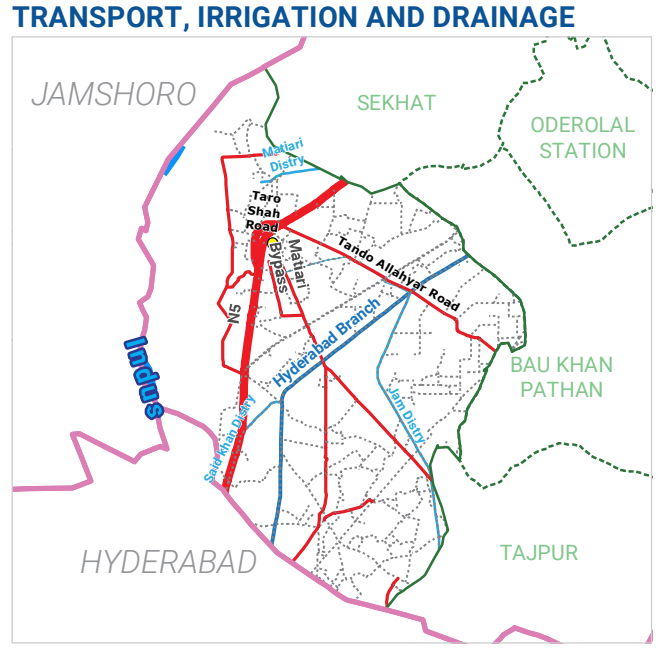
DEM AND FLOW DIRECTION



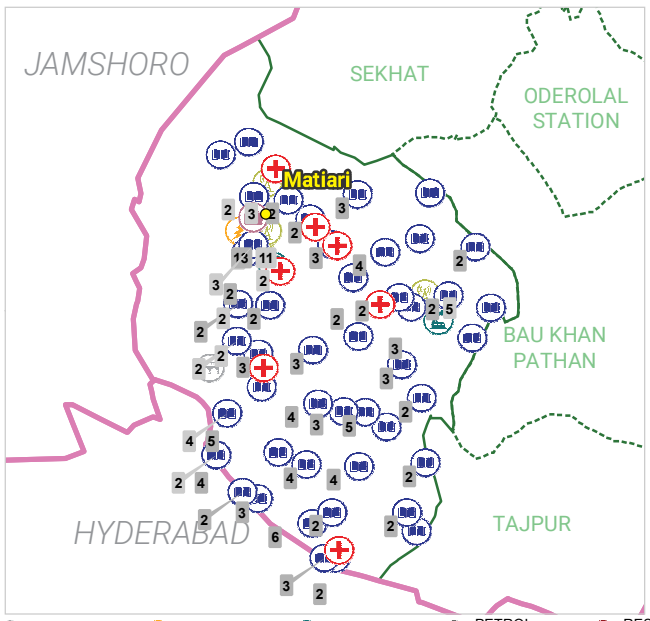
LAND USE / LAND COVER



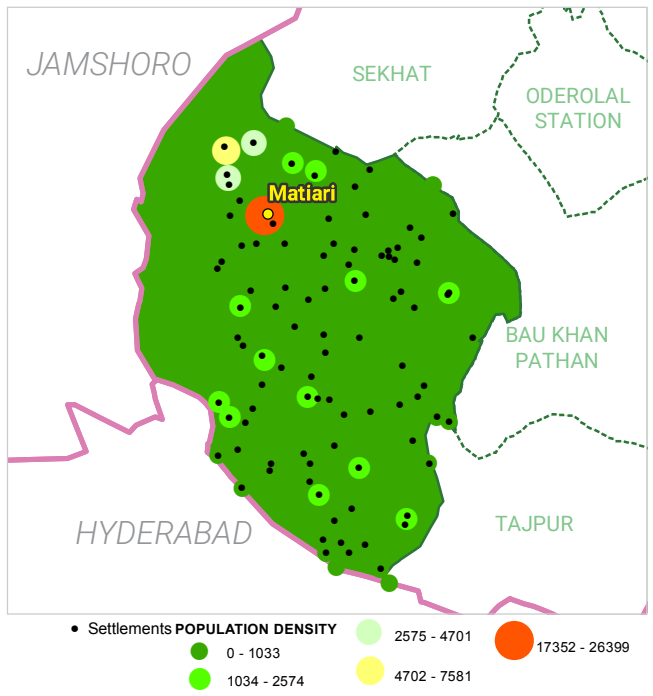
TRANSPORT, IRRIGATION AND DRAINAGE



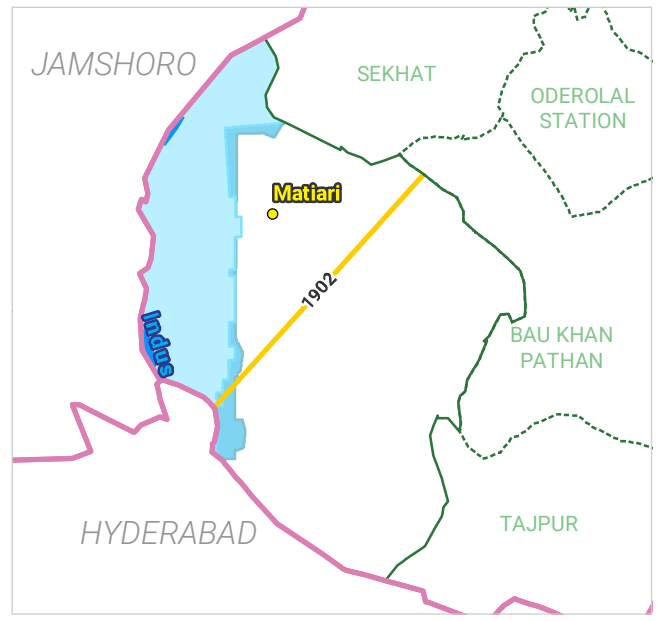
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

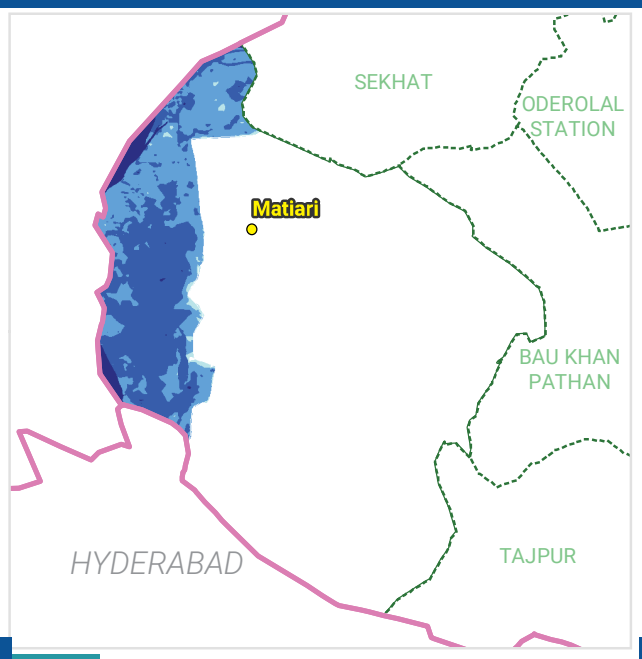


PAST HAZARDS

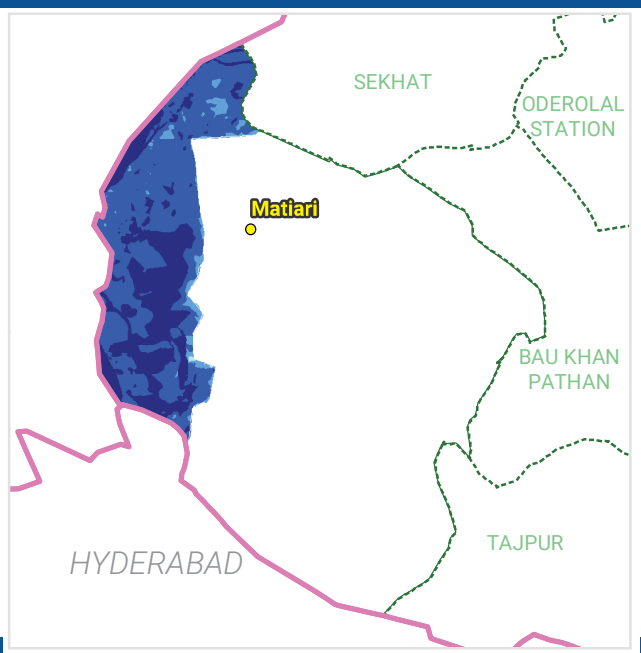


FLOOD

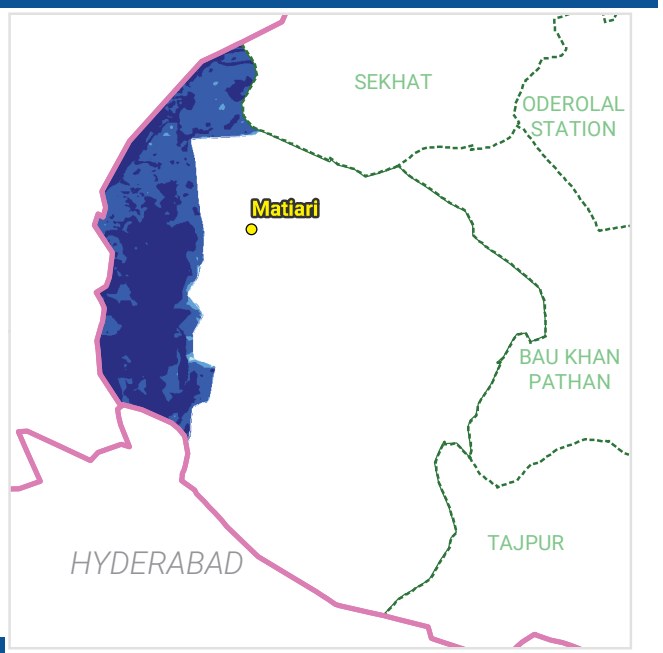
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

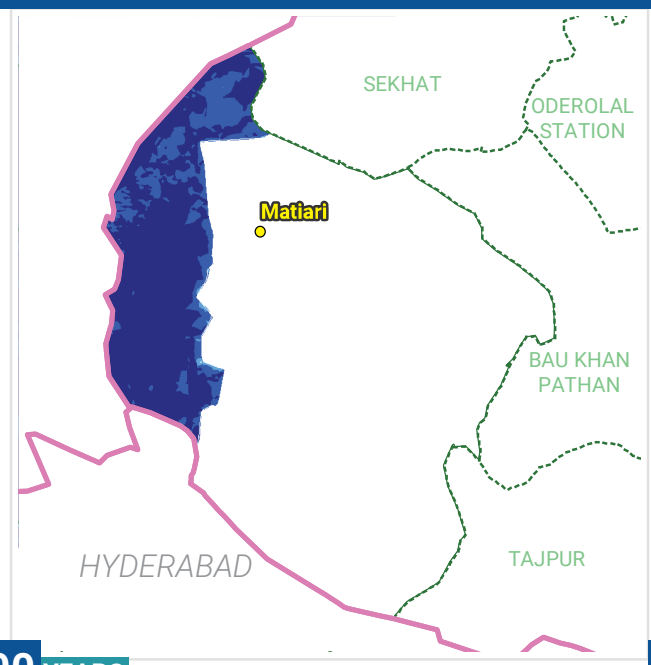


25 YEARS

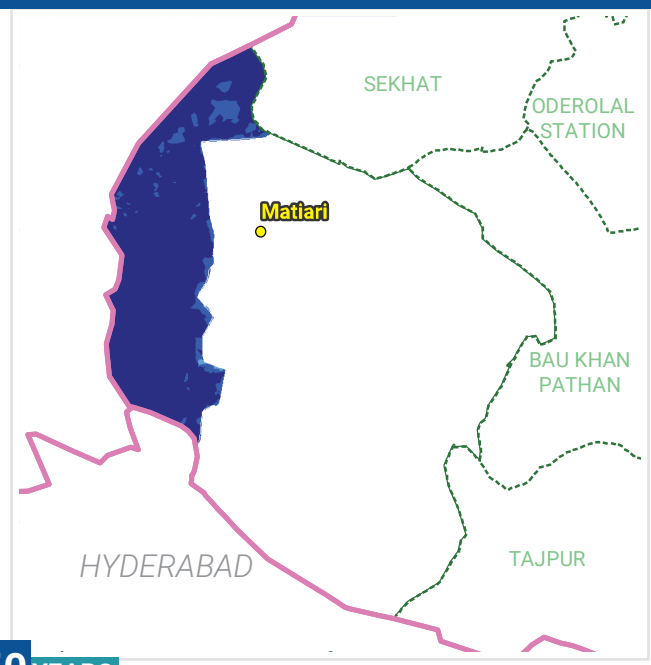


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

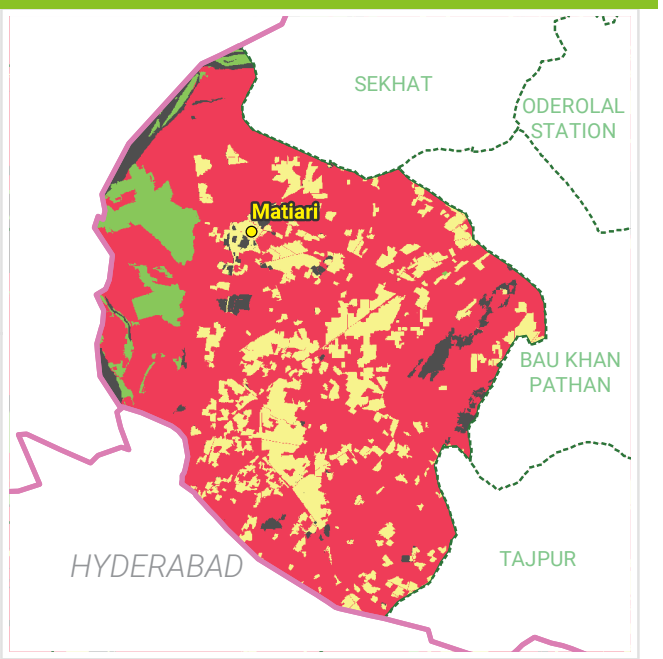


100 YEARS

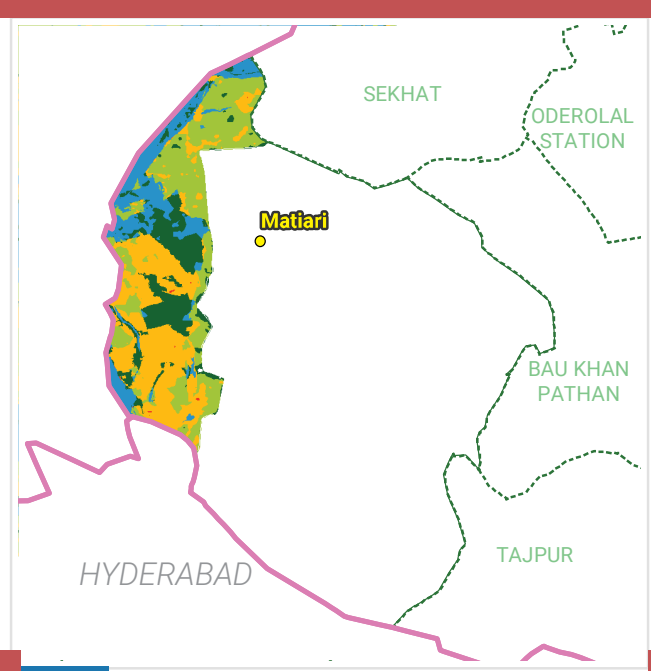


250 YEARS

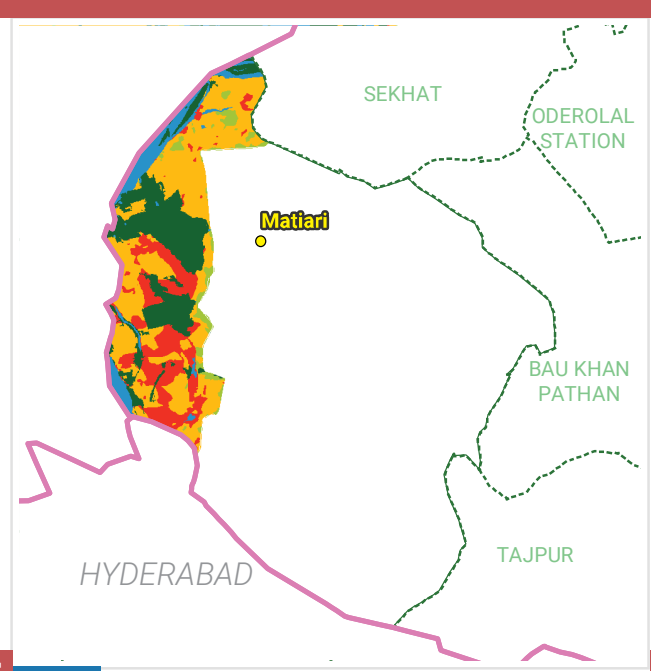
VULNERABILITY



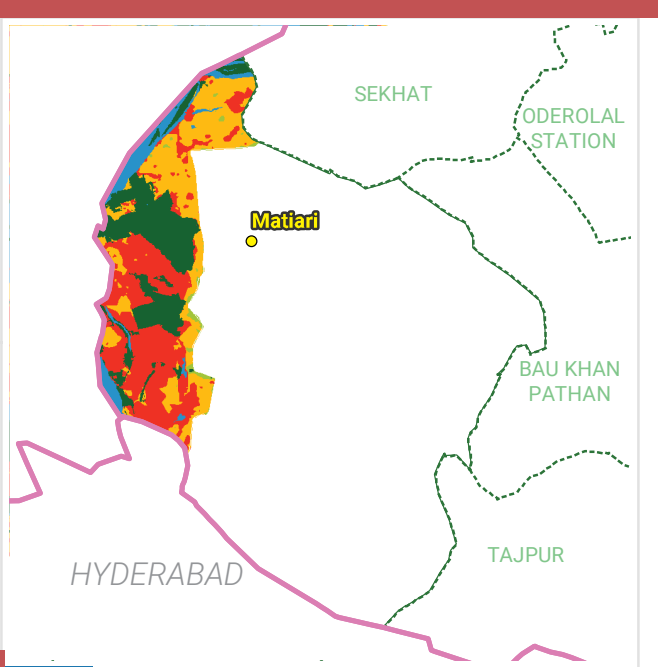
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

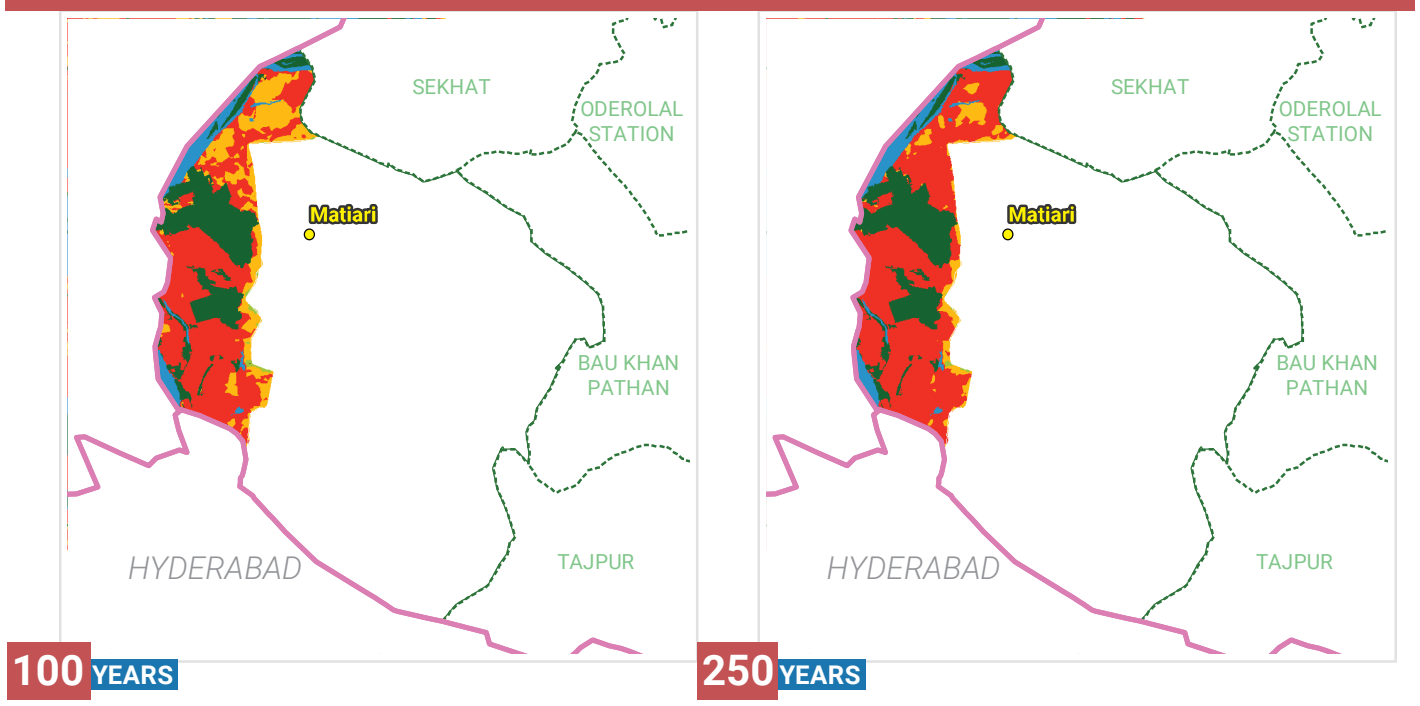
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



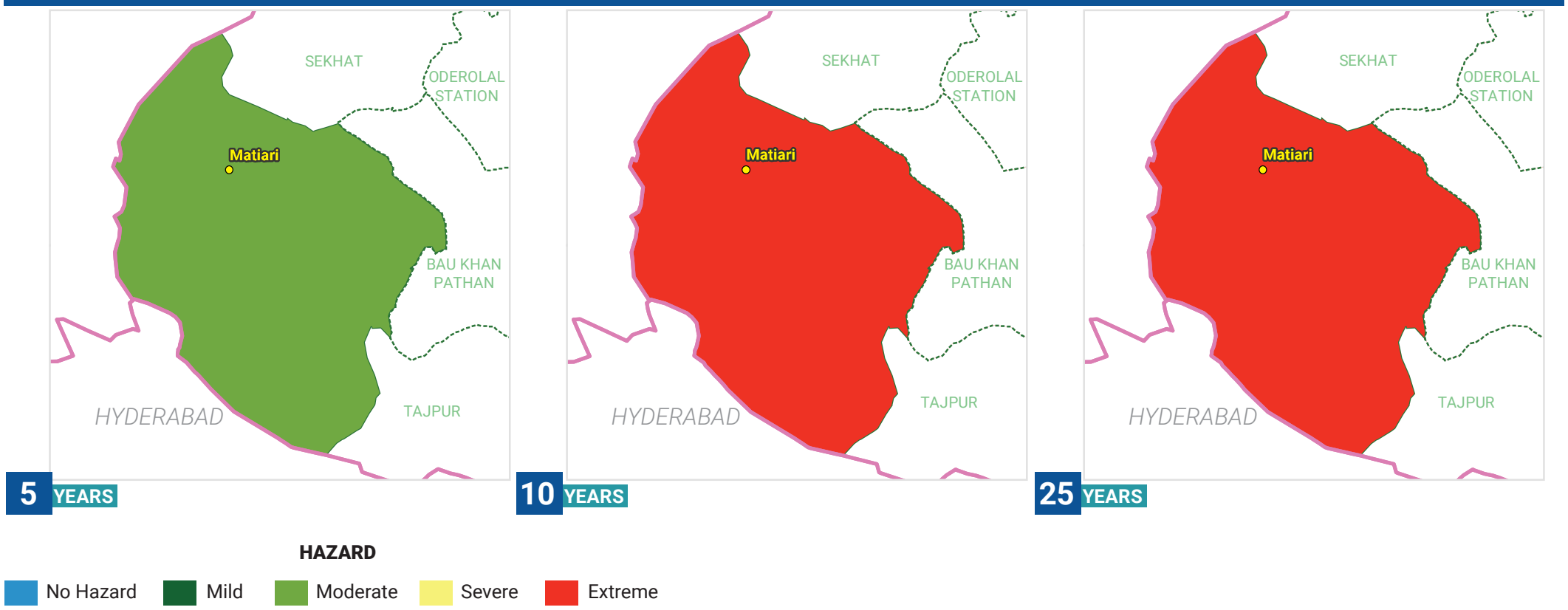
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

0	29	155	24.25	0	0	9.04	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.01	0	4.94	0	0	0	0	1
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

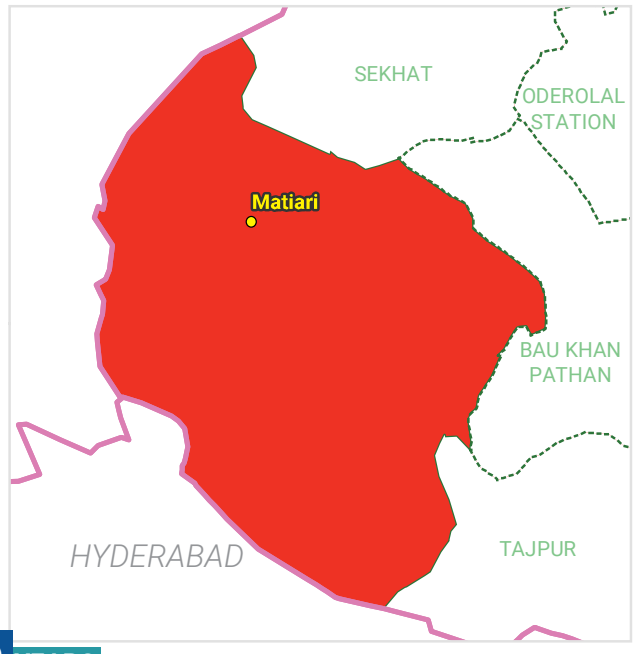
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



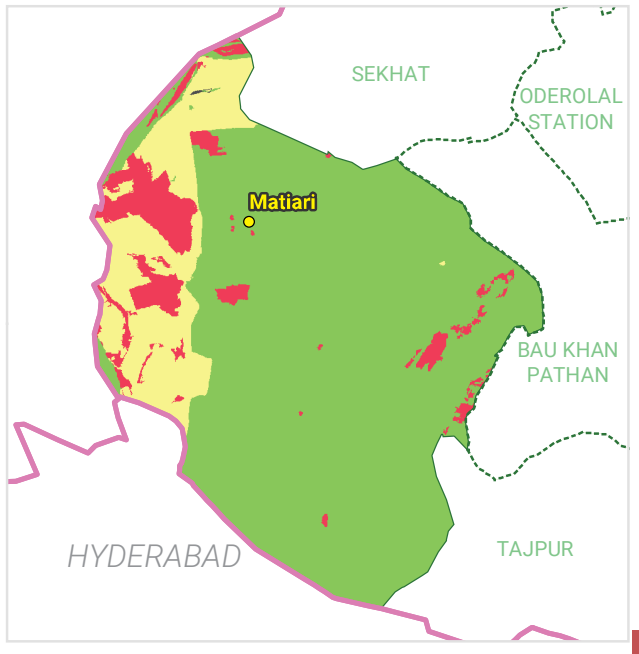
METEOROLOGICAL DROUGHT

HAZARD

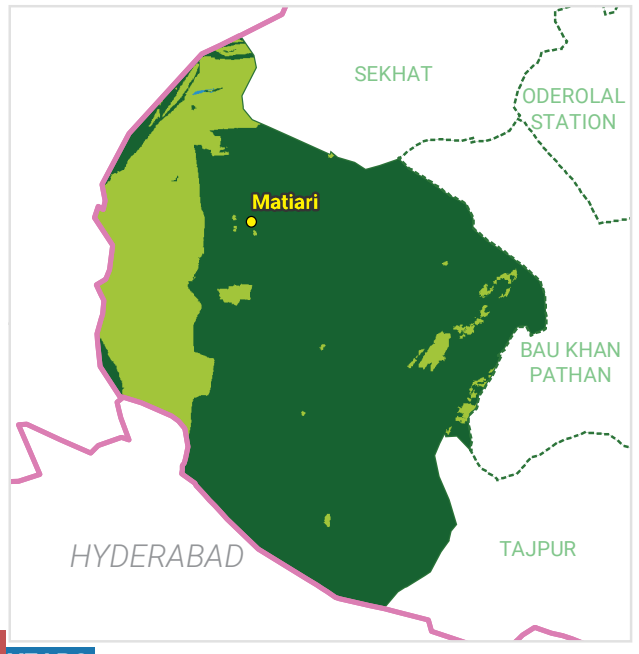


50 YEARS

VULNERABILITY

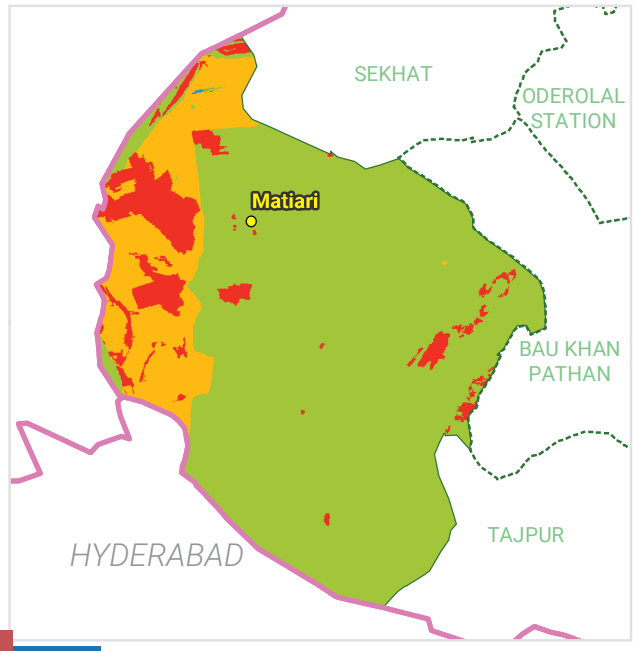


RISK

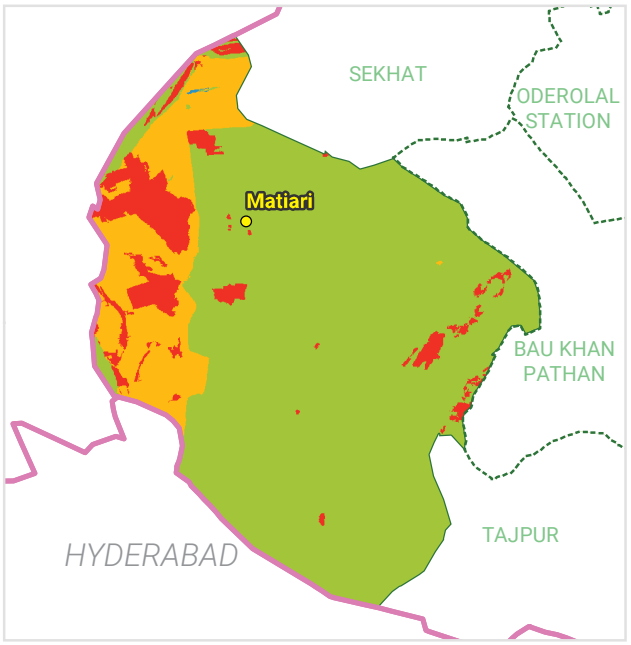


5 YEARS

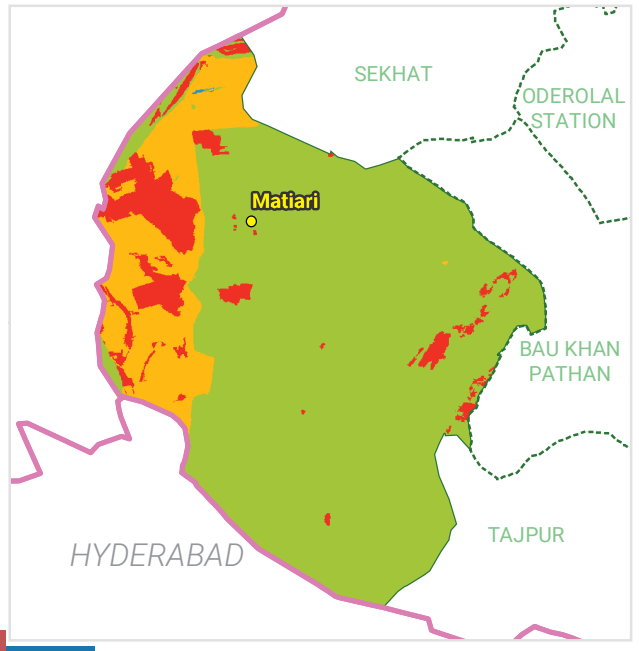
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

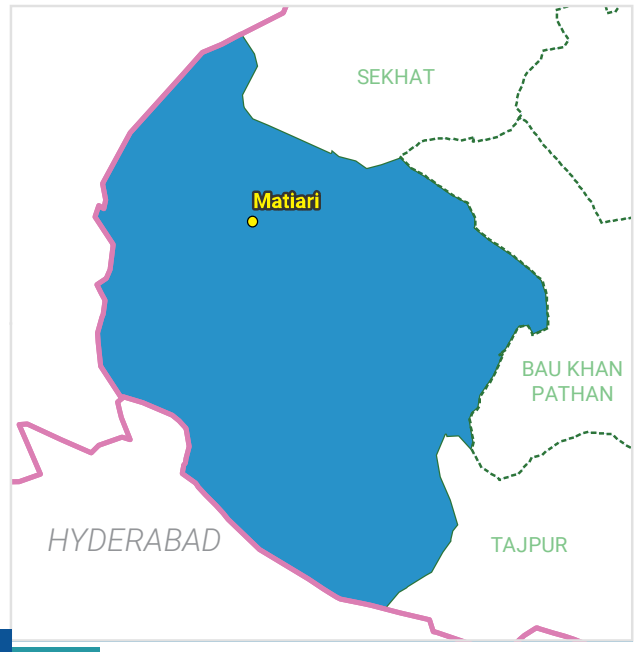
(BASED ON 50 YEARS RETURN PERIOD)

98	15559	80040	147.62	0	0.02	9.08	1.67
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

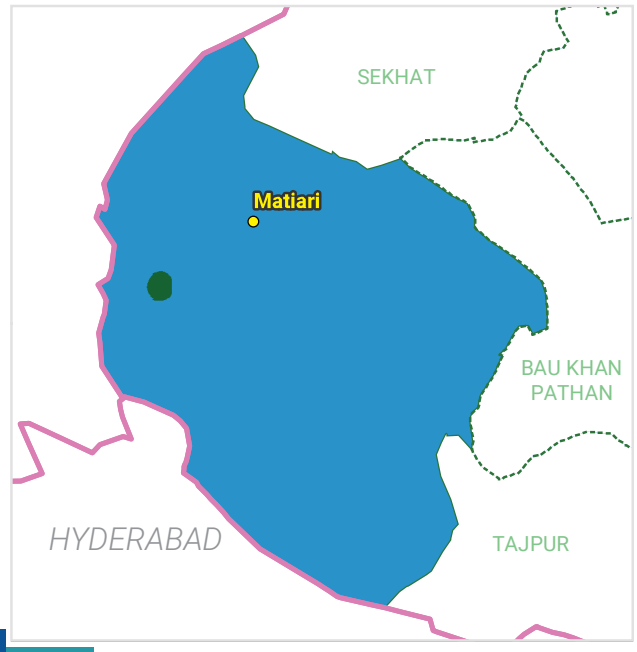
1.07	0.87
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

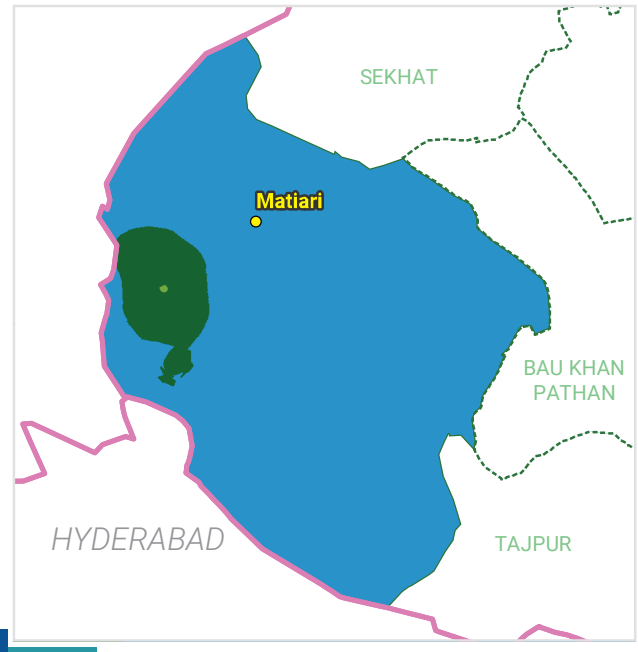
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

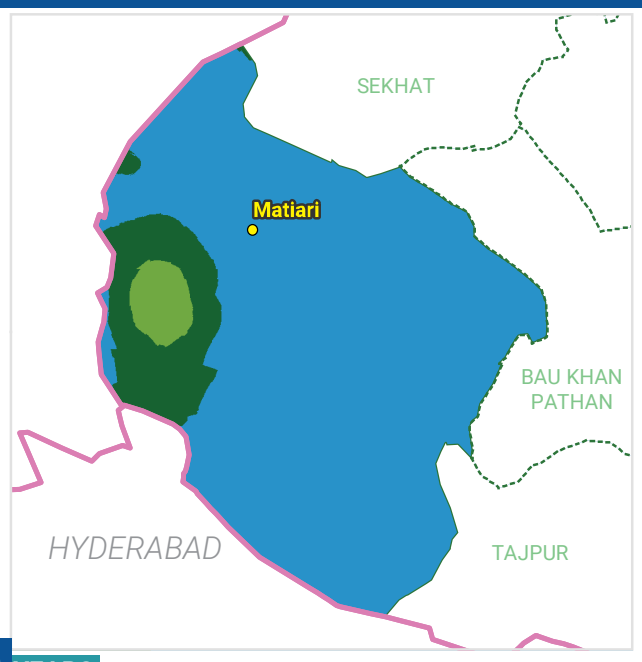


10 YEARS



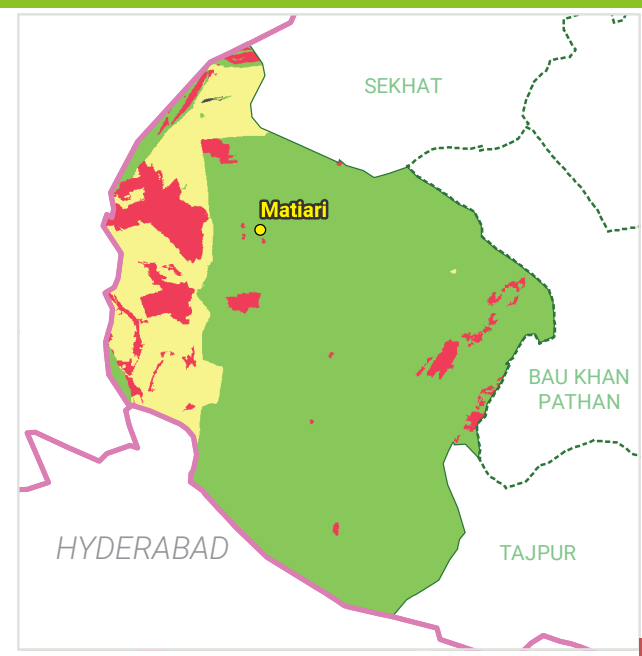
25 YEARS

HAZARD

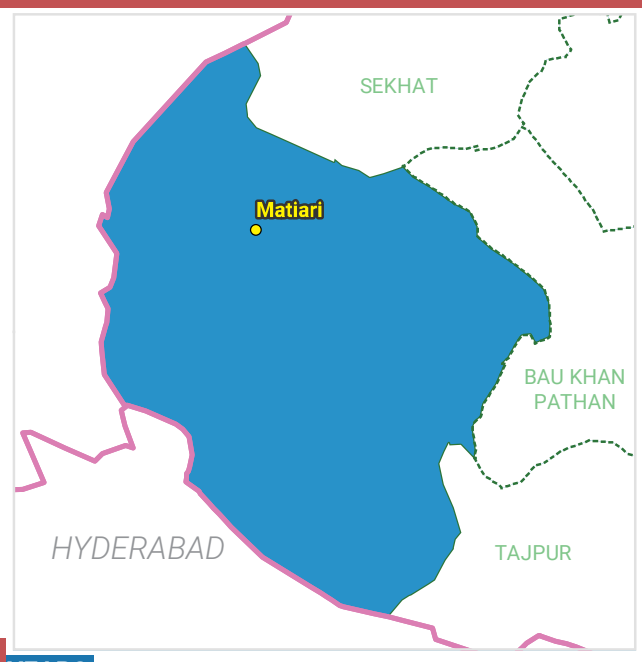


50 YEARS

VULNERABILITY

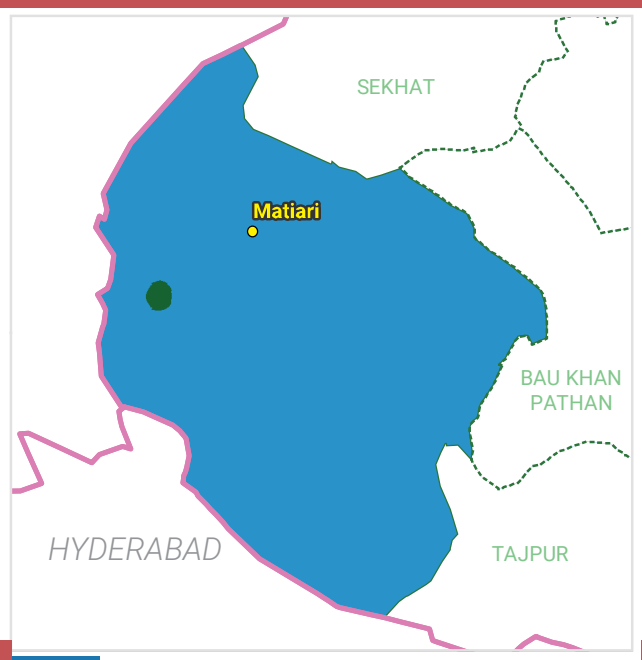


RISK

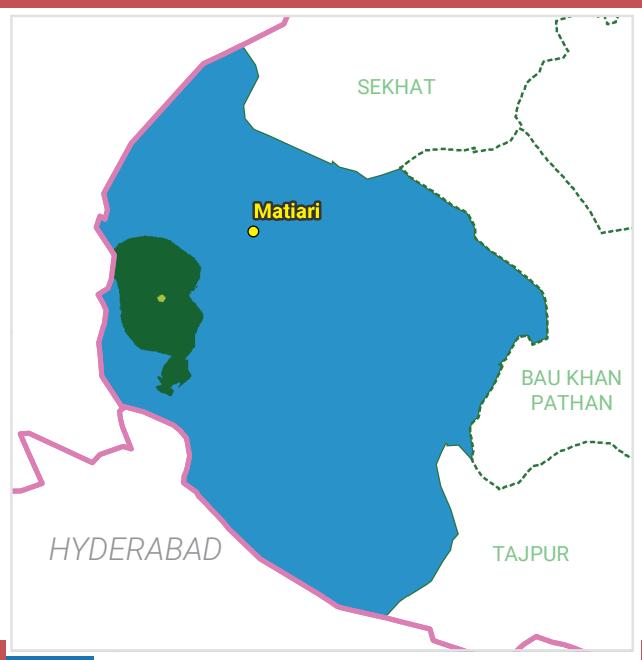


5 YEARS

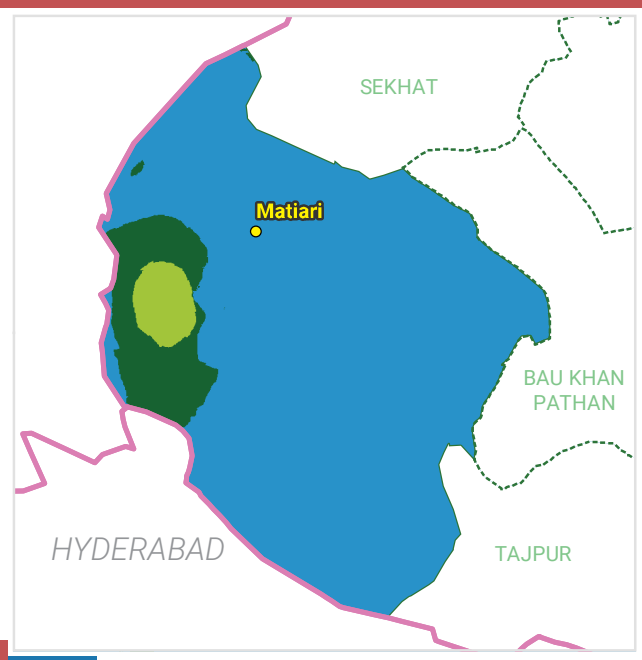
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

ELEMENTS AT RISK

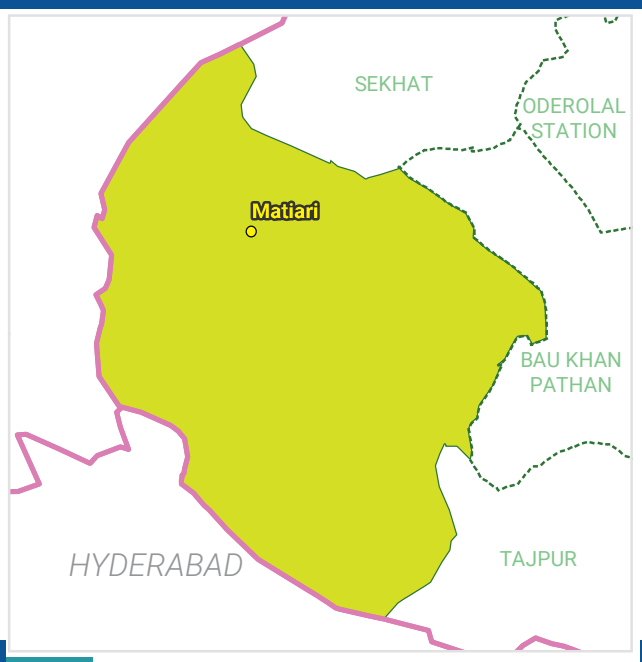
(BASED ON 50 YEARS RETURN PERIOD)

1	64	328	17.52	0	0	5.84	0.00
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

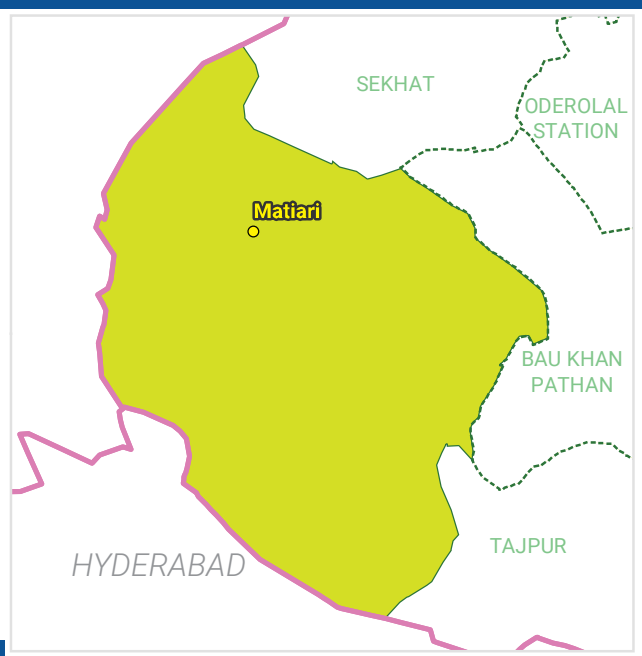
0.26	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

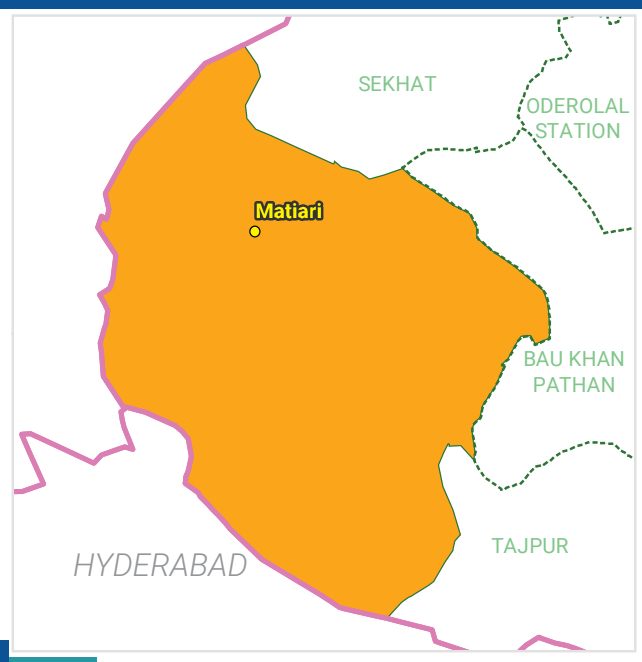
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

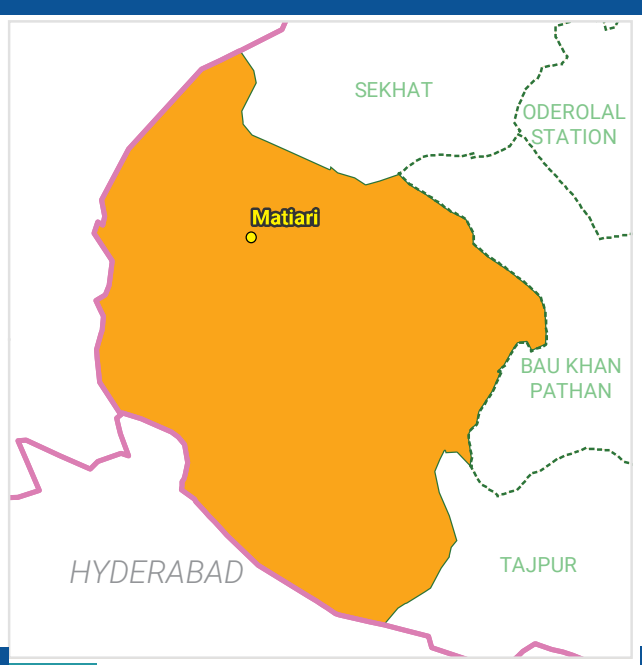


10 YEARS

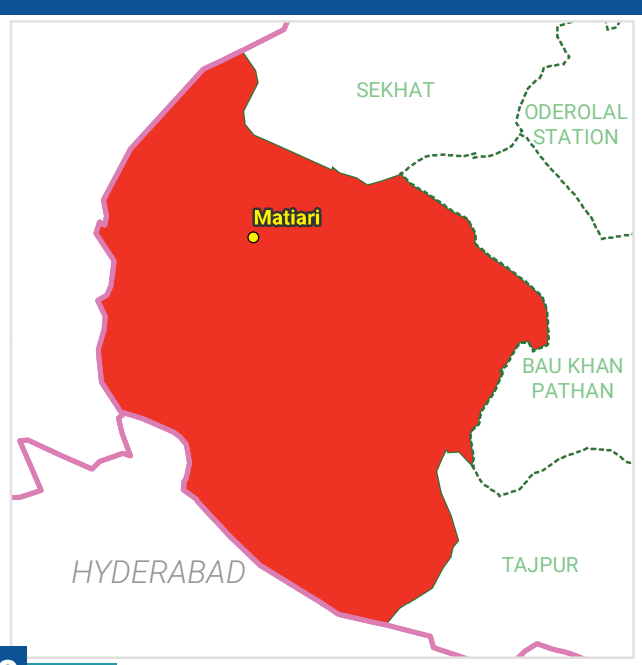


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

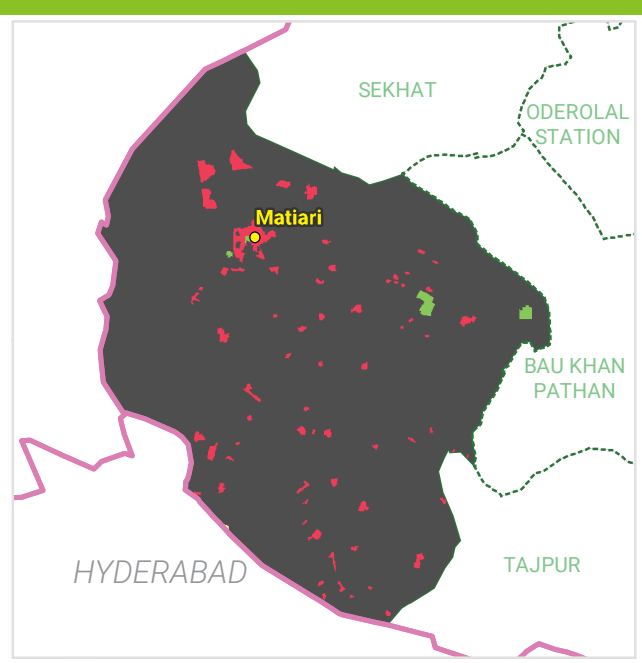


50 YEARS



100 YEARS

VULNERABILITY



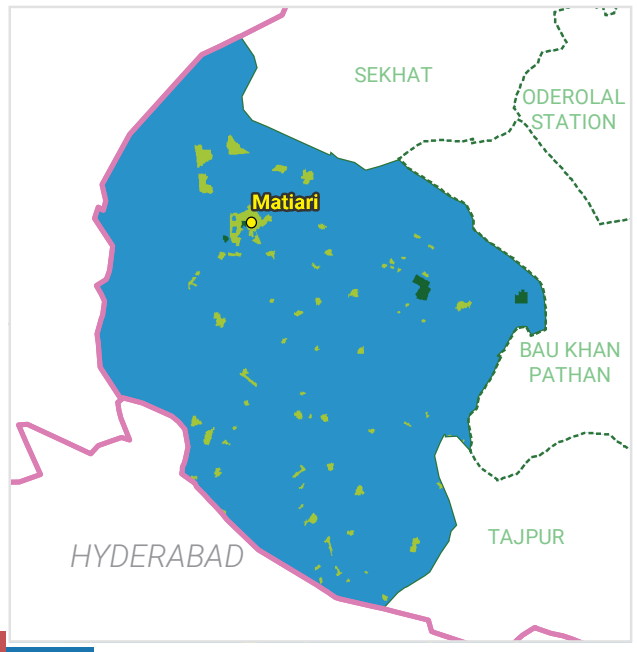
HAZARD

Normal | Moderate | High | Severe | Extreme

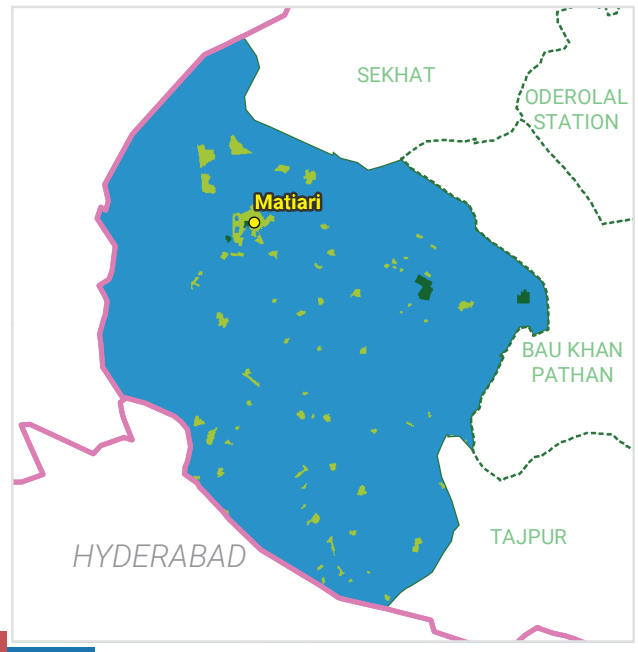
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

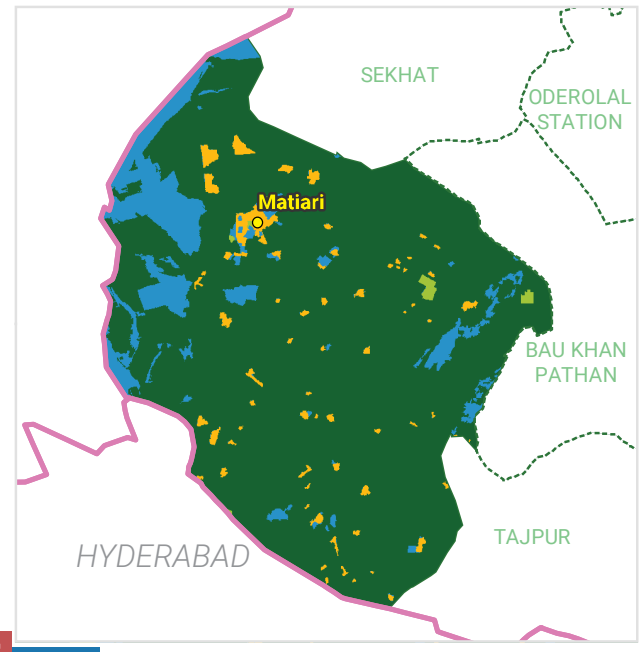
RISK AT DIFFERENT RETURN PERIODS



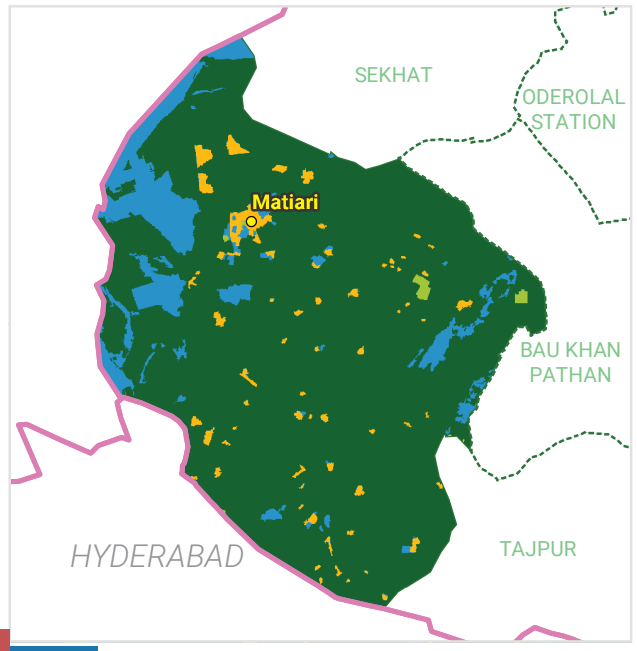
5 YEARS



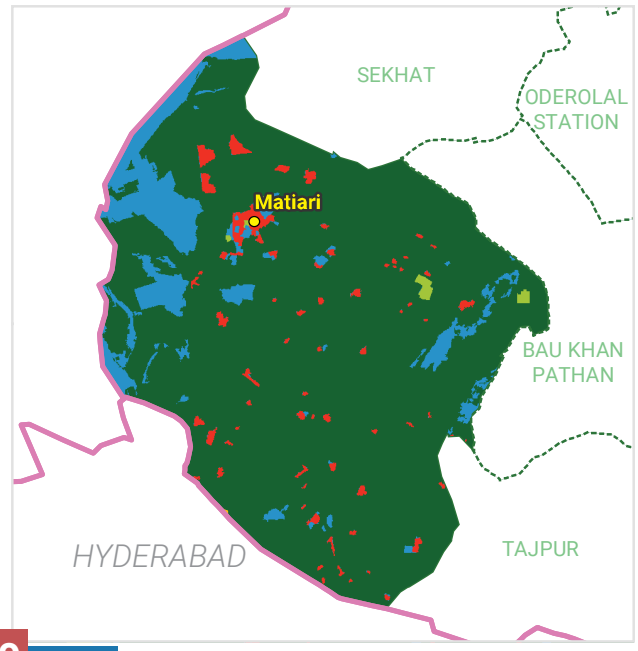
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

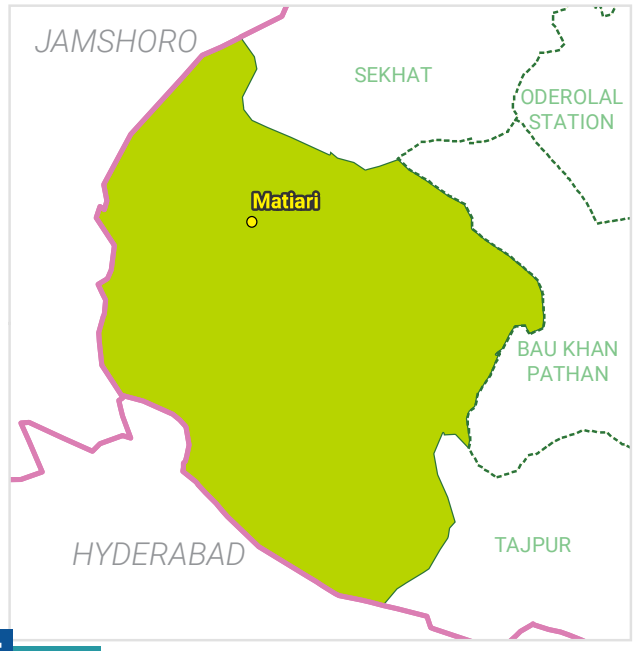
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

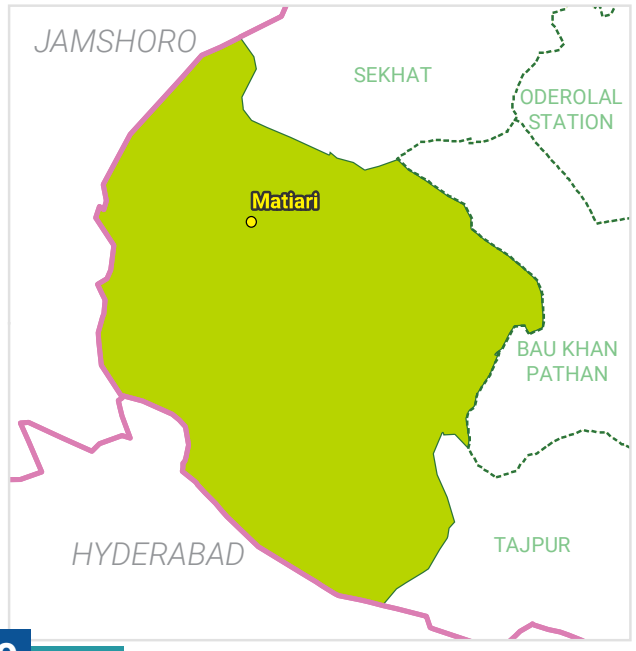
97	15444	79454	147.22	0.03	0.59	3.85
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

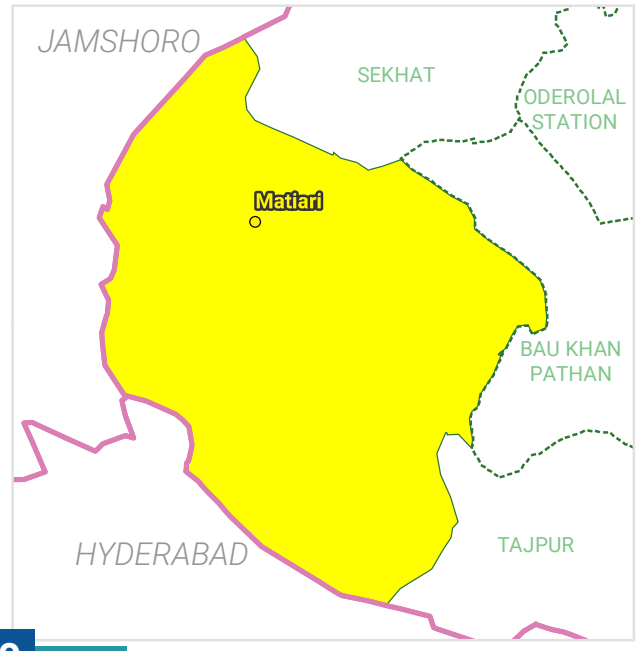
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

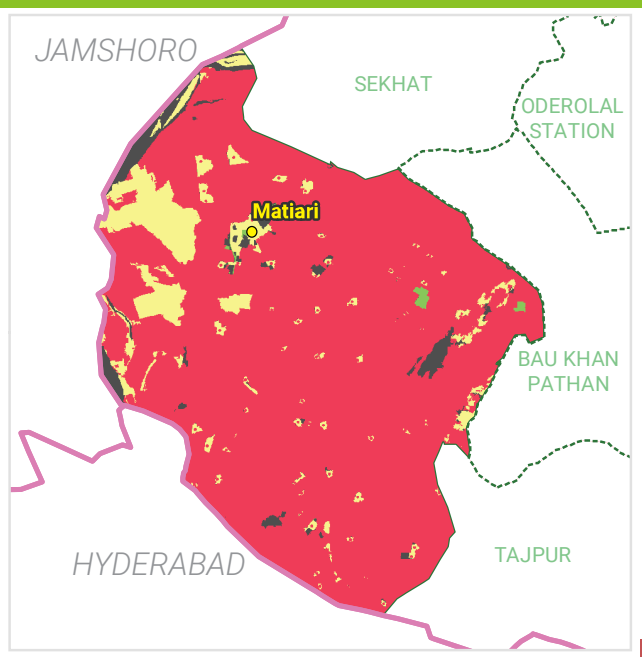


100 YEARS

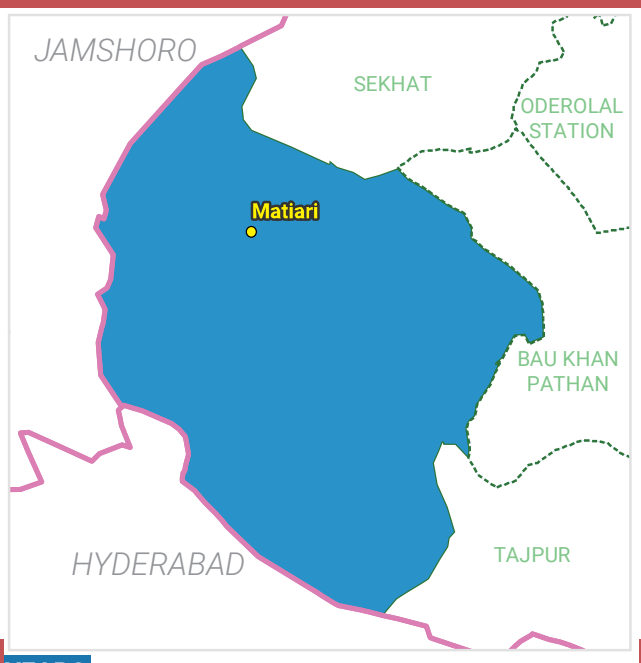


500 YEARS

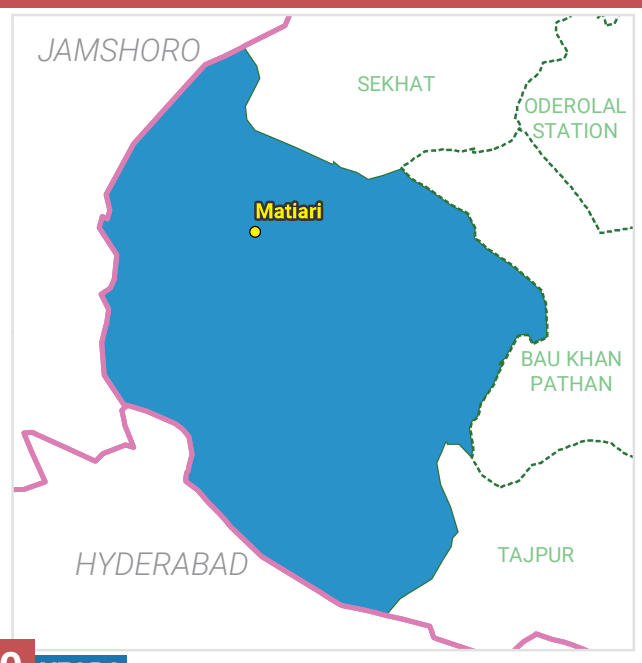
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

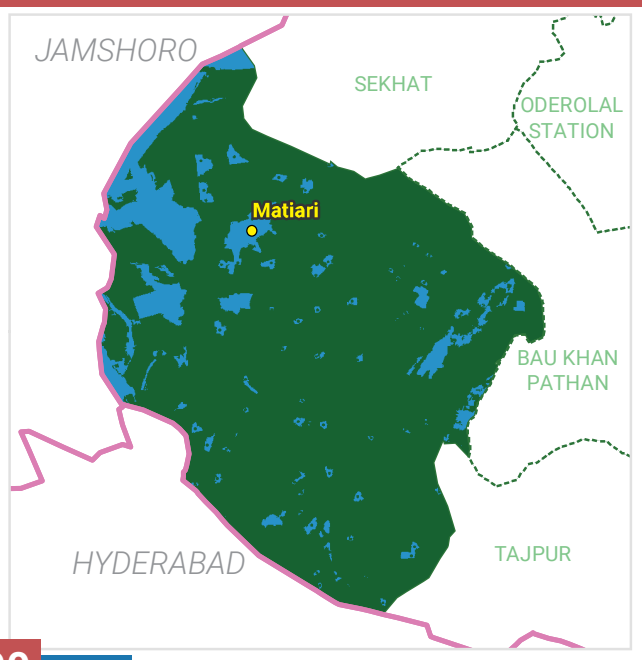


25 YEARS



100 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

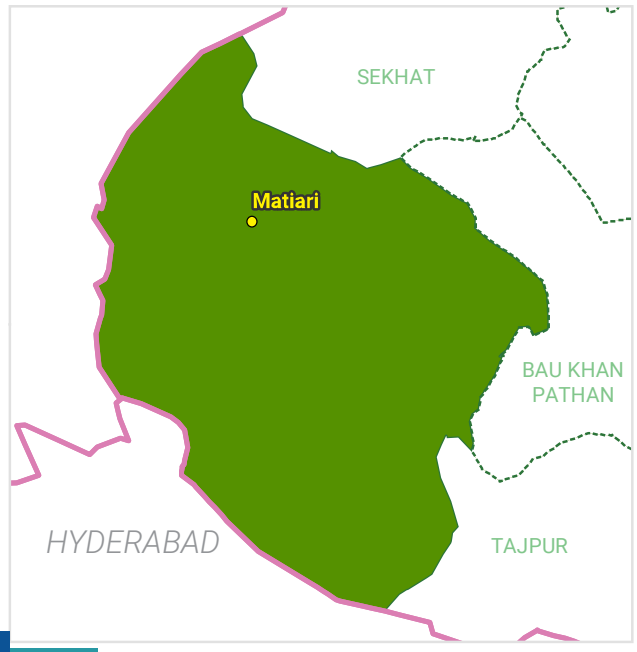
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

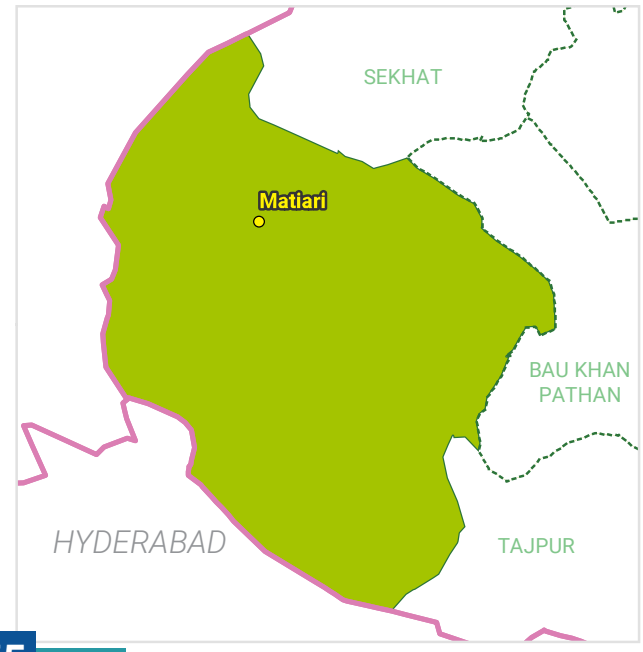
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

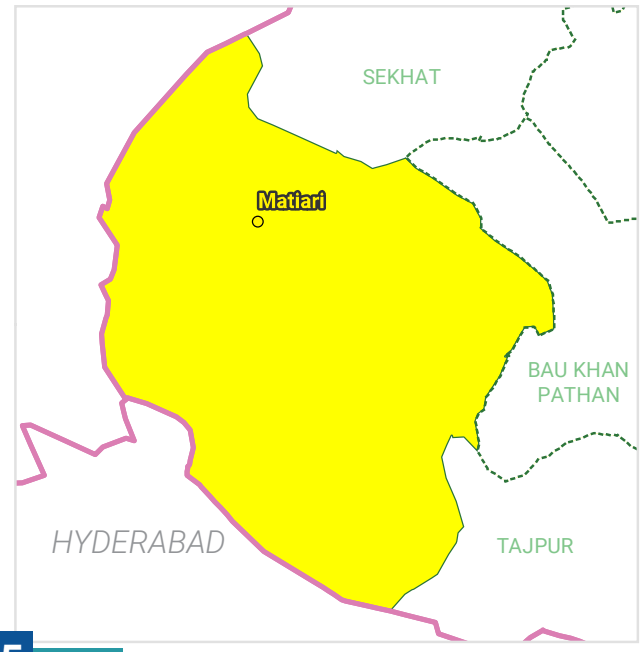
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

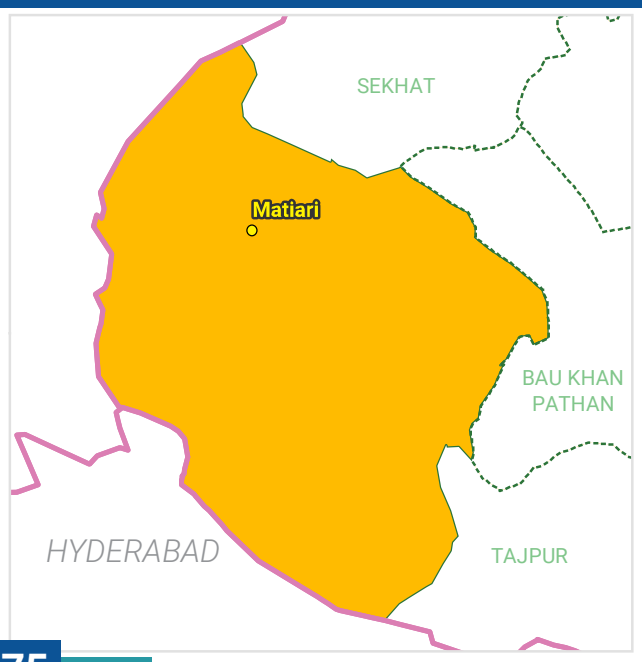


475 YEARS



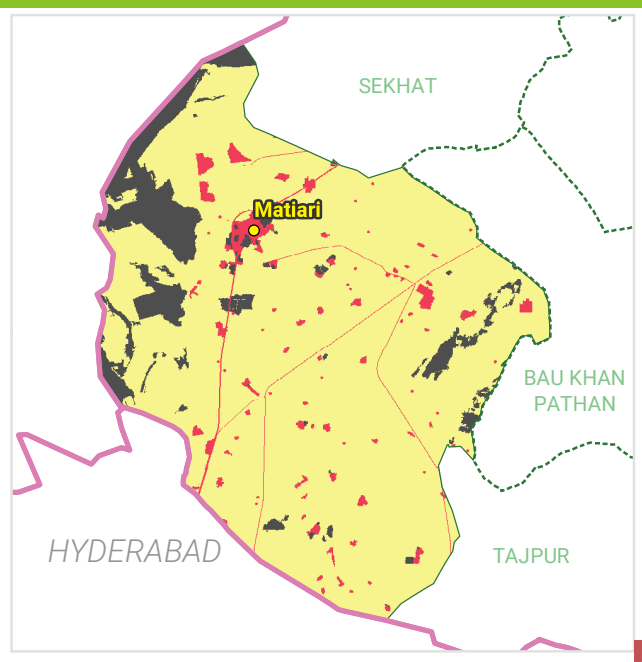
975 YEARS

HAZARD

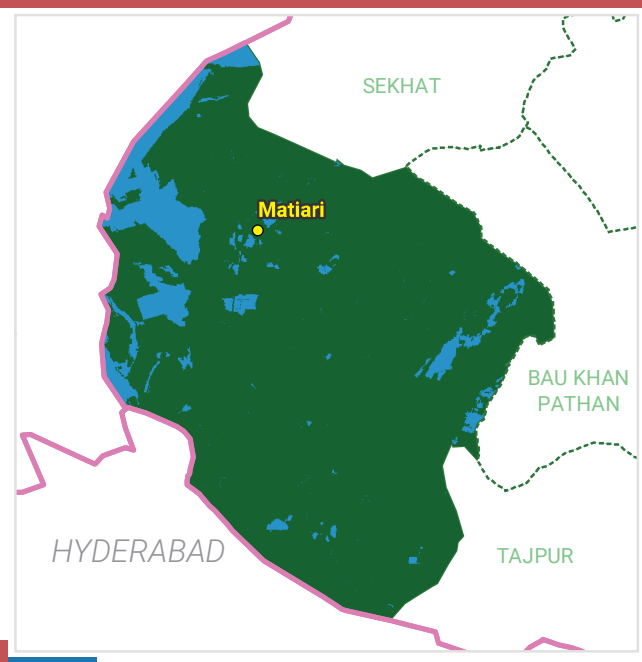


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

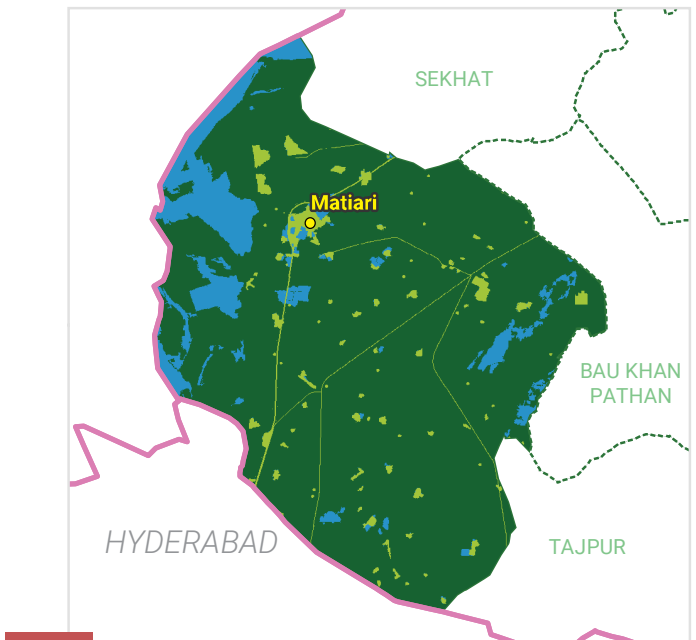
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

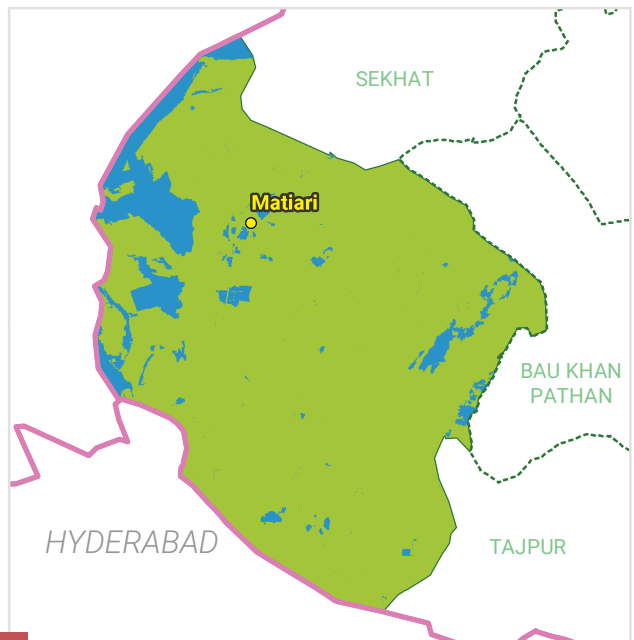
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

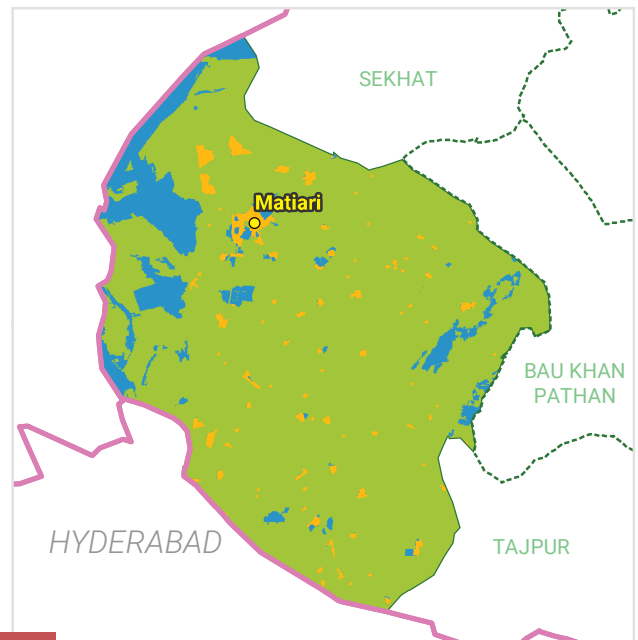
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

98	15416	79310	147.33	0.00	0.03	0.10	0.59
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
3.84	0.09	312.93	0	36.65	1	2	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
119	0	0	1	17	7	7	21
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
3	0	0	0	1	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low, Medium, High, Extreme	●	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	●
METEOROLOGICAL DROUGHT	Low, Medium	Medium, High, Extreme	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	None	Low	Low, Medium	Low, Medium	●	●	●
HEATWAVE	Low, Medium	Low, Medium	Low, Medium, High	Low, Medium, High	Low, Medium, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - ODEROLAL STATION

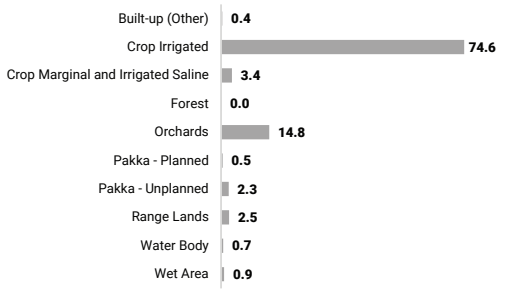
Union Council area in sq. km **100**

Surrounding UCs / Features
SEKHAT in North West
ODEROLAL VILLAGE in North
TANDO ALLAHYAR DISTRICT in South
BAU KHAN PATHAN in West

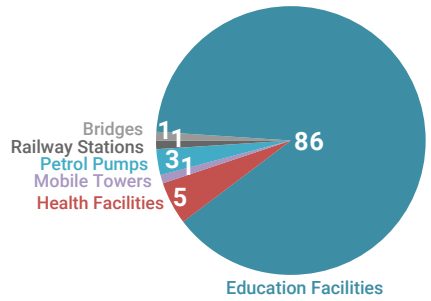
Population	2017 approx.	54,364
No. of household	2017 approx.	10,521

Land Use Land Cover

coverage area in sq.km



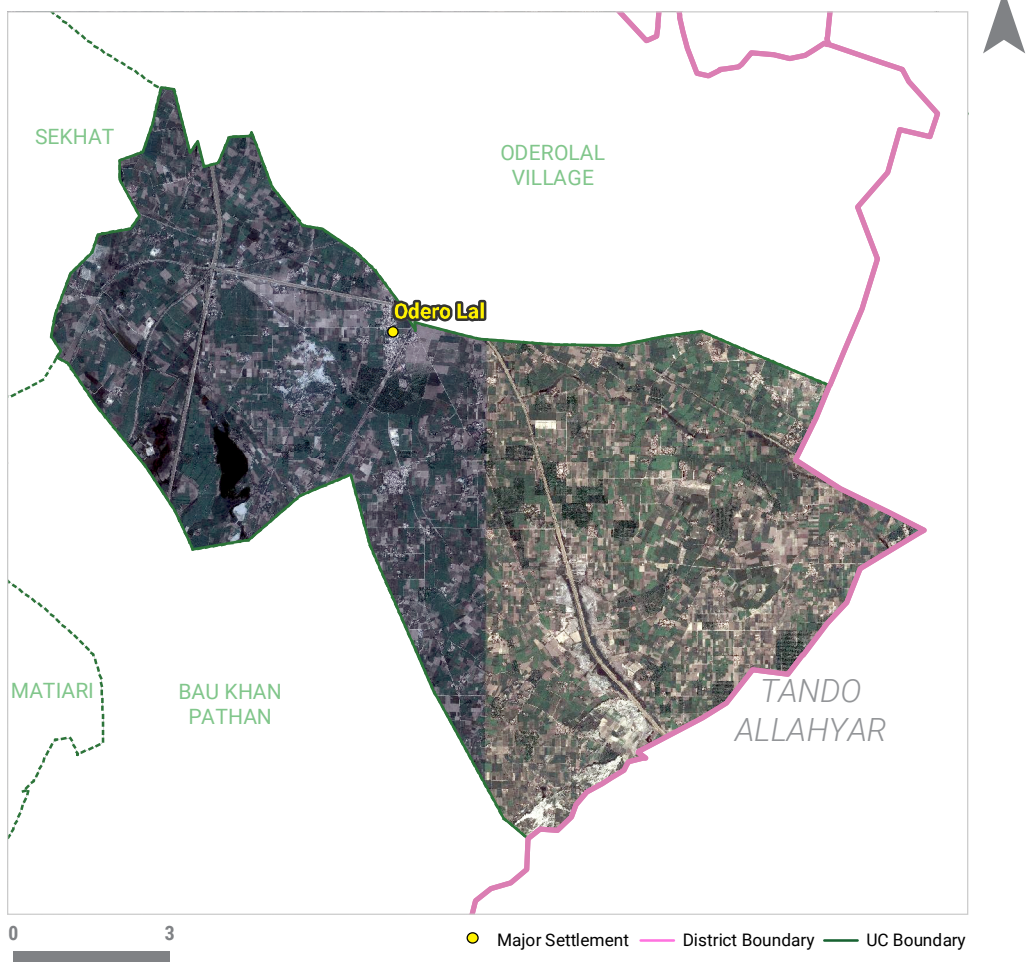
Critical Infrastructure



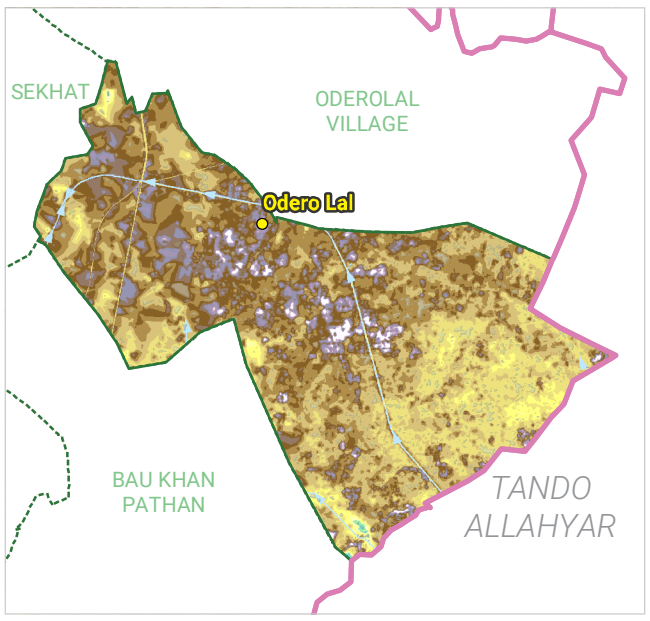
NO. OF SETTLEMENTS

111

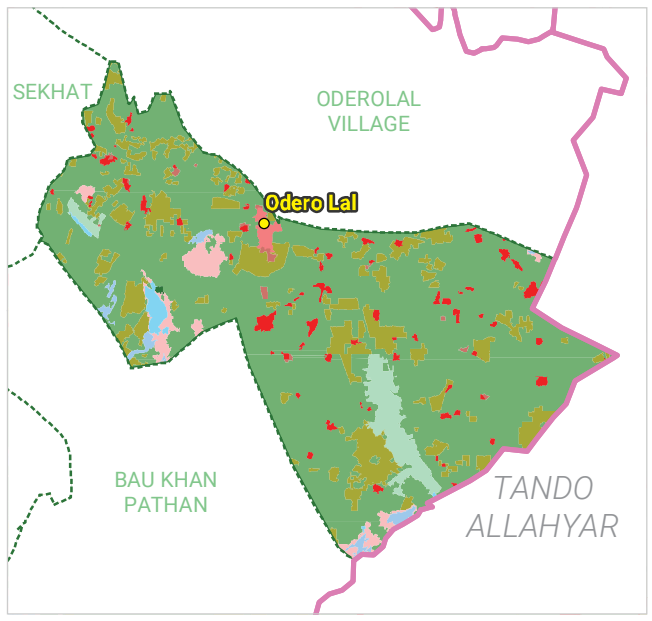
SATELLITE IMAGERY



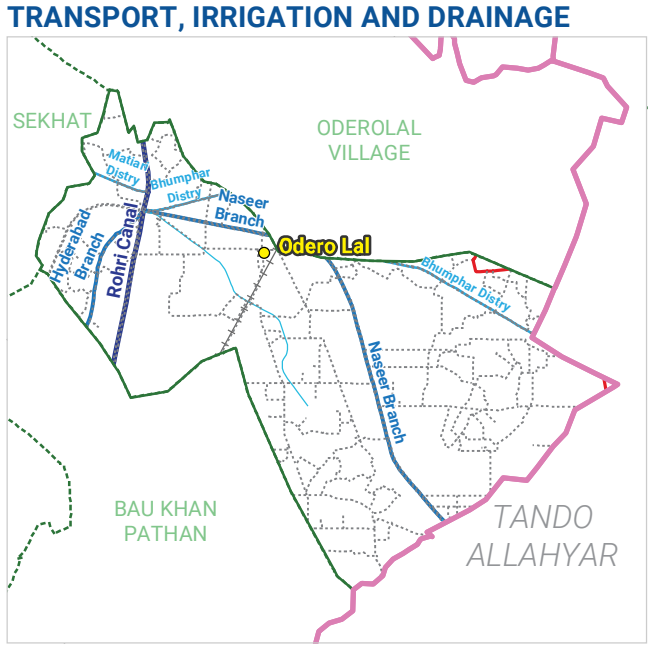
DEM AND FLOW DIRECTION



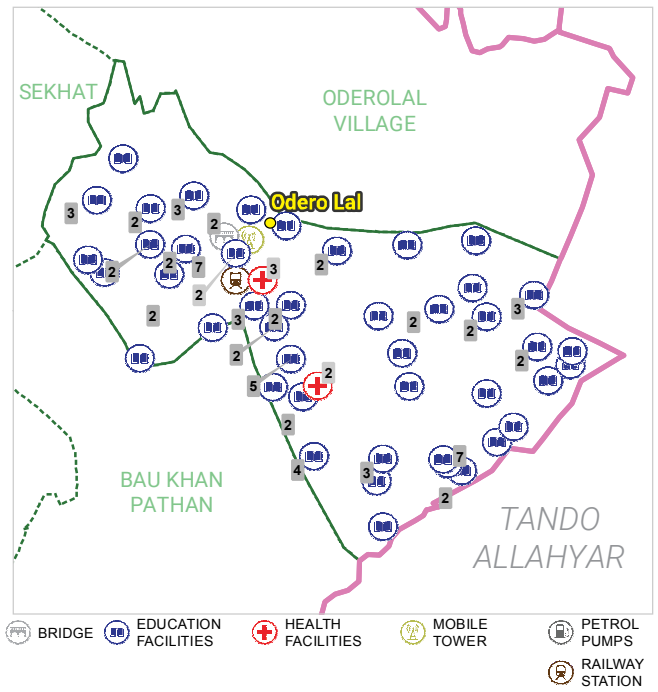
LAND USE / LAND COVER



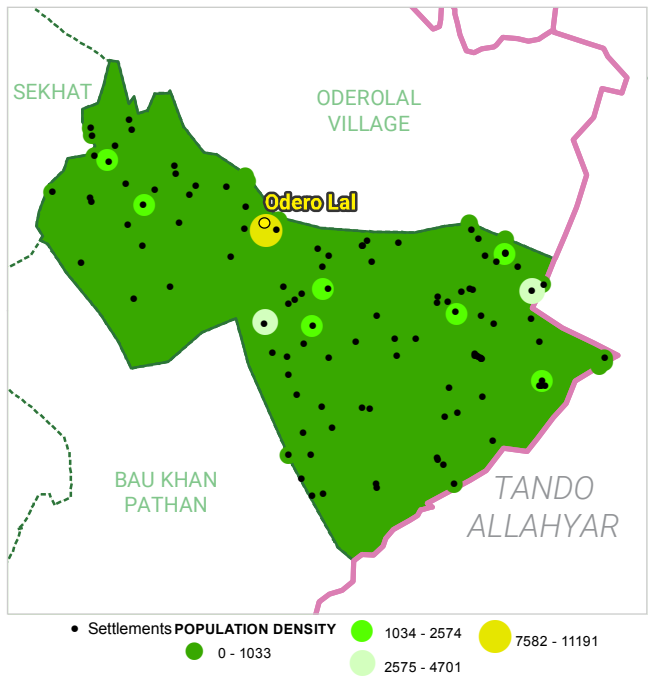
TRANSPORT, IRRIGATION AND DRAINAGE



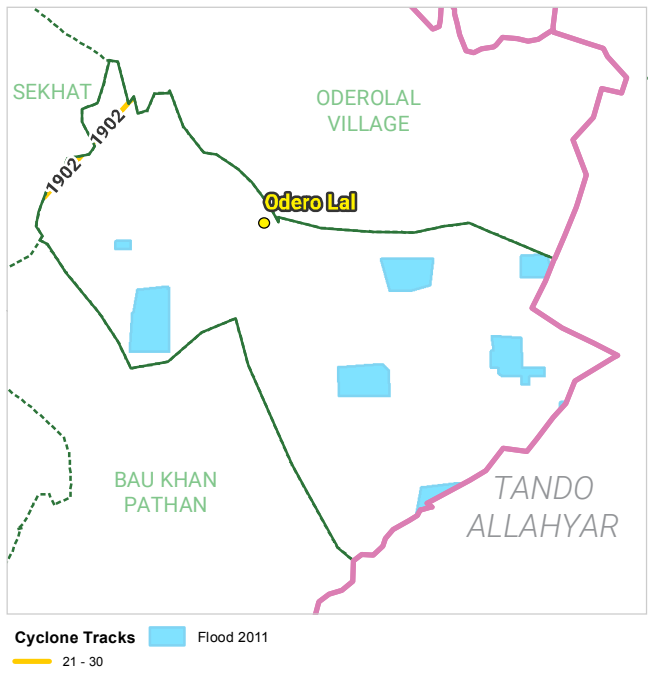
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

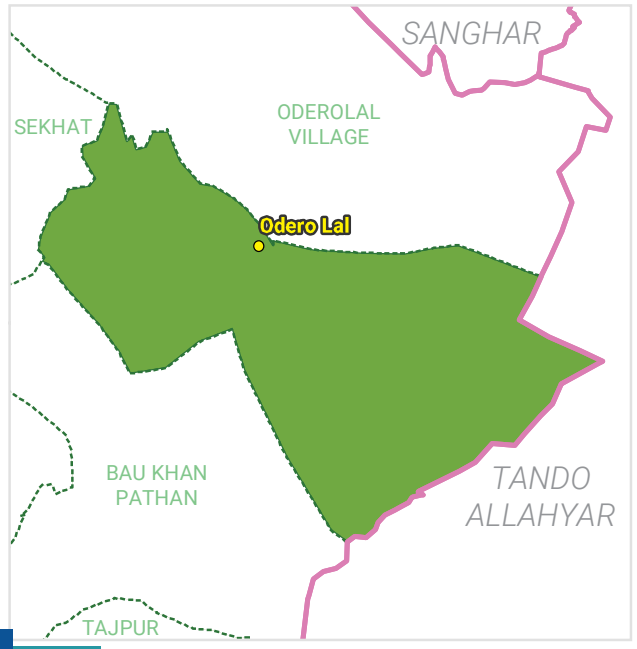


FLOOD

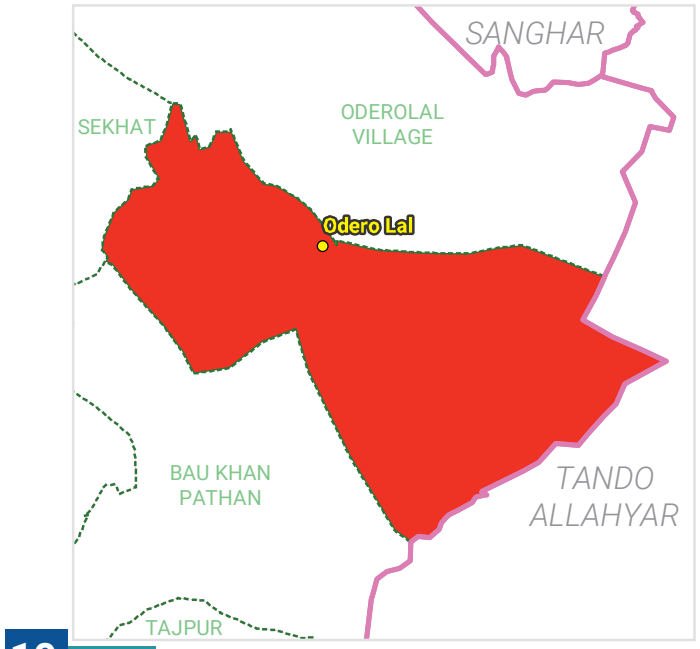
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

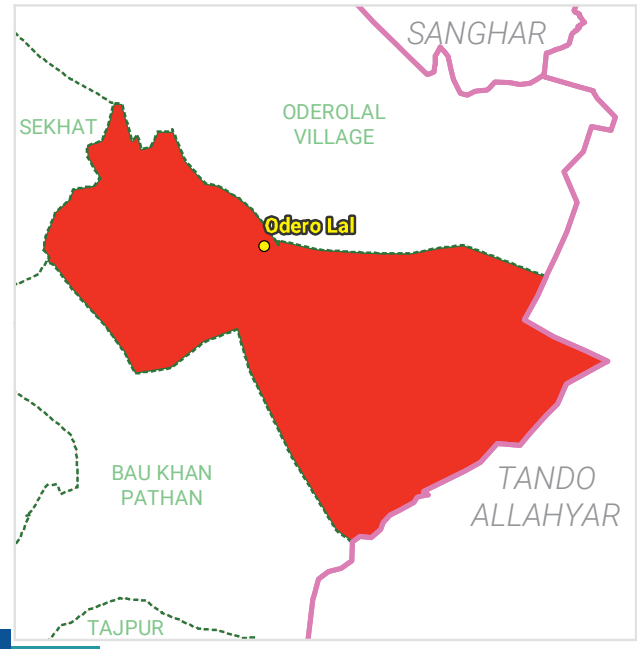
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

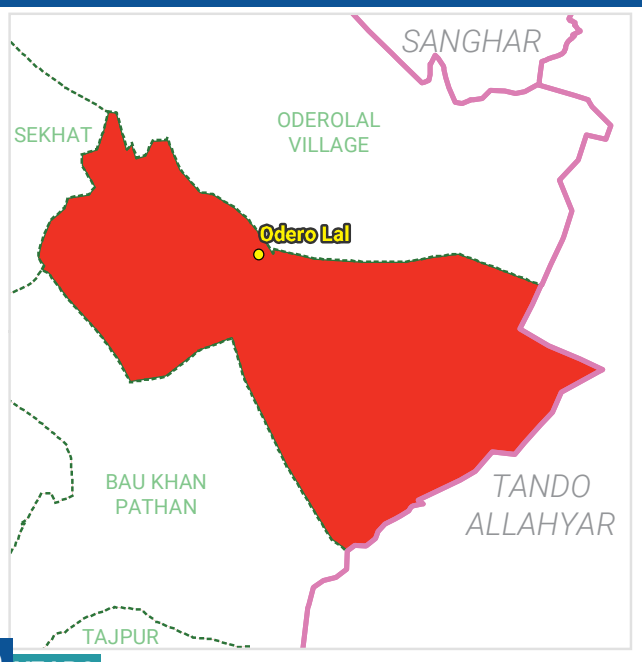


10 YEARS

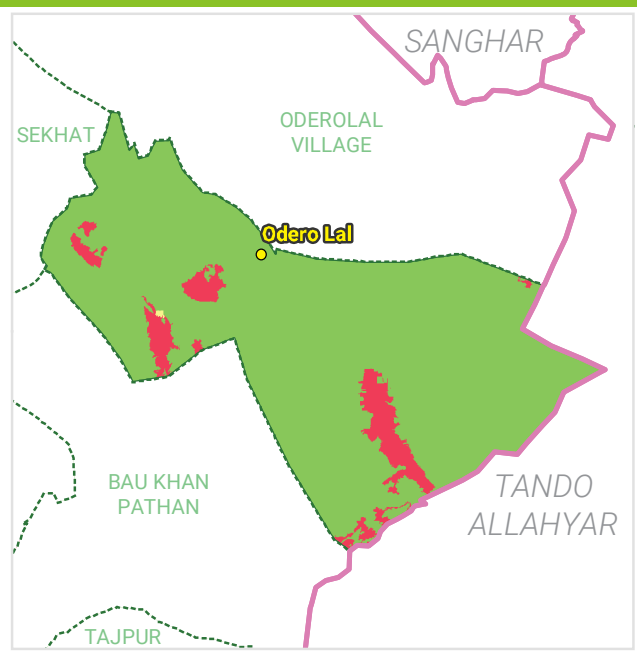


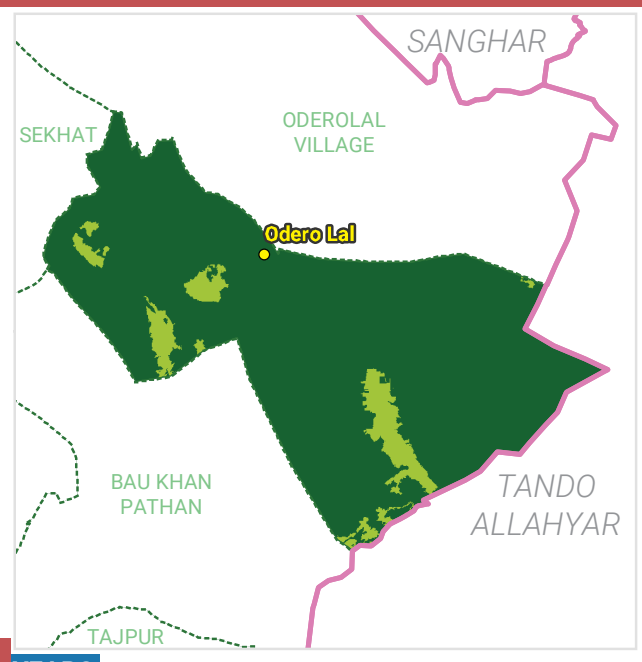
25 YEARS

HAZARD | VULNERABILITY | RISK



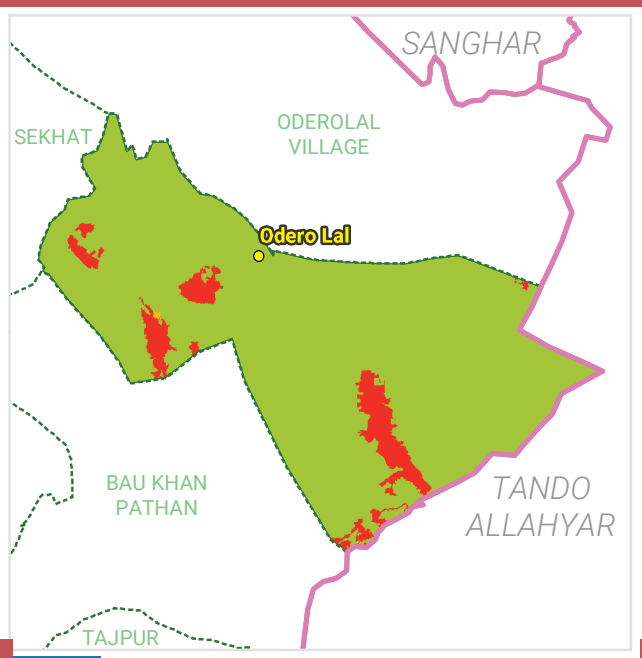
50 YEARS



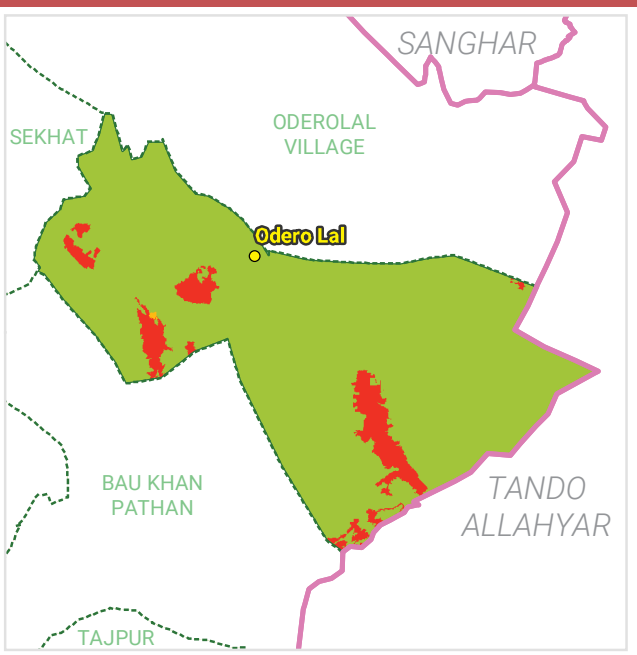


5 YEARS

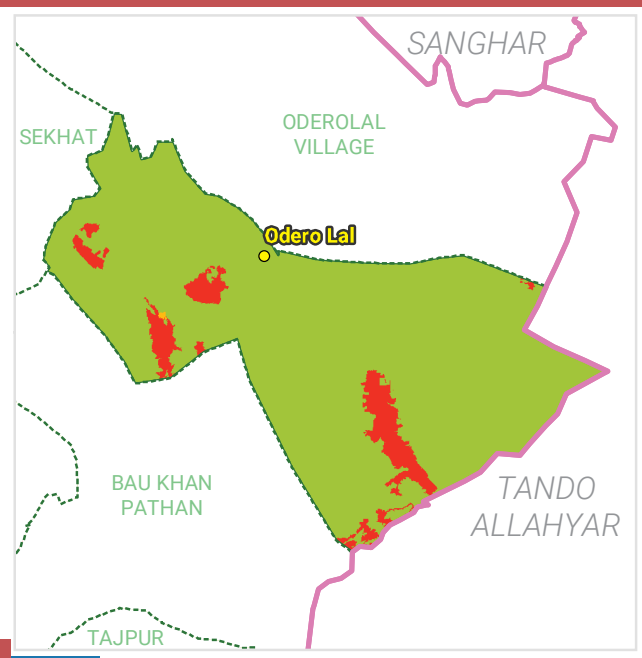
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

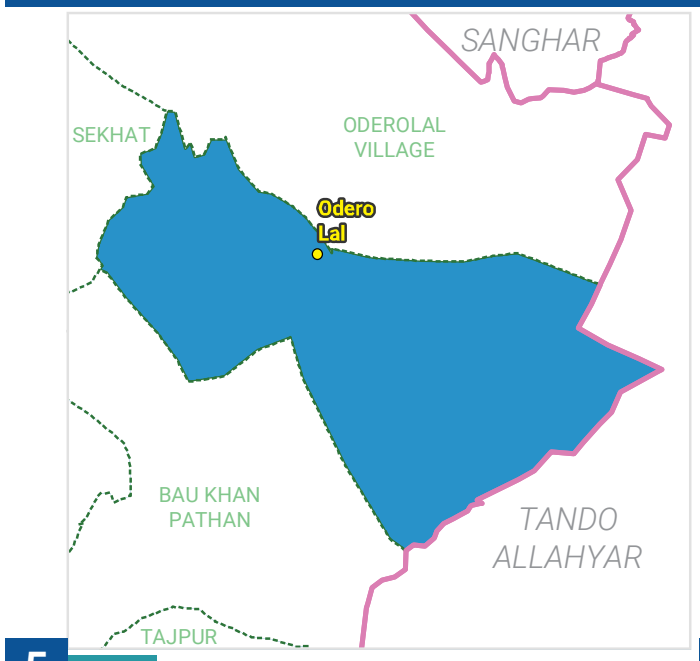
(BASED ON 50 YEARS RETURN PERIOD)

111	10521	54364	92.76	0	0.05	0	2.49
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

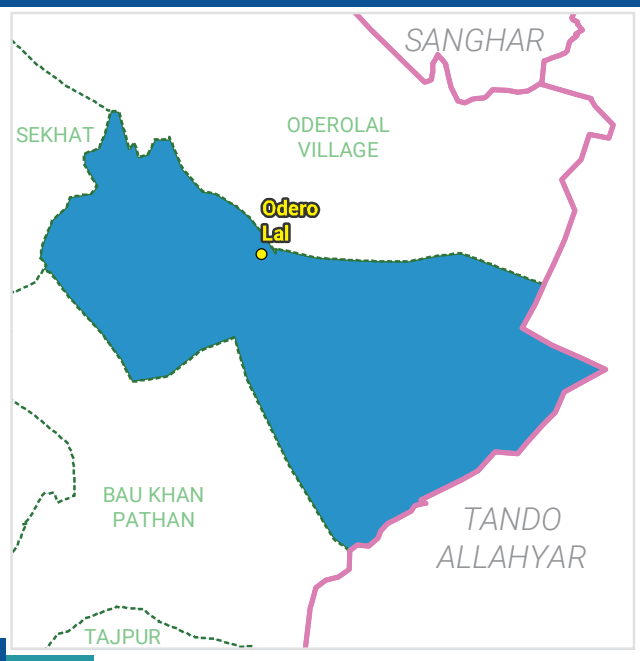
0.68	0.95
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

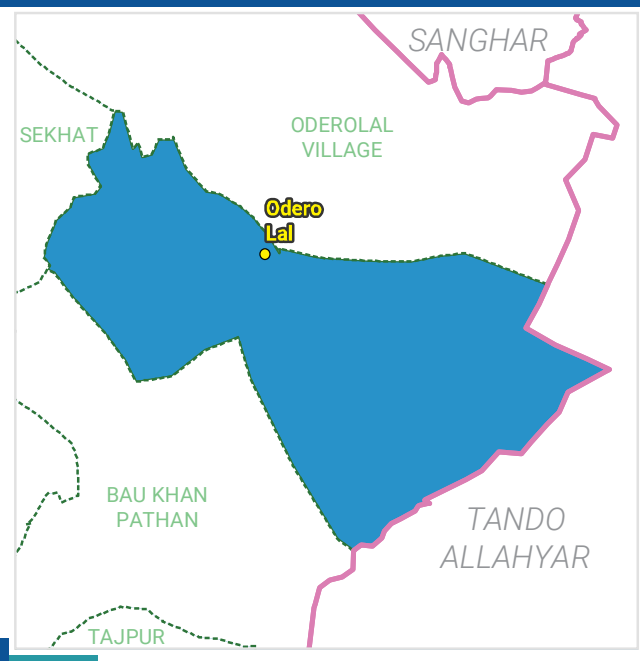
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

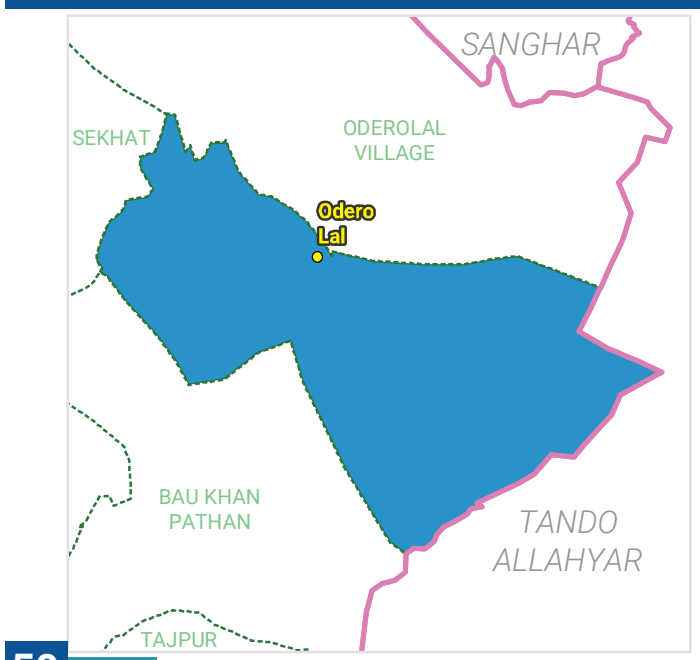


10 YEARS



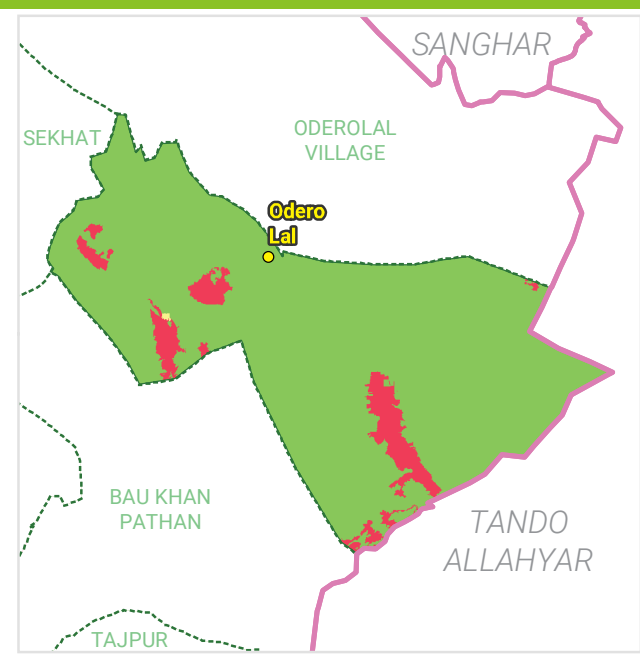
25 YEARS

HAZARD

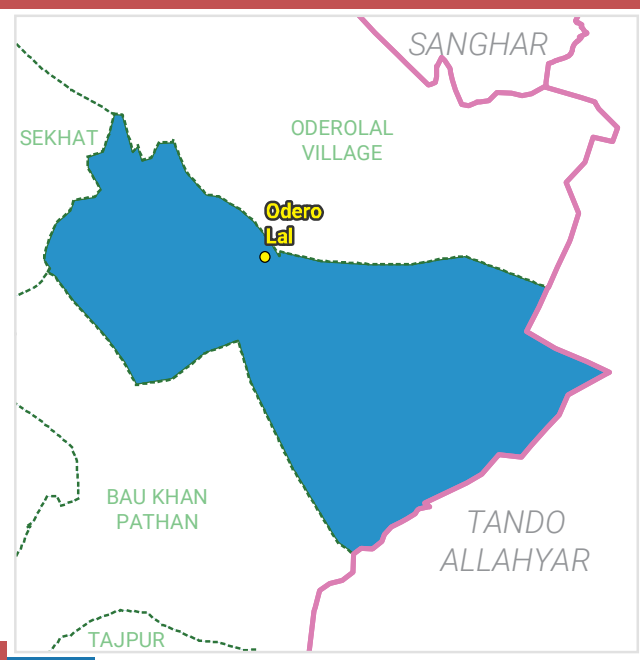


50 YEARS

VULNERABILITY



RISK



5 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

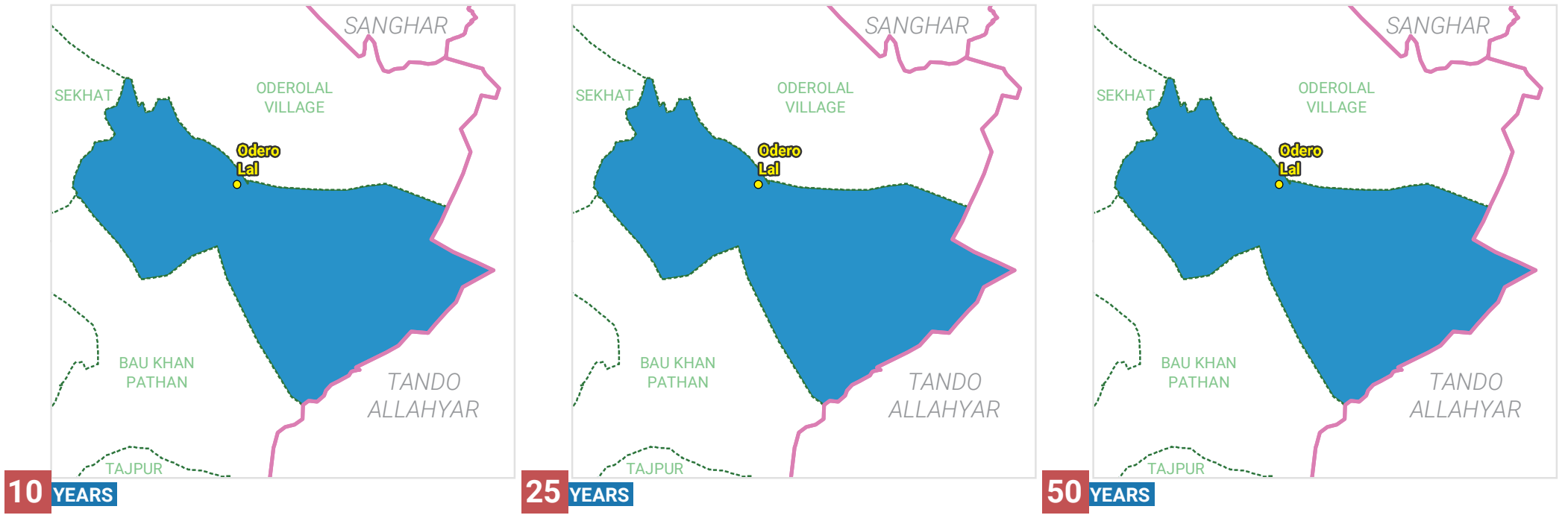
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

RISK AT DIFFERENT RETURN PERIODS



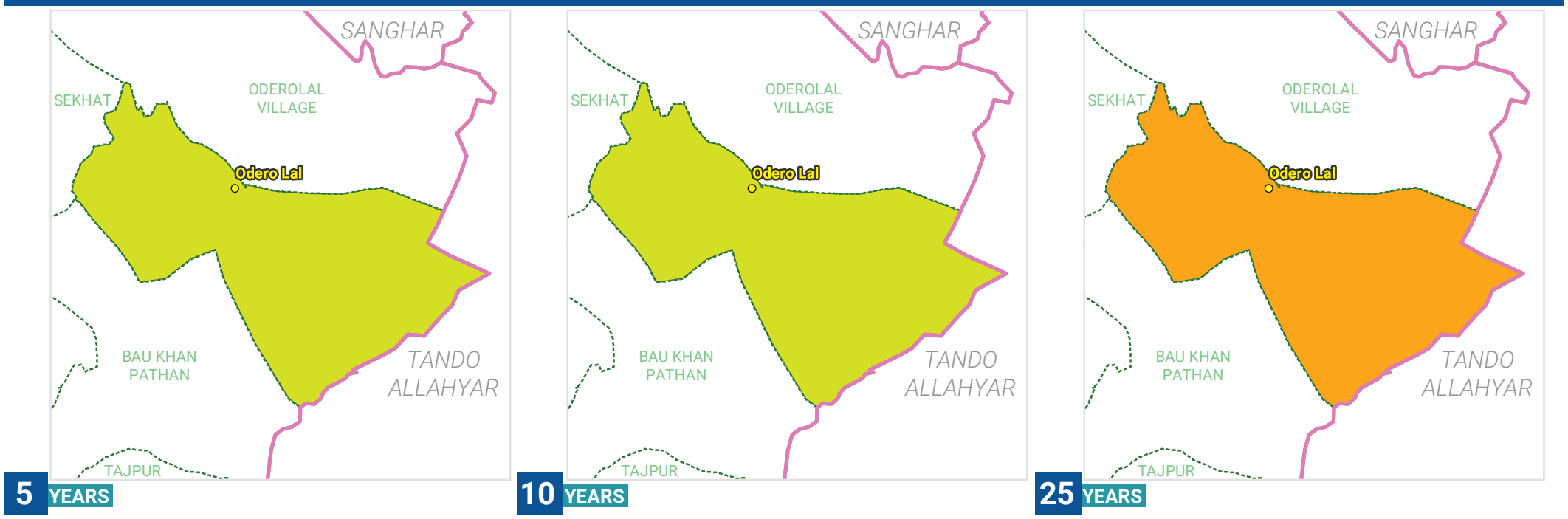
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

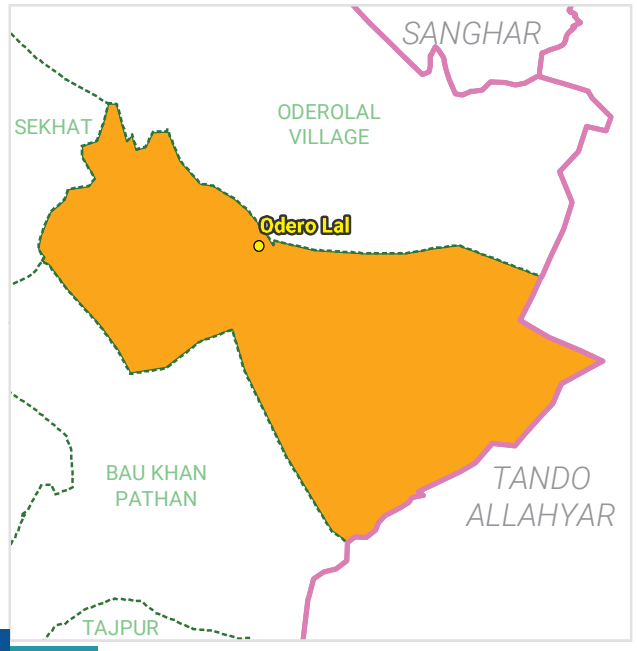
NO ELEMENTS AT RISK FOR AGRICULTURAL DROUGHT

HEATWAVE

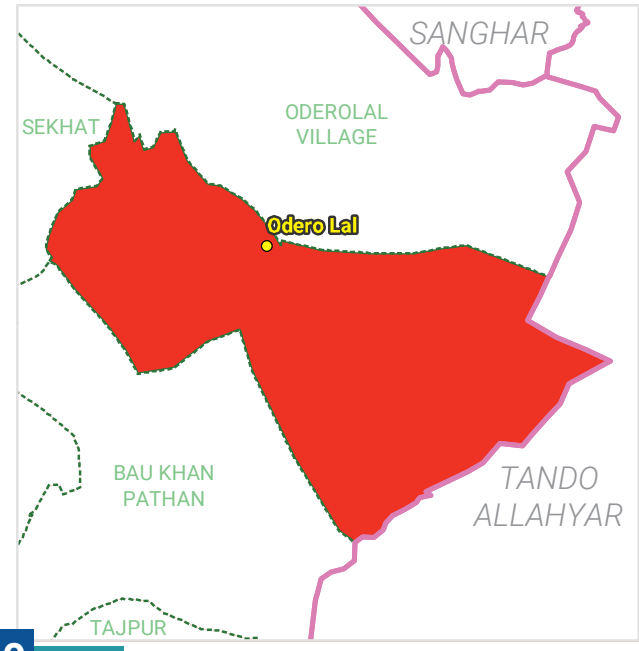
HAZARD AT DIFFERENT RETURN PERIODS



HAZARD AT DIFFERENT RETURN PERIODS

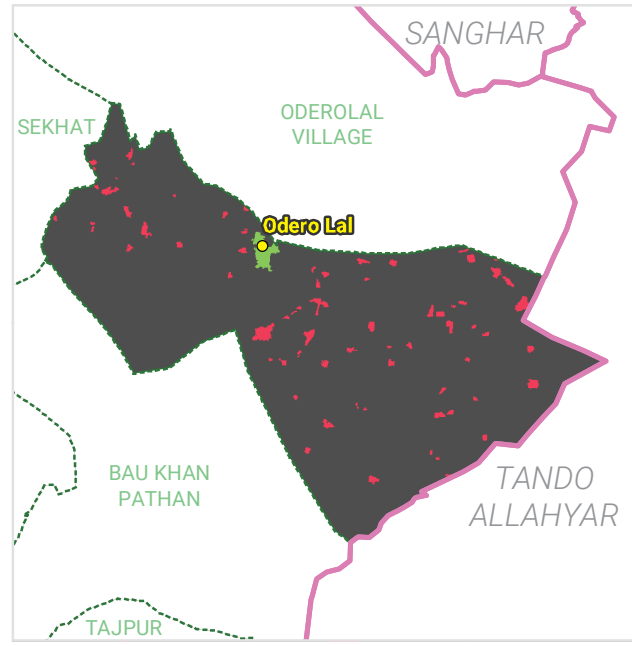


50 YEARS

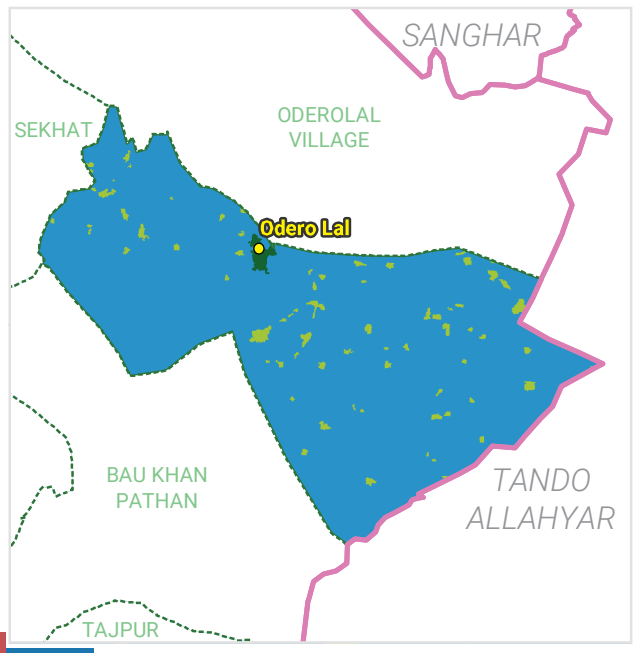


100 YEARS

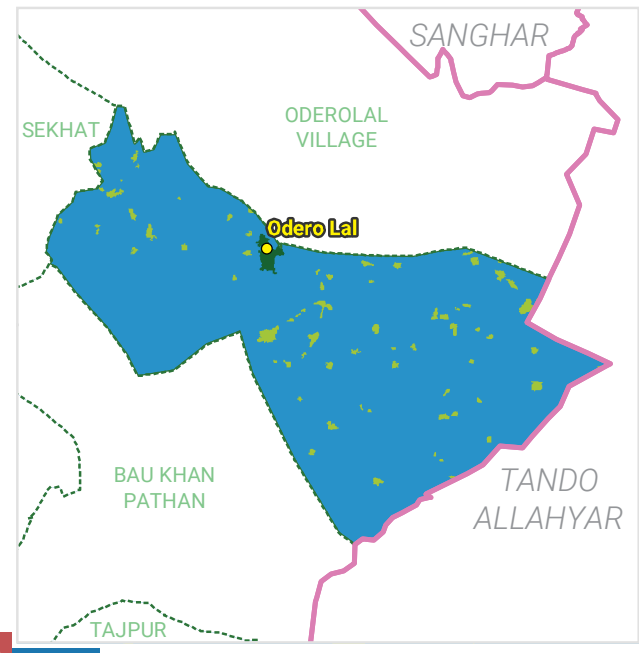
VULNERABILITY



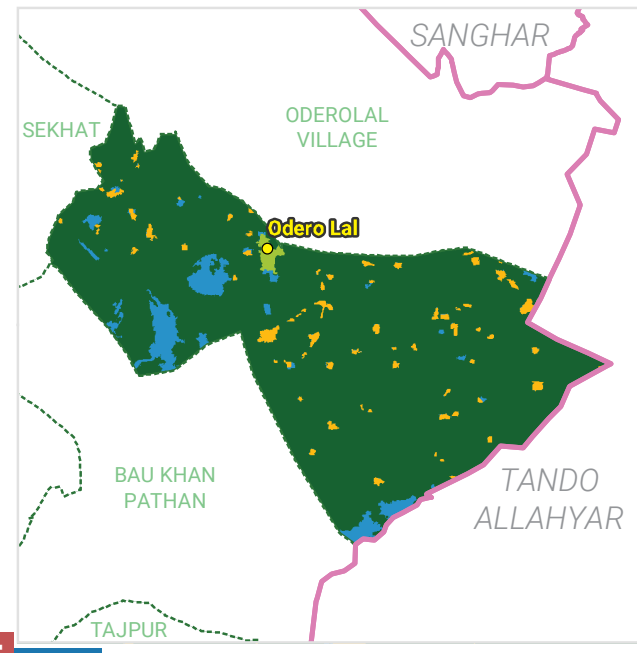
RISK AT DIFFERENT RETURN PERIODS



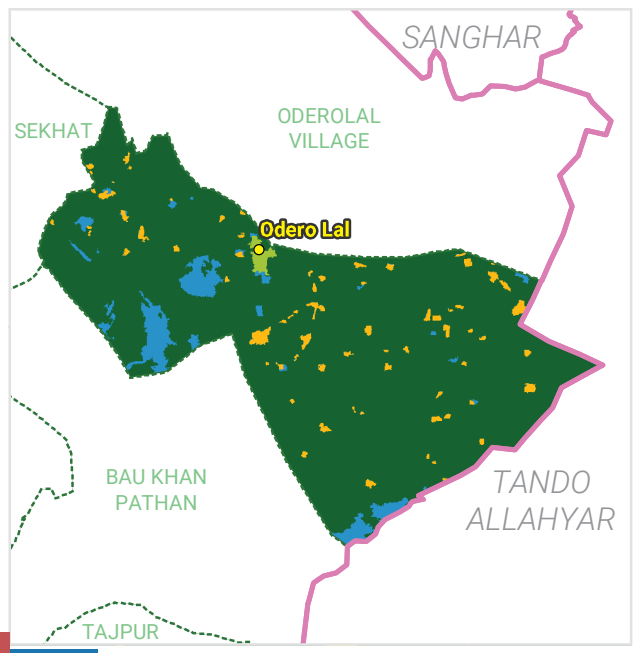
5 YEARS



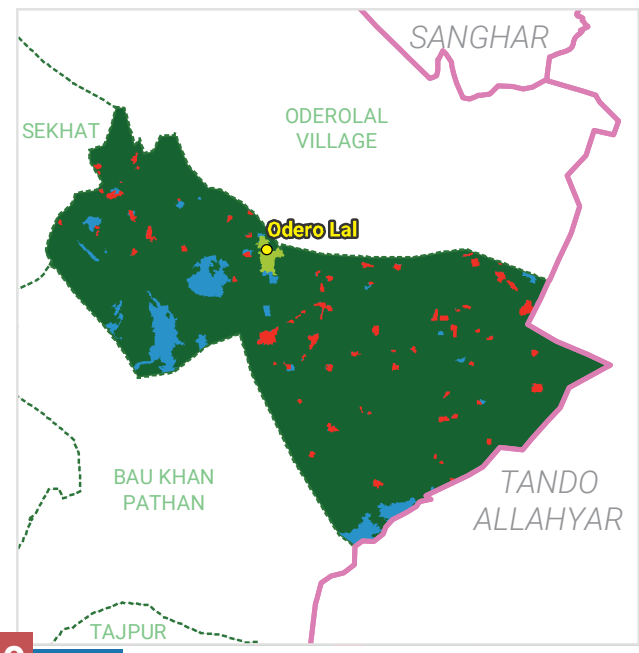
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

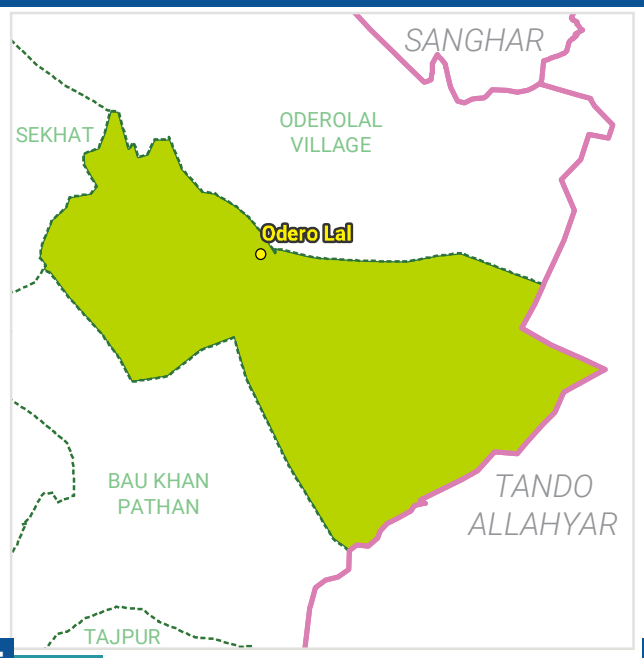
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

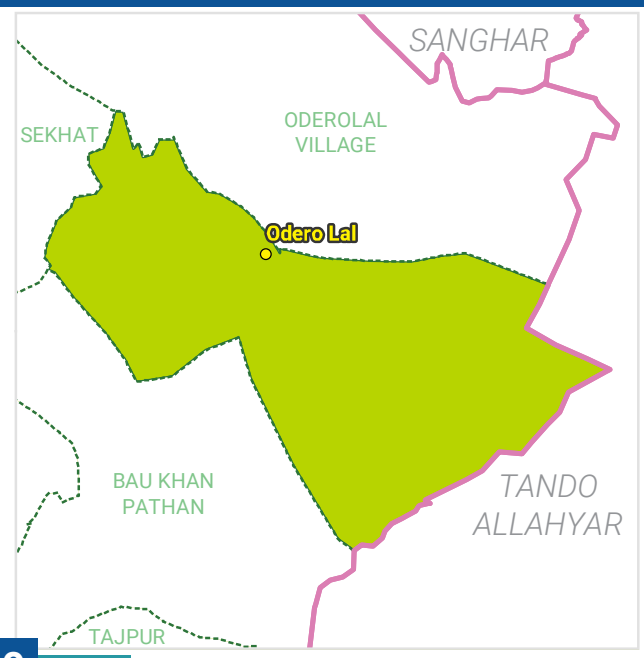
110	10439	53932	92.55	0	0.49	2.32
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

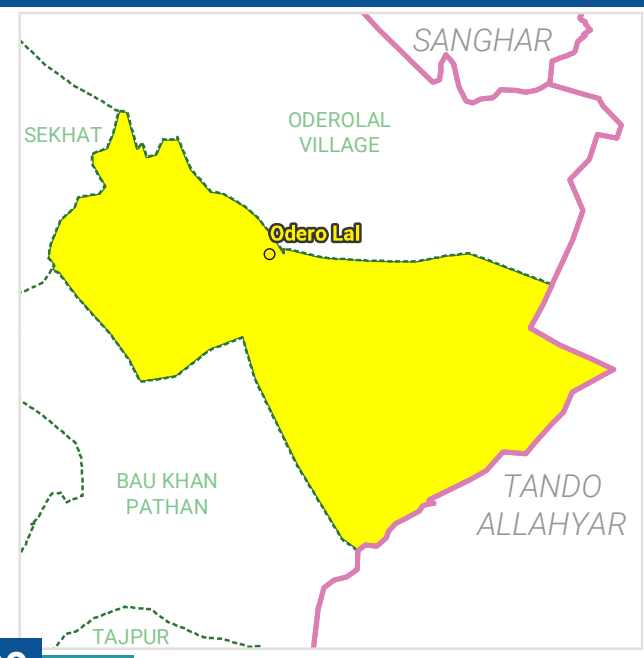
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

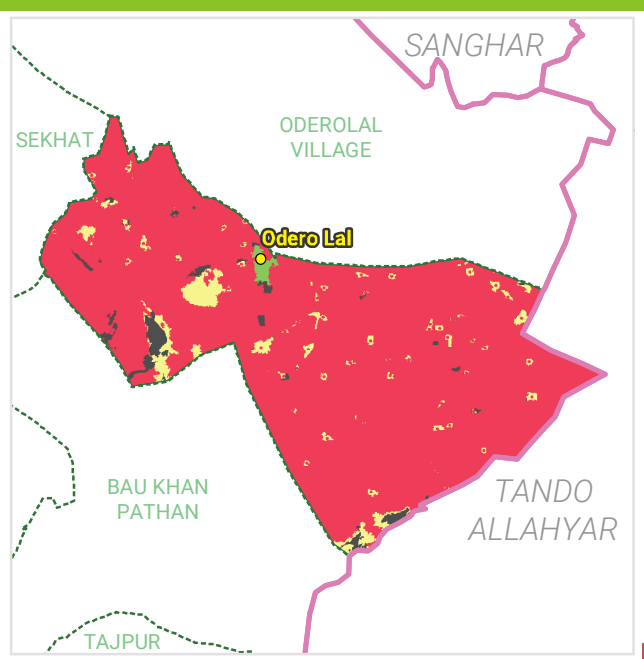


100 YEARS



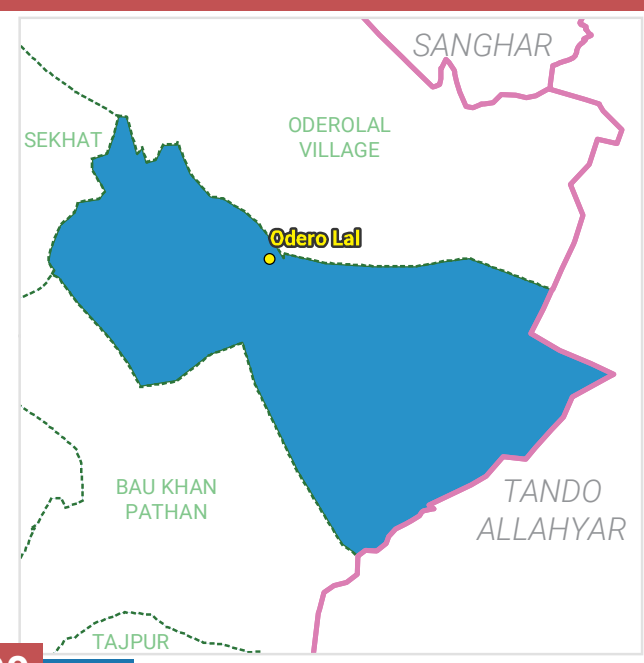
500 YEARS

VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK

500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

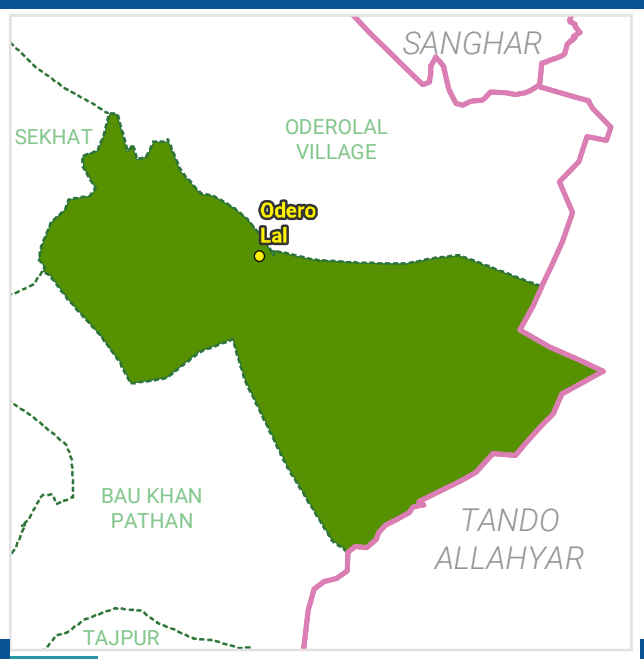
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

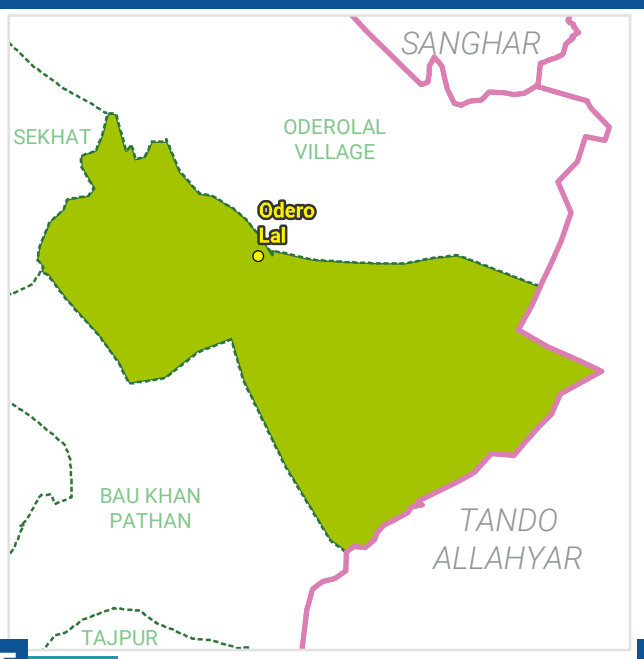
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

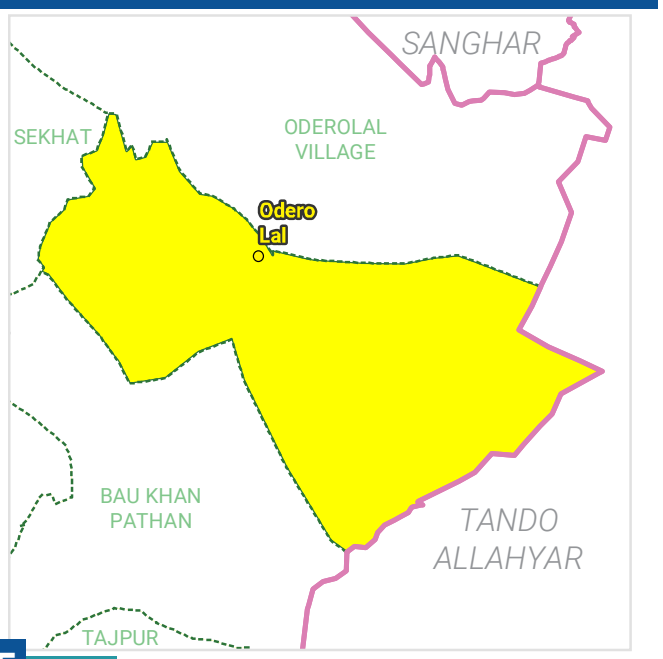
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS



475 YEARS



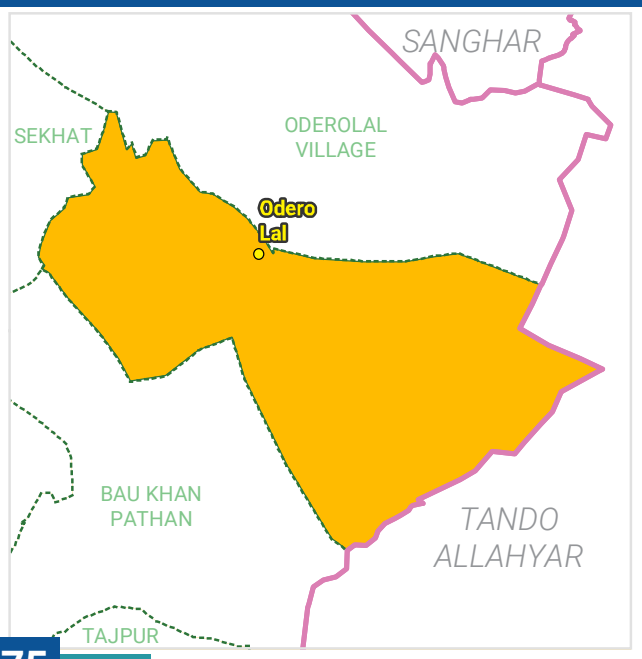
975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

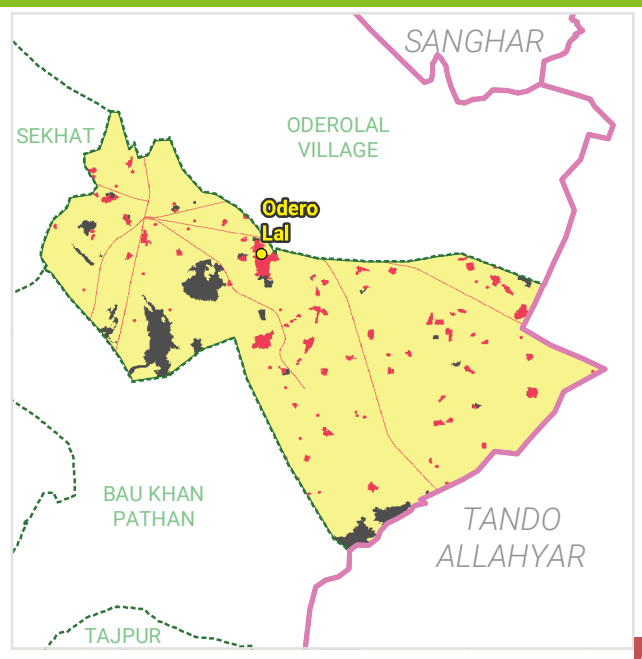
EARTHQUAKE

HAZARD

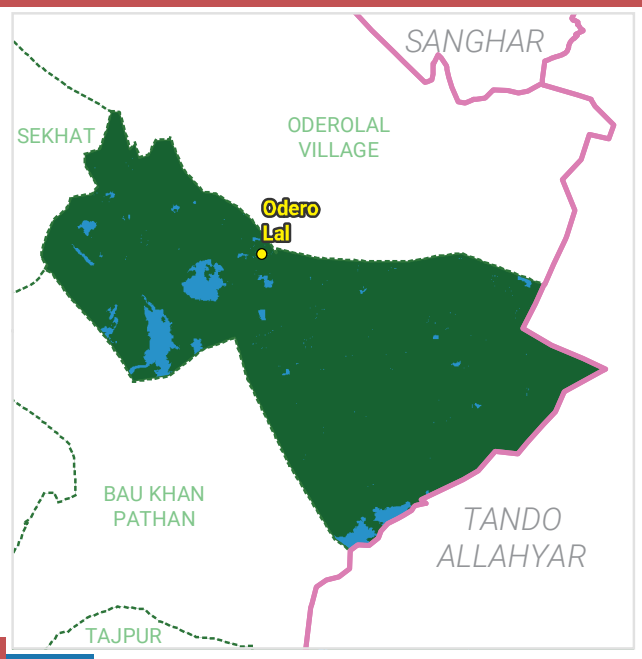


2475 YEARS

VULNERABILITY

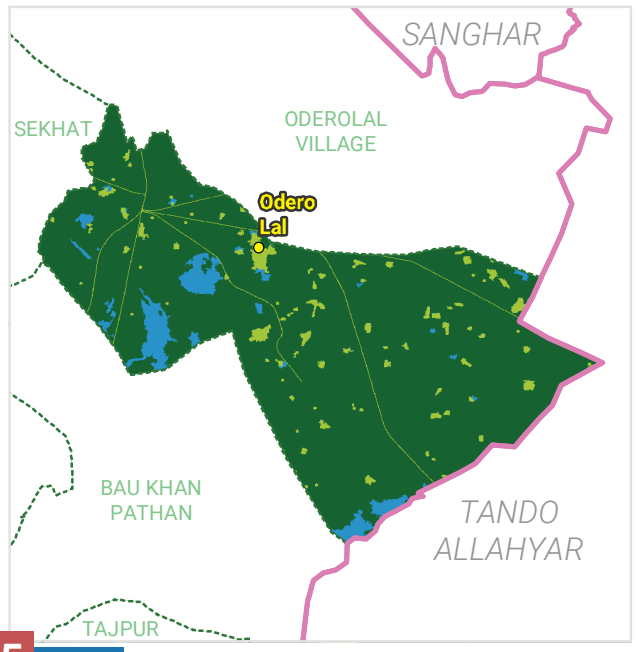


RISK

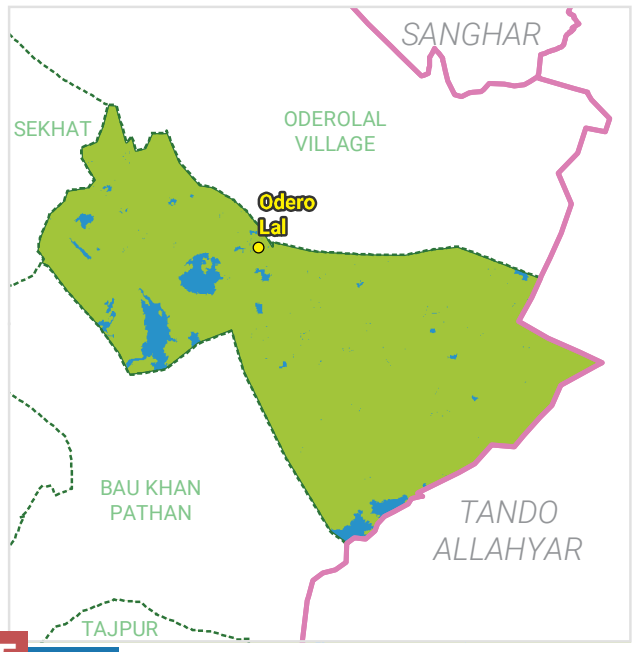


95 YEARS

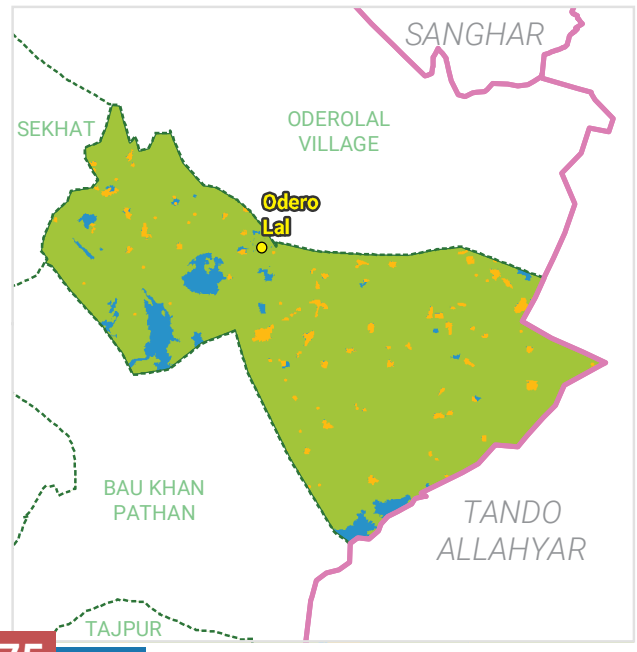
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

111	10398	53741	92.62	0.00	0	0	0.48
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
2.31	0.06	226.70	3.46	39.76	0	1	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
86	0	0	0	5	0	1	3
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	1	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low Medium	Medium High Extreme	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	None	●	●	●
HEATWAVE	Low Medium	Low Medium	Low Medium High	Low Medium High	Low Medium Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - ODEROLAL VILLAGE

Union Council area in sq. km **147**

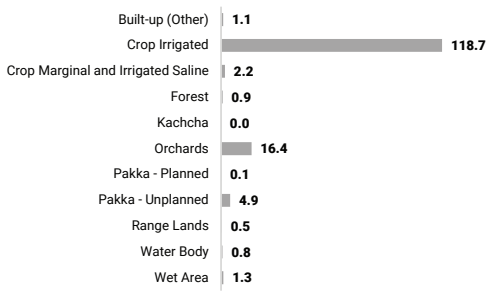
Surrounding UCs / Features
SEKHAT in West
SANGHAR DISTRICT in East
ODEROLAL STATION in South
FAQEER NOOH HOTHYAI in North West

Population — 2017 approx. **99,549**

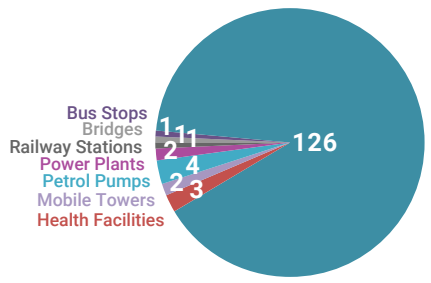
No. of household — 2017 approx. **19,024**

Land Use Land Cover

coverage area in sq.km



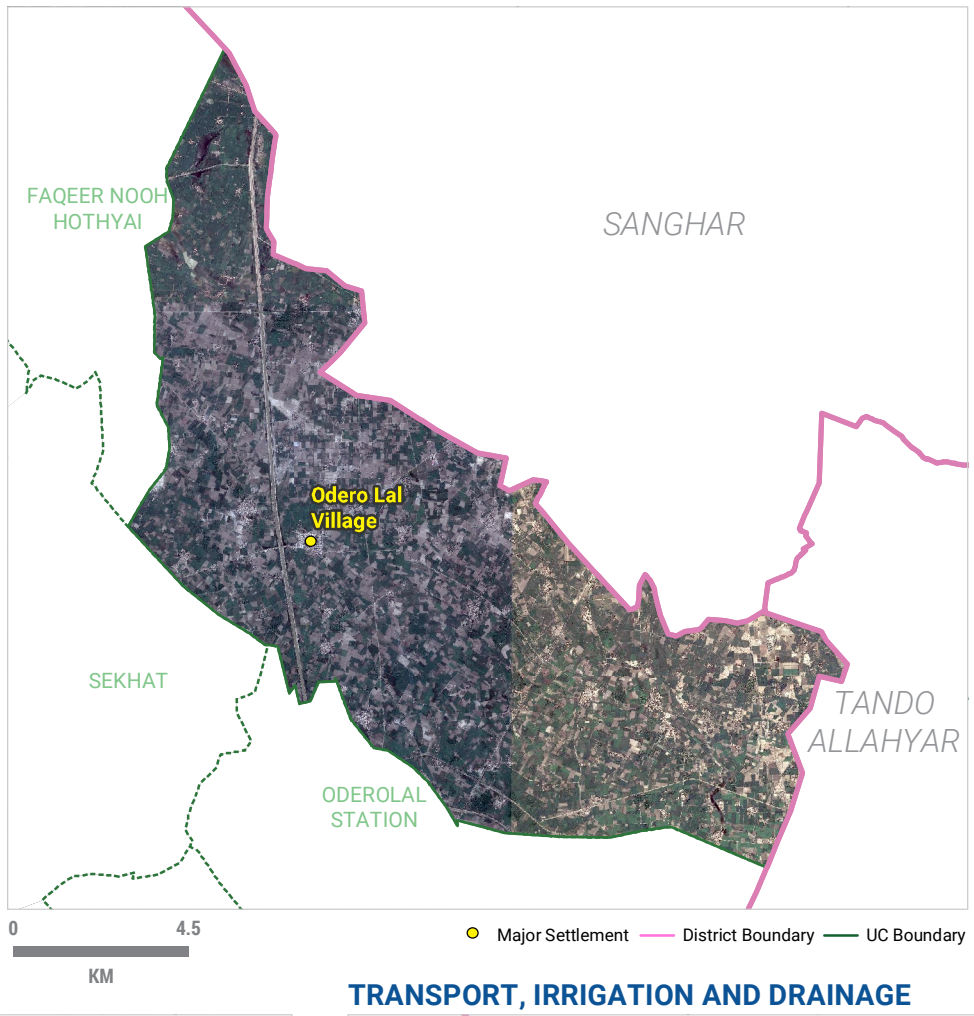
Critical Infrastructure



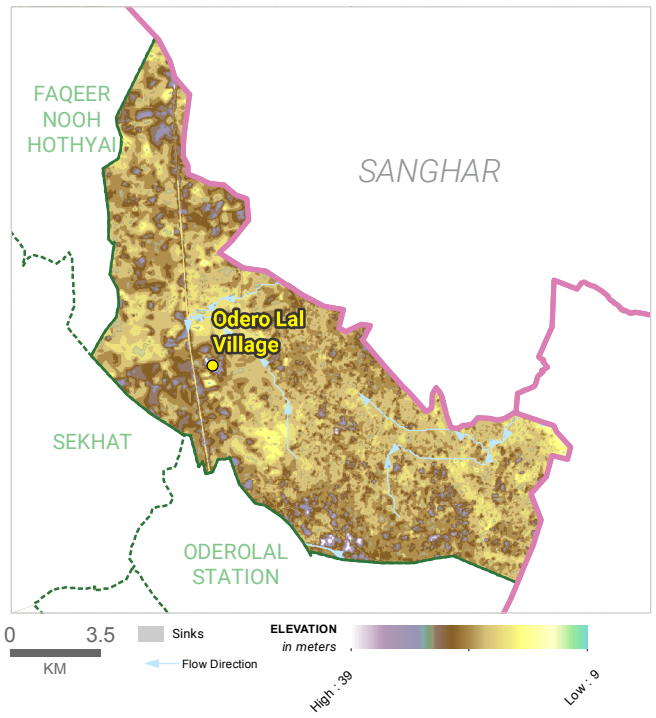
NO. OF SETTLEMENTS

138

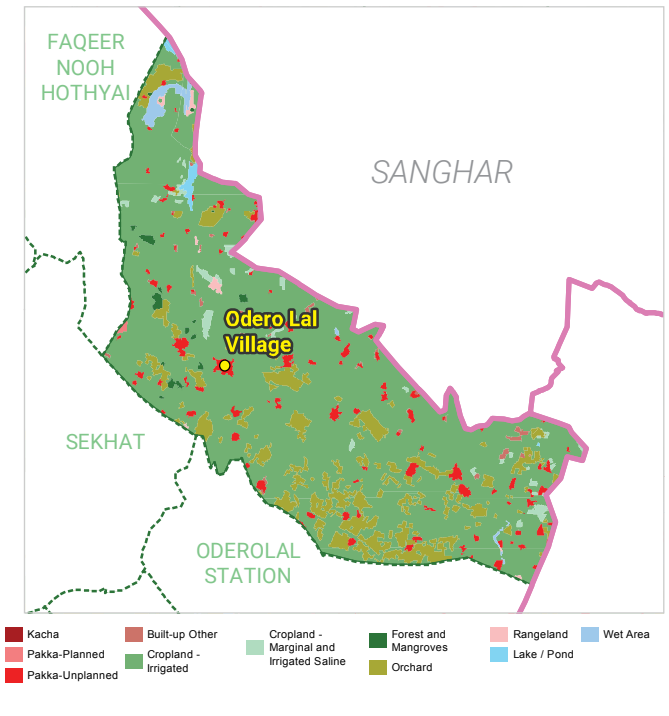
SATELLITE IMAGERY



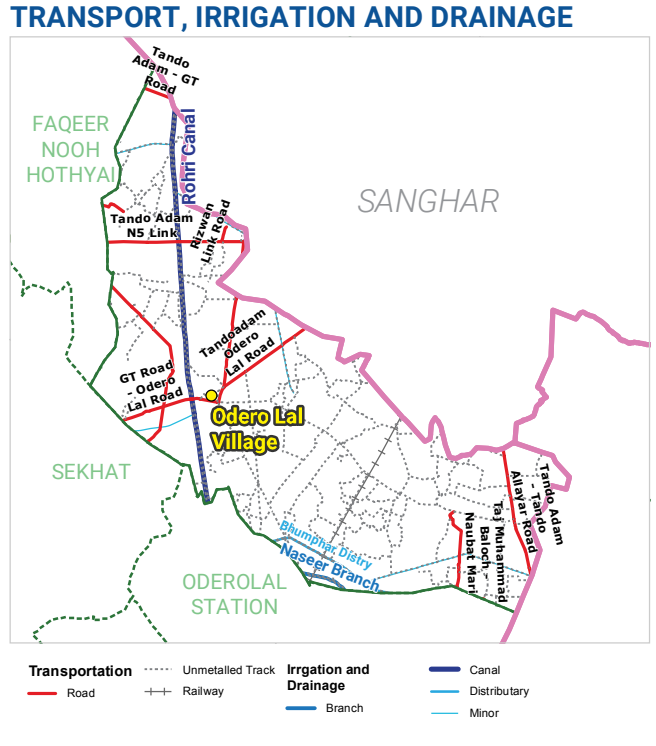
DEM AND FLOW DIRECTION



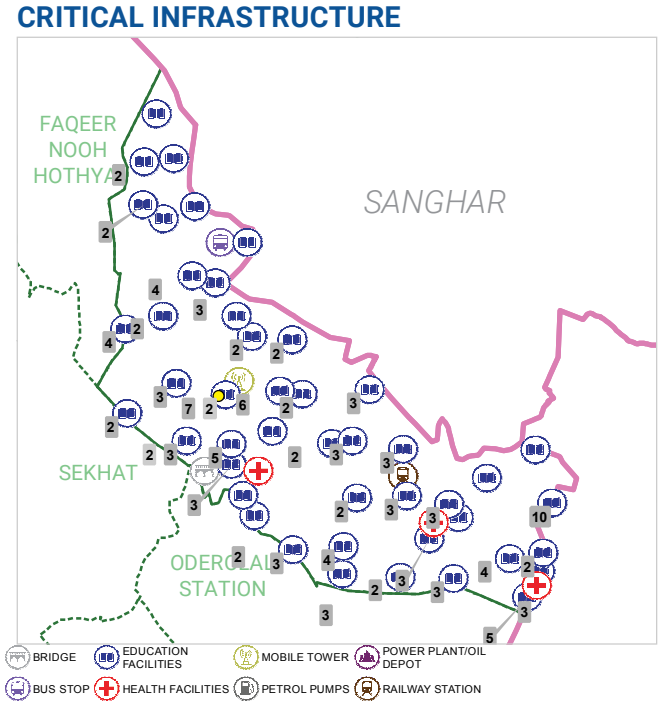
LAND USE / LAND COVER



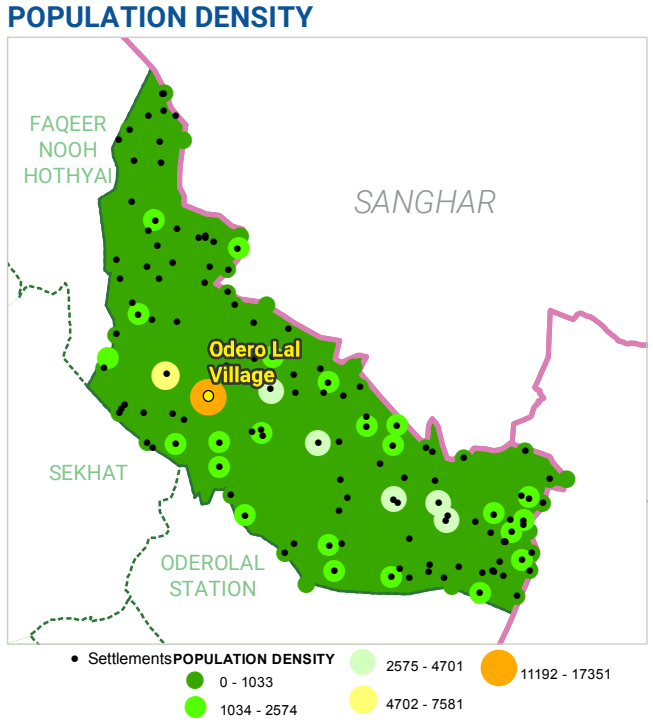
TRANSPORT, IRRIGATION AND DRAINAGE



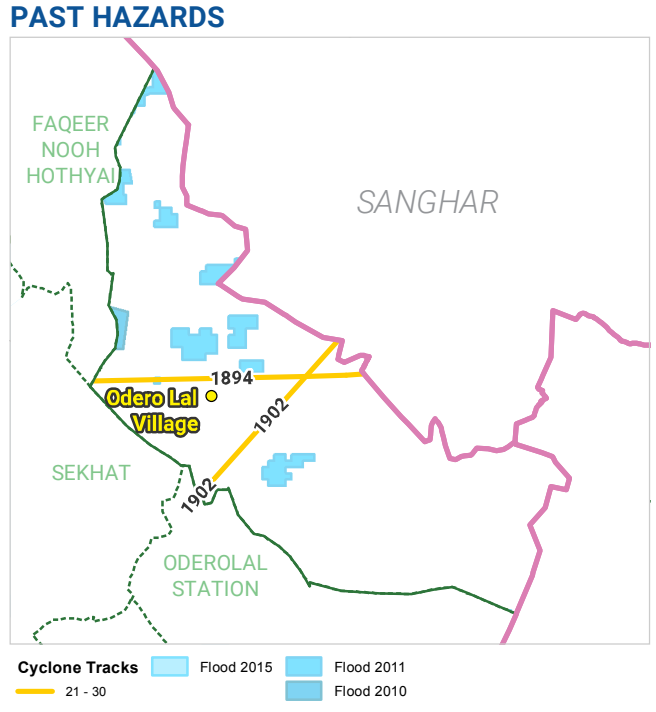
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

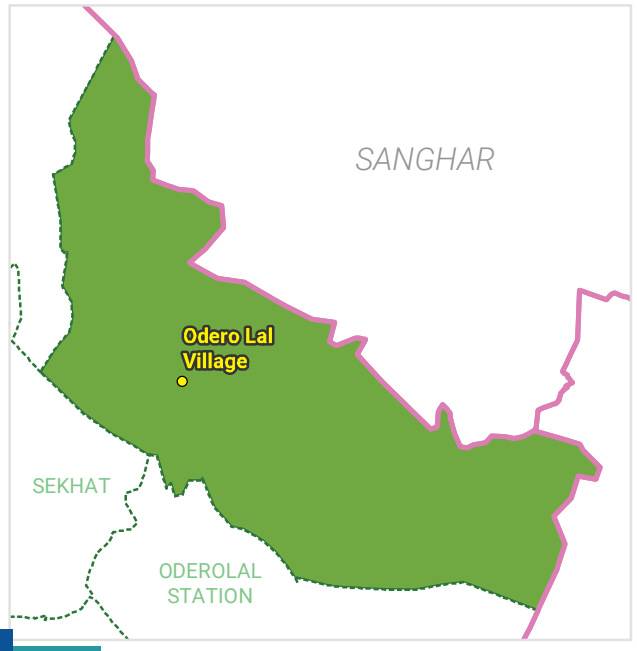


FLOOD

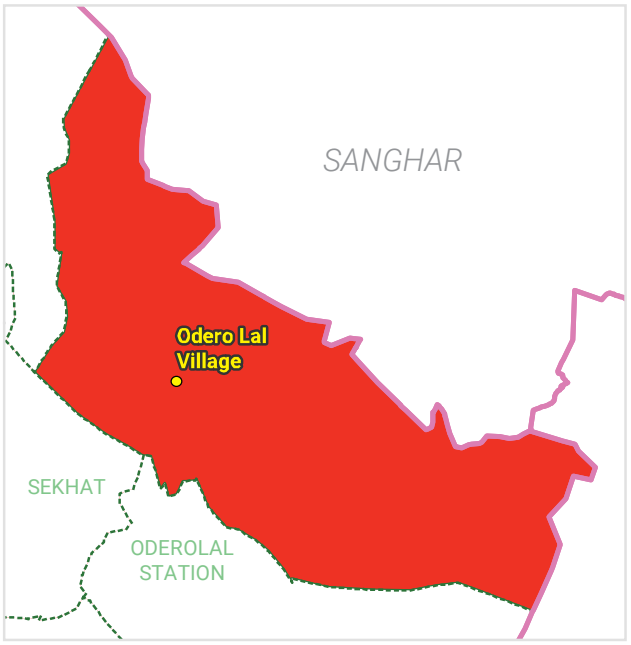
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

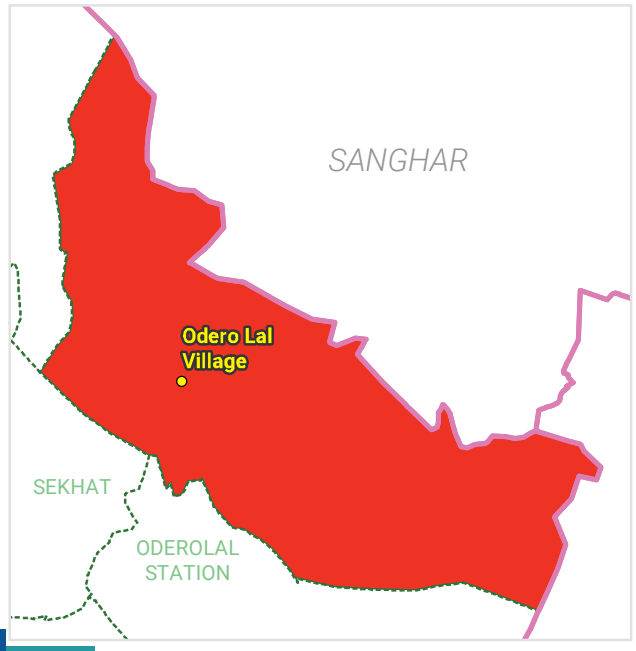
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS



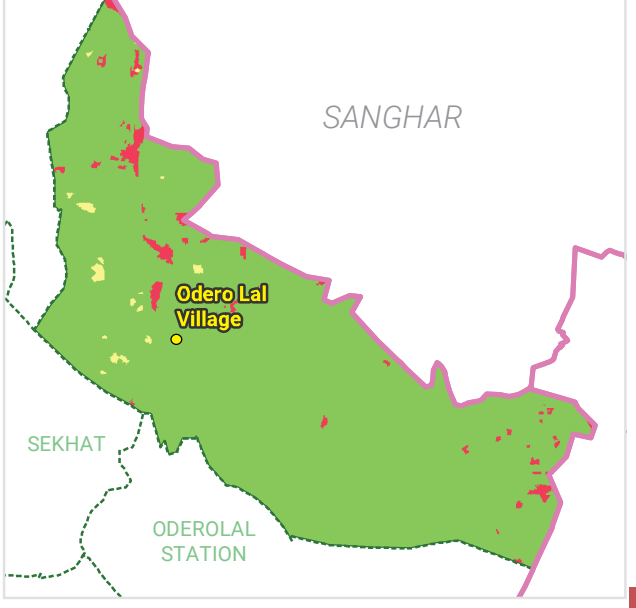
10 YEARS



25 YEARS

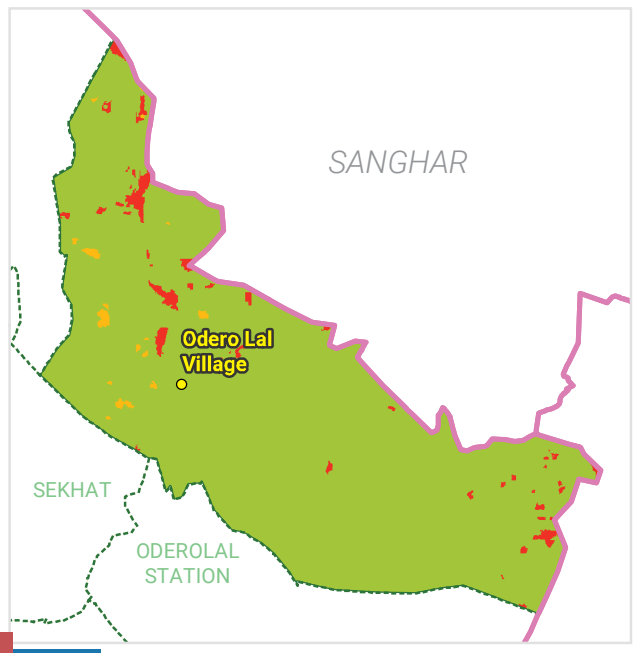
HAZARD	VULNERABILITY	RISK

50 YEARS

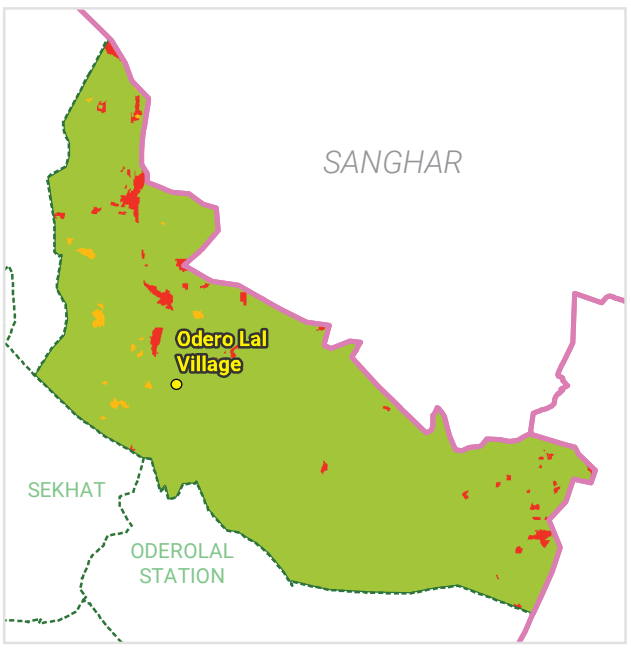


5 YEARS

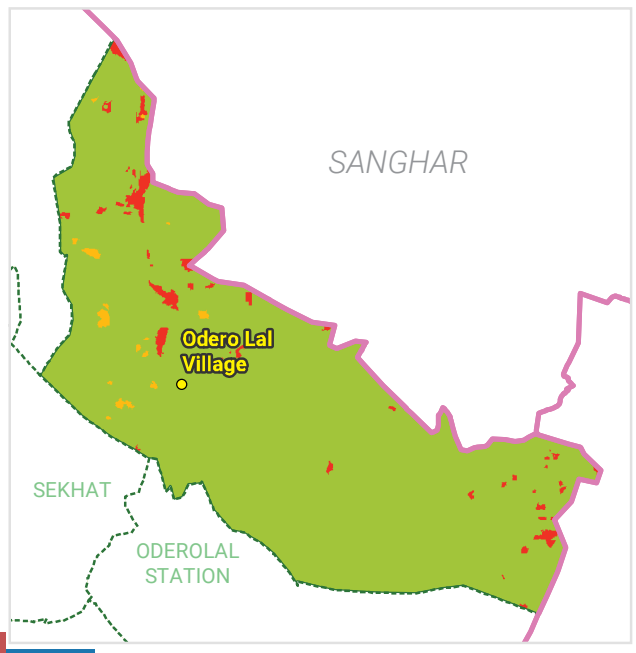
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

138	19024	99549	137.25	0	0.86	0	0.50
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

0.76	1.30
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS

5 YEARS

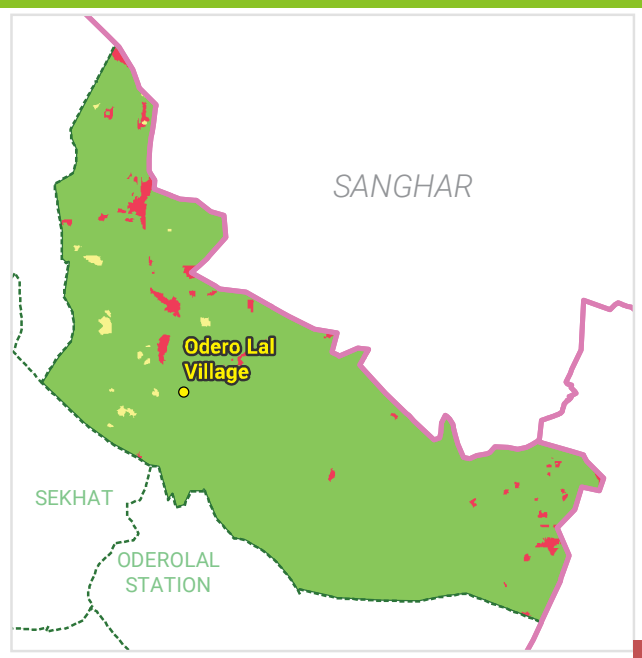
10 YEARS

25 YEARS

HAZARD

50 YEARS

VULNERABILITY



RISK

5 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

RISK AT DIFFERENT RETURN PERIODS

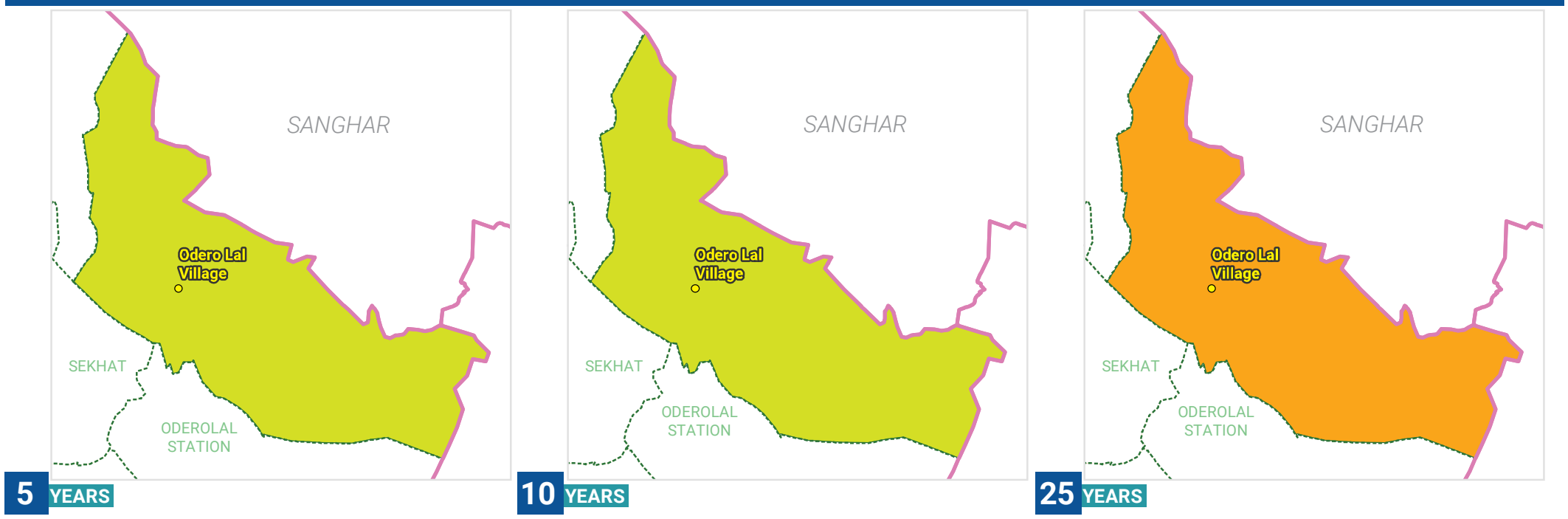
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

NO ELEMENTS AT RISK FOR AGRICULTURAL DROUGHT

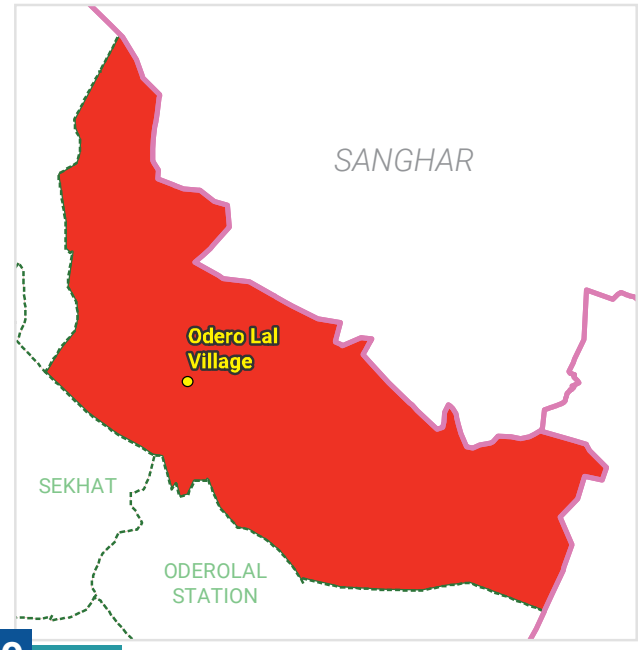
HEATWAVE

HAZARD AT DIFFERENT RETURN PERIODS



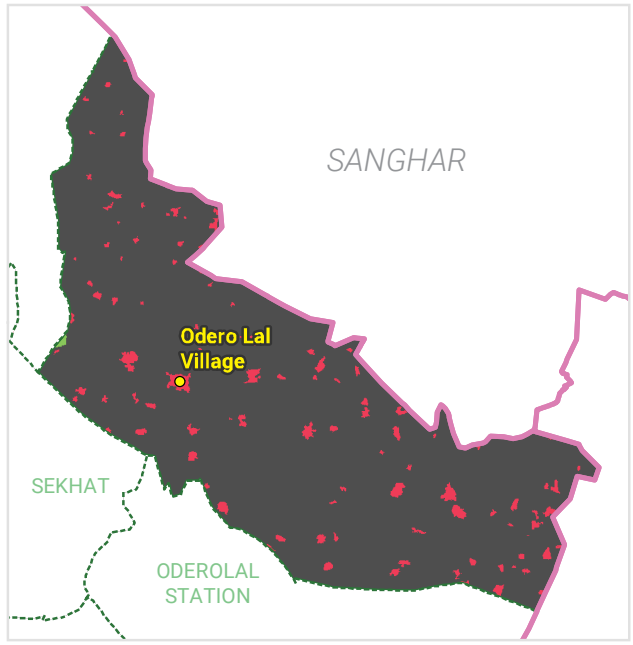
HAZARD AT DIFFERENT RETURN PERIODS

50 YEARS

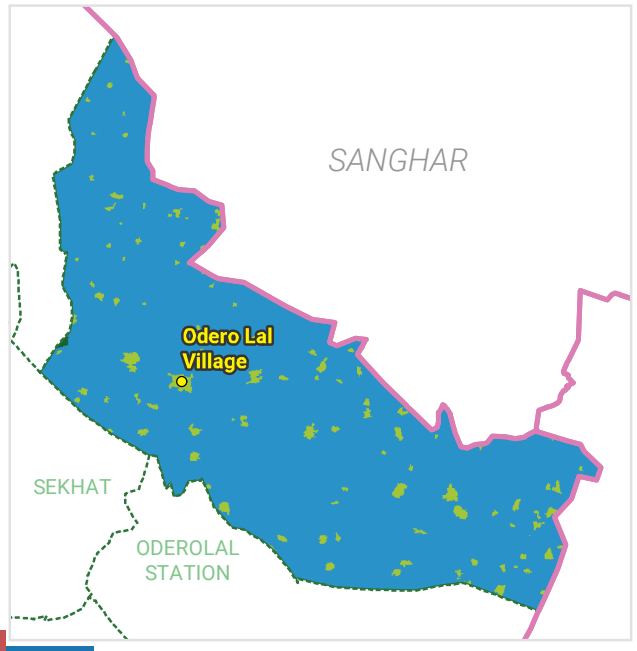


100 YEARS

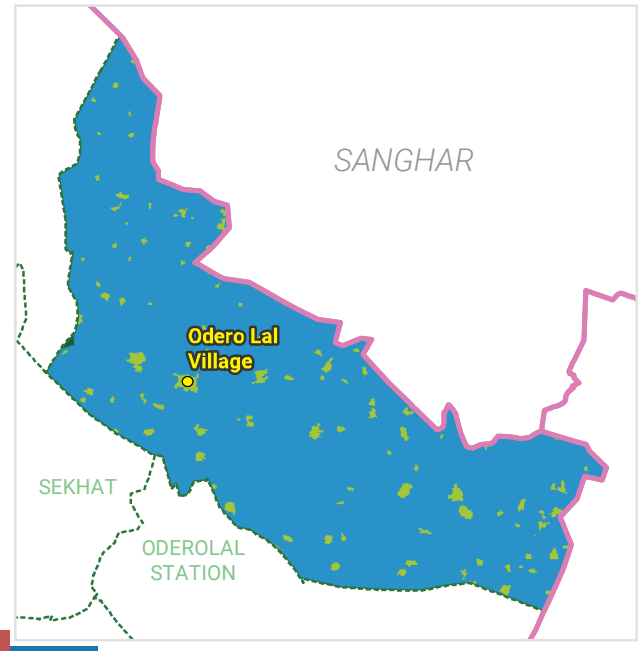
VULNERABILITY



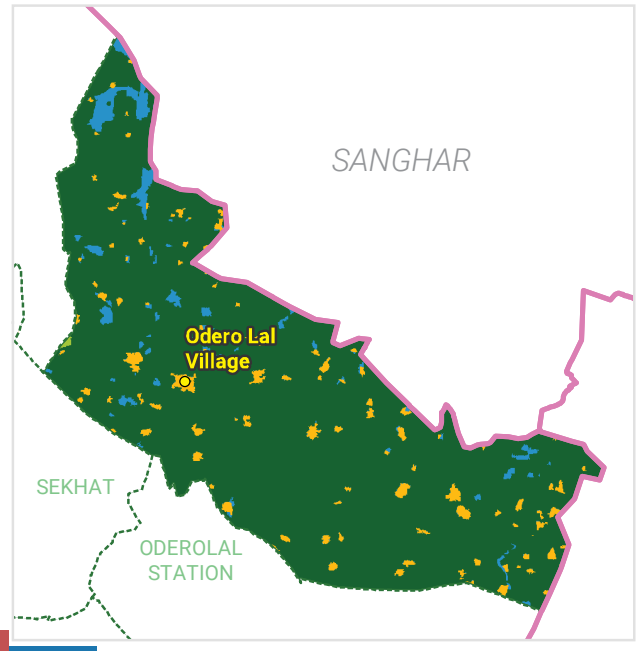
RISK AT DIFFERENT RETURN PERIODS



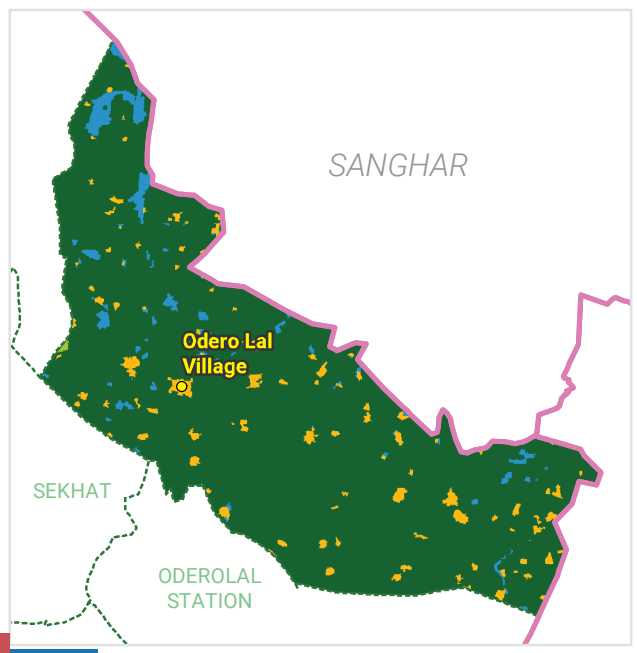
5 YEARS



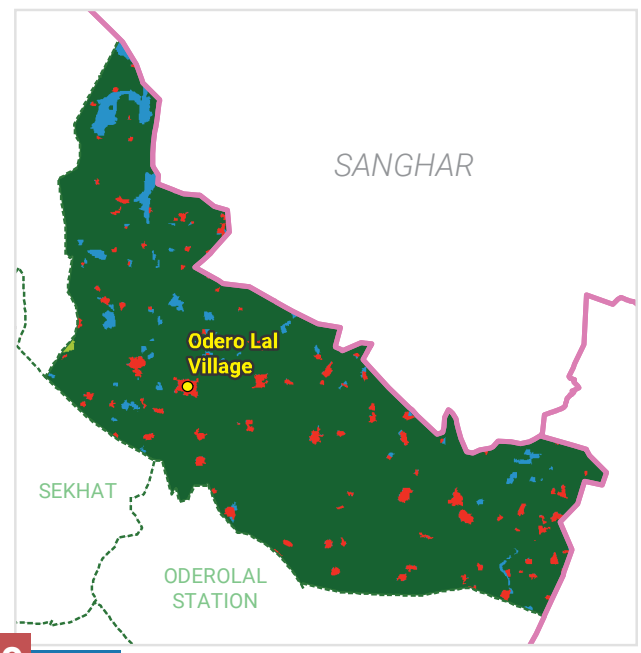
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

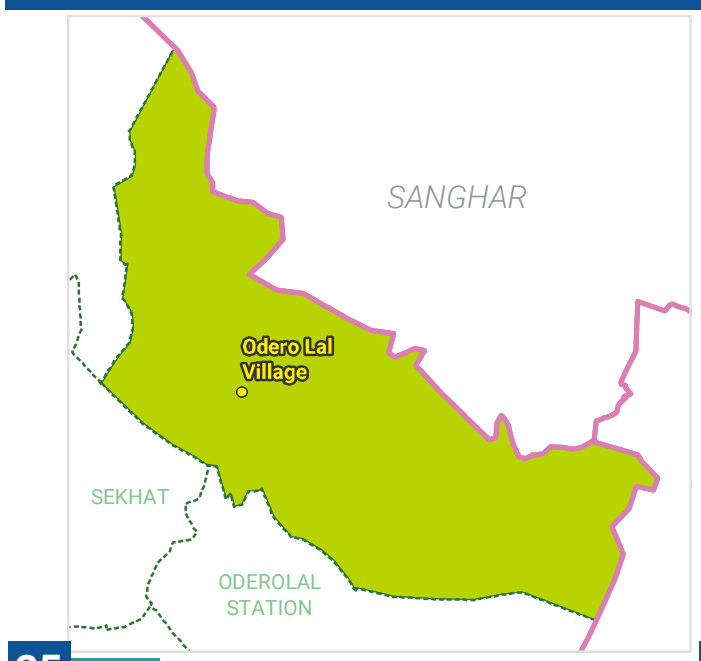
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

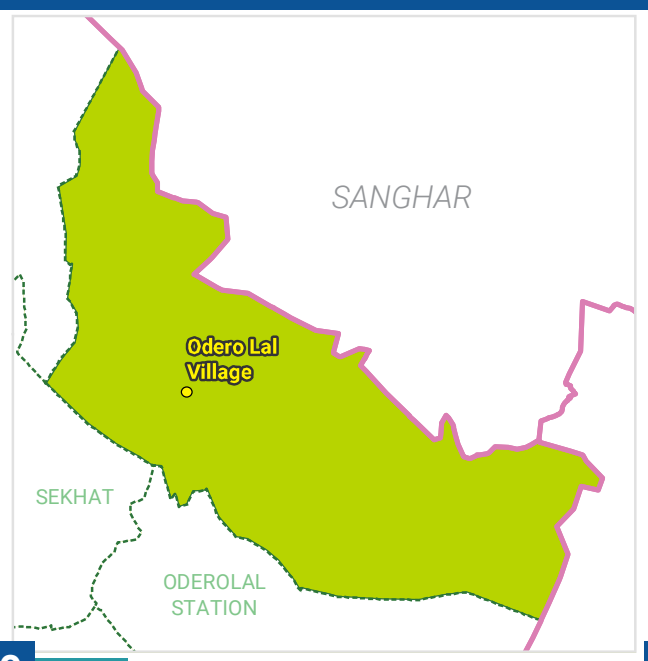
136	18892	98828	136.99	0.00	0.12	4.85
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

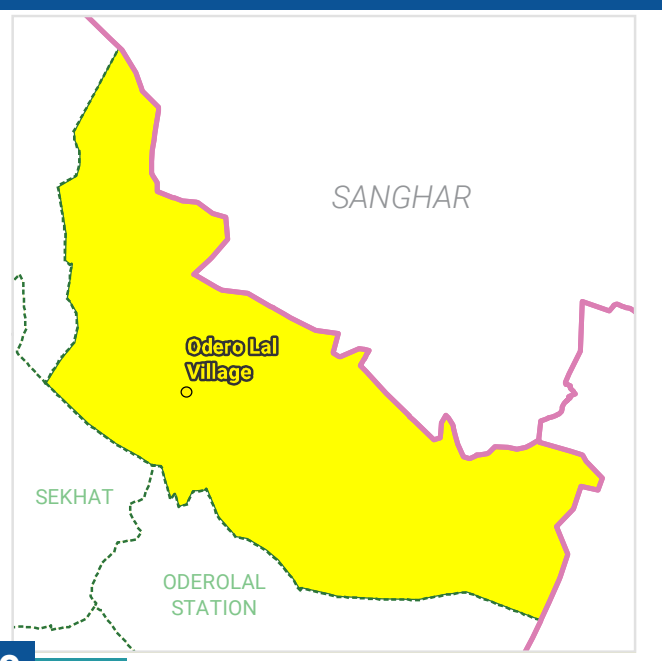
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

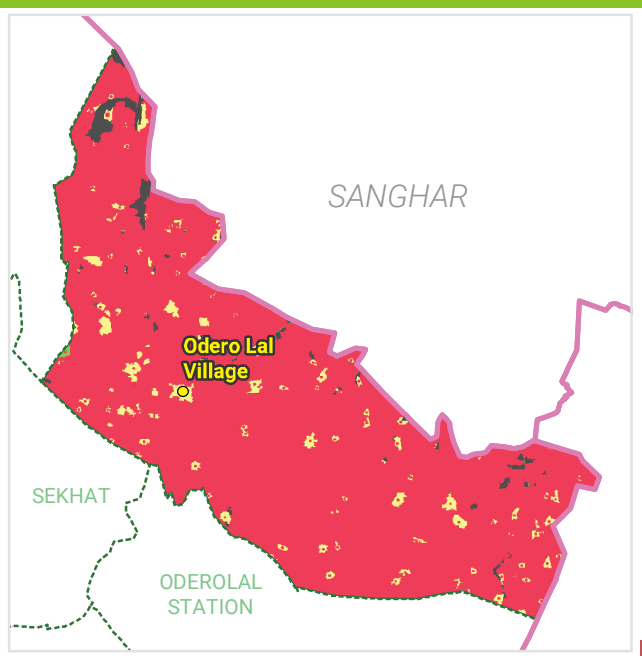


100 YEARS



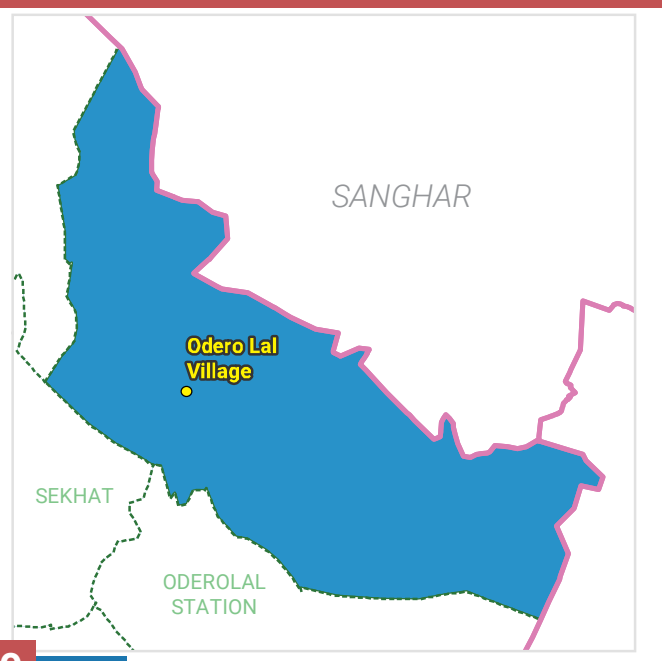
500 YEARS

VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

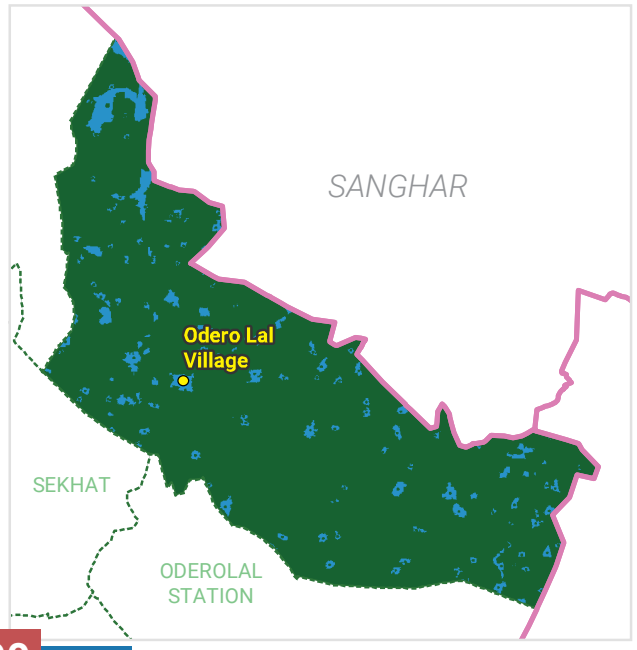
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

NO ELEMENTS AT RISK FOR CYCLONE

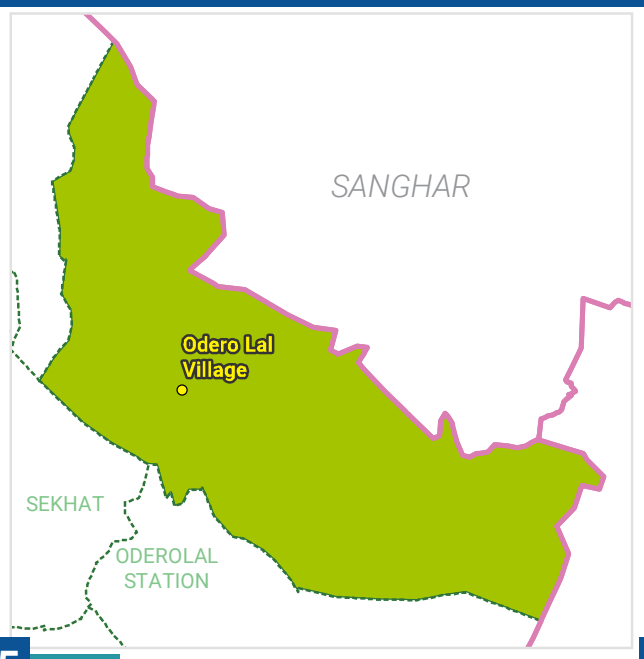
STORM SURGE

NO HAZARD OF STORM SURGE IN UC

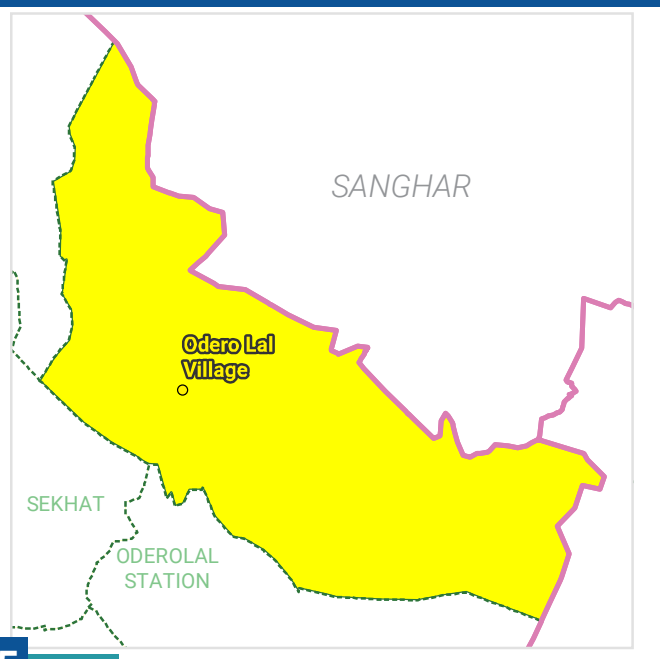
EARTHQUAKE

HAZARD AT DIFFERENT RETURN PERIODS

95 YEARS



475 YEARS



975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

EARTHQUAKE

HAZARD

2475 YEARS

VULNERABILITY

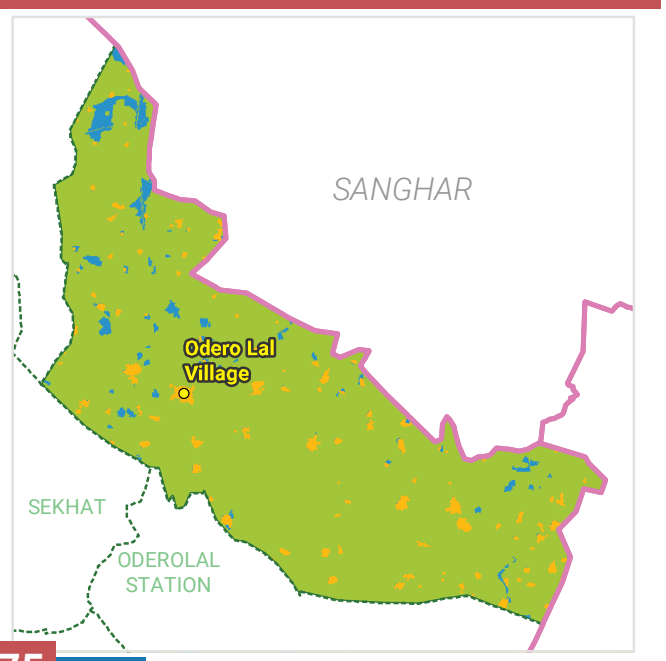
RISK

95 YEARS

RISK AT DIFFERENT RETURN PERIODS

475 YEARS

975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

138	18822	98478	137.06	0.06	0.00	0	0.12
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
4.83	0.02	282.65	7.37	39.07	0	1	1
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
126	0	0	0	3	0	2	4
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	2	1	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low Medium	Medium High Extreme	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	None	●	●	●
HEATWAVE	Low Medium	Low Medium	Low Medium High	Low Medium High	Low Medium Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - SAEED ABAD

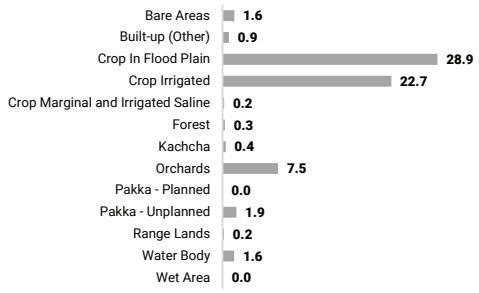
Union Council area in sq. km **66**

Surrounding UCs / Features **SHAH MIR RAHU** in North
BHALIDINO KAKA in North East
ZERPIR in East
SHAHEED BENAZIRABAD DISTRICT in North West
BHANOTH in West

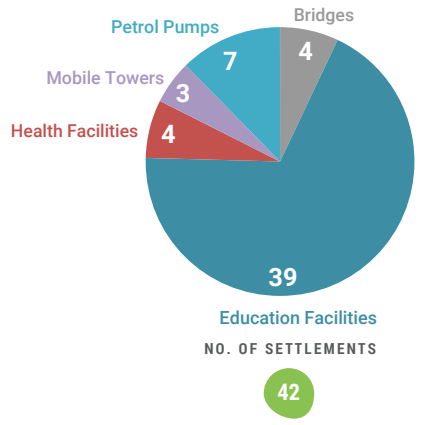
Population	2017 approx.	41,734
No. of household	2017 approx.	7,681

Land Use Land Cover

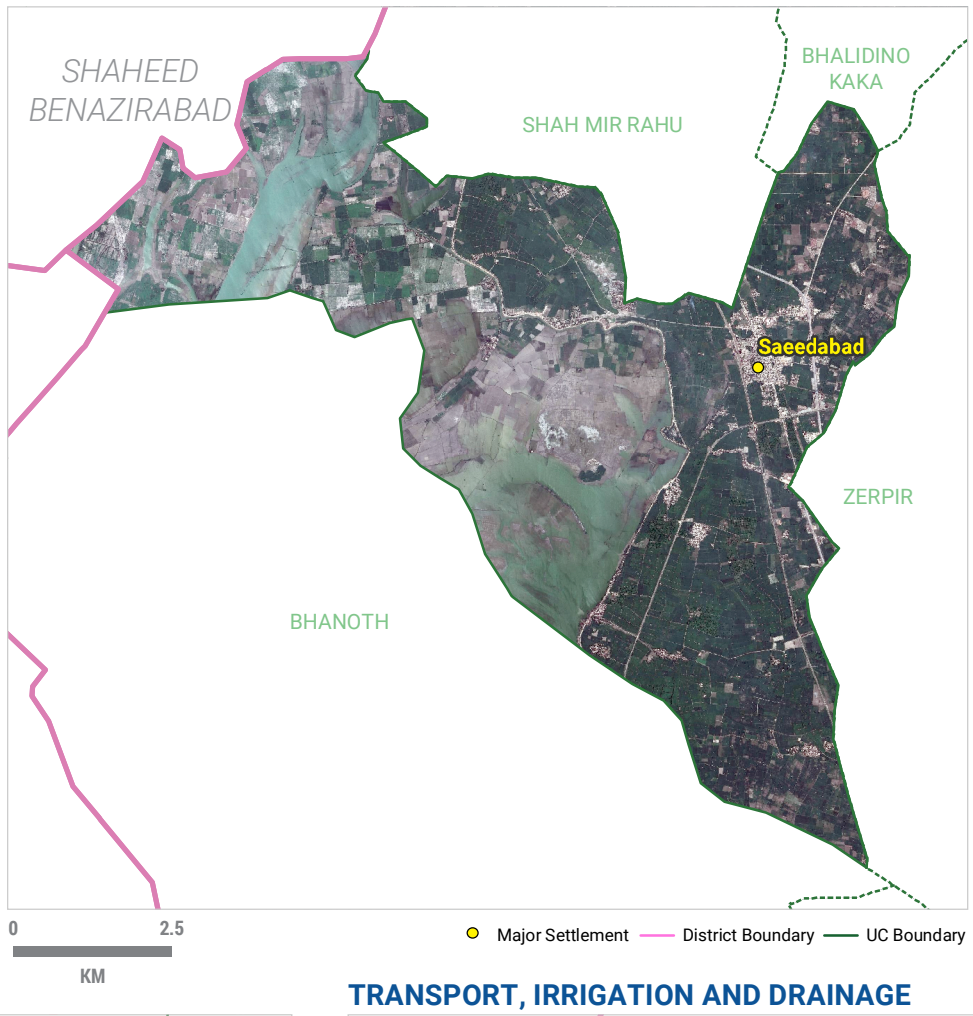
coverage area in sq.km



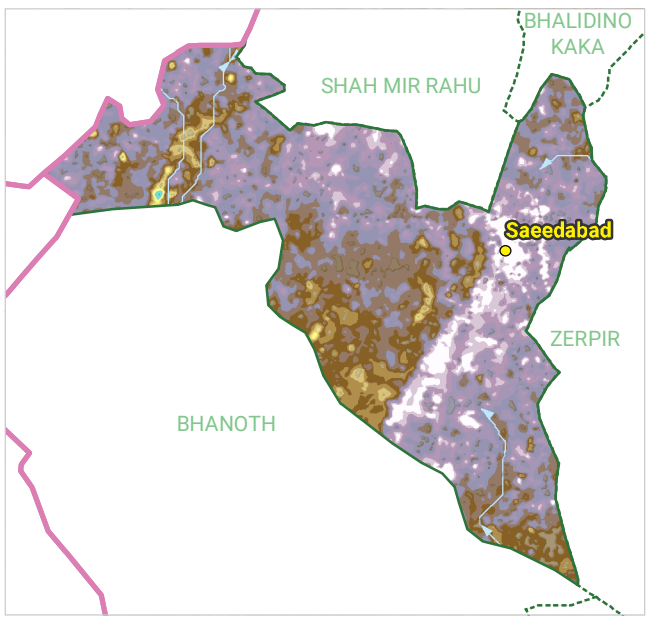
Critical Infrastructure



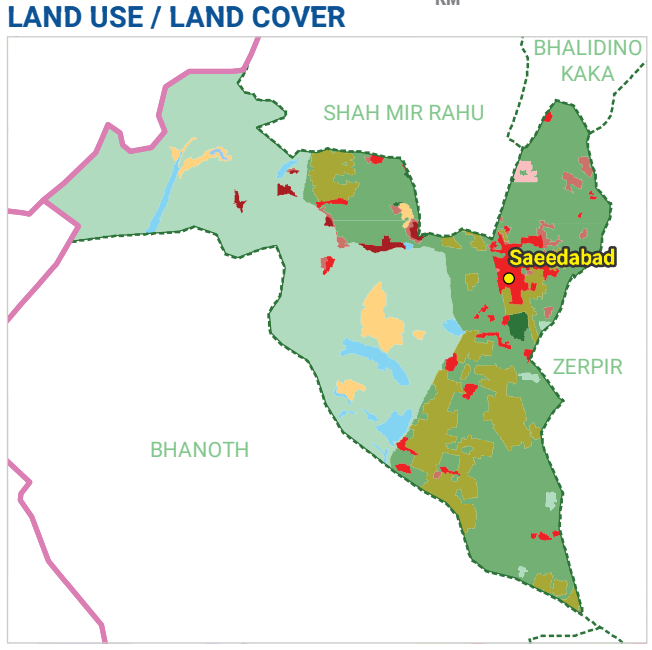
SATELLITE IMAGERY



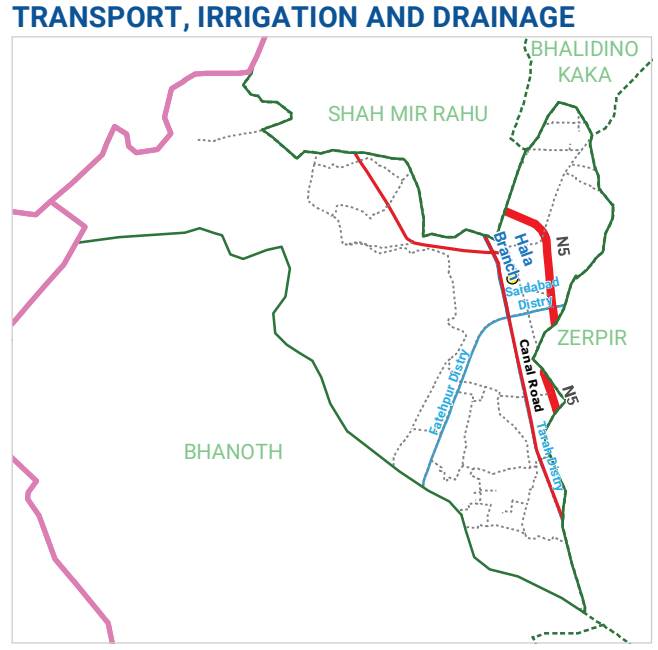
DEM AND FLOW DIRECTION



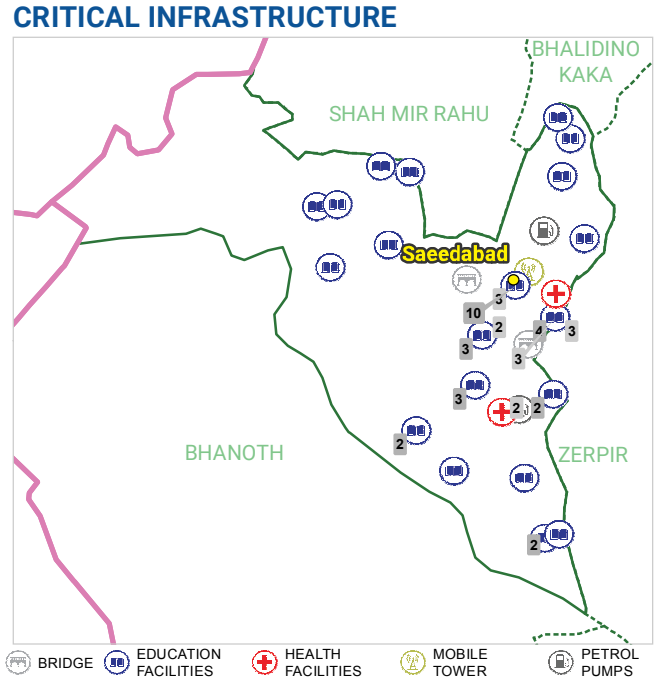
LAND USE / LAND COVER



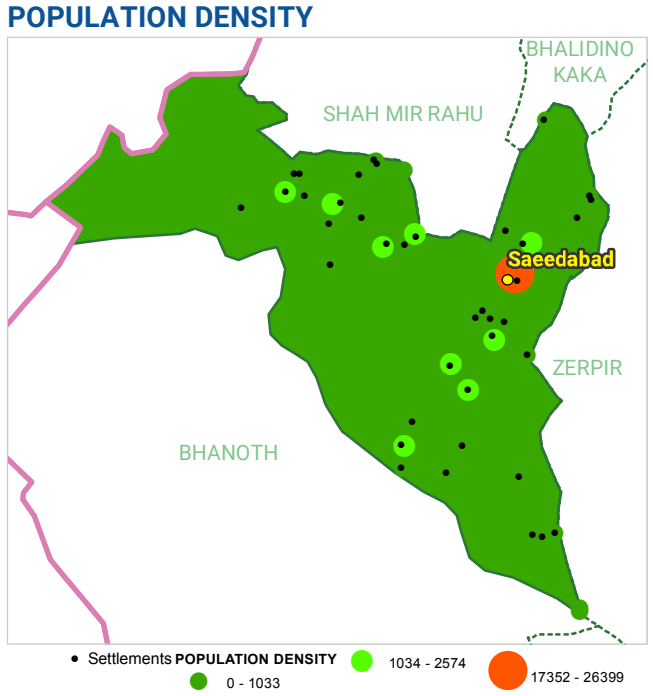
TRANSPORT, IRRIGATION AND DRAINAGE



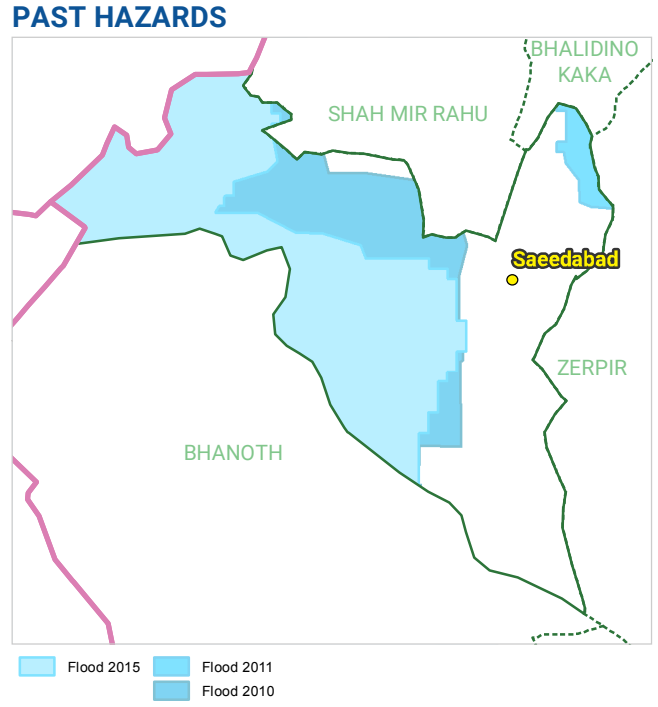
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

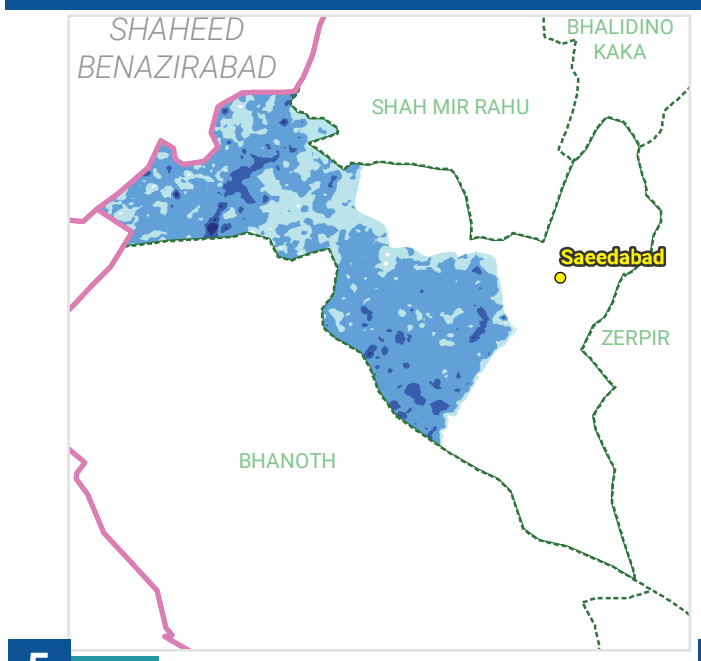


PAST HAZARDS

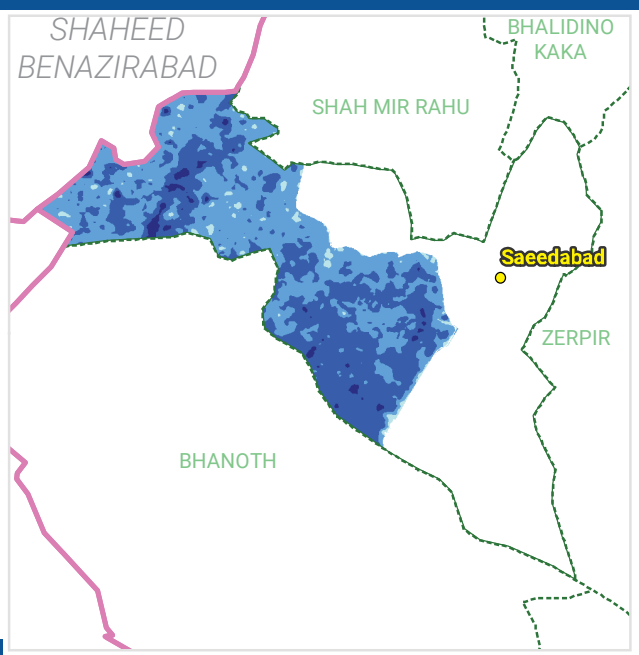


FLOOD

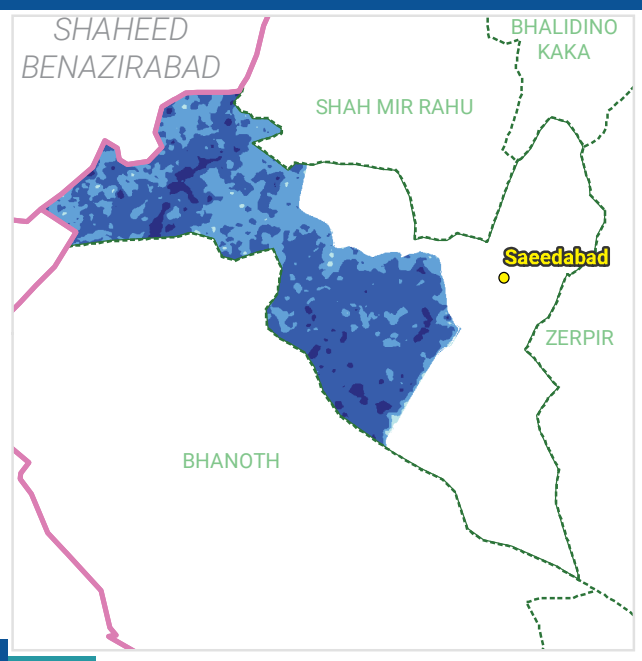
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

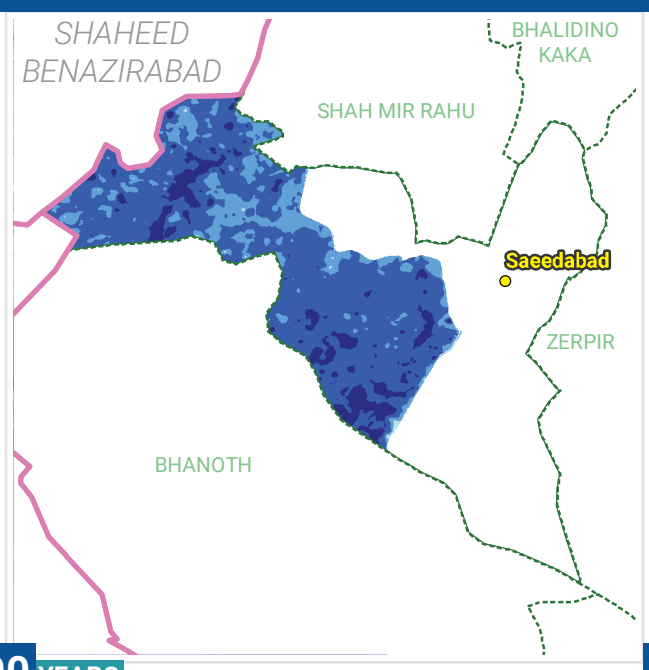


25 YEARS

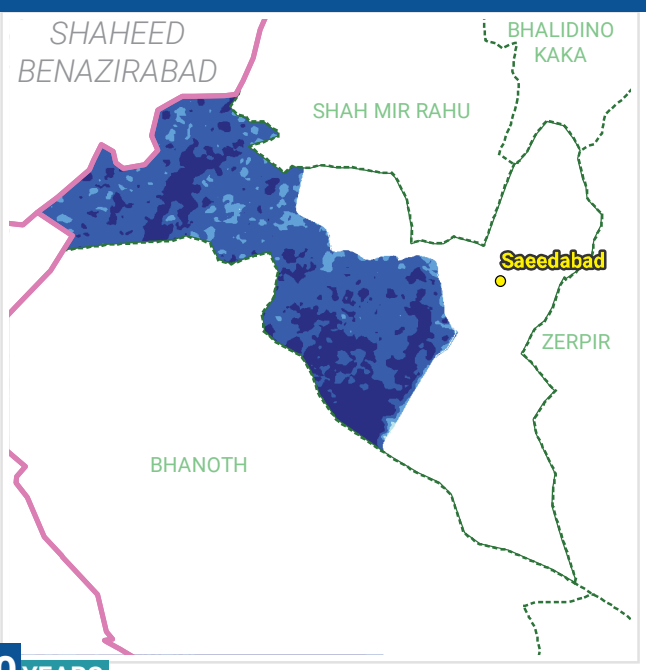


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

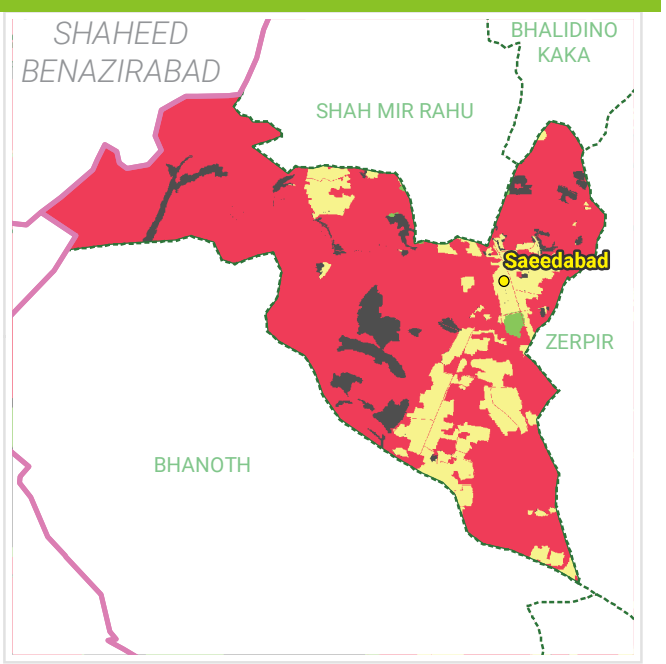


100 YEARS

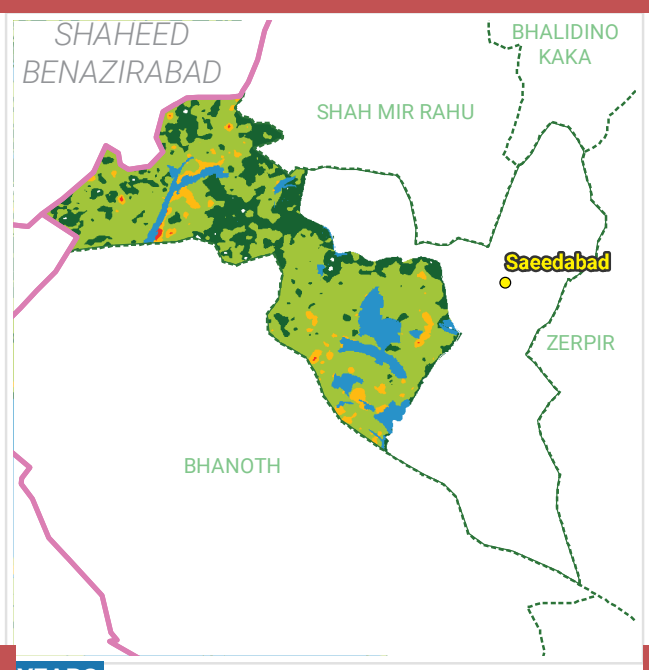


250 YEARS

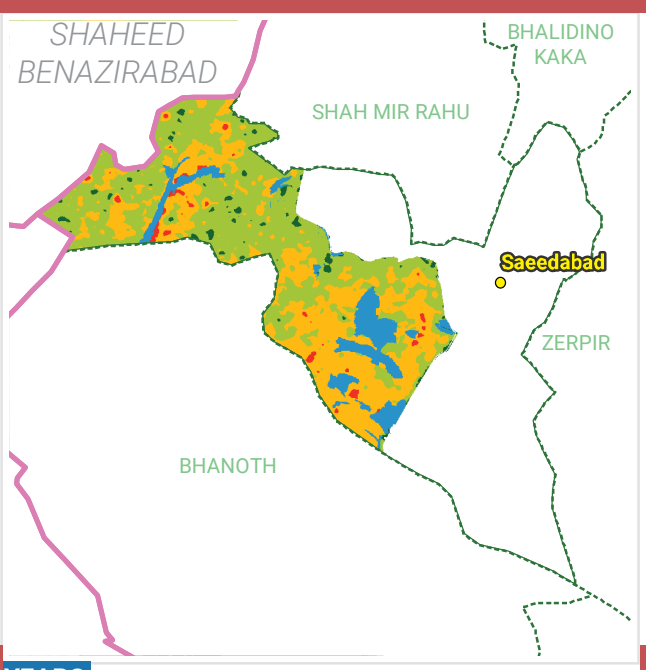
VULNERABILITY



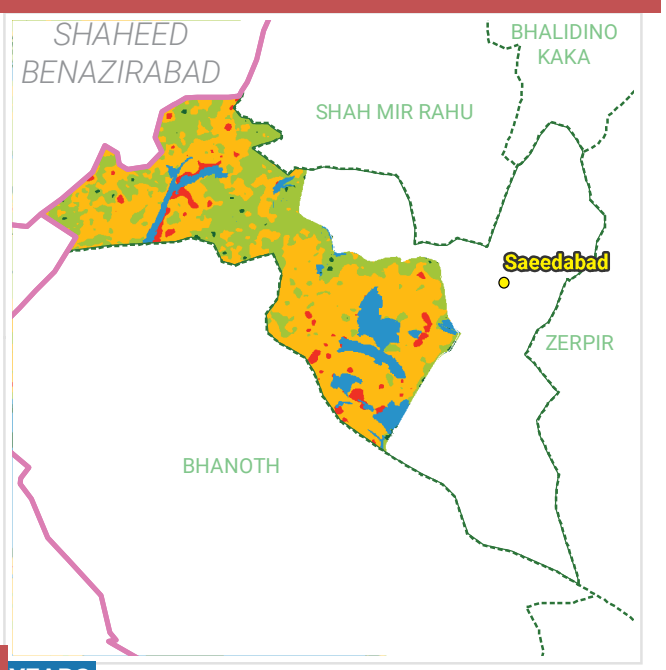
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

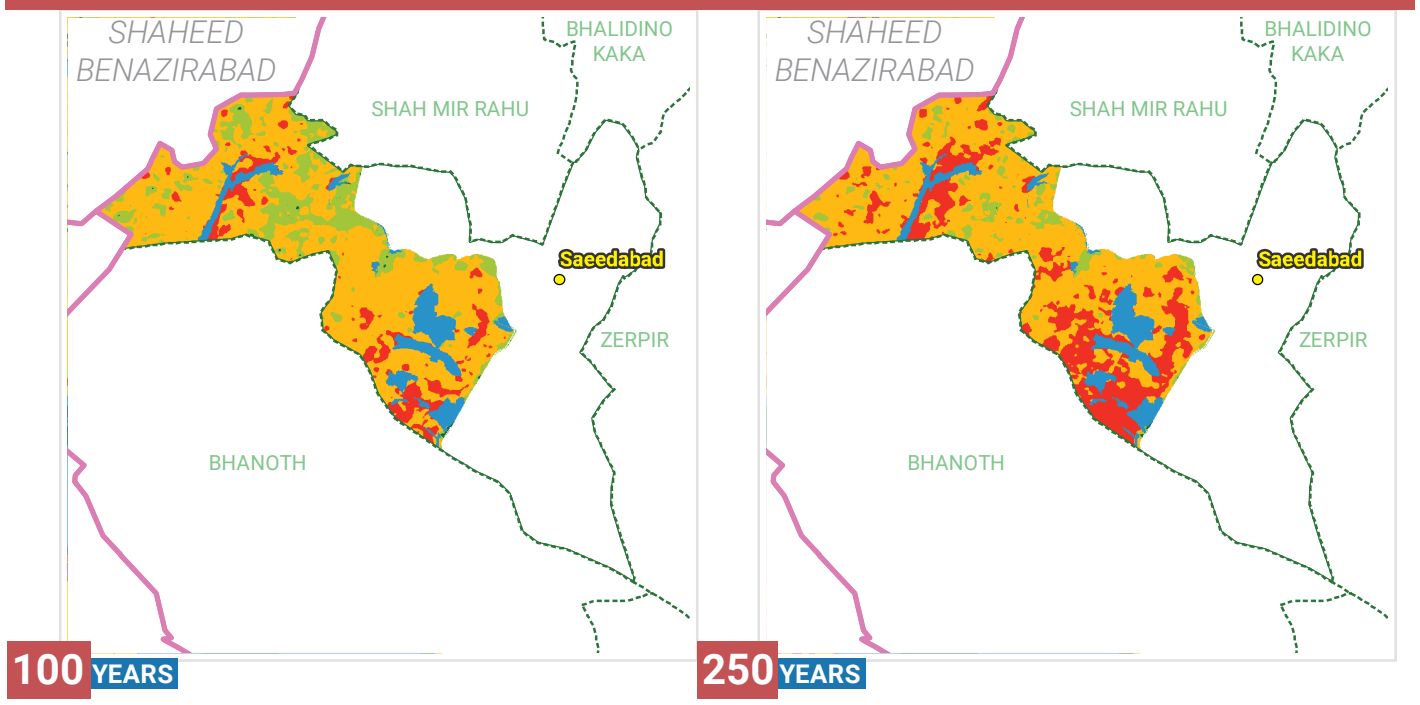
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



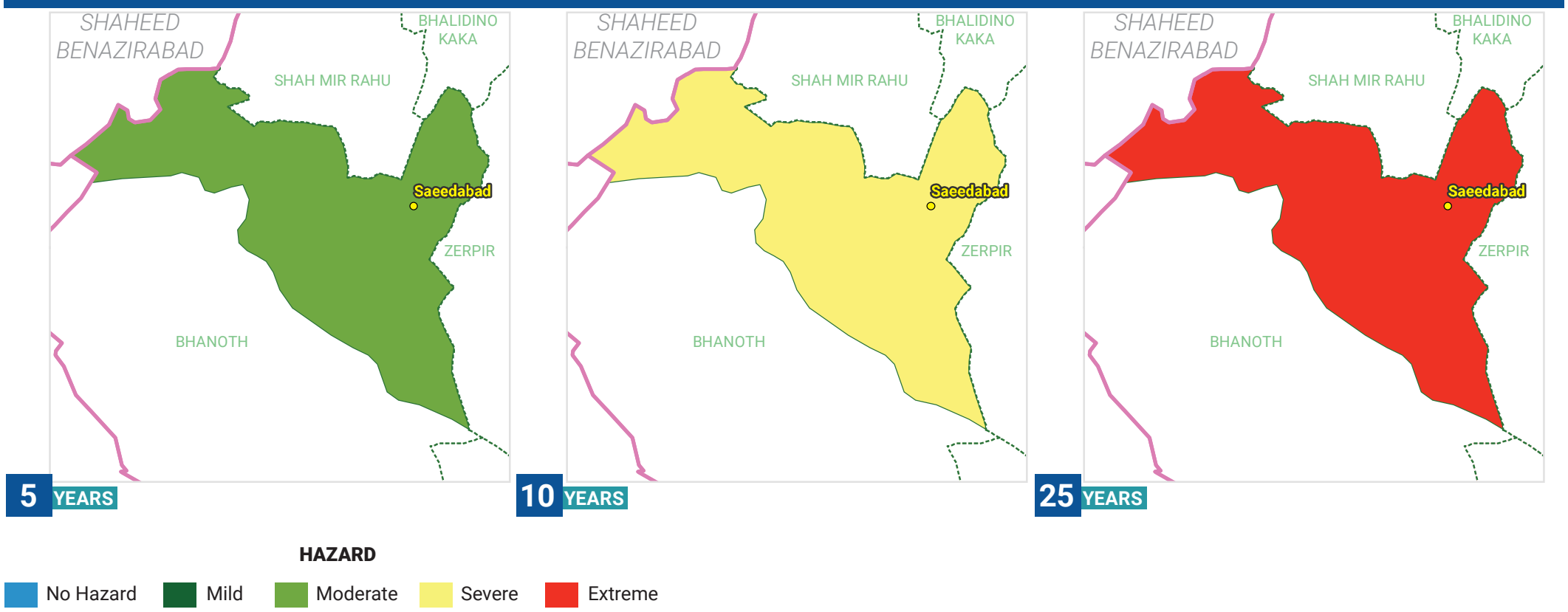
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

6	673	3458	28.51	0	0.18	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.06	0	2.64	0	0	0	0	1
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

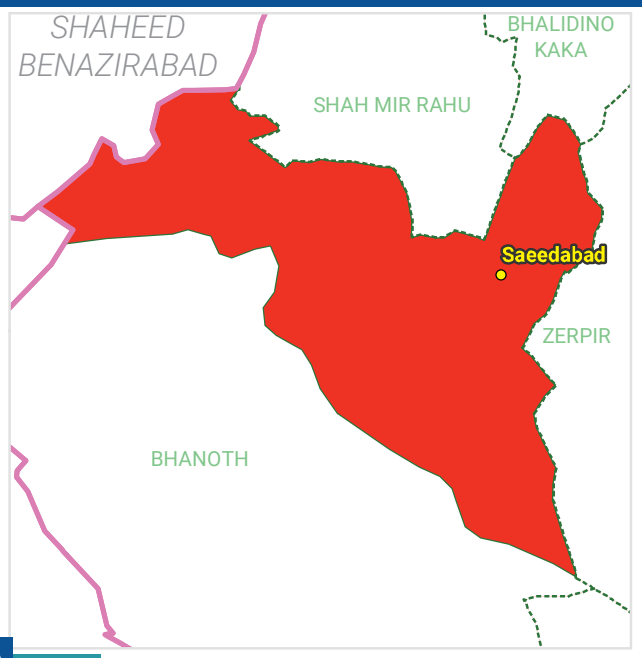
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



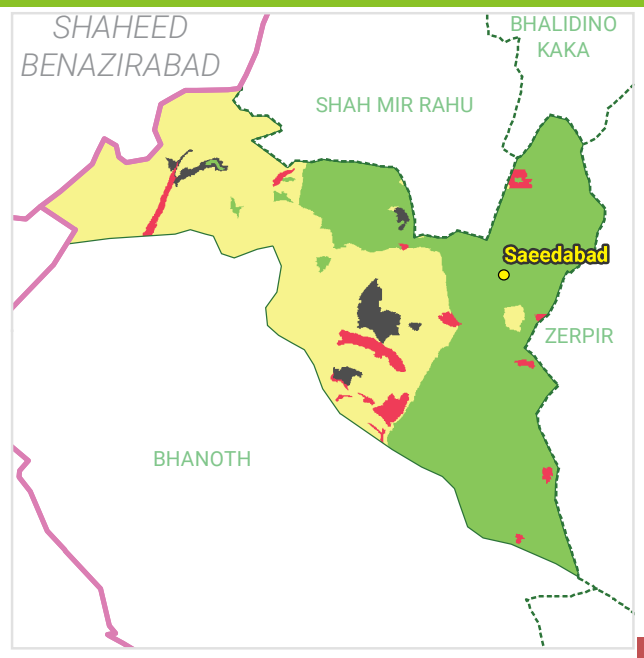
METEOROLOGICAL DROUGHT

HAZARD

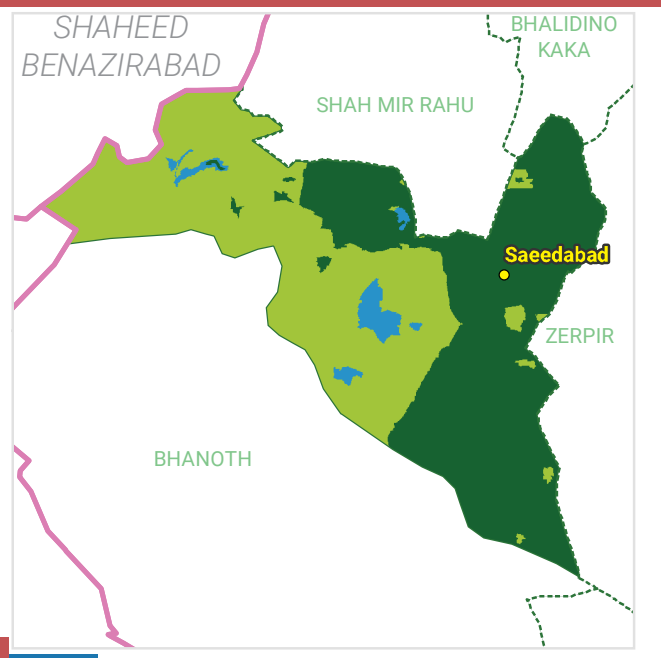


50 YEARS

VULNERABILITY

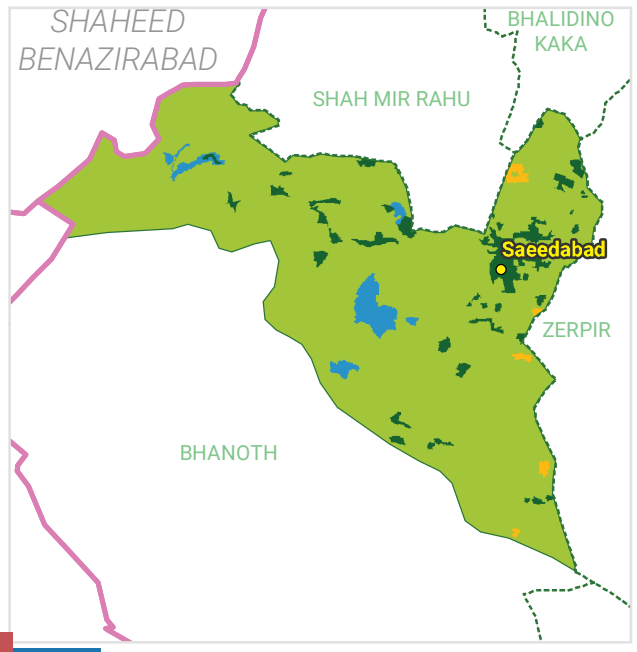


RISK

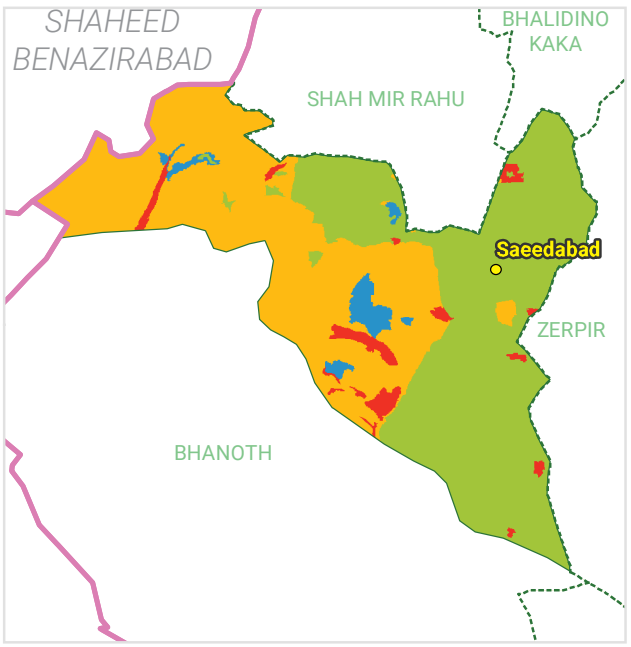


5 YEARS

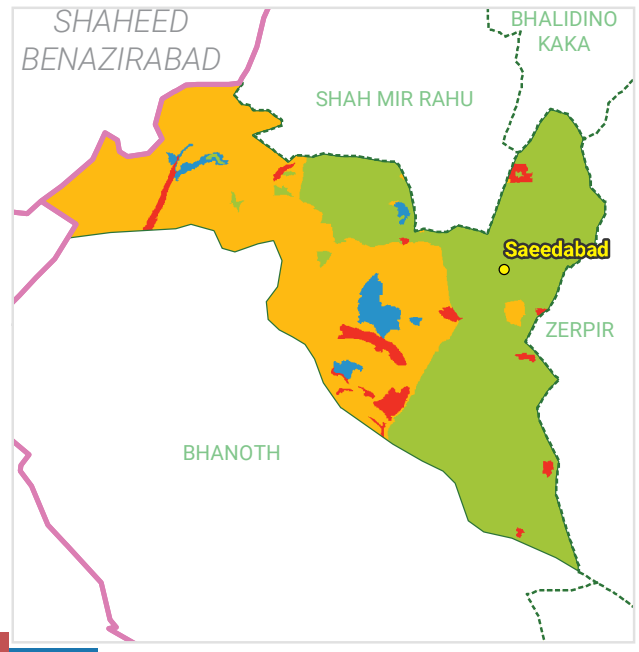
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard, Mild, Moderate, Severe, Extreme

VULNERABILITY

None 0 - 25, Low 26 - 50, Medium 51 - 75, High 76 - 100

RISK

Very Low 0 - 49, Low 50 - 99, Medium 100 - 199, High 200 - 249, Extreme 250 - 300

ELEMENTS AT RISK

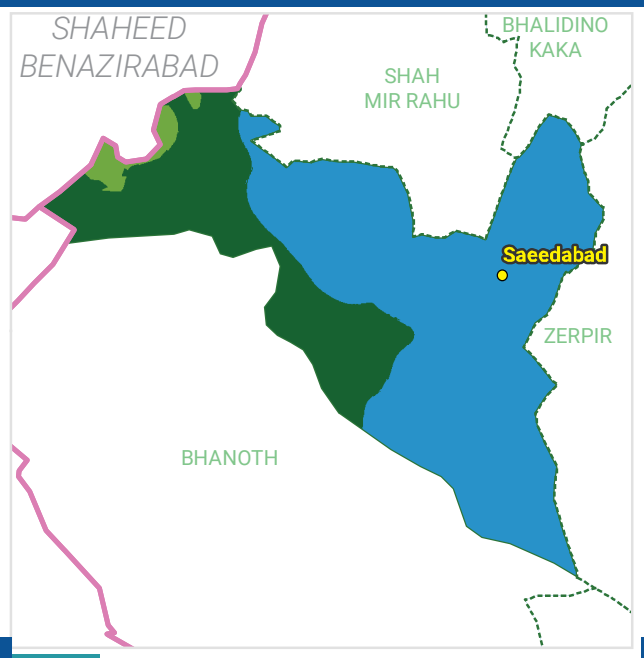
(BASED ON 50 YEARS RETURN PERIOD)

42	7681	41734	59.21	0	0.30	0	0.20
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

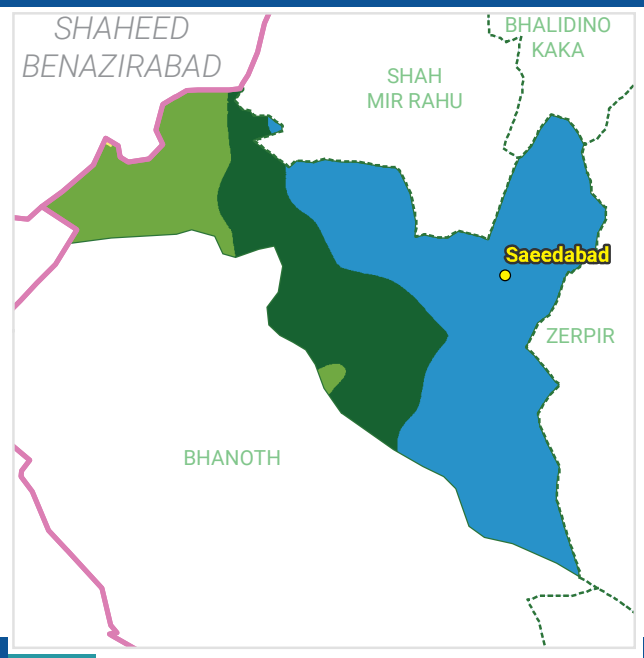
1.57	0.04
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

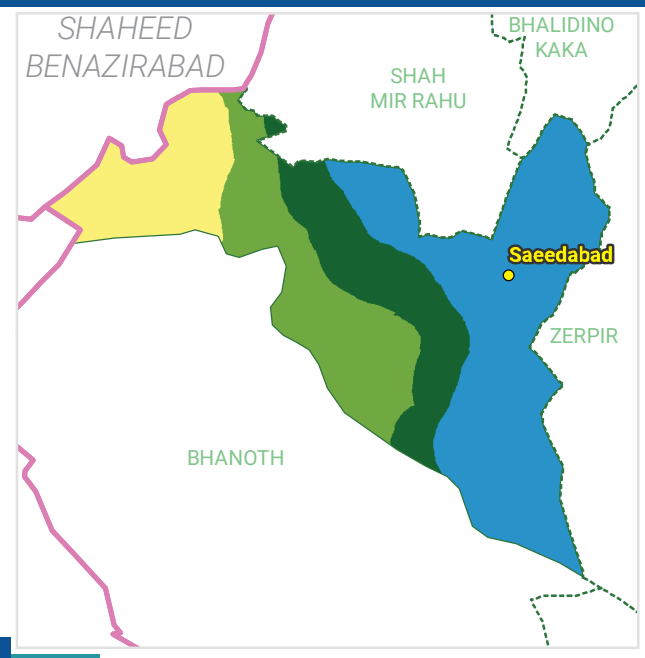
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

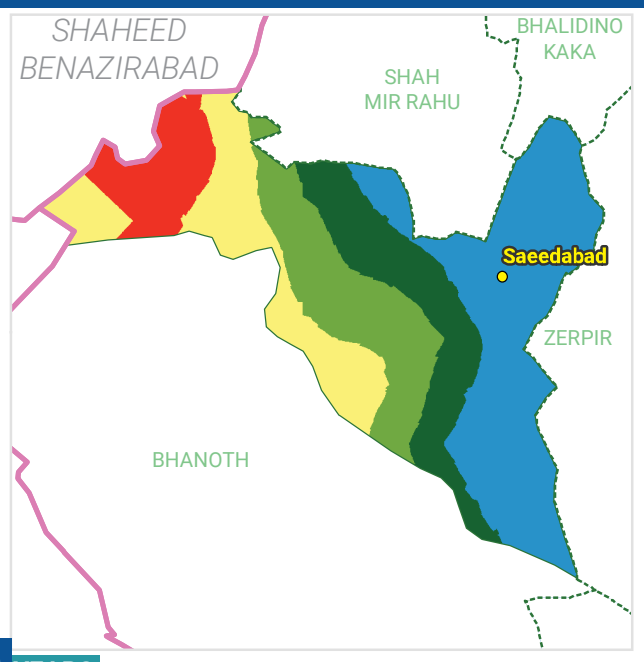


10 YEARS



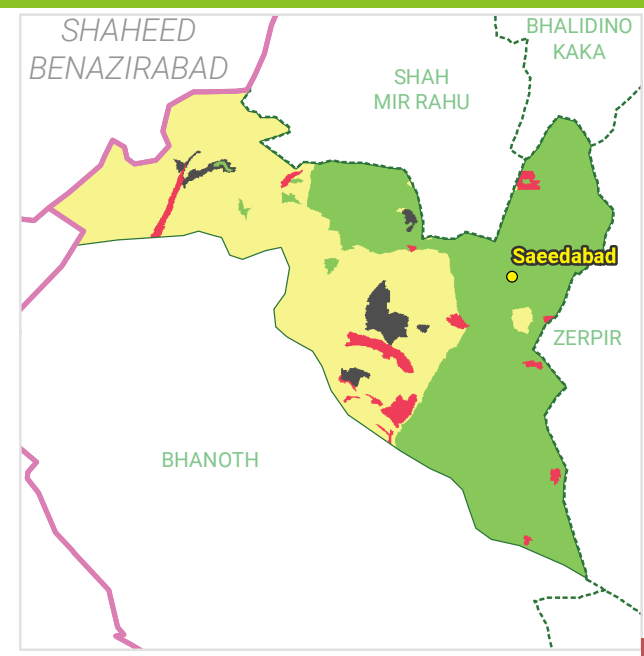
25 YEARS

HAZARD

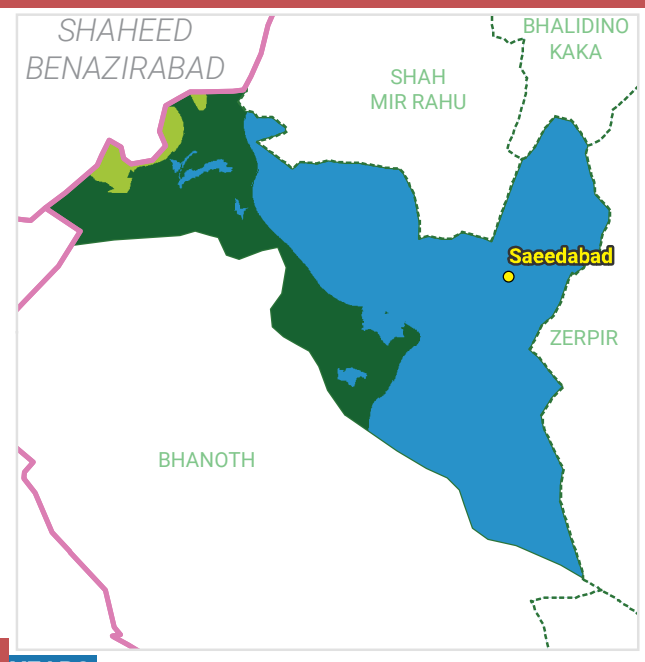


50 YEARS

VULNERABILITY

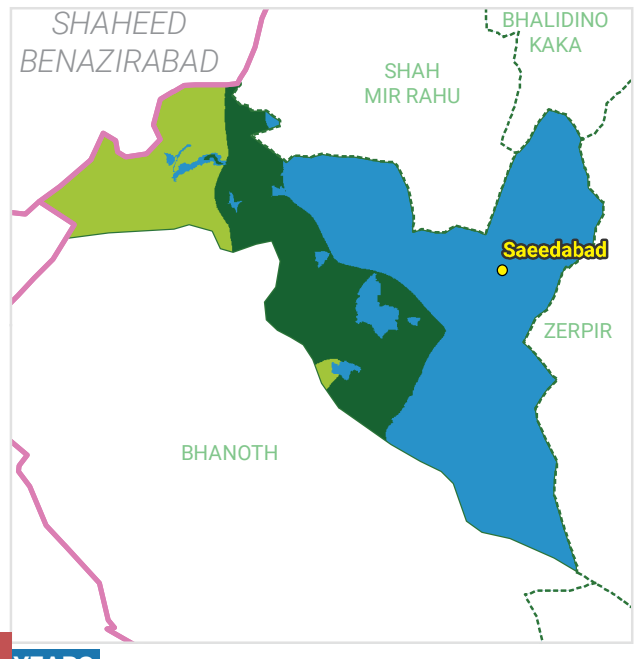


RISK

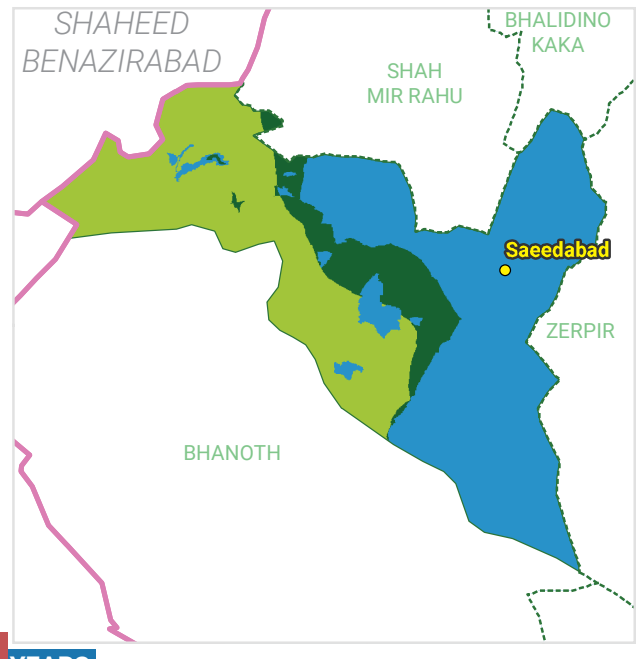


5 YEARS

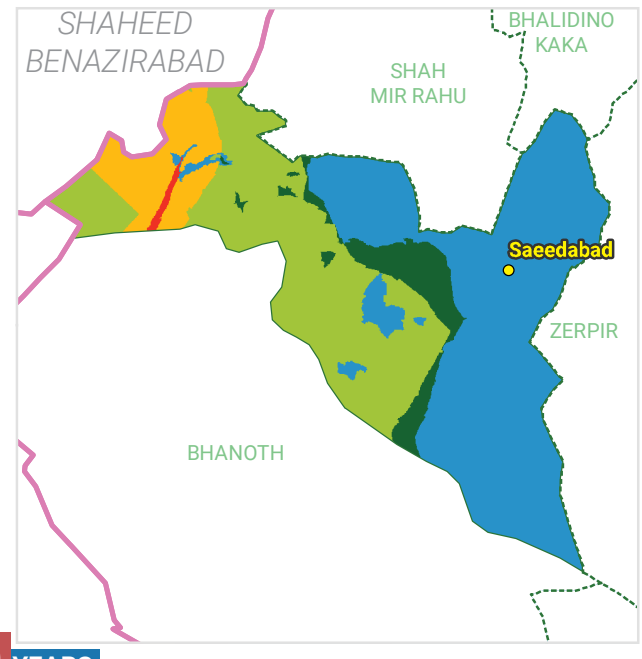
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

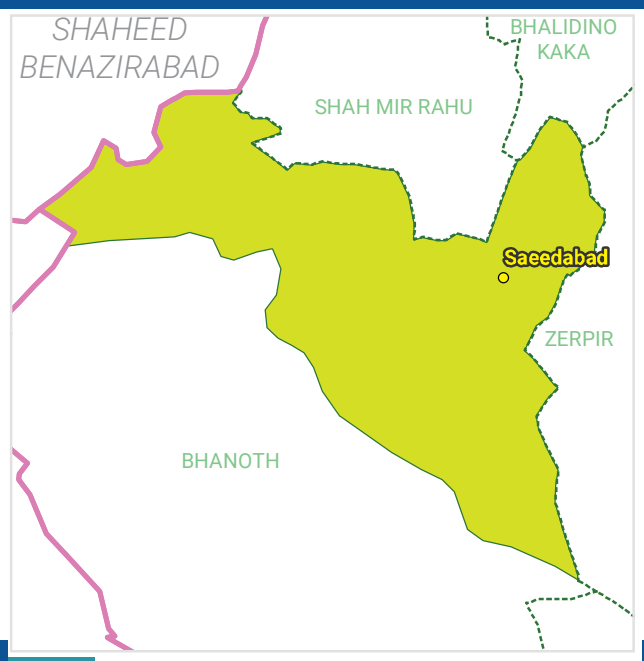
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

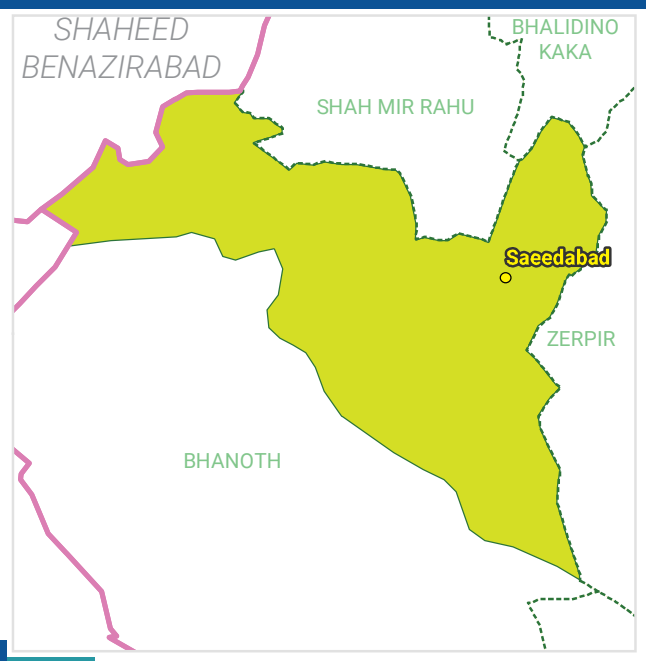
10	1103	5647	36.82	0	0	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)
1.94	0.05						
WATER BODY (SQ. KM)	WET AREA (SQ. KM)						

HEATWAVE

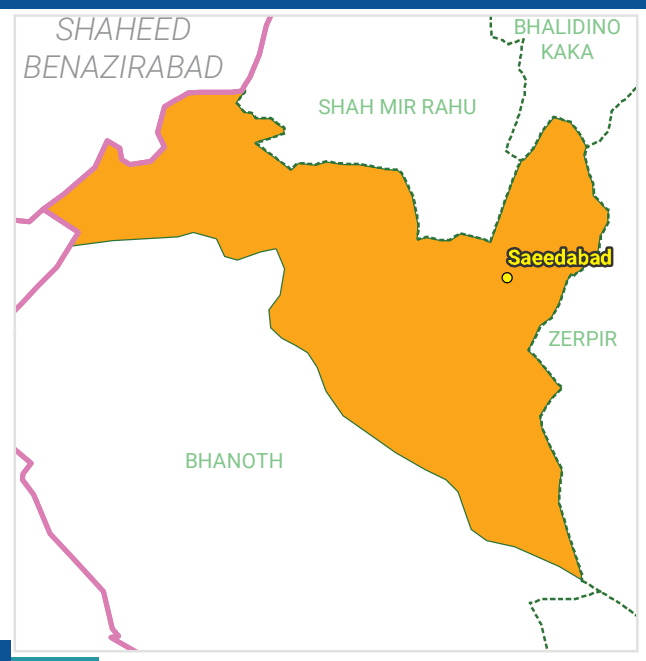
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

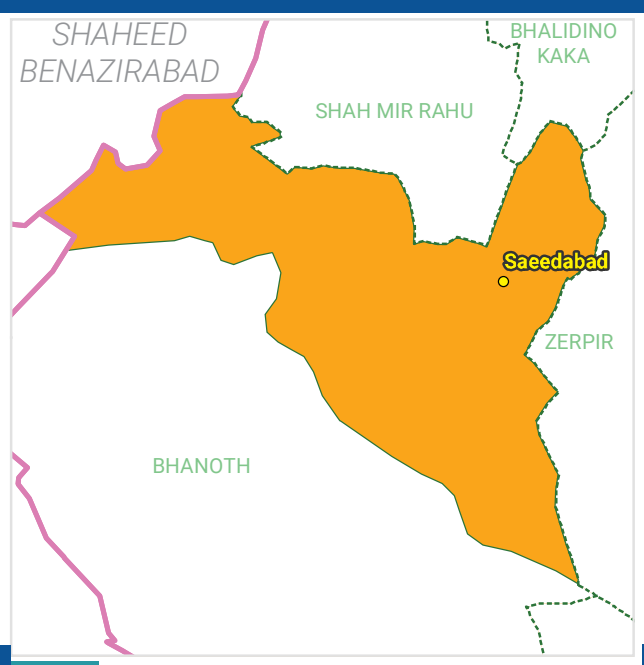


10 YEARS

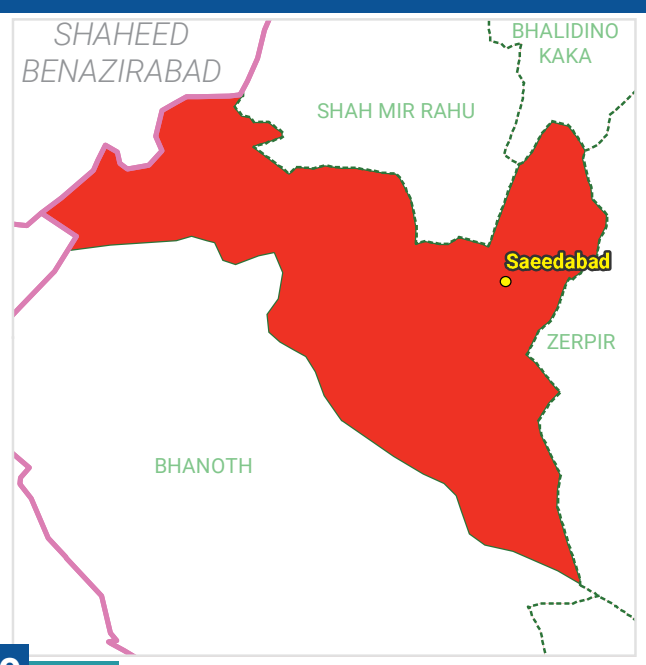


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

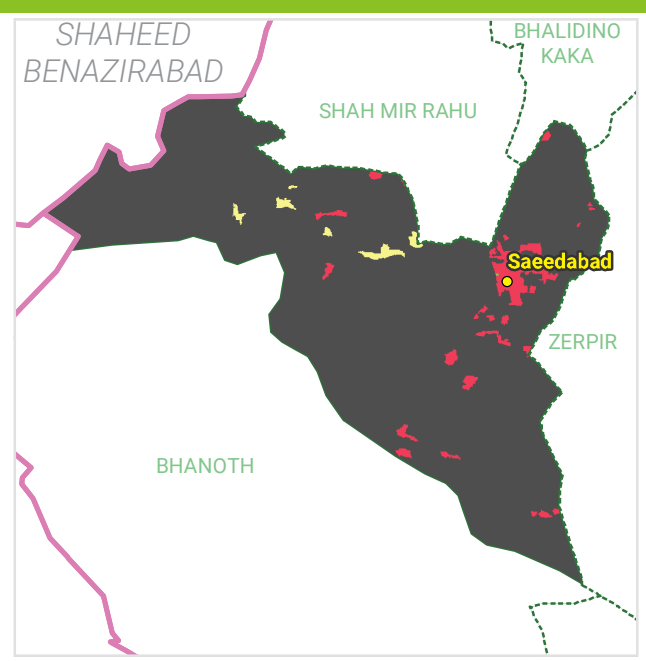


50 YEARS



100 YEARS

VULNERABILITY



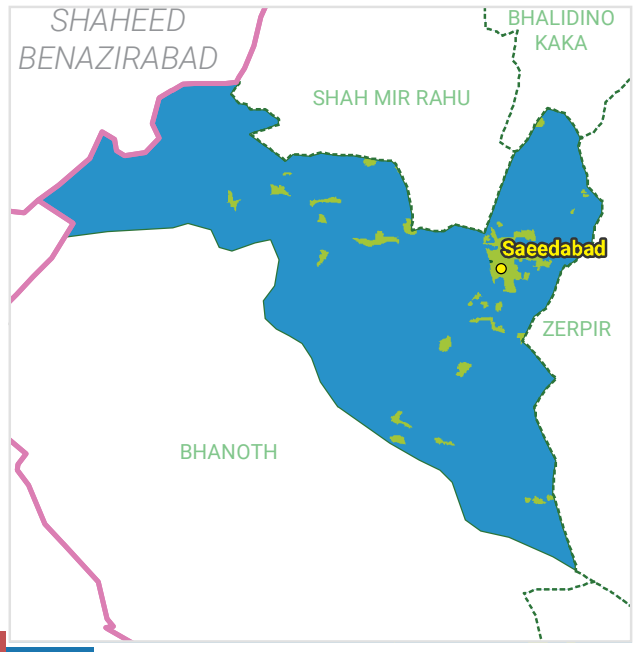
HAZARD

Normal | Moderate | High | Severe | Extreme

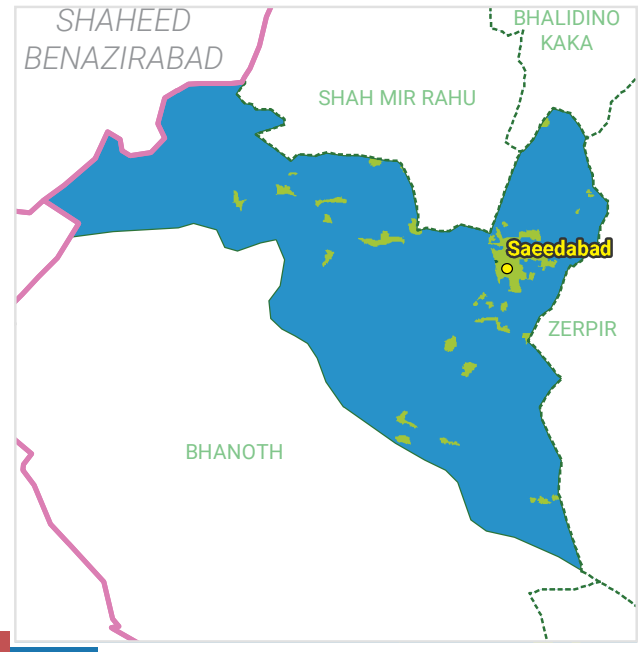
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

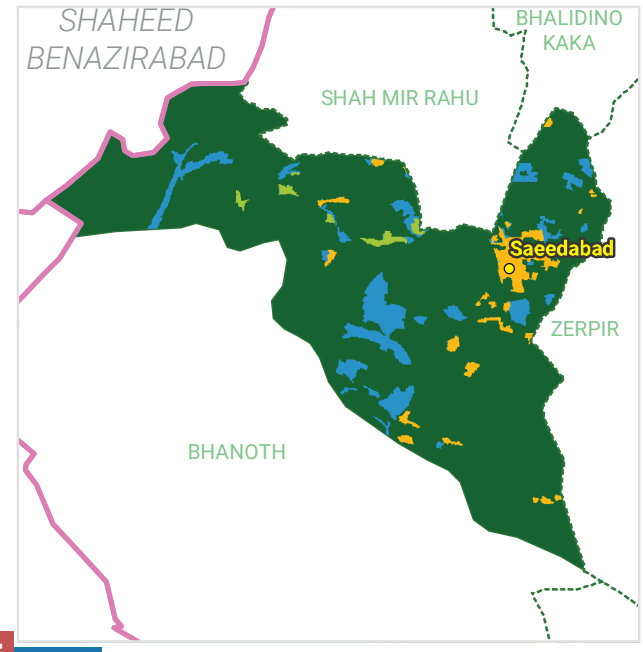
RISK AT DIFFERENT RETURN PERIODS



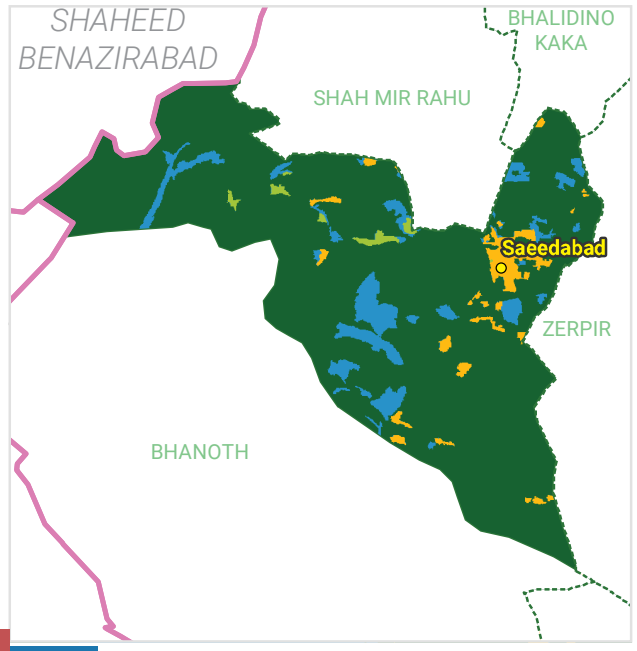
5 YEARS



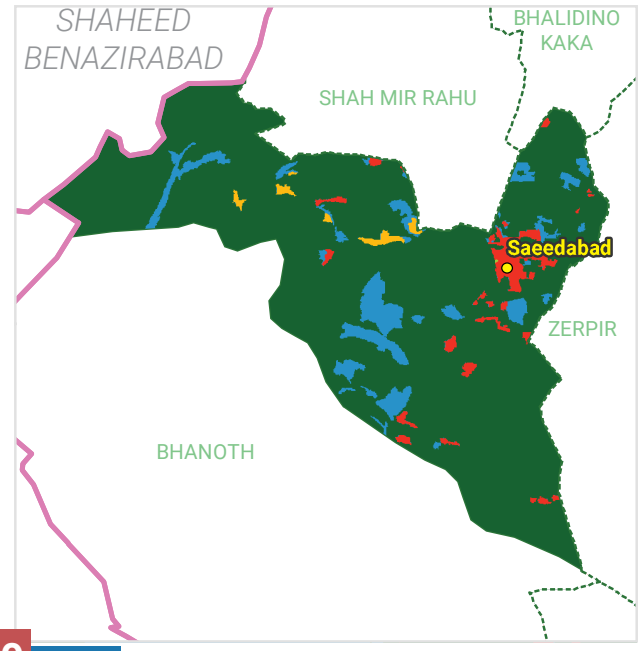
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

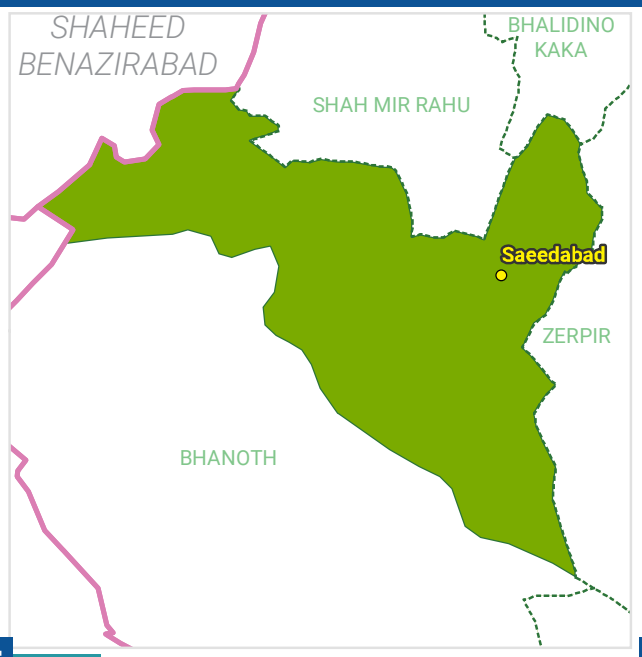
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

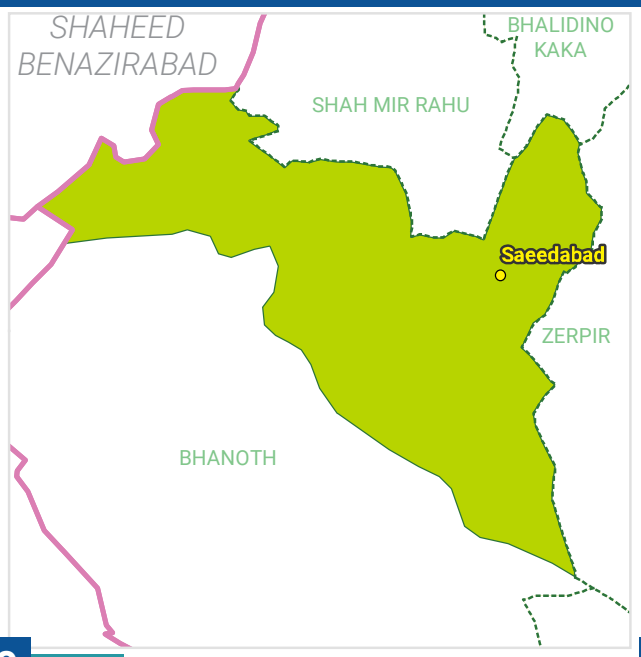
41	7638	41493	59.07	0.42	0.01	1.86
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

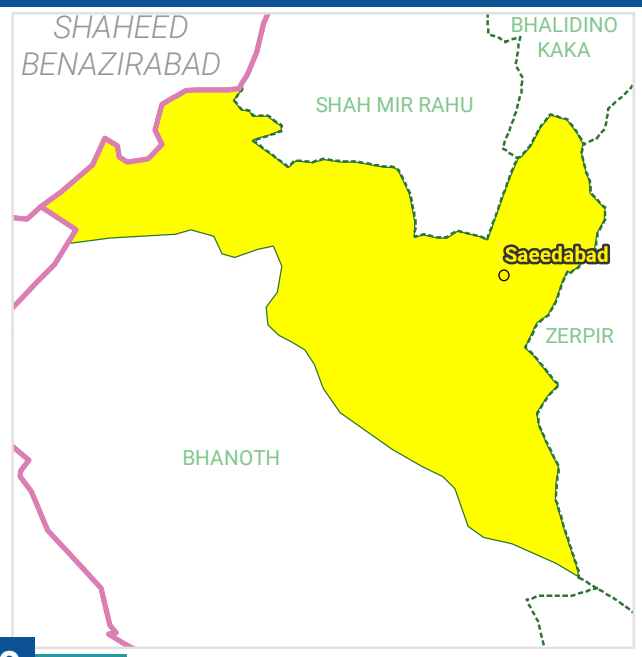
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

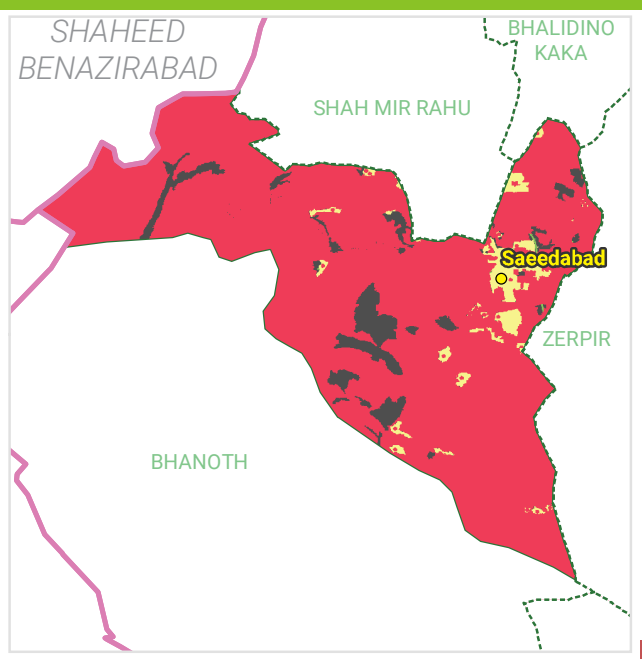


100 YEARS



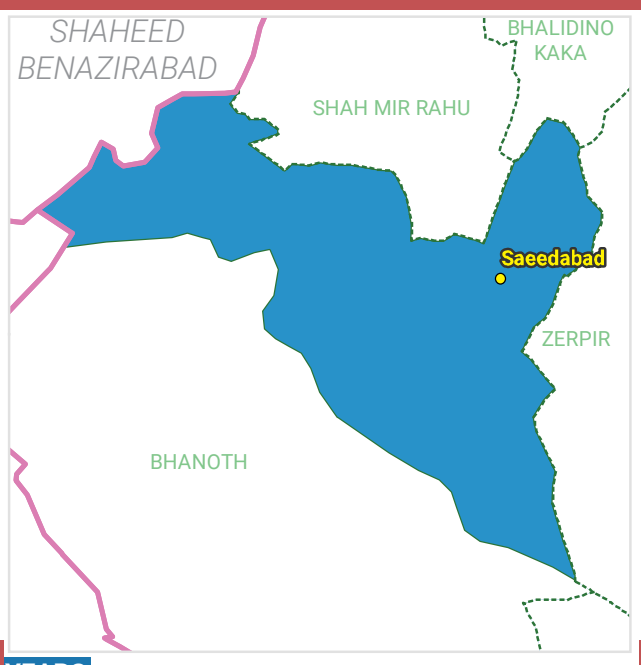
500 YEARS

VULNERABILITY

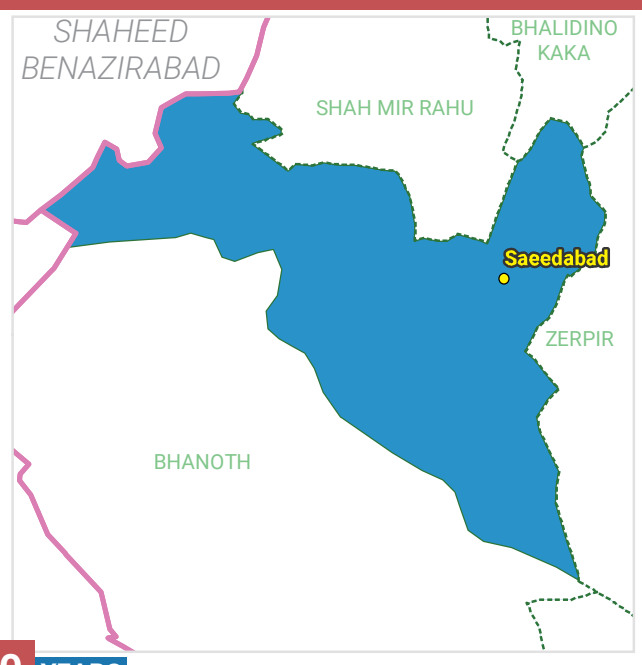


25 YEARS

RISK AT DIFFERENT RETURN PERIODS

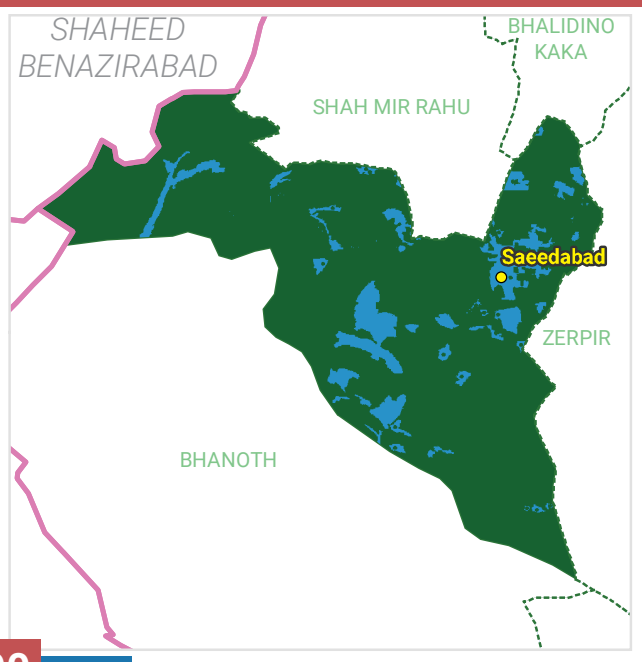


100 YEARS



500 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

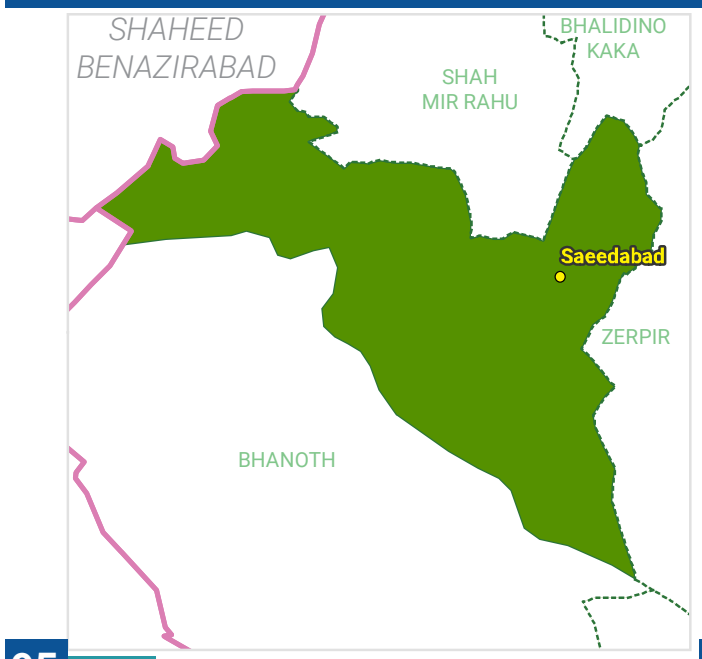
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

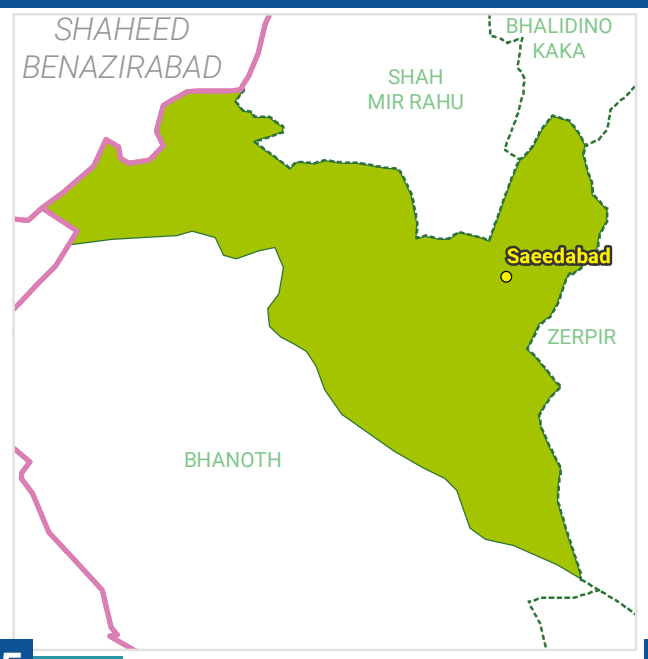
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

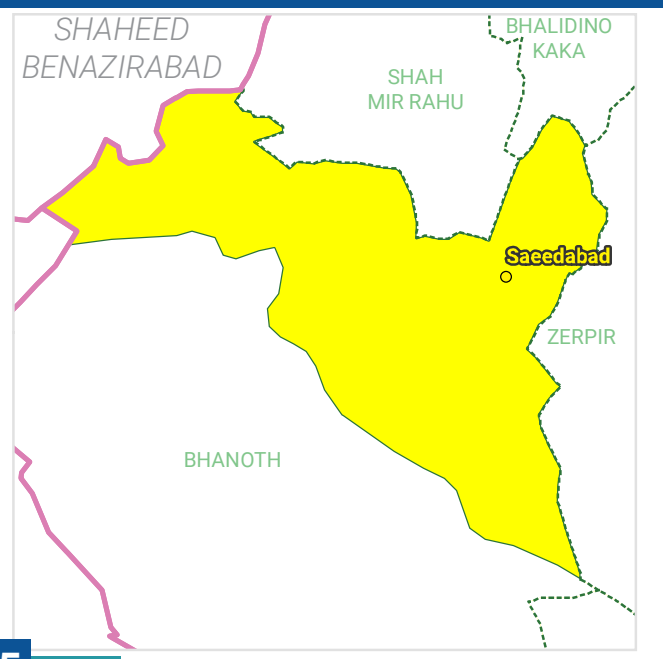
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

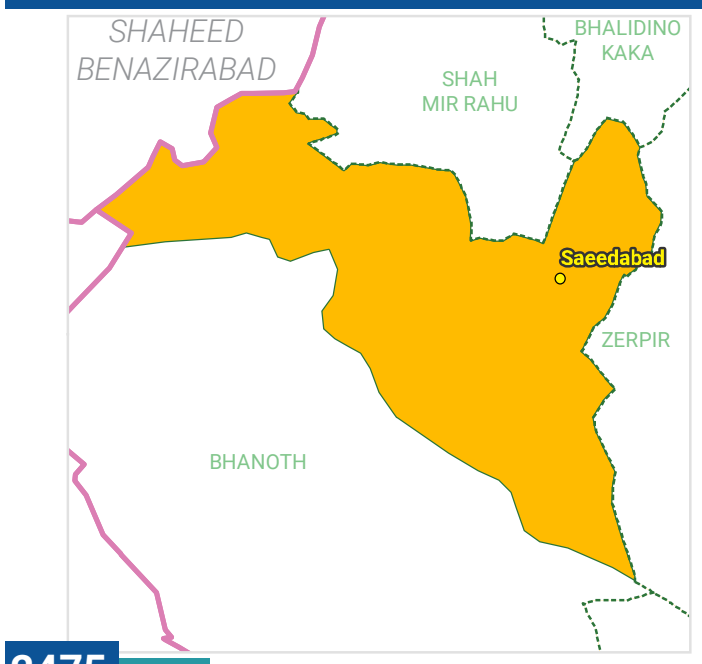


475 YEARS



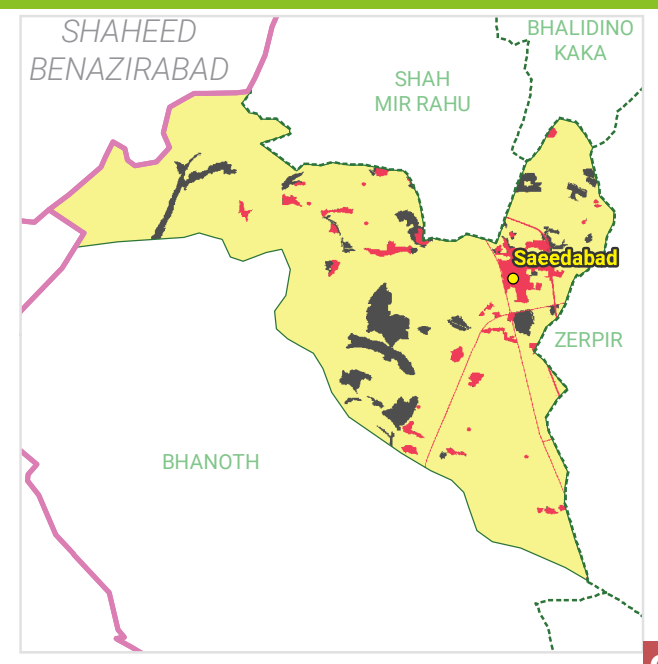
975 YEARS

HAZARD

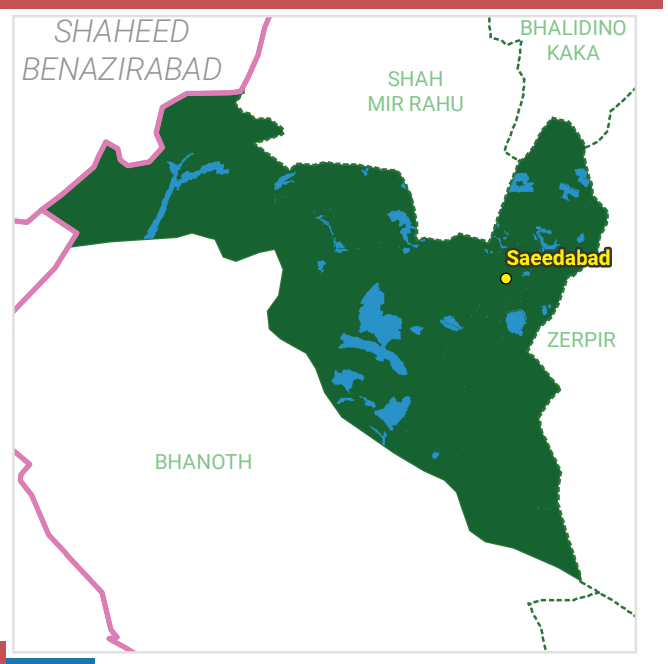


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3
Zone 4 | Zone 5 | Zone 6

VULNERABILITY

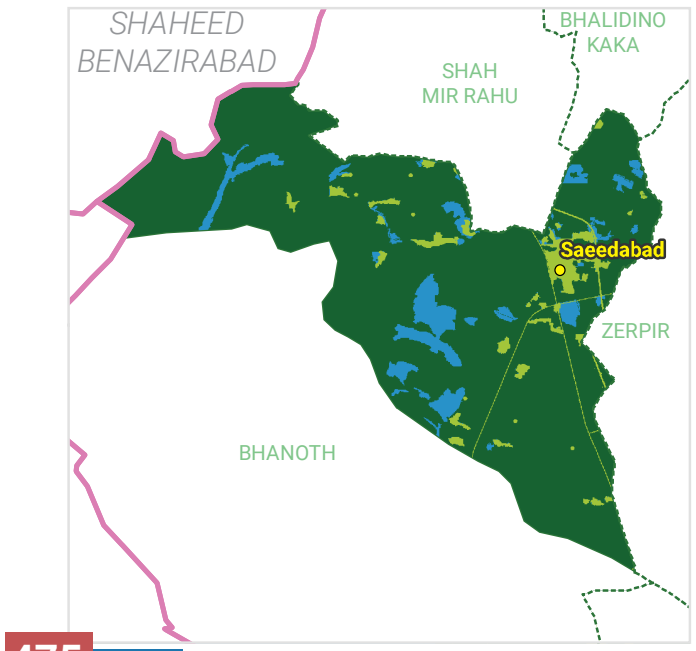
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

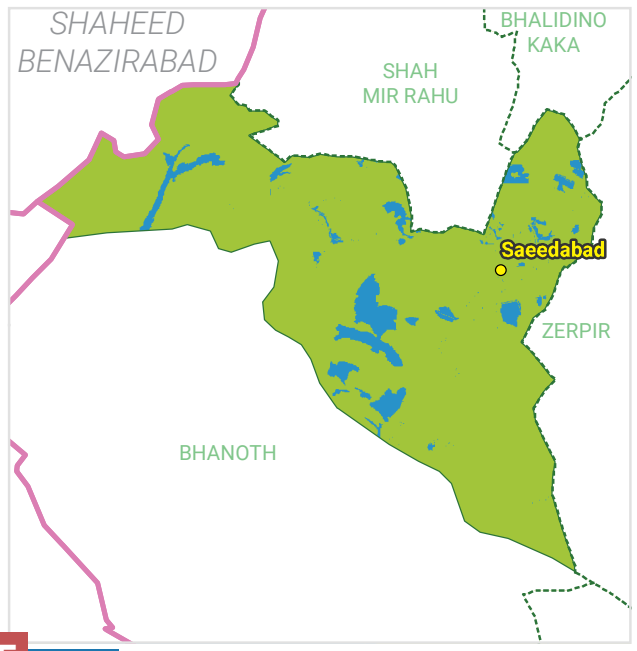
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

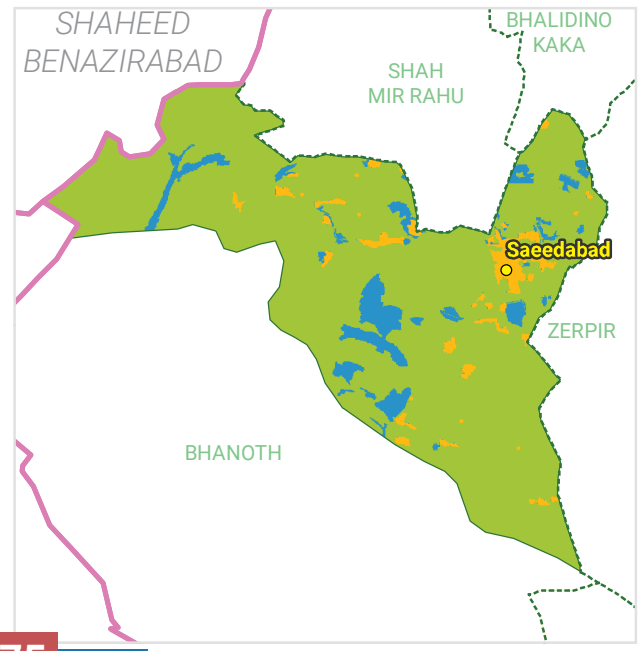
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

42	7621	41411	59.10	0.02	0.42	0	0.01
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.85	0.00	80.84	0	13.35	0	4	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
39	0	0	0	4	0	3	7
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low, Medium, High, Extreme	●	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	●
METEOROLOGICAL DROUGHT	Low, Medium	Low, Medium, High	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	Low, Medium	Low, Medium	Low, Medium	Low, Medium, High, Extreme	●	●	●
HEATWAVE	Low, Medium	Low, Medium	Low, Medium, High	Low, Medium, High	Low, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

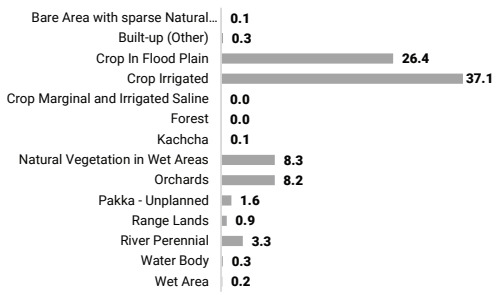
Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - SEKHAT

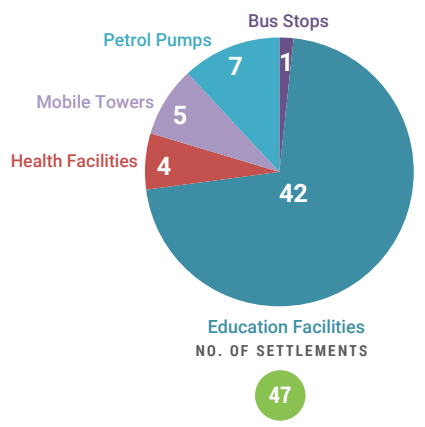
Union Council area in sq. km	87
Surrounding UCs / Features	**MATIARI** in South **FAQEER NOOH HOTHYAI** in North **BAU KHAN PATHAN** in South East **ODEROLAL VILLAGE** in East **JAMSHORO DISTRICT** in West
Population	2017 approx. **35,696**
No. of household	2017 approx. **6,870**

Land Use Land Cover

coverage area in sq.km



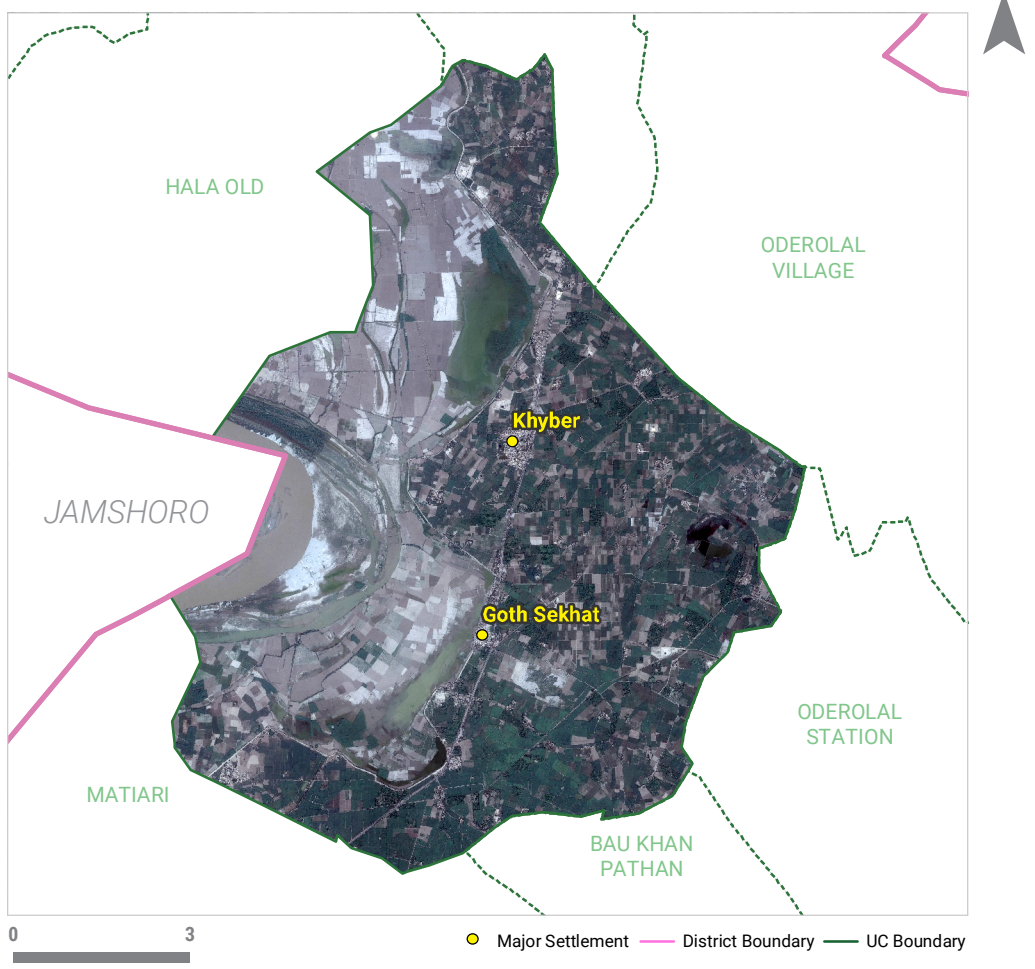
Critical Infrastructure



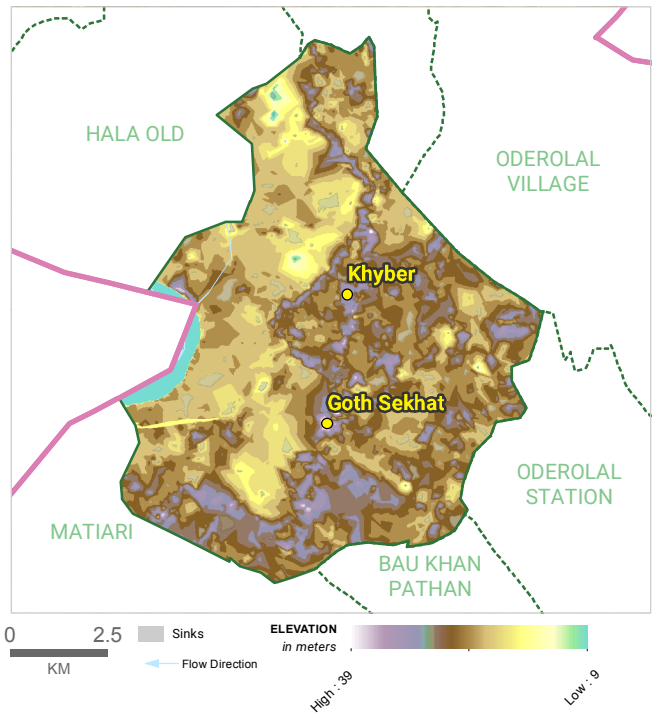
NO. OF SETTLEMENTS

47

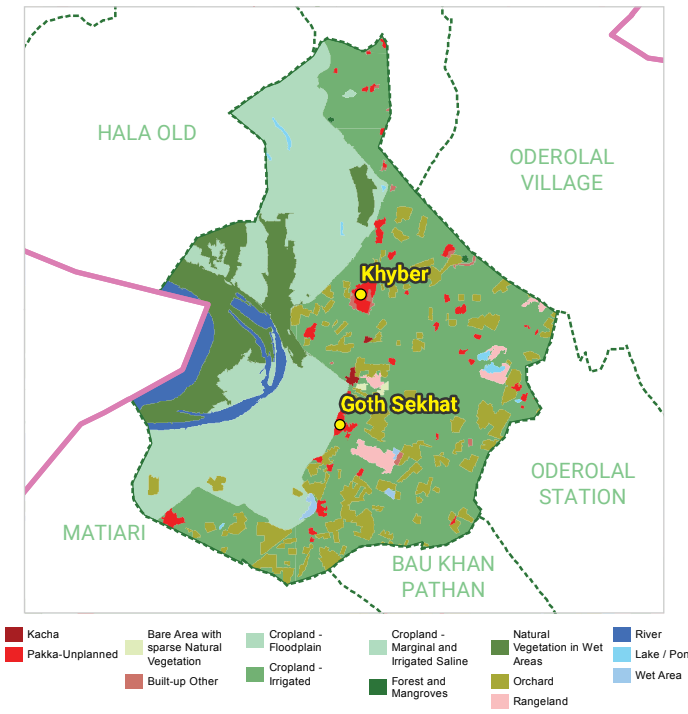
SATELLITE IMAGERY



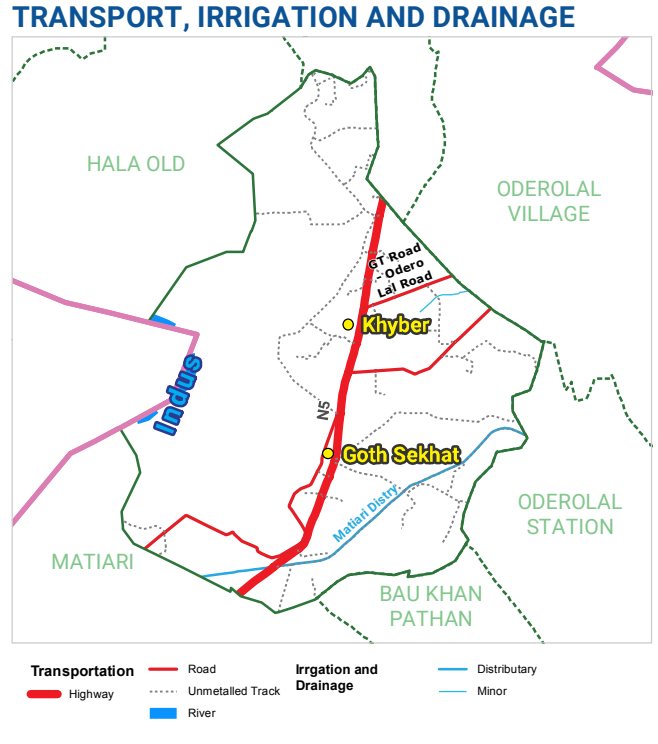
DEM AND FLOW DIRECTION



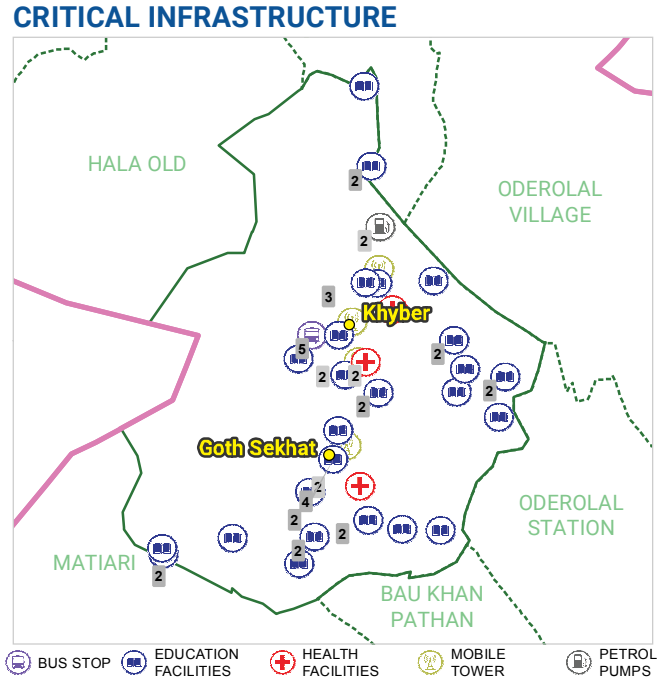
LAND USE / LAND COVER



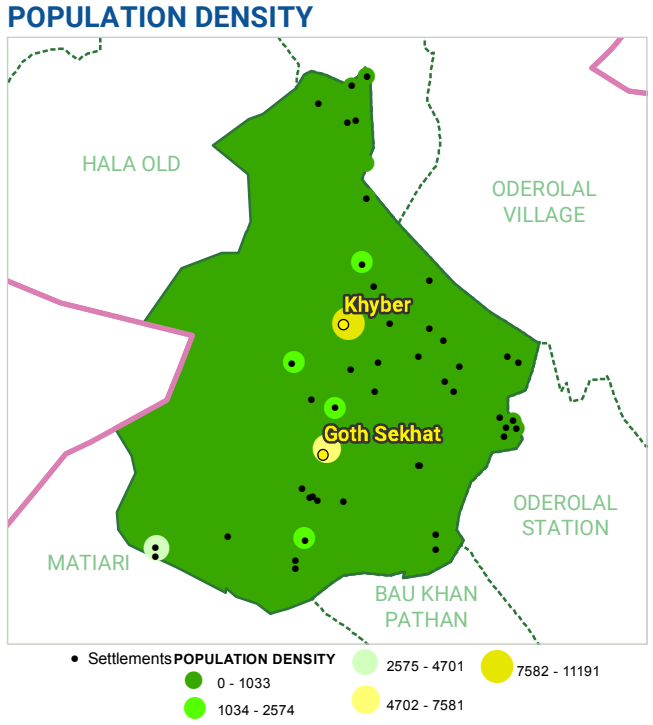
TRANSPORT, IRRIGATION AND DRAINAGE



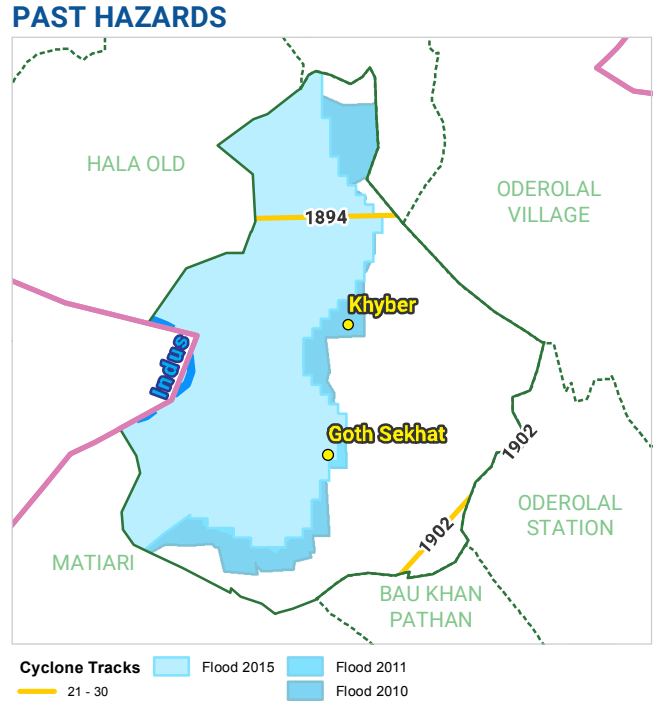
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

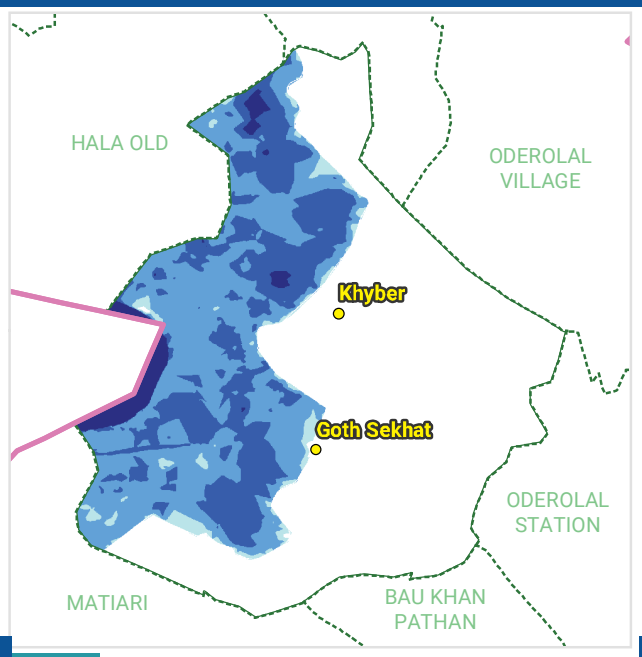


PAST HAZARDS

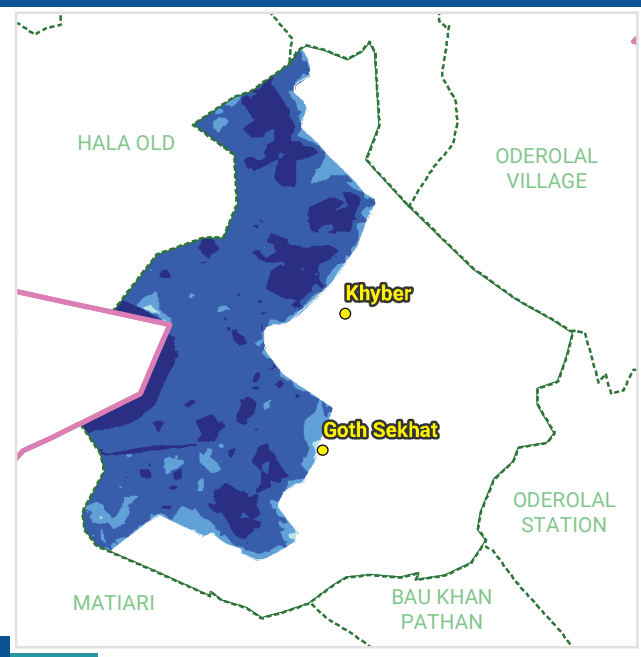


FLOOD

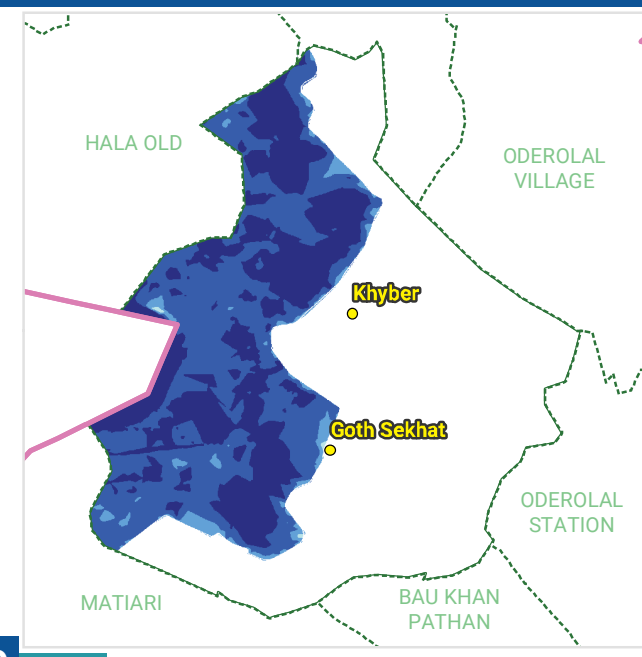
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

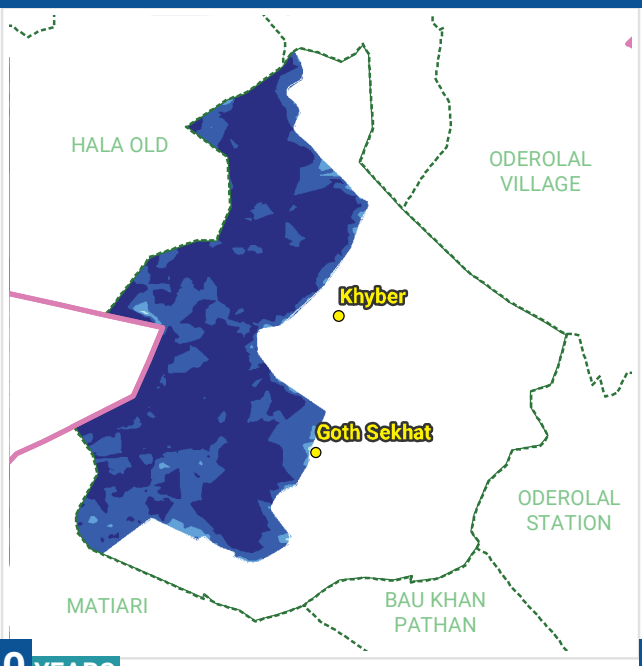


25 YEARS

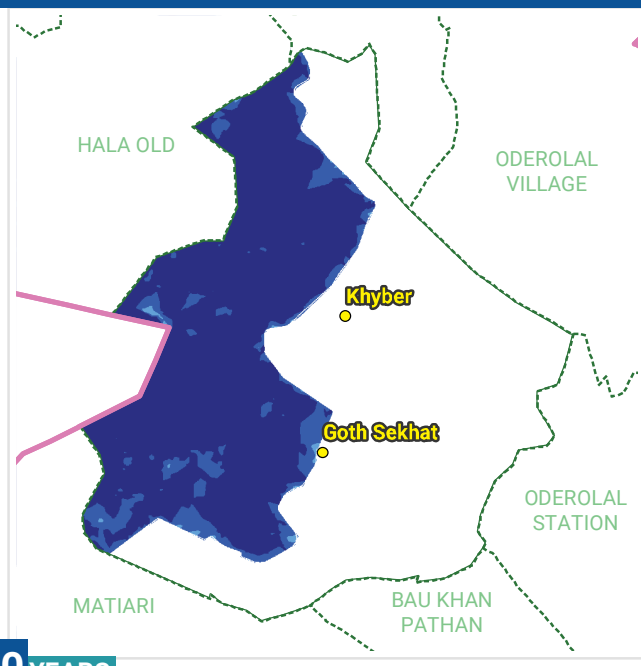


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

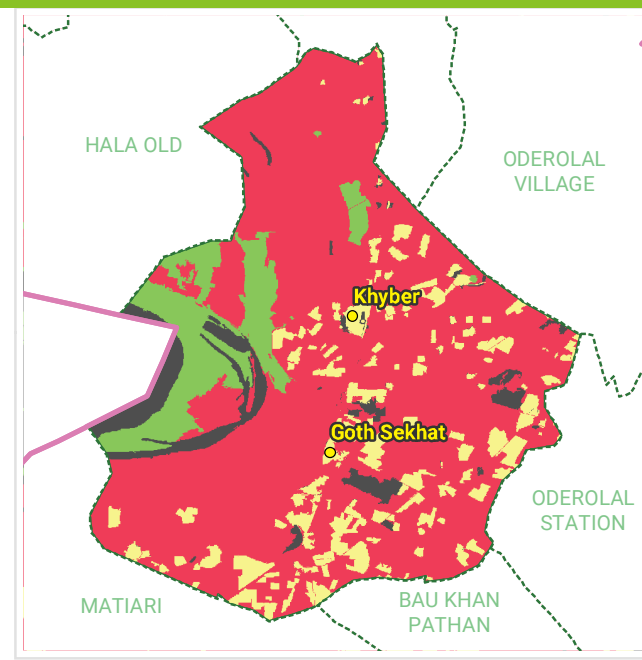


100 YEARS

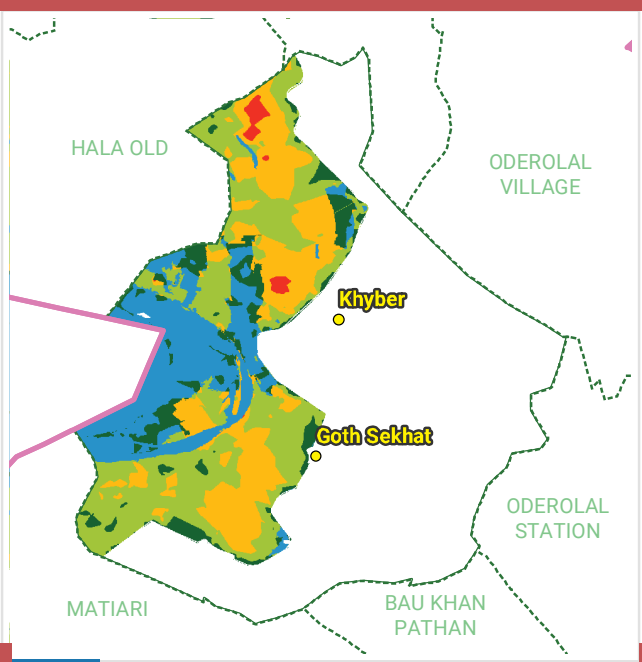


250 YEARS

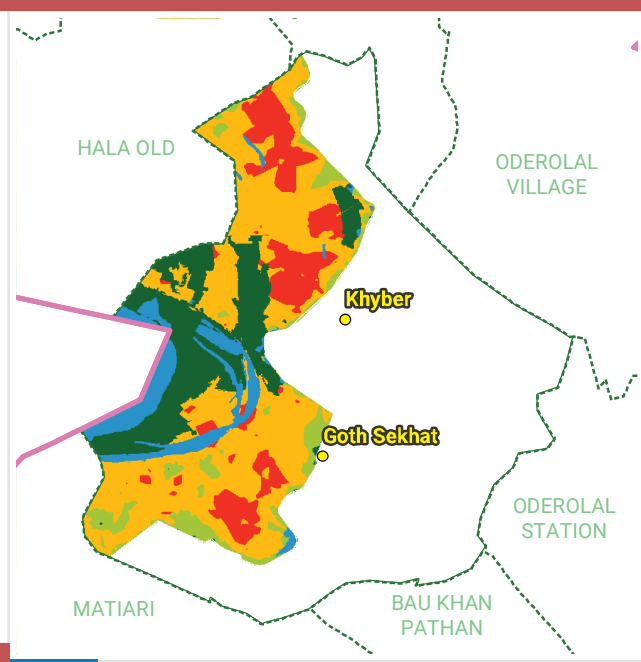
VULNERABILITY



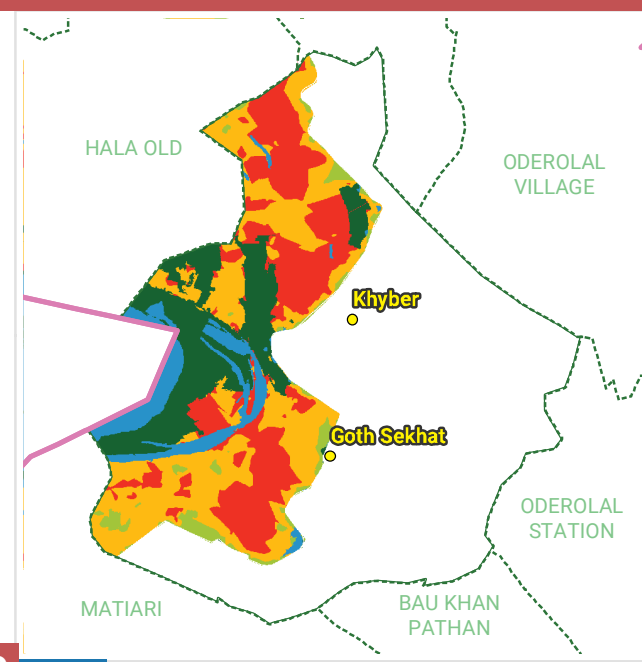
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

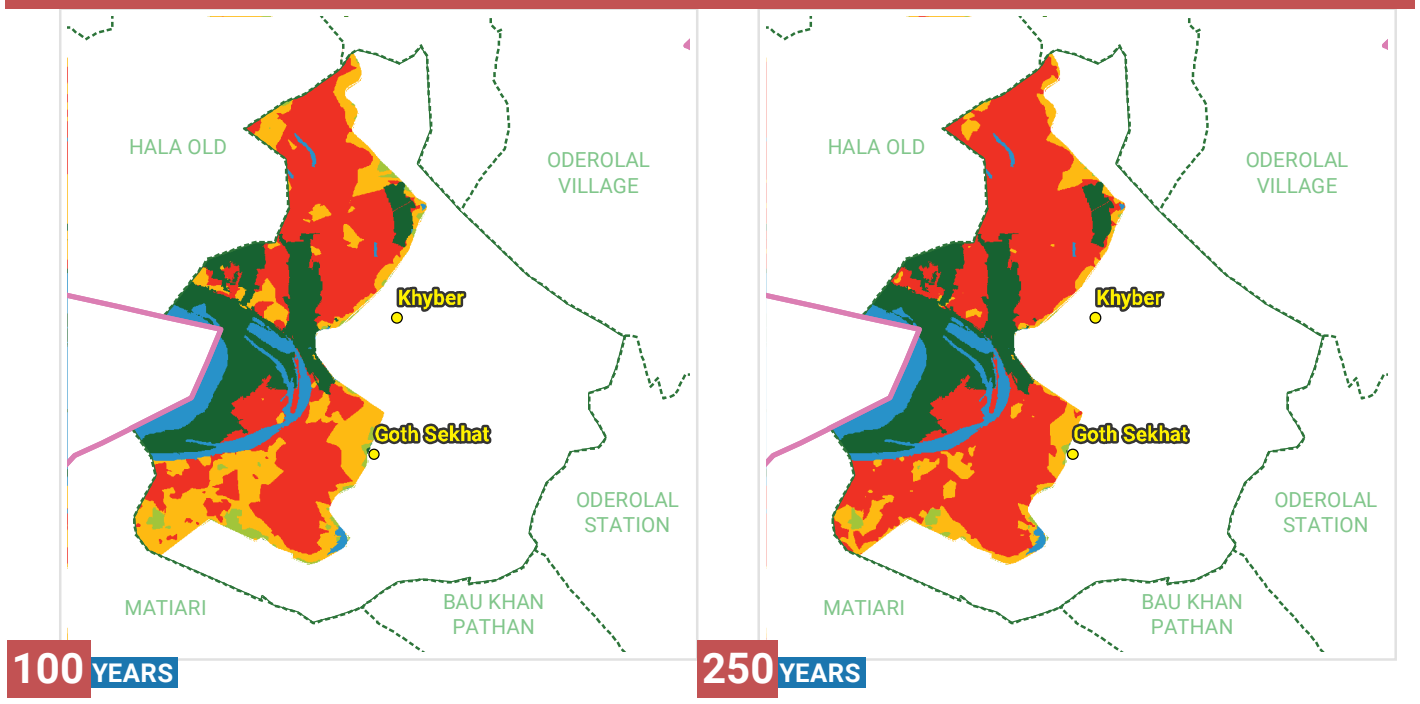
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



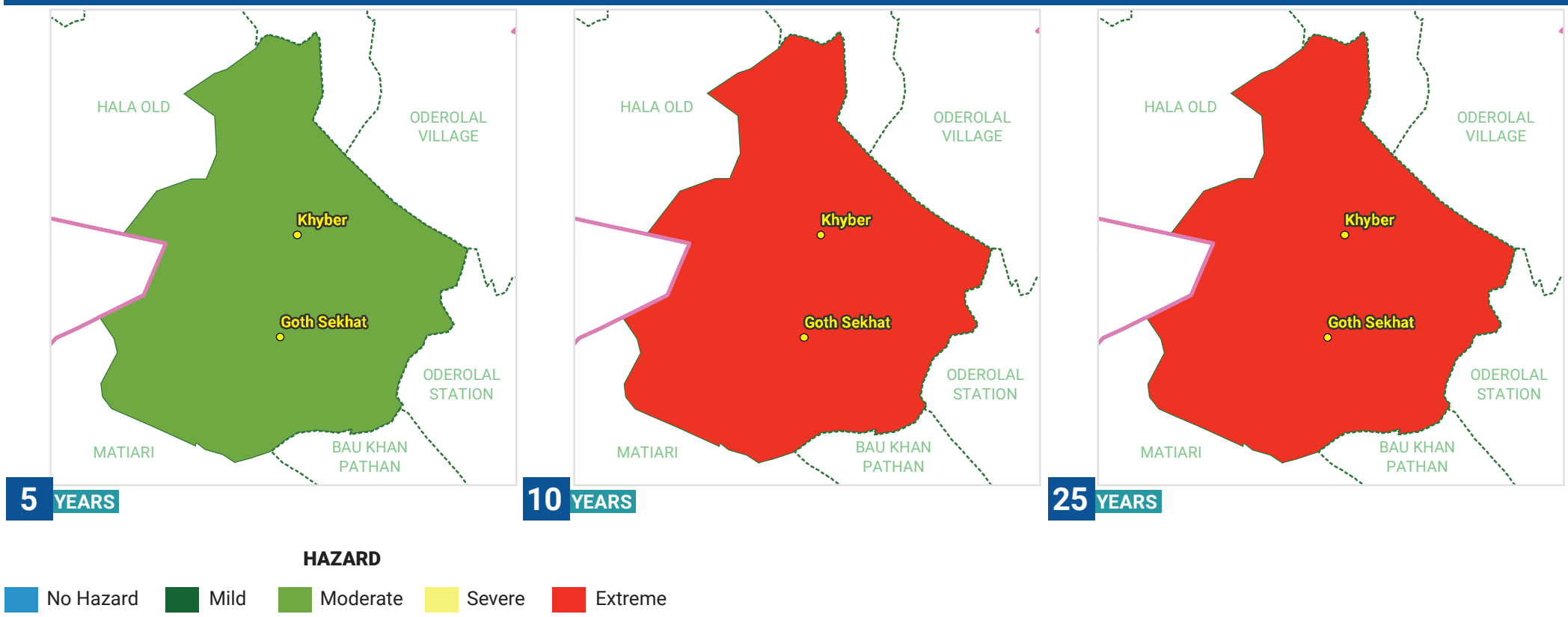
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

1	33	178	26.41	0	0	8.00	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0.01	0	4.58	0	0	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

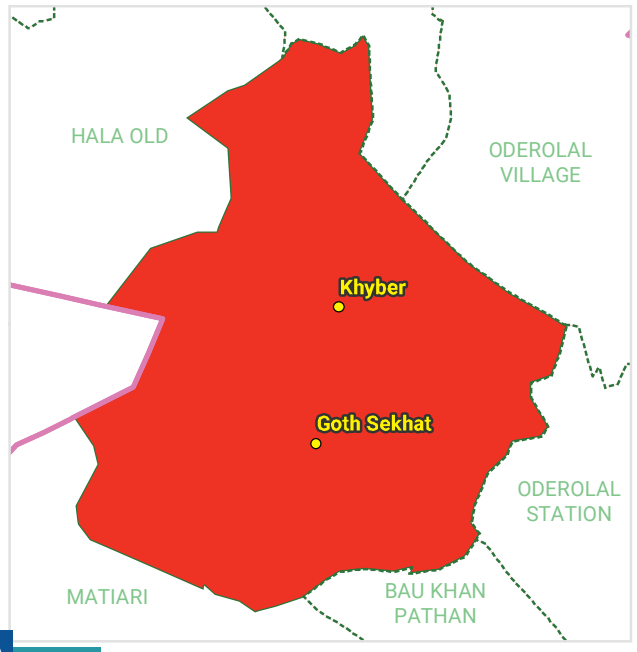
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



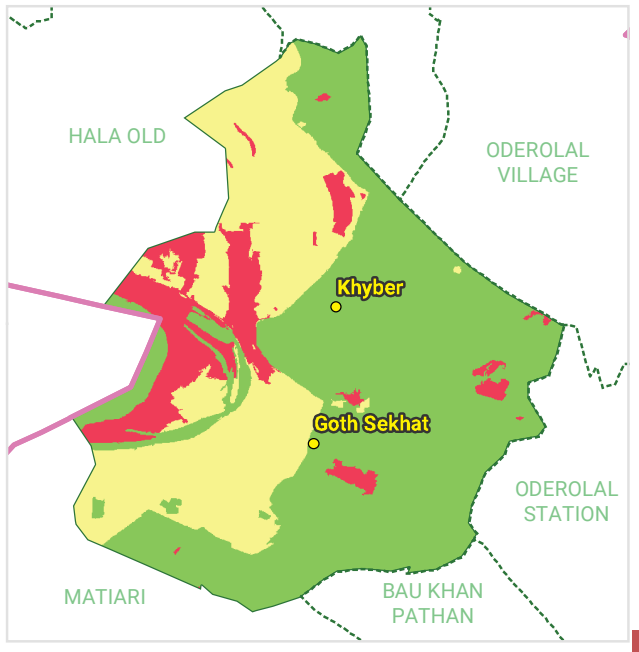
METEOROLOGICAL DROUGHT

HAZARD

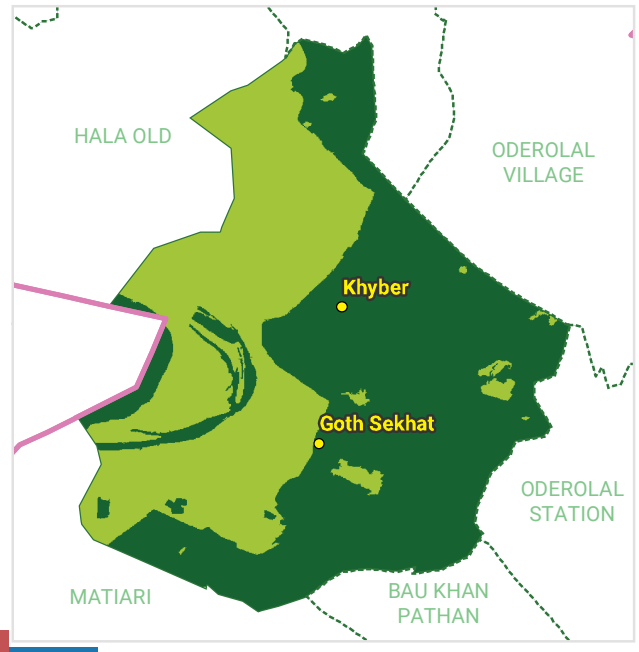


50 YEARS

VULNERABILITY

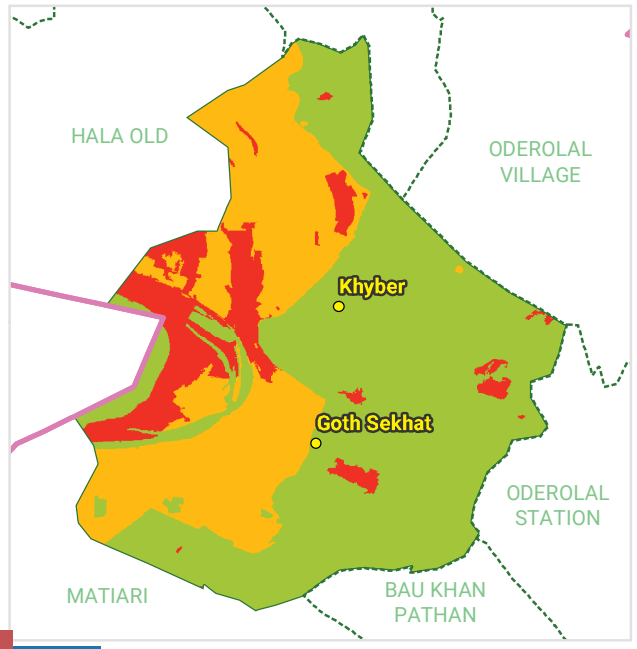


RISK

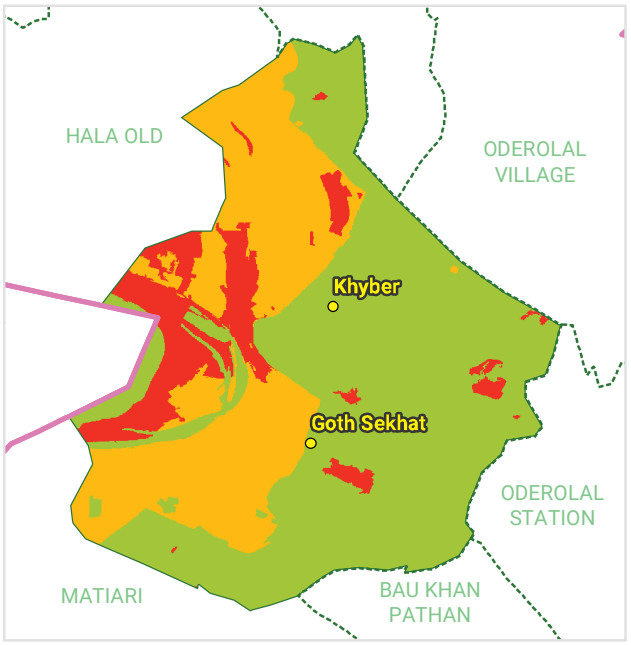


5 YEARS

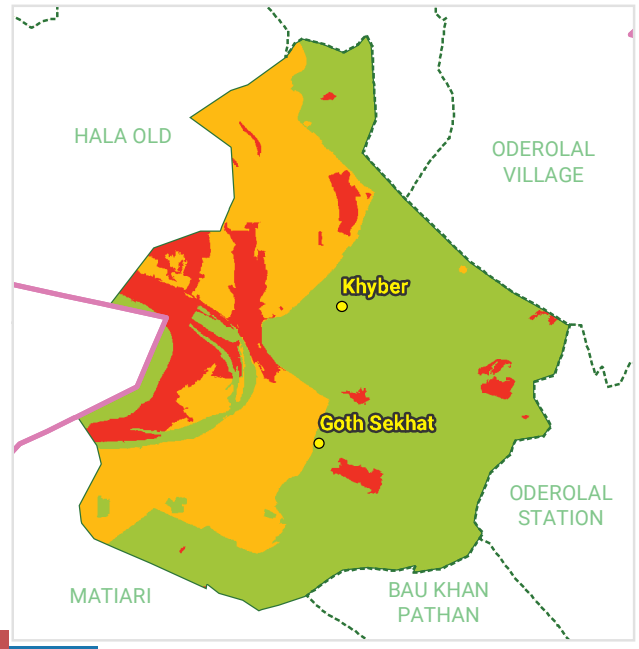
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

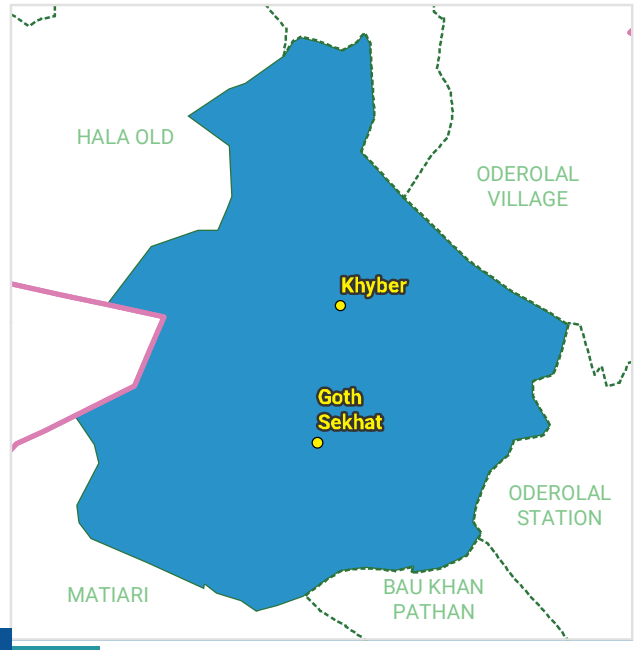
(BASED ON 50 YEARS RETURN PERIOD)

0	0	0	14.06	0	0.02	5.38	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

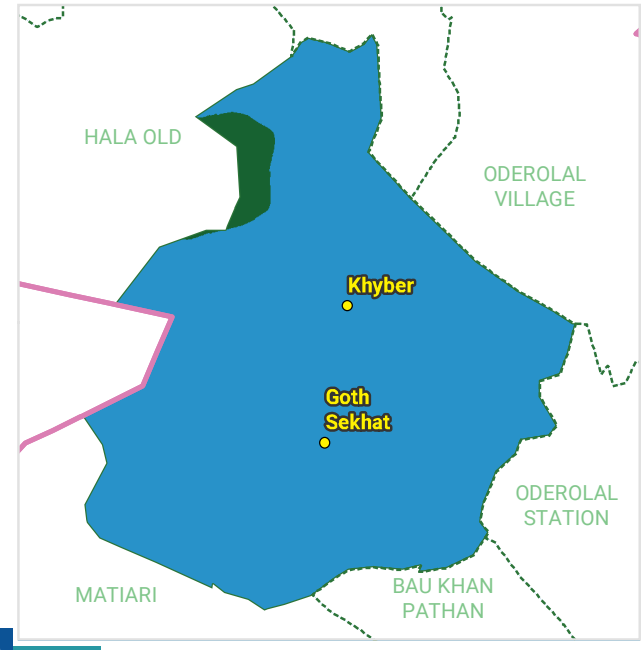
0.14	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

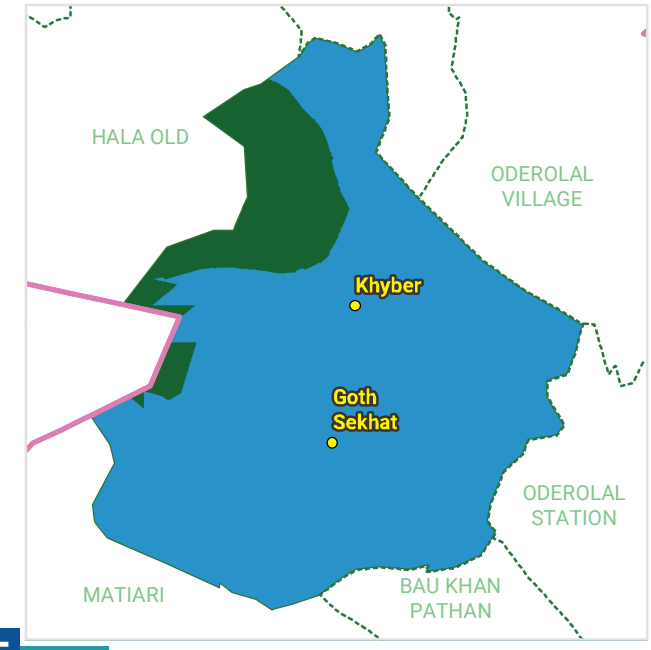
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

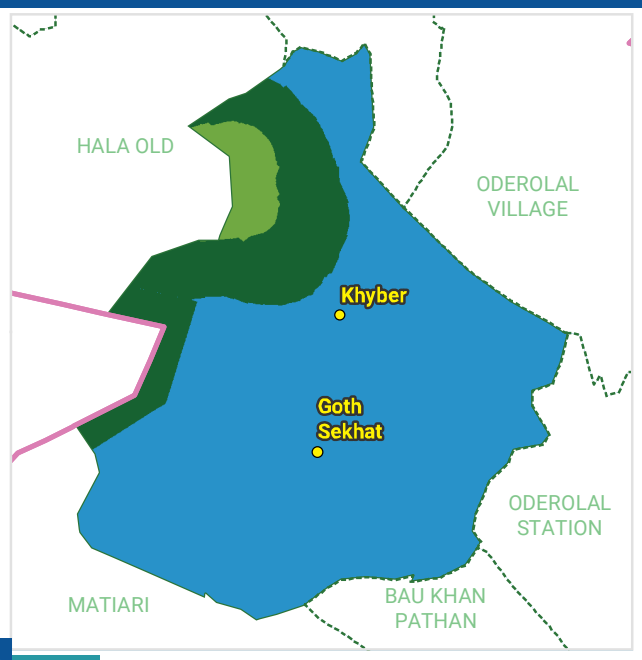


10 YEARS



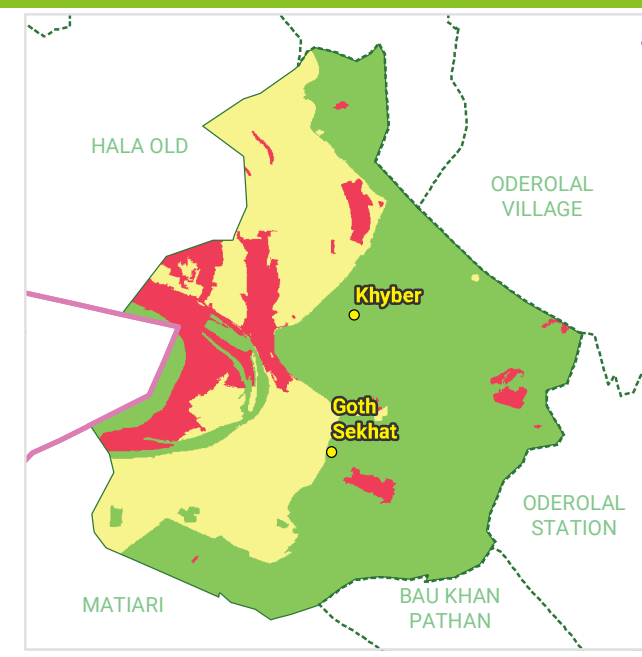
25 YEARS

HAZARD

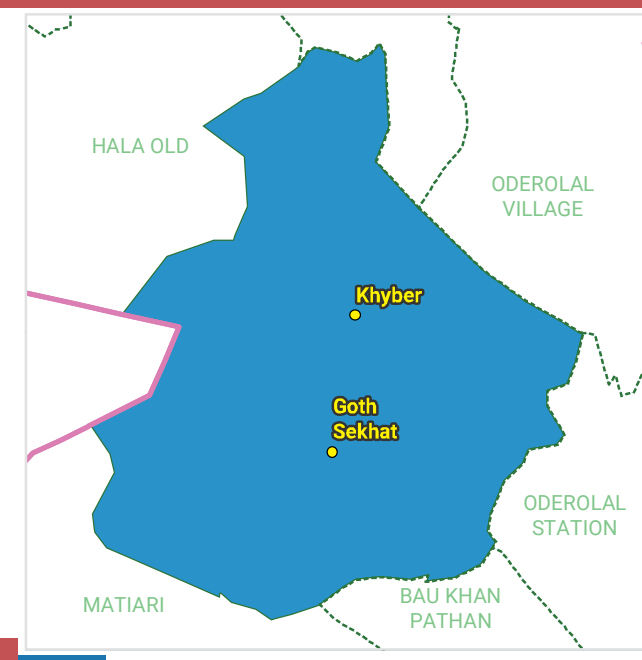


50 YEARS

VULNERABILITY

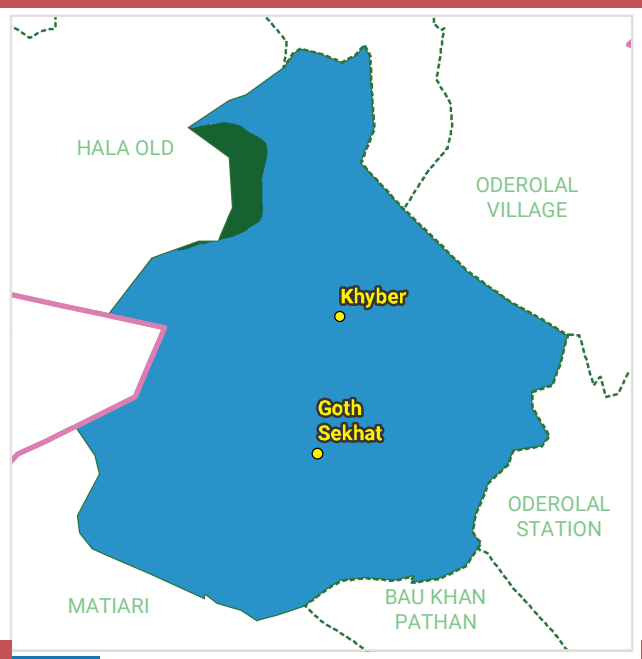


RISK

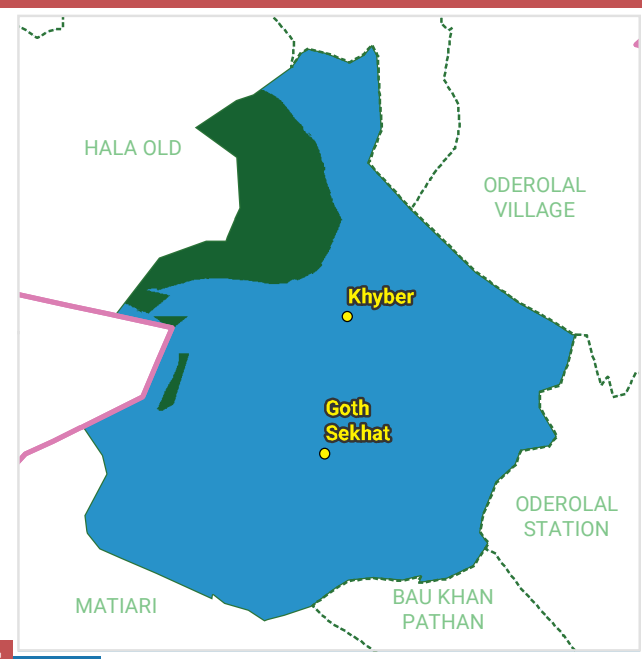


5 YEARS

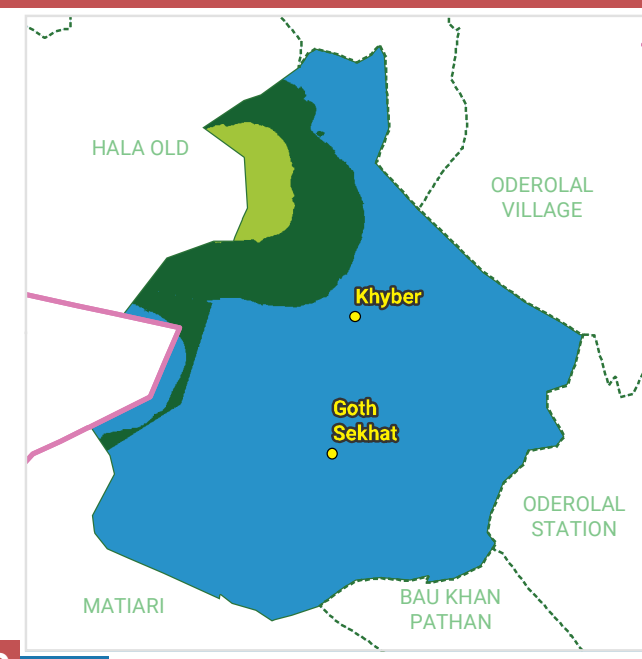
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

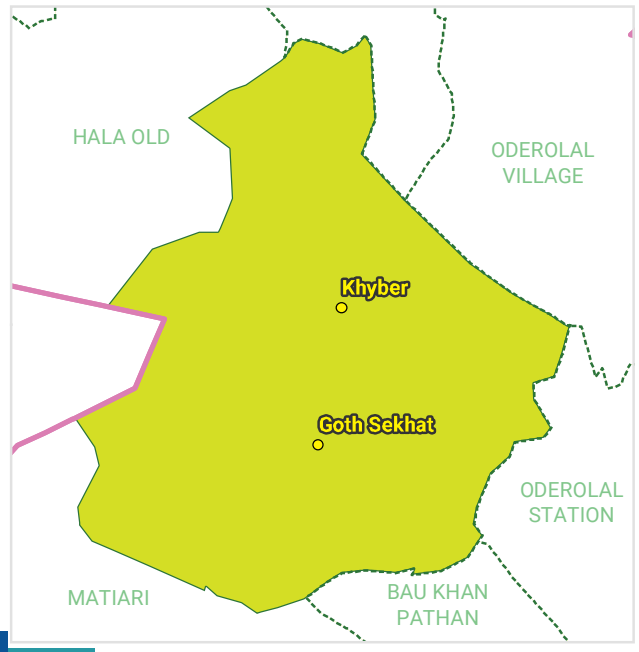
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

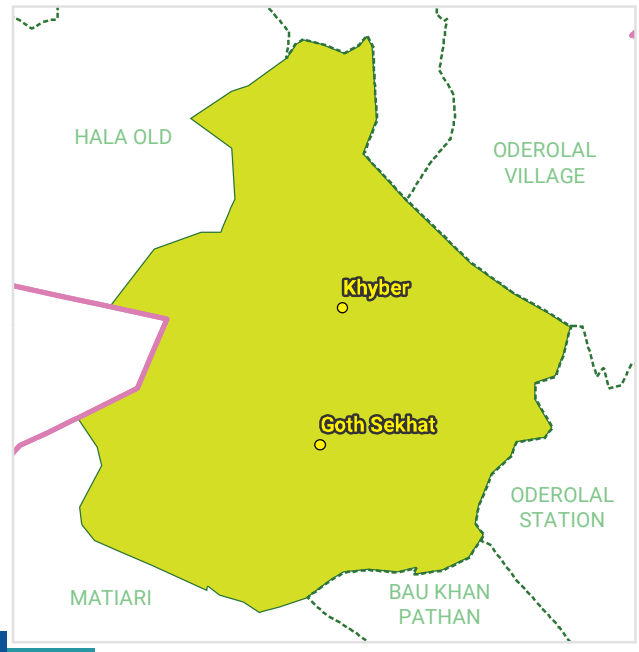
0	0	0	14.06	0	0.02	5.38	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)
0.14	0						
WATER BODY (SQ. KM)	WET AREA (SQ. KM)						

HEATWAVE

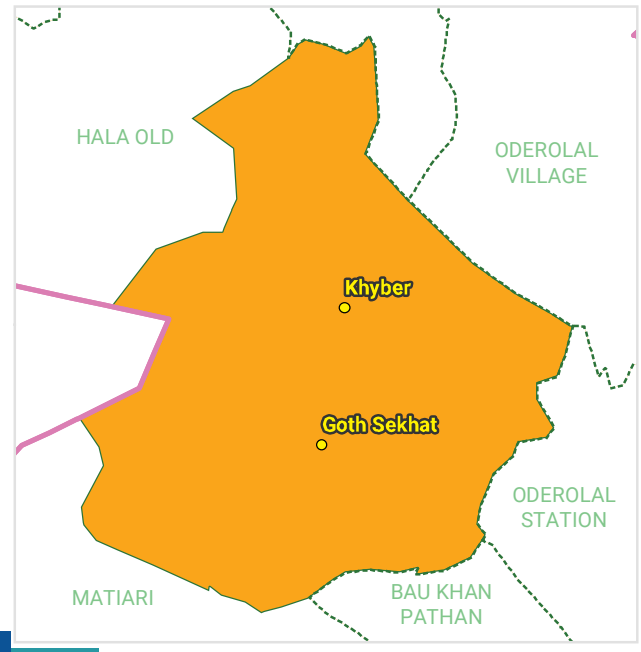
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

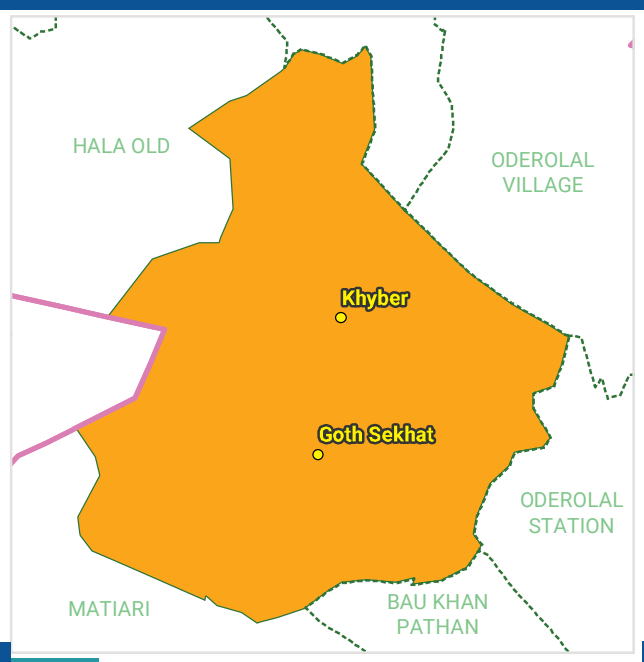


10 YEARS

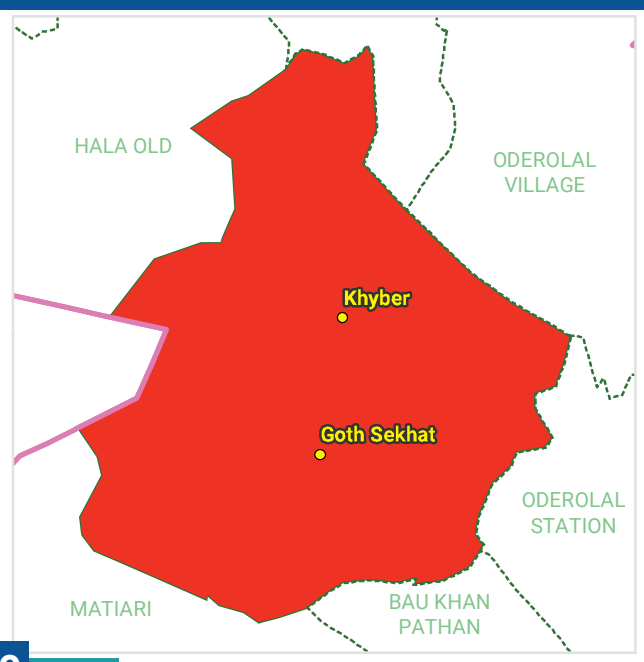


25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

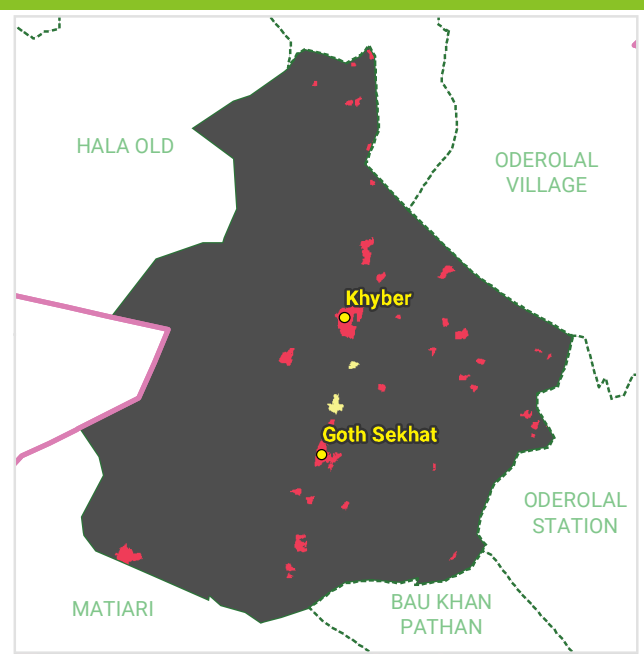


50 YEARS



100 YEARS

VULNERABILITY



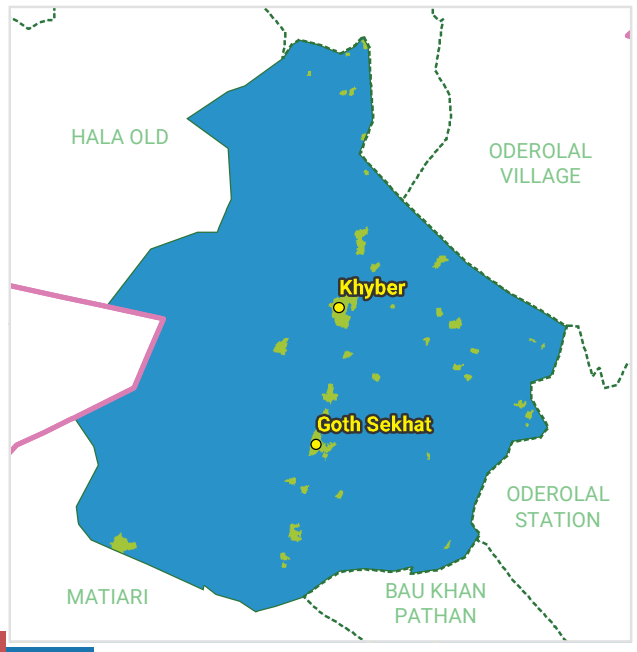
HAZARD

Normal | Moderate | High | Severe | Extreme

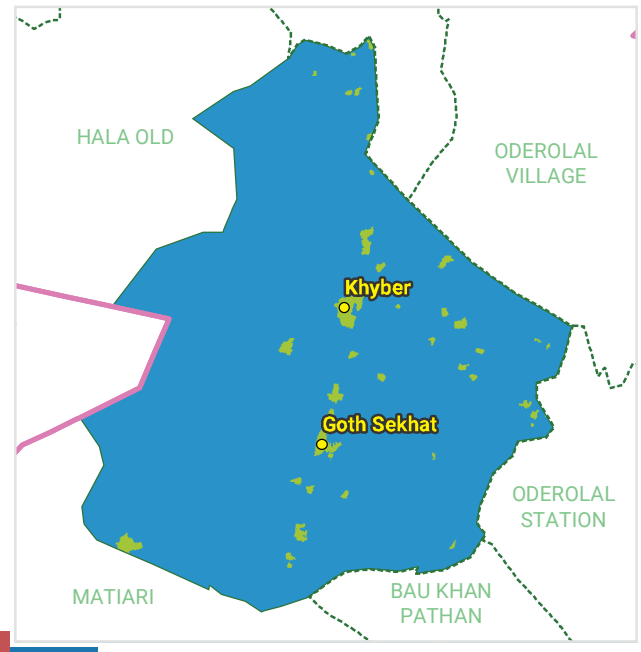
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

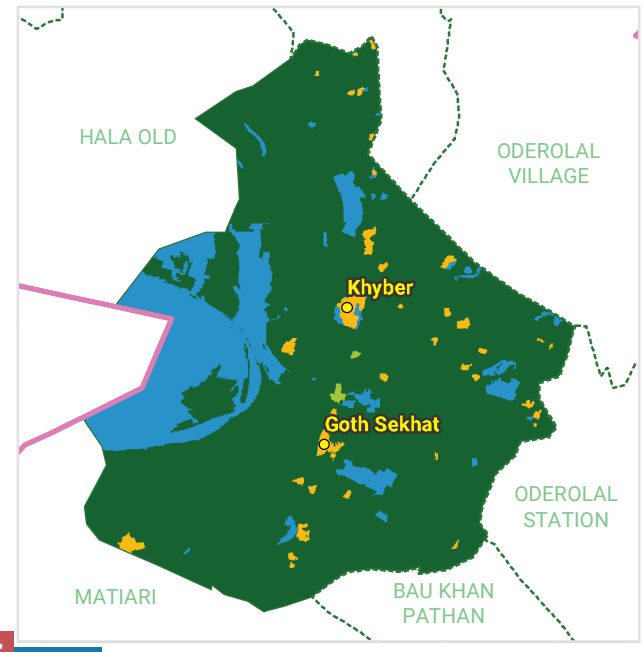
RISK AT DIFFERENT RETURN PERIODS



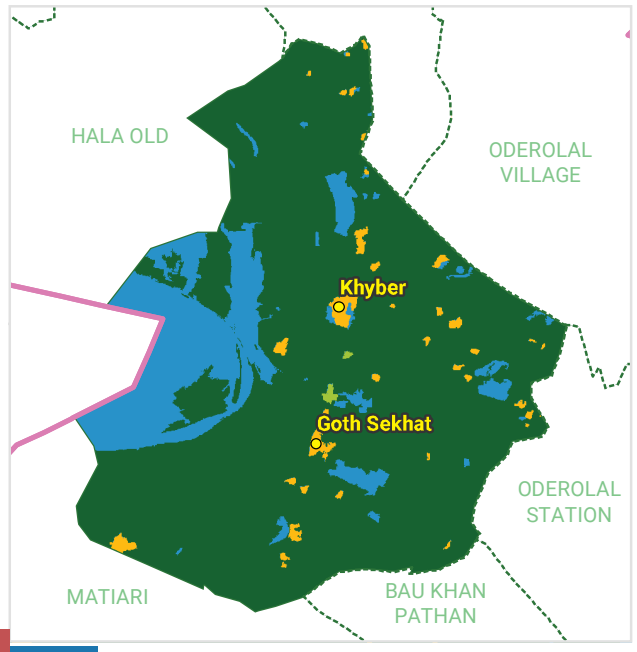
5 YEARS



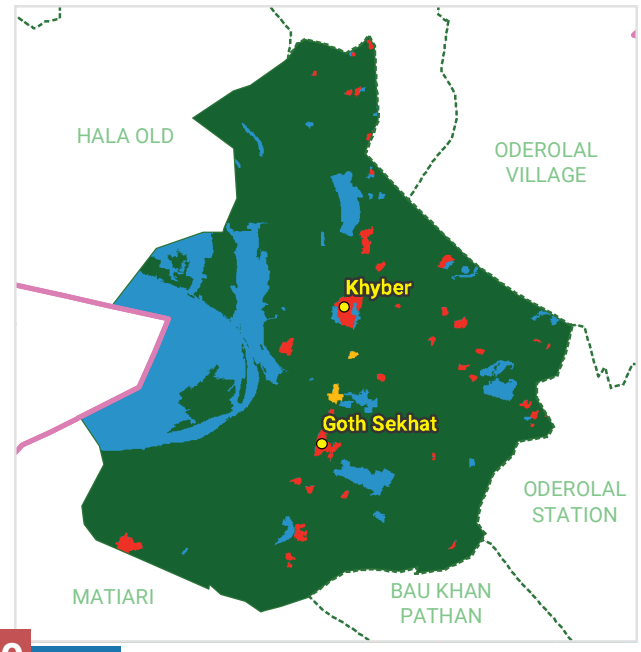
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

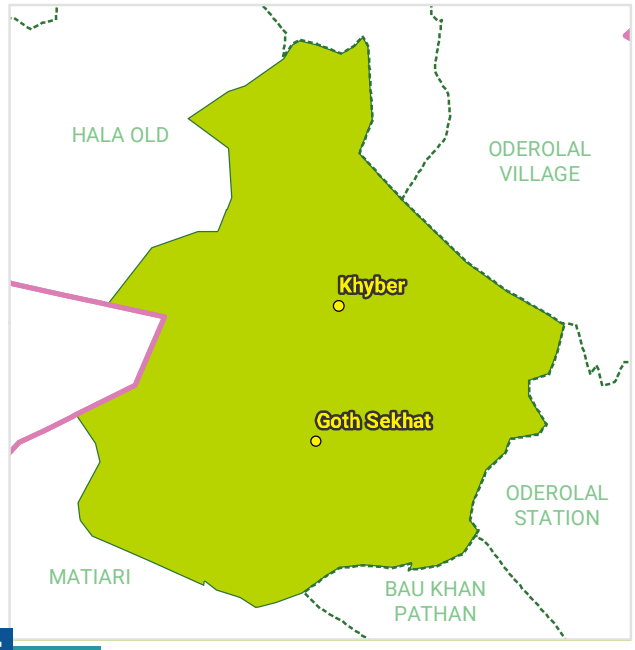
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

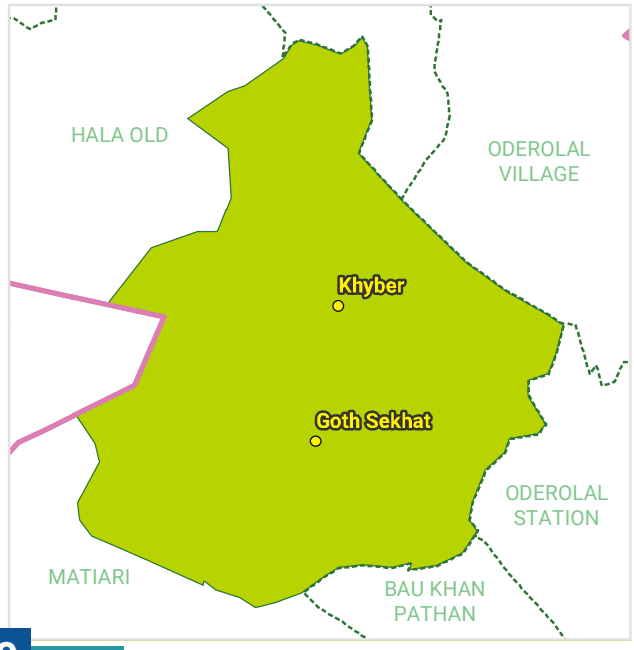
47	6825	35445	71.62	0.10	0	1.58
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

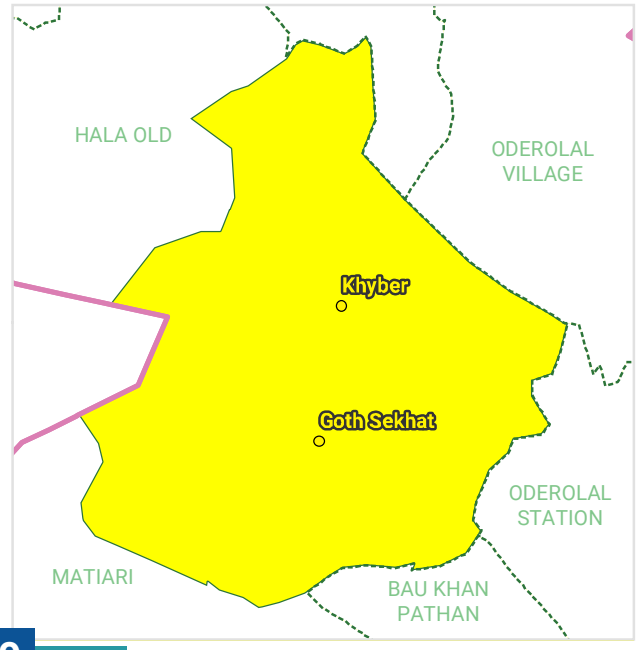
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

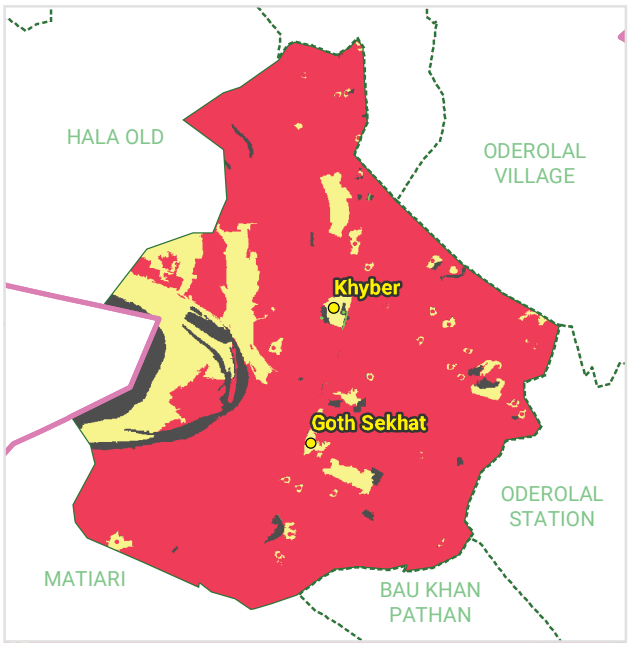


100 YEARS



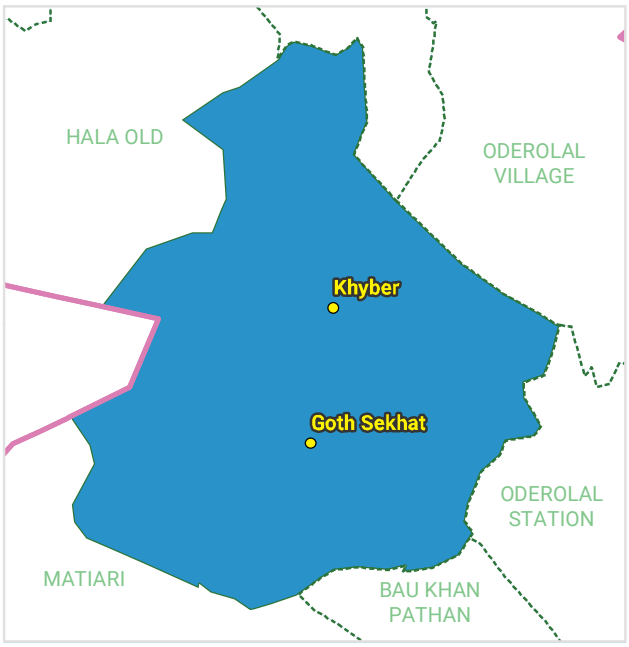
500 YEARS

VULNERABILITY

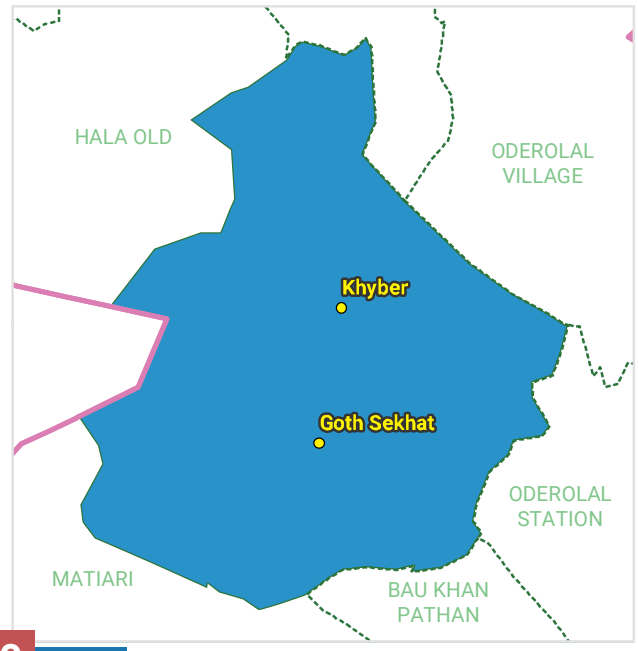


25 YEARS

RISK AT DIFFERENT RETURN PERIODS

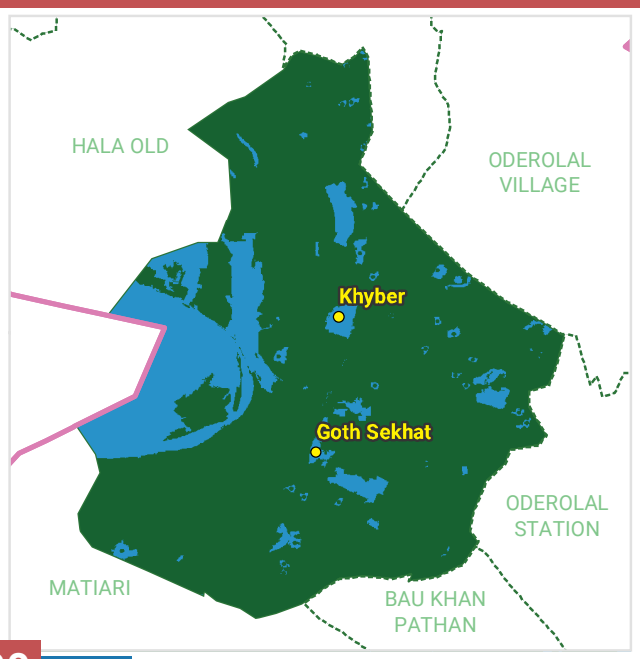


100 YEARS



500 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

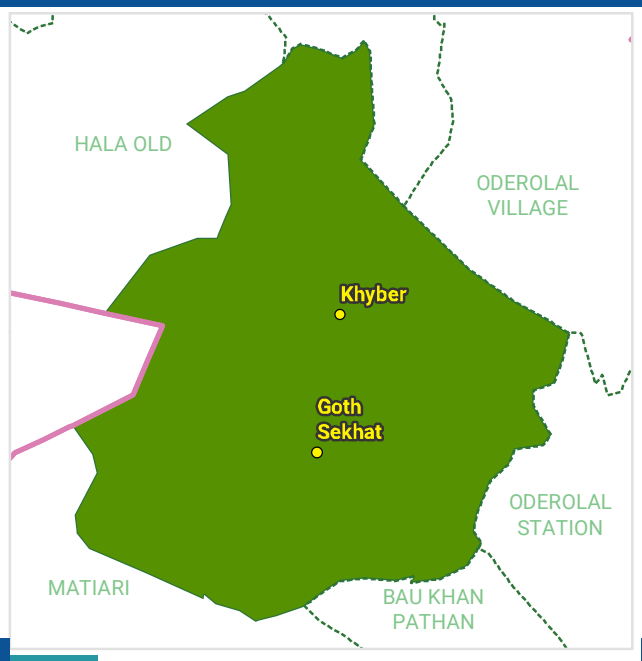
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

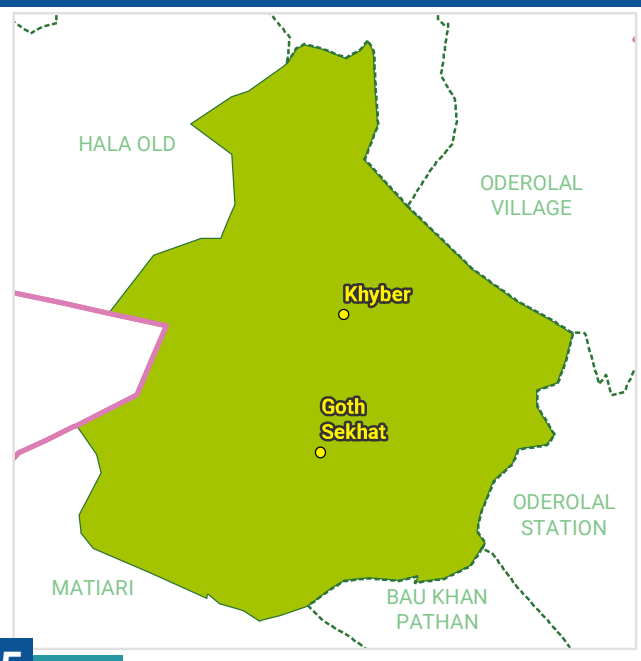
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

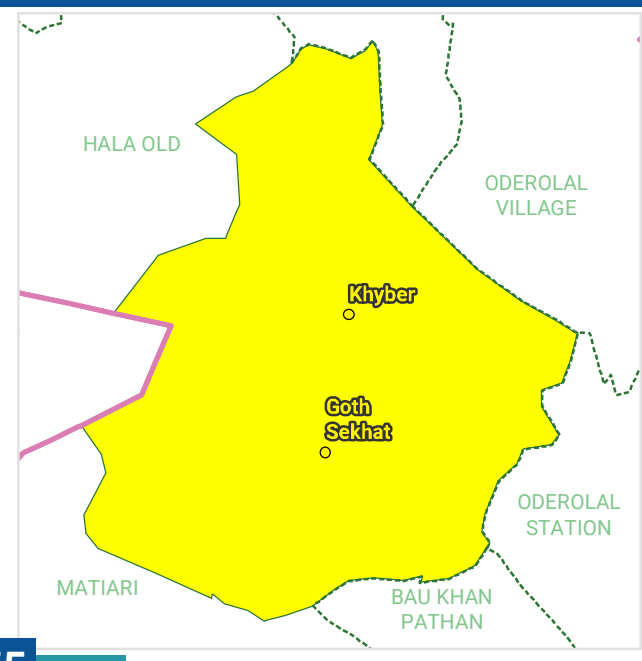
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

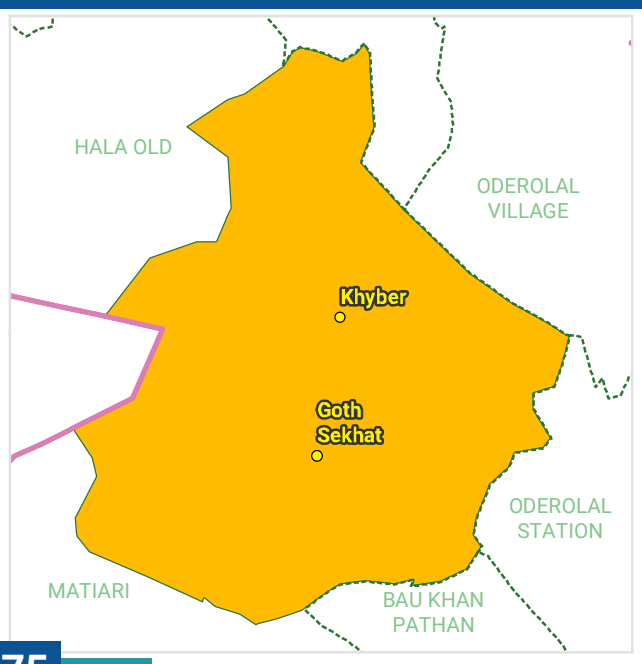


475 YEARS



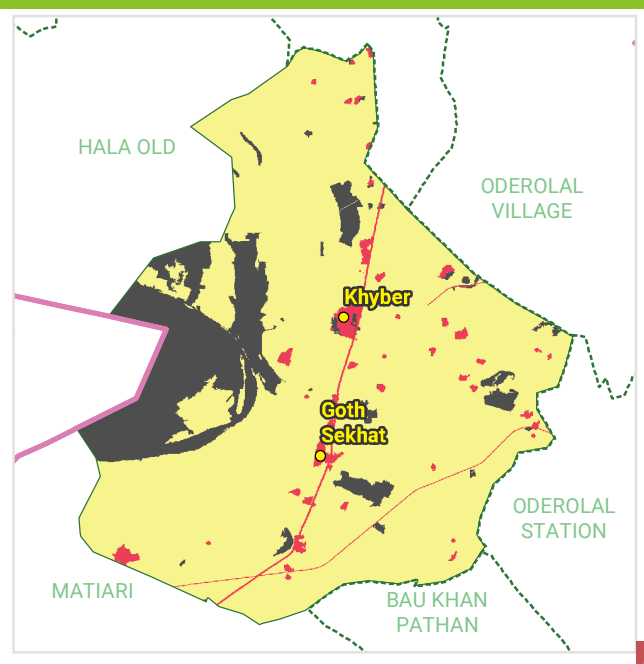
975 YEARS

HAZARD

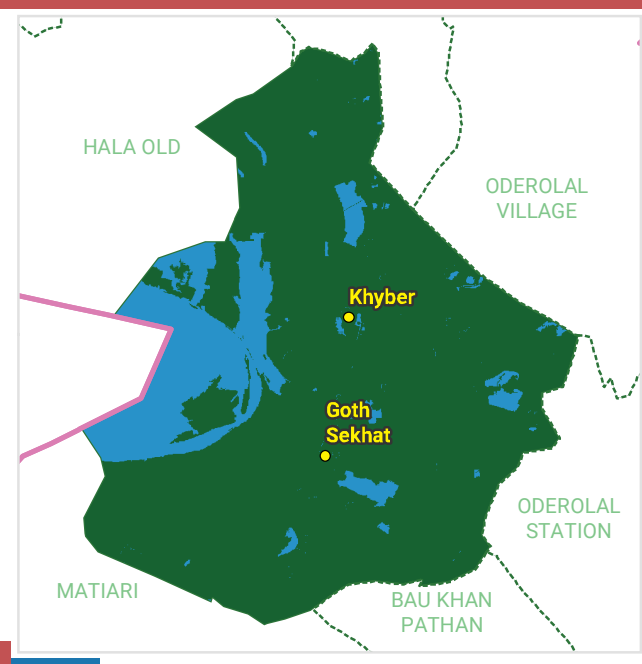


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

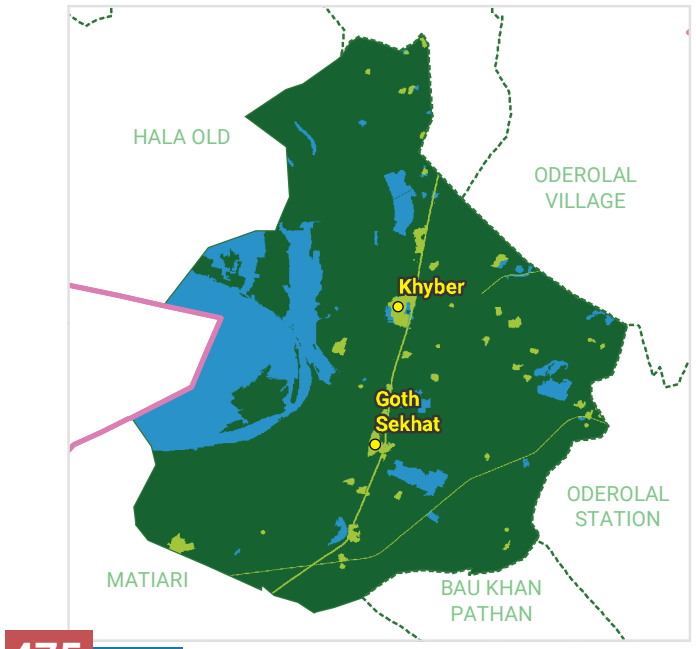
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

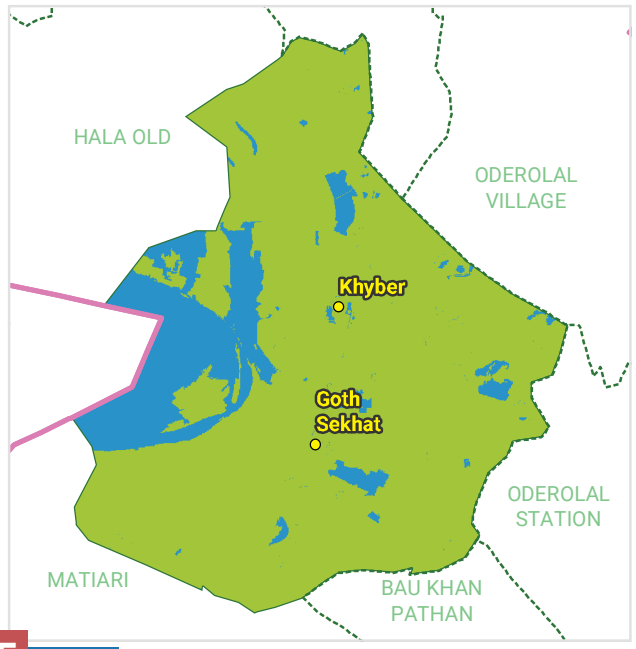
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

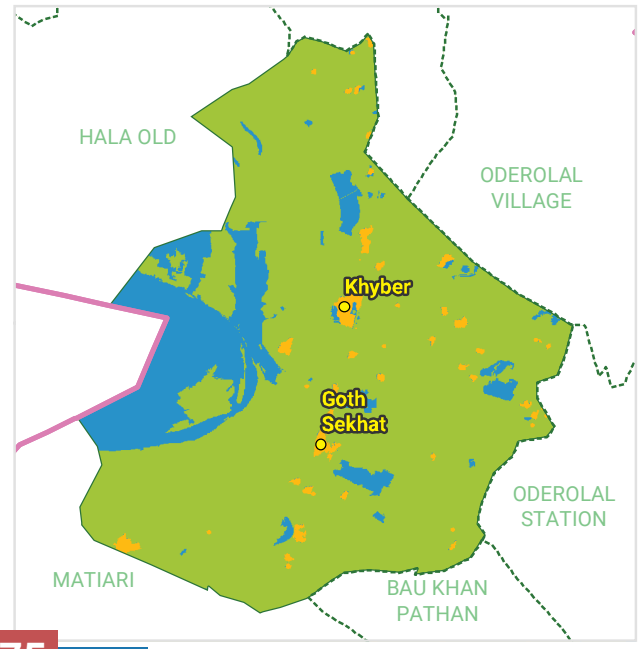
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

47	6800	35329	71.68	0.00	0.10	0.08	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.57	0.02	88.48	0	10.96	0	0	1
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
42	0	0	0	4	0	5	7
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low, Medium, High, Extreme	●	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	Low, Medium, High, Extreme	●
METEOROLOGICAL DROUGHT	Low, Medium	Medium, High, Extreme	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	None	Low	Low	Low, Medium	●	●	●
HEATWAVE	Medium	Medium	Low, Medium, High	Low, Medium, High	Low, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - SHAH MIR RAHU

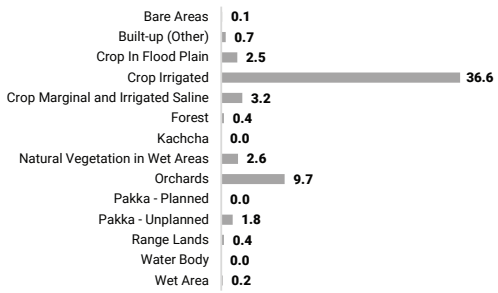
Union Council area in sq. km **58**

Surrounding UCs / Features
SAEED ABAD in South
BHALIDINO KAKA in East
SHAHEED BENAZIRABAD DISTRICT in North

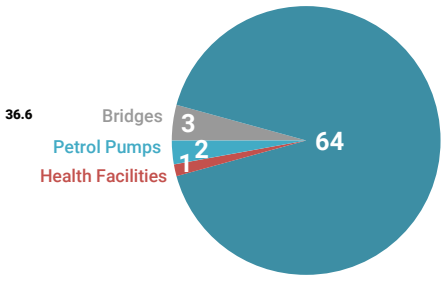
Population	2017 approx.	25,775
No. of household	2017 approx.	5,036

Land Use Land Cover

coverage area in sq.km

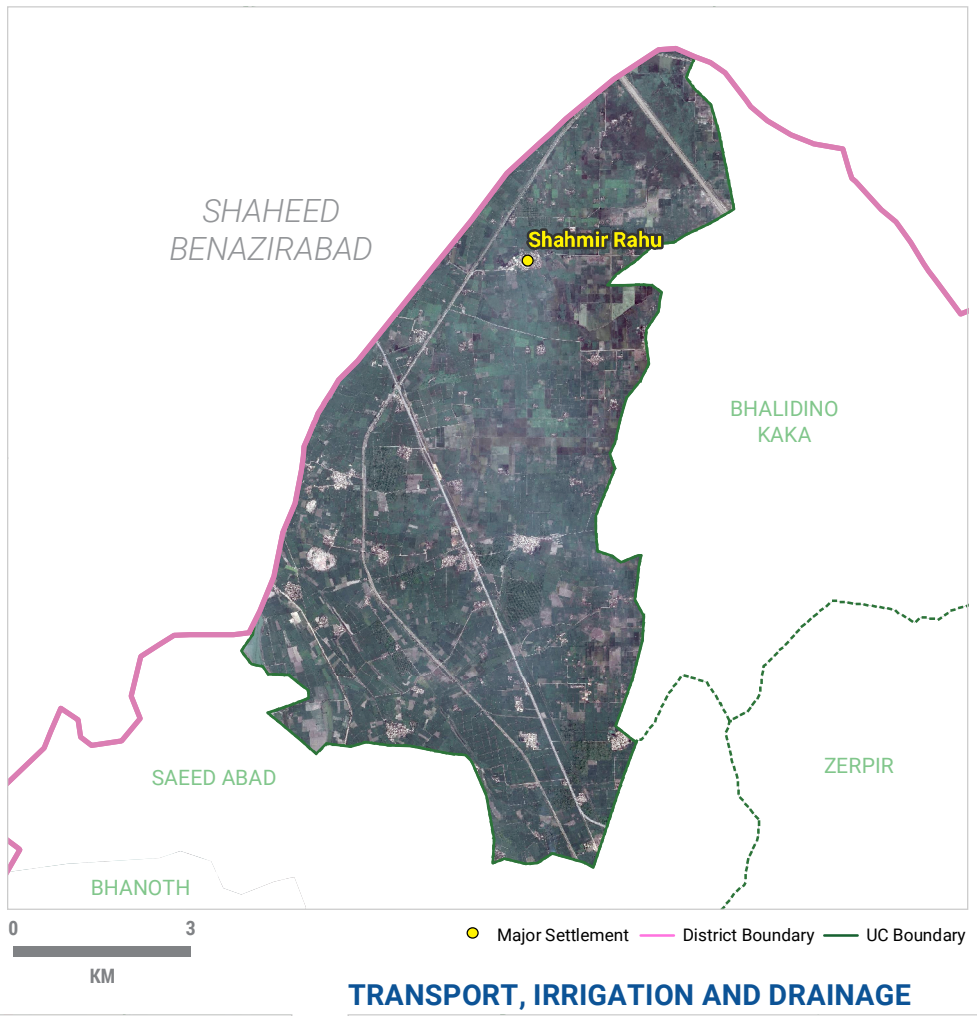


Critical Infrastructure

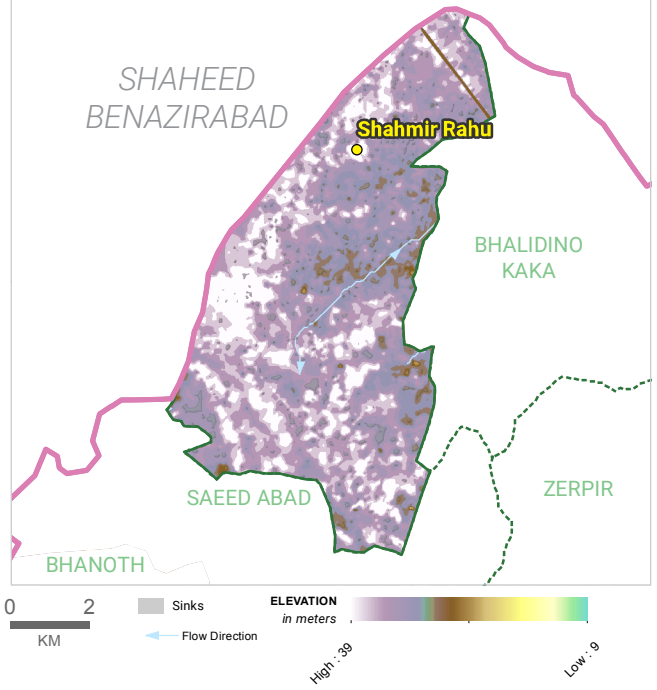


NO. OF SETTLEMENTS
58

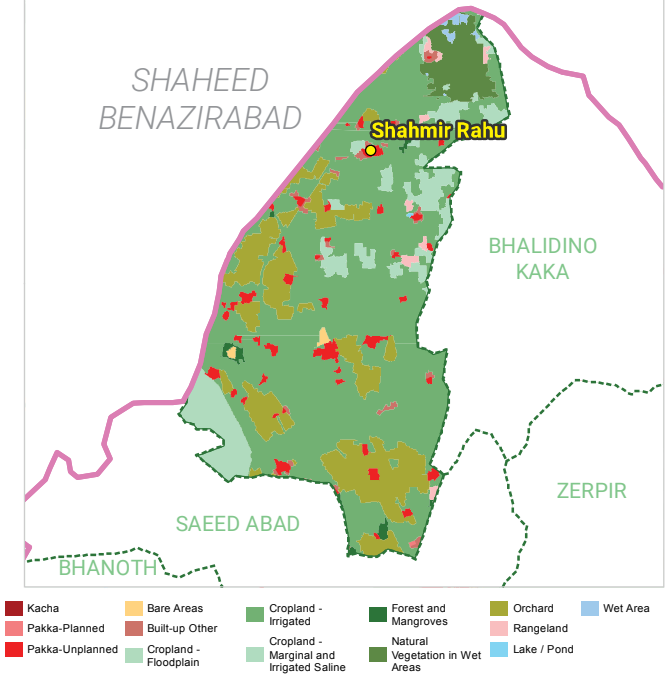
SATELLITE IMAGERY



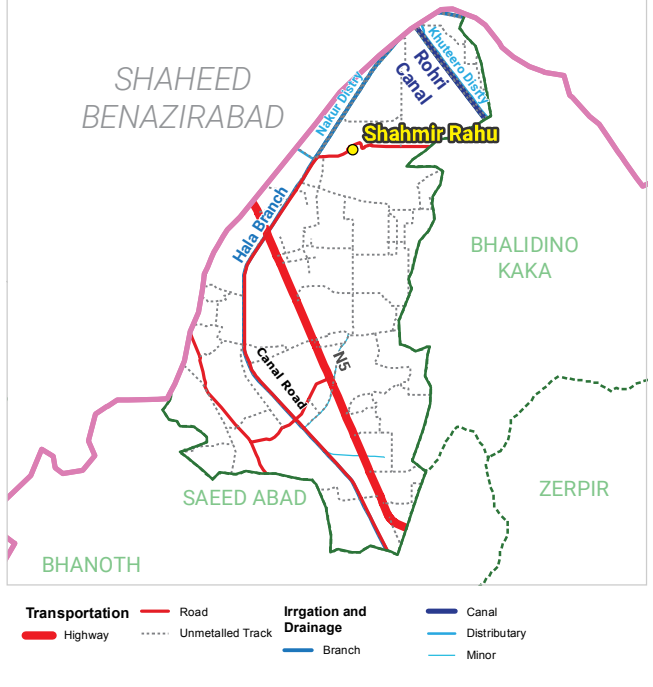
DEM AND FLOW DIRECTION



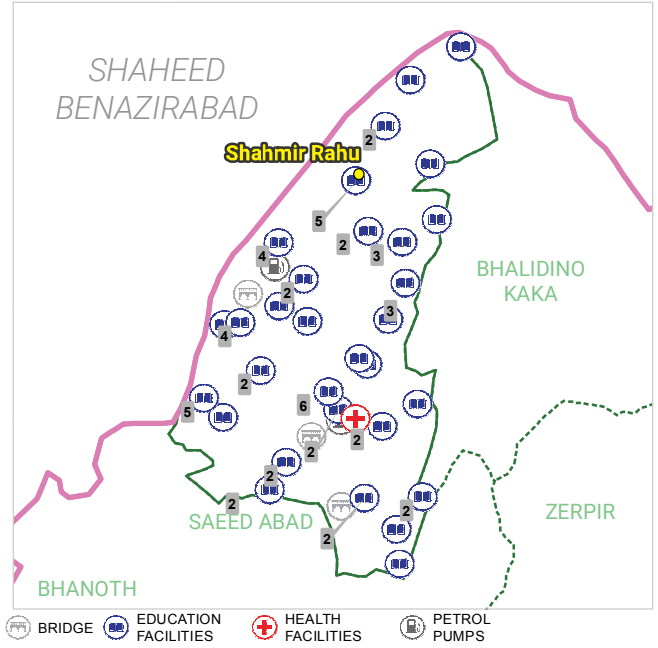
LAND USE / LAND COVER



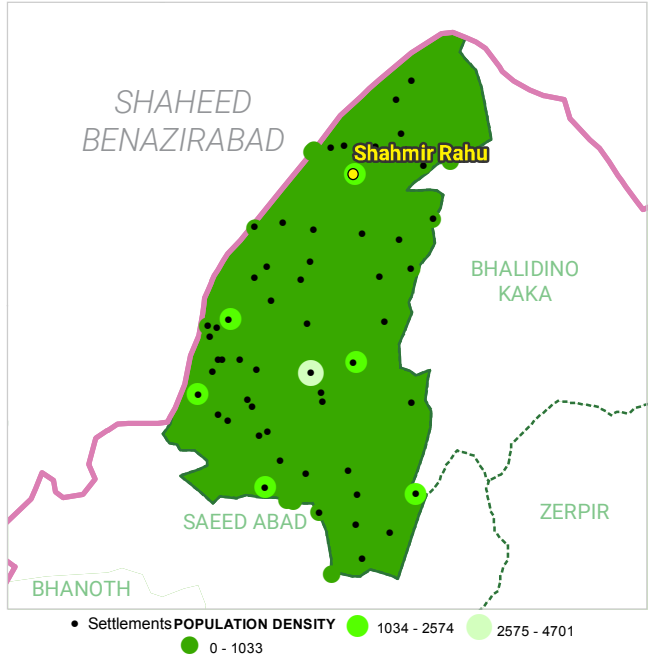
TRANSPORT, IRRIGATION AND DRAINAGE



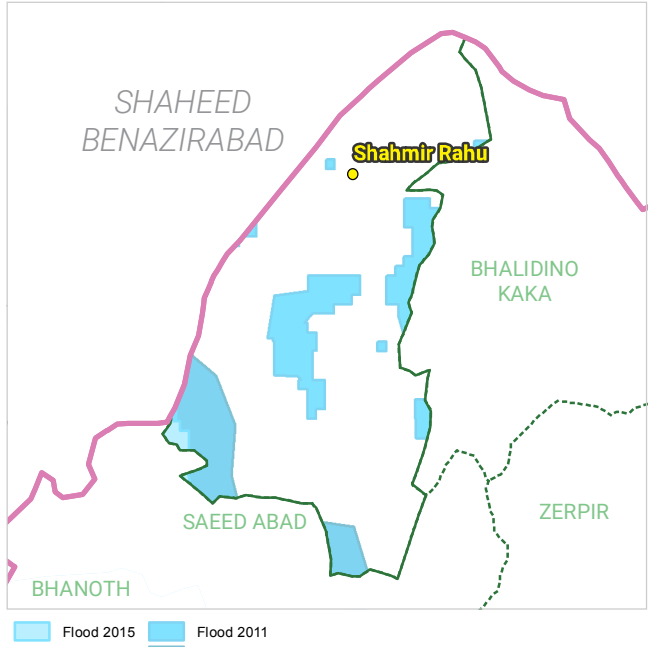
CRITICAL INFRASTRUCTURE



POPULATION DENSITY

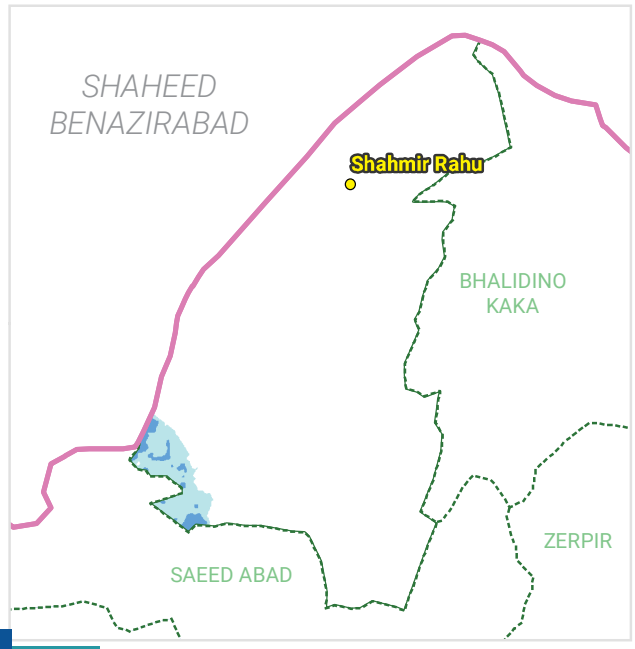


PAST HAZARDS

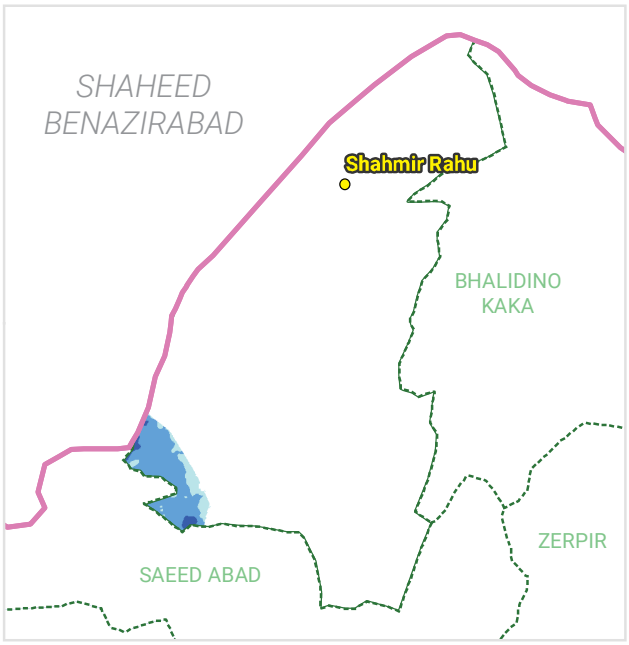


FLOOD

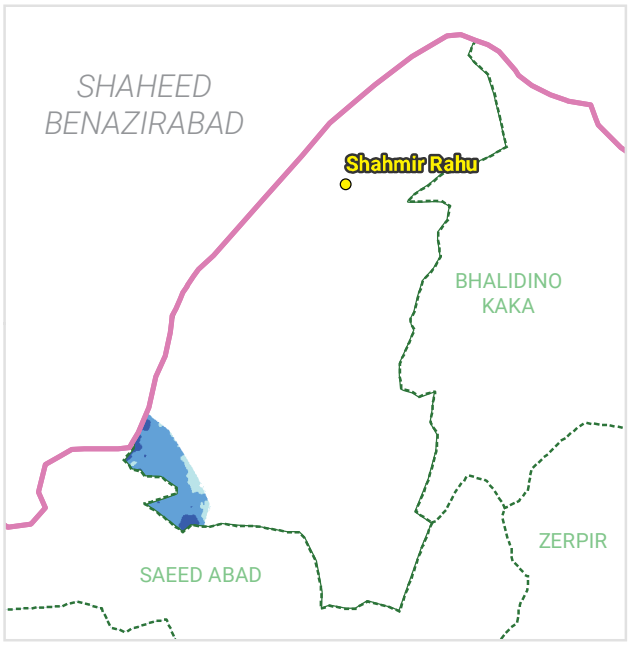
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

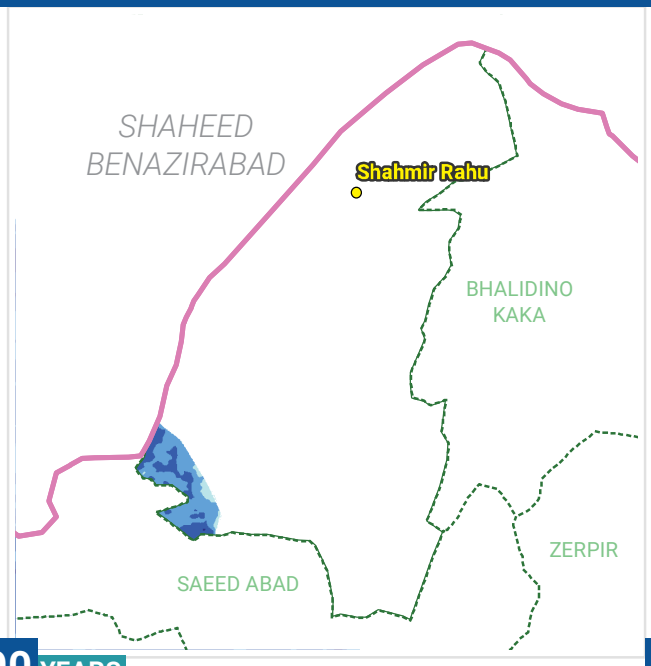


25 YEARS

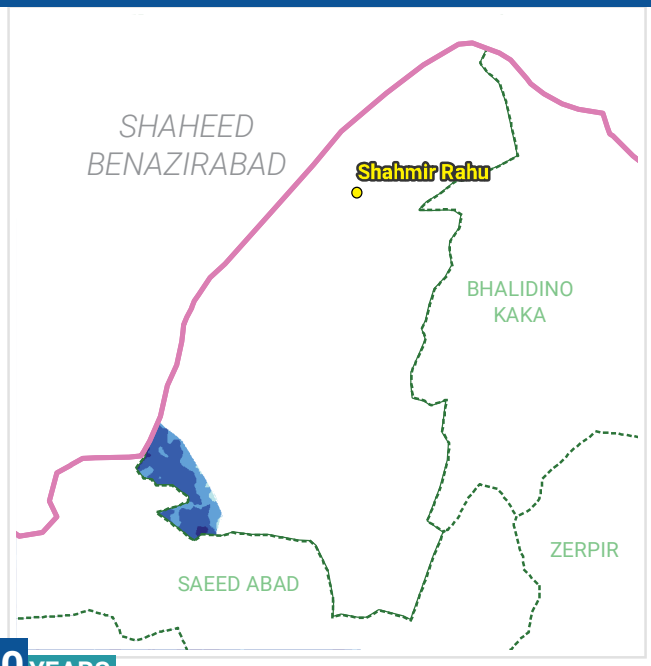


50 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

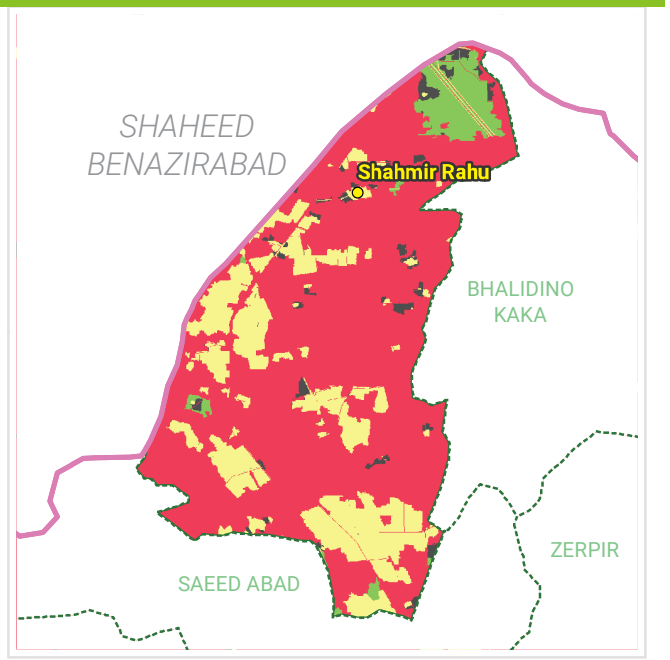


100 YEARS

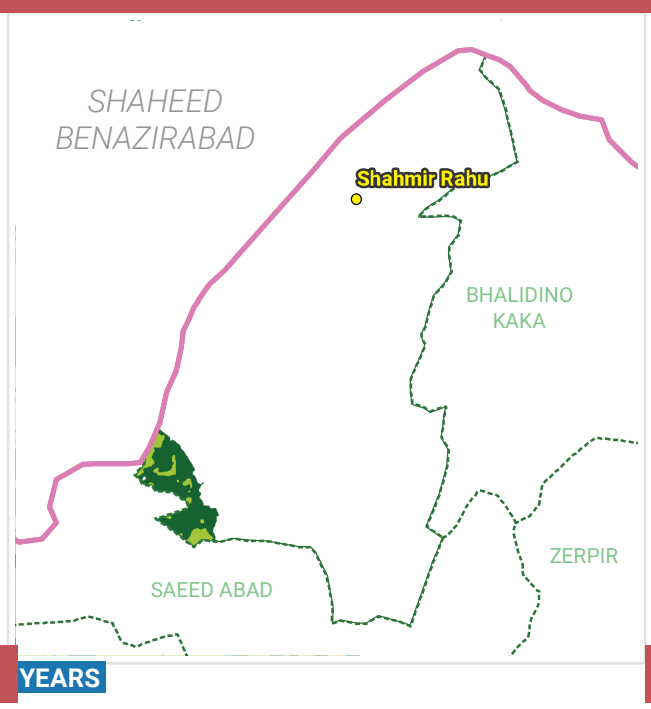


250 YEARS

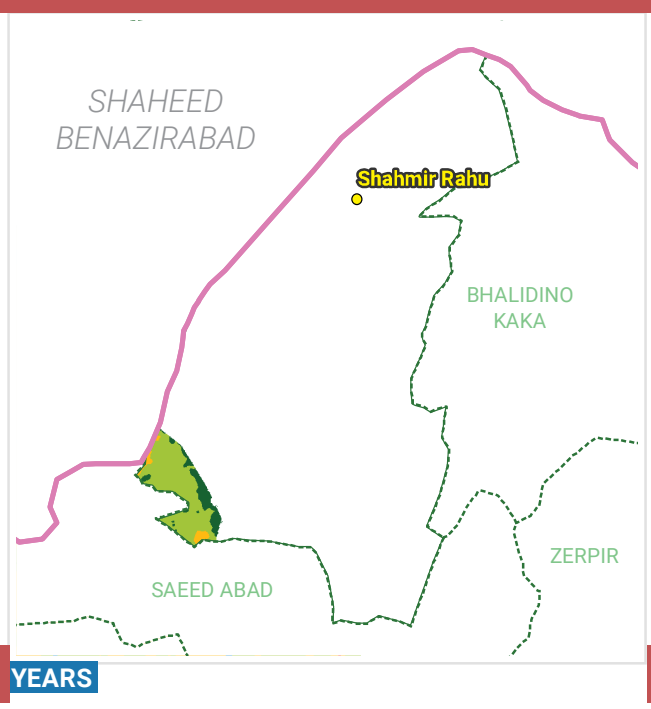
VULNERABILITY



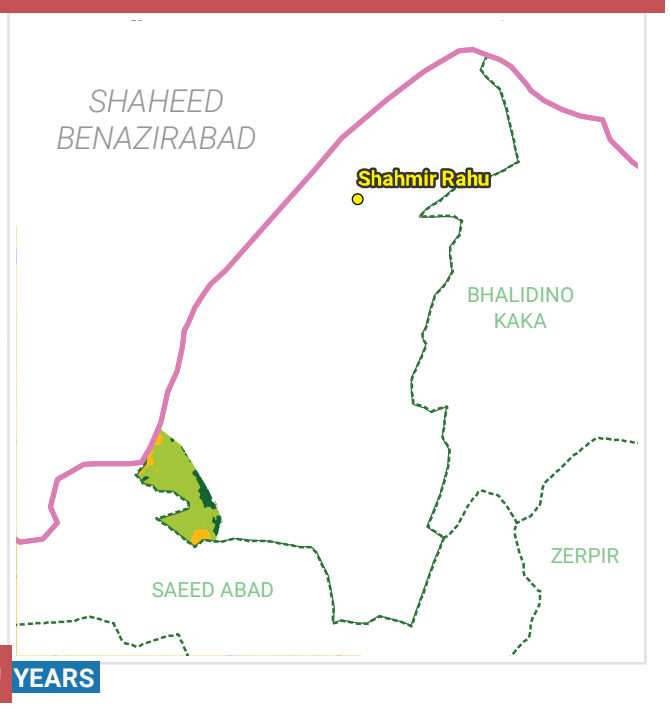
RISK AT DIFFERENT RETURN PERIODS



5 YEARS



25 YEARS



50 YEARS

HAZARD

Low | Medium | High | Very High

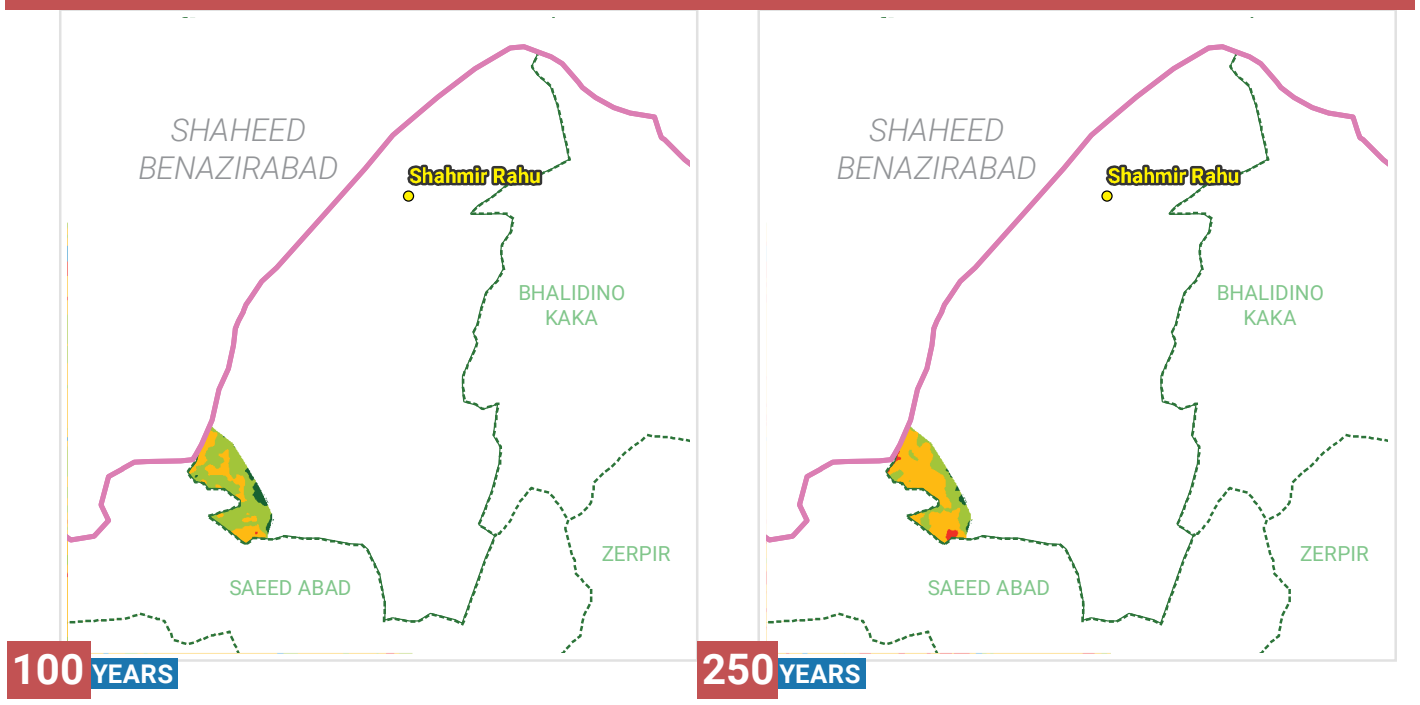
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK AT DIFFERENT RETURN PERIODS



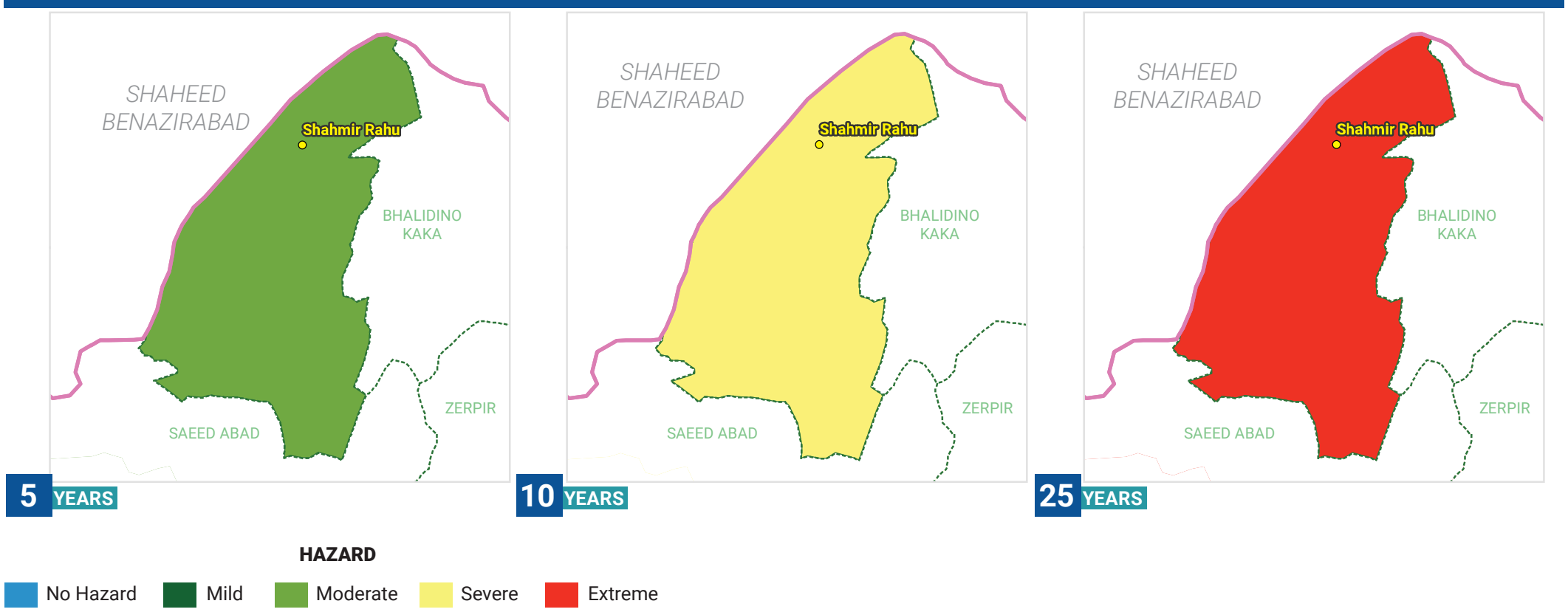
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

0	0	0	2.44	0	0	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
0	0	1.51	0	0	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	BRIDGES	BUS STOPS	EDUCATION FACILITIES
0	0	0	0	0	0	0	
HEALTH FACILITIES	MOBILE TOWERS	PETROL PUMPS	POLICE STATIONS	POST OFFICES	RAILWAY STATIONS	TOURIST PLACES	

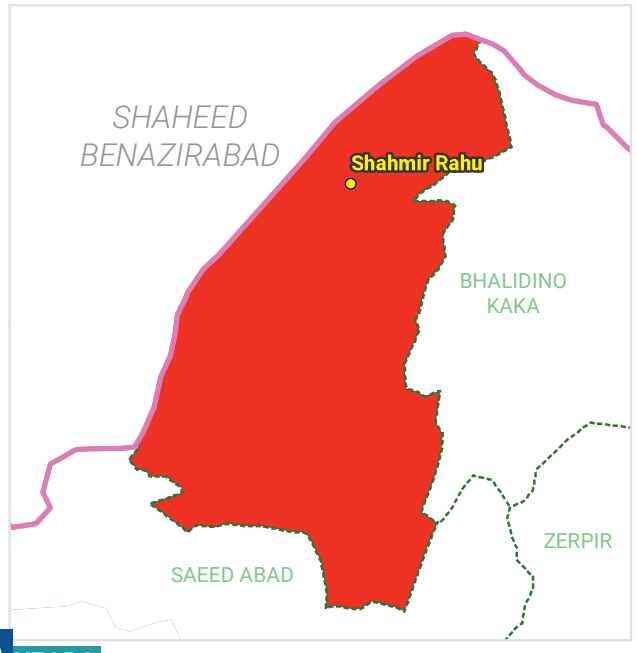
METEOROLOGICAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS



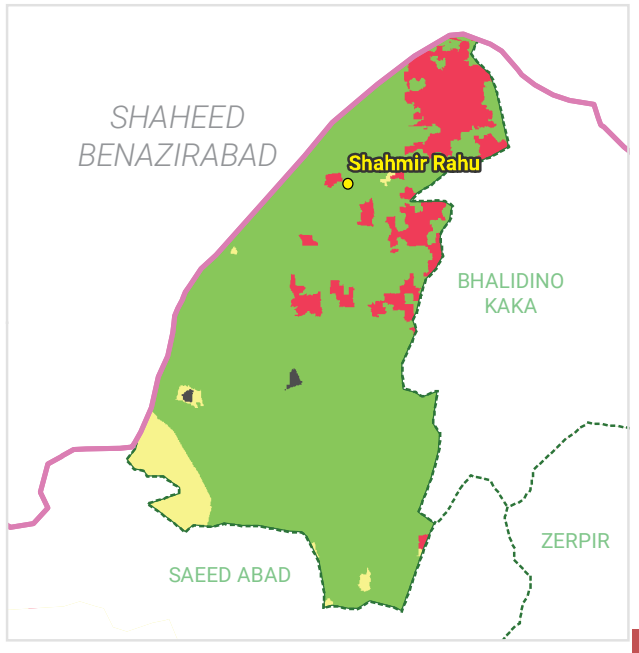
METEOROLOGICAL DROUGHT

HAZARD

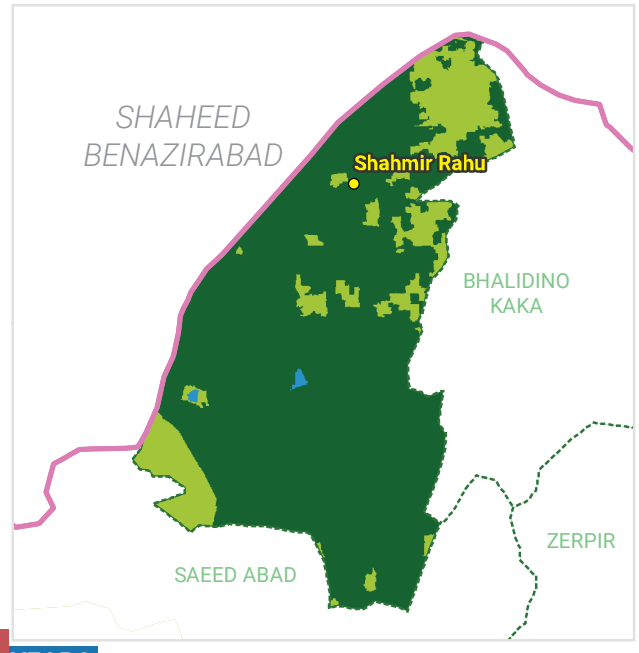


50 YEARS

VULNERABILITY

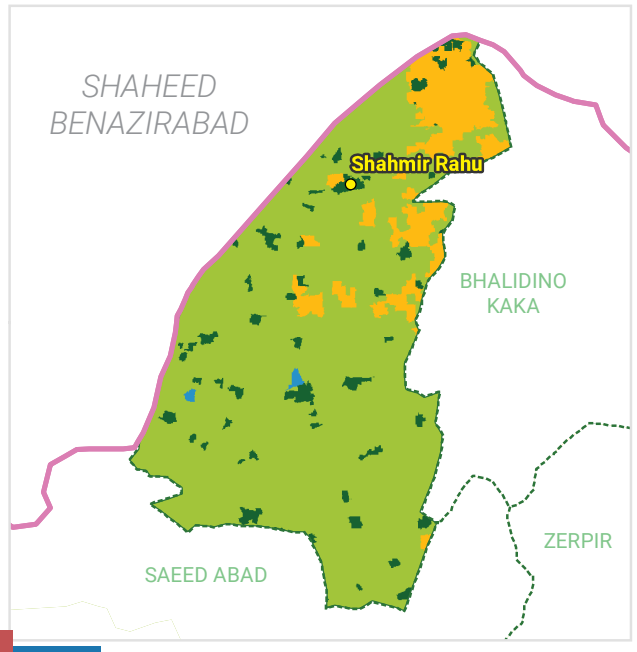


RISK

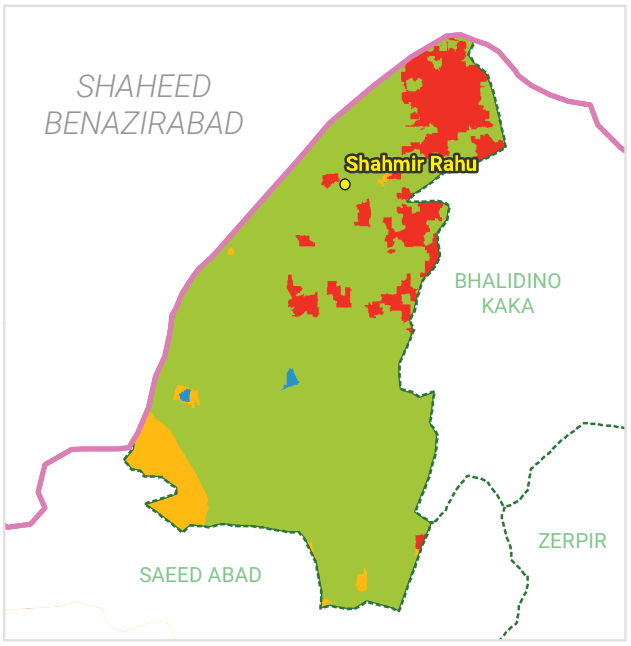


5 YEARS

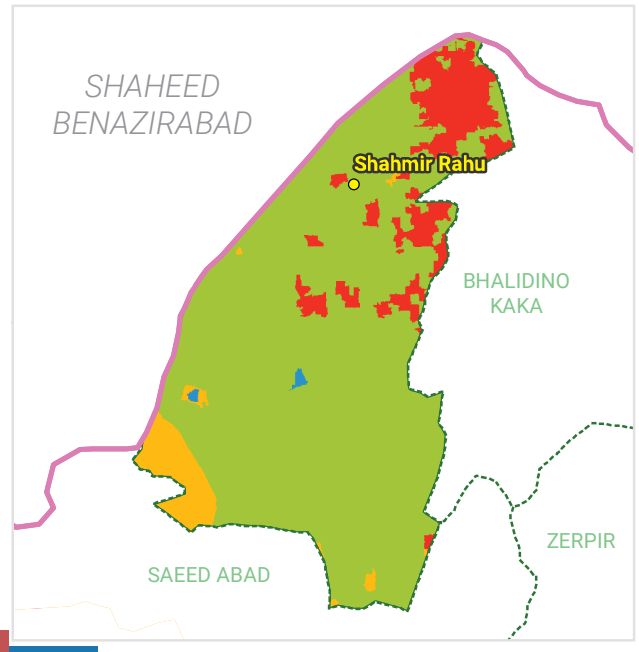
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

ELEMENTS AT RISK

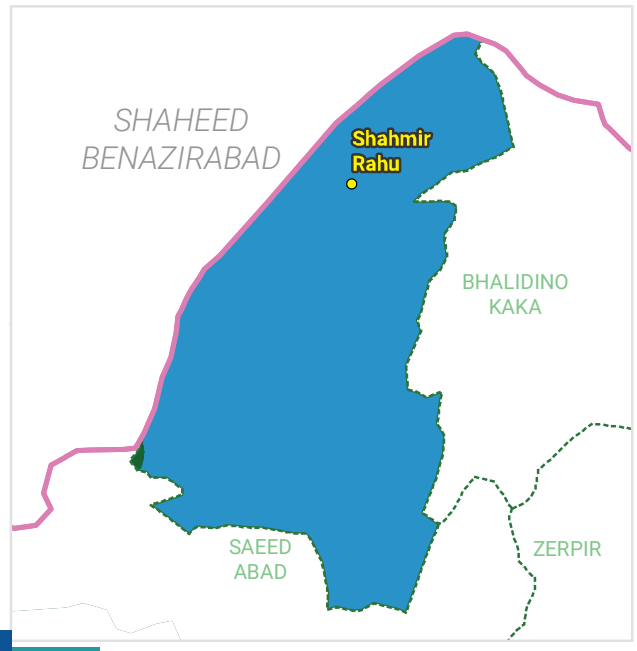
(BASED ON 50 YEARS RETURN PERIOD)

58	5036	25773	52.09	0	0.42	2.58	0.42
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

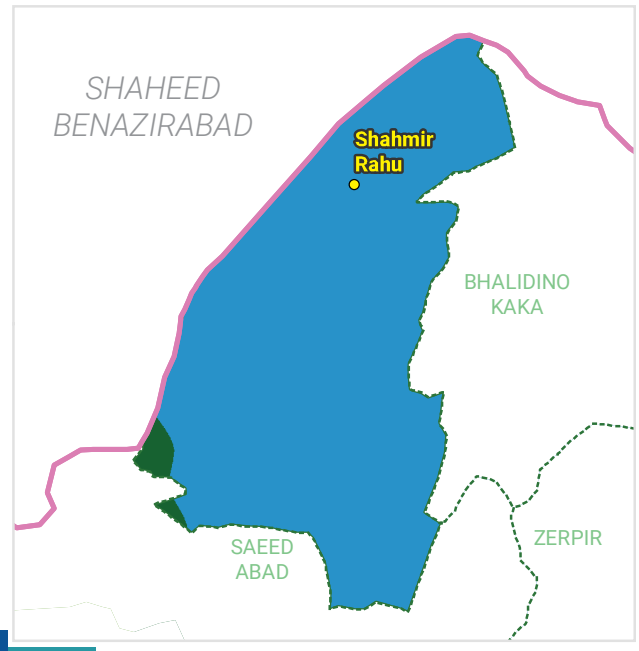
0.01	0.22
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

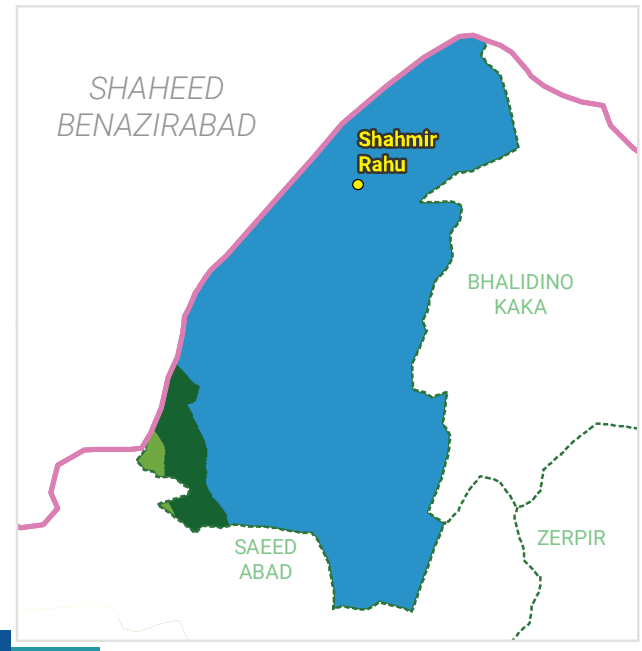
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

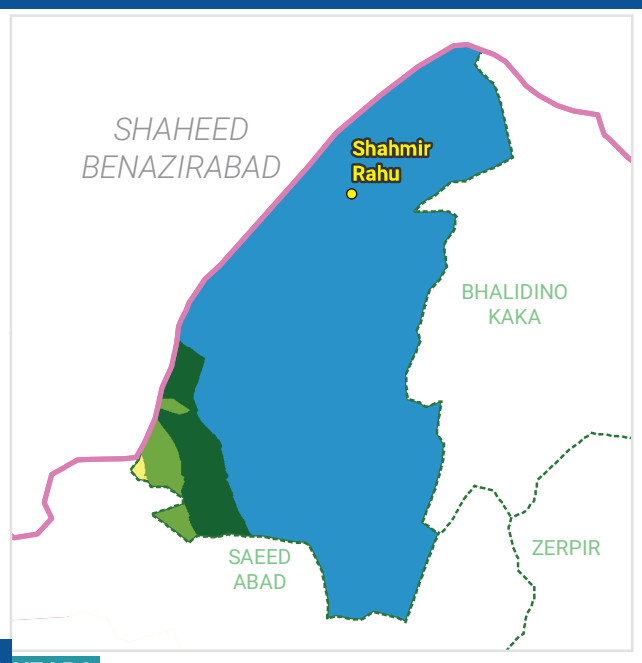


10 YEARS



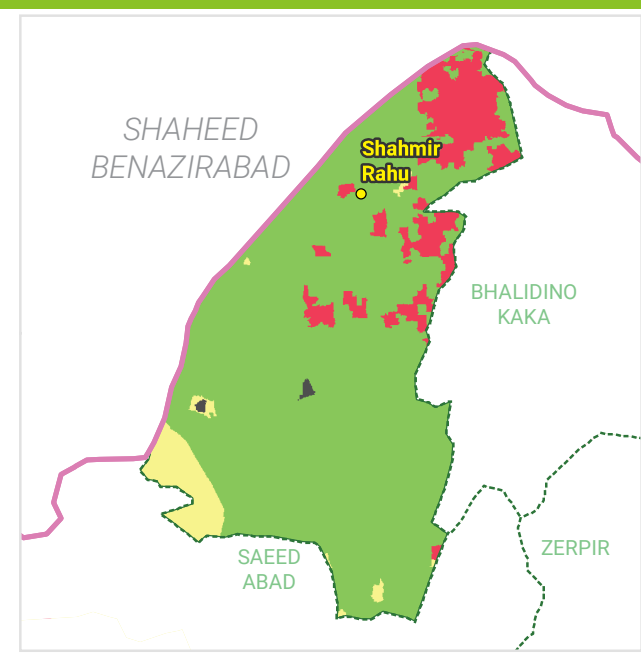
25 YEARS

HAZARD

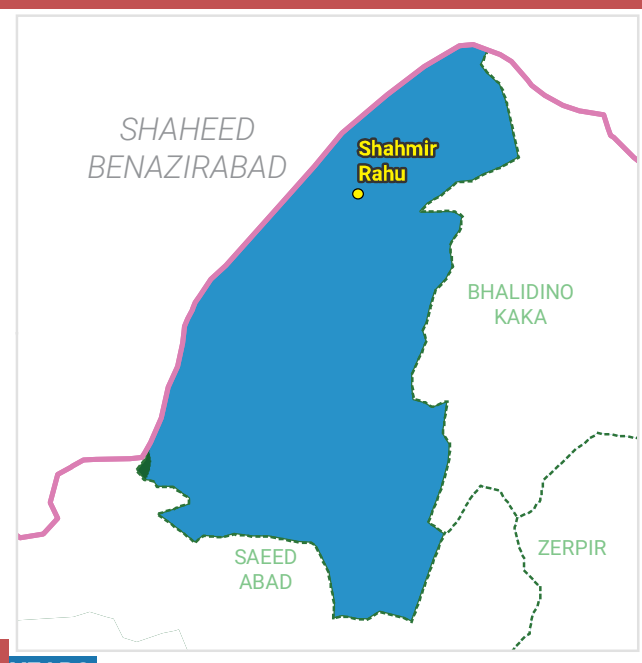


50 YEARS

VULNERABILITY

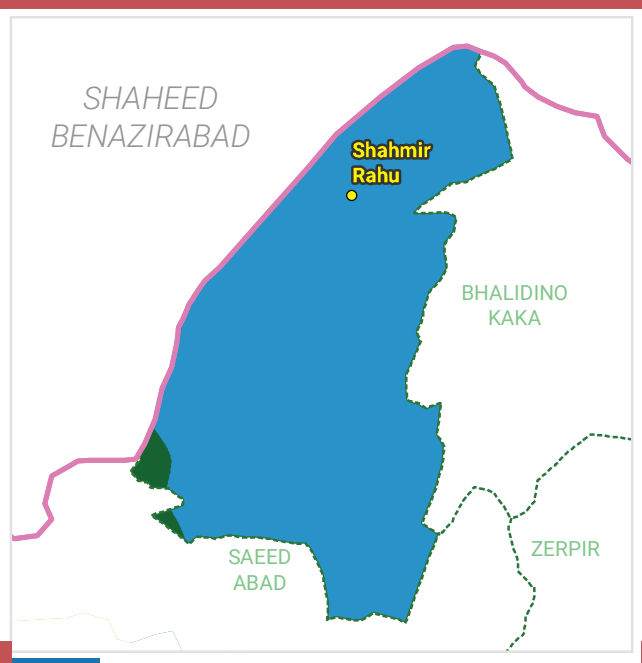


RISK

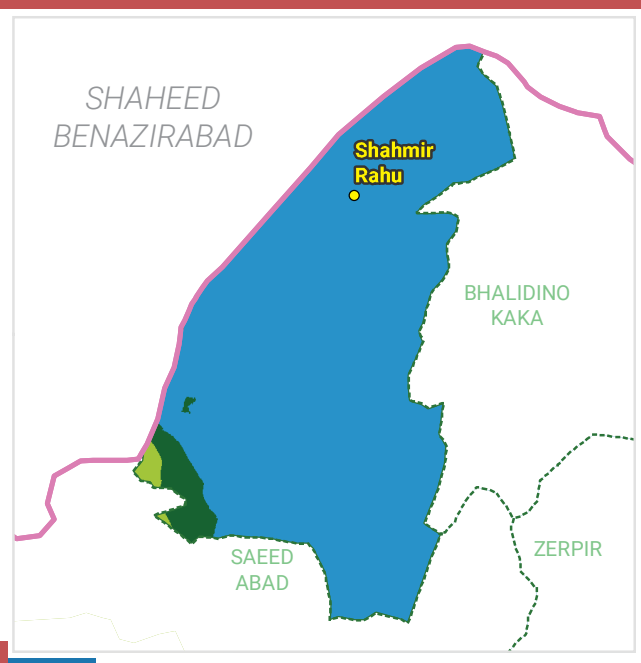


5 YEARS

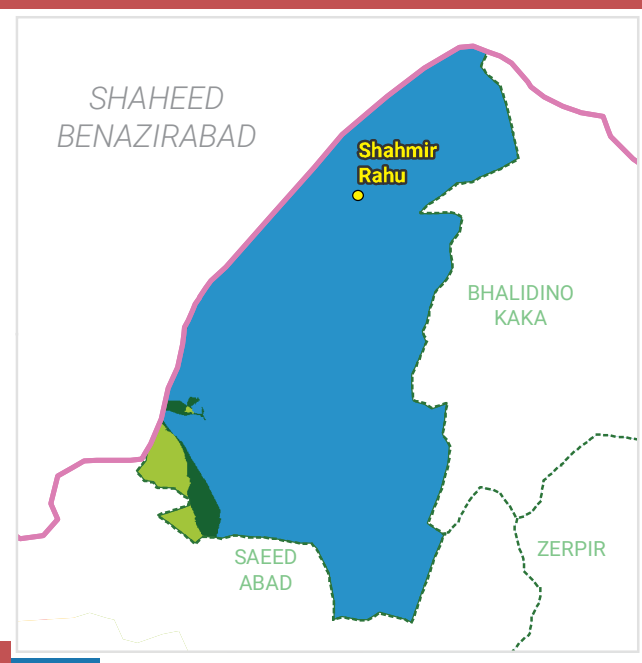
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

HAZARD

- No Hazard
- Mild
- Moderate
- Severe
- Extreme

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

AGRICULTURAL DROUGHT

ELEMENTS AT RISK

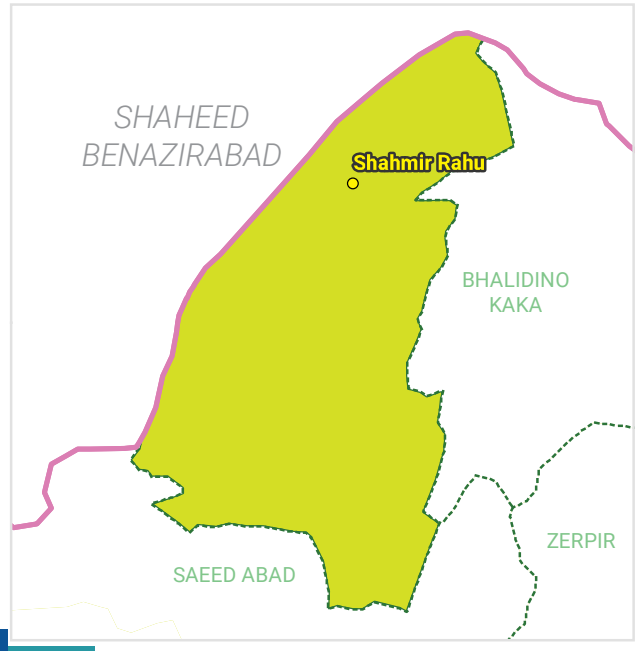
(BASED ON 50 YEARS RETURN PERIOD)

1	17	88	3.25	0	0.09	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

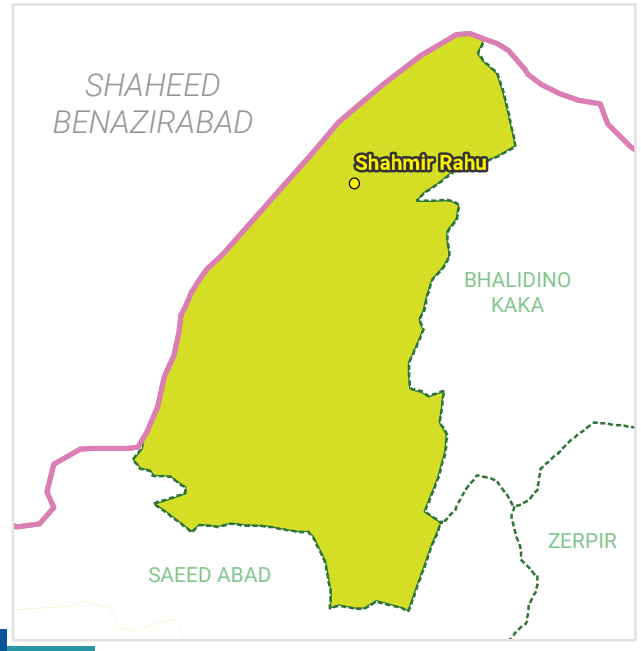
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

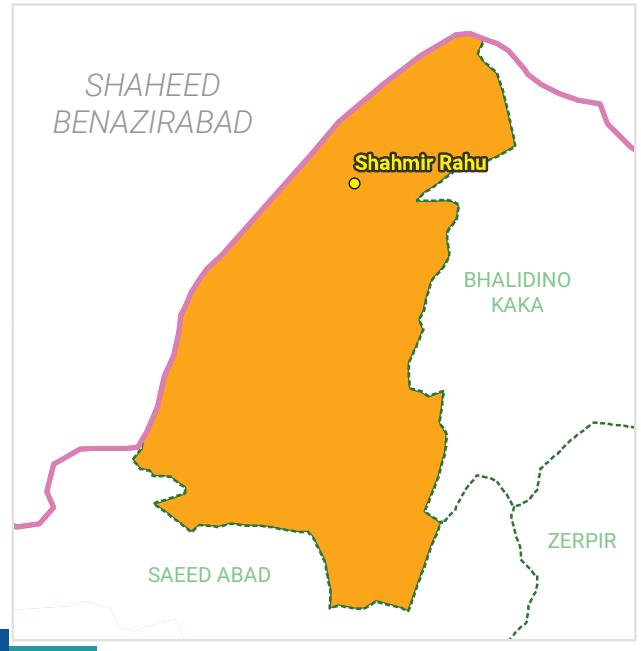
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS



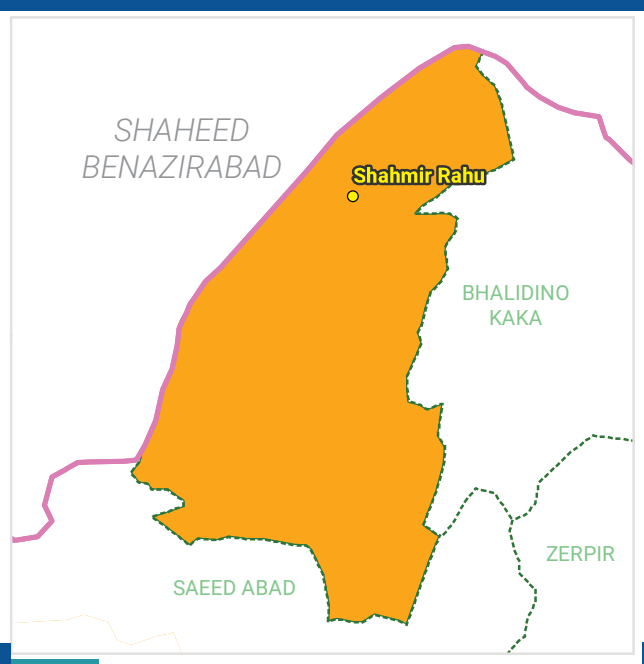
10 YEARS



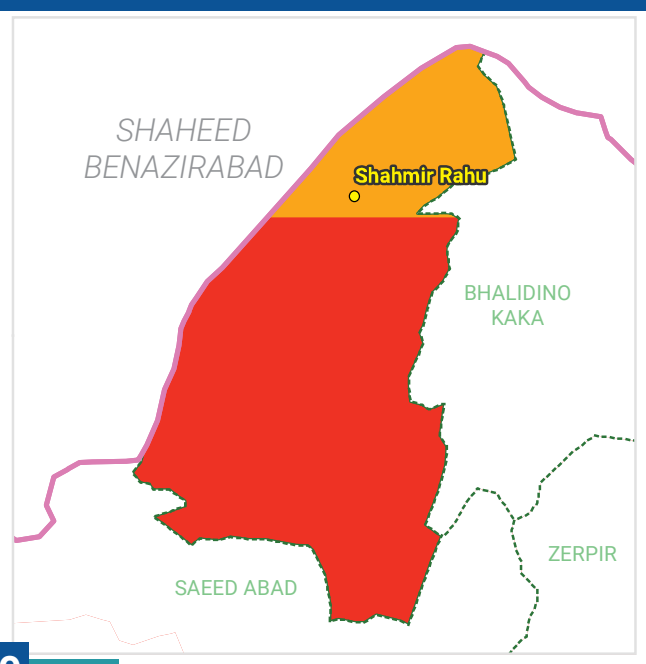
25 YEARS

HAZARD AT DIFFERENT RETURN PERIODS

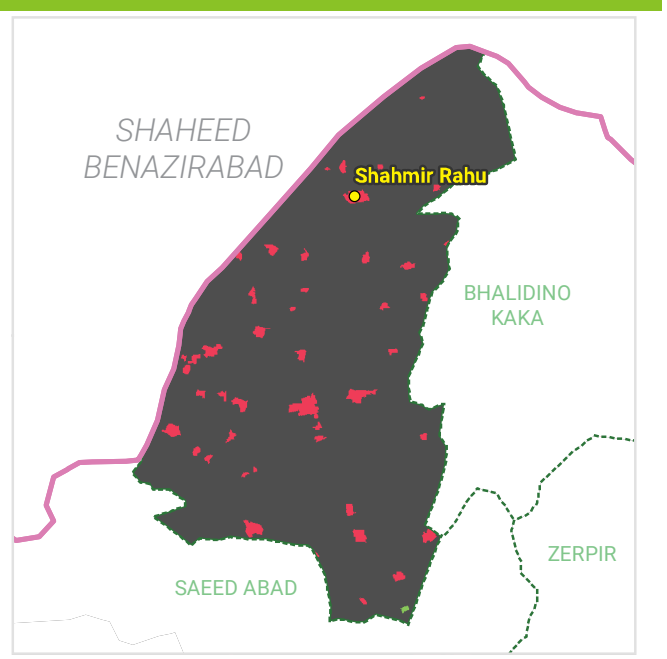
VULNERABILITY



50 YEARS



100 YEARS



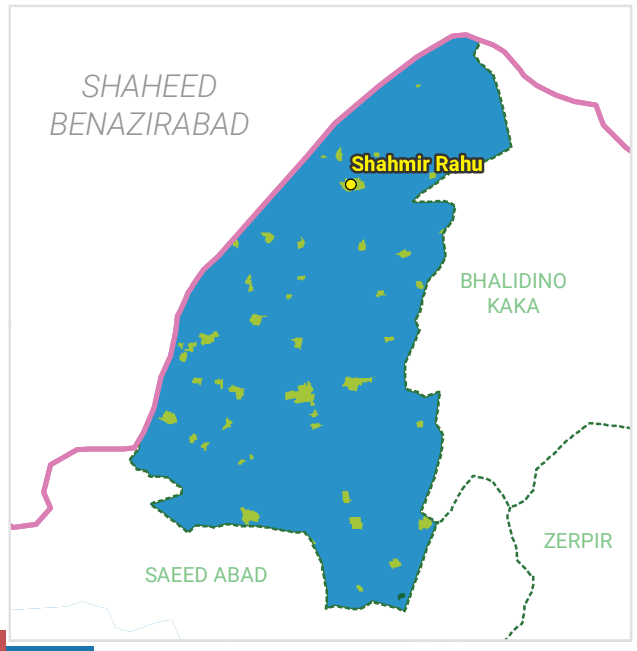
HAZARD

Normal | Moderate | High | Severe | Extreme

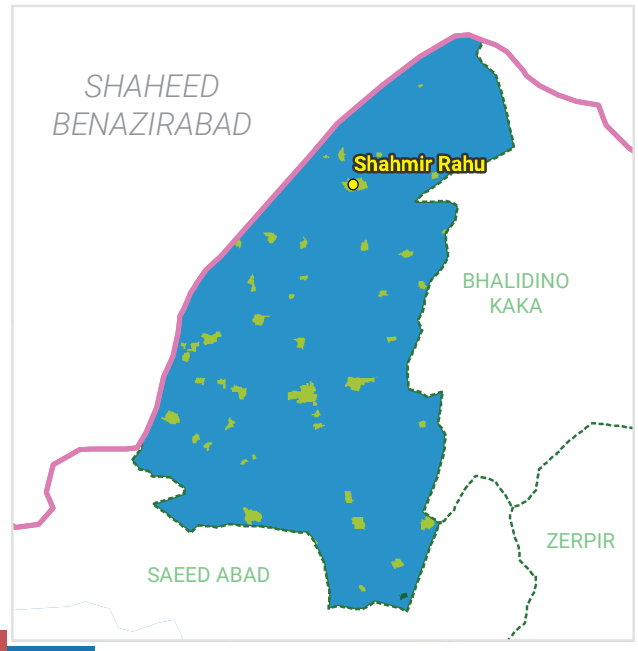
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

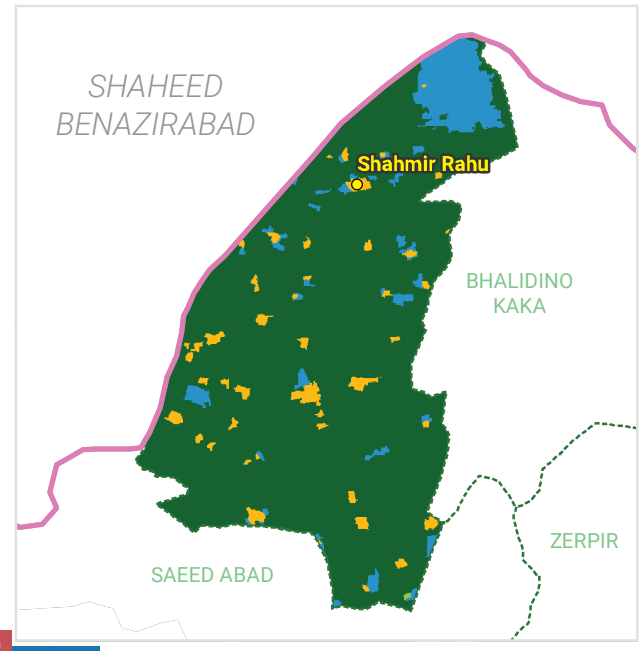
RISK AT DIFFERENT RETURN PERIODS



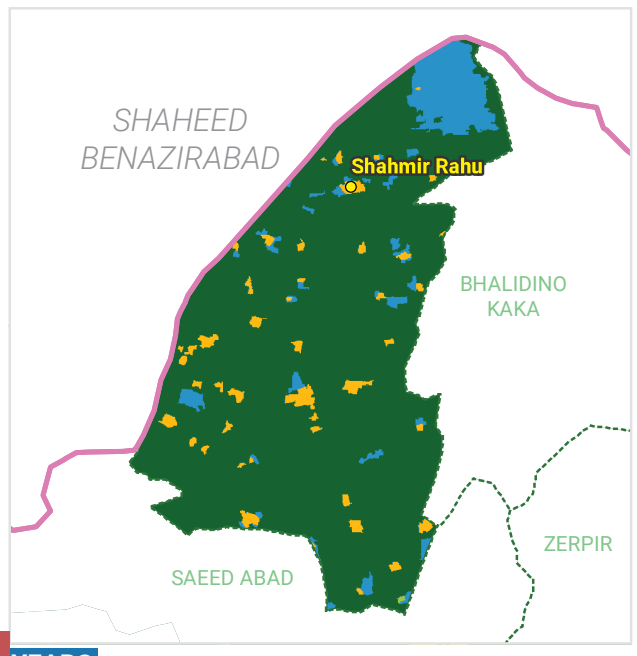
5 YEARS



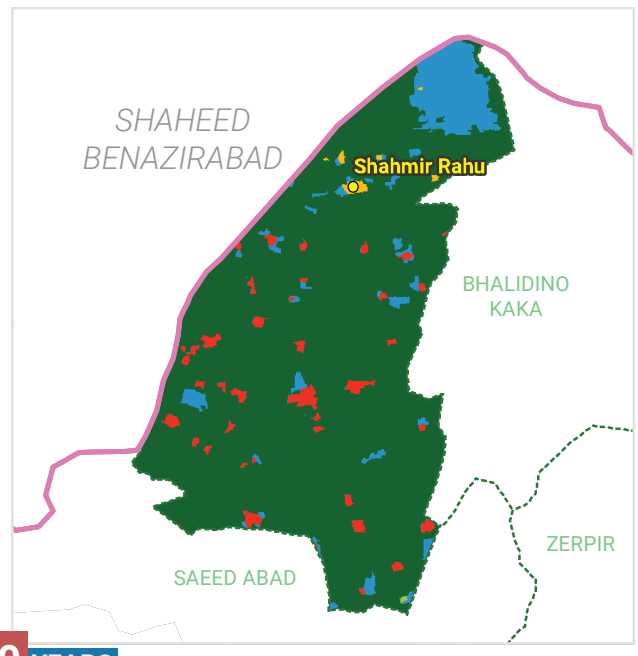
10 YEARS



25 YEARS



50 YEARS



100 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

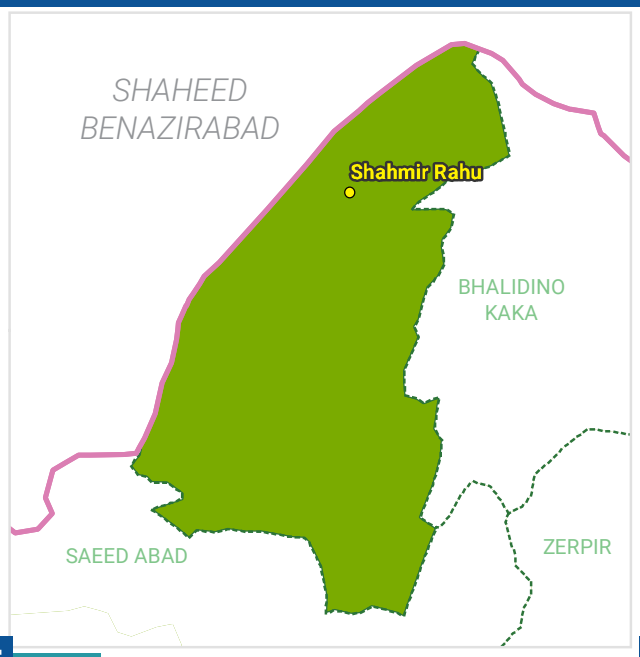
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

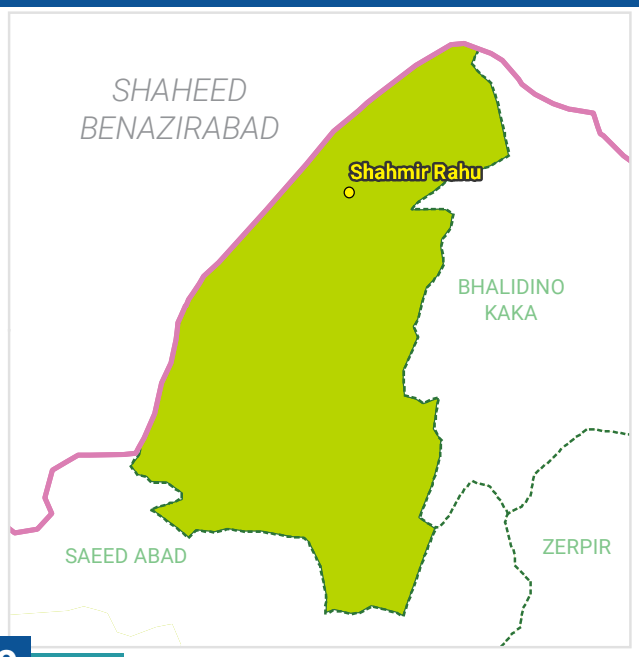
57	4997	25579	51.98	0.00	0.02	1.74
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

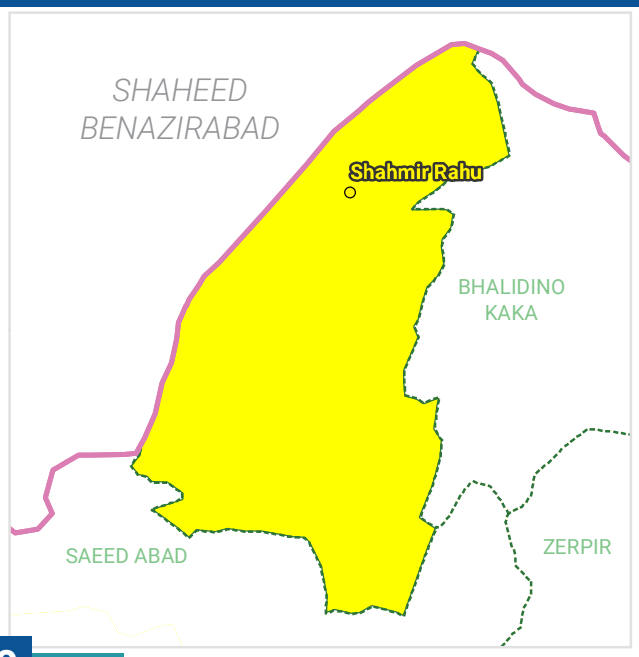
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

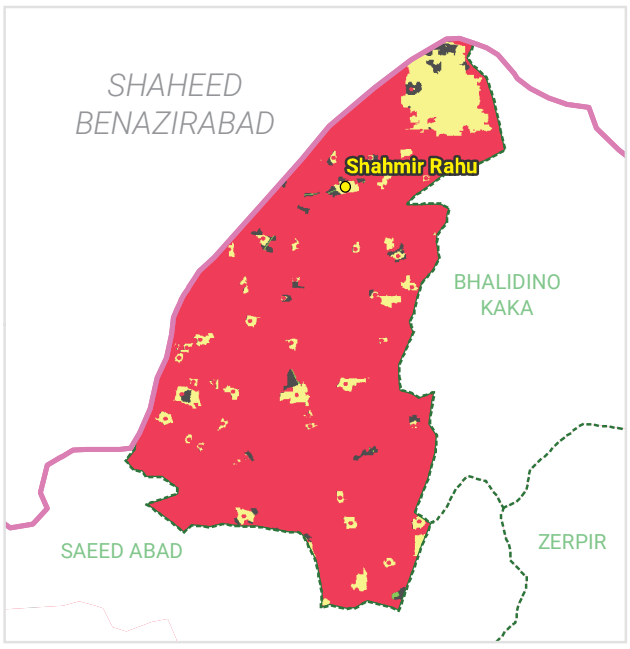


100 YEARS

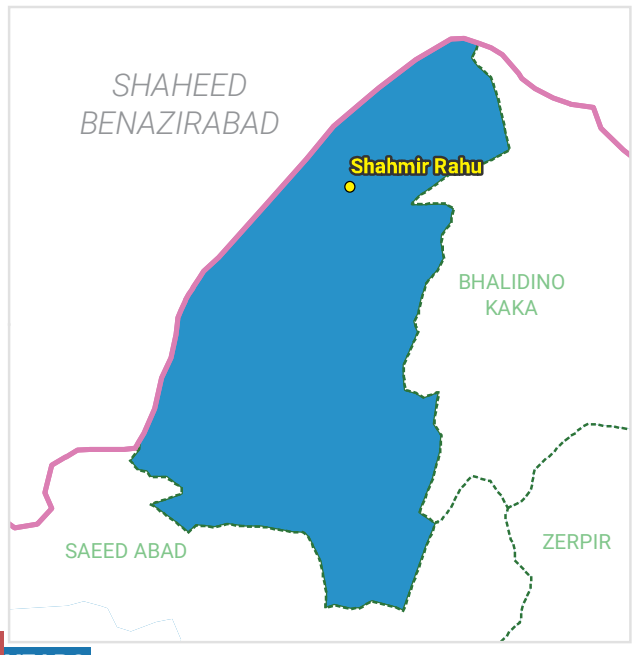


500 YEARS

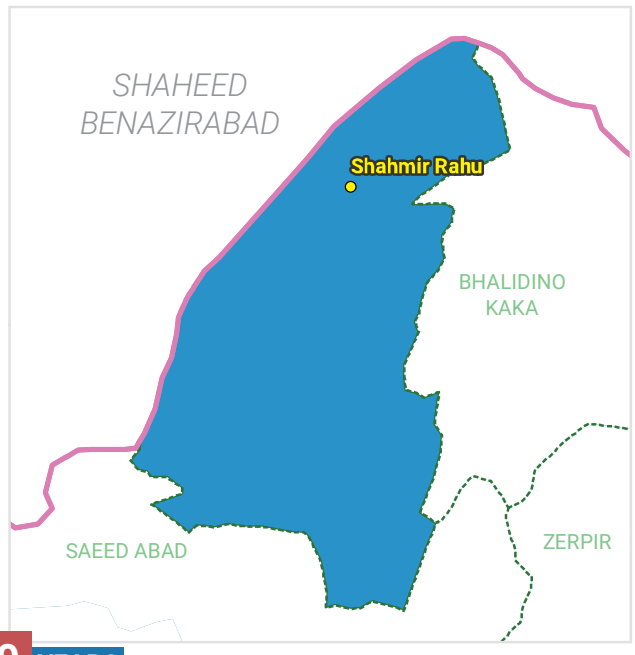
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS

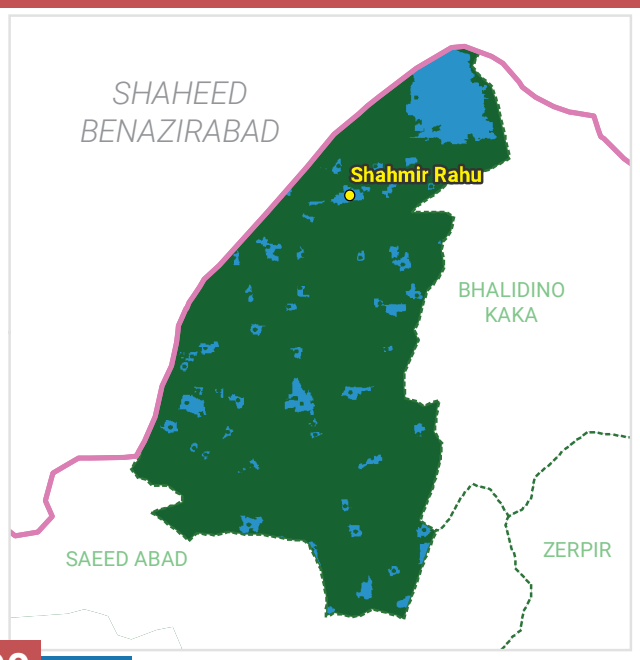


25 YEARS



100 YEARS

RISK



500 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

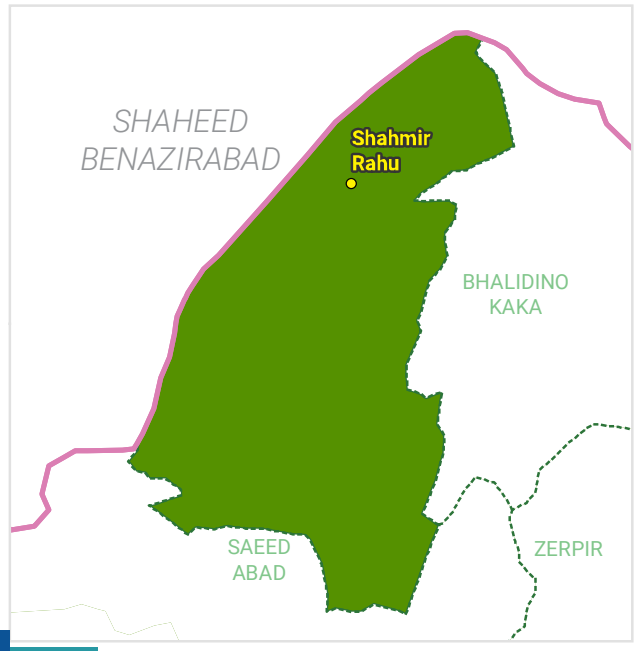
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

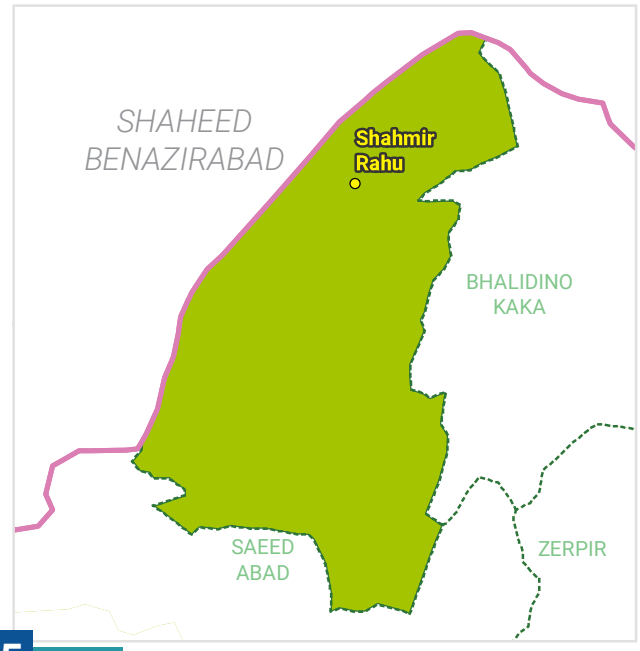
NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

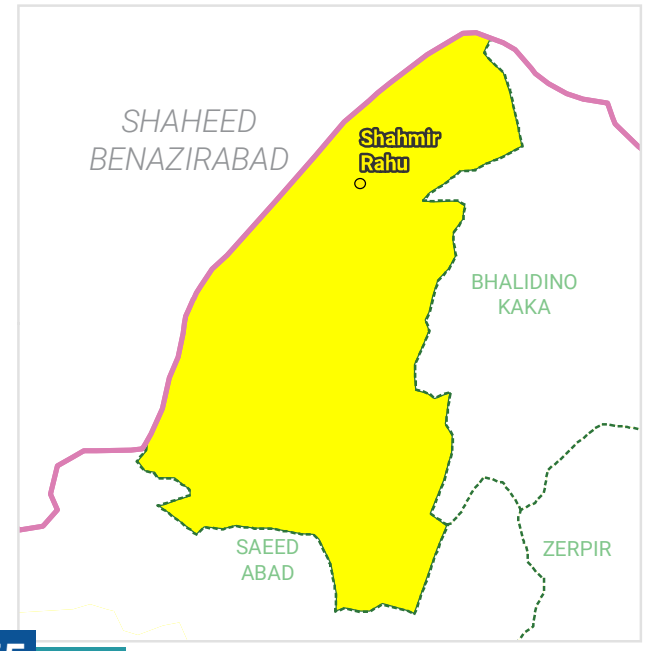
HAZARD AT DIFFERENT RETURN PERIODS



95 YEARS

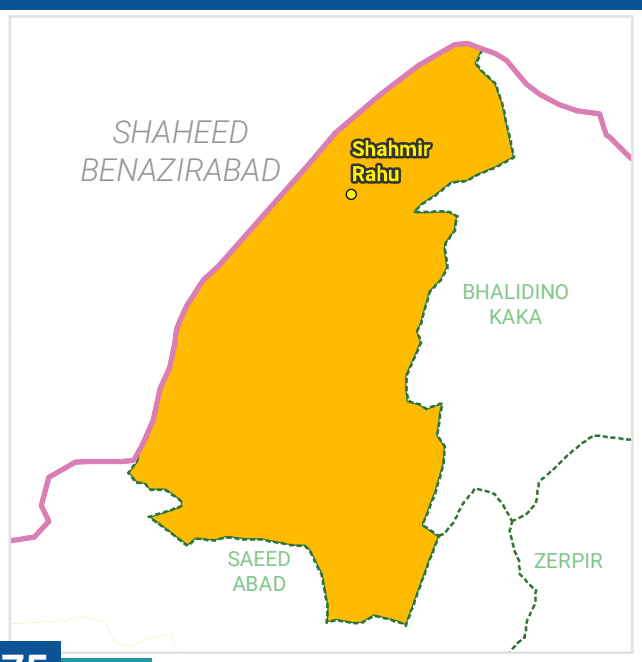


475 YEARS



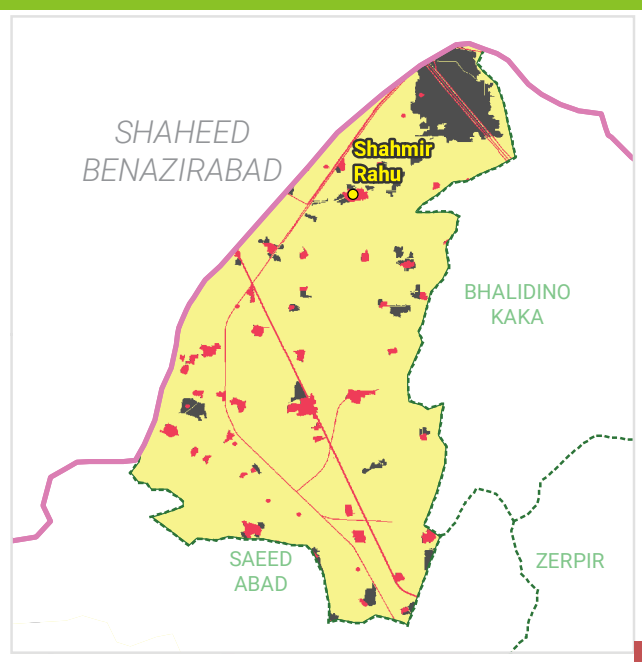
975 YEARS

HAZARD

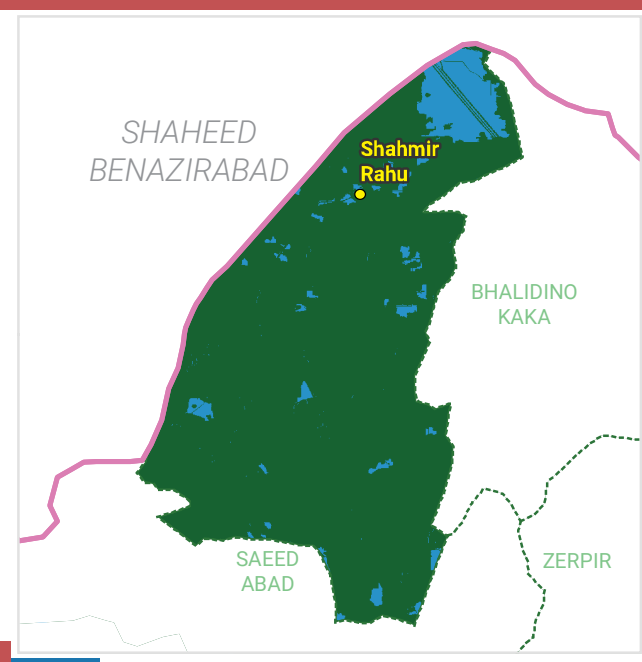


2475 YEARS

VULNERABILITY



RISK



95 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

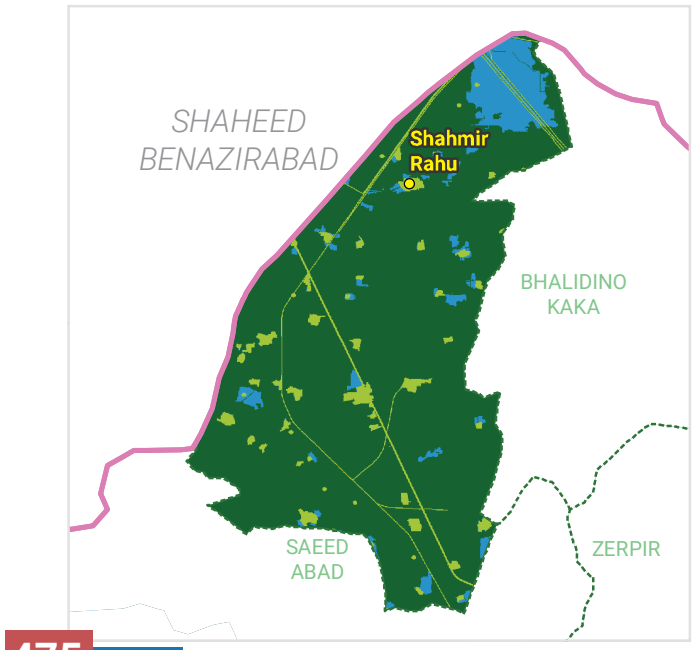
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

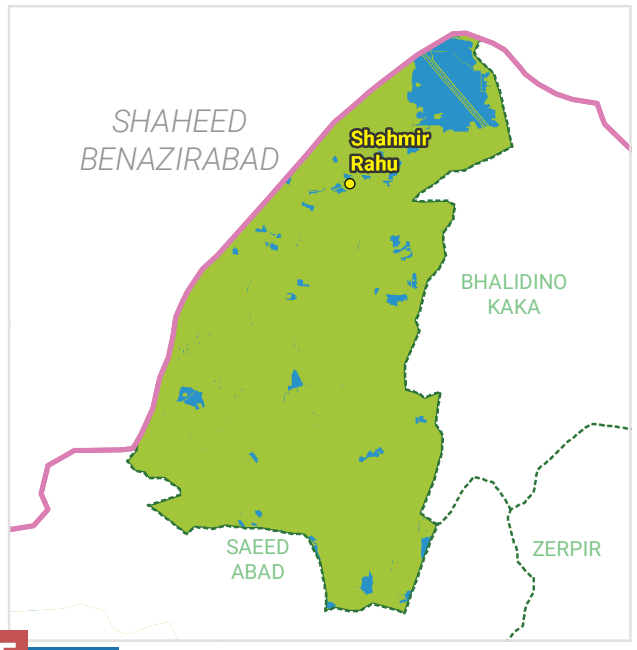
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

EARTHQUAKE

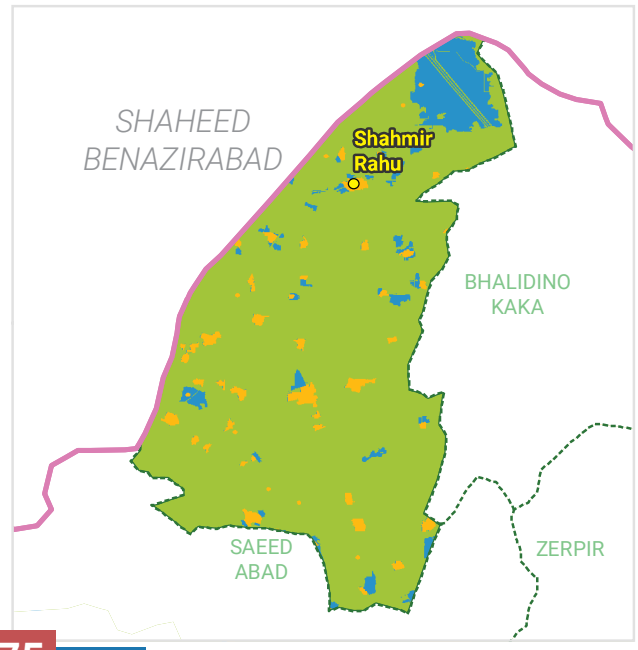
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
58	4975	25469	52.01	0.03	0.00	0.22	0.02
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
1.73	0.03	130.75	0	38.24	0	3	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
64	0	0	0	1	0	0	2
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		
0	0	0	0	0	0		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	Low, Medium	●	Low, Medium, High	Low, Medium, High	Low, Medium, High, Extreme	Low, Medium, High, Extreme	●
METEOROLOGICAL DROUGHT	Low, Medium	Low, Medium, High	Medium, High, Extreme	Medium, High, Extreme	●	●	●
AGRICULTURAL DROUGHT	Low	Low	Low, Medium	Low, Medium	●	●	●
HEATWAVE	Low, Medium	Low, Medium	Low, Medium, High	Low, Medium, High	Low, Medium, High, Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low, Medium	Medium	Medium, High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - TAJPUR

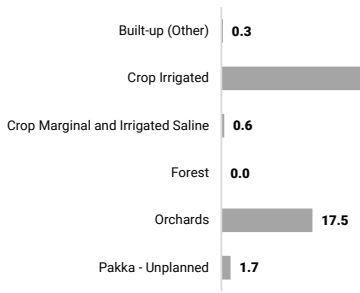
Union Council area in sq. km **64**

Surrounding UCs / Features
MATIARI in West
BAU KHAN PATHAN in North
TANDO ALLAHYAR DISTRICT in East
HYDERABAD DISTRICT in South

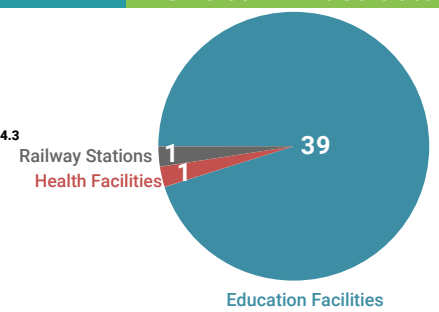
Population	2017 approx.	33,309
No. of household	2017 approx.	6,449

Land Use Land Cover

coverage area in sq.km



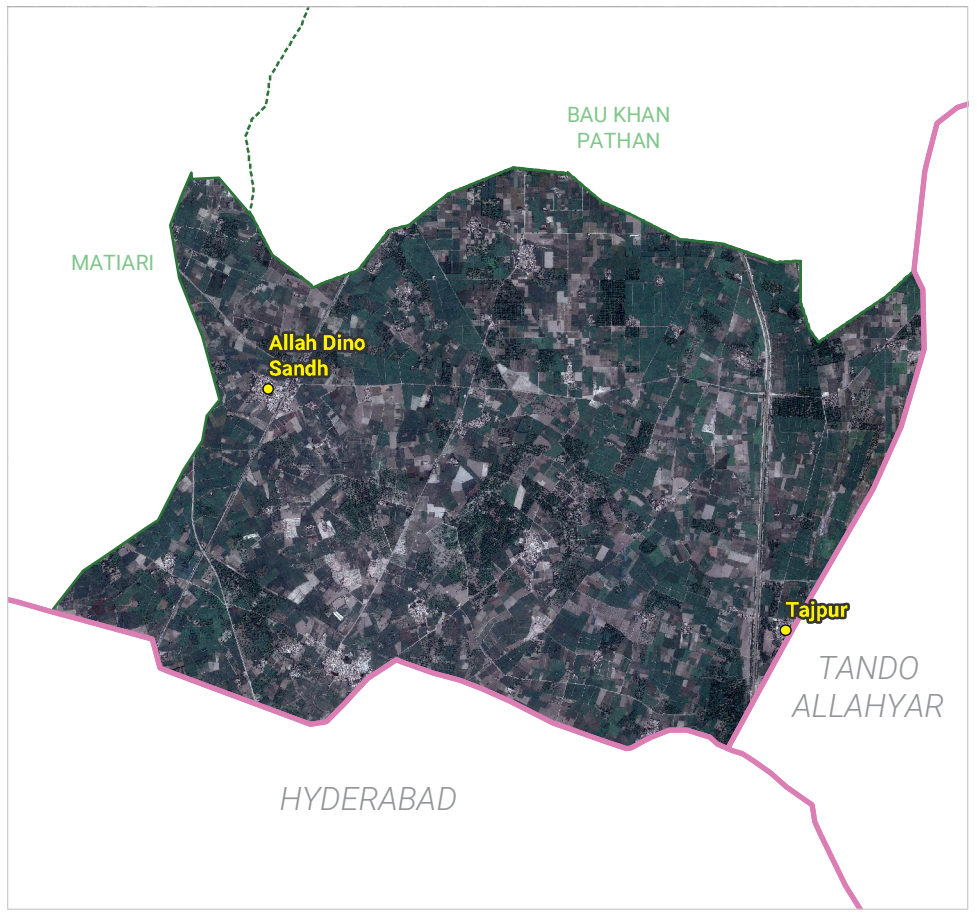
Critical Infrastructure



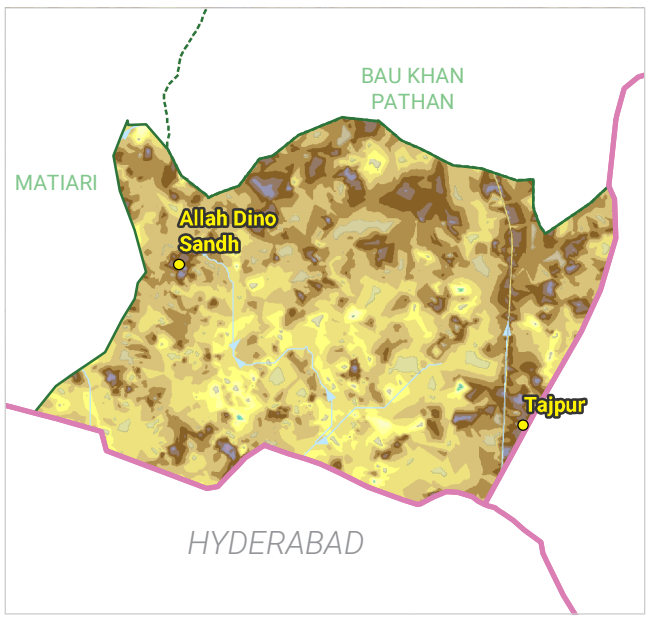
NO. OF SETTLEMENTS

43

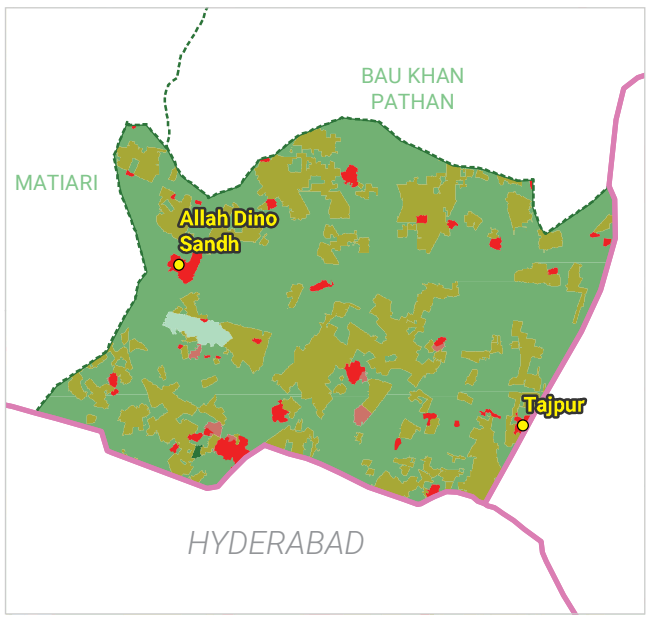
SATELLITE IMAGERY



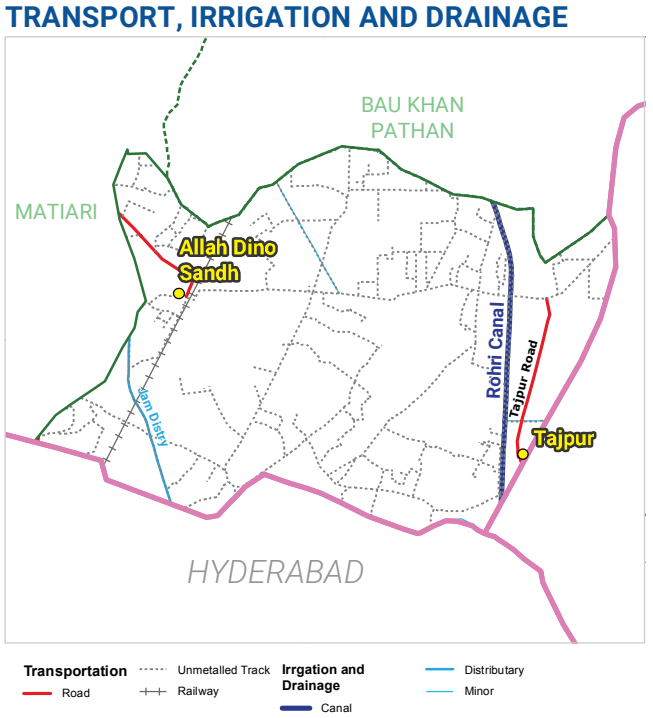
DEM AND FLOW DIRECTION



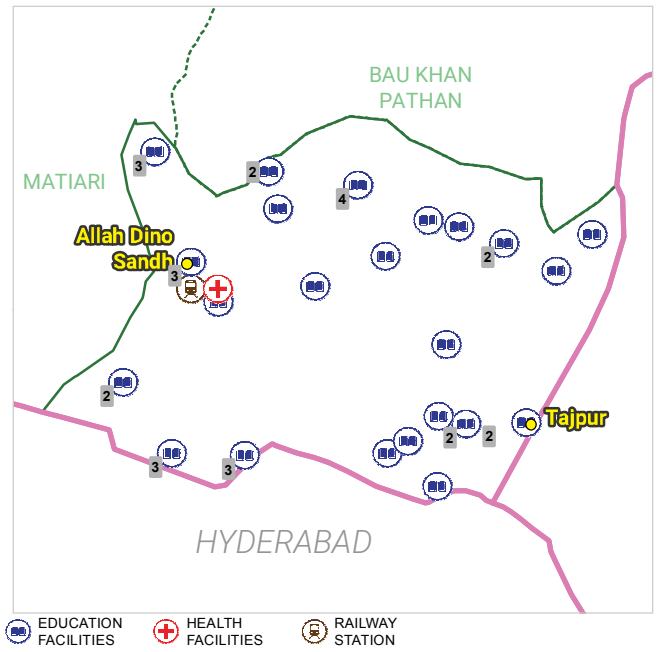
LAND USE / LAND COVER



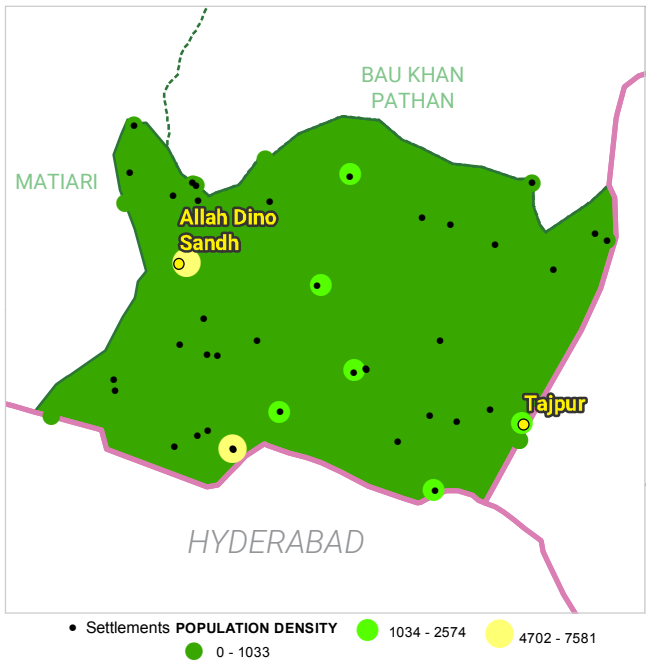
TRANSPORT, IRRIGATION AND DRAINAGE



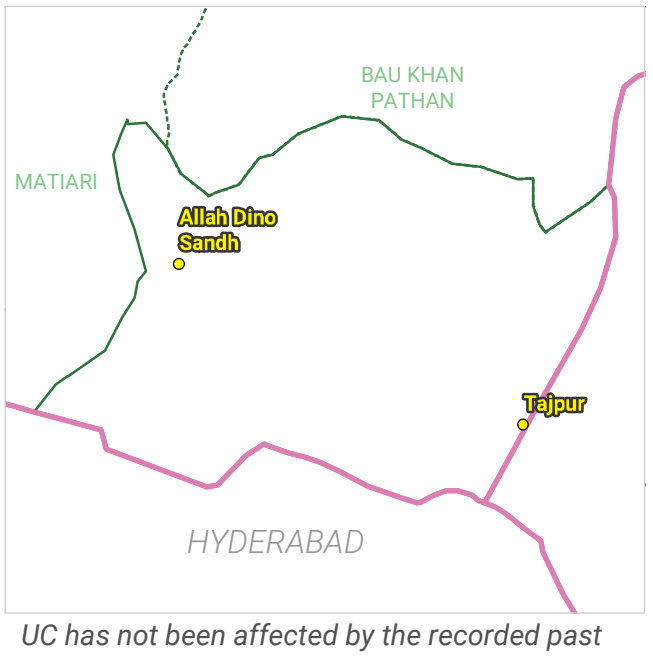
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS



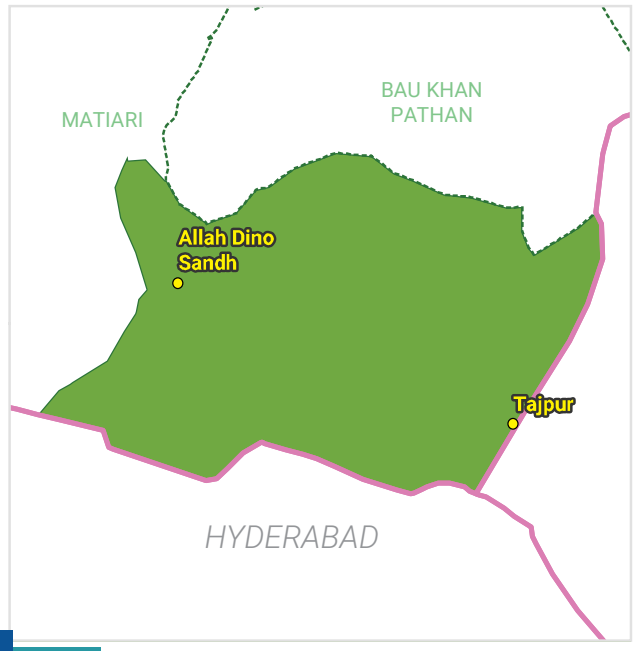
UC has not been affected by the recorded past hazards

FLOOD

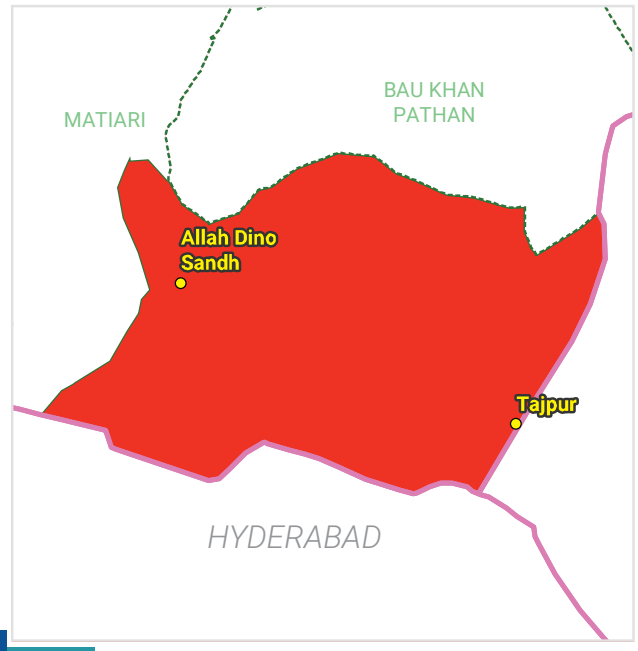
NO HAZARD OF RIVERINE FLOOD IN UC

METEOROLOGICAL DROUGHT

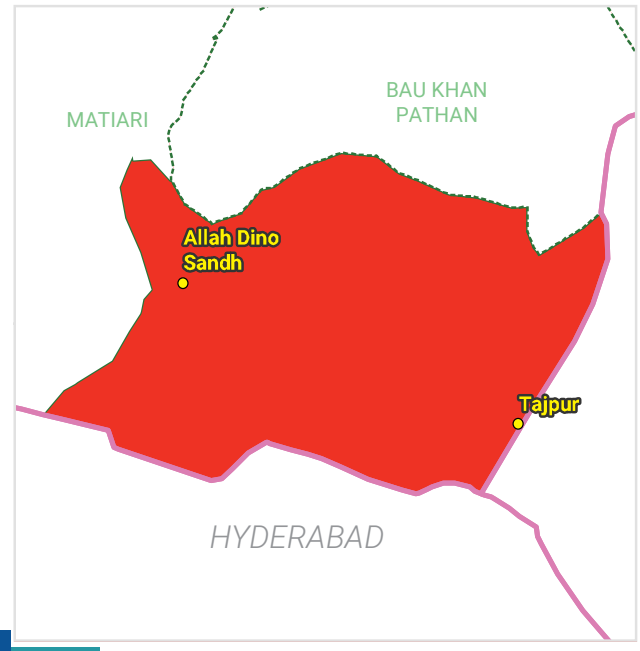
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

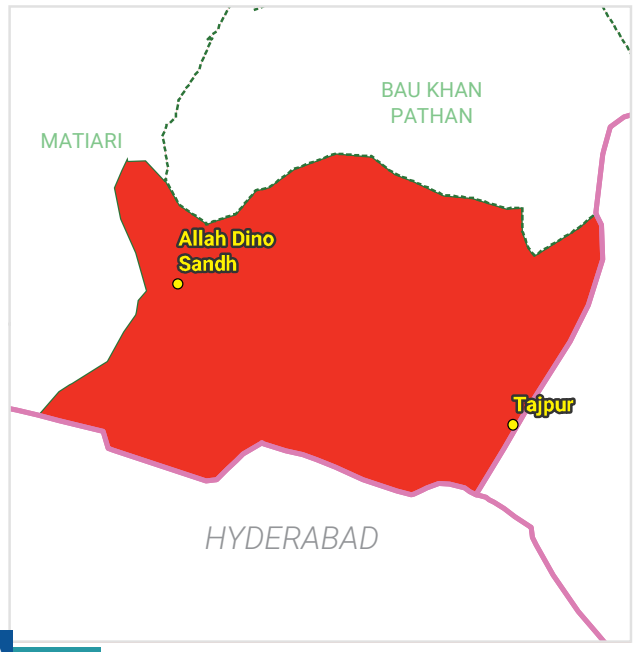


10 YEARS



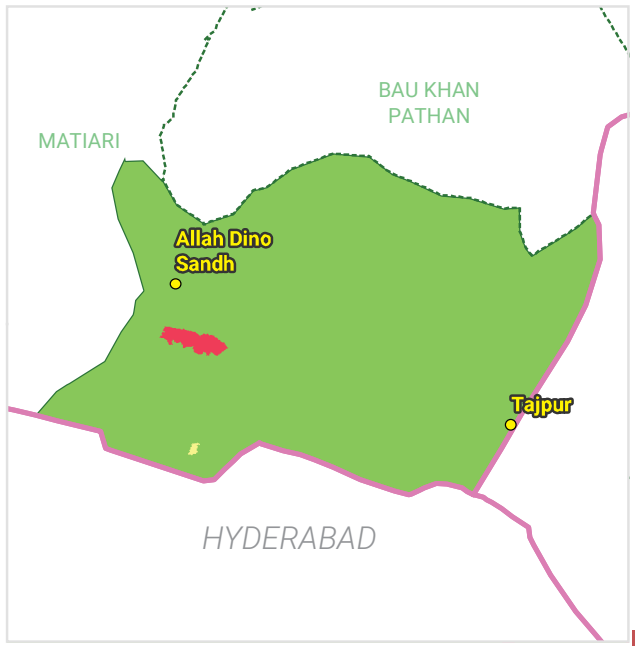
25 YEARS

HAZARD

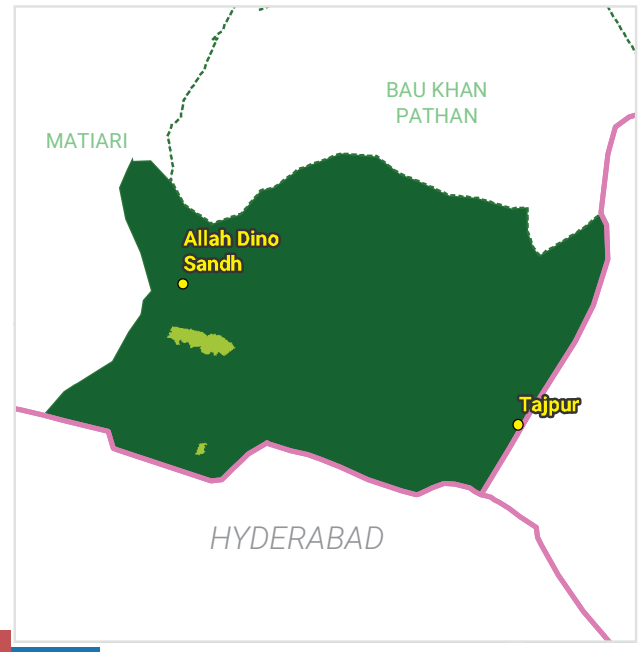


50 YEARS

VULNERABILITY

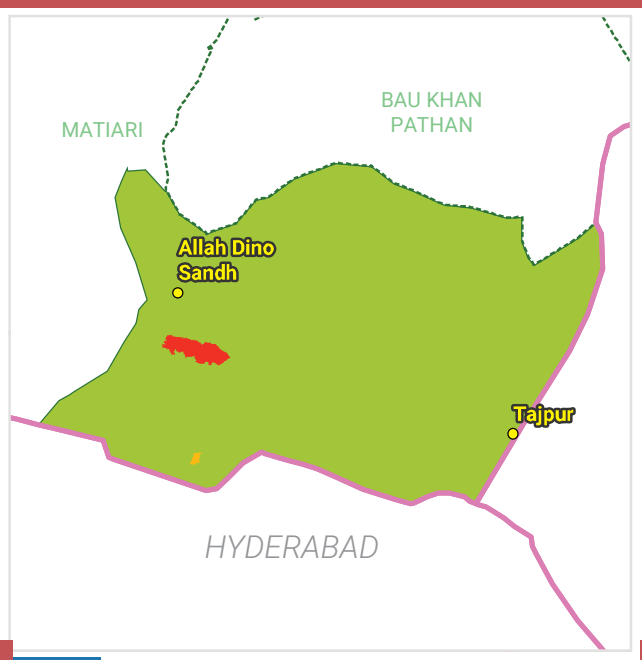


RISK

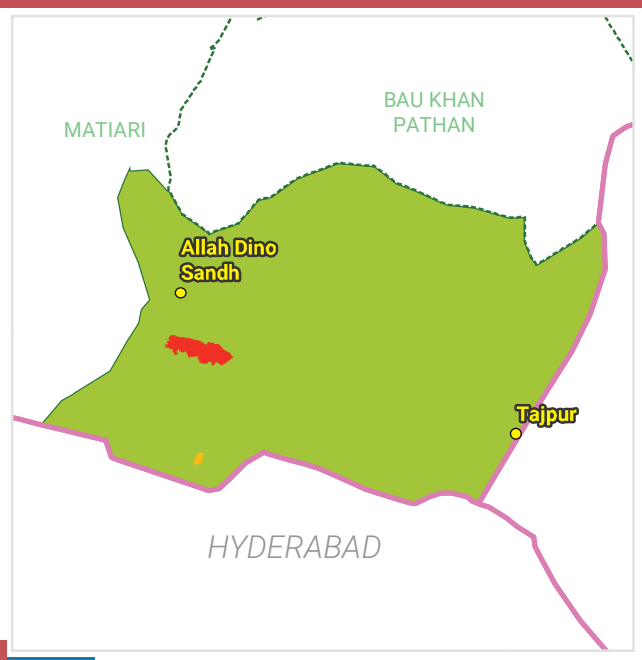


5 YEARS

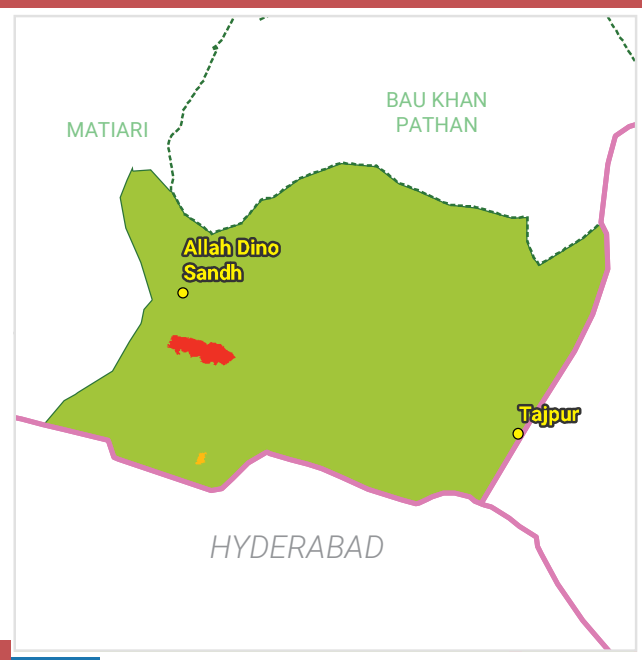
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

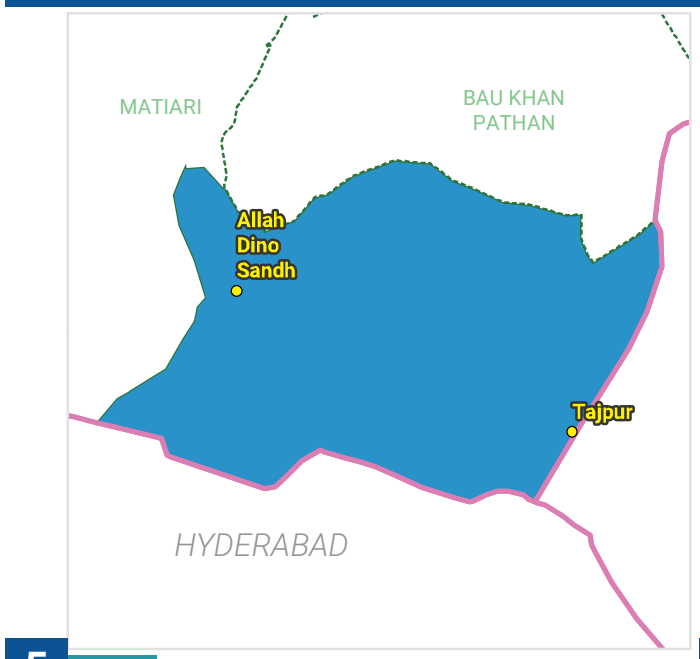
(BASED ON 50 YEARS RETURN PERIOD)

43	6449	33309	62.37	0	0.04	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

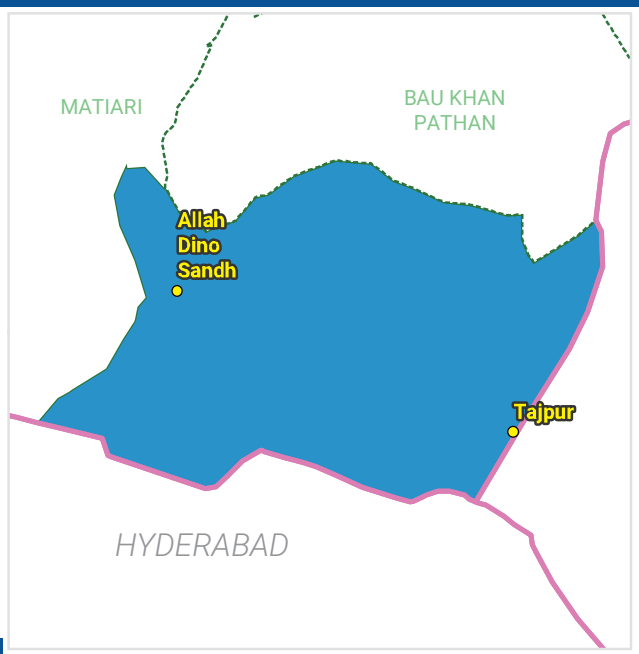
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

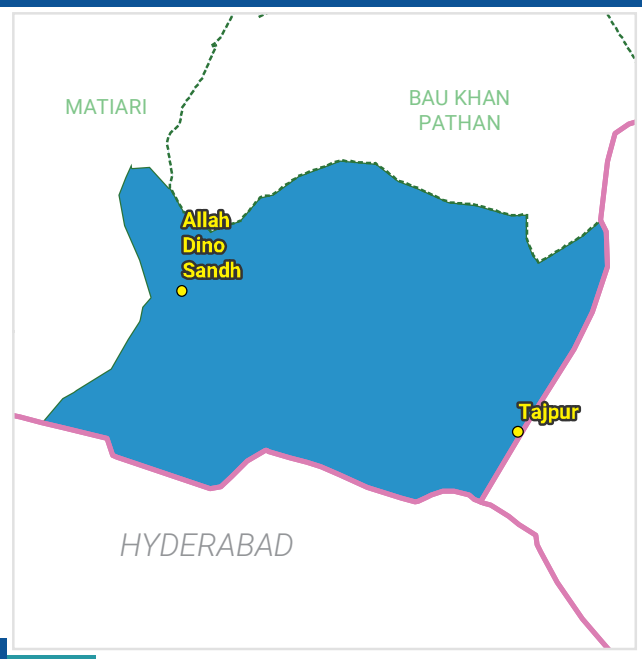
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

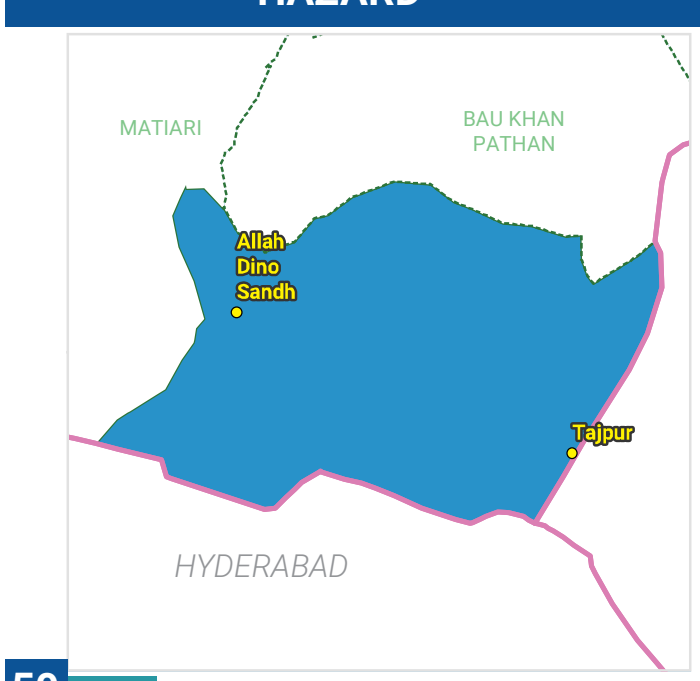


10 YEARS



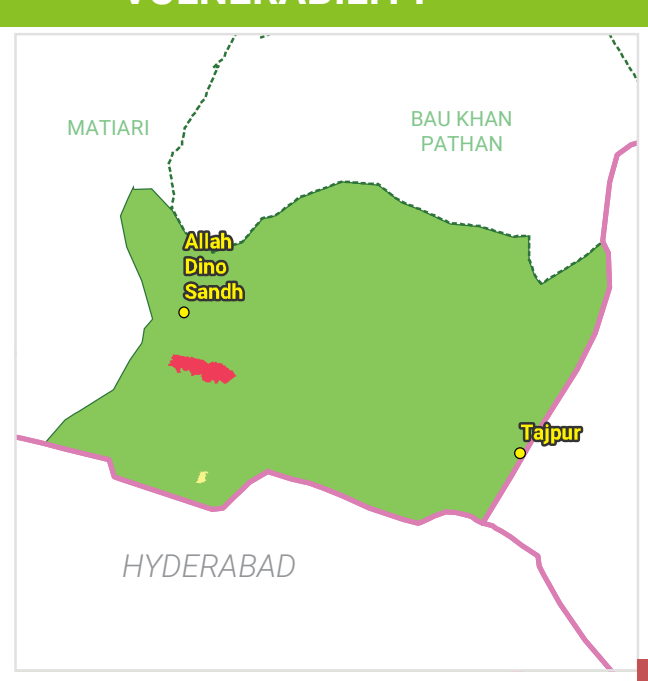
25 YEARS

HAZARD

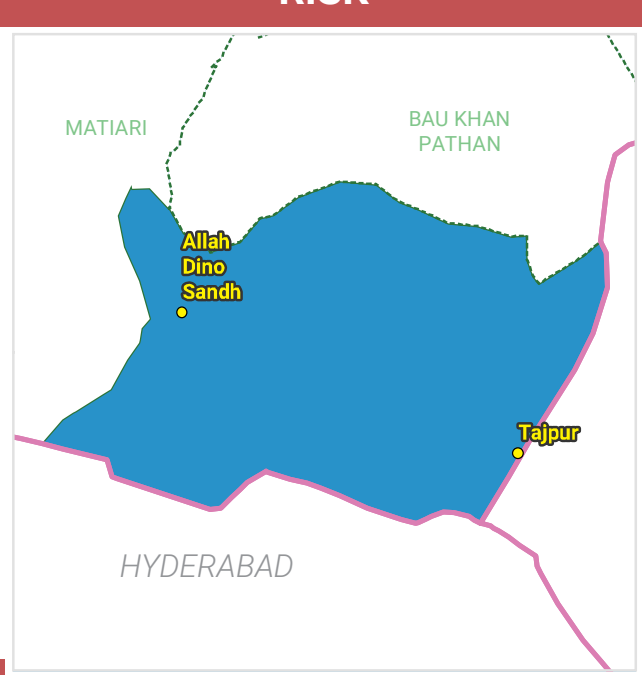


50 YEARS

VULNERABILITY



RISK



5 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

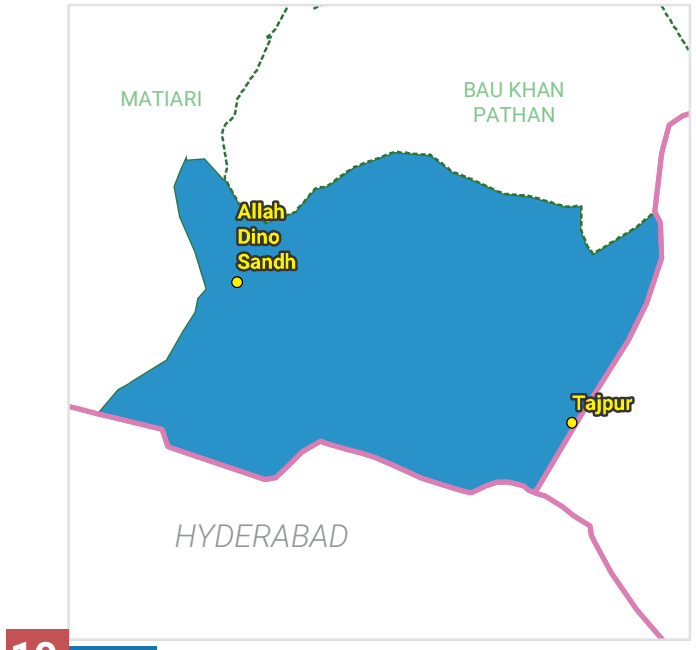
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

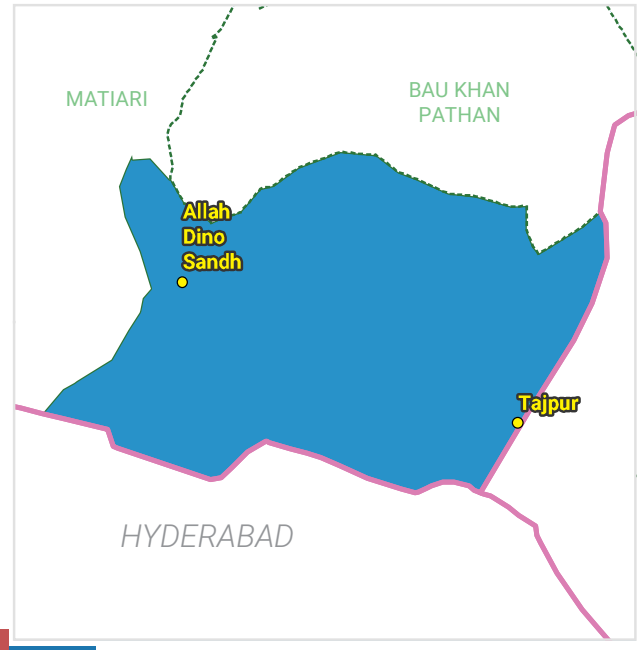
Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

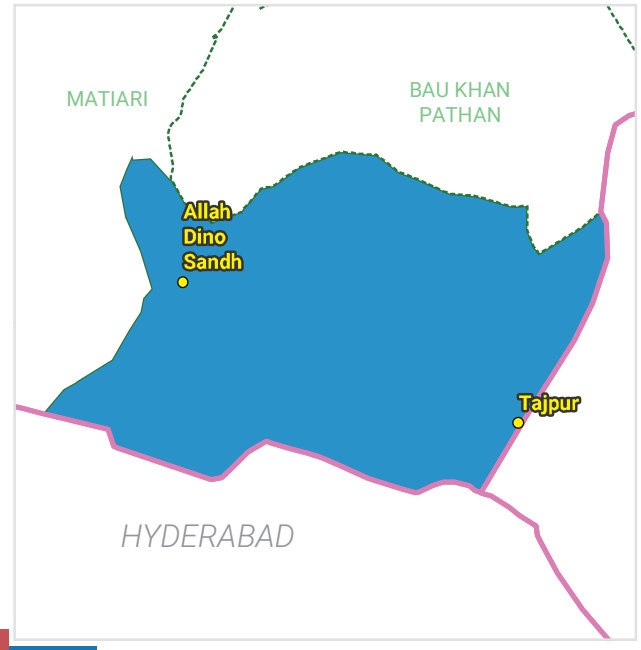
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

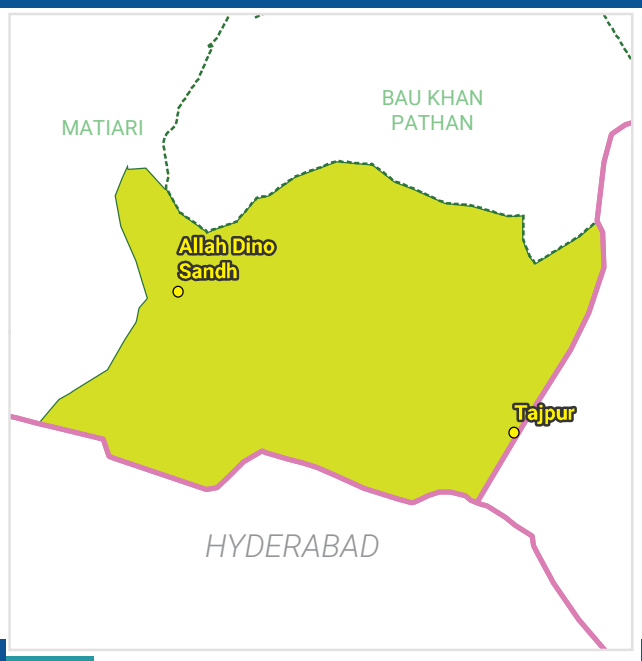
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

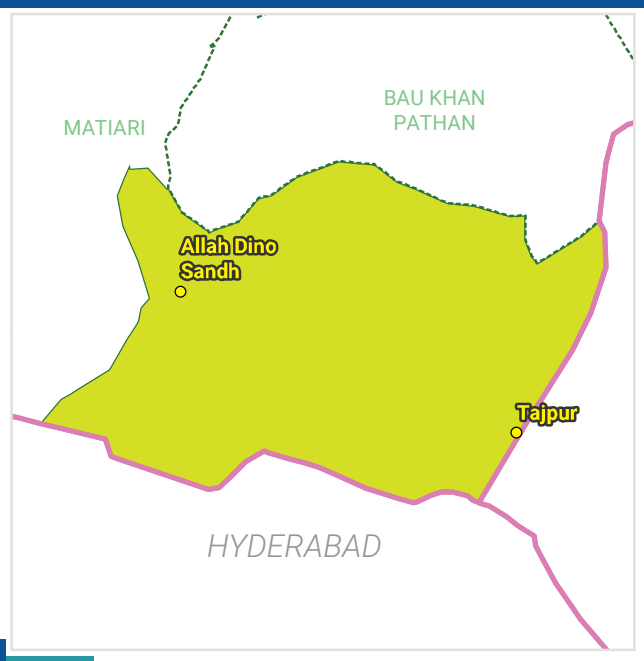
NO ELEMENTS AT RISK FOR AGRICULTURAL DROUGHT

HEATWAVE

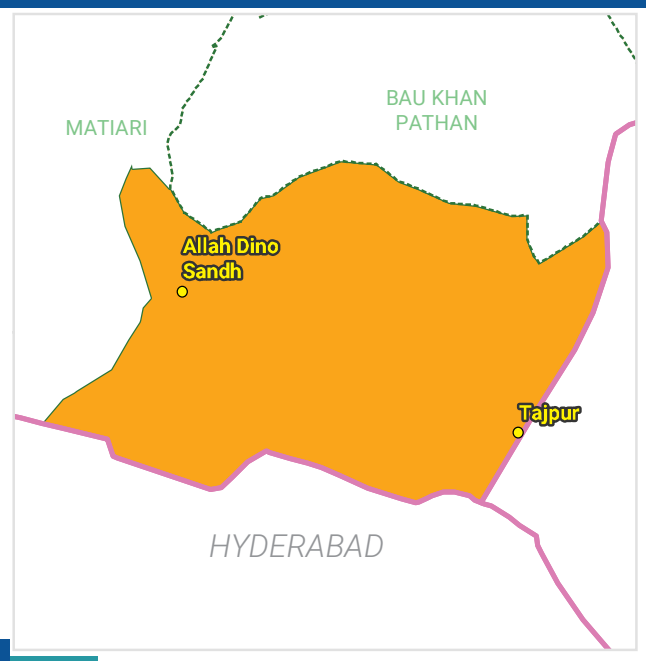
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS



10 YEARS

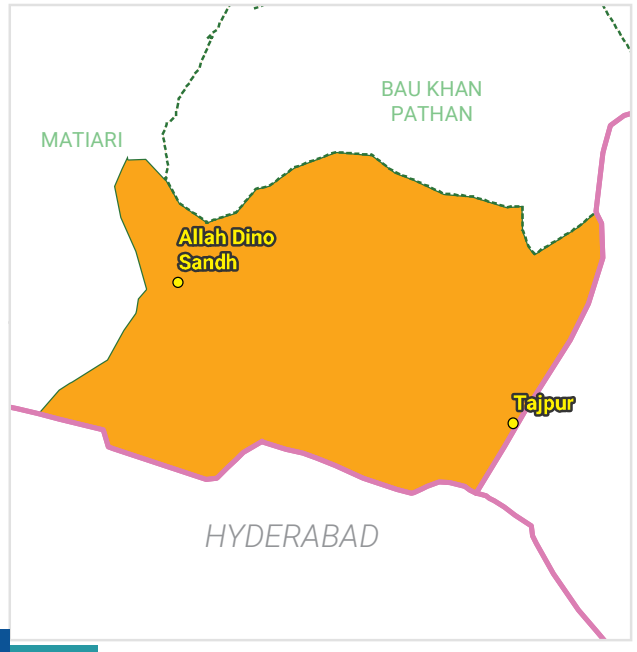


25 YEARS

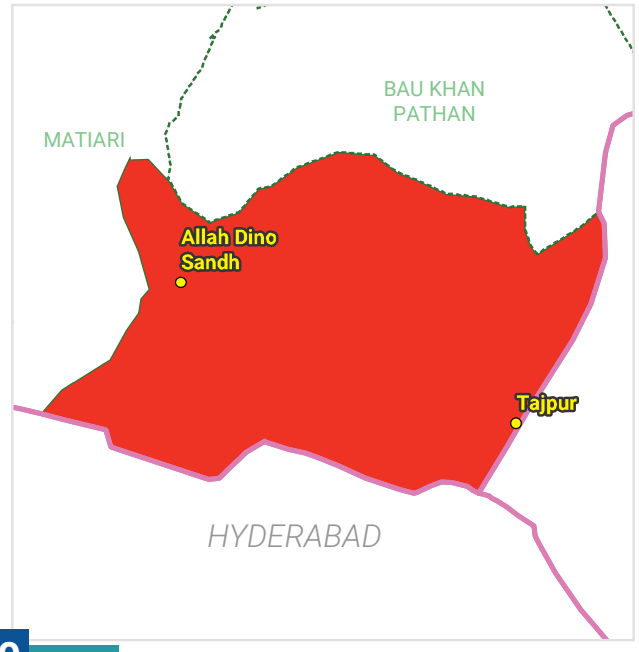
HAZARD

Normal	Moderate	High	Severe	Extreme

HAZARD AT DIFFERENT RETURN PERIODS

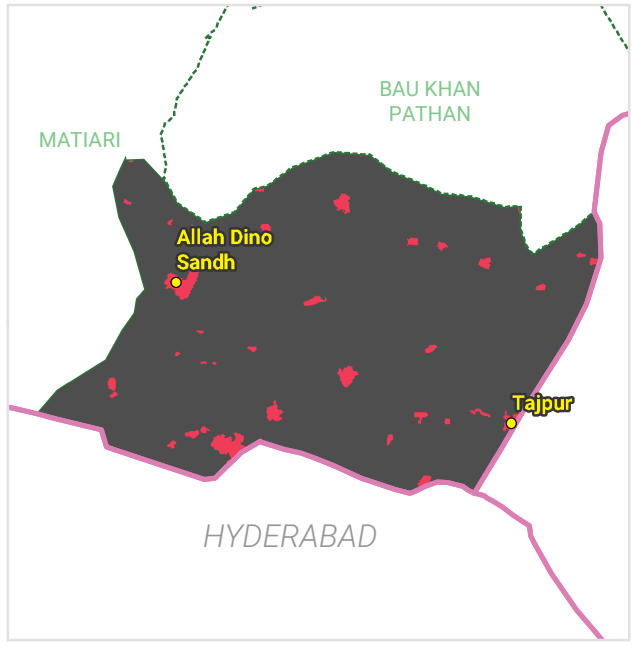


50 YEARS

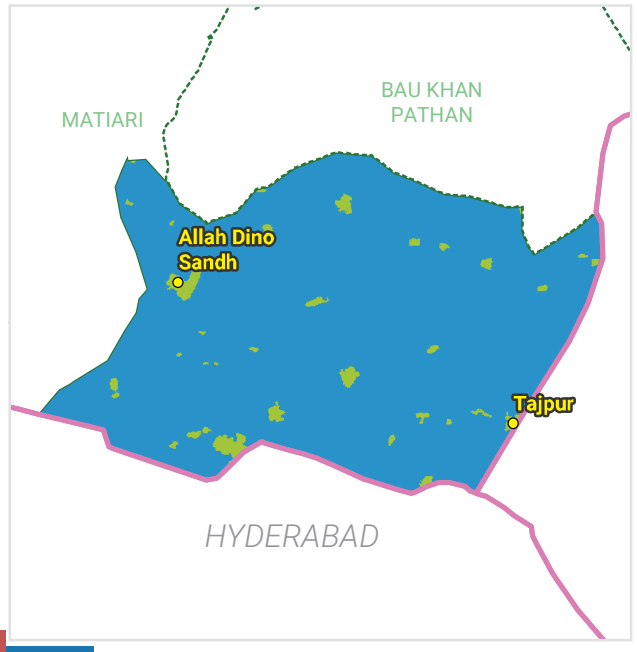


100 YEARS

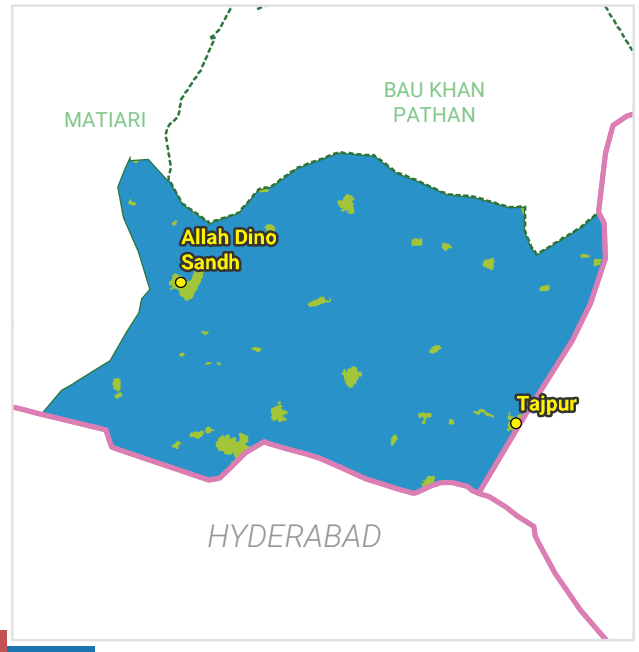
VULNERABILITY



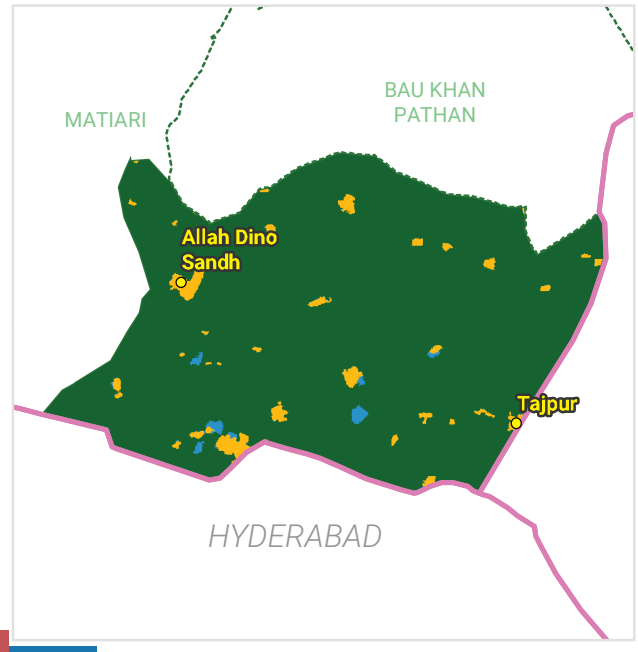
RISK AT DIFFERENT RETURN PERIODS



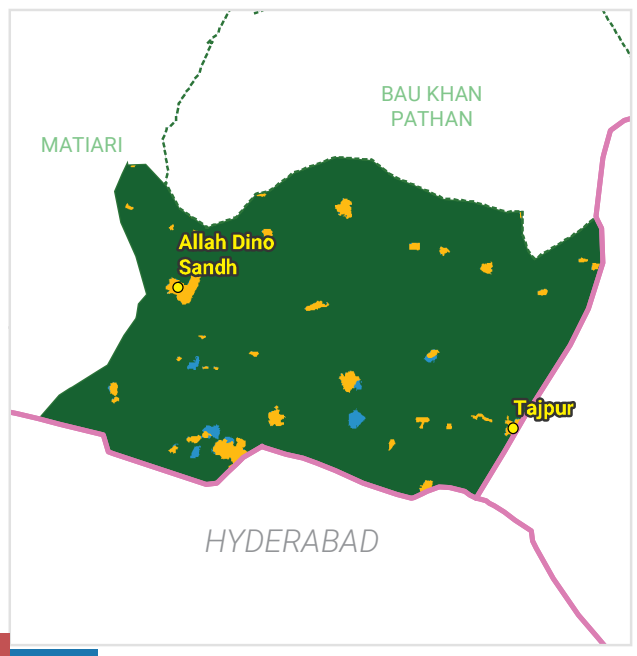
5 YEARS



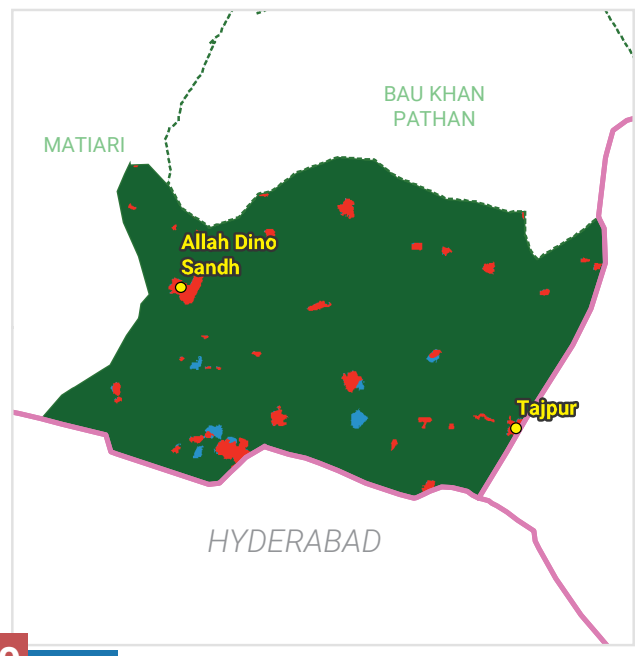
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

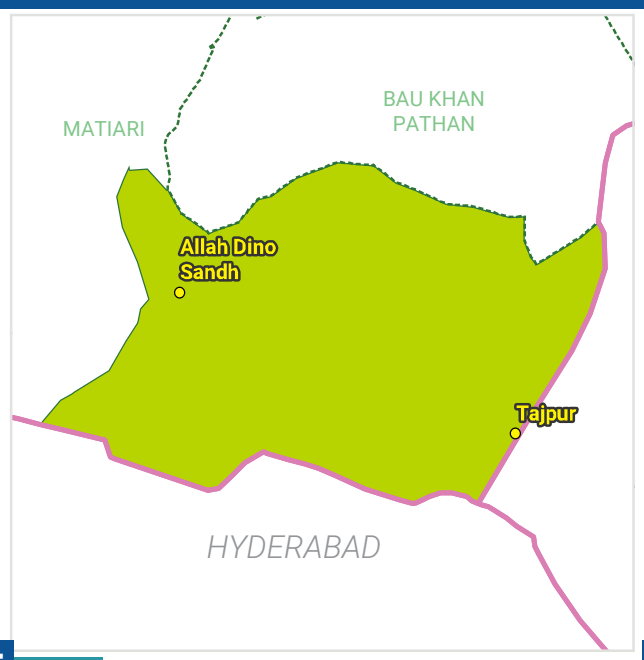
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

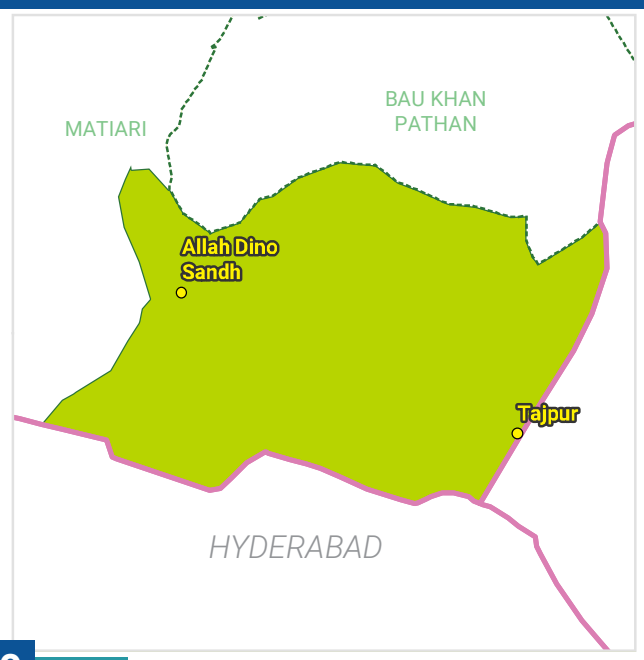
43	6405	33089	62.32	0	0	1.72
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

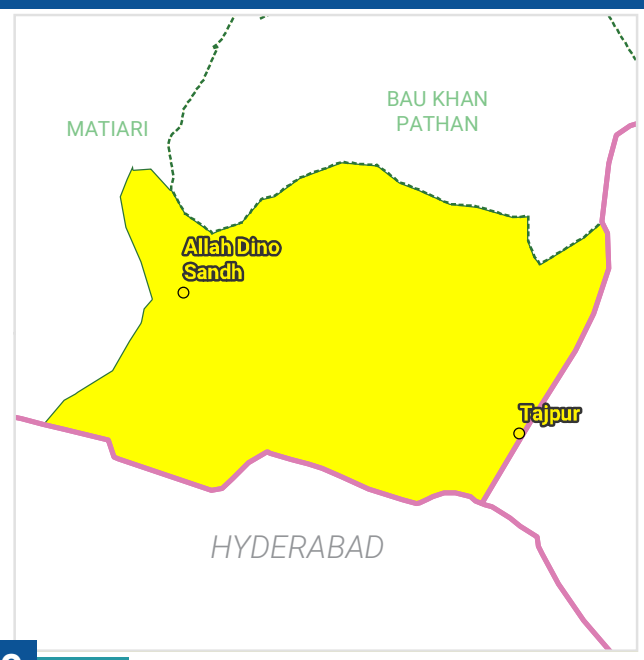
HAZARD AT DIFFERENT RETURN PERIODS



25 YEARS

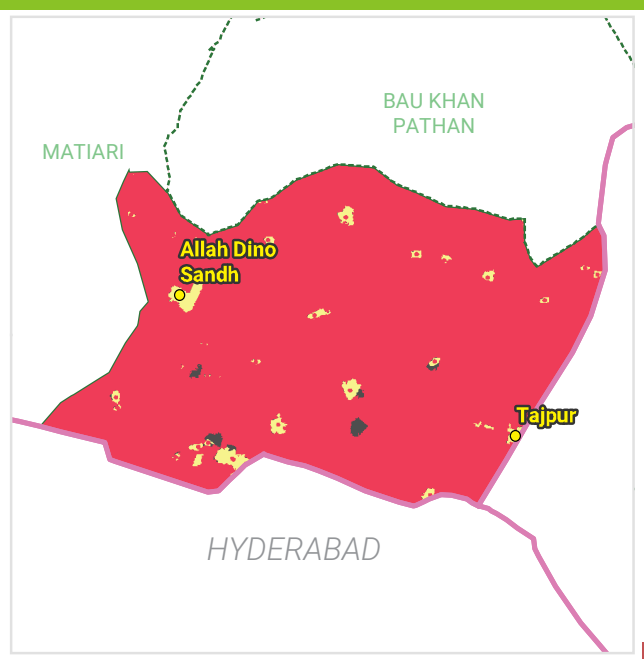


100 YEARS

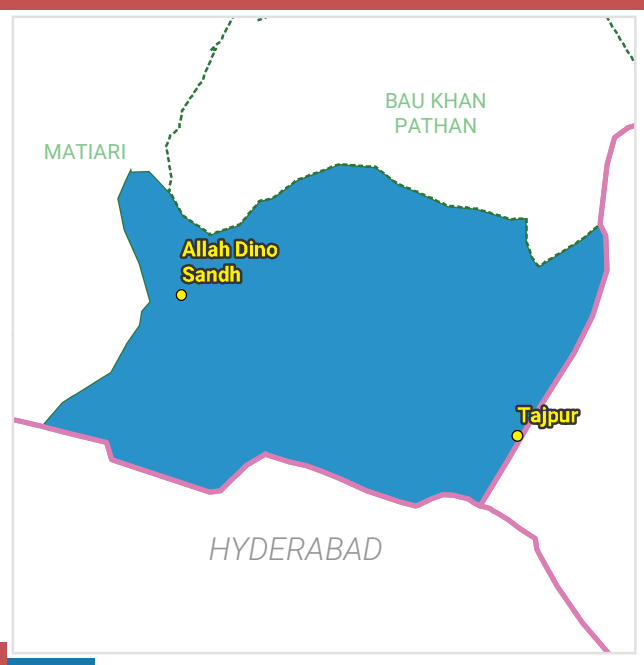


500 YEARS

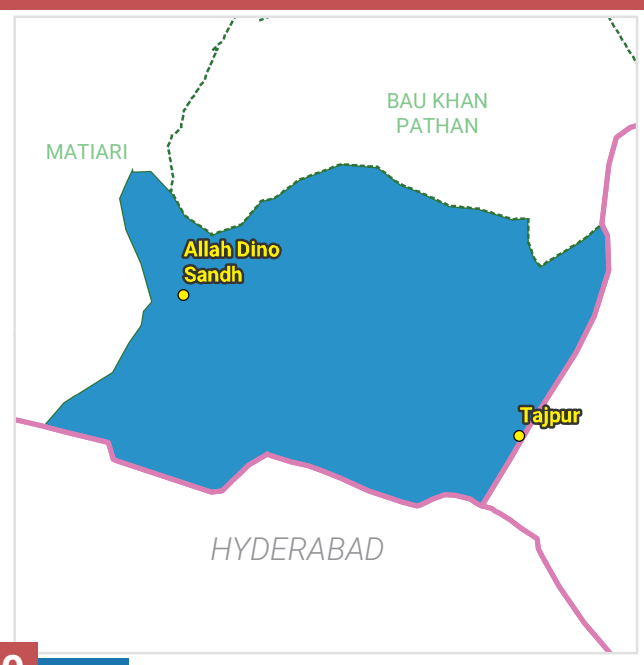
VULNERABILITY



RISK AT DIFFERENT RETURN PERIODS



25 YEARS



100 YEARS

HAZARD

Calm Wind | Tropical Depression | Tropical Storm | Cat-1 TC | Cat-2 TC | Cat-3 TC | Cat-4 TC | Cat-5 TC

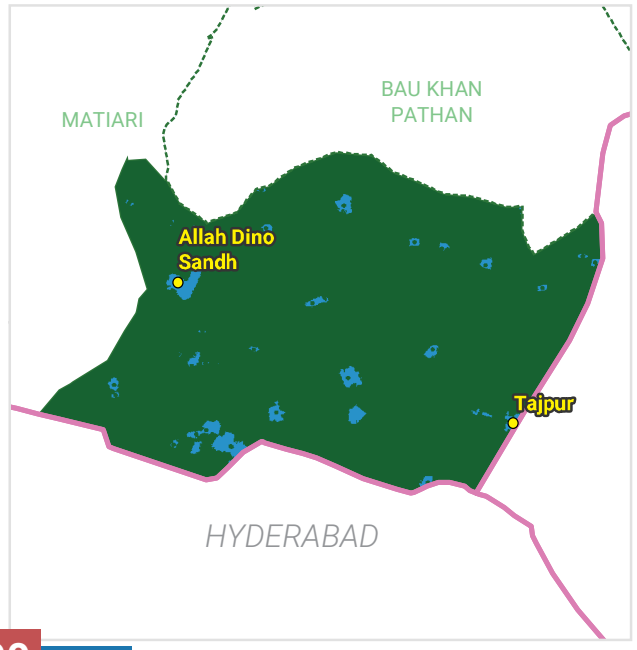
VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

RISK



500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	50 - 99	100 - 199	200 - 249	250 - 300

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

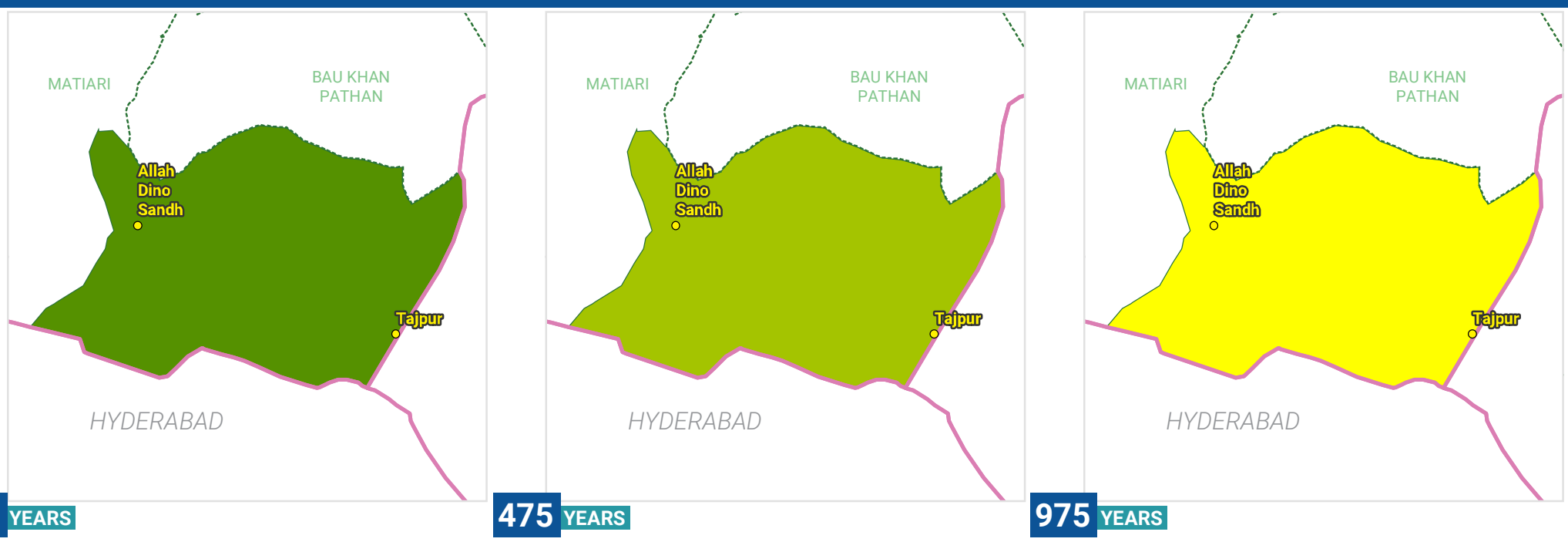
NO ELEMENTS AT RISK FOR CYCLONE

STORM SURGE

NO HAZARD OF STORM SURGE IN UC

EARTHQUAKE

HAZARD AT DIFFERENT RETURN PERIODS

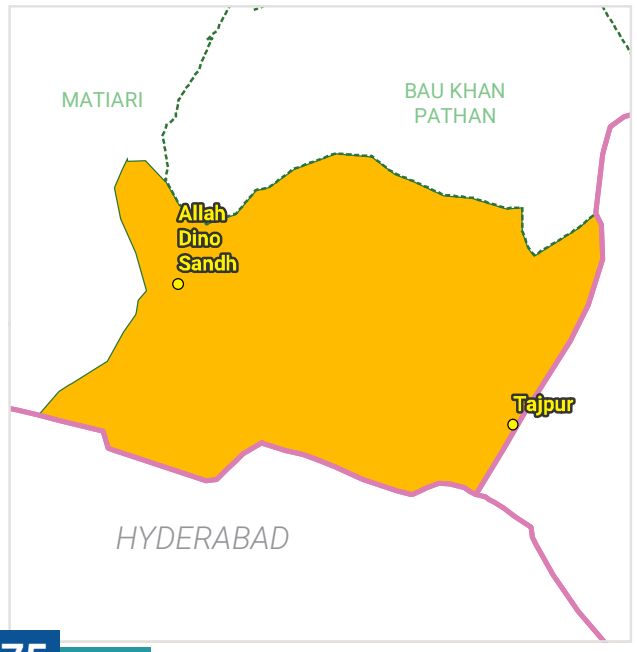


HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

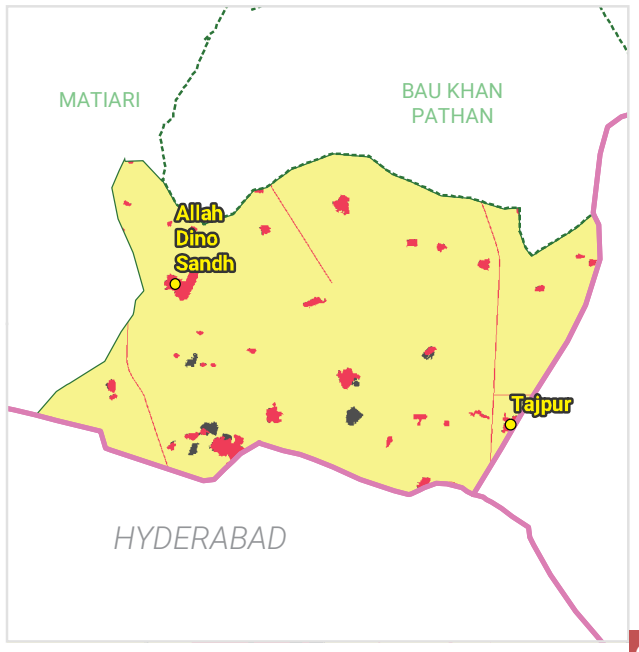
EARTHQUAKE

HAZARD

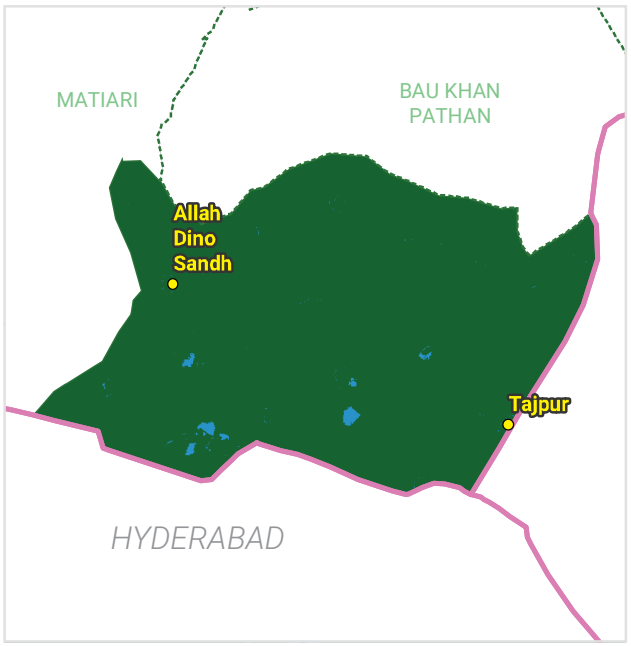


2475 YEARS

VULNERABILITY

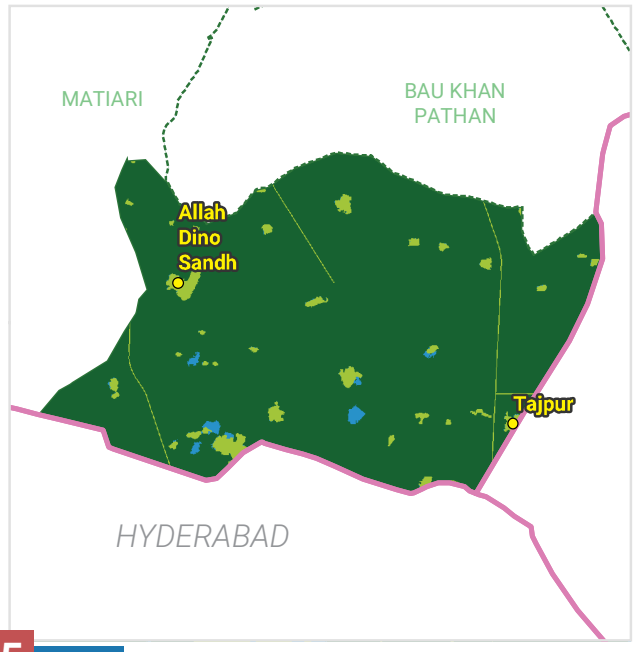


RISK

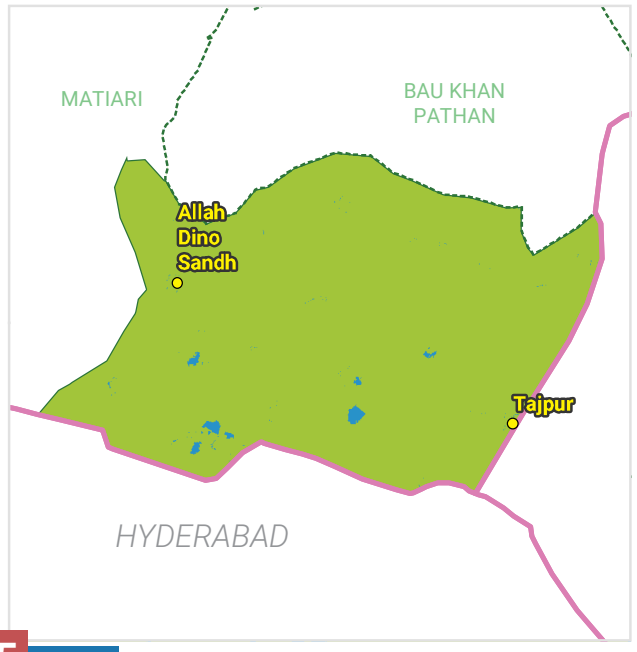


95 YEARS

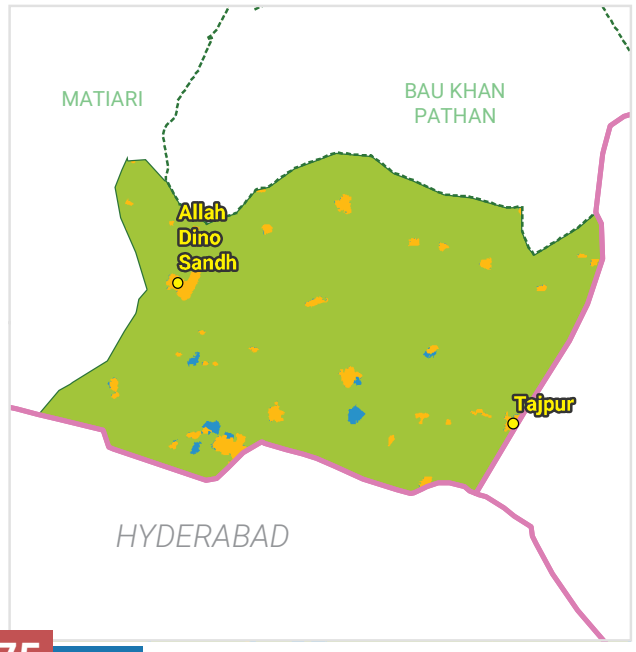
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

43	6390	32999	62.34	0.00	0	0	0
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
1.72	0	139.30	5.87	14.37	0	0	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
39	0	0	0	1	0	0	0
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	1	0	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low / Medium	Medium / High / Extreme	Medium / High / Extreme	Medium / High / Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	None	●	●	●
HEATWAVE	Medium	Medium	Low / High	Low / High	Low / Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low / Medium	Medium	Medium / High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

UC - ZERPIR

Union Council area in sq. km **175**

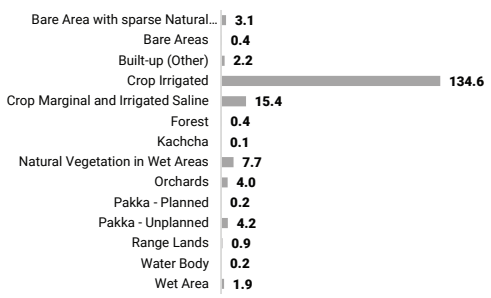
Surrounding UCs / Features
SAEED ABAD in West
SANGHAR DISTRICT in North
KARAM KHAN NIZAMANI in South
BHALIDINO KAKA in North West

Population — 2017 approx. **66,217**

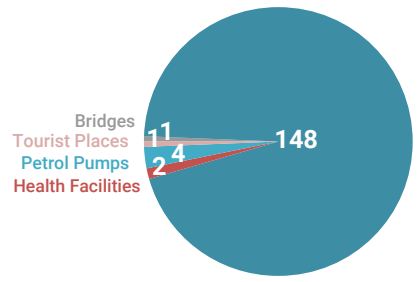
No. of household — 2017 approx. **12,923**

Land Use Land Cover

coverage area in sq.km



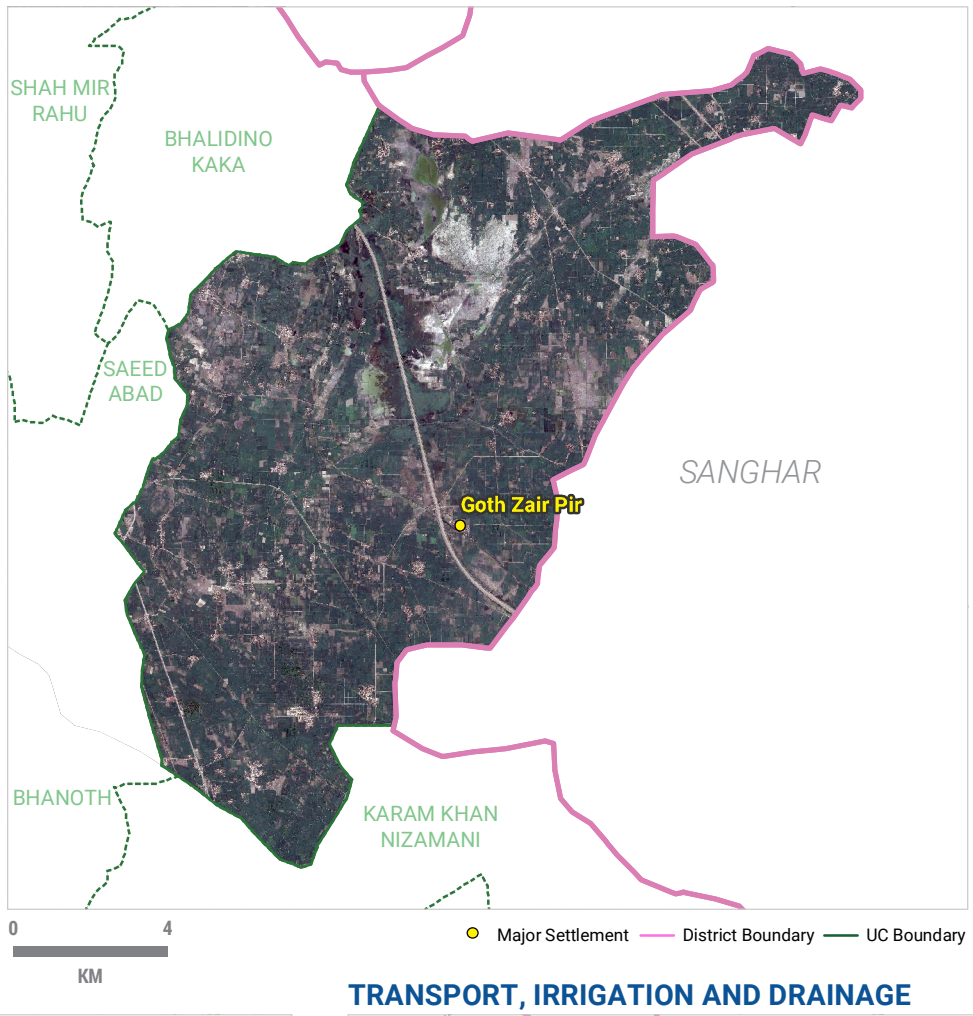
Critical Infrastructure



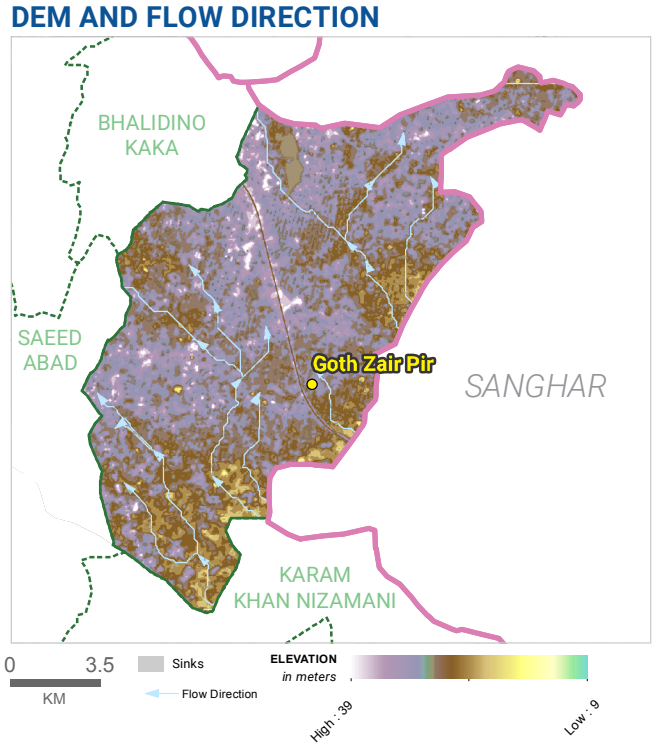
NO. OF SETTLEMENTS

127

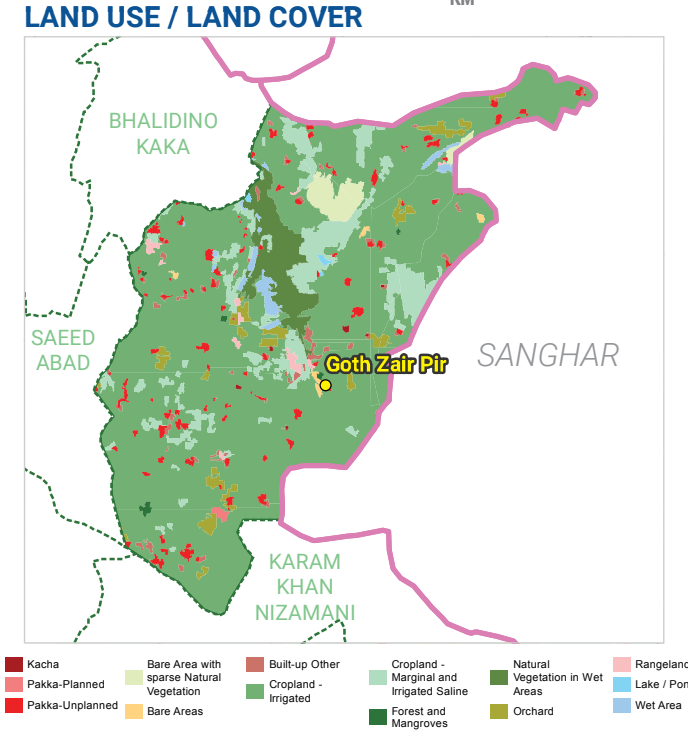
SATELLITE IMAGERY



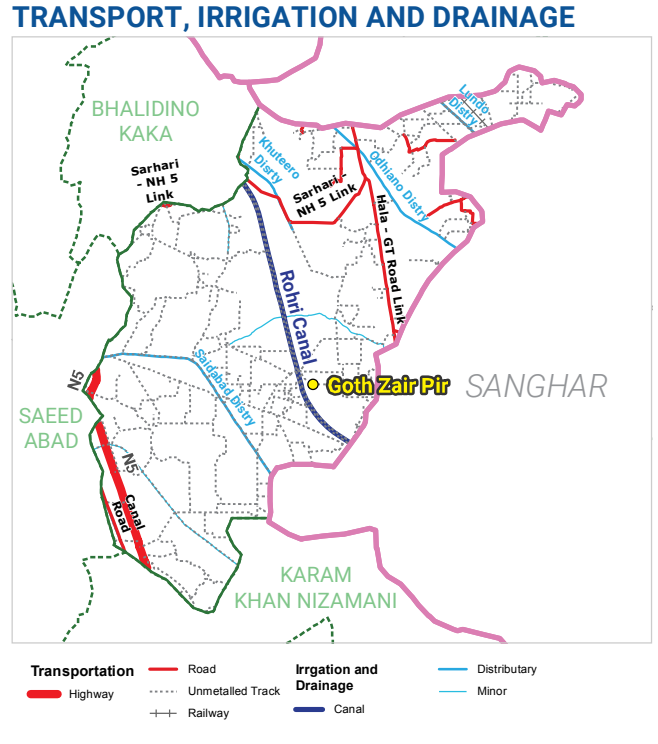
DEM AND FLOW DIRECTION



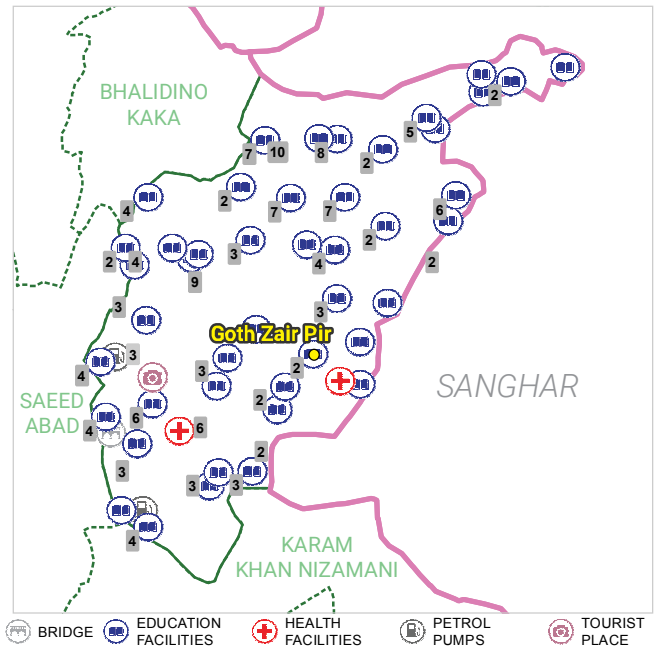
LAND USE / LAND COVER



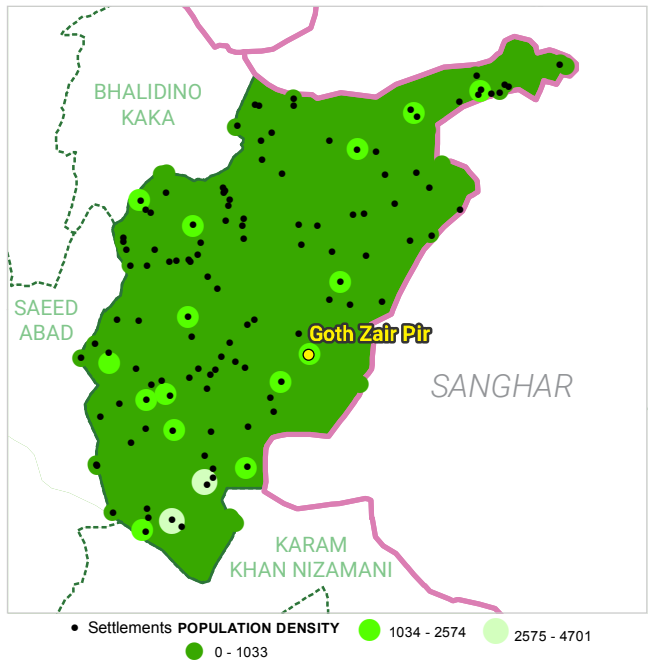
TRANSPORT, IRRIGATION AND DRAINAGE



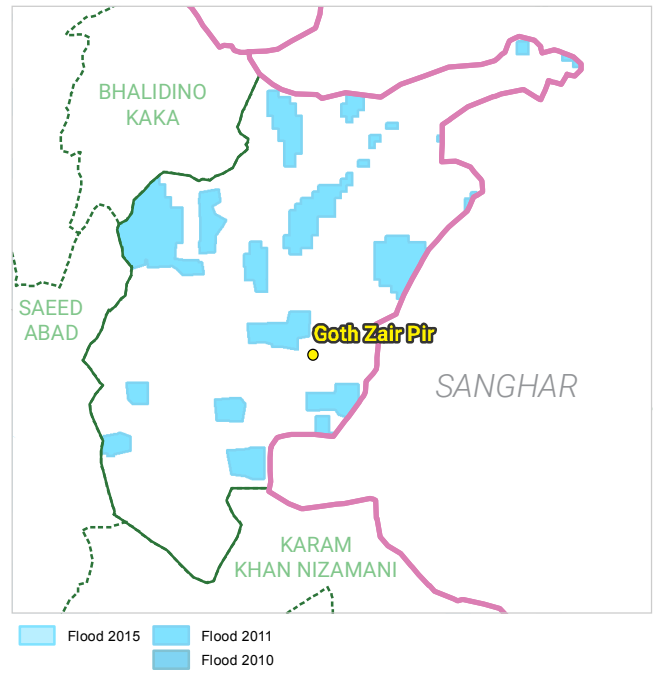
CRITICAL INFRASTRUCTURE



POPULATION DENSITY



PAST HAZARDS

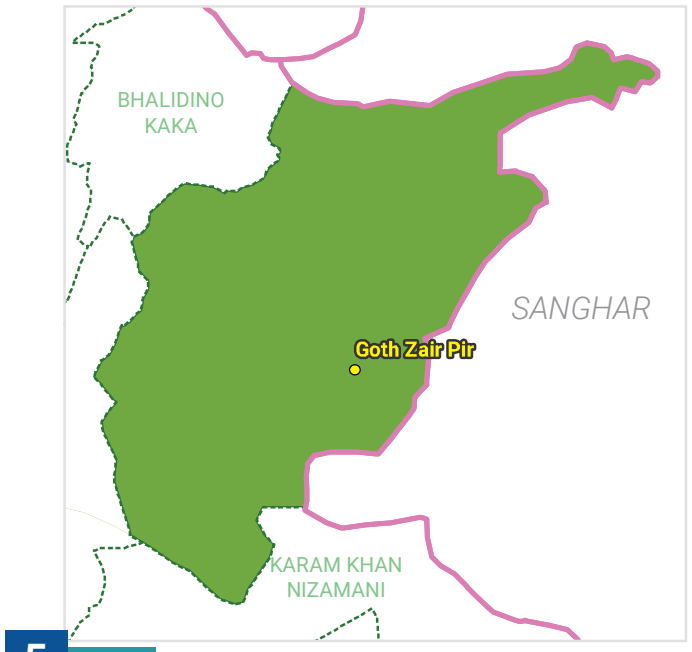


FLOOD

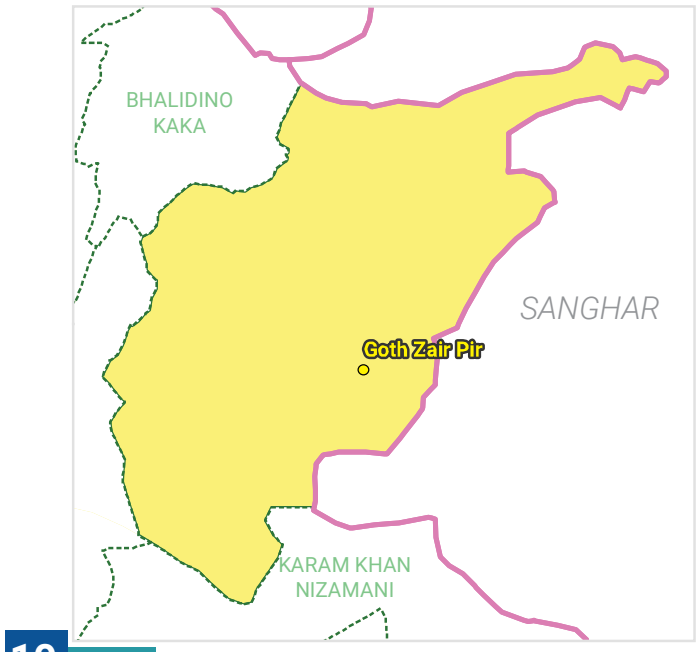
THERE IS NO HAZARD/RISK OF RIVERINE FLOOD IN THIS UC, HOWEVER IT IS PRONE TO THE FLOODS OCCURRING DUE TO HEAVY RAINFALL AND EMBANKMENT BREACHES

METEOROLOGICAL DROUGHT

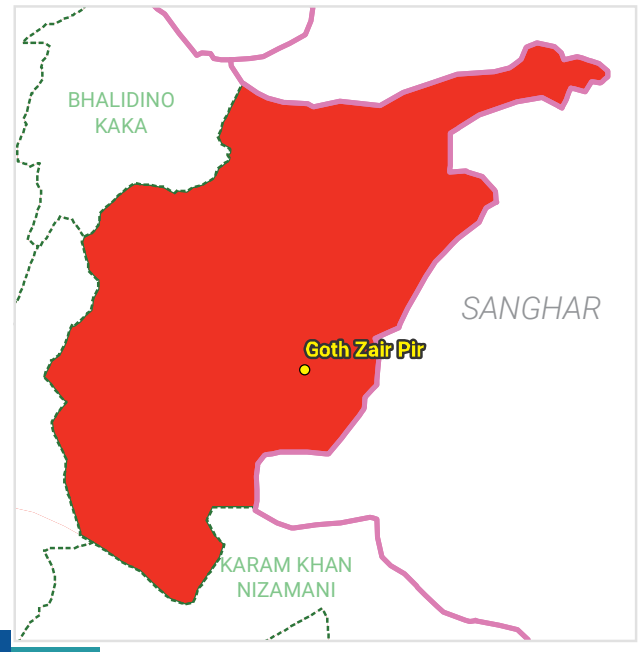
HAZARD AT DIFFERENT RETURN PERIODS



5 YEARS

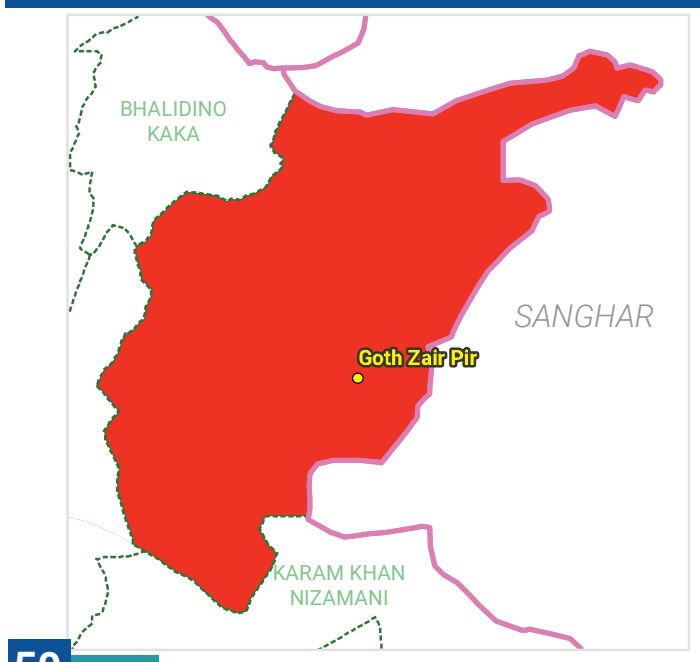


10 YEARS

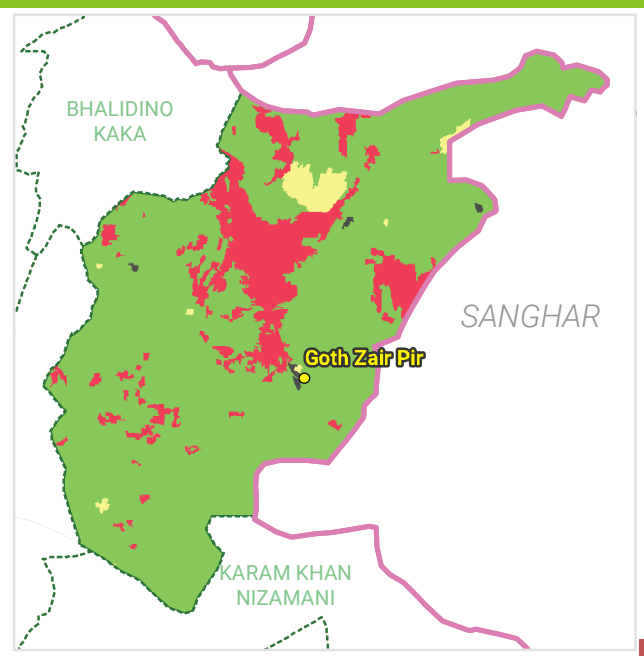


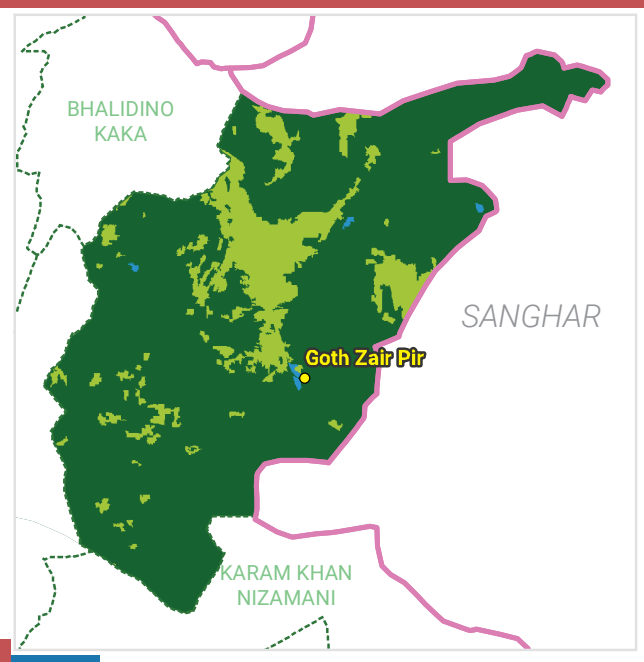
25 YEARS

HAZARD | VULNERABILITY | RISK



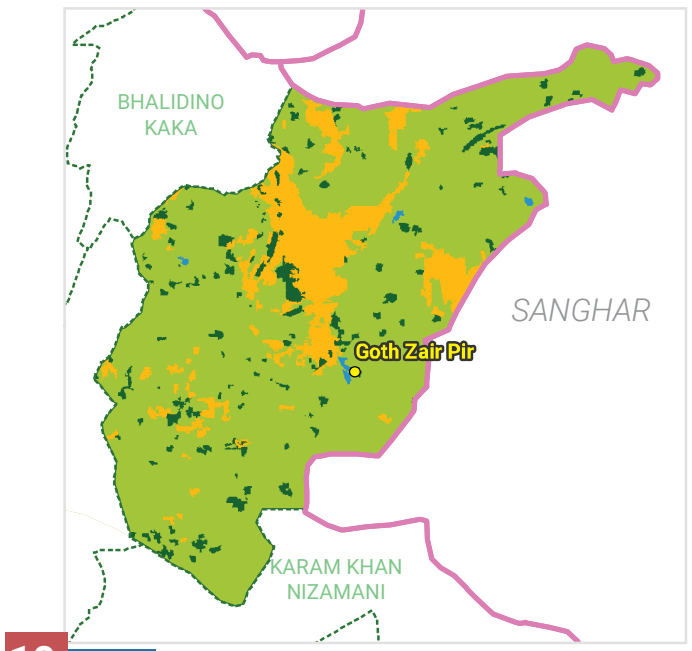
50 YEARS



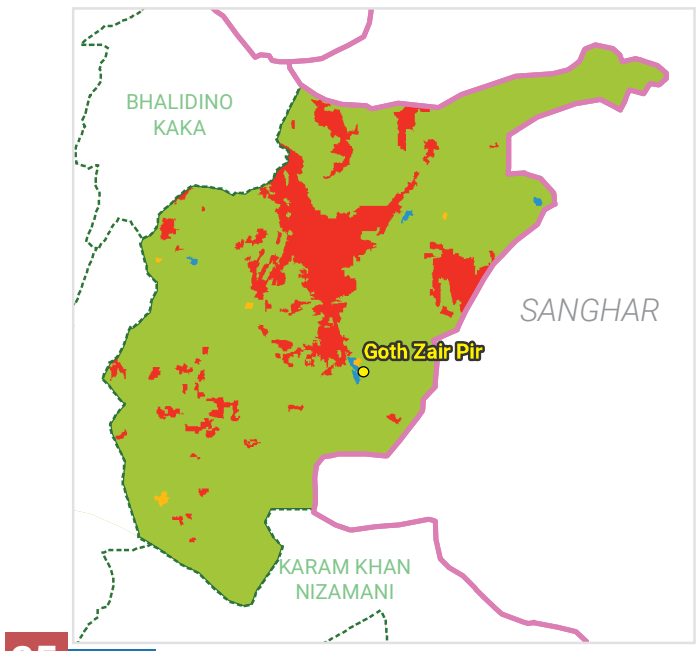


5 YEARS

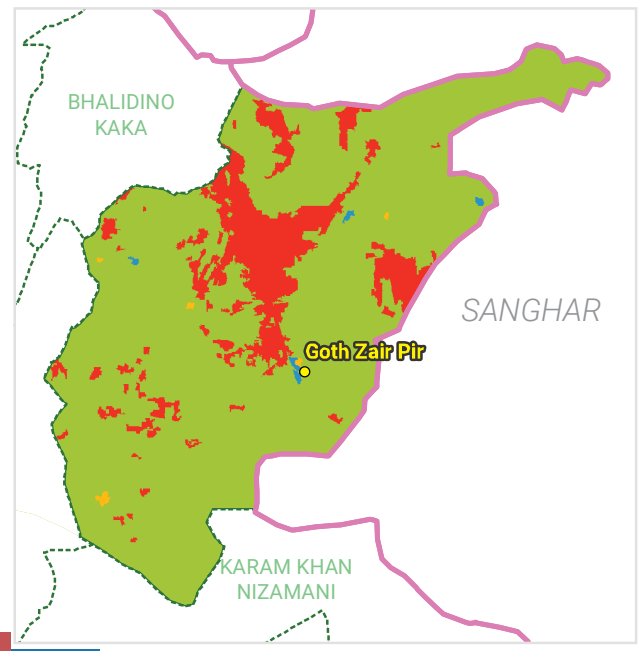
RISK AT DIFFERENT RETURN PERIODS



10 YEARS



25 YEARS



50 YEARS

ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

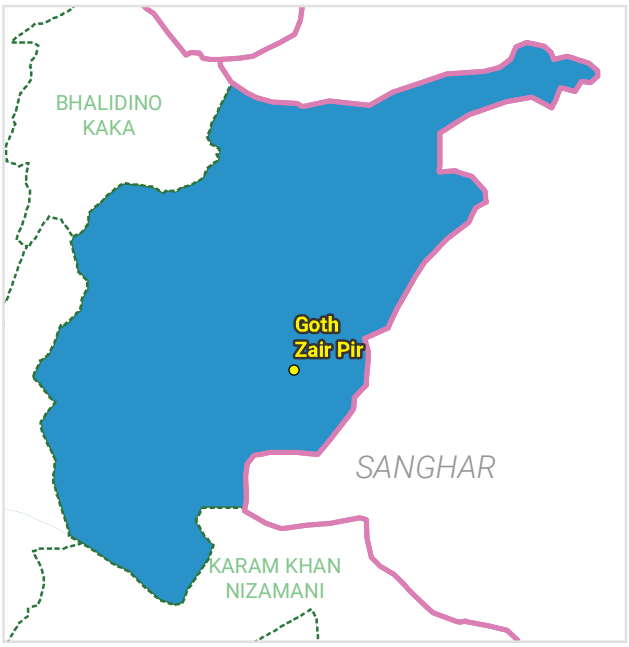
127	12922	66214	153.96	3.11	0.36	7.66	0.85
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

0.22	1.87
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

AGRICULTURAL DROUGHT

HAZARD AT DIFFERENT RETURN PERIODS

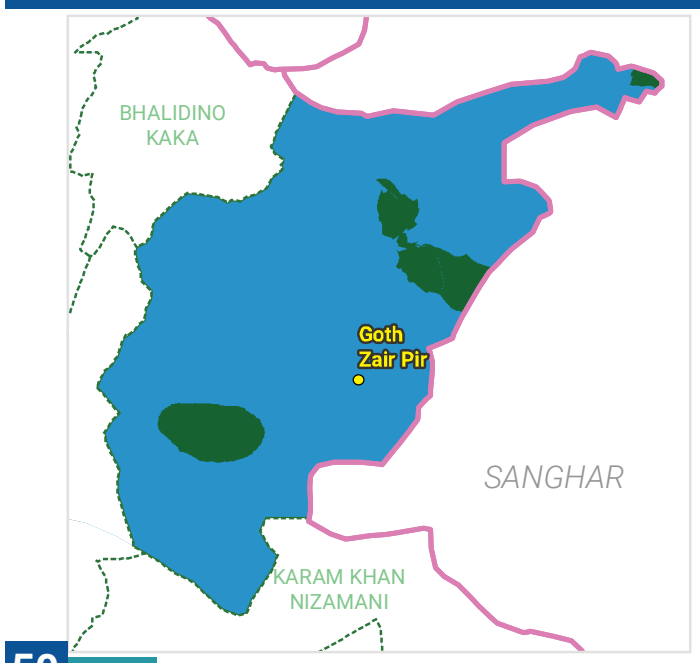
5 YEARS



10 YEARS

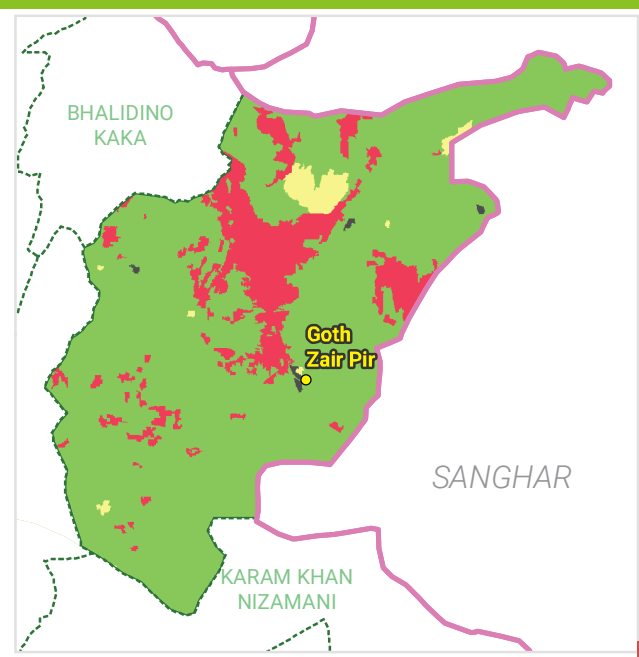
25 YEARS

HAZARD

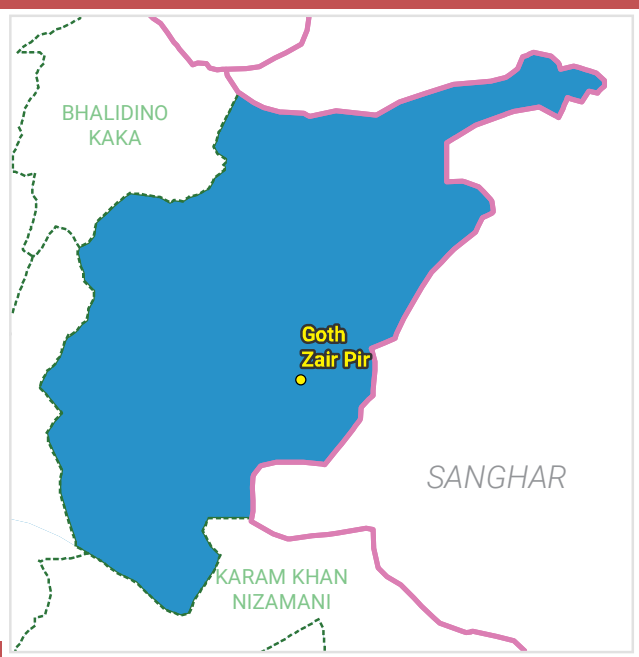


50 YEARS

VULNERABILITY



RISK



5 YEARS

HAZARD

No Hazard | Mild | Moderate | Severe | Extreme

VULNERABILITY

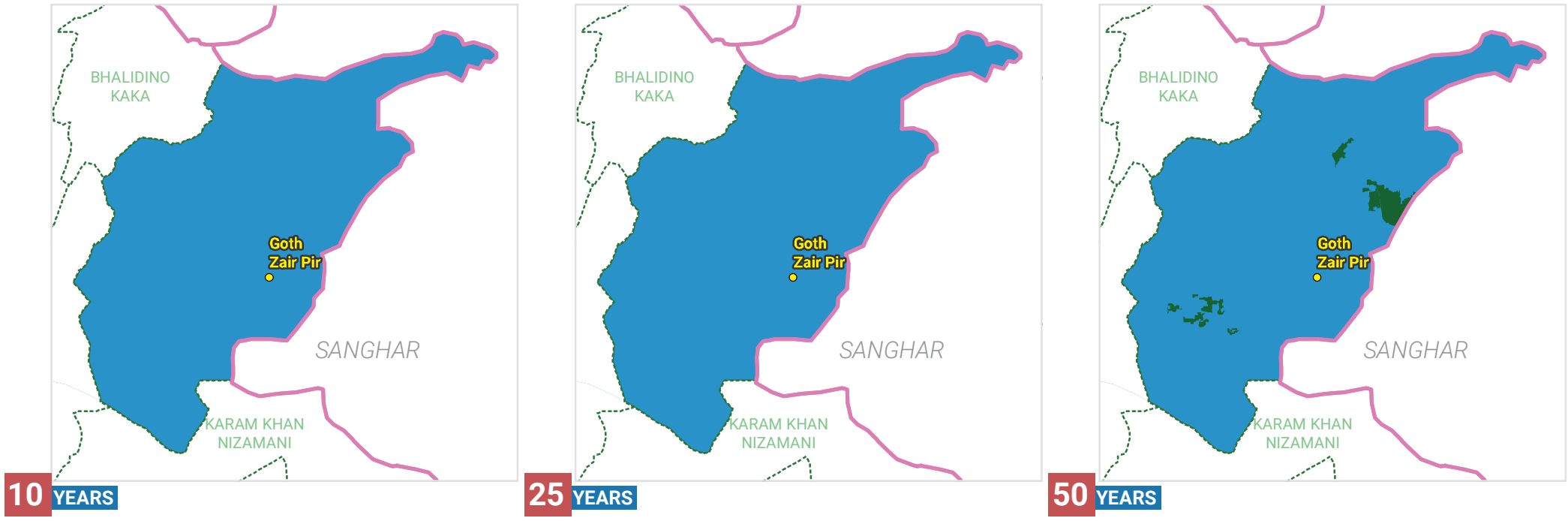
None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

AGRICULTURAL DROUGHT

RISK AT DIFFERENT RETURN PERIODS



ELEMENTS AT RISK

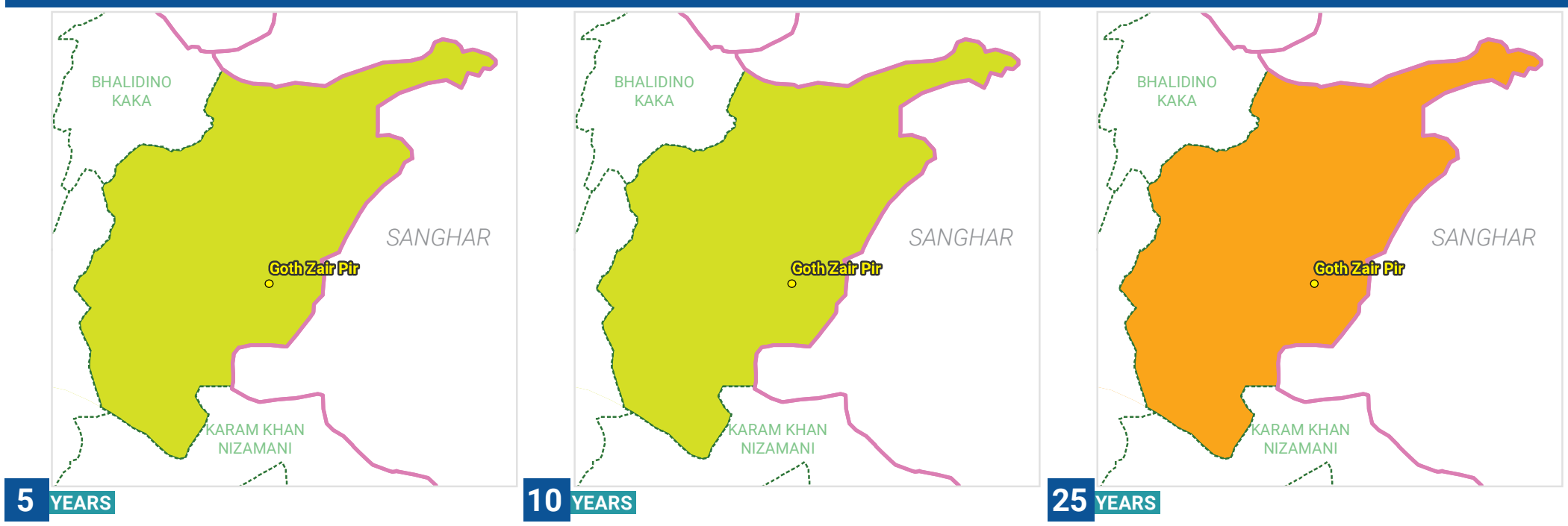
(BASED ON 50 YEARS RETURN PERIOD)

0	3	14	4.98	0.00	0	0	0.04
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	BARE AREA WITH SPARSE NATURAL VEGETATION (SQ. KM)	FOREST AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	RANGE LAND (SQ. KM)

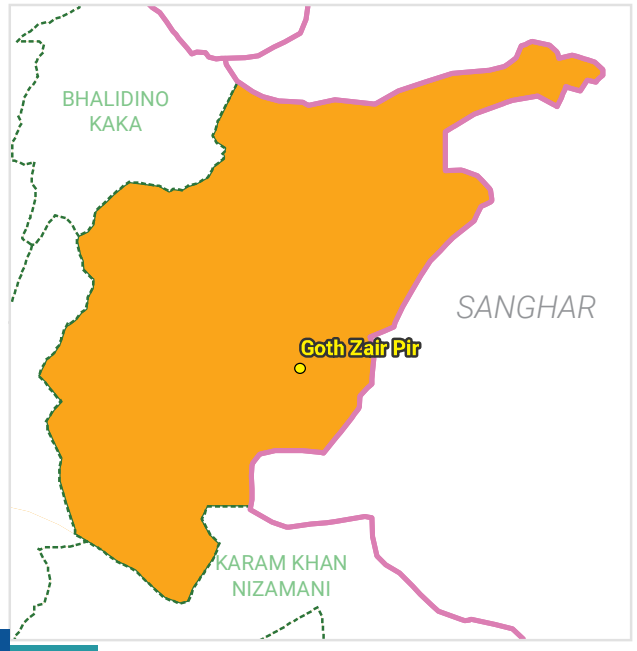
0	0
WATER BODY (SQ. KM)	WET AREA (SQ. KM)

HEATWAVE

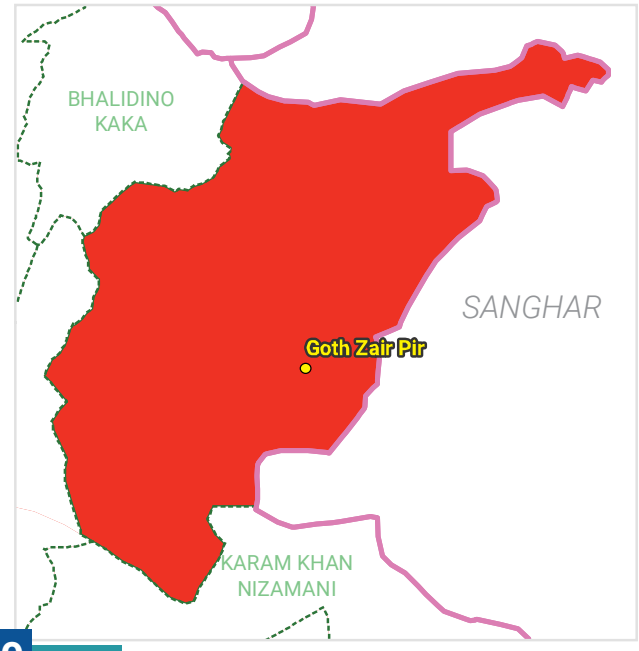
HAZARD AT DIFFERENT RETURN PERIODS



HAZARD AT DIFFERENT RETURN PERIODS

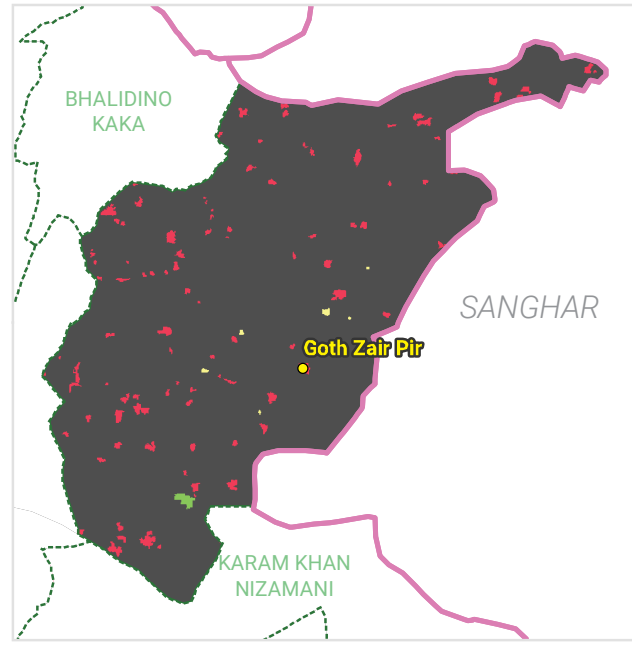


50 YEARS

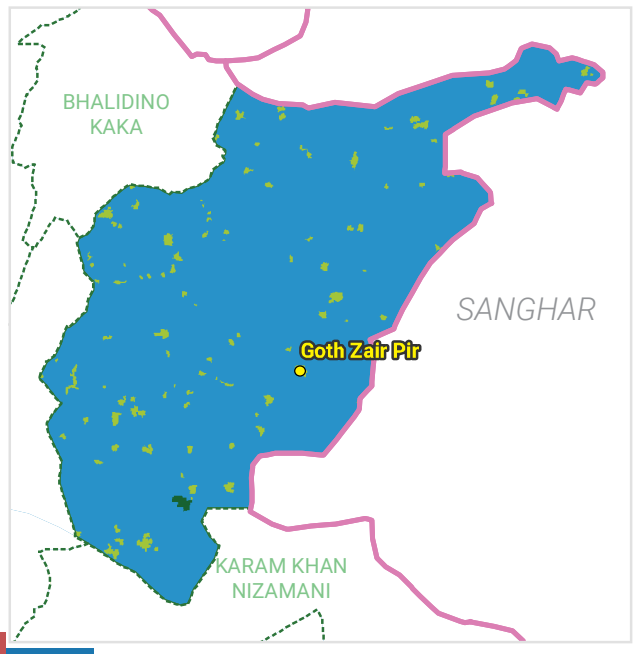


100 YEARS

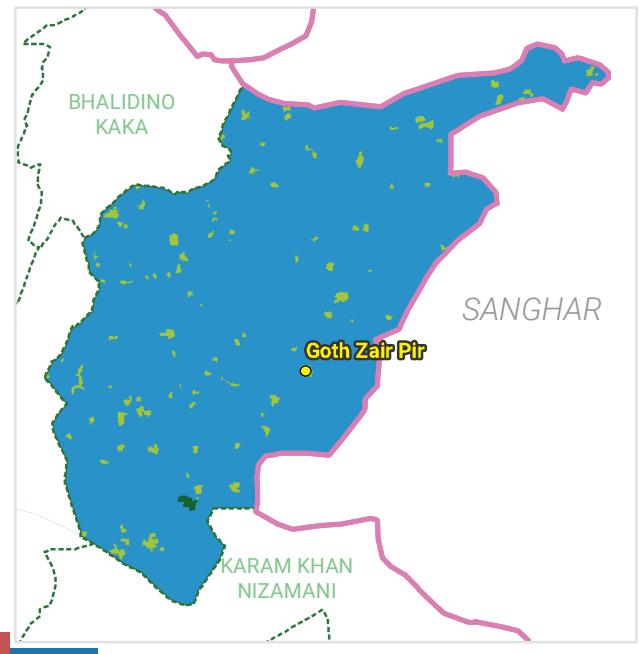
VULNERABILITY



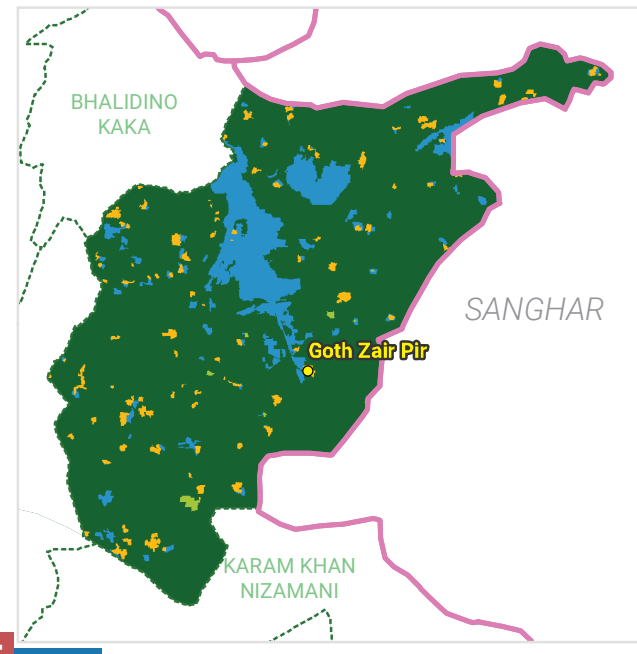
RISK AT DIFFERENT RETURN PERIODS



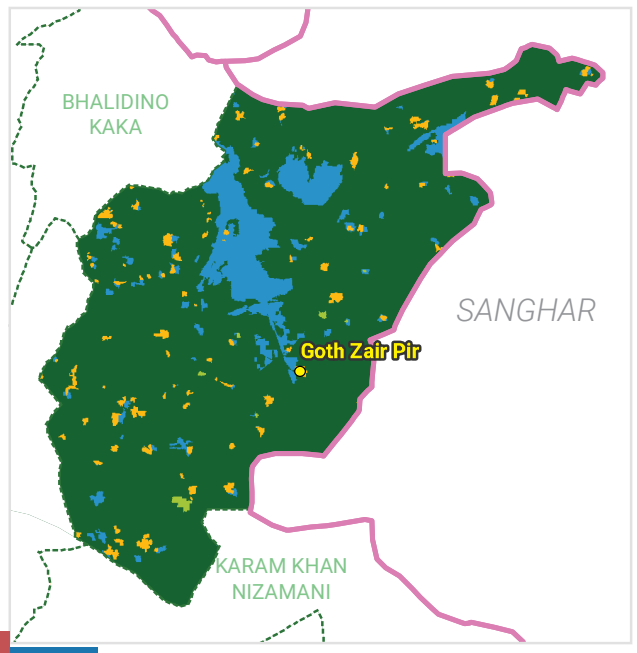
5 YEARS



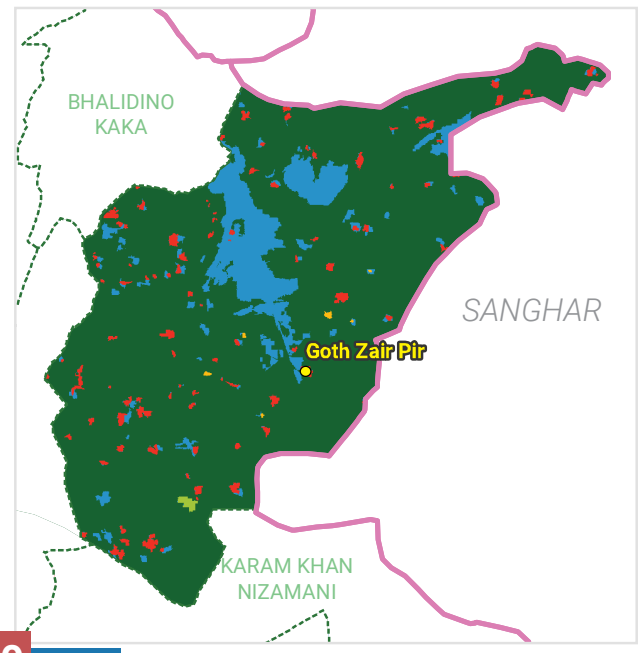
10 YEARS



25 YEARS



50 YEARS



100 YEARS

HAZARD

- Normal
- Severe
- Moderate
- Extreme
- High

VULNERABILITY

- None *0 - 25*
- Low *26 - 50*
- Medium *51 - 75*
- High *76 - 100*

RISK

- Very Low *0 - 49*
- Low *50 - 99*
- Medium *100 - 199*
- High *200 - 249*
- Extreme *250 - 300*

HEATWAVE

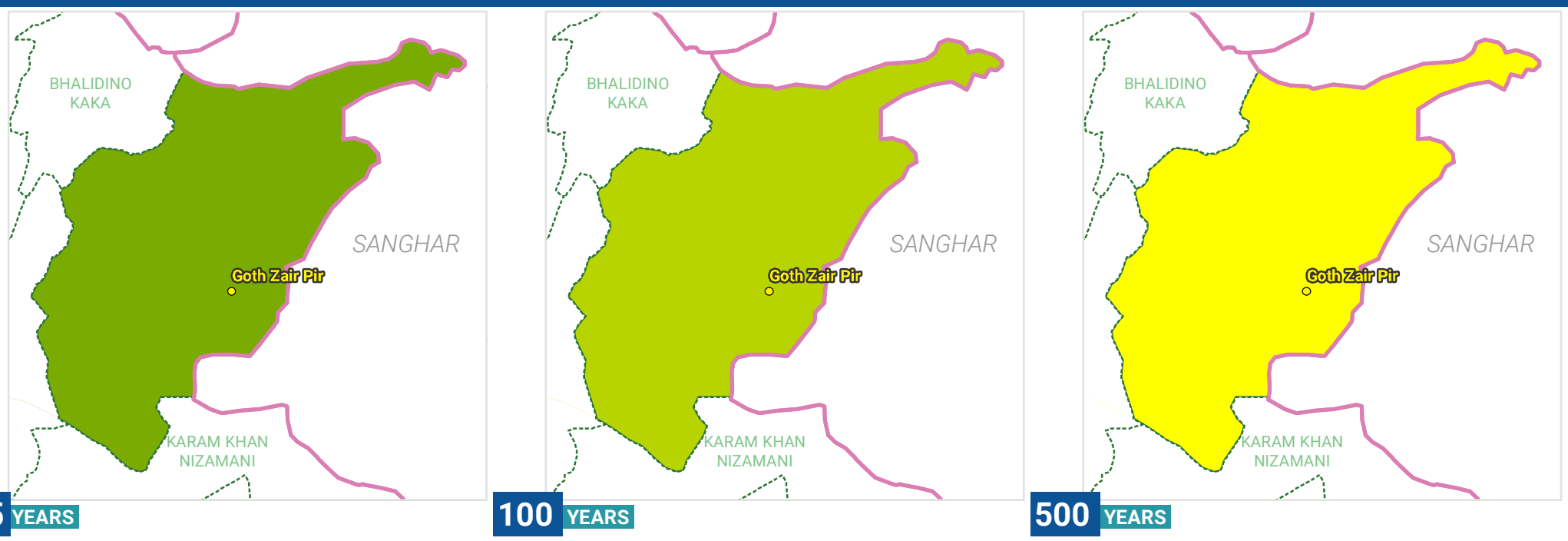
ELEMENTS AT RISK

(BASED ON 50 YEARS RETURN PERIOD)

124	12808	65604	153.60	0.13	0.22	4.11
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)	PAKKA - UNPLANNED AREA (SQ. KM)

CYCLONE

HAZARD AT DIFFERENT RETURN PERIODS



VULNERABILITY

RISK AT DIFFERENT RETURN PERIODS

HAZARD

Calm Wind · Tropical Depression · Tropical Storm · Cat-1 TC · Cat-2 TC · Cat-3 TC · Cat-4 TC · Cat-5 TC

VULNERABILITY

None *0 - 25* · Low *26 - 50* · Medium *51 - 75* · High *76 - 100*

RISK

Very Low *0 - 49* · Low *50 - 99* · Medium *100 - 199* · High *200 - 249* · Extreme *250 - 300*

RISK

500 YEARS

RISK

Very Low	Low	Medium	High	Extreme
0 - 49	*50 - 99*	*100 - 199*	*200 - 249*	*250 - 300*

ELEMENTS AT RISK

(BASED ON 100 YEARS RETURN PERIOD)

NO ELEMENTS AT RISK FOR CYCLONE

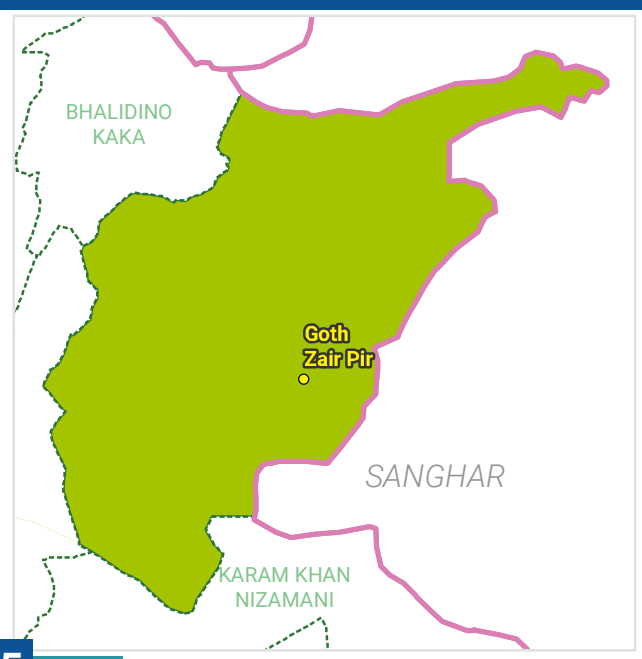
STORM SURGE

NO HAZARD OF STORM SURGE IN UC

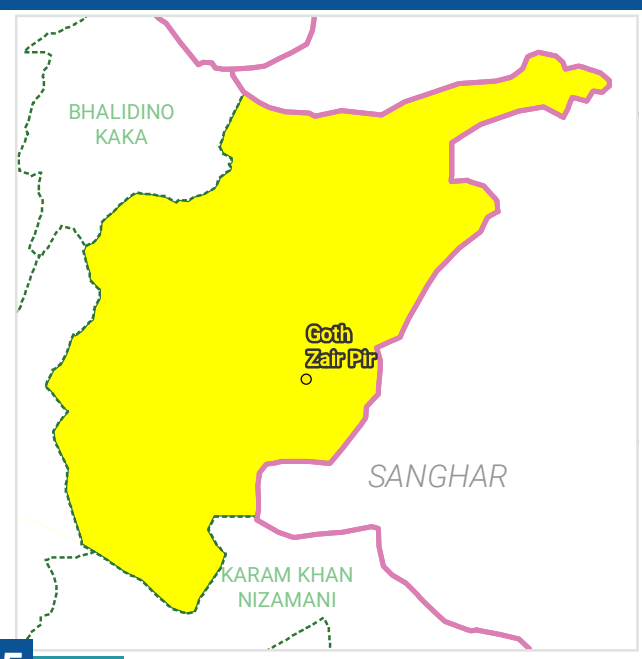
EARTHQUAKE

HAZARD AT DIFFERENT RETURN PERIODS

95 YEARS



475 YEARS



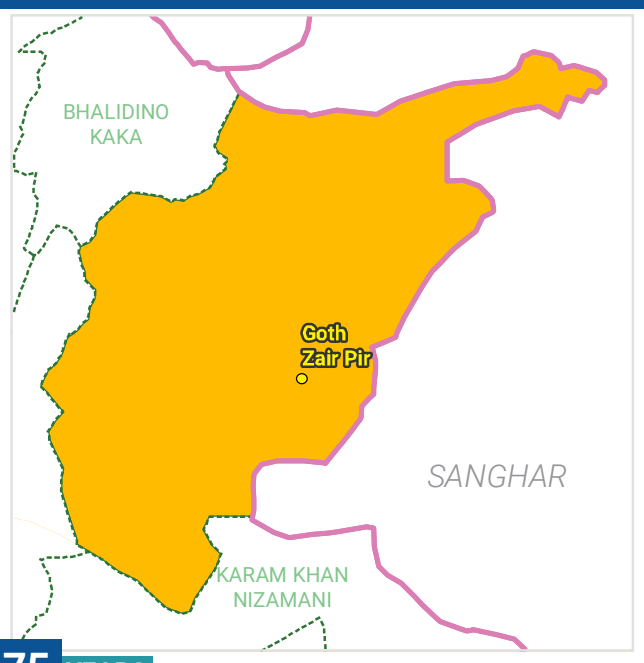
975 YEARS

HAZARD

Zone 1	Zone 2 A	Zone 2 B	Zone 3	Zone 4	Zone 5	Zone 6

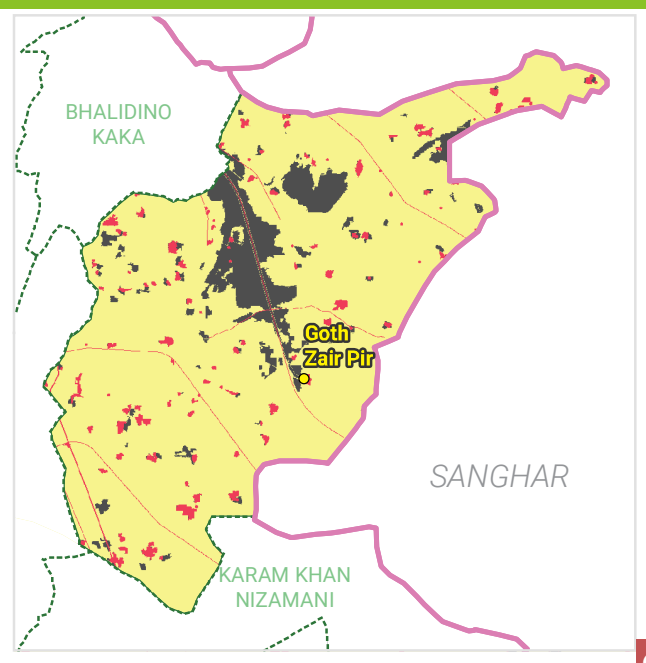
EARTHQUAKE

HAZARD

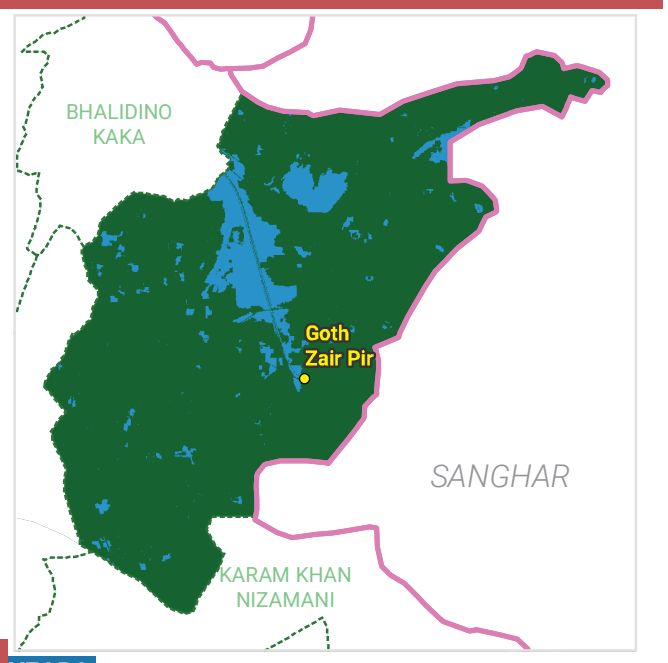


2475 YEARS

VULNERABILITY

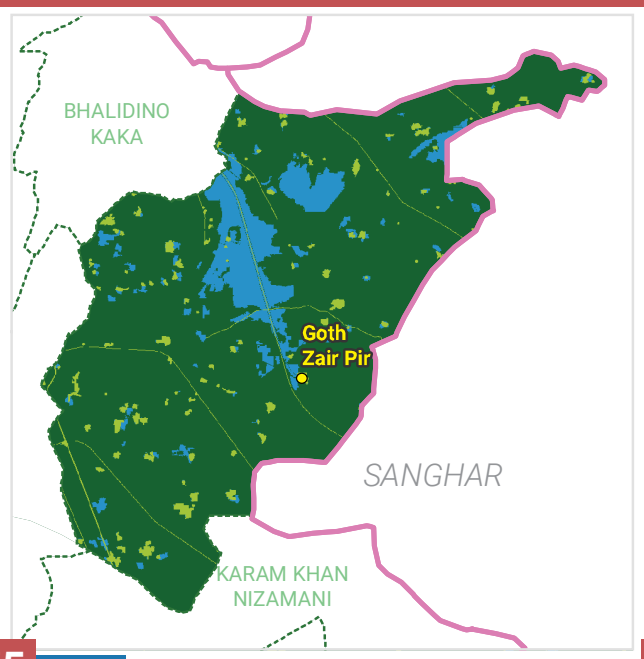


RISK

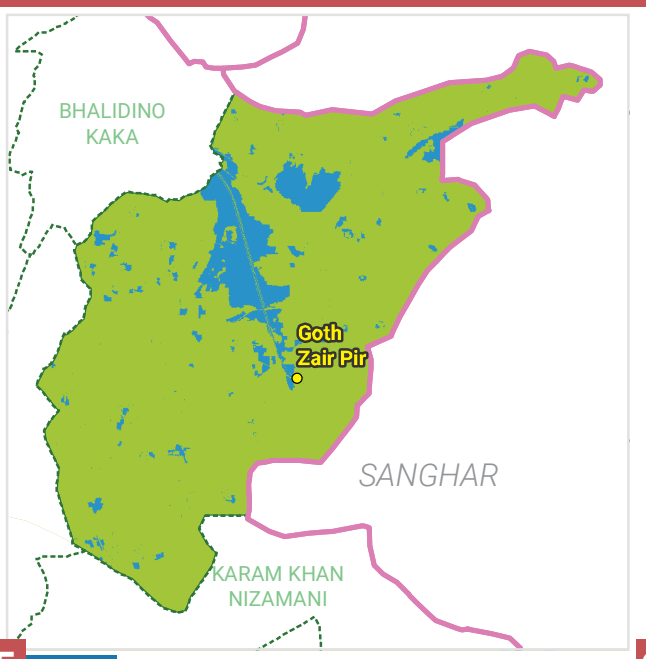


95 YEARS

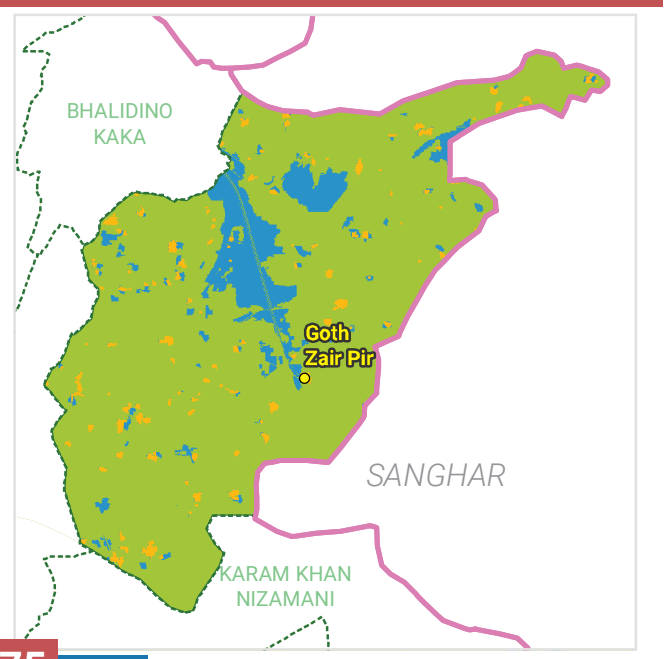
RISK AT DIFFERENT RETURN PERIODS



475 YEARS



975 YEARS



2475 YEARS

HAZARD

Zone 1 | Zone 2 A | Zone 2 B | Zone 3 | Zone 4 | Zone 5 | Zone 6

VULNERABILITY

None *0 - 25* | Low *26 - 50* | Medium *51 - 75* | High *76 - 100*

RISK

Very Low *0 - 49* | Low *50 - 99* | Medium *100 - 199* | High *200 - 249* | Extreme *250 - 300*

ELEMENTS AT RISK

(BASED ON 95 YEARS RETURN PERIOD)

127	12744	65281	153.68	0.02	0.13	0.39	0.21
SETTLEMENTS	HOUSEHOLD	POPULATION	AGRICULTURE AREA (SQ. KM)	FOREST AREA (SQ. KM)	KACHCHA AREA (SQ. KM)	NATURAL VEGETATION IN WET AREAS (SQ. KM)	PAKKA - PLANNED AREA (SQ. KM)
4.09	0.04	309.25	1.71	51.82	0	1	0
PAKKA - UNPLANNED AREA (SQ. KM)	RANGE LAND (SQ. KM)	ROAD NETWORK (KM)	RAILWAY LINE (KM)	IRRIGATION AND DRAINAGE NETWORK (KM)	AMBULANCES	BRIDGES	BUS STOPS
148	0	0	0	2	0	0	4
EDUCATION FACILITIES	FIRE STATIONS	GRAIN MANDIES	GRID STATIONS	HEALTH FACILITIES	INDUSTRIES	MOBILE TOWERS	PETROL PUMPS
0	0	0	0	1	0		
POLICE STATIONS	POST OFFICES	POWER PLANTS / OIL DEPOTS	RAILWAY STATIONS	TOURIST PLACES	WELFARE TRUSTS		

TSUNAMI

NO HAZARD OF TSUNAMI IN UC

RISK MATRIX

HAZARD

	RETURN PERIODS						
	5 YEARS	10 YEARS	25 YEARS	50 YEARS	100 YEARS	250 YEARS	500 YEARS
FLOOD	None	●	None	None	None	None	●
METEOROLOGICAL DROUGHT	Low Medium	Low Medium High	Medium High Extreme	Medium High Extreme	●	●	●
AGRICULTURAL DROUGHT	None	None	None	Low	●	●	●
HEATWAVE	Low Medium	Low Medium	Low Medium High	Low Medium High	Low Medium High Extreme	●	●
CYCLONE	●	●	None	●	None	●	Low
STORM SURGE	●	●	None	●	None	●	None

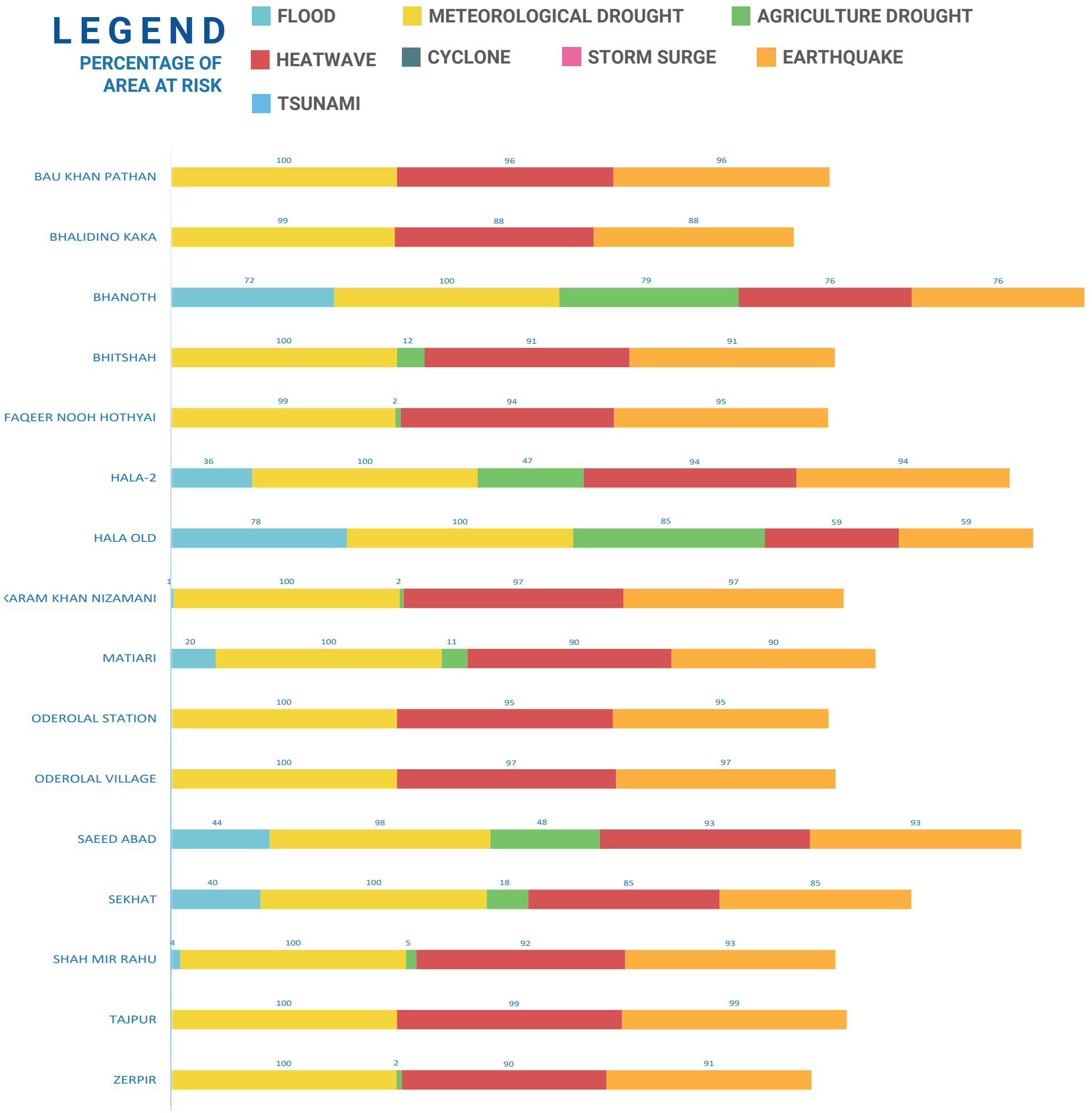
	RETURN PERIODS			
	95 YEARS	475 YEARS	975 YEARS	2475 YEARS
EARTHQUAKE	Low	Low Medium	Medium	Medium High

	EARTHQUAKE MAGNITUDES		
	8.0 MAG.	8.5 MAG.	9.0 MAG.
TSUNAMI	None	None	None

Low *50-99*
Medium *100-199*
High *200-249*
Extreme *250-300*

MULTI-HAZARD RISK - DISTRICT MATIARI

AT DISTRICT LEVEL



DEVELOPED BY

PDMA SINDH

THROUGH

SUPARCO

WITH THE SUPPORT OF