DISTRICT JHANG

PUNJAB - PAKISTAN

MULTI HAZARD VULNERABILITY & RISK ASSESSMENT (MHVRA)

Project Management Unit
National Diasaster Management Authority
Islamabad, Pakistan

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Constitution Avenue, Islamabad - Pakistan
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The National Disaster Management Authority (NDMA) is the lead federal agency to deal with the whole spectrum of Disaster Management in Pakistan. It was established in 2007 through NDM Ordinance and was finally provided parliamentary cover by an act of Parliament in 2010. The NDMA is the executive arm of the National Disaster Management Commission (NDMC), which was established under the Chairmanship of the Prime Minister of Pakistan, as an apex policy making body in the field of Disaster Management. The NDMA aims to develop sustainable operational capacity and professional competence to coordinate the emergency response of Federal Government in the event of a national disaster.

Developed by
Project Management Unit (PMU),
National Disaster Management Authority,
Prime Minister's Office
Published in Pakistan (2018)
ISBN: 978-969-7672-00-8

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We appreciate your feedback

Questions and comments concerning this publication may be addressed to the Project Management Unit, National Disaster Management Authority, Pakistan vide contact details given below.

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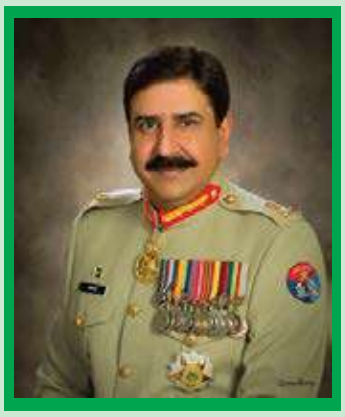
FOREWARD



The primary goal of the National Disaster Management Authority (NDMA) is to achieve sustainable social, economic and environmental development in Pakistan through reducing risks and vulnerabilities by effectively responding to and recovery from all types of disasters.

Pakistan is among the countries most vulnerable to natural and man-made disasters. The country's acute vulnerability to disasters is due to its geographical location, diverse topography, hydrological configuration and extended fault-lines. The recurrent disasters have taken a heavy toll on the long-term sustainability of the country. The vulnerability to disasters is growing in both urban and rural areas, placing even more lives and livelihoods at risk.

NDMA, being the country's apex body for implementing, coordinating and monitoring whole spectrum of disaster management activities in Pakistan, has always remained focused to achieve its vision of building disaster resilient Pakistan. Significant efforts have been made in this direction to reduce the country's vulnerability to several impending disasters. National Disaster Management Plan (NDMP) 2012-2022 reflects our priorities i.e. adopting a proactive approach towards disaster risk management. For implementation of NDMP's key interventions, NDMA conceived an implementation roadmap for NDMP (2016-2030) wherein particular emphasis has been laid on Multi Hazard Vulnerability & Risk Assessment (MHVRA) Intervention.

MHVRA study plays an instrumental role in integrated Disaster Risk Reduction (DRR) planning and mainstreaming DRR into development at local, provincial, and national level. It guides the relevant agencies/ line departments in requisite land-use planning and implementation of national scale programs aligned to vulnerabilities at a community level. The knowledge gain from the study can also play a cardinal role in development of robust knowledge management framework for long-term socio-economic sustainable growth.

For MHVRA related activities, NDMA has raised Project Management Unit (PMU). I am delighted to know that PMU has successfully conducted the MHVRA study of five selected districts of Punjab by utilizing the in-house technical resources. It is noteworthy to mention that this Project is first of its kind and demonstrates high degree of expertise for data processing and visualization. I am very much satisfied with the results and hope this document will act as a constant source for informed decision making for all stakeholders. I would like to extend my gratitude to the Members of NDMP Steering Committee for taking keen interest in guiding the project team throughout the course of this Study and endorsing its results.

I would like to place on record my sincere appreciation for the contributions of Development Partners, NGOs/INGOs and academia for their valuable inputs during the execution of this Study. A profound gratitude goes to the United Nation World Food Program, Pakistan for their support and cooperation for initiating and pioneering MHVRA initiatives in Pakistan and for their long-term support in establishing PMU in NDMA.

Last but not the least, the Project was also meant for development of NDMA in-house capacity to take similar endeavors in the future as well and with the Blessing of Almighty Allah we have been able to cover a lot of mileage. I believe, this is the first step for a long journey ahead which requires a steadfast and consistent efforts which for contributions of partners will be highly appreciated.

Lieutenant General
Omar Mahmood Hayat, HI (M)
Chairman, National Disaster
Management Authority (NDMA)

ACKNOWLEDGEMENT

The National Disaster Management Authority (NDMA) is pleased to launch the Multi Hazards Vulnerability and Risk Assessment (MHVRA) Atlas of five selected districts of Punjab, prepared mainly as a dynamic planning tool for Disaster Risk Management (DRM) officials of Government, Humanitarian Agencies and Development Partners at provincial and district levels for improved and informed Disaster Risk Reduction (DRR), Preparedness and Contingency Planning.

An esteem of gratitude is owed to the Former Chairman NDMA, Major General (R) Asghar Nawaz HI(M) and the Current Chairman Lieutenant General Omar Mahmood Hayat HI(M), for their visionary approach, guidance and direction in constituting this Study. They remained a source of guidance at each stage of this project which ultimately had resulted in successful execution of this Project..

We profoundly acknowledge Senior DRM Officer, Mr. Sultan Mehmood of Disaster Risk Reduction (DRR) Unit and Program Officer Mr. Iftikhar Abbas of Vulnerability Analysis & Mapping (VAM) Unit of World Food Program (WFP) for their support and cooperation for all our initiatives and endeavors throughout the working of this project. We acknowledge and express our sincere and deep appreciation for their assistance in this regard.

Our sincere and passionate felicitations to Former Member Disaster Risk Reduction (DRR) NDMA, Mr. Ahmed Kamal, Current Member DRR, NDMA, Mr. Idrees Mehsud, Director Implementation Lieutenant Colonel (R) Raza Iqbal and Assistant Director Projects Mr. Shafi Agha for their continuous support, prized guidance and relevant inputs based on their vast experience and knowledge that contributed immensely in this endeavor.

We acknowledge significant contributions made by institutions and individuals at district, provincial, national by providing data and information required to smoothly carryout this project. In addition, the proficiencies provided by the consultant of different disciplines were crucial, as it helped to maintain precision throughout the assessment.

In the end, we would like to extend our heartiest gratitude to all our relevant stakeholders who rendered their full support, contribution and active participation during execution of this Study. Their contributions are sincerely appreciated and acknowledged.

PREFACE

Pakistan by virtue of its diverse topographic features is vulnerable to wide degree of natural and man-made disasters. Events exhibited under many forms in the past are the testimonies to the country's susceptibility to disasters. Until recently, a reactive emergency response approach remained chiefly applicable to deal with disasters in Pakistan. However, disasters continued to exact a heavy toll on country's economy, human lives and environment and, consequently, manifested the need for developing a different strategy towards Disaster Risk Management (DRM). Against this backdrop, a shift from hitherto response based approach to proactive disaster management was adopted through 2007 National Disaster Management Ordinance, now known as National Disaster Management (NDM) Act 2010.

National Disaster Management Authority (NDMA), with provision of NDMA Act 2010 and in-line with the DRR Policy, formulated a 10-year comprehensive National Disaster Management Plan (NDMP) 2012–2022 outlining ten priority areas and 118 specific interventions and projects for implementation over the span of ten years. The priority number three and four under NDMP 2012-2022 warrant execution of Multi Hazard Vulnerability and Risk Assessment (MHVRA) Intervention in the Country. In this regard, a roadmap i.e. NDMP implementation roadmap 2016-2030 was chalked out for phase-wise execution of MHVRA Intervention at micro level, down to UC Level, for all districts of Pakistan and AJ&K.

In view of the Country's vulnerability to multiple disasters, the implementation of MHVRA Intervention is considered essential for achieving national and global commitments, some of those outlined in Millennium Development Goals (MDGs) & Sustainable Development Goals (SDGs), Sendai Framework for Disaster Risk Reduction (SFDRR), Climate Change Policy 2012, National Disaster Risk Reduction (DRR) Policy 2013, NDMP 2012-2022 and Pakistan Vision 2025.

Cognizance of the importance of MHVRA component, NDMA, being an apex body to deal with the whole spectrum of disaster management, embarked upon establishing holistic and well-structured methodology for country-specific MHVRA activity. To this end, Project Management Unit (PMU) has been established in NDMA for execution and monitoring of the MHVRA Studies in the Country, with an aim to clearly estimate and map the risk of communities nationwide. PMU, as the first step, laid down "NDMA Policy & Execution Guidelines for the conduct of MHVRA" to maintain unanimity in risk assessment methodology across the Country and AJ&K. The Guidelines constitute an important part of NDMA's effort towards provision of unified standards and procedures for the hazard, exposure, vulnerability and risk assessments.

To test the various attributes of the MHVRA Guidelines, PMU with the support of World Food Programme (WFP), conducted a micro-level MHVRA intervention, down to the level of Union Council, for selected five districts of Punjab namely Bahawalpur, Jhang, Khushab, Multan and Rahim Yar Khan. This Project has a distinction of being the only study to be endorsed by Steering Committee formulated to oversee implementation of NDMP. The NDMP Steering Committee consists members from all lead technical agencies of Pakistan including representatives from S/GB/F/PDMA, Pakistan Meteorological Department (PMD), Planning Commission, Planning Development & Reforms Division, Finance Division, Economic Affairs Division, Ministry of Water & Power, Ministry of Climate Change, Federal Flood Commission (FFC), Geological Survey of Pakistan (GSP), Space & Upper Atmosphere Research Commission (SUPARCO) and Survey of Pakistan (SOP) as well as representatives from academia.

This Study involved identification and analysis of prevailing hazards in the study districts through field level consultation with local stakeholders and analysis of historical records. Three hazards namely drought, flood, earthquake have been considered for hazard analysis owing to their frequent recurrence in the study districts. The project covered various scientific and technical activities, including a review of past and ongoing studies related to hydrological, seismological and geological phenomenon. For hazard modelling and analysis, probabilistic and scenario based hazard assessment tools have been employed in the project. Technical parameters used for hazard estimation include information concerning soil moisture condition, climatic, biotic & edaphic factors of soil, temperature condition, vegetation health, water flow paths, flood catchment area, streamline data, land use data, river discharge information, flood extent, flood velocity, precipitation, seismic sources, plate tectonics, geomorphology, soil data, bore hole data, fault zones, ground motion prediction equations, seismic intensity (PGA), soil ground motion amplification factor and so on.

Exposure have been mapped in the dimensions of population, physical elements, life lines, essential facilities, transportation facilities, socio-economic aspects, economic activities, environmental elements, critical infrastructure, agriculture and livestock elements; being termed as elements at risk. Various statistical tools such as projection equations, dissimilarity index, have been employed in the Project to extrapolate information beyond the available frame.

Vulnerability analysis have been conducted considering three dimensions i.e. physical, social and agriculture (Food Insecurity). For physical vulnerability, fragility curves have been developed using available technical and statistical tools (Probabilistic or Empirical fragility models). For social vulnerability, several technical tools such as Principal Component Analysis (PCA) and Social Vulnerability Indicator (SoVI) have been utilized to obtain possible driving factors contributing to the social vulnerability in the study area. Vulnerability analysis in the context of agriculture and food security have also also been undertaken to determine sets of contributing factors to food insecurity and agricultural vulnerability. The stressor covered epidemic, endemic, biotic and edaphic factors and sudden shocks such as earthquake, flood and drought.

Coping capacity has been anticipated by assessing existing capacities of organization to manage disasters. The coping capacity has further been divided into three main factors i.e. capacity to anticipate risk, capacity to respond and capacity recover. Adaptive capacity has been evaluated using fifteen indicators.

For Risk Assessment, Analytical Hierarchy Process (AHP) and Multi Criteria Decision Making approaches have been employed in the Study. The risk assessment has been carried out using qualitative, quantities or semi quantitative approach. On basis of these factor components, the cumulative risk profile of the study districts (risk indexing down to UC Level) have been developed. Various DRR intervention and mitigation measures have formulated and finally Cost Benefit Analysis (CBA) of proposed DRR interventions have been performed to estimate their economic feasibility.

(Continued)

Close linkages with the National, provincial and district organizations have been established through stakeholder consultation arrangements in order to facilitate secondary data collection, hazard specific information exchange, and sharing of any other relevant data. For this purpose, several data collection tools have been utilized in the Study such as focus group discussion, key informant interviews, participatory rural appraisal, semi structured interviews and one-to-one interviews with community level stakeholders and line departments.

ABOUT THIS ATLAS

An accurate, easy-to-interpret and up-to-date information is one of the most fundamental elements of decision-making process. Information, particularly in the realm of disaster management, plays an instrumental role in the risk-informed Disaster Risk Reduction (DRR) planning. It makes the relevant departments aware of the likely losses, relative vulnerabilities, exposure and impending disaster risks in the study area, enabling them to effectively undertake prevention, mitigation, preparedness and response based measures before or at the onset of any emergency situation. However, compilation and visualization of information concerning Multi Hazard Vulnerability & Risk Assessment (MHVRA) study is fairly a challenging task since it demands multi-dimensional analysis of different natural processes to understand their composite effects over the study area. Similarly, presentation of the outputs of MHVRA study to the end user, in an easy manner, is yet another challenging task, which requires development of data visualizing tools, graphic aids, catalog of charts and map composition with effective cartographic language. This Atlas in one major step to achieve the said objectives. Much effort has been put in to provide easy to comprehend and interactive information to the users.

This Atlas provides detailed baseline maps of the study district covering several dimensions to include geology, climatology, land use, land cover, elevation, population, settlements, buildings, transportation, telecommunication, health, education, irrigation infrastructure, industries, livestock, agriculture etc. Several graphical tools have been employed to produce easy to grasp charts, these include pie-charts, histograms, ring charts, matrix diagram, bar charts, line graphs, 3D charts and informative tables. The Atlas also provides brief hazard assessment methodologies for each selected hazards i.e. drought, earthquake and flood, along with maps for various return periods. Exposure Matrix Tables identifying the exposed elements at risk have also been developed along with the exposure maps. A brief risk assessment methodology is also provided in the atlas with the risk maps. All the study has been conducted at micro-level, down to the level of Union Council. This Study is first of its kind and demonstrates high level of expertise, arduous work and coordinated approach involving cross-sectorial stakeholder linkages.

The Product shall be useful for policymakers and practitioners for risk-informed land-use planning, mainstreaming DRR into development programs and implementation of national scale programs aligned to ground. The project would render substantial baseline information over which other micro level DRR plans could be devised and will serve as a state of the art planning tool enabling mapping of resources in the study district.

List of Officers/Officials involved in MHVRA Punjab Study

Technical Team

Name	Designation/Position
Mr. Ehtisham Khalid Khan	Project Director / Team Lead
Ms. Nimrah Khalid	MHVRA Expert
Mr. Asif Jan Turangzai	Senior MHVRA Expert (Till October, 2016)
Mr. Saad Shams Butt	GIS Expert (Till September, 2016)
Mr. Syed Muhammad Tayyab Shah	Project Officer
Mr. Aamir Qayyum	Project Officer
Ms. Mashal Riaz	MHVRA Officer
Ms. Sana Zahid Shah	GIS Officer
Ms. Zahra Hassan	GIS Officer
Mr. Ismail Khan	Project Officer (Till September, 2016)
Mr. Malik Zaheer-ud-Din	Project Officer (Till August, 2016)
Ms. Sarah Ovais	GIS Associate (Till September, 2016)
Ms. Saman Mushtaq	GIS Associate (Till September, 2016)
Mr. Muhammad Waqas	MHVRA Associate (Till February, 2017)
Mr. Sheikh Rafay Ehsan	MHVRA Intern

Consultants

Name	Consultancy Area
Dr. Naveed Ahmad	Seismic Hazard Analysis and Vulnerability Analysis
Dr. Bashir Ahmad	Drought Hazard Analysis
Dr. Athar Ashraf	Flood Hazard Analysis
Dr. Wajid Pirzada	Food Insecurity Study
Dr. Shahzad Ali Khan	Cost & Benefit Analysis
Mr. Amjad Ahmad	Risk Assessment

Support Team

Name	Designation/Position
Ms. Muqaddas Iqbal	Project Coordinator (Till September, 2016)
Mr. Ghulam Rasool	Admin and Account Officer
Mr. Shahid Malik	Field Surveyor
Mr. Ali Tassadaq	Account Intern (Till February, 2017)
Mr. Tilwat Khan	Office Assistant
Mr. Nasir Khan	Office Assistant

National Disaster Management Plan (NDMP)

Steering Committee - Participants List (19th Sep & 9th Dec 2016)

Name	Designation	Position	Department
Maj. Gen. Asghar Nawaz	Chairman	Chair	National Disaster Management Authority (NDMA), Pakistan
Mr. Ahmed Kamal	Member (Disaster Risk Reduction)	Member/ Secretary	
Brig. Ishtiaq Ahmed	Member (Operations)	Member	
Mr. Ehtisham Khalid Khan	Project Director/Team Lead	Member	
Mr. Chaudhry Muhammad Anwar	Chief (PPH)	Member	Planning and Development Division
Mr. Syed Zawad Haider Shah	Section Officer	Member	Economics Affairs Division
Mr. Syed Zakria Ali Shah	Deputy Secretary (UN)		
Mr. Muhammad Saleem Khatak	Deputy Secretary	Member	Ministry of Climate Change
Mr. Wasim Akhtar	Deputy Secretary (Development)		
Mr. Muhammad Afzal Shabzada	Deputy Director		
Mr. Arshad Ahmed	Senior Joint Secretary	Member	Finance Division
Mr. Malik Aman	DSA (NDMA)		
Mr. Khalid Sher Dil	Director General	Member	Provincial Disaster Management Authority, Punjab
Mr. Hameedullah Malik	Project Director		
Mr. Nisar Ahmed Sani	Documentation Officer		
Mr. Syed Ahmed Fawad	Director (Operations)	Member	Provincial Disaster Management Authority, Sindh
Mr. Amer Afaq	Director General	Member	Provinicial Disaster Management Authority, Khyber Pakhtoonkha
Mr. Wajid Ali Khan	Deputy Director (Relief)		
Mr. Israr Muhammad	Director (R&R)		
Mr. Faisal Khan Baloch	Assistant Director	Member	Provincial Disaster Management Authority, Balochistan
Mr. Muhammad Khalid Sherdil	Director General	Member	FATA Disaster Management Authority
Mr. Main Adil Zahoor	Assistant Director (Operations & Relief)		
Mr. Zaheer-udin-Babar	Deputy Director	Member	Gilgit Baltistan Disaster Management Authority
Mr. Abdul Waheed Shah	Director General		
Mr. Zaheer-udin-Qureshi	Director General	Member	State Disaster Management Authority Azad Jammu & Kashmir
Dr. Muhammad Hanif	Director (NWFC)	Member	Pakistan Meteorological Department
Mr. Zafar Iqbal	Senior Engineer	Member	Federal Flood Commission, Ministry of Water and Power
Mr. Alamgir	Chief Engineer		
Mr. Muhammad Ishtiaq	Director	Member	Survey of Pakistan
Mr. Syed Zuhair Bukhari	Director	Member	Pakistan Space and Upper Atmosphere Research Commission (SUPARCO)
Mr. Zafar Iqbal	Director		
Mr. Muhammad Farooq	General Manager		
Mr. Sardar Saeed Akhter	Director	Member	Geological Survey of Pakistan
Mr. Simon Sadiq	Deputy Director		
Brig Sajid Naeem (R)	Senior Capacity Building Expert	Member	National Institute of Disaster Management
Dr. Talat Iqbal	Deputy Chief Scientist / Director	Co-opted Member	Center for Earthquake Studies, PAEC
Dr. Muhammad Ali Shah	Manager (DM & R Division)	Co-opted Member	Micro Seismic Studies Program, Pakistan Automic Energy Commission (MSSP,PAEC)
Mr. Thi Van Hoary	Head of Vulnerability Analysis & Mapping	Observer	World Food Program, Pakistan (UN- WFP)
Mr. Iftikhar Abbas	Program Officer (Spatial Analyst)		
Ms. Umber Khan	Program Officer	Observer	Department for International Development (DFID)
Mr. Sherwan Asif	Program Manager		
Mr. Shaukat Shafi	Senior Project Officer	Observer	Asian Development Bank (ADB)

GLOSSARY OF TERMS

Acceptable Risk	The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.
Accountability	Obligation to demonstrate that work has been conducted in compliance with agreed rules and standards or to report fairly and accurately on performance results vis a vis mandated roles and/or plans. This may require a careful, even legally defensible, demonstration that the work is consistent with the contract terms.
Activity	Actions taken or work performed through which inputs, such as funds, technical assistance and other types of resources.
Adaptation	The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
Affected Area	An area or part of country affected by disaster.
Alluvium Deposits	A deposit of clay, silt, and sand left by flowing floodwater in a river valley or delta, typically producing fertile soil.
Avalanche	An avalanche (also called a snow slide) is a rapid flow of snow down a sloping surface of a mountain. Avalanches are triggered due to mechanical failure of the snow when the forces on the snow exceed its cohesion strength.
Average Household Size	Average Number of persons per household.
Bare Area with Sparse Natural Vegetation	Sand Dunes with natural vegetation, bare rocks (with sparse vegetation) and desert flat pains are included in this class.
Bare Areas	This class describes areas that have very less natural and manmade vegetation cover which include sand dunes and barren land.
Base-Line Study	An analysis describing the situation prior to a development intervention, against which progress can be assessed or comparisons made.
Basic Health Unit (BHU)	The BHU is located at a Union Council and serves a catchment population of up to 25,000. Services provided at BHU are promotive, preventive, curative and referral. BHU provides all PHC services along with in tegral services that include basic medical and surgical care. MCH services are also part of the services package being provided at BHU. BHU provides first level referral to patients referred by LHWs. BHU refers patients to higher level facilities as and when necessary.
Built-up Area	It defines all built areas (urban, industrial, airport etc.) with all vegetated areas linked to the built-ups such as gardens, golf courses, urban recreation parks, plots devoted to urban expansion etc.
Capacity	The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.
Capacity Building	Efforts aimed to develop human skills or societal infrastructure within a community or organization needed to reduce the level of risk. In extended understanding, capacity building also includes development of institutional, financial, political and other resources, at different levels of the society.
Census	Census is an official count or a survey, especially of a population.
Climate Change	(a) The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external force or to persistent anthropogenic changes in the composition of the atmosphere or in land use". (b) The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".
Climatology	Climatology or climate science is the scientific study of climate, scientifically defined as weather conditions averaged over a period of time.
Coping Capacity	The means by which people or organizations use available resources and abilities to face a disaster. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions.
Craton	The term craton is used to distinguish the stable portion of the continental crust from regions that are more geologically active and unstable. Cratons can be described as shields, in which the basement rock crops out at the surface, and platforms, in which the

	basement is overlaid by sediments and sedimentary rock.
Critical Facilities	The primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.
Crop Irrigated	Areas used for the production of annual crops, such as corn, vegetables, soybeans, tobacco and cotton. This class also includes all land being actively tilled.
Crop Marginal and Irrigated Saline	Crop marginal and irrigated saline are identified as those areas which are currently used for agriculture with low and unstable rainfall or higher rainfall areas intensively used, relative to user capability, under existing population densities, traditional technologies and institutional structures.
Crop Rainfed	The term rainfed agriculture is used to describe farming practicesthat rely only on rainfall for water.
Cyclone	A large-scale system of winds that spiral in toward a region of low atmospheric pressure. Because low-pressure systems generally produce clouds and precipitation, cyclones are often simply referred to as storms. A tropical cyclone is one that forms over warm tropical waters. Such a system is characterized by a warm, well-defined core and can range in intensity from a tropical depression to a tropical cyclone. While tropical cyclones can produce extremely powerful winds and torrential rain, they are also able to produce high waves and damaging storm surge.
Debris Flow	This is a phenomenon in which soil and rock on the hillside or in the riverbed are carried downward at a dash under the influence of continuous rain or torrential rain.
Demographics	It is the statistical data relating to the population and particular groups within it.
Density	Density refers to number of elements (population, buildings, roads etc.) per unit area.
Disaster	A catastrophe or a calamity in an affected area arising from natural or man-made causes or by accident which results in substantial loss of life or human suffering or damage to, and destruction of property. A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.
Disaster Management	Managing the complete spectrum of disaster including preparedness, mitigation, response, recovery, relief and rehabilitation.
Disaster Risk	The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.
Disaster Risk Management (DRM)	The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.
Disaster Risk Reduction (DRR)	The concept and practice of reducing disaster risks through systematic efforts to analyses and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.
District Head Quarter (DHQ)	The District Head Quarters (DHQ) Hospital is located at District headquarters level and serves a population of 1 to 3 million, depending upon the category of the hospital. The DHQ hospital provides promotive, preventive, curative, advance diagnostics, inpatient services, advance specialist and referral services. All DHQ hospitals are supposed to provide basic and comprehensive care.
Drought	A drought is an extended period when an area notes a deficiency in its water supply when the demand for water exceeds the supply. Generally, this occurs when an area receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region.
Early Warning	The provision of timely and effective information, through identified institutions, to communities and individuals so that they could take action to reduce their risks and prepare for effective response.
Earthquake	Earthquake is defined as shaking and vibration at the surface of the earth resulting from underground movement along a fault plane of from volcanic activity or due to movement of plate boundaries of the Earth. The scale of earthquakes is measured by moment magnitude and the shaking intensity at each location is usually reported by Mercalli intensity scale.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Element at Risks	Elements at Risk include all tangible (population, essential and critical infrastructure, building, crops and so on) and intangible elements (monetary values) that are at risk to any potential damage during extreme events.
Elevation	The measurement of height of a surface above sea level or ground level.

Emergency Management	The management and deployment of resources for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation.
Employment	The "employed" comprises all persons ten years of age and above who worked at least one hour during the reference period and were either "paid employed" or "self-employed". Persons, employed on permanent/regular footings, who have not worked for any reason during the reference period are however, treated as employed.
Entity	Any government or non-government organization, national or international stakeholders including Federal, Provincial and District agencies and United Nations' agencies relevant to Disaster Management as described in Section 23-2 [(a) and (d)] of NDM Act 2010, which is interested in the execution of MHVRA activity hereinafter referred to as Entity.
Eolian Deposits	Eolian Deposits are the Wind-blown deposits on Planetary surface.
Evaluation	The systematic and objective assessment of an on-going or completed project, program or policy, its design, implementation and results. The aim is to determine the relevance and fulfillment of objectives, development efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision making process of both recipients and donors.
Evaporites	Evaporites are individual minerals found in the sedimentary deposit of soluble salts that results from the evaporation of water.
Exposure	People, property, systems, or other elements present in hazard zones that are subject to potential losses.
Flash Flood	A flash flood is a phenomenon of rapid flooding (mostly less than 6 hours) of geomorphic low-lying areas due to downpour or heavy rains caused by low depression, climate front line (thunderstorm) or cyclone.
Flood	Flood is a phenomenon of inundation by water coming from a direct rainfall or river, drainage or other water bodies, such as lakes or seas due to overflowing from ordinary boundary between land and water or water surging.
Flood Plain Deposits	Floodplain deposits are also called as Alluvial Plain, flat land area adjacent to a stream, composed of unconsolidated sedimentary deposits (alluvium) and subject to periodic inundation by the stream.
Food Insecurity	The state of being without reliable access to a sufficient quantity of affordable and nutritious food.
Forecast	Estimate of the occurrence of a future event (UNESCO, WMO). The term is used with different meanings in different disciplines.
Geography	Geography is the study of the Earth and its features, its inhabitants, and its phenomena.
Geological Composition	Geological composition is the fundamental unit of lithostratigraphy that contain certain amount of rock strata that have a comparable lithology, facies or other similar properties.
Geology	Geology is an earth science concerned with the solid Earth, the rocks of which it is composed and the processes by which they change over time.
Geospatial Data Bank	Spatial Data and Geographic Information Management System (GIS) data relevant to disaster and the corresponding data integration in the form of geospatial data bank. In the context of disaster management, following types of data is required: i. Data on the disastrous phenomena (e.g. landslides, floods, earthquakes), their location, frequency, magnitude etc. ii. Data on the environment in which the disastrous events might take place: topography, geology, geomorphology, soils, hydrology, land use, vegetation etc. iii. Data on the elements that might be destroyed if the event takes place: infrastructure, settlements, population, socioeconomic data etc. iv. Data on the emergency relief resources, such as hospitals, fire brigades, police stations, warehouses etc.
GLOF	"GLOF" refers to a Glacial Lake Outburst Flood that occurs when water in a glacier lake suddenly discharges due to a breach of a moraine dam (glacier lake). The results can be catastrophic to the downstream riparian area. (Richardson and Reynolds 2000).
Hazard	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.
Hazard Analysis	Identification, studies and monitoring of any hazard to determine its potential, origin, characteristics and behavior.
Hill Torrent (Flood)	Hill torrent floods are basically a rapid flooding of geomorphic steep surface areas at alluvial cones or floodplain areas caused by overflowing water from channels due to rapid velocity and any amount of flow quantity.
Household	A household is defined to be constituted of all those persons who usually live together and share their meals. A household may consist of one person or more than one person who may or may not be related to each other.
Human-Induced Disasters	Natural disasters that are accelerated/ aggravated by human influence. A landslide, for example, may be purely natural, as a result of a heavy rainfall or earthquake, but it may also be human induced, as a result of an over steepened road-cut.

Human-Made Disasters	Events which are caused by human activities (such as atmospheric pollution, industrial chemical accidents, major armed conflicts, nuclear accidents, oil spills etc.)
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Indicators	Indicators are variables or parameters used to describe drought conditions. Examples include precipitation, temperature, streamflow, groundwater and reservoir levels, soil moisture, snowpack, etc.
Indices	Indices are typically a computed numerical representation of drought severity, assessed using climatic or hydro-meteorological inputs including the indicators listed above. In short, they aim to measure the qualitative state of drought on the landscape for a given time period. Indices are technically indicators as well. Monitoring the climate at various timescales allows identification of short-term wet periods within long-term droughts or short-term dry spells within long-term wet periods.
Infant Mortality Rate	The number of deaths of infants under one year of age per 1000 live births in a given year.
Irrigated Area	Irrigated agricultural area refers to the area in which the moisture of soil is controlled for the better growth of seeds and better crop production by providing water through different mode of water supply such as rivers, major, minor or distributary canals, tube wells, wells, spraying or other water to the crops.
Irrigation Sources	It refers to the source(s) by means of which the cultivated area is irrigated partially or wholly.
Land Cover	Land Cover is defined as the observed (bio) physical cover on the earth's surface.
Land Use	Land Use is characterized by the arrangements, activities and inputs that people undertake in a certain type of land in order to produce, change or maintain it.
Land Use Planning	The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses. Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas, control of population density and expansion Mitigation Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.
Landslide	A landslide is a phenomenon in which the movement of a mass of rock, debris, or earth down a slope due to gravity. The materials may move by falling, toppling, sliding, spreading, or flowing. Since a large amount of soil mass usually moves, serious damage can occur.
Latitude	Latitude is a geographic coordinate that specifies the north–south position of a point on the Earth's surface. Latitude is an angle (defined below) which ranges from 0° at the Equator to 90° (North or South) at the poles.
Longitude	Longitude is a geographic coordinate that specifies the east-west position of a point on the Earth's surface. It is an angular measurement, usually expressed in degrees
Meander-Belt	The part of a valley bottom across which a stream shifts its channel from time to time especially in flood.
Middle Schools	Middle Schools are the schools that provide education from 5^{th} to 8^{th} grade.
Mitigation	The lessening or limitation of the adverse impacts of hazards and related disasters.
Monitoring & Evaluation (M&E)	A continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds.
Mortality Rate	Number of deaths recorded in a population of particular region in a year.
Mouza / Deh	It is a territorial unit with a separate name, definite boundaries, and area precisely measured and divided into plots / khasras / survey numbers. Each mouza is a revenue estate and has a cadastral map maintained in the land revenue record with a Hadbast Number except Sindh Province. Mouza, Deh, Village, Killi and Chak are the names commonly used for it. The term mouza / deh is widely used in the settled areas while the term village and or killi are used in the unsettled areas. There may be one or more settlements, abadies, basties, dhokes, goths, etc. in the territory of a mouza / deh. The mouzas / dehs may also have scattered inhabitation while there may be some mouzas without population as well.
Multi Hazard Vulnerability and Risk Assessment (MHVRA)	Multi Hazard Vulnerability and Risk Assessment is a comprehensive study which intends to evaluate the expected vulnerabilities, risks and losses due to different hazardous events; both natural or man-induced.
Multi Hazards	The term Multi Hazards, as the name would suggest, are the hazards evolved from multiple sources, either inter-related or independent phenomena, and are subject to joint probability theory and analysis.

National Authority	National Authority means National Disaster Management Authority (NDMA).
Natural Disasters	Events which are caused purely by natural phenomena such as earthquakes, floods, cyclones etc.
Nullah	A Pakistani term, used for small rivers a streams carrying fresh water or sewerage disposal.
Performance Indicator	A variable that allows the verification of changes in the development intervention or shows results relative to what was planned.
Physical / Structural Vulnerability	The measure of the fragility structure, engineered or non-engineered, and its associated susceptibility to the natural stresses such as earthquake, flood etc.
Piedmont	Piedmont, in geology, landform created at the foot of a mountain or mountains by debris deposited by shifting streams.
Population Growth Rate	The growth rate is the rate at which a population is increasing (or decreasing) in a given year.
Population Projections	Population Projections are estimates of population number typically based on an estimated population consistent with most recent decennial census and are produced using cohort-component method.
Precipitation	Precipitation is the water that falls from the clouds towards the ground, especially as rain or snow.
Preparedness	Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.
Prevention	Activities to ensure complete avoidance of the adverse impact of hazards.
Primary Healthcare	The primary care facilities include Basic Health Units (BHUs) and Rural Health Centers (RHCs) mainly preventive, outpatient and basic inpatient care.
Primary School	. A primary school is an education facility in which children receive primary or elementary education, coming after preschool and before secondary school.
Quality Assurance	Quality assurance encompasses any activity that is concerned with assessing and improving the merit or the worth of a development intervention or its compliance with given standards. Note: examples of quality assurance activities include appraisal, RBM, reviews during implementation, evaluations, etc.
Range Lands	Range Lands are vast natural landscapes grasslands, shrub lands and wood lands.
Recovery	Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.
Relative Humidity	The amount of water vapour present in air expressed as a percentage of the amount needed for saturation at the same temperature.
Reliability	Consistency or dependability of data and evaluation judgments, with reference to the quality of the instruments, procedures and analyses used to collect and interpret evaluation data.
Relief / Response	The provision of assistance during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.
Residual Risk	The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.
Retrofitting	Reinforcement of existing buildings and structures to become more resistant and resilient to the forces of natural hazards.
Risk	The combination of the probability of an event and its negative consequences.
Risk Assessment	A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.
Risk Management	The systematic approach and practice of managing uncertainty to minimize potential harm and loss.
Risk Transfer	The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

River	A river is a natural waterway, usually freshwater, flowing toward lower level of water surface such as a lake, a sea, or another river.
Riverine Flood	Flood is a phenomenon of inundation by water coming from a river, drainage or other water bodies, such as lakes or seas due to overflowing from ordinary boundary between land and water or water surging.
Rural Area	A rural area is an open area that has very low population and building density. Generally rural areas are away from cities/towns and its inhabitants are mostly linked with agriculture based livelihood.
Rural Health Centre (RHC)	The RHCs have 10-20 inpatients beds and each serves a catchment population of up to 100,000 people. The RHC provides promotive, preventive, curative, diagnostics and referral services along with inpatient services. The RHC also provides clinical, logistical and managerial support to the BHUs, LHWs, MCH Centers, and Dispensaries that fall within its geographical limits. RHC also provides medico-legal, basic surgical, dental and ambulance services.
Secondary Health Care	It is an intermediate level of health care that is concerned with the provision of specific technical, therapeutic or diagnostic services. It is the first referral level serving a district or a tehsil. Specialist consultation procedures and hospital admissions fall into this category of care. The role of a district hospital in primary health care has been expanded beyond being dominantly curative and rehabilitative to include promotional, preventive and educational roles as part of a primary health care approach.
Secondary School or Higher School	Secondary Schools are the schools which provide education from grade 8 till Intermediate Level, i.e. 12th Grade or FSc.
Sedimentary Rocks	Sedimentary rocks are types of rock that are formed by the deposition and subsequent cementation of that material at the Earth's surface and within bodies of water.
Slope Failure	In this phenomenon, a slope abruptly collapses when the soil that has already been weakened by moisture in the ground loses its self-cohesiveness under the influence of rain or an earthquake. Due to sudden collapse, many people fail to escape if it occurs near a residential area, thus leading to a higher rate of fatalities.
Social Vulnerability	Characteristics of social systems that create the potential for harm or loss to it
Steppe Climate	A semi-arid climate or steppe climate is the climate of a region that receives precipitation below potential evapotranspiration, but not as low as a desert climate.
Storm Surge	A Storm Surge is phenomena of sea level rise associated with a low-pressure weather system, typically a tropical cyclone. Therefore, an early warning plan for “storm surge” should be incorporated with that of “cyclone”.
Streambed	A stream bed is the channel bottom of a stream or river, the physical confine of the normal water flow
Structural / Non-Structural Measures	Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure. Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs. (Brundtland Commission, 1987)
Tehsil Head Quarter (THQ)	These hospitals are located at each THQ and serves a population of 0.5 to 1.0 million. At present majority of THQ hospitals have 40 to 60 beds. The THQ hospital provides promotive, preventive, curative, diagnostics, in patients, referral services and also specialist care. THQ hospitals are supposed to provide basic and comprehensive Emergency Obstetric and New born Care (EmONC). THQ hospital provides referral care to the patients including those referred by the Rural Health Centers, Basic Health Units, Lady Health Workers and other primary care facilities.
Tertiary Healthcare	Tertiary care hospitals are located in the major cities for more specialized inpatient care. Tertiary care is specialized consultative health care, usually for inpatients and on referral from a primary or secondary health professional.
Tsunami	A tsunami is a series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean or a large lake. Earthquakes, volcanic eruptions and other underwater explosions, landslides, avalanche, meteorite impacts and other disturbances above or below water all have the potential to generate a tsunami.
Unemployment	The “unemployed” comprises all the persons ten years of age and above who during the reference period were without work, currently available for work and are seeking work.
Urban Area	An Urban area is human settlement with high population density and infrastructure of built environment. Urban areas are created through urbanization and are categorized by urban morphology as cities, towns, conurbations and suburbs.
Urban Flood	Flood and inundation phenomena occurring in the city or built-up areas.

Veterinary Facility	It refers to the availability of veterinary facilities for livestock with qualified veterinarian (Doctor / Assistant) for provision of medical facilities for farm animals.
Vulnerability	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.
Wet Areas	Areas which are naturally covered with fresh or saline water such as river and lakes are grouped in this class.
Wheat Procurement Centre	These centres are established every year at the time of wheat harvest in surplus wheat producing areas particularly of the Punjab and Sindh provinces by the Provincial Food Departments and or Pakistan Agricultural Services and Storage Corporation (PASSCO) at appropriate locations. These centres are not permanent in nature and their number in a tehsil / district varies on year to year basis depending upon the procurement policy.

LIST OF ACRONYMS

AMS	Assistant Medical Superintendent
APWMO	Assistant Principal Women Medical Officer
AWO	Automatic Weather Observation
AWS	Automatic Weather Station
C&W	Communication & Works
CBDRM	Community Based Disaster Risk Management
CBEWS	Community-Based Early Warning System
CMO	Casualty Medical Officer
CRI	Composite Risk Index
DC	Deputy Commissioner
DCO	District Coordination Officer
DDMA	District Disaster Management Authority
DDRMP	District Disaster Risk Management Plan
DEWS	Disease Early Warning System
DHQ	District Headquarter Hospital
DM	Disaster Management
DMS	Deputy Medical Superintendent
DRR	Disaster Risk Reduction
DSHA	Deterministic Seismic Hazard Assessment
ENT	Ear, Nose, Throat
EPI	Expanded Program on Immunization
EWS	Early Warning System
PDMA	Provincial Disaster Management Authority
FFC	Federal Flood Commission
FGD	Focus Group Discussion
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Flood
GMPE	Ground Motion Prediction Equation
GOERE	Government Officer Emergency Response Exercise
GPS	Global Positioning System
GSP	Geological Survey of Pakistan
HFA	Hyogo Framework for Action
HTC	Hydro-Thermal Coefficient
INGOs	International Non-governmental Organizations
LSWI	Land Surface Water Index
M&E	Monitoring and Evaluation
MBT	Main Boundary Thrust
MCE	Maximum Considered Earthquake
MGDs	Millennium Development Goals
MHVRA	Multi Hazard Vulnerability and Risk Assessment
MKT	Main Karakorum Thrust
MMT	Main Mantle Thrust
MO	Medical Officer
MOVERE	Mobilization of Volunteer for Emergency Response Exercise
MPE	Most Probable Earthquake
MS	Medical Superintendent
MSSP	Micro Seismic Study Program (Pakistan Atomic Energy Commission)
MM	Moment Magnitude
NARC	National Agricultural Research Center
NCEG	National Center of Excellence in Geology
NDI	NOAA Drought Index
NDMA	National Disaster Management Authority
NDMC	National Disaster Management Commission
NDMP	National Disaster Management Plan
NDMP-SC	Steering Committee for National Disaster Management Plan
NDRIS	National Disaster Risk Information System
NDVI	Normalized Difference Vegetation Index
NDWI	Normalized Difference Water Index
NEOC	National Emergency Operations Centre
NFPP	National Flood Protection Plan
NHA	National Highway Authority
NHEPRN	National Health Emergency Preparedness and Response Network
NIDM	National Institute of Disaster Management
PARC	Pakistan Agricultural Research Council
PASSCO	Pakistan Agricultural Services and Storage Corporation
PBC	Pakistan Broadcasting Corporation
PBS	Pakistan Bureau of Statistics
PCIW	Pakistan Commissioner for Indus Waters
PCRWR	Pakistan Center for Research on Water Resources
PDMA	Provincial Disaster Management Authority
PDSI	Palmer Drought Severity Index
PGA	Peak Ground Acceleration
PHDI	Palmer Hydrological Drought Severity Index
PIPD	Provincial Irrigation and Power Department
PMD	Pakistan Meteorological Department
PMO	Principal Medical Officer
PMU	Project Management Unit
PRA	Participatory Risk Assessment
PSC	Project Steering Committee
PSHA	Probabilistic Seismic Hazard Assessment
PTA	Pakistan Telecommunication Authority
PTCL	Pakistan Telecommunication Company Limited
PTWC	Pacific Tsunami Warning Center
PWMO	Principal Women Medical Officer

R&D	Research and Development
RDMC	Regional Drought Monitoring Centre
RP	Return Period
SFDRR	Sendai Framework for Disaster Risk Reduction
SMA	Soil Moisture Anomaly
SMDI	Soil Moisture Deficit Index
SMO	Senior Medical Officer
SMRFC	Specialized Medium Range Forecasting Centre
SOP	Survey of Pakistan
SoVI	Social Vulnerability Index
SPEI	Standardized Precipitation Evapotranspiration
SPI	Standard Precipitation Index
SPI	Stream Power Index
SPT	Standard Penetration Test
SRSI	Standardized Reservoir Supply Index
SSFI	Standardized Stream Flow Index
SSI	Semi Structured Interviews
SUPARCO	Pakistan Space and Upper Atmospheric Research Commission
SWI	Standardized Water-Level Index
SWMO	Senior Women Medical Officer
SWS	Soil Water Storage
SWSI	Surface Water Severity Index
SWSI	Surface Water Supply Index
TCI	Temperature Condition Index
THQ	Tehsil Headquarter Hospital
TMA	Tehsil Municipal Administration
UC	Union Council
UN	United Nations
VCI	Vegetation Condition Index
VegDRI	Vegetation Drought Response Index
VIC	Variable Infiltration Capacity
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Agency
WFP	World Food Program
WHO	World Health Organization
WMO	World Meteorological Organization
WMO	Women Medical Officer
WOE	Weight of Evidence (Statistical Model)
WRF	Weather Research and Forecast (Name of Numerical Calculation Model)

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1 JHANG DISTRICT OVERVIEW

Jhang District is located in Province Punjab of Pakistan, with Jhang City as its capital. The district is situated on the east bank of the Chenab River and is located at Latitude 31.15° N and longitude 72.22°E. The adjoining areas of the Jhang district include Toba Tek Singh and Faisalabad which lie towards its East, Hafizabad to its North-East, Khanewal to the South, Sargodha in the North, whereas Khushab, Bhakkar and Layyah are located to the West of the district. Jhang is predominantly a rural area. The district is composed of four tehsils namely Jhang, Shorkot, 18-Hazari and Ahmadpur Sial. The main languages spoken in Jhang are Punjabi and Urdu.

History

Jhang was built in 1288 by Rai Sial with the advice of Hazrat Shah Jalal Bukhari. The first ruler of Jhang was Mal Khan in 1462. Sial tribe ruled this area for 360 years and the last ruler of the Sial Tribe was Ahmad Khan. Jhang is said to have been founded in the fifteenth century, and to have been destroyed by the river and re-founded in the reign of Aurangzeb. Under Central Asian Mughal rule, the city flourished and was notable for commerce and trade. In the late 18th century it was added to Afghanistan and became part of the Afghan Empire. With disarray and chaos falling internal strife in western Afghanistan and the gradual decline of the Mughal Empire, the region was briefly taken by Ranjit Singh in 1805. Later in 1849, The British made inroads into the Panjab and added Jhang to their expanding South Asian empire. During British Rule the towns of Jhang and Maghiana, lying two miles apart, became a joint municipality, then known as Jhang-Maghiana. Jhang-Maghiana became a municipality in 1867. The income during the ten years ending 1902-3 averaged Rs.46,800 and the expenditure Rs. 44,200, in 1903-4 the income was Rs. 49,700 mainly derived from octroi. Maghiana lies on the edge of the highlands, overlooking the alluvial valley of the Chenab, while the older town of Jhang occupies the lowlands at its foot.

The Government offices and establishments had been removed to the higher site, and commerce declined in Jhang, which was no longer considered a place of importance. Maghiana, however, had a considerable trade in grain and country cloth, and manufactured leather, soap, locks and other brass-work. Maghiana also contained a civil hospital, whilst Jhang had a high school and a dispensary.

The population in 1901, according to the 1901 census of India, was 24,381 of whom 12,189 were Hindus and 11,684 were Muslims. Jhang is the burial place of Heer and Ranjha, of Punjabi folklore.

Brief Account of History of District Jhang

- **1206**: Naula rule was established on Jhang.
- **1460**: Sials rule was established when Mal Khan Sial conquered Jhang by defeating the Nauls.
- **1818**: With the conquest of Multan, Jhang was included in the Sikh rule.
- **1848**: Sikh were defeated and Jhang had gone unde the control of the Colonial Rulers.
- **1849**: Jhang District was annexed.
- **1851**: The greater part of Ravi Riverain villages were transferred to Multan.
- **1854**: The Faruka Taluka, north of Kot Isa Shah of Jhang Tehsil, was transferred the then District Shahpur(Sargodha).
- **1856**: The first settlement in the district was carried out. Land Revenue Assessment was also done along with the determination of proprietary rights, during the same period. But the most recent settlement took place in 1924-25 by the British Govt. in which new land revenue was also assessed.
- **1861**: At early days of this year the Kalowal villages, west of the Chenab in Chiniot Tehsi were received from Shahpur District while the Garhmaharaja ilaqas were taken over from mazaffargarh. But tehsil of Kalwal and Qadirpur were given up and that of Shorkot constituted. The existing divisions of district into the three teshsils of Chiniot Jhang and Shorkot, dates from this period.
- **1884**: Thirteen rakhs of Chiniot Tehsil were transferred to the Gujranwala District and placed under the forest Department.
- **1890**: Boundaries of Jhang were redelimited, according to which Layyah was excluded from Jhang and attached to Muzaffargarh district, Similarly Hyderabad of jhang was included to Mianwali, Pindi bhattian added to Gujranwala when Sahiwal was notified as a separate district under the name of Mantgomary.
- **1886**: Lyallpur Tehsil was extablished as a tehsil of Jhang District, after the colonization of the Chenab Colony portion.
- **1899**: The whole of the colonized Chenab Colony of Montgomery (Sahiwal) District, was added to the Lyllpur Tehsil of Jhang District.
- **1900**: The Toba Tek Singh and samundri Tehsils were created, and 34 villages of the Layllpur Tehsil were included in Chiniot.
- **1904**: Lyallpur was notified as a separate District. A small adjustment was made between Jhang and Toba Tek Singh tehsils by which the first absorbed 9 additional colony villages. In this year also whole of the portion of Kirana Bar, which had hitherto been included in the Chiniot Tehsil, was transferred to the Shahpur Distt.
- **1907**: The Jhang Tehsil portion known as jungle Subhaga, comprising 18 colony villages, was transferred to Sargodha (Shahpur) District in order to bring the whole of the Jhelum colony village within one district. That portion of the Sandal-bar colony, whichin themain had been allotted to Janglis and to Jhang-Hitharis (the portion of the Jhang branch of the Chenab –Colony) was detached from the colony and became a part of the Jhang District.
- **1913**: Thirty &-two villages of Toba Tek Singh Tehsil, were transferred to Jhang District and added to Shorkot Tehsil.
- **1917**: Chak No.634, in which Shorkot Road Railway Station in situated, was transferred from the Faisalabad District and was attached to Shorkot Tehsil of Jhang District.
- **1948**: After independence, the same/subdivisions of the district, Chiniot, Jhang and Shorkot were maintained, but the emergence of a new town, namely "Chenab Nagar" (the centre of Non-Muslim Qadiani Community) on the map of Jhang District, was the only Change since then.

Land Scape

District Jhang is composed of three distinct surface levels namely Sand dunes of Thal on the extreme west, low lying river valley in the center and old Sandal Bar on the extreme east. The district has two major rivers i.e. Chenab River and Jhelum River. Chenab flows from north-east to south-west and Jhelum river flows from east to south-west, both of which meet at a point called Trimmu where Trimmu barrage is constructed to regulate flow of water. The area of Thal desert extends toward the north into Districts Bhakkar & Khushab while to the south, it touches Districts Layyah & Muzaffargarh . A fertile plain lies to the east of the Rivers Jhelum & Chenab. It is a part of Sandal Bar. The soil is generally fertile in the area. The low-lying areas along the banks of Rivers Jhelum & Chenab experience flood on regular basis.

Culture

Punjabi folk dances such as Jhummar and Sammi originated in Jhang District. Jhummar is a dance for men while Sammi is for women. The district also originated a well-known form of folk music known as "Dhola", or "Jhang da Dhola". Traditionally men wear turbans and dhotis though in recent years people have started wearing the national dress, shalwar kameez. Some older women also wear dhotis. When women wear dhotis, the style is referred to called "Majhla" in Jhangochi; the male style is called "Dhudder". However, it is more common for women to wear shalwar kameez. Street sports are important in Jhang District and include tent pegging (naiza baazi), kabaddi, volleyball, cricket and football (soccer). In the past, women wove cloth with spinning wheels – known as Teeyan and Trinjan – but now that the area is industrialized the practice is no longer common. The northwestern Jhang District, particularly the area at the west bank of the Jhelum River, is somewhat different in its culture because it is more influenced by the Thalochi culture emanating from the neighboring districts of Mianwali, Bhakkar and Khushab.

Folk Dance

Language

95% people speaks punjabi language in Jhang District.

Notable People

- Sultan Bahoo, a Sufi saint
- Abdus Salam, Nobel Prize winner in physics
- Aleem Dar, cricket player
- Muhammad Tahir-ul-Qadri, a Sufi Scholar, Politician, Founder of Minhaj-Ul-Quran International and Pakistan Awami Tehreek

Traditional Crafts

Paranda is distinct in design and details are made in Jhang district. These are crafted with Gota Kinnari, mirrors and silk tassels. Paranda making is completely a home industry in Jhang and a bedeck Paranda is sold for Rs. 300 to Rs. 500. Another attractive handicraft, was Chaba, a handmade bread platter made of date palm leaves.

In Jhang Prandas are crafted with Gota Kinnari, mirrors, silk tassels and a lot of love.

The district is famous in making traditional Chabba and Baskets.

Historical Places

- Shrine of Heer Ranjha
- Gurudwara Garh Fateh Shah Distt
- Gurudwara Nanaksar
- Shrine of Sultan Bahu

Shrine of Sultan Bahu

DISTRICT JHANG AT A GLANCE

Geography

Location

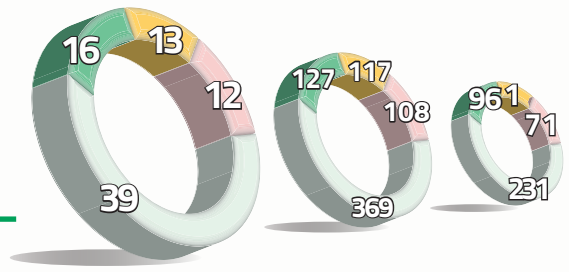
Lat: 31°16′05″ North
Long: 72°19′05″ East

Neighbouring Districts

- **North** — Sargodha, Khushab
- **East** — Bhakkar, Layyah
- **West** — Chiniot, Toba Tek Singh
- **South** — Khanewal, Muzaffargarh

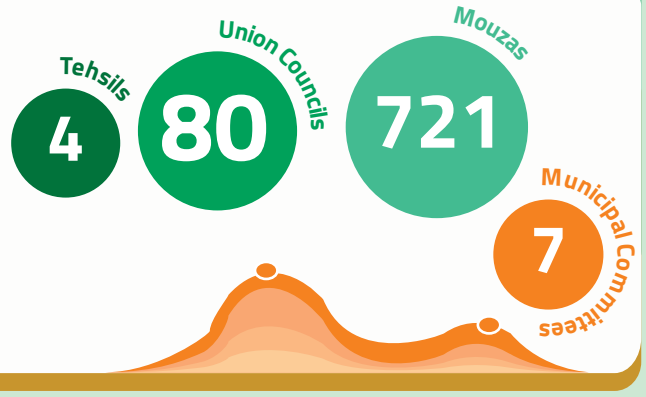
Administrative Setup

Area	218,700 sq.km
District Capital	Jhang City
Language	Punjabi and Urdu
Elevation to District	6,359 sq.km



Union Councils | Mouzas | Municipal Committees

Tehsils
- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot



Population Distribution

Total Population in District

2,056,144	1998 Census
2,743,416	2017 Census

Population Density (Person per sq.km)

9.4	1998 Census
12.5	2017 Census

Growth Rate

2.3%
(1998 Census)

Educational Facilities

Govt. Schools	Colleges	Universities
1,433	12	2

Public Health Care Facilites
(Numbers)

75

Tourist Attractions

Historical Sites
Shrine of Heer Ranjha, Gurudwara Garh Fateh Shah, Gurudwara Nanaksar, Shrine of Sultan Bahu

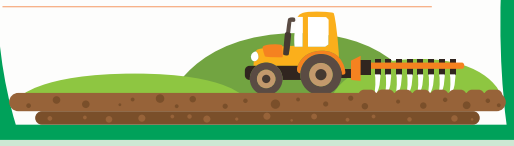
Agriculture

Major Crops
Sugarcane, Gram, Wheat, Rice. Ground Nut, Jawar, Bajra, Tobacco, Moong, Mash, Masoor, Maiz, Oil Seed

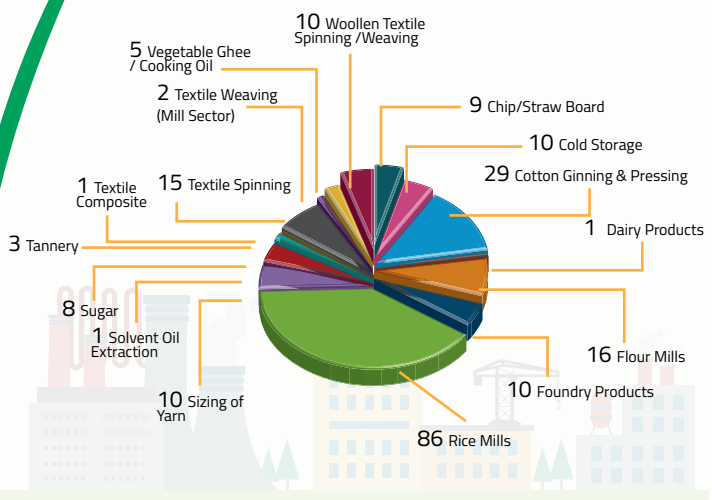
Major Fruits
Citrus, Guava and Banana

Major Vegetables
Potato, Cauliflower and Tomato

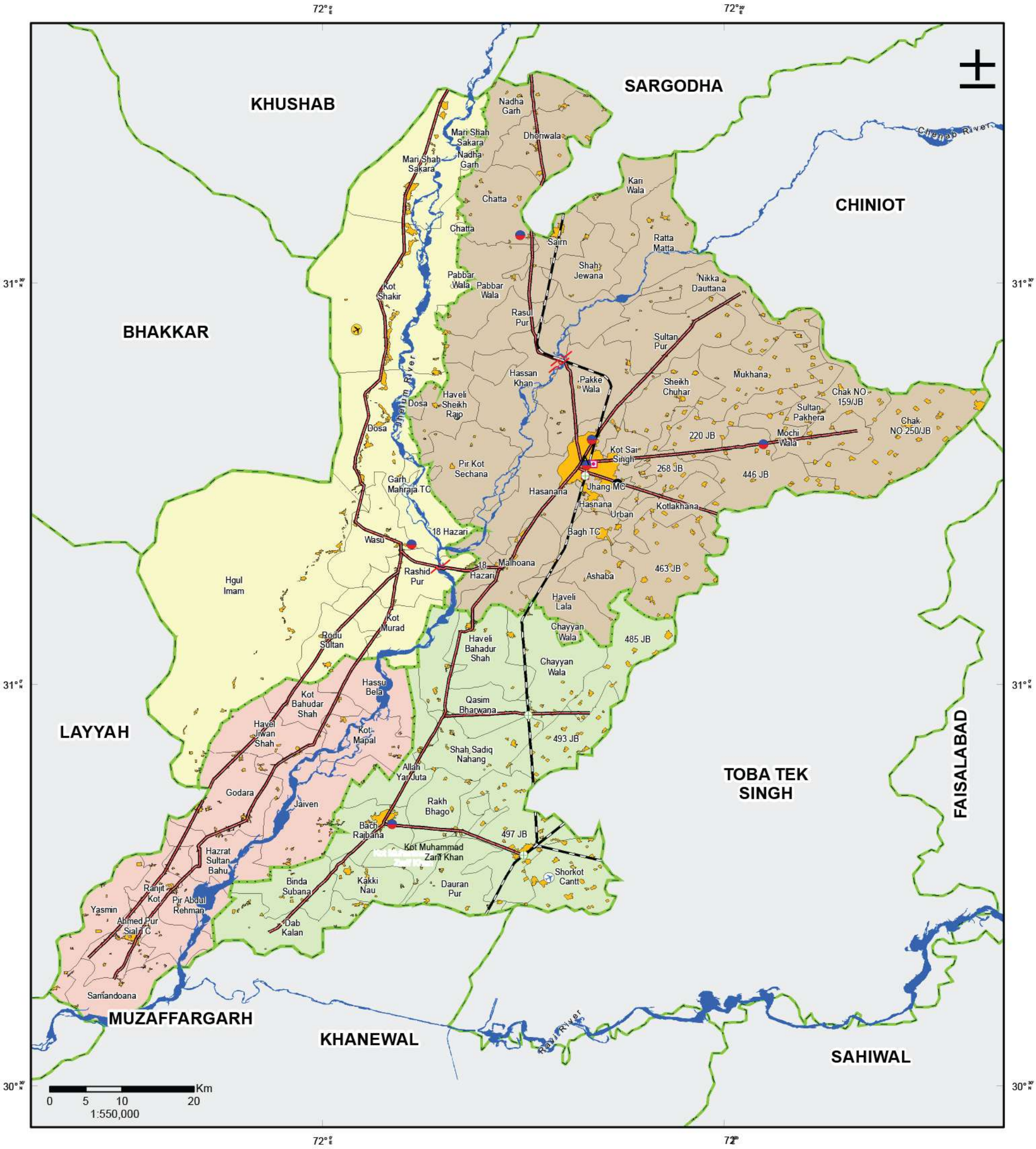
Major Livestock
Buffaloes, Cattles, Goat, Sheep



Major Industries



DISTRICT ADMINISTRATIVE MAP



Legend

- Rescue 1122
- Police Station
- Railway Station
- Airport
- Airfield/Landing Strips
- Archaeological Sites
- District Headquarter
- Tehsil Headquarter
- Bridge
- Broad Gauge Railway Track
- Other Gauge Railway Track
- Motorway
- Wide Width Metalled Road
- Builtup Area
- River & Water Body
- Union Council Boundary (Abc)

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

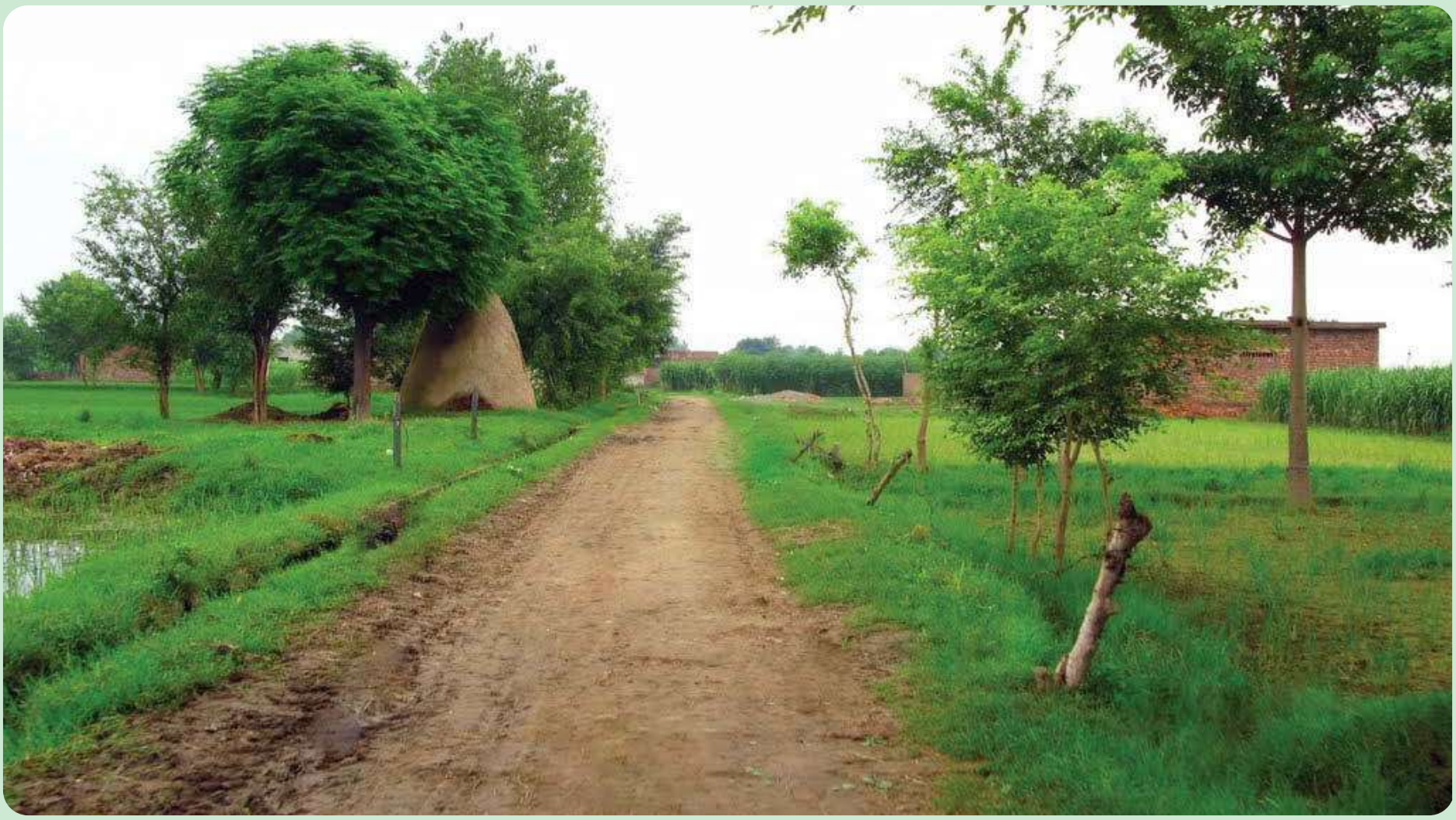
MAP INFORMATION

Data Source(s):
Punjab Emergency Services - Rescue 1122
Punjab Police
Survey of Pakistan
National Highway Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-001
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

2 GEOLOGY

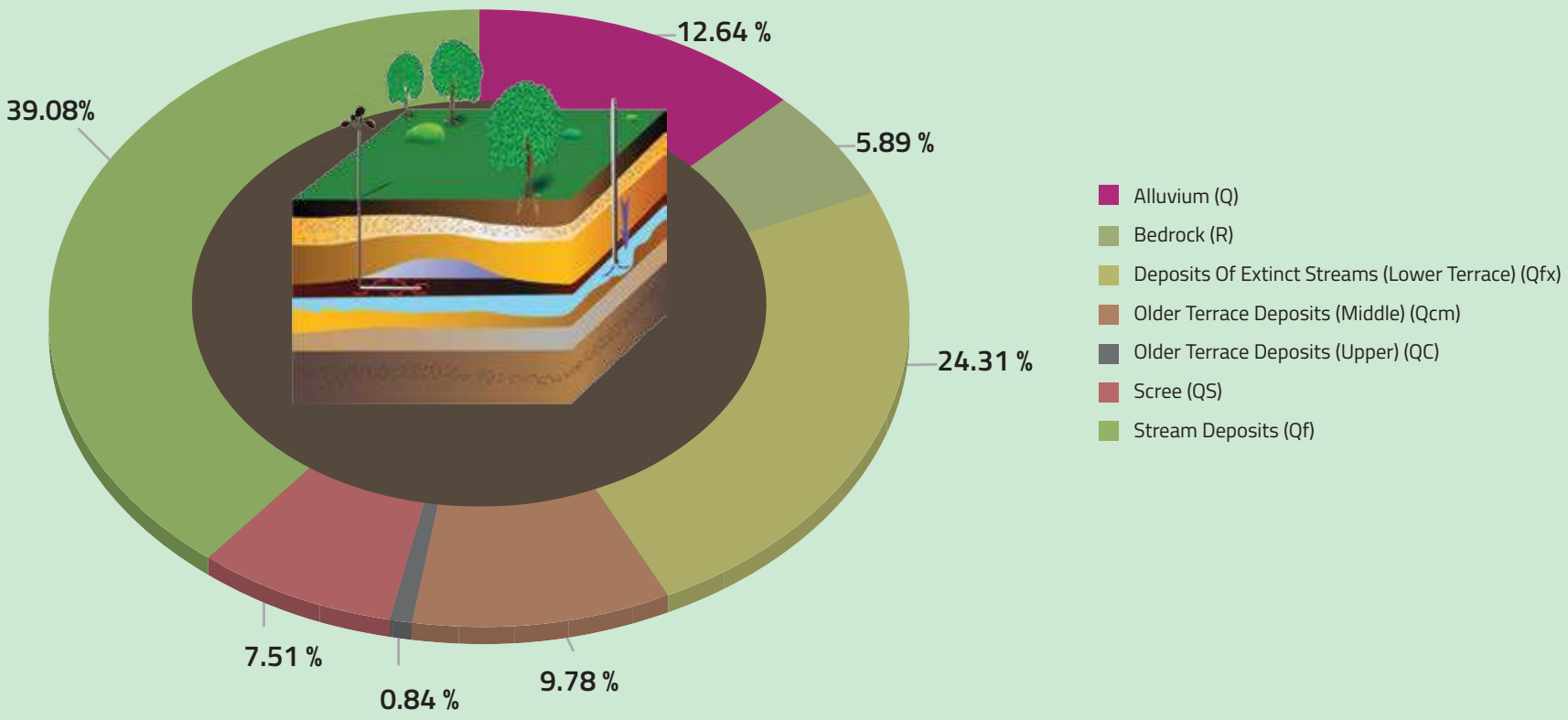


The surface geology of District Jhang is mainly composed of Stream Deposits (39.03%), Deposits of Extinct Streams (24.31%) and Alluvium Deposits (12.64%). Other geological composition of the district includes Bedrock, Older Terrace Deposits (Middle), Older Terrace Deposits (Upper) and Scree Deposits.

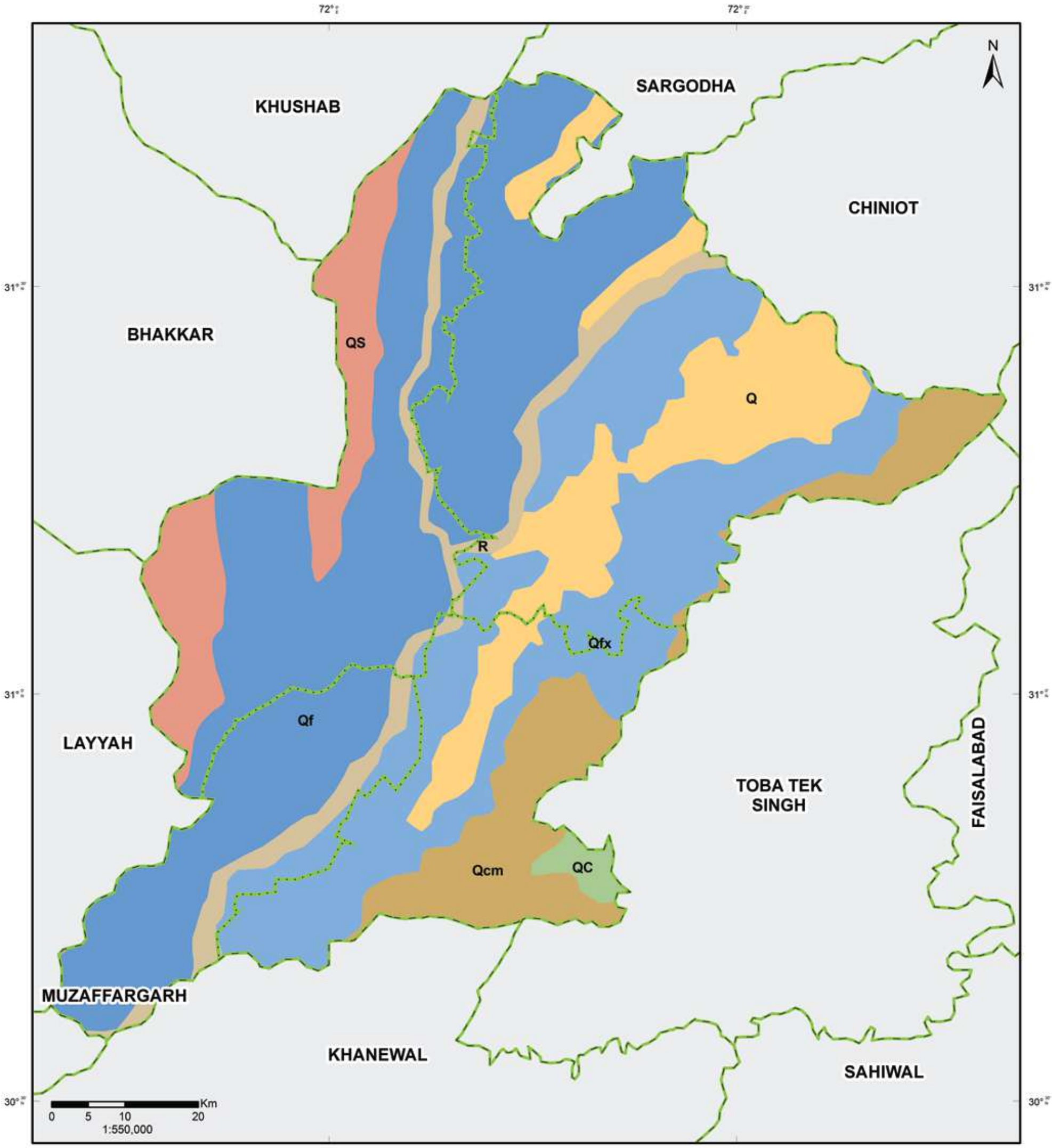
Based on its physical features, the district can be divided into three parts namely Sand Dunes of Thal on the extreme west, Low Lying River Valley in the center and Old Sandal Bar on the extreme east. The district has two major rivers i.e. Chenab River and Jhelum River. Chenab flows from north-east to south-west and Jhelum river flows from east to south-west, both of which meet at a point called Trimmu where Trimmu barrage is constructed to regulate flow of water. Since the district is situated between two rivers, it receives thick alluvial soils and stream deposits, making it favorable for cultivation. The area of Thal desert extends toward the north into Districts Bhakkar & Khushab while to the south, it touches Districts Layyah & Muzaffargarh . A fertile plain lies to the east of the Rivers Jhelum & Chenab. It is a part of Sandal Bar. The soil is generally fertile in the area. The low-lying areas along the banks of Rivers Jhelum & Chenab experience flood on regular basis.

Geological Formation	Area (sq.km)	Composition
Alluvium (Q)	803.98	12.64%
Bedrock (R)	374.56	5.89%
Deposits Of Extinct Streams (Lower Terrace) (Qfx)	1545.91	24.31%
Older Terrace Deposits (Middle) (Qcm)	622.09	9.78%
Older Terrace Deposits (Upper) (QC)	53.27	0.84%
Scree (QS)	477.35	7.51%
Stream Deposits (Qf)	2482.28	39.03%
	6359.44	

Geological Composition



GEOLOGY MAP



Legend

- Alluvium
- Bedrock
- Deposits of Extinct Streams (Lower Terrace)
- Older Terrace Deposits (Middle)
- Older Terrace Deposits (Upper)
- Scree
- Stream Deposits
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Geological Survey of Pakistan
Survey of Pakistan
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-004
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

3 LAND USE & LAND COVER

Land Cover (LC) is defined as the observed (bio) physical cover on the earth's surface, whereas Land Use (LU) is characterized by the arrangements, activities and inputs that people undertake in a certain type of land in order to produce, change or maintain it. Knowledge of the LC/LU distribution helps Land Use Planners and Policy Makers to determine pragmatic land use polices.

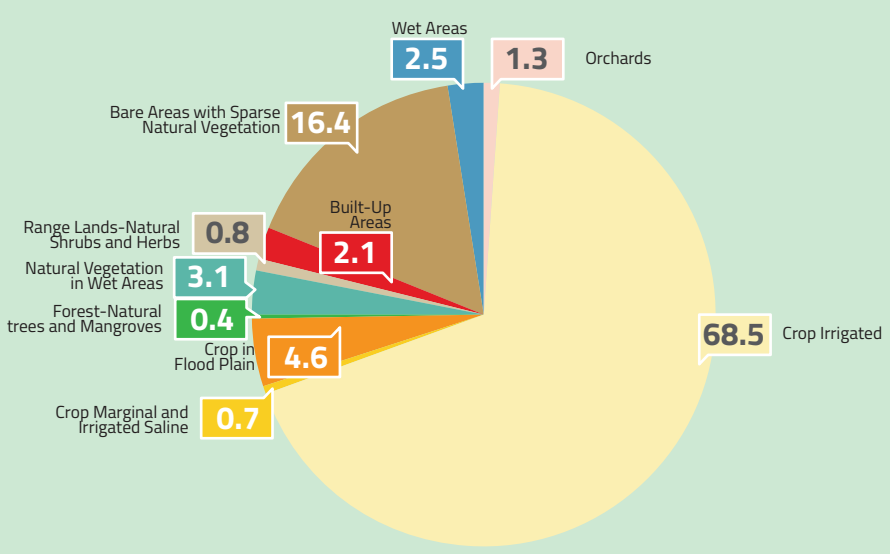
Land Cover/ Land Use (LC/LU) processes are important to be monitored since they are the direct drivers of Climate & Ecosystem Change. For this study, LC/LU demarcation carried out by Space & Upper Atmosphere Research Commission (SUPARCO) has been used which provides a comprehensive description of the biotic and abiotic resources of the study area and includes, inter alia, numerous categories of cultivated land; natural vegetation and non-vegetated areas including bare and rocky areas, and areas of human settlements. In this study, Land Cover Classification System (LCCS) approach has been used with an aim to capture the physiographic characteristics down to a UC level.

The geospatial database, prepared by SUPARCO, is used to provide basis for the development of an improved capacity for natural resources monitoring and management.

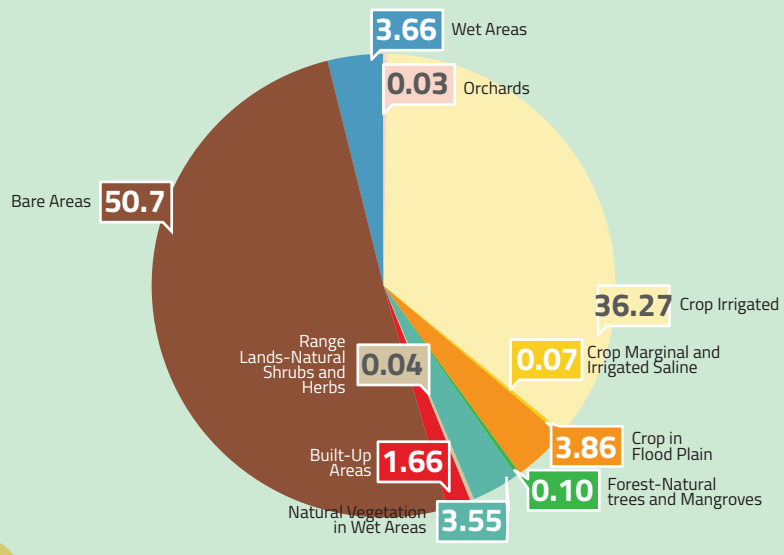
The legend consisting 13 main land cover classes have been used in this study which are being further subdivided into 36 classes, and have been mapped based on the analysis, interpretation and validation of SPOT-5 high resolution satellite imagery (5 meter). For this purpose, satellite images were segmented into homogeneous polygons and labeled using the LCCS classification system.

Land Cover Distribution of District

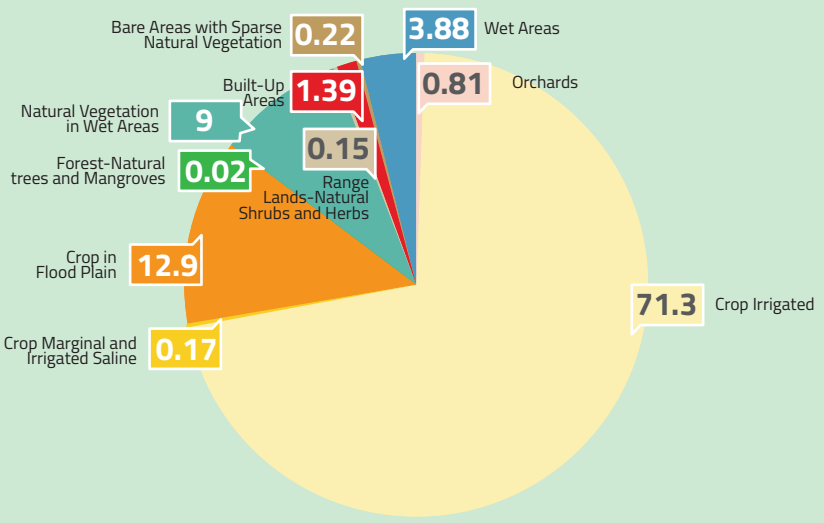
(Percentage)



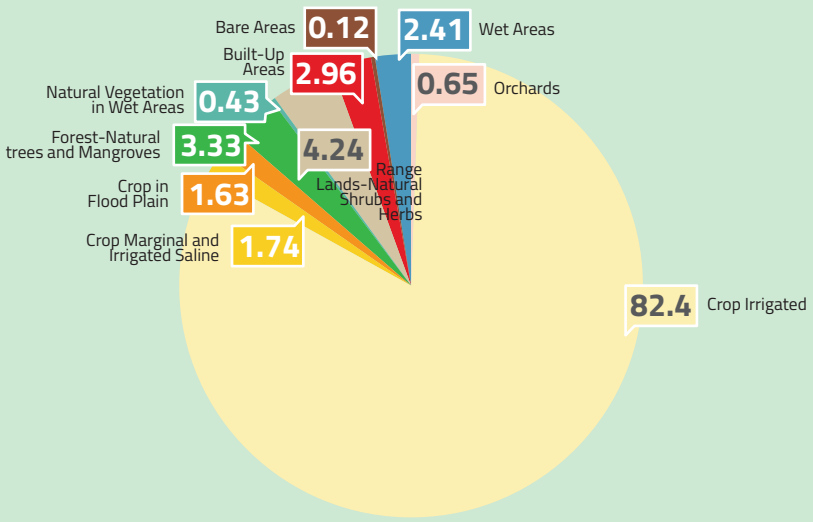
Tehsil 18-Hazari



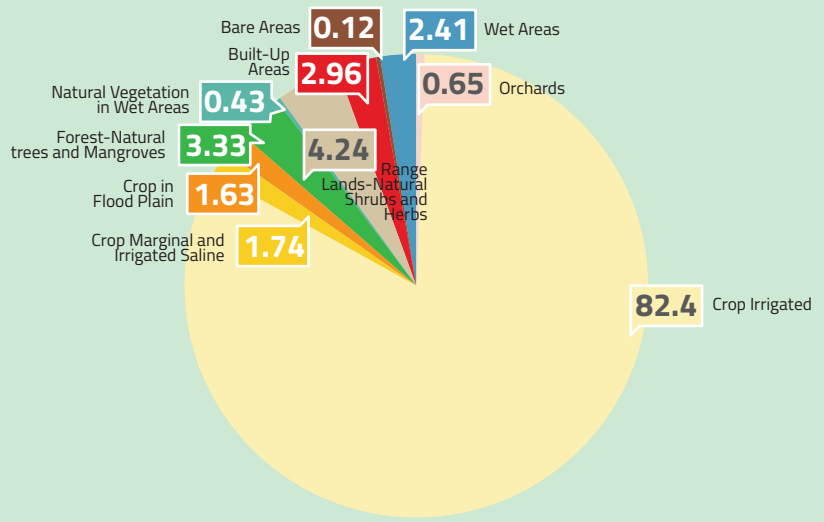
Tehsil Ahmedpur Sial



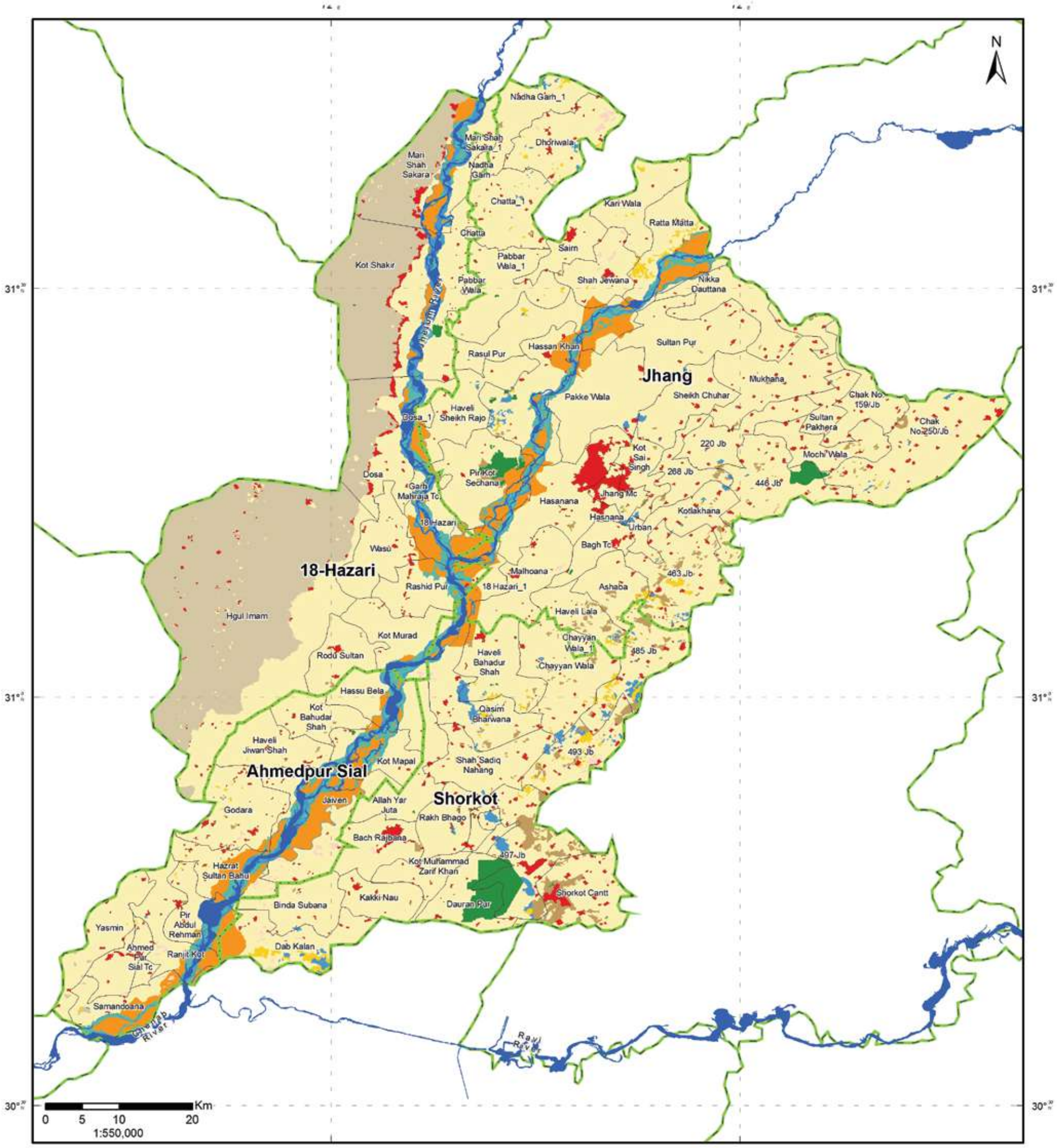
Tehsil Jhang



Tehsil Noorpur



LAND USE & LAND COVER MAP



Legend

- Bare Areas
- Bare Areas with Sparse Natural Vegetation
- Built-up
- Crop in Flood Plain
- Crop Marginal and Irrigated Saline
- Crop Rainfed
- Crop Irrigated
- Forest - Natural Trees and Mangroves
- Natural Vegetation in Wet Areas
- Orchards
- Range Lands - Natural Shrubs and Herbs
- Snow and Glaciers
- Wet Areas
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provinvial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Landcover-SUPARCO

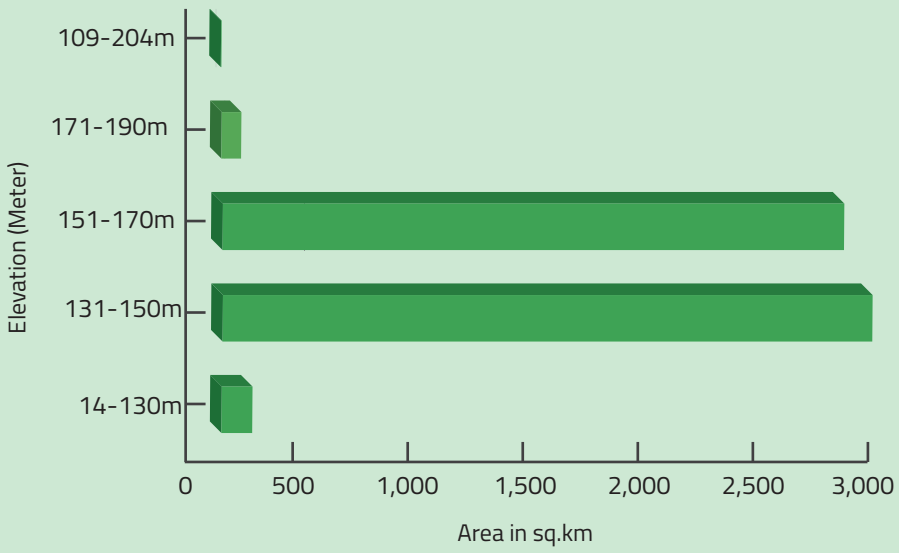
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-002
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

4 ELEVATION

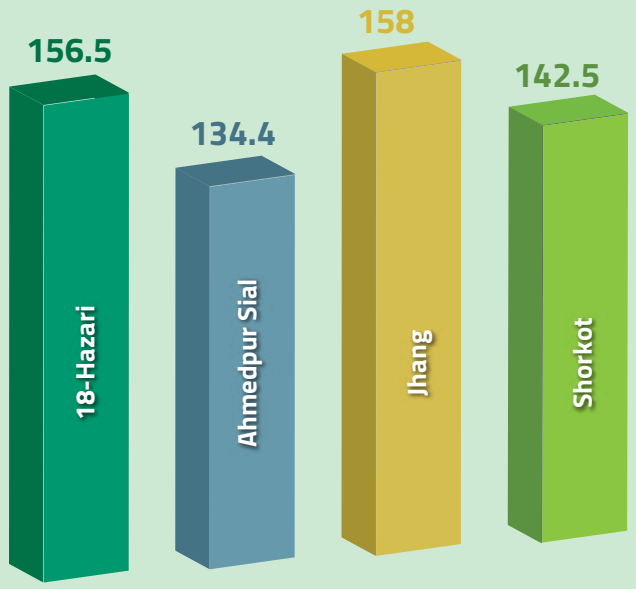
Elevation is the measurement of height of the land with respect to sea level or the sea floor. Elevation maps are used to identify how flat, elevated or hilly an area is, as well as to analyze other features of land using contour lines and symbols.

The elevation of the district is between 204m (High) to 14m (Low). It can be analyzed from the map that around 47% of the district lies within elevation range of 131 – 150m, whereas 46% of the district area falls within elevation range of 151-170m.

Elevation Distribution of District Jhang

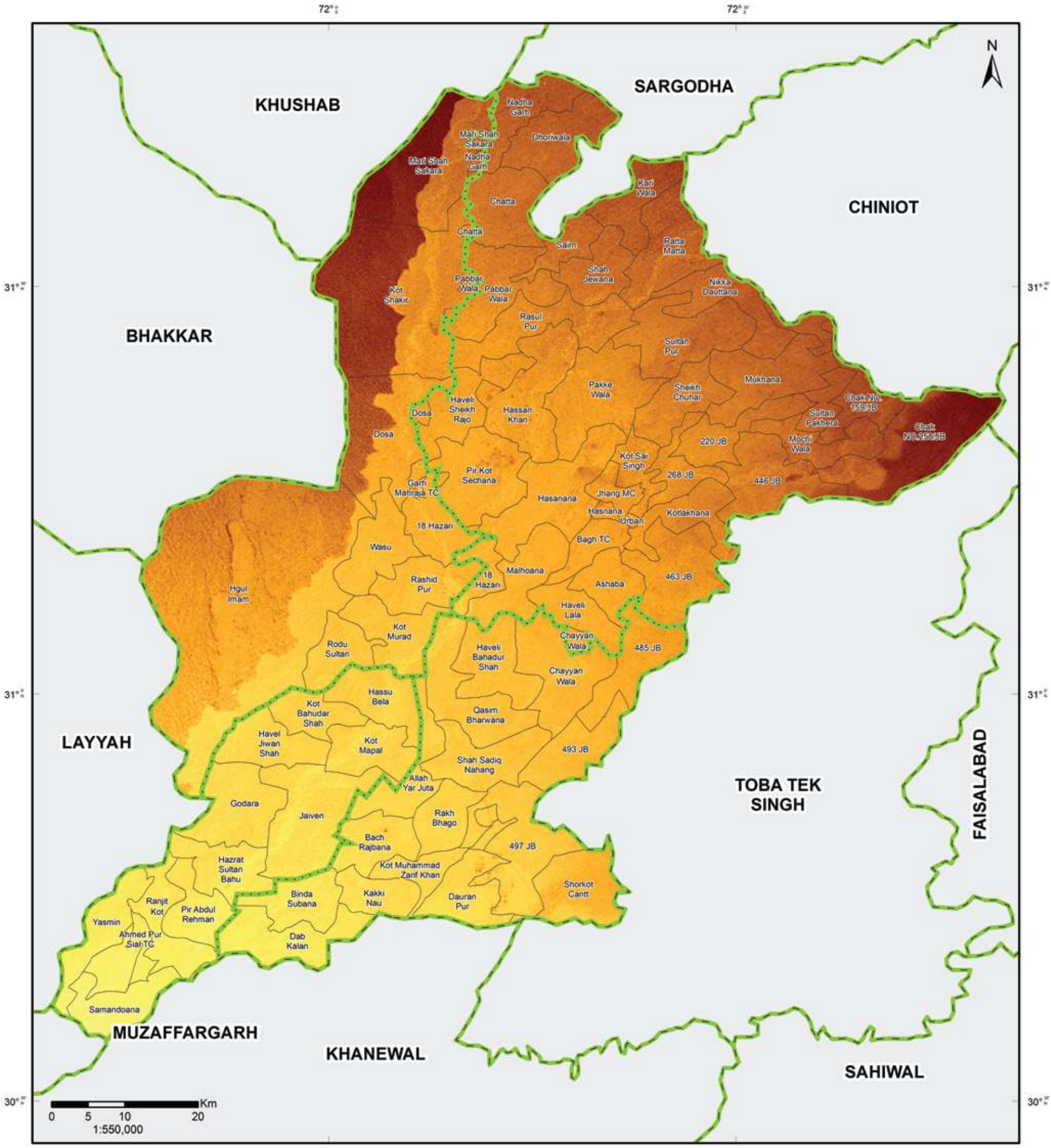


Tehsil Wise Mean Height (Meter)



Elevation Bands	Tehsil Wise Area Coverage (sq.km)				District Total (sq.km)
	18-Hazari	Ahmedpur Sial	Jhang	Shorkot	
14-130m	1.26	209.66	0.21	9.38	220.59
131-150m	862.00	652.82	445.67	1033.13	2993.84
151-170m	721.39	0.54	2045.87	184.23	2952.38
171-190m	71.43	0.00	120.52	0.36	192.38
109-204m	0.01	0.00	0.09	0.01	0.11

ELEVATION MAP



Legend

- High : 202
- Low : 107
- Provincial Boundary
- Line of Control
- International Boundary
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

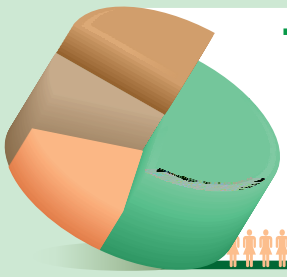
Data Source(s):
NASA (SRTM 30m DEM)
Survey of Pakistan
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-003
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

5 POPULATION DISTRIBUTION

According to the Census of 1998, the total population of Jhang District was 2834545. Out of this, 1474099 were males and 1360446 were females. The projected population of Jhang (2015) is 2556726, where 1327882 are male and 1228849 are female. The Population of district as of Census 2017 is recorded to be 2,743,416 with gender segregation as 1,396,612 males and 1,346,660 females.



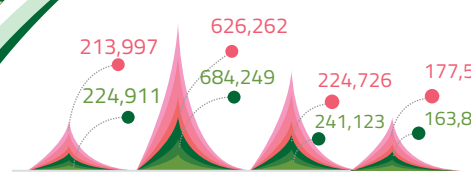
Tehsil Wise Population

Total Population (Projected 2017)

2,743,416

Jhang	18 Hazari	Shorkot	Ahmadpur Sial
1,465,472	295,801	548,626	433,517

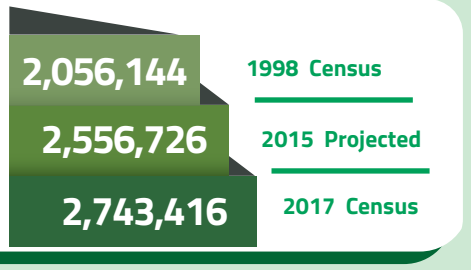
Tehsil Wise Gender Distribution



	MALE	FEMALE
Total	1,327,882	1,228,849

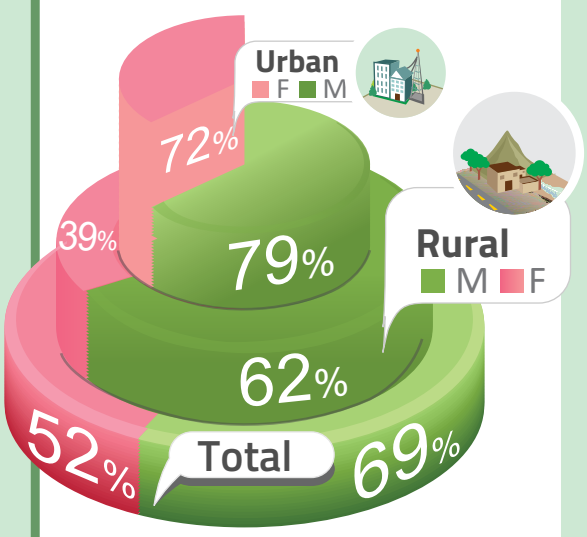
Population on Basis of Religion (1998)

Muslims	Christians	Qadiani Ahmadi	Hindu / Jati	Others	Scheduled Castes
2,776,950	14,723	42,593	82	164	33

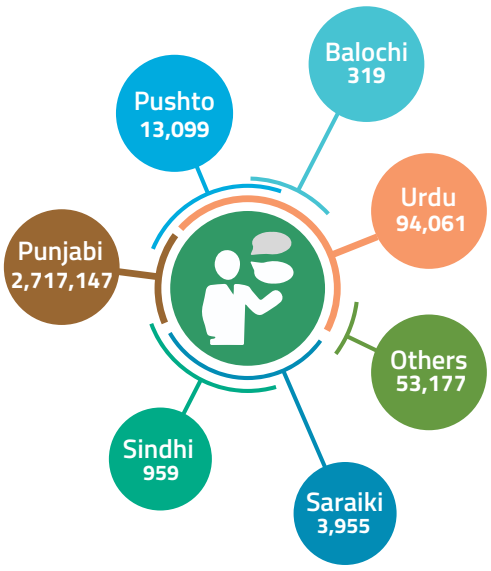


Literacy Rate (%)

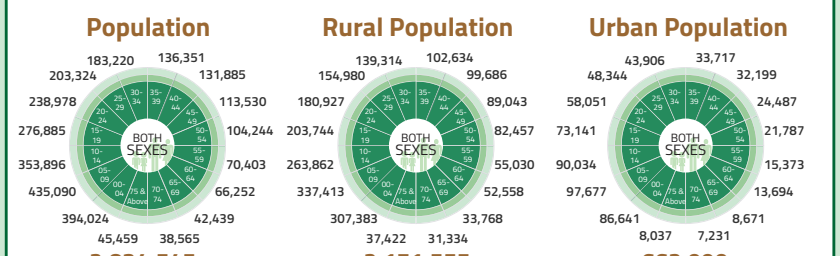
2015



Mother Tongue



Age & Location Wise Disaggregated Population (1998 Census)



Population			Rural Population			Urban Population		
FEMALE	Age Group	MALE	FEMALE	Age Group	MALE	FEMALE	Age Group	MALE
202,068	0 to 4	191,956	149,741	0 to 4	157,642	42,215	0 to 4	44,426
227,025	5 to 9	208,065	160,998	5 to 9	176,415	47,067	5 to 9	50,610
187,518	10 to 14	166,378	123,454	10 to 14	140,408	42,924	10 to 14	47,110
143,067	15 to 19	133,818	98,325	15 to 19	105,419	35,493	15 to 19	37,648
117,476	20 to 24	121,502	93,014	20 to 24	87,913	28,488	20 to 24	29,563
102,893	25 to 29	100,431	77,107	25 to 29	77,873	23,324	25 to 29	25,020
96,034	30 to 34	87,186	66,363	30 to 34	72,951	20,823	30 to 34	23,083
72,385	35 to 39	63,966	48,222	35 to 39	54,412	15,744	35 to 39	17,973
66,771	40 to 44	65,114	49,650	40 to 44	50,036	15,464	40 to 44	16,735
59,115	45 to 49	54,415	42,752	45 to 49	46,291	11,663	45 to 49	12,824
55,653	50 to 54	48,591	38,270	50 to 54	44,187	10,321	50 to 54	11,466
38,718	55 to 59	31,685	24,588	55 to 59	30,442	7,097	55 to 59	8,276
35,307	60 to 64	30,945	24,383	60 to 64	28,175	6,562	60 to 64	7,132
23,511	65 to 69	18,928	15,039	65 to 69	18,729	3,889	65 to 69	4,782
21,327	70 to 74	17,238	14,015	70 to 74	17,319	3,223	70 to 74	4,008
25,231	75 & Above	20,228	16,768	75 & Above	20,654	3,460	75 & Above	4,577
1,360,446		**1,474,099**	**1,042,689**		**1,128,866**	**317,757**		**345,233**
2,834,545			**2,171,555**			**662,990**		

18-Hazari

	Union Councils	
17,819	18 Hazari	16,505
16,172	Chatta	15,498
18,595	Dosa	18,029
19,420	Garh Mahraja Tc	18,035
16,142	Hgul Imam	14,835
19,822	Kot Murad	18,426
17,856	Kot Shakir	17,595
17,756	Mari Shah Sakara	17,650
14,548	Nadha Garh	14,289
16,790	Pabbar Wala	15,436
14,259	Rashid Pur	13,489
16,907	Rodu Sultan	16,144
18,825	Wasu	18,066

Shorkot

	Union Councils	
19,679	485 Jb	18,356
16,826	493 Jb	15,488
14,558	497 Jb	13,636
17,377	Allah Yar Juta	16,395
18,021	Binda Subana	16,892
17,303	Chayyan Wala	16,071
15,951	Dab Kalan	15,213
16,760	Haveli Bahadur Shah	15,408
19,288	Kakki Nau	18,444
15,502	Kot Muhammad Zarif	14,204
15,548	Qasim Bharwana	14,270
17,878	Rakh Bhago	16,198
19,725	Shah Sadiq Nahang	18,842
16,707	Shorkot Cantt	15,309

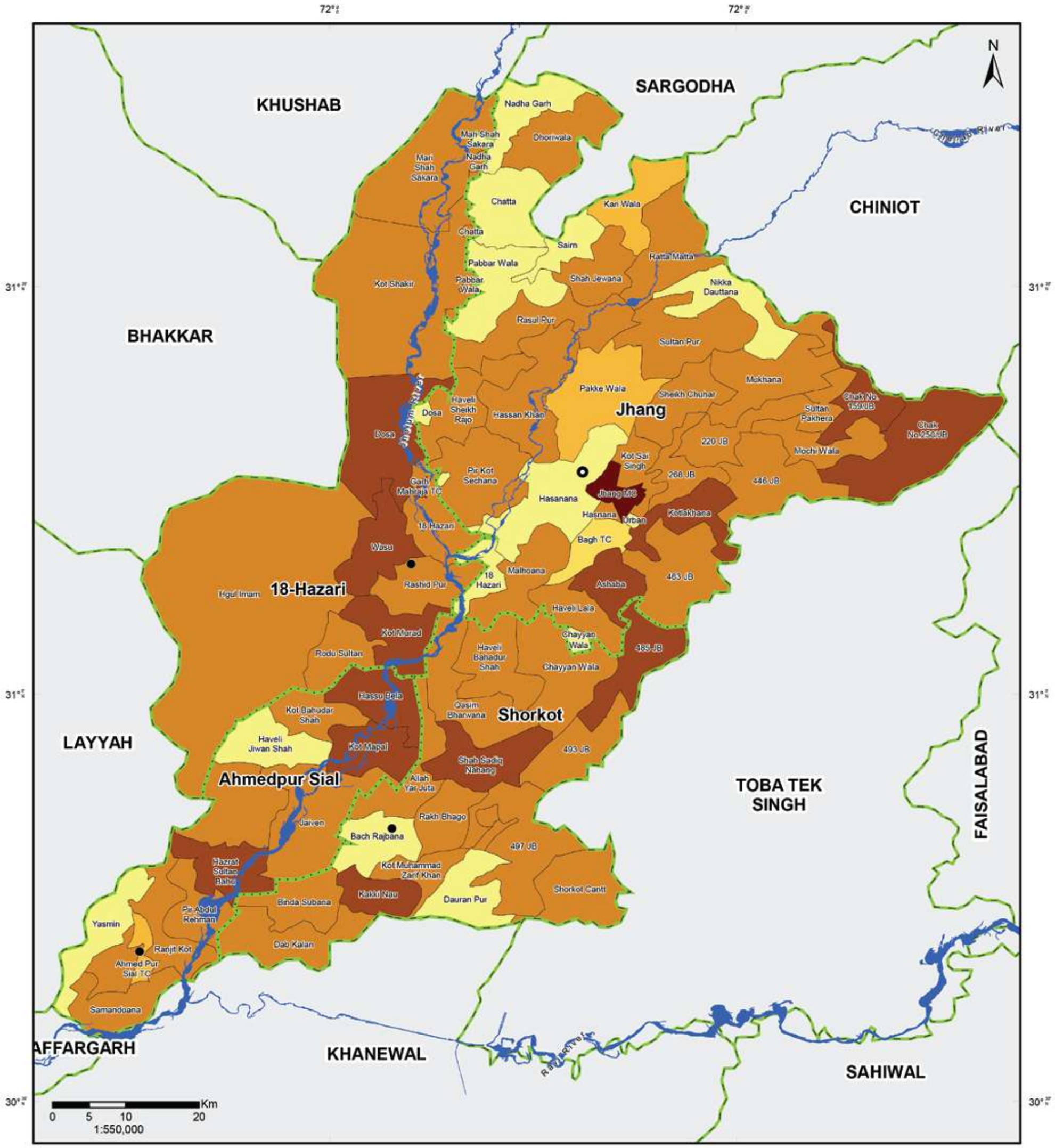
Jhang

	Union Councils	
18,139	220 Jb	16,642
14,275	268 Jb	12,890
16,381	446 Jb	14,627
18,096	463 Jb	16,351
20,141	Ashaba	18,342
8,663	Bagh Tc	8,214
18,902	Chak No.250/jb	17,295
16,257	Dhoriwala	15,718
17,283	Hasnana	15,929
15,772	Hassan Khan	14,326
16,568	Haveli Lala	15,411
16,462	Haveli Sheikh Rajo	15,490
233,837	Jhang Mc	214,167
13,620	Kari Wala	12,636
18,111	Kot Sai Singh	16,602
18,741	Kotlakhana	17,338
18,599	Malhoana	17,068
16,153	Mochi Wala	14,711
18,162	Mukhana	16,351
2,702	Nikka Dauttana	2,497
13,733	Pakke Wala	12,605
16,263	Pir Kot Sechana	15,005
16,286	Rasul Pur	14,992
14,605	Ratta Matta	13,130
15,824	Shah Jewana	14,766
18,120	Sheikh Chuhar	16,396
15,627	Sultan Pakhera	13,880
17,196	Sultan Pur	15,254
19,731	Chak No. 159/jb	17,629

AHMEDPUR SIAL

	Union Councils	
13,840	Ahmed Pur Sial Tc	12,834
16,947	Godara	15,165
19,316	Hassu Bela	18,143
780	Haveli Jiwan Shah	740
20,091	Hazrat Sultan Bahu	18,519
18,549	Jaiven	17,217
14,870	Kot Bahudar Shah	13,686
20,817	Kot Mapal	19,356
17,795	Pir Abdul Rehman	16,534
17,024	Ranjit Kot	15,496
17,570	Samandoana	16,174

POPULATION DISTRIBUTION MAP



Legend

- District Headquarter
- Tehsil Headquarter

Population Distribution

- Abc <= 9000
- Abc 9001 - 18000
- Abc 18001 - 27000
- Abc 27001 - 36000
- Abc 36001 - 45000
- Abc >45000

- River & Water Body
- Abc Tehsil Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

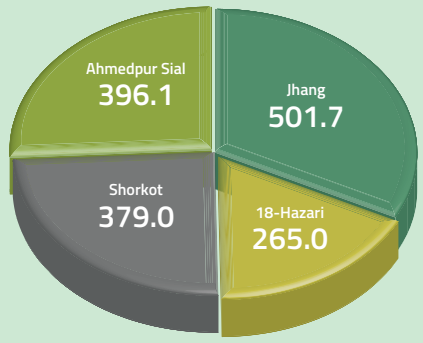
Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-628-FEB-2016-GEN-NDMA-005
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

6 POPULATION DENSITY

The average population density of District Jhang was nearly 321 persons per sq.km in 1998 which in 2015 has grown to 402 persons per sq.km. The most densely populated Tehsil of the district is Jhang whereas 18-Hazari is comparably the most sparsely populated tehsil of the district.`

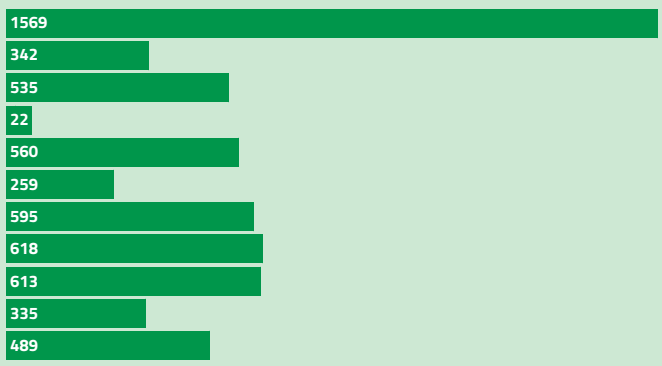
Tehsil Wise Population Density
(Persons/sq.km)



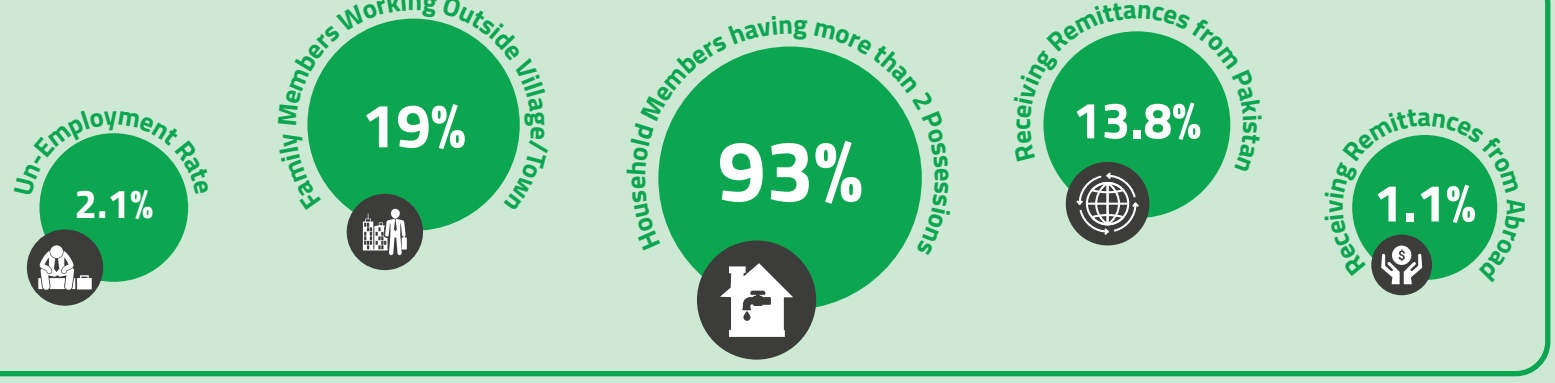
Union Councils	Population	Male	Female	Area (sq km)	Density (Person / sq.km)
Tehsil 18-hazari					
18 Hazari	34,324	17,819	16,505	62	554
Chatta	31,670	16,172	15,498	4	7,918
Dosa	36,624	18,595	18,029	147	249
Garh Mahraja Tc	37,455	19,420	18,035	3	12,485
Hgul Imam	30,977	16,142	14,835	671	46
Kot Murad	38,248	19,822	18,426	74	517
Kot Shakir	35,450	17,856	17,595	315	113
Mari Shah Sakara	35,406	17,756	17,650	174	203
Nadha Garh	28,837	14,548	14,289	4	7,209
Pabbar Wala	32,226	16,790	15,436	5	6,445
Rashid Pur	27,747	14,259	13,489	68	408
Rodu Sultan	33,050	16,907	16,144	54	612
Wasu	36,891	18,825	18,066	75	492
Tehsil Total:	**438,905**	**224,911**	**213,997**	**1,656**	**37,251**
Tehsil Shorkot					
485 Jb	38,035	19,679	18,356	80	475
493 Jb	32,314	16,826	15,488	71	455
497 Jb	28,194	14,558	13,636	123	229
Allah Yar Juta	33,772	17,377	16,395	65	520
Binda Subana	34,913	18,021	16,892	62	563
Chayyan Wala	33,374	17,303	16,071	108	309
Dab Kalan	31,164	15,951	15,213	90	346
Haveli Bahadur Shah	32,168	16,760	15,408	81	397
Kakki Nau	37,732	19,288	18,444	47	803
Kot Muhammad Zarif Khan	29,706	15,502	14,204	44	675
Qasim Bharwana	29,818	15,548	14,270	100	298
Rakh Bhago	34,076	17,878	16,198	59	578
Shah Sadiq Nahang	38,567	19,725	18,842	80	482
Shorkot Cantt	32,016	16,707	15,309	90	356
Tehsil Total:	**465,849**	**241,123**	**224,726**	**379**	**1,229**
Tehsil Jhang					
18 Hazari	0	0	0	36	0
220 Jb	34,782	18,139	16,642	58	600
268 Jb	27,165	14,275	12,890	43	632
446 Jb	31,008	16,381	14,627	98	316
463 Jb	34,447	18,096	16,351	108	319
Ashaba	38,483	20,141	18,342	49	785
Bagh Tc	16,877	8,663	8,214	37	456
Chak No.250/jb	36,197	18,902	17,295	159	228
Dhoriwala	31,976	16,257	15,718	89	359
Hasnana	33,212	17,283	15,929	6	5,535
Hassan Khan	30,098	15,772	14,326	116	259
Haveli Lala	31,979	16,568	15,411	51	627
Haveli Sheikh Rajo	31,952	16,462	15,490	76	420
Jhang Mc	448,004	233,837	214,167	24	18,667
Kari Wala	26,256	13,620	12,636	64	410
Kot Sai Singh	34,713	18,111	16,602	37	938
Kotlakhana	36,079	18,741	17,338	64	564
Malhoana	35,667	18,599	17,068	75	476
Mochi Wala	30,864	16,153	14,711	58	532
Mukhana	34,513	18,162	16,351	100	345
Nikka Dauttana	5,199	2,702	2,497	74	70
Pakke Wala	26,338	13,733	12,605	122	216
Pir Kot Sechana	31,268	16,263	15,005	106	295
Rasul Pur	31,277	16,286	14,992	99	316
Ratta Matta	27,735	14,605	13,130	98	283
Shah Jewana	30,591	15,824	14,766	59	518
Sheikh Chuhar	34,516	18,120	16,396	66	523
Sultan Pakhera	29,507	15,627	13,880	48	615
Sultan Pur	32,450	17,196	15,254	111	292
Chak No. 159/jb	37,359	19,731	17,629	52	718
Tehsil Total:	**1,310,512**	**684,249**	**626,262**	**2,612**	**502**

Tehsil Ahmedpur Sial

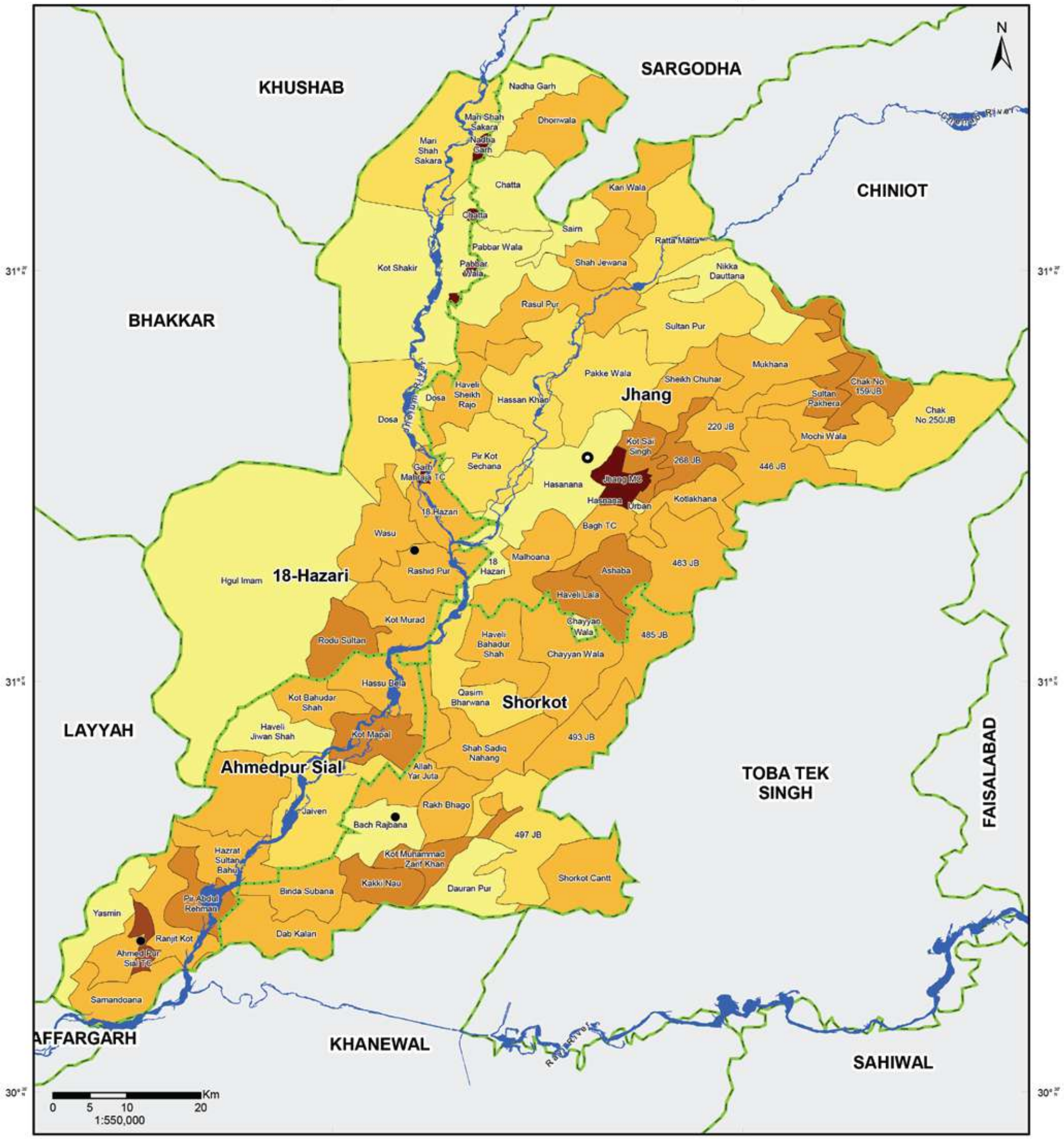
Ahmed Pur Sial Tc	26,674	13,840	12,834	17	1569
Godara	32,112	16,947	15,165	94	342
Hassu Bela	37,458	19,316	18,143	70	535
Haveli Jiwan Shah	1,519	780	740	68	22
Hazrat Sultan Bahu	38,610	20,091	18,519	69	560
Jaiven	35,765	18,549	17,217	138	259
Kot Bahudar Shah	28,556	14,870	13,686	48	595
Kot Mapal	40,173	20,817	19,356	65	618
Pir Abdul Rehman	34,329	17,795	16,534	56	613
Ranjit Kot	32,520	17,024	15,496	97	335
Samandoana	33,744	17,570	16,174	69	489
Tehsil Total:	**341,460**	**177,599**	**163,864**	**396**	**862**
District Total:	**2,556,726**	**1,327,882**	**1,228,849**	**6,359**	**482**



Socio-Economics Statistics (2015)



POPULATION DENSITY (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Population Density (Person/Sq. Km.)

- <= 150
- 151 - 300
- 301 - 600
- 601 - 1200
- 1201 - 2400
- > 2400

- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

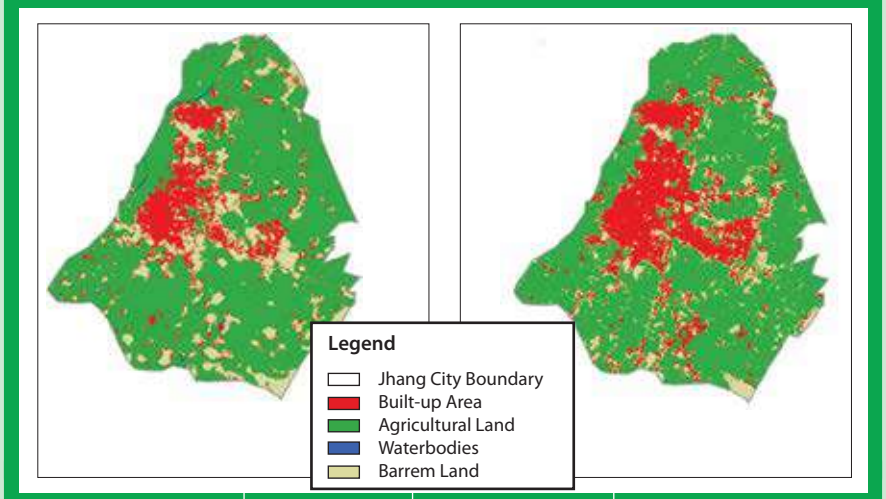
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-628-FEB-2016-GEN-NDMA-006
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

7 SETTLEMENTS

The settlements of the district include tehsils, union councils, cities and villages. We can broadly classify the settlement of Jhang District into two categories i.e. Urban and the Rural Settlement. The geographic distribution of settlements over the district is manifested in the Settlement Map.

Urban Sprawl of Jhang City in 2000 and 2013 is shown in the figures on the right. It can be seen that the most part of the city is occupied by the Agricultural land use i.e. 70.19 %, followed by the built-up land i.e. 13.15 % and barren land about 16.37%. In 2013 the Built-up area of the city increases with the decrease in agricultural and barren land. The built-up land reaches up to 20.01% from 13.5% while there was a decrease of almost 08% in Agricultural land use and 03% in the barren land of the city.

Land Use Pattern (1981 & 2014)



Class	Area % 2000	Area % 2013	Change Detection %
Built-up Area	13.15	20.01	6.86
Agriculture	70.90	66.94	3.96
Water Bodies	0.29	0.00	0.29
Barren Area	16.37	13.05	3.32

Settlements Vulnerable to Riverine Flood on Basis of Inundation Frequency (2010 to 2016)

Tehsil Shorkot

- Shorkot Plantation Reserve Forest
- Basira Distributary
- Chak Seven Hundred One B
- Chelianwala
- Bangalwala
- Chak Four Hundred Eighty-Nine JB
- Muhammadpura
- Chak Four Hundred Eighty-Three JB
- Jamani
- Chak Four Hundred Ninety-Two
- P R Shorkot Kantt-Malakwai Branch
- Bandi Bakhsh
- Lal Shahwala
- Basti Bhagtun
- Basti Mochian
- Saidpur
- Allahdittawala Khu
- Basti Reriwala
- Bela Surbana
- Nawan Chak Rakh Kakki Kohna
- Budhuana
- Basira Distributary
- Shufewala
- Chak Six Hundred Ninety-one-Thirty-three
- Basti Mir Bharwana
- Basti Mehrban Shah
- Chak Twelve D
- Shorkot Reserve Forest
- Nawan Shahr
- Khaki Lakhi Minor
- Dab Kalan
- Basti Dad
- Hassuwali Distributary
- Kotli Janderan
- Maddo Garawala
- Chak Six Hundred Ninety-two-Thirty-four
- Basti Kisranwali
- Mahram Sayal
- Bela Ali Khanana
- Tibba Janderan
- Sadan Nekokara
- Sadan Nekokara
- Sadiq Muhammad Jander
- Singhyanwala
- Mirda
- Basti Mahram
- Bela Phulianwala
- Basti Muhammad Ala
- Piranwala
- Basti Makorianwali
- Nai Basti Budhwan
- Basti Kala Khera

- Basti Hasan Shah
- Basti Pinhar
- Basti Kala Khera
- Bheni Talib Husain
- Dogar Malang
- Dab Kala
- Basti Bhab
- Muhammadyar Chishti
- Basti Naurangwala
- Basti Khanranwali
- Bheni Ahmadwala
- Mirasiwala
- Hodan di Basti
- Kacha Kamira
- Jalal Dab
- Basti Sarangwali

Tehsil Ahmedpur Sial

- Ibalwala
- Shah Alamwala
- Sidhana
- Singanwala
- Sobani Basti
- Sultan Bahu
- Sultan Bhu
- Tibbewala
- Tibianwala
- Tutwala
- Wanwala
- Watwala
- Yusufwala
- Hussainwala
- Charyari
- Kalianwala
- Mochianwala
- Muhammad Rasul Shah
- One L Minor
- Piarewala
- Loharanwala
- Pir ki Bhaini
- Purana Sewa
- Qalandarwala
- Qasimwala
- Qatala
- Rajabana Minor
- Rariwala
- Retri Basti
- Riazabad
- Sabuwala
- Sadeiwala
- Sadnanwala
- Samundri
- Sangianwala

- Nikkewala
- Fatehpur Paratti
- Khu Jalalwala
- Kariwala
- Chah Taliwala
- Chah Chakarwala
- Bamaniwala
- Bula
- Basti Lalwali
- Basti Narang
- Basti Hassuwali
- Basti Nawab
- Badh Rajbana
- Dagri
- Malki Basti
- Basti Lasaruwala
- Hidayatwala
- Lakkanwala
- Kikranwala
- Jamalwala
- Chak Eight-Three L
- Mad Sial
- Mal Bagi
- Chak Five-Five R
- Laiwala
- Chak Nine-Three L
- Harlanwala
- Darajanwala
- Gadianwala
- Chishtianwala
- Garh Maharaja
- Godrahwala
- Gul Shah
- Hakimwala
- Boharwali
- Basti Manak
- Chadhar
- Babalwala
- Basti Mian Ismail
- Basti
- Basti Amir
- Mirnewala
- Basti Girdani
- Khanpur
- Kissowana
- Kot Mapal
- Khuiwala
- Ahmadwala
- Indus Basin
- Sab
- Daulewala

- Basti Dhalani
- Sultanwala
- Taliwala
- Ubani Basti
- Haslana Pind
- Syed Muhammad
- Inayat Shah
- Jandiranwala
- Miraliwala
- Muradshahwali
- Sai Basti
- Sarinwala
- Dera Fazil
- Islampur Firaz
- Islamwala
- Mirasianwala
- Khu Rahwala
- Khu Baghwala
- Chak Munawala
- Nekokara
- Basti Shafiqabad
- Aputh Janjiana
- Islampur Nesheb
- Basti Walinwali
- Nawabpur Mauza
- Talibwala
- Jamanewala
- Khagranwala
- Basti Qasim
- Basti Shami Shah
- Basti Fateh Muhammad
- Bindiwala
- Boharwala
- Dhup Sarl
- Binda Fauja Dhara
- Jhok Dargahi Shah
- Maqsudpur
- Jakharwali
- Metlianwala Basti
- Najaf Shah
- Qaimwala
- Qaimwala Chhara
- Rajbana Pattan
- Sidqana Mirali
- Sanpal
- Sasrani Basti
- Binda Sargana
- Basti Islampur
- Deti Sial
- Jusa
- Kot Rustam
- Piru

Tehsil Jhang

- Bhonani Basti
- Karam Wah
- Garh Pattan
- Chirwan Chhara
- Faqir Sial
- Basti Jota
- Basti Kandewali
- Bhajni Nala
- Basti Wali Muhammad
- Baghwala
- Basti Sialan
- Basti Sultan Sial
- Wanwala
- Kokaranwala
- Two R Three L Minor
- Shorkot
- Kot Isa Shah
- Mari Shah Sakhira
- Kesarwala
- Sabbar
- Chhatta
- Jandran
- Saiyidanwala
- Chah Hawanwala
- Khanna Bati
- Patoana
- Chah Tahliwala
- Chah Sardarwala
- Chah Sherwala
- Chah Kanahi Ram
- Billi
- Chah Khajiwala
- Chah Jamanwala
- Chah Mamunwala
- Chah Garianahwala
- Dauke
- Pakka Naulanwala
- Dhoriwala
- Mubarak Shah
- Shergarh
- Mongar
- Shah Jiwana
- Jhugge Karlu
- Chah Machhiwala
- Chak One Hundred Fifty-Three
- Basti Jogian
- Awanan-de-Jhugge
- Chah Lalianwala
- Dnaulka
- Lang Shimali
- Koba
- Buri
- Nawin Dilli
- Basti Mahniwala
- Basti Ferozi
- Dhaulka Resthouse
- Gudawala
- Sattiwala
- Khanpur
- Jhang District
- Basti Bambewala
- Chah Nusratwala
- Basti Faujianwali
- Pindi Jabana
- Rangpur Canal
- Wasu Astana
- Lahoriwala
- Kot Khushhal
- Kolar
- Doaba
- Haidan
- Mudwala
- Lower Raniwali Drain
- Bunga Tatari
- Sargana
- Tattar Kot
- Jand Mall
- Bibranwala
- Butta
- Chandia Faraz
- Dauka
- Husainabad
- Chhotiwala
- Bela Shahr
- Chandna
- Thatti Gul
- Chela
- Gajiabad
- Loha Bhir
- Sahjar
- Aliana
- Sangra
- Ziarat Pir Bahlol
- Bahlol Pir
- Kilchah
- Sahjowal
- Mochiwala
- Dhoin Muhammad
- Trimu Resthouse
- Rampur
- Wasu Wastana
- Atharan Hazari
- Billar
- Sultan Nagar
- Munirabad
- Kamoshiwala
- Wasawa
- Dara Sakhira
- Chaukan Janpur
- Jamali Kalan
- Kikarwala
- Kirariwala
- Kot Bahadur Janubi
- Malkana
- Malkana
- Hassu Balel
- Tibba Gahli
- Kot Murad
- Paharpur
- Rodu Sultan
- Lashari
- Hussainabad
- Ahmadabad
- Jabboana
- Basti Arain
- Rashidpur
- Basti Sialanwali
- Rasidwala
- Jamalwala
- Basti Sultan Lashari
- Dargahi Shah
- Uch
- Basti Bahar
- Hazrewala Bhira
- One L - One R Minor
- One R Left Distributary
- Ziarat Piro Shahid
- Ziarat Mian Mewa
- Thatti Warrian
- Basti Haveliwala
- One R-Left Distributary
- Kunjer
- Laliana
- Chah Gujranwala
- Daduwala
- Isa Faqir-da-Pindi
- Chah Baralanwala
- Thatta Mahla Station
- Chah Shaikhana
- Thatta Mahlu
- Kot Murad
- Chah Bagwala
- Nandkana
- Ballo
- Thatta Ali
- Thatta Sherka
- Mian Bhaga
- Chah Tahliwala
- Ballo Shahabal
- Noya Chah
- Chah Korwala
- Chah Laiwala
- Chah Sangiwala
- Sultanpur
- Chund
- Sandrano
- Chah Lekanwala
- Chah Saiwala
- Chak Hamza
- Thatta Sardar Shah
- Khiwa
- Laura
- Thatta Joyan
- Khanuana
- Chah Langrewala
- Wajidabad
- Basti Jana
- Minor Number 4
- Baggianawala
- Chah Traglah
- Chah Pindwala
- Tahliwala
- Beliwala
- Hasnana
- Chah Aliwala
- Virkanwala
- Vigrana Sial
- Chah Kamirwala
- Masudabad
- Lakharwala
- Chah Lakhiwala
- Khairwala Main Drain
- Harmalpur
- Chah Fateh Chana
- Chah Balochanwala
- Drainage Number Forty-five
- Basti Bakainwala
- One L-One R Minor
- Rajjewala
- Basti Kikarwali
- Malhewala
- Nimewala
- Mirwala
- Jandianwala
- Basti Morwali
- Basti Arain
- Baggewala
- Shiahwala
- Lower Raniwal Drain
- Shah Jindan
- One L Distributary
- Basti Naurangwala
- Basti Daranwala
- Basti Rajba
- One AL Distributary
- One L-AL Minor
- Bakhshi
- Fateh Shahwala
- Thatti Suan
- One R AL Minor
- Muhammadwala
- Chah Darkhanwala
- Muchranwala
- Chah Chhillewala
- Battewala
- Tutwala
- Pindiwala
- Saijurwala
- Sandrani Basti
- Kothewala
- Hothewala
- Tahliwala
- Basti Badhuana
- Two R Daubiana Distributary
- Basti Kamiani
- Samanwala
- Basti Jalwala
- Bullo
- Karari
- Jamali Khurd
- Jamalwala
- Tahliwala
- Nijabatwala
- Chah Kaurianawala
- Bakainwala
- Uch Canal
- Jhang
- Kot Bahadur
- Qureishi
- Lal Jhalar
- Qadian
- Kotli Baqar Shah
- Alipur
- Chandia Nasheb
- Akilpur
- Alman Sharqi
- Dhan Miani
- Chah Rattewala
- Habib
- Bali
- Chah Mullanwala
- Jindiana
- Khollar Awan
- Bahadur Balli, Ziarat
- Saiyidanwala
- Chah Sherwala
- Jhalar Nathu Shah
- Chah Khokharanwala
- Sadrwala
- Retwala
- Taror
- Bhochra
- Thatta Sawan Mal
- Chakar
- Thatti Ahmad
- Ubhanwala
- Chah Raniwala
- Ali Khanana
- Thatti Panju
- Bindi Haidan
- Baroki
- Aqilpur Minor Two Right
- Tarkhanwala
- Thatti Janu
- Winpal
- Dinar
- Thatta Miana
- Mal
- Madari
- Kiran
- Thatti Nusrat
- Lal Datri
- Silmana
- Dhokar
- Ahmad De Jhugge
- Tibba Dhupsari
- Thatti Ali
- Patti Allanwali
- Laghari
- Mal Sultan
- Somiwala
- Soa Majoka
- Jahangirpur
- Muhammadwala
- Bela Shehr
- Thatta Chandna
- Awanwala
- Thatta Nawan
- Thatta Bela
- Nialewala
- Kot Bura
- Kanjrianwala Khu
- Ghughiana
- Saliana
- Sai Sarwar
- Kot Sukha
- Shah Shakur
- Kot Sahib
- Khutiana
- Talwara
- Najabat
- Sherkot
- Basti Baluchan
- Mulkhiana
- Pirkot Sidhana
- Kot Brahim
- Lala Johla
- Chah Makaurian
- Munda Sayyad

Kot Maldeo
Dosa
U H Canal
Shah Shahwala
Sheroana
Ghari Fatehullah
Mullaniwala
Udhoana
Jhakh
Kurhianwala
Sahjhar Kalasan
Massan
Machhiwal
Samadh Jinda Kaliyana
Basti Pathan
Basti Murad Chaddhar
Dhidoana
Bela Massan Forest
Ziarat Pir Fateh Shahid
Jhark
Haweli Ghulam Jannat
Raju Branch Distributary
Mahram Sial
Haweli Haji Mahmud
Ahmadabad
Thatti Musalli
Khokhar
Guniana
Kot Shakir
Joiya
Guniana
Lang
Basti Nur
Chak Jalal Din
Haweli Shaikh Raju
Basti Marla
Jhandiwala
Sultanwala
Haweli Diwan
Kot Khan
Hasan Khan
Chak Aliyana
Rajana
Kabli
Kora Basti
Tibbawala
Kharal
Chauntra
Kotla Ahmad
Umrana Janubi
Ali Khanana
Mahranwala
Mohal
Mohal Anwar Baig
Mallawala
Bohri Ghulam Jahanian
Shahana
Chah Bhatianwala
Thatta Muhammad
Thatta Hidayat
Thatta Kauriana
Chund Bharwana
Massan Distributary
Chah Piranwala
Chah Jhandewala
Chah Hidayawala
Thatta Kauriana
Chah Kalwaranwala
Chah Bhajianwala
Thatta Manerianwala
Ramana
Chah Mukhtiarwala
Chah Tahilpurwala
Chah Kaurewala
Chah Khotianwala
Thatta Hamayun
Muhammadwala, Chah
Chah Kandanwala
Buddheke
Sahmal
Chah Marianwala
Sandelianwala
Chah Polianwala

Chah Mamurewala
Chah Kaluanwala
Chah Khizarwala
Chah Mahinwala
Thatta Kandarka
Qadian
Thatta Bharwana
Chah Dinanwala
Basti Nunan
Chah Muhammadwala
Virkanwala
Sialwala
Sultanwala
Chah Dhariwala
Mohanawala
Chah Sherwala
Wagha Kaleka
Bindi Amir Shah
Chak Ganesh Das
Hasan Khan
Bandawala
Janiana
Chah Mastiwala
Basti Adhan
Basti Kotla Ahmad
Mari Shah Sukhan
Ziarat Pir Abdul Qadir
Chah Pirwala
Thatti Saiyidan
Sahjhowala Forest Reserve
Thatti Faqirwali
Haji Shahwala
Thatti Bakar
Shah Mahmud
Chah Maiwala
Gusainwala
Khibewala
Sayal
Kala Nala
Mastiala
Qadirpur
Thatti Buslani
Chah Samundarwala
Basti Berwali
Machhiwala
Chawaliwala
Jhagar
Kalera
Changran ki Basti
Chah Ratanawala
Chah Tehliwala
Subhiana
Lashkari
Sarwani Patoana
Tahli Gadanwali
Jhugge Rang Shah
Bela Mirjana
Haveli Canal
Chah Bahmanwala
Bela Jhabana
Jogera
Naya Thatta
Diraj
Thatti Maharani
Mallahan
Pir Joaya Shah
Mangar
Jhok Usman
Paropi
Machhiana
Loharanwala
Chhohan
Turk
Jhok Bhorani
Bindi Patoana Kalan
Namdar Phuli
Ahmadpur
Chauri Nunan
Bela Sidhane
Chak Ganesh Dass
Kharkan
Massan Distributary
Halki Phat

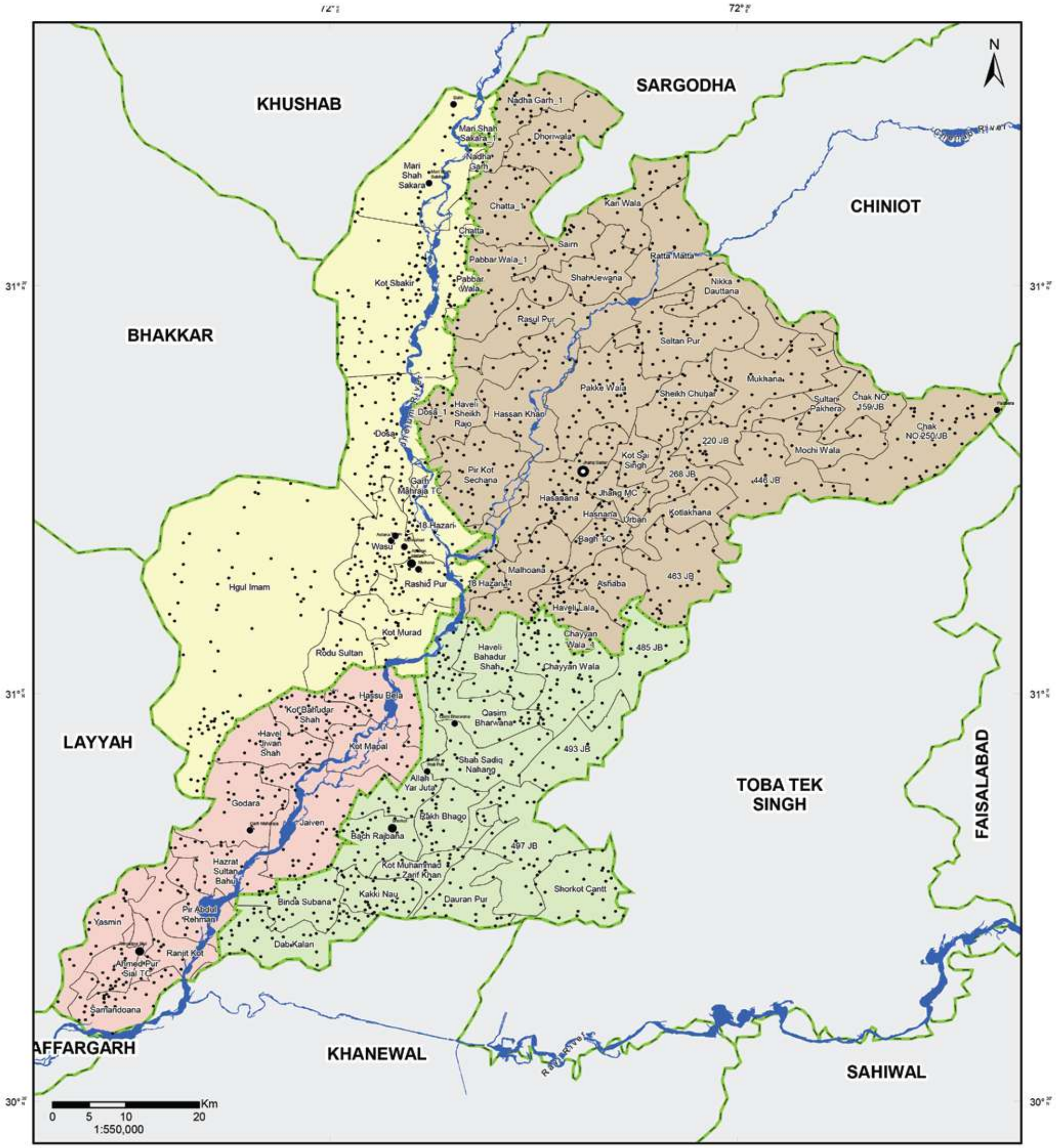
Chah InayatwalaLurka
Dhabbi
Chauntra
Sidha
Berwala
Shah Shakur
Kamra
Jhelum River
Latif Shah
Basti Rashid
Trimmu Canal Headworks
Binda Makana
Bitafi
Bulha Patoana
Namdar
Tahli Ghulamun
Bela Baggar
Bela Jutianwala
Nutkana
Jahan Khan
Rivaz West Bank Station
Rivaz East Bank Station
Daduana
Daduana Nau
Budha Darya
Budha Darya
Sialanwala
Nange ka Pump
Thatta Zabana
Chah Pir Ramalwala
Chah Bakainwala
Mungassiwala
Bangas
Chah Sherwala
Darbar Bahadurwali
Basti Balianan
Chah Thakurwala
Kharora
Bela Kandrana
Chah Rohelwala
Pathanwala
Bela Anaranwala
Sarwani Patoana
Kaliarwali
Ragi
Saliwala
Qadirpur
Jhugge Awan
Thatta Kanhaiya Lal
Thatti Ali
Lidoana
Suhalwala
Pir Roshan Shah
Dhuin
Aputh Bahadur
Basti Sanga
Umrana
Basti Hasan Shah
Balochwala

Legend:

Flood Inundation Frequency

1 2 3

SETTLEMENTS MAP



Legend

- District Headquarter
- Tehsil Headquarter
- Major Town
- Settlements / Villages
- River & Water Body
- Union Council Boundary (Abc)
- District Boundary (ABC)

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

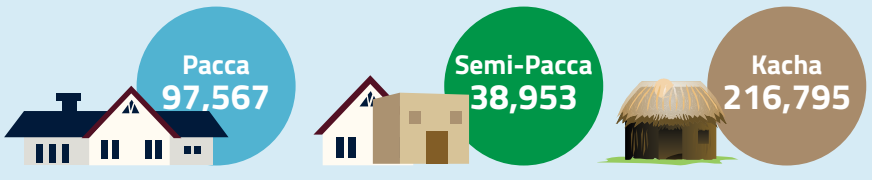
Data Source(s):
Pakistan Bureau of Statistics (PBS)
Survey of Pakistan (SOP)

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-001
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

8 BUILDING DISTRIBUTION

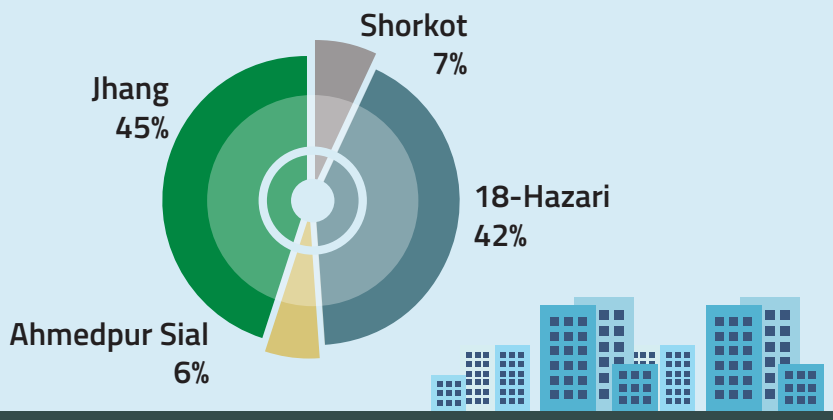
The distribution of building over different parts of the district is shown in the Building Distribution Map. Based on nature of building material used, buildings can be categorized as Kacha, Semi Pacca and Pacca as per Pakistan Bureau Statistics.

District Total

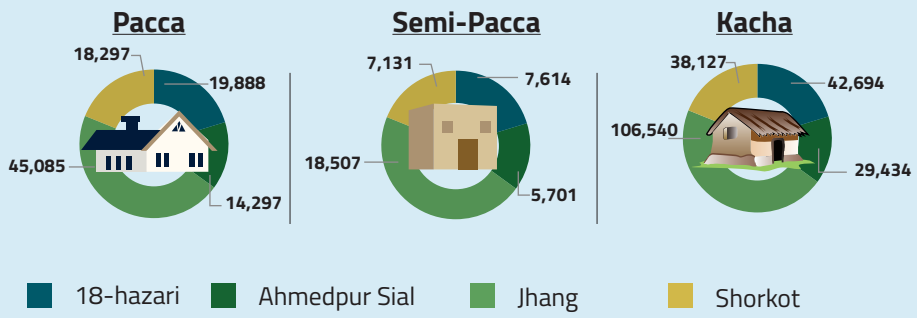


Total Buildings: 353,315

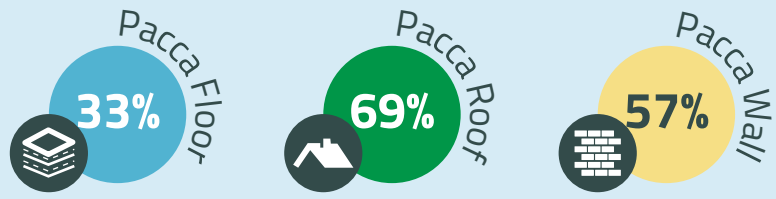
Tehsil Wise Building Distribution



Tehsil Wise Building Distribution by Type

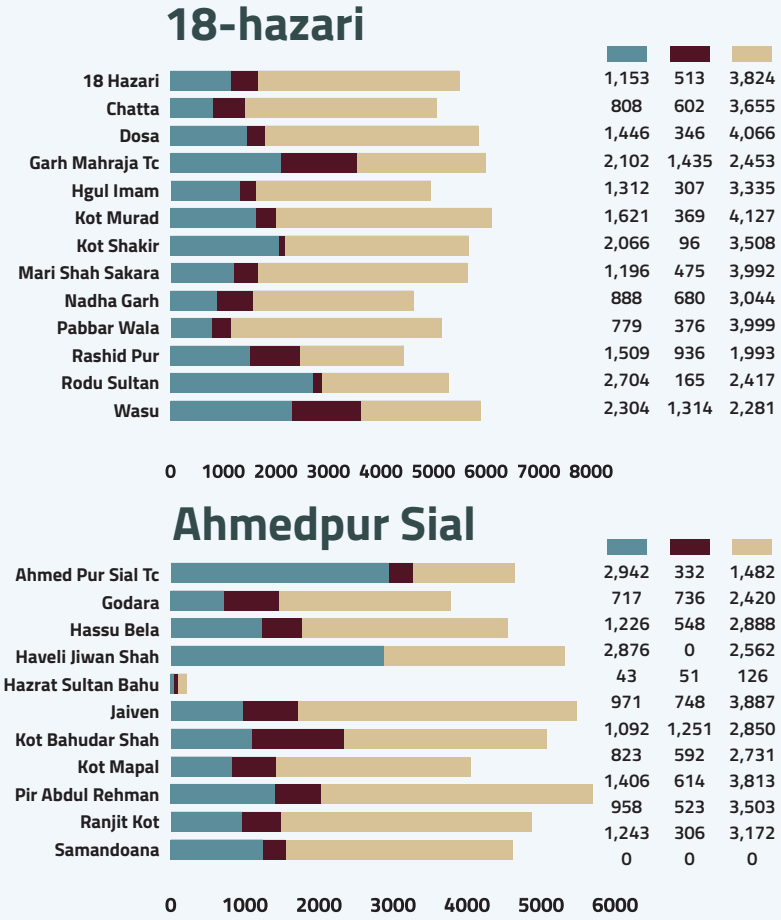


House Hold Characteristics



UC Wise Building Distribution

18-hazari



	Pacca	Semi Pacca	Kacha
18 Hazari	1,153	513	3,824
Chatta	808	602	3,655
Dosa	1,446	346	4,066
Garh Mahraja Tc	2,102	1,435	2,453
Hgul Imam	1,312	307	3,335
Kot Murad	1,621	369	4,127
Kot Shakir	2,066	96	3,508
Mari Shah Sakara	1,196	475	3,992
Nadha Garh	888	680	3,044
Pabbar Wala	779	376	3,999
Rashid Pur	1,509	936	1,993
Rodu Sultan	2,704	165	2,417
Wasu	2,304	1,314	2,281

0 1000 2000 3000 4000 5000 6000 7000 8000

Ahmedpur Sial

	Pacca	Semi Pacca	Kacha
Ahmed Pur Sial Tc	2,942	332	1,482
Godara	717	736	2,420
Hassu Bela	1,226	548	2,888
Haveli Jiwan Shah	2,876	0	2,562
Hazrat Sultan Bahu	43	51	126
Jaiven	971	748	3,887
Kot Bahudar Shah	1,092	1,251	2,850
Kot Mapal	823	592	2,731
Pir Abdul Rehman	1,406	614	3,813
Ranjit Kot	958	523	3,503
Samandoana	1,243	306	3,172
	0	0	0

0 1000 2000 3000 4000 5000 6000

Shorkot

	Pacca	Semi Pacca	Kacha
485 Jb	1,859	752	2,911
493 Jb	1,375	117	3,200
497 Jb	1,483	291	2,319
Allah Yar Juta	597	655	3,651
Binda Subana	1,103	267	4,214
Chayyan Wala	810	555	3,480
Dab Kalan	731	528	3,265
Haveli Bahadur Shah	1,825	364	2,481
Kakki Nau	1,762	731	2,985
Kot Muhammad Zarif Khan	1,192	361	2,760
Qasim Bharwana	916	473	2,941
Rakh Bhago	3,267	1,538	196
Shah Sadiq Nahang	1,377	499	3,724

0 1000 2000 3000 4000 5000 6000

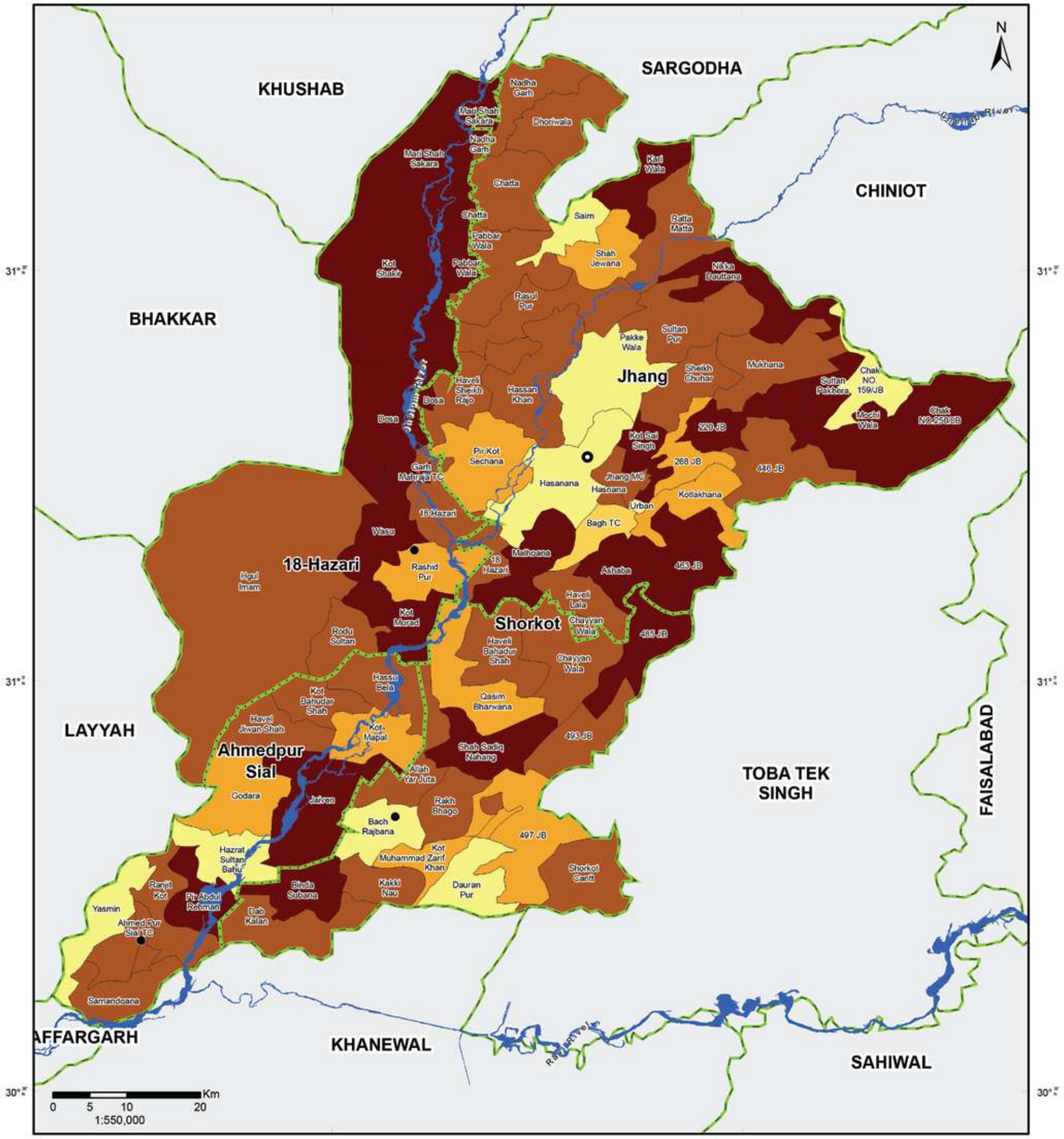
Jhang

	Pacca	Semi Pacca	Kacha
18 Hazari	1,153	513	3,824
220 Jb	1,467	736	3,360
268 Jb	1,768	650	1,926
446 Jb	1,464	562	2,933
463 Jb	1,175	567	3,767
Ashaba	2,006	570	3,579
Bagh Tc	1,279	517	903
Chak No.250/jb	1,455	856	3,478
Chatta	808	602	3,655
Chayyan Wala	810	555	3,480
Dhoriwala	1,050	1,102	2,962
Dosa	1,446	346	4,066
Hasnana	2,053	783	2,475
Hassan Khan	1,153	746	2,914
Haveli Lala	1,984	225	2,906
Haveli Sheikh Rajo	1,106	213	3,791
Kari Wala	0	0	0
Kot Sai Singh	776	832	4,809
Kotlakhana	3,449	600	1,720
Malhoana	1,786	326	2,087
Mari Shah Sakara	2,126	209	3,216
Mochi Wala	1,196	475	3,992
Mukhana	1,913	600	2,997
Nadha Garh	1,089	512	3,335
Nikka Dauttana	888	680	3,044
Pabbar Wala	1,331	139	4,049
Pakke Wala	779	376	3,999
Pir Kot Sechana	277	142	413
Rasul Pur	457	217	3,537
Ratta Matta	1,253	745	3,452
Shah Jewana	644	679	3,679
Sheikh Chuhar	1,170	722	2,544
Sultan Pakhera	1,854	518	2,521
Sultan Pur	1,012	812	3,696
Chak No. 159/jb	908	380	3,431
	0	0	0

0 1000 2000 3000 4000 5000 6000 7000 8000

Pacca Semi Pacca Kacha

BUILDING DISTRIBUTION (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

- River & Water Body
- Abc Tehsil Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

NDMA
Pakistan Bureau of Statistics

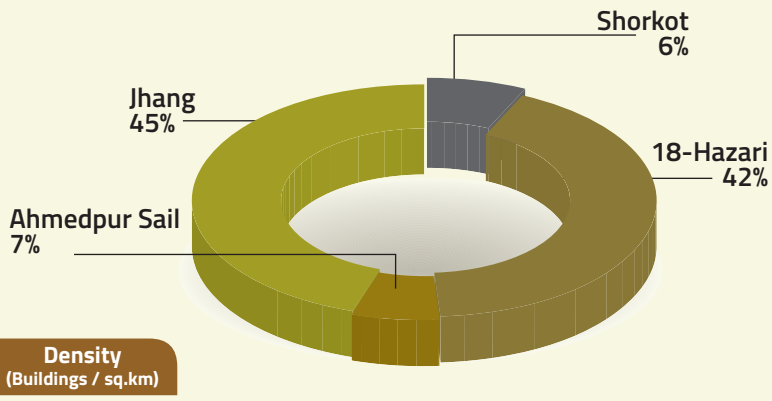
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-008
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

9 BUILDING DENSITY

There are a variety of building groups in District Jhang, covering residential, non-residential, office and administrative buildings, which are located in areas with relatively favourable geo-physical and socio-economic conditions.

Tehsil Wise Building Density
(Buildings / sq.km)

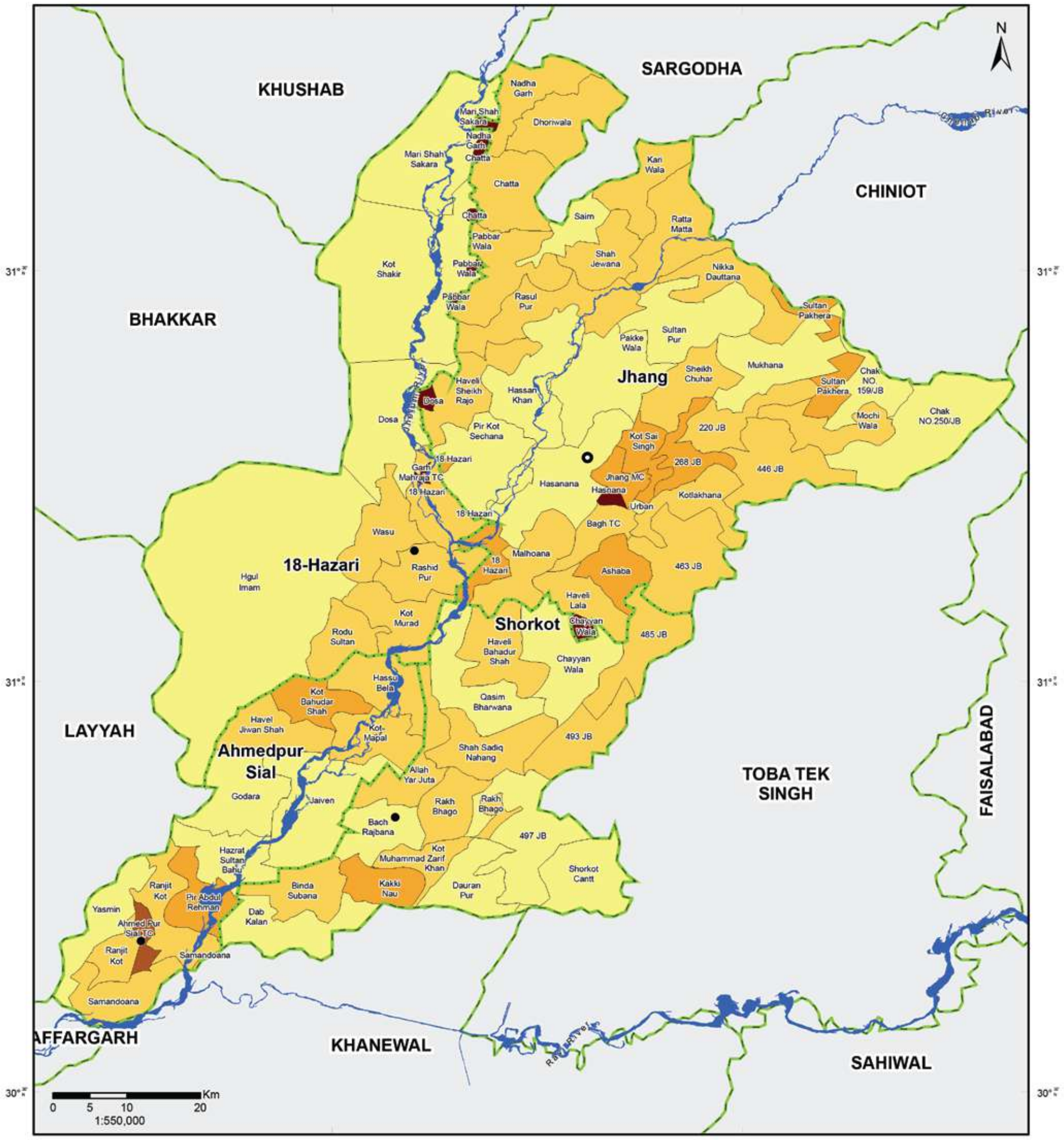


	Union Council	Building Types: Pacca	Semi Pacca	Kacha	Total Buildings	Area (sq.km)	Density (Buildings / sq.km)
Tehsil 18-Hazari	18 Hazari	1,153	513	3,824	5,490	62	89
	Chatta	808	602	3,655	5,065	4	1,266
	Dosa	1,446	346	4,066	5,858	147	40
	Garh Mahraja Tc	2,102	1,435	2,453	5,990	3	1,997
	Hgul Imam	1,312	307	3,335	4,954	671	7
	Kot Murad	1,621	369	4,127	6,117	74	83
	Kot Shakir	2,066	96	3,508	5,670	315	18
	Mari Shah Sakara	1,196	475	3,992	5,663	174	33
	Nadha Garh	888	680	3,044	4,612	4	1,153
	Pabbar Wala	779	376	3,999	5,154	5	1,031
	Rashid Pur	1,509	936	1,993	4,438	68	65
	Rodu Sultan	2,704	165	2,417	5,286	54	98
	Wasu	2,304	1,314	2,281	5,899	75	79
	Tehsil Total:	**19,888**	**7,614**	**42,694**	**70,196**	**1,656**	**5,959**
Tehsil Ahmedpur Sial	Ahmed Pur Sial Tc	2,942	332	1,482	4,756	17	280
	Godara	717	736	2,420	3,873	94	41
	Hassu Bela	1,226	548	2,888	4,662	70	67
	Haveli Jiwan Shah	2,876	0	2,562	5,438	68	80
	Hazrat Sultan Bahu	43	51	126	220	69	3
	Jaiven	971	748	3,887	5,606	138	41
	Kot Bahudar Shah	1,092	1,251	2,850	5,193	48	108
	Kot Mapal	823	592	2,731	4,146	65	64
	Pir Abdul Rehman	1,406	614	3,813	5,833	56	104
	Ranjit Kot	958	523	3,503	4,984	97	51
	Samandoana	1,243	306	3,172	4,721	69	68
	Yasmin	0	0	0	0	71	0
	Tehsil Total:	**14,297**	**5,701**	**29,434**	**49,432**	**862**	**907**
Tehsil Shorkot	485 Jb	1,859	752	2,911	5,522	80	69
	493 Jb	1,375	117	3,200	4,691	71	66
	497 Jb	1,483	291	2,319	4,093	123	33
	Allah Yar Juta	597	655	3,651	4,903	65	75
	Binda Subana	1,103	267	4,214	0	61	0
	Chayyan Wala	810	555	3,480	5,583	62	90
	Dab Kalan	731	528	3,265	4,845	108	45
	Haveli Bahadur Shah	1,825	364	2,481	4,524	90	50
	Kakki Nau	1,762	731	2,985	0	68	0
	Kot Muhammad	1,192	361	2,760	4,670	81	58
	Qasim Bharwana	916	473	2,941	5,478	47	117
	Rakh Bhago	3,267	1,538	196	4,313	44	98
	Shah Sadiq Nahang	1,377	499	3,724	4,329	100	43
	Shorkot Cantt	0	0	0	5,001	59	85
	Bach Rajbana	0	0	0	5,599	80	70
	Dauran Pur	0	0	0	4,512	90	50
	Tehsil Total:	**18,297**	**7,131**	**38,127**	**68,063**	**1,229**	**949**

Tehsil Jhang

18 Hazari	1,153	513	3,824	5,490	36	152	152
220 Jb	1,467	736	3,360	5,563	58	96	96
268 Jb	1,768	650	1,926	4,344	43	101	101
446 Jb	1,464	562	2,933	4,959	98	51	51
463 Jb	1,175	567	3,767	5,509	108	51	51
Ashaba	2,006	570	3,579	6,155	49	126	126
Bagh Tc	1,279	517	903	2,699	37	73	73
Chak No.250/jb	1,455	856	3,478	0	52	0	0
Chatta	808	602	3,655	5,789	159	36	36
Chayyan Wala	810	555	3,480	5,065	83	61	61
Dhoriwala	1,050	1,102	2,962	4,845	8	606	606
Dosa	1,446	346	4,066	5,114	89	57	57
Hasnana	2,053	783	2,475	5,858	6	976	976
Hassan Khan	1,153	746	2,914	0	126	0	0
Haveli Lala	1,984	225	2,906	5,311	6	885	885
Haveli Sheikh Rajo	1,106	213	3,791	4,813	116	41	41
Jhang Mc	0	0	0	5,115	51	100	100
Kari Wala	776	832	4,809	5,110	76	67	67
Kot Sai Singh	3,449	600	1,720	4,657	24	194	194
Kotlakhana	1,786	326	2,087	6,417	64	100	100
Malhoana	2,126	209	3,216	5,769	37	156	156
Mari Shah Sakara	1,196	475	3,992	4,199	64	66	66
Mochi Wala	1,913	600	2,997	5,551	75	74	74
Mukhana	1,089	512	3,335	5,663	4	1,416	1,416
Nadha Garh	888	680	3,044	5,510	58	95	95
Nikka Dauttana	1,331	139	4,049	4,936	100	49	49
Pabbar Wala	779	376	3,999	4,612	65	71	71
Pakke Wala	277	142	413	5,519	74	75	75
Pir Kot Sechana	457	217	3,537	5,154	96	54	54
Rasul Pur	1,253	745	3,452	832	122	7	7
Ratta Matta	644	679	3,679	4,211	106	40	40
Shah Jewana	1,170	722	2,544	5,450	99	55	55
Sheikh Chuhar	1,854	518	2,521	5,002	98	51	51
Sultan Pakhera	1,012	812	3,696	0	38	0	0
Sultan Pur	908	380	3,431	4,436	59	75	75
Chak No. 159/jb	0	0	0	4,893	66	74	74
Hasanana	0	0	0	5,520	48	115	115
Sairn	0	0	0	4,719	111	43	43
Urban	0	0	0	0	3	0	0
Tehsil Total:	**45,085**	**18,507**	**106,540**	**174,789**	**2,612**	**6,289**	
District Total:	**97,567**	**38,953**	**216,795**	**362,480**	**6,359**	**176.3**	

BUILDING DENSITY (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Building Density (Buildings/Sq.km)

- < 50
- 51 - 100
- 101 - 200
- 201 - 500
- > 500

- River and Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

NDMA
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

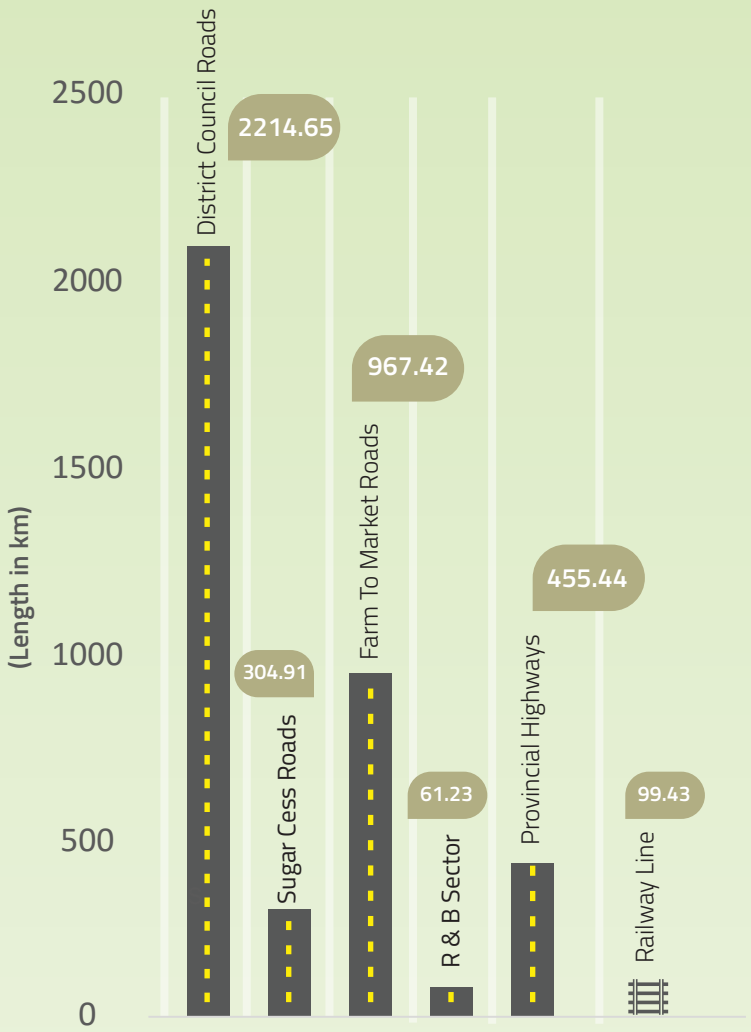
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-009
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

10 TRANSPORTATION NETWORK

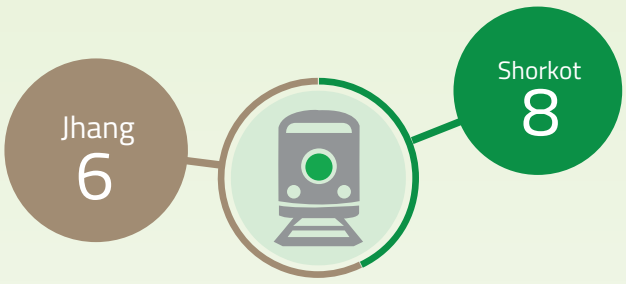
District Jhang has a total metalled road-length of 4003.65 Kilometers. The district is linked with Faisalabad, Toba Tek Singh, Sargodha, Hafizabad, Khushab, Bhakkar, Layyah and Khanewal through metalled road. The Transportation Network Map of the district identifies all the essential road links including trunk, primary, secondary, tertiary and residential roads.

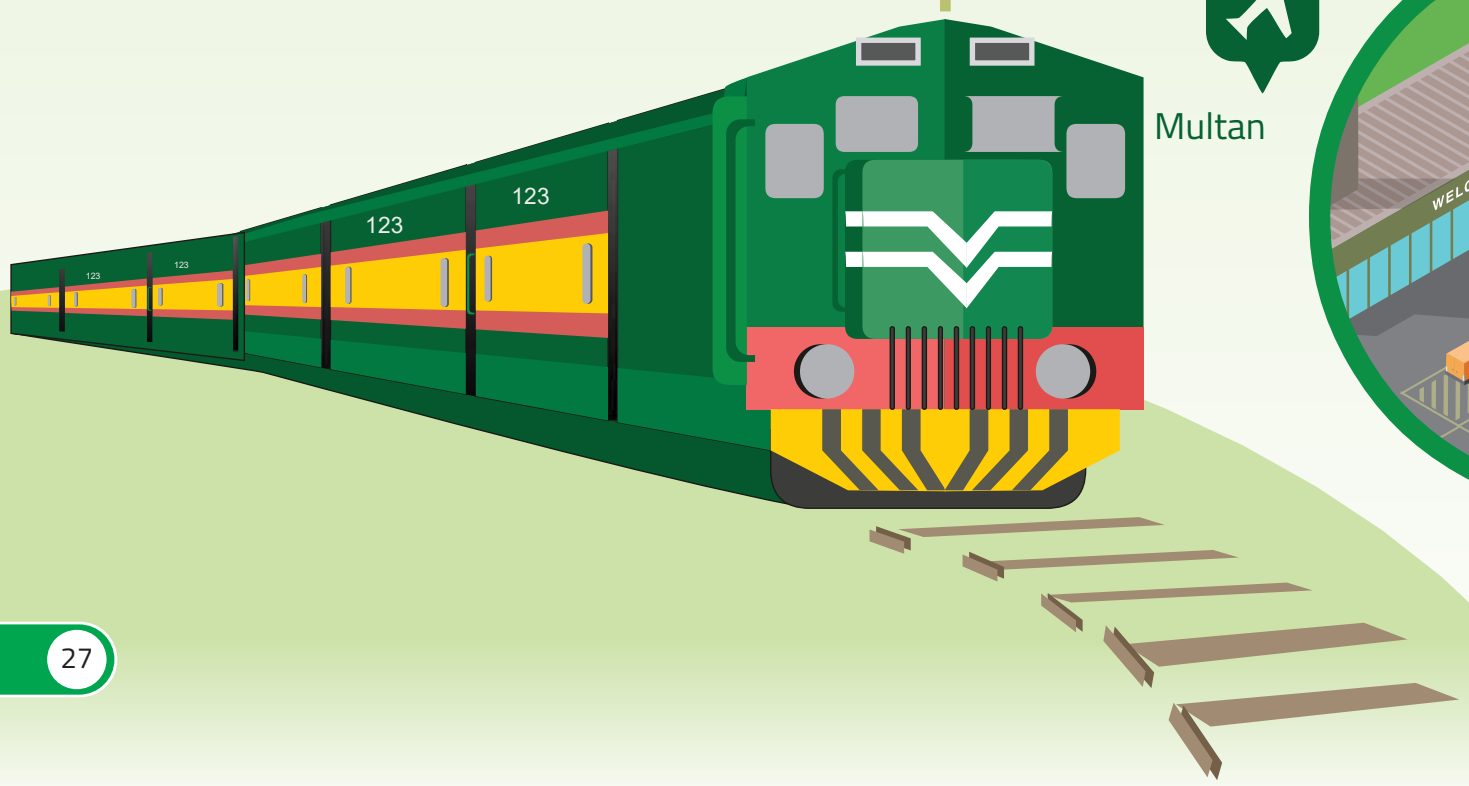
Besides roads, the district has also a fully functioning railway network. The district is linked with Sargodha, Shorkot and Khanewal through railway network. The total length of railway network in the district is 99.43km. There is only one landing strip in the district located at Mahni Decoy Strip. The nearest international airport to the district is Muhammad Bin Qasim International Airport located at Multan.

Road Length (km)



Number of Railway Stations

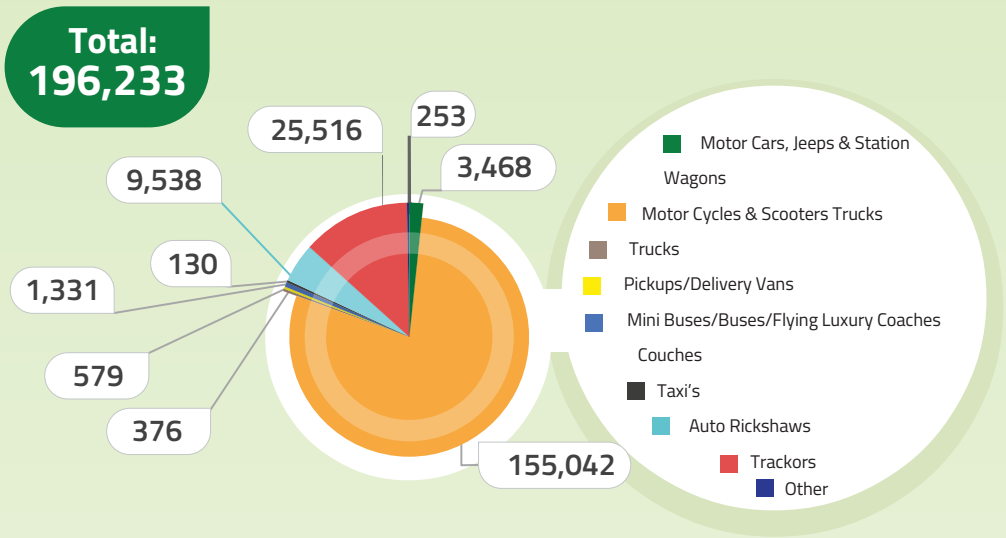




Motor Vehicles 'Registered'

by Type as on 30th June, 2014

Mini Buses / Buses / Flying Luxury Coaches	Motor Cars, Jeeps & Station Wagons	Pickups / Delivery Vans	Motor Cycles & Scooters	Trucks	Auto Rickshaws	Tractors	Taxi's	Others
1,33 1	3,468	579	155,042	376	9,538	25,516	130	253



Nearest Major Airports from Jhang City

TRANSPORTATION NETWORK MAP

United Nations
World Food
Programme

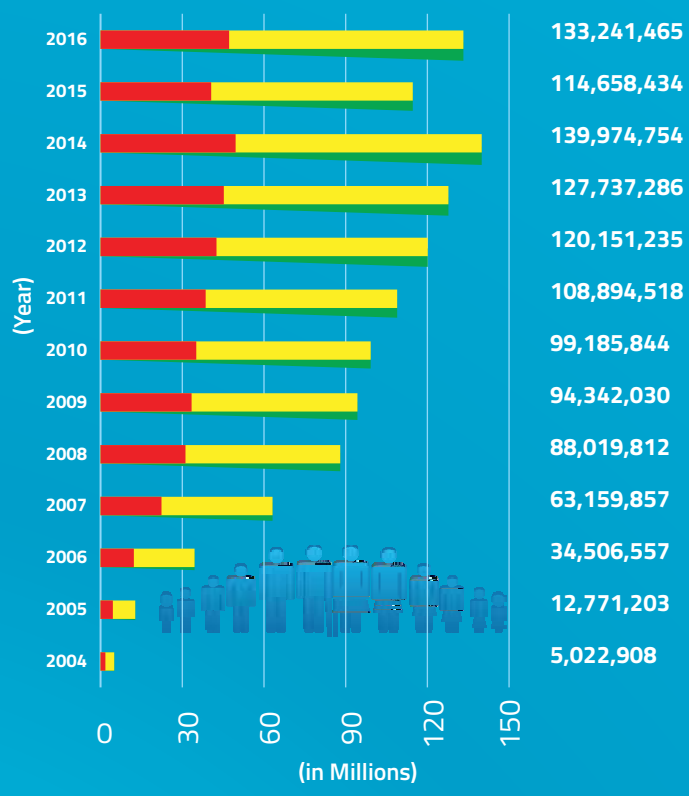
11 TELECOMMUNICATION

Communication System; particularly telecommunication services, plays a role of significant importance in connecting distant people either through wired or wireless voice services. These telecommunication technologies have been changed immensely in the last twenty years. Before the emergence of cellular systems, the communication system of District Multan was primarily based on telephone services, known as Public Service Telephone Systems (PSTNS). However, with worldwide expansion/growth and recognition of wireless communication systems, cellular systems have also been deployed in the district.

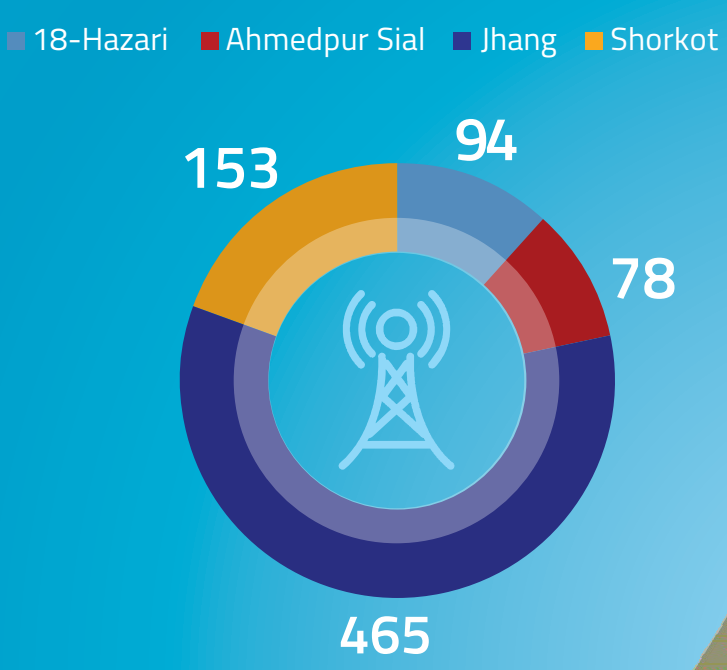
There are 28 telephone exchanges operating in the district, ranging in capacities from 50 lines to 34000 lines. Cellular phone services are available in the district.

The Cellular Service Providers in the districts include Mobilink, Telenor, Ufone, Warid and Zong. The map on right, identifies total number of telecommunication towers distributed over the different parts of the district.

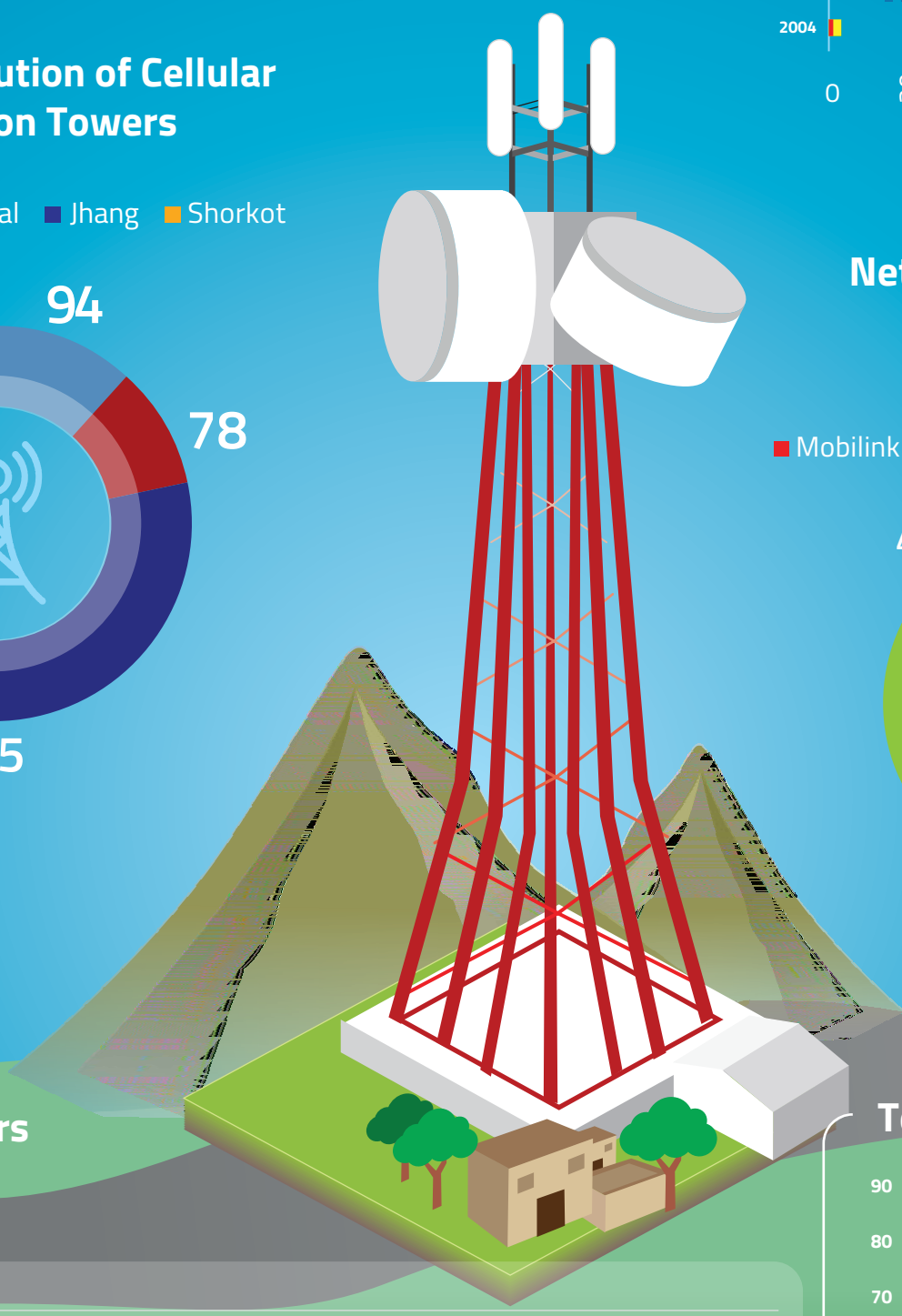
Cellular Subscribers in Pakistan



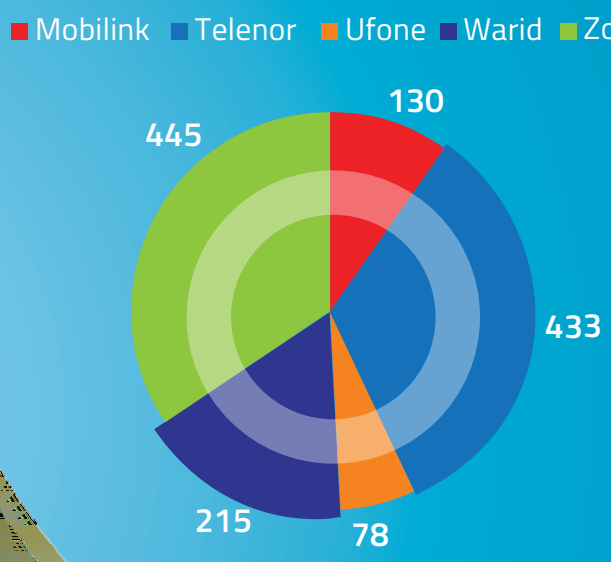
Tehsil Wise Distribution of Cellular Communication Towers



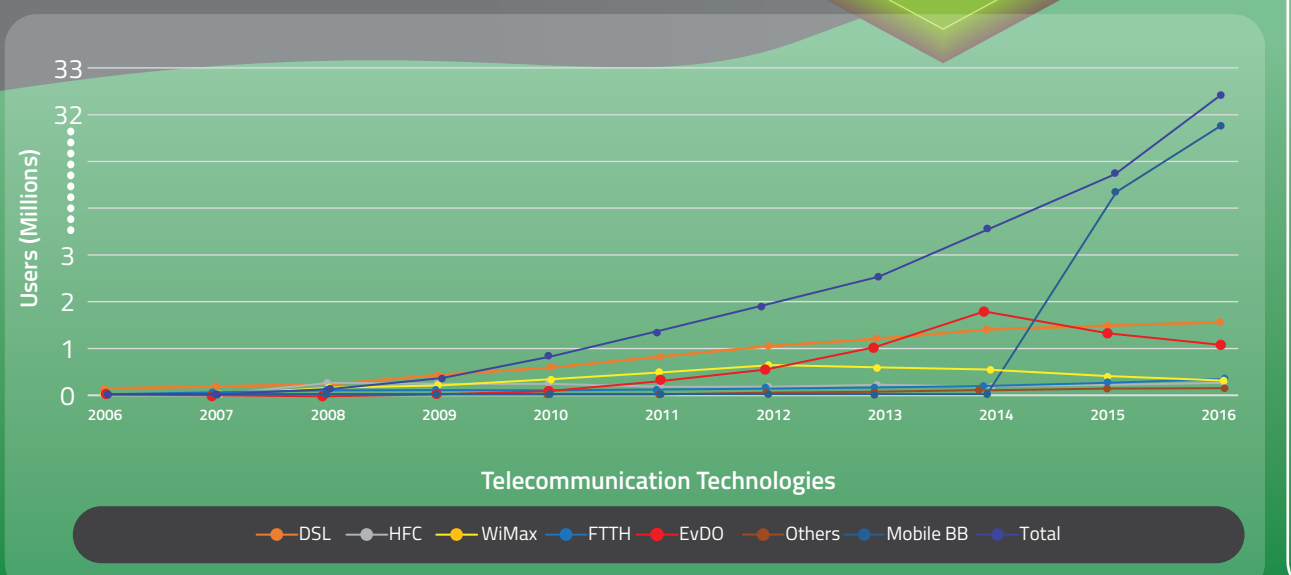
Total: 790



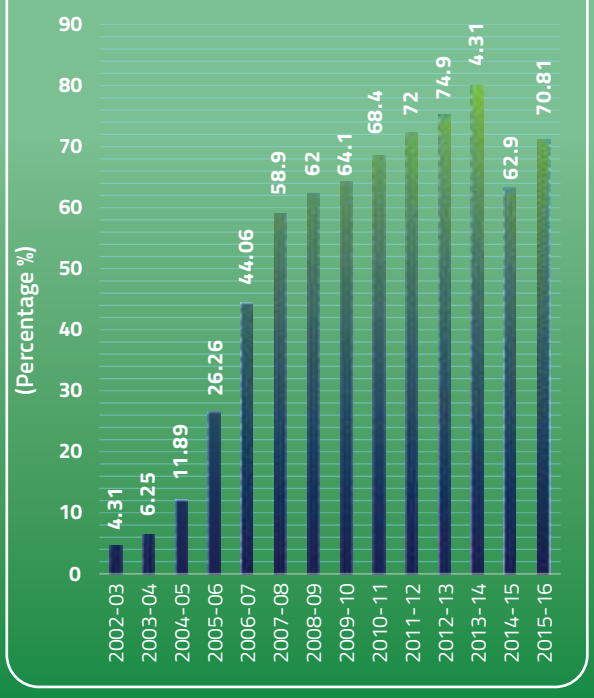
Network Wise Distribution of Cellular Towers (in Jhang District)



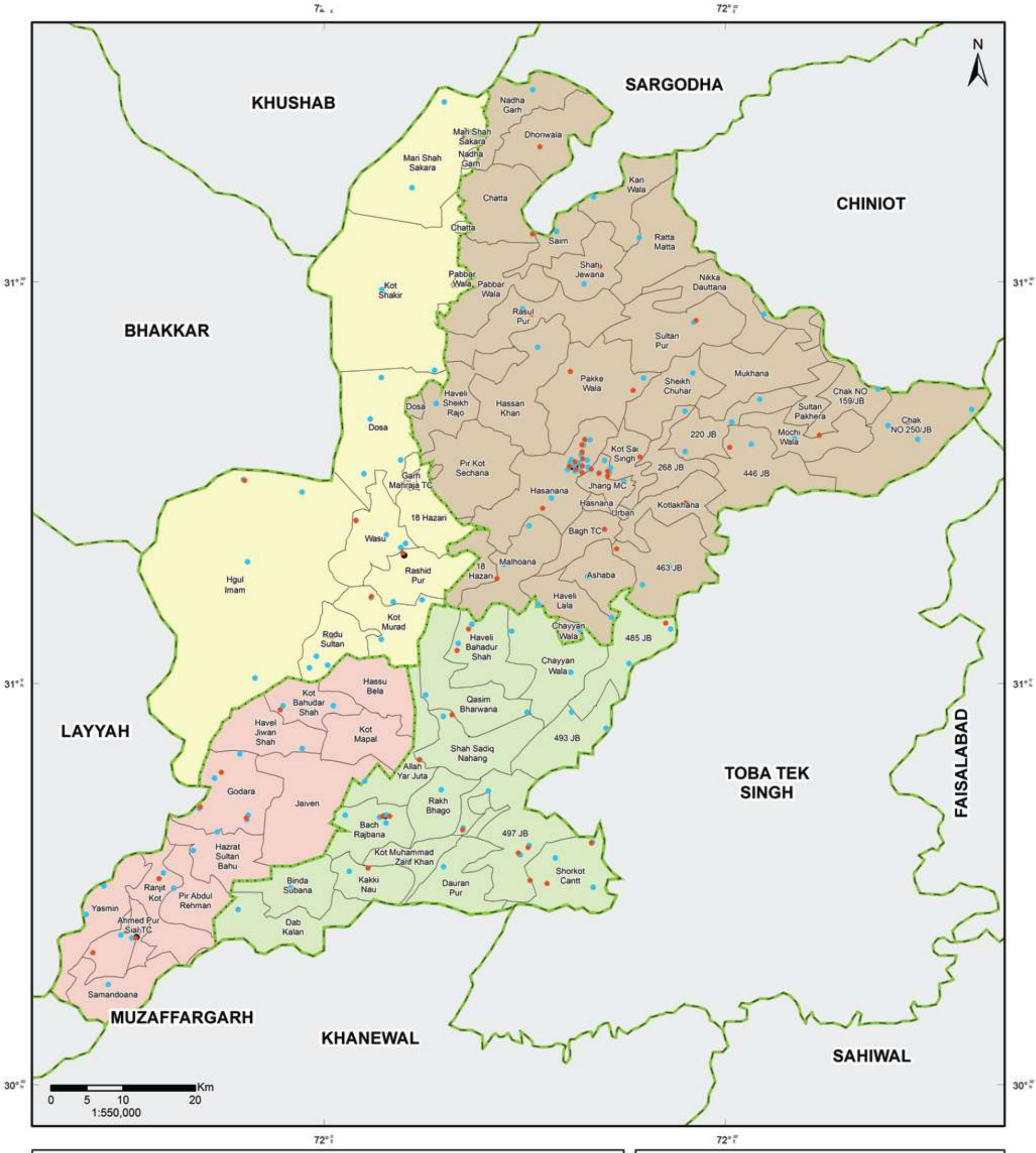
Internet Subscribers in Pakistan



Teledensity in Pakistan



COMMUNICATION TOWER MAP



Legend

- District Headquarter
- Tehsil Headquarter

Network

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Abc Union Council Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Telecommunication Authority
Survey of Pakistan
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

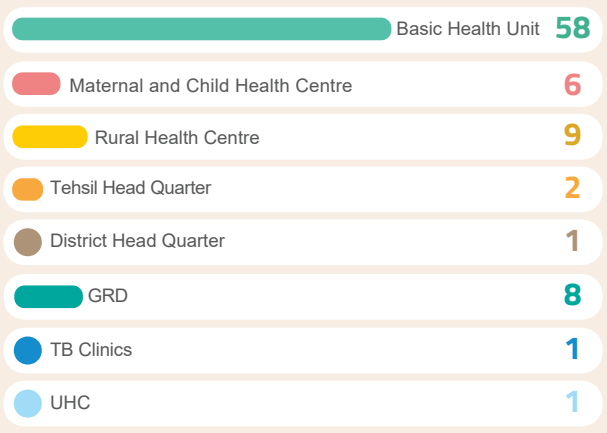
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-011
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

12 PUBLIC HEALTHCARE FACILITIES

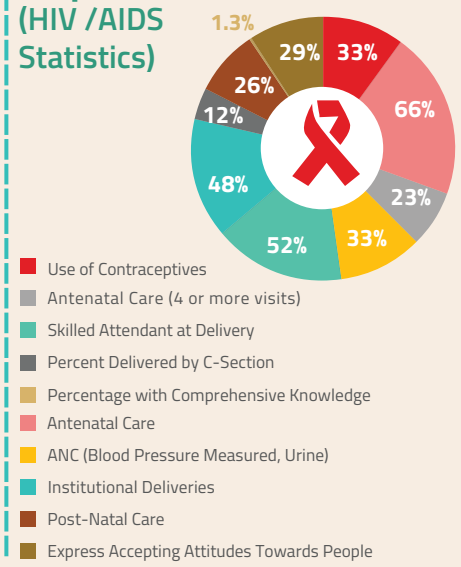
The provision of easily accessible, affordable and quality Health care facilities is among the basic amenities of life that must be provided to the people for their wellbeing and health safety. Health facilities include hospitals, clinics, maternal & birth centers, dispensaries and other forms of health care centres.

In district Jhang, for 14,289 population there is one certified doctor available in public healthcare facilities.

Health Facilities by Type



Reproductive Health (HIV /AIDS Statistics)



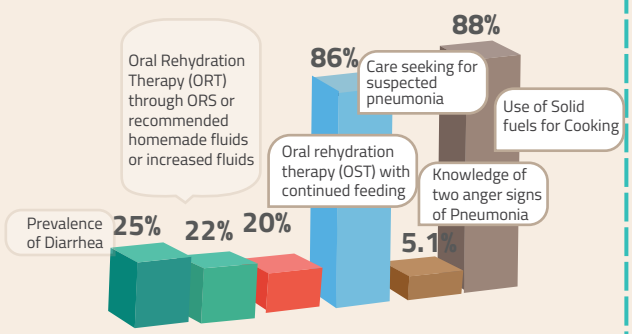
Primary Healthcare Sanctioned Staff

Health Facility Type	Medical Officers & Surgeons	Nurse (Head/ Staff/ Charge)	Assistants (Medical/ Xray/ Lab/ Dental)	LHVs / LHWs / Midwives / Vaccinators	Medical Tech/ Dispenser	Others
Basic Health Unit (BHU)	58	0	7	447	112	213
GRD	4	0	0	11	8	16
Maternal & Child Health (MCH)	0	0	0	12	0	5
Rural Health Centre (RHC)	40	55	23	75	51	88
TBC	0	0	0	0	0	0
UHC	5	7	3	1	3	30

Secondary Healthcare Sanctioned Staff

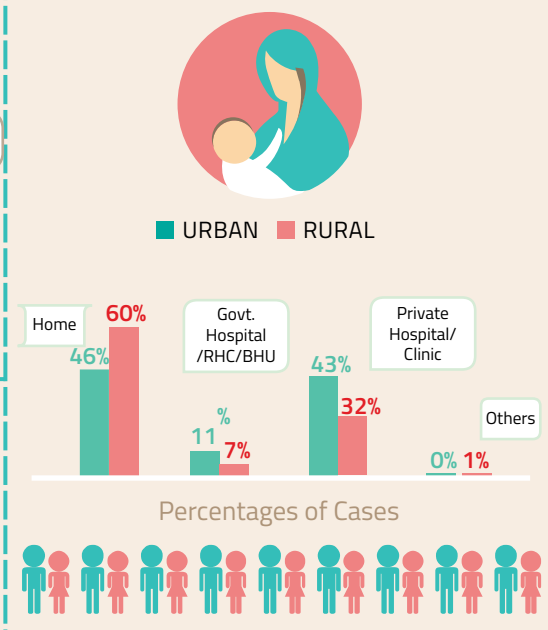
Health Facility Type	MS/AMS/ Deputy MS	PMO/AP MO/CMO/ SMO/MO	PWMO/A PWMO/S WMO/W MO	Specialists (Eye/ENT/ Chest/Child/ Surgical/ Medical)	Surgeons (Cardio/Neuro/ Ortho/Gyne/ Dental)	Non Surgical Staff (Anesthetist/ pathologist/ Radiologist/ Physiotherapists	Assistants (Lab/ Medical/ X-Ray/ Dental/ ECG Techs)	Nurse (Head/Staff Nurse/ Matron)	LHVS/ LHWS/ Midwives /EPI Vacciantors/ LHWs	Health/ Medical Tech/ Dispensers	Other
District Headquarters (DHQ)	4	22	32	10	9	8	13	84	4	19	188
Tehsil Headquarters (THQs)	0	0	0	0	0	0	0	0	0	0	0
Total:	4	22	32	10	9	8	13	84	4	19	188

Statistics of Disease in Children

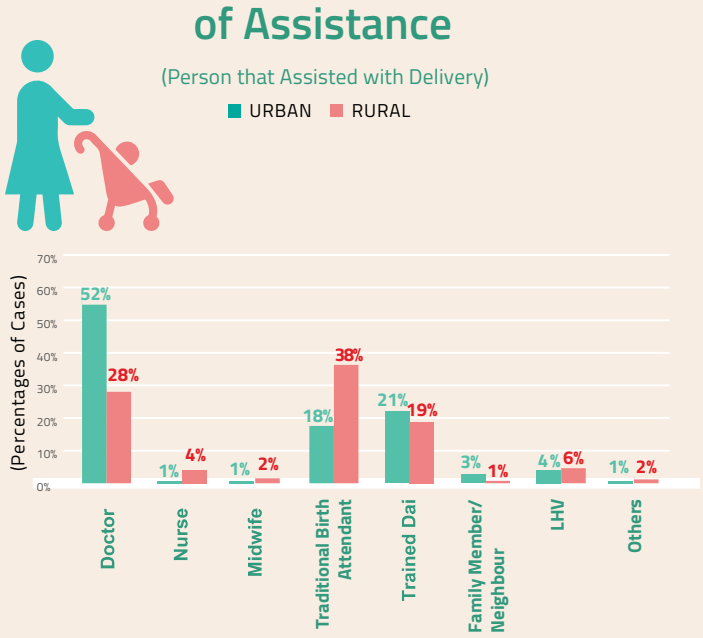


Child Mortality Statistics

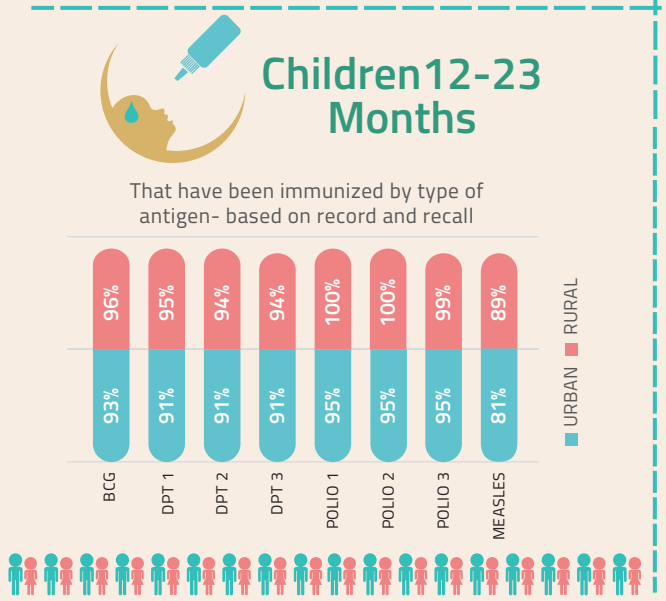
Child Delivery by Location



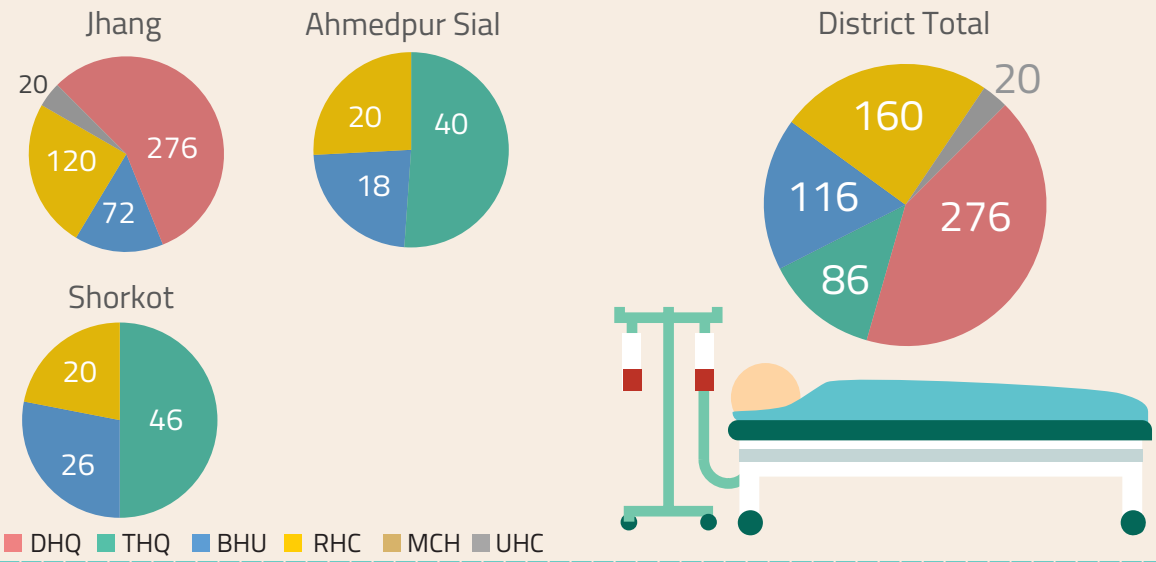
Child Delivery by Type of Assistance



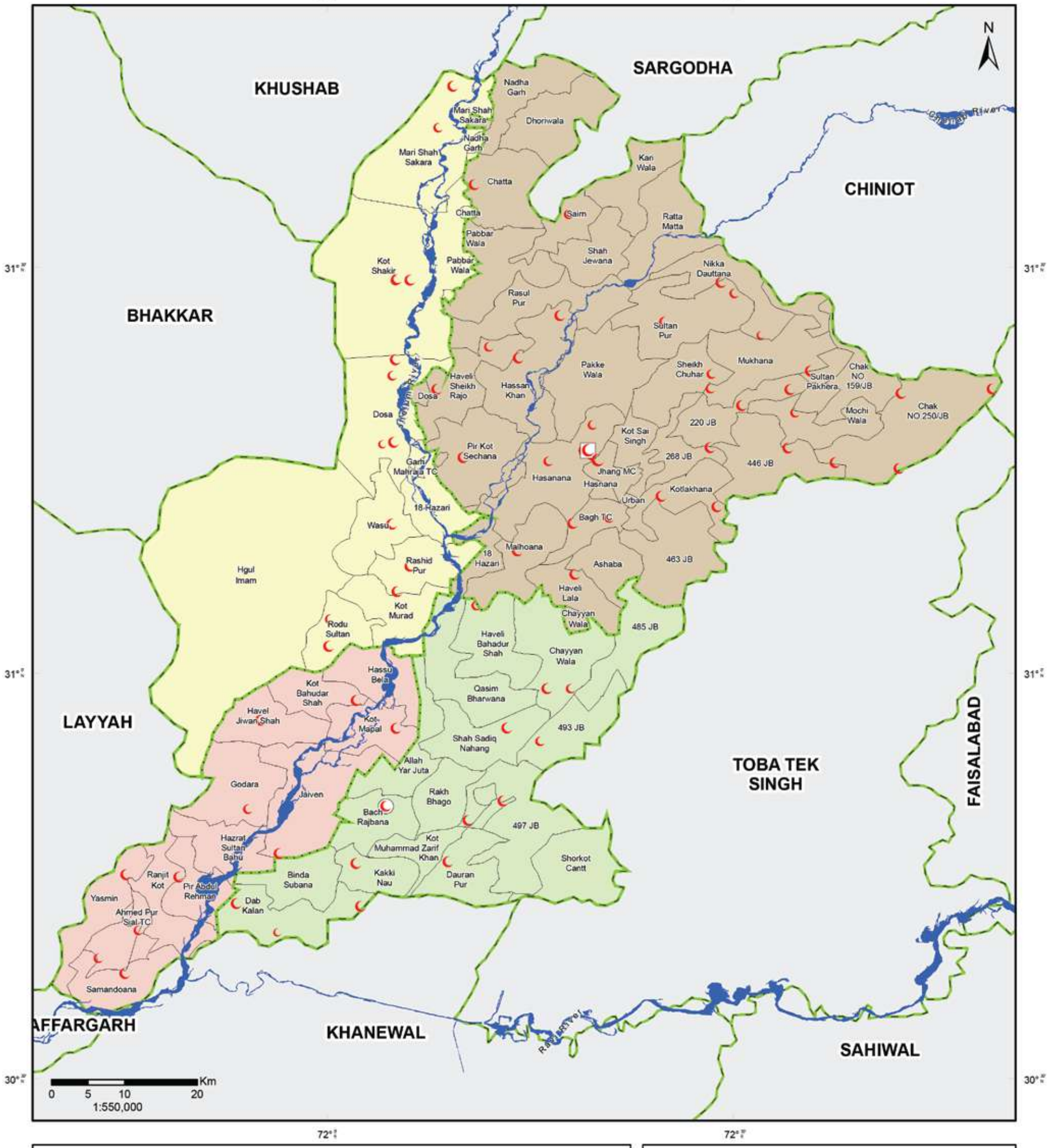
Children12-23 Months



Tehsil Wise Bedding Capacity in Healthcare Facilities



HEALTH FACILITIES



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- River & Water Body
- Union Council Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

World Health Organization
Health Department Punjab

Datum: WGS 1984
Units: Degree

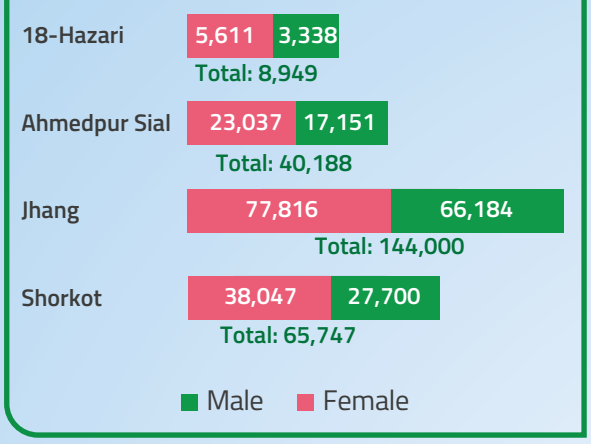
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-013
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

13 PUBLIC EDUCATION FACILITIES

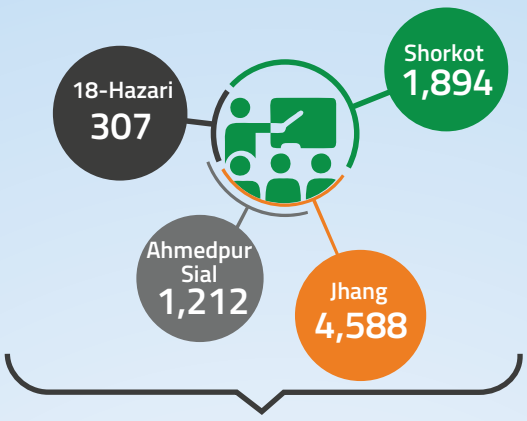
Education Facilities

Schools	Colleges	Universities
3,236	10	2

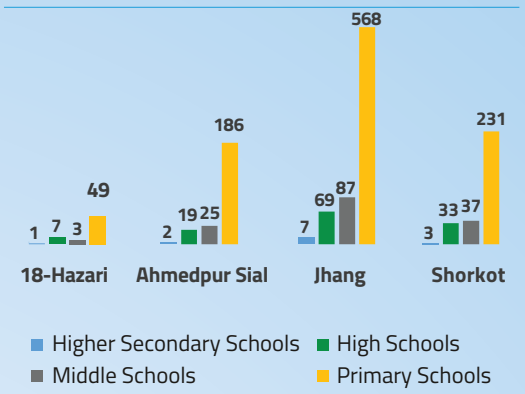
Total Enrollment by Gender



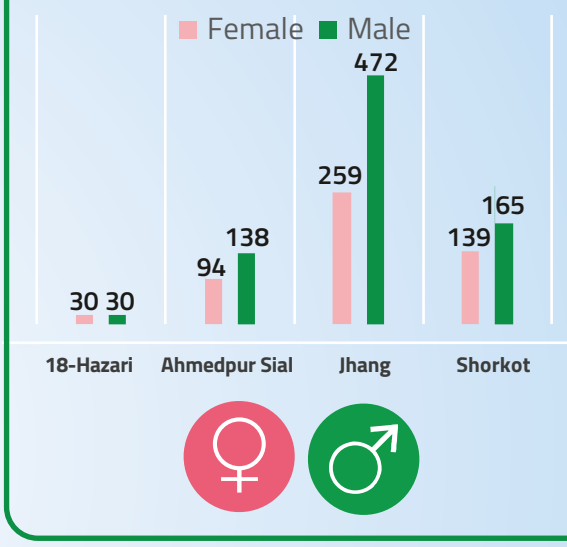
Number of Teachers



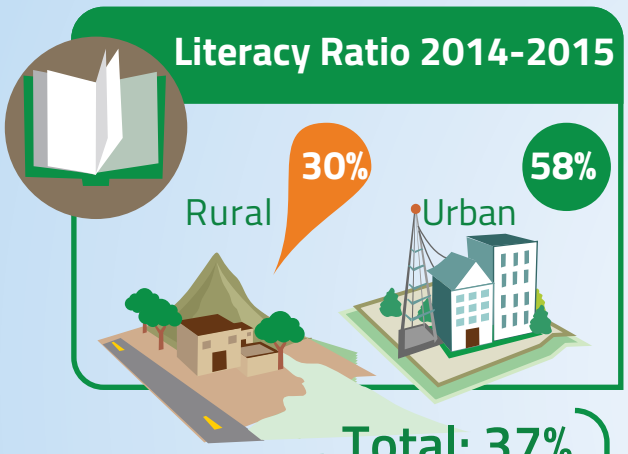
Tehsil Wise Govt. School by Type



Tehsil Wise Govt. School by Gender



Literacy Ratio 2014-2015

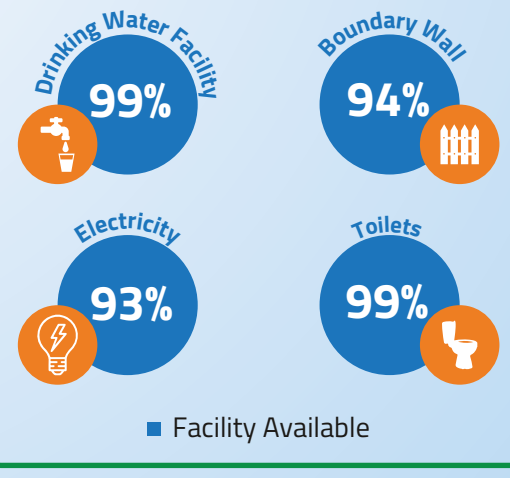


Total School Buildings

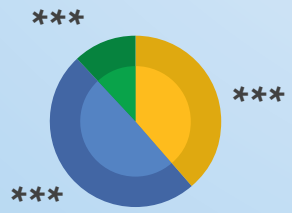
Tehsil Wise Govt. School by Building Type

Tehsils	Kacha	Semi Pacca	Pacca	Total
18-Hazari	3	1	55	59
Ahmedpur Sial	19	3	201	223
Jhang	53	3	665	721
Shorkot	29	0	268	297
Total:	104	7	1,189	1,300

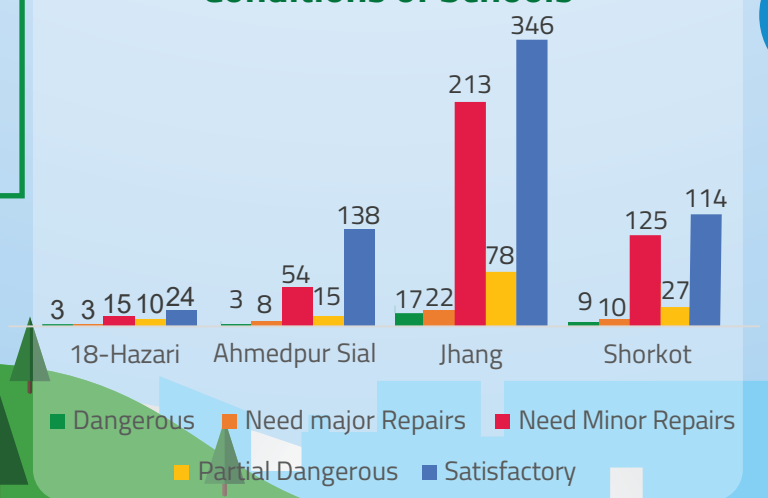
Tehsil Wise Facilities in Schools



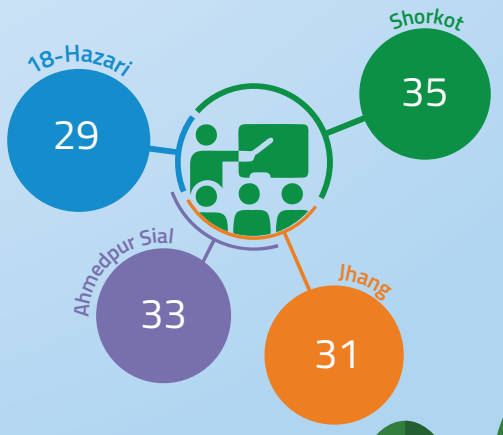
Private Education Facilities



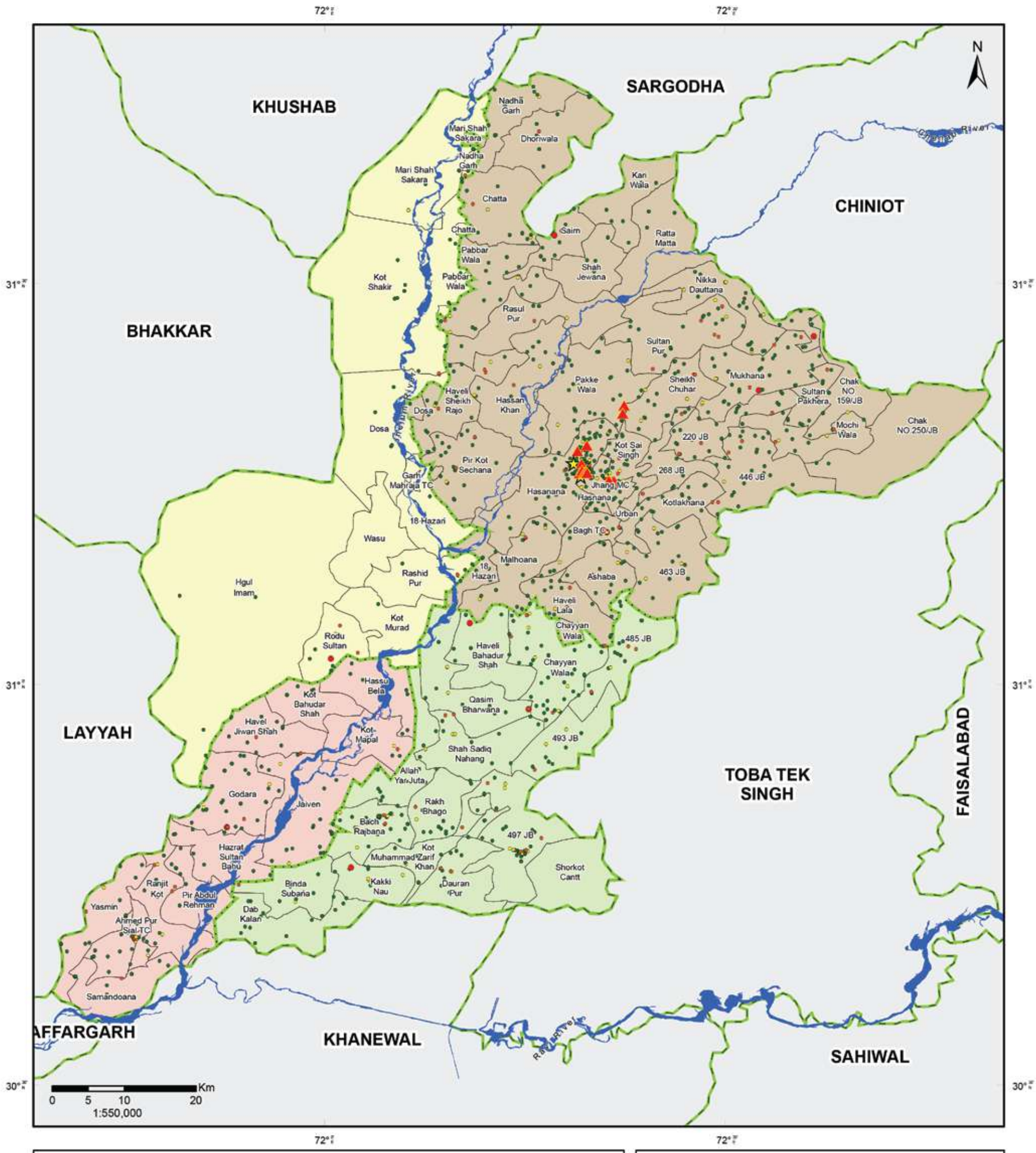
Tehsil Wise Building Conditions of Schools



Student to Teacher Ratio



EDUCATION FACILITIES MAP



Legend

- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School
- River & Water Body
- Union Council Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

School Education Department,
Government of the Punjab

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-014
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

14 IRRIGATION INFRASTRUCTURE

Canal System

Name	Length (km)
Major Canals	
Rajbah Kot Sultan	28.6
Minor Canals	
Nur Ka Minor	9.2
Bhanga Minor	26.9
Kakki Konah Minor	13.7
Mari Minor	22.5
Jalalpur Minor	9.4
Lakhi Minor	27.2
Distributaries	
Naurang Disty	12.4
Raja Branch Disty	26.1
Ghannu Disty	26.6
Chagh Disty	16.3
Hassuana Disty	19.2
3L Disty	32.2
Thada Garh Maharaja Disty	30.3
Dauluana Disty	27.8
Shorkot Disty	12.3
Massan Disty	11.3
Dhaular Disty	55.1
Manor Disty	35.6
Others	
Unknown	9.5
Sem Nala	16.2

Area Sown

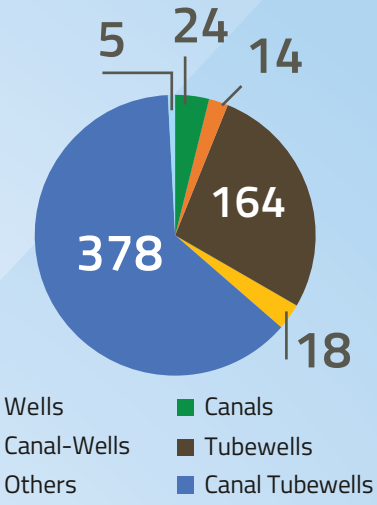
(Thousand Hectares)

Note: Excludes 485,000 hectares under orchards & 17,000 hectares under Tobacco, sown under "Zaid Rabi" Crop.

- **Total Area** 682
  - **Unirrigated** 79
  - **Irrigated** 603
    - **Canals** 24
      - **Tube Wells** 164
      - **Canals Wells** 18
    - **Wells** 14
      - **Canals Tube Wells** 378
      - **Others** 5

Area Sown by Different Irrigation Techniques

(Thousand Hectares)

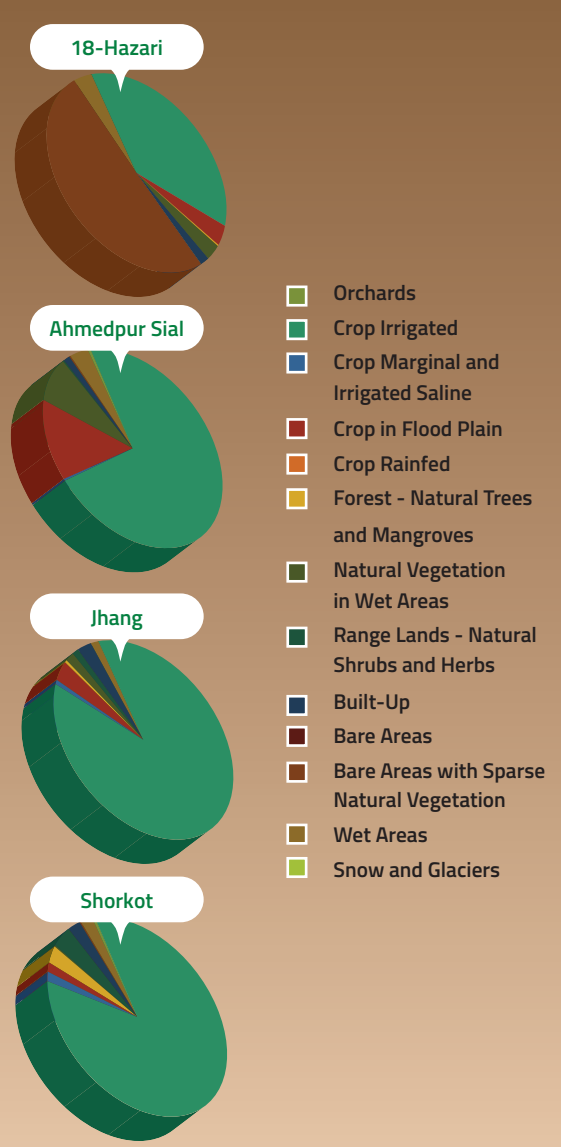


Tube Wells Installed by Energy Source (2013-14)

Total: 47,407

- Electric 7,127
- Diesel 40,280

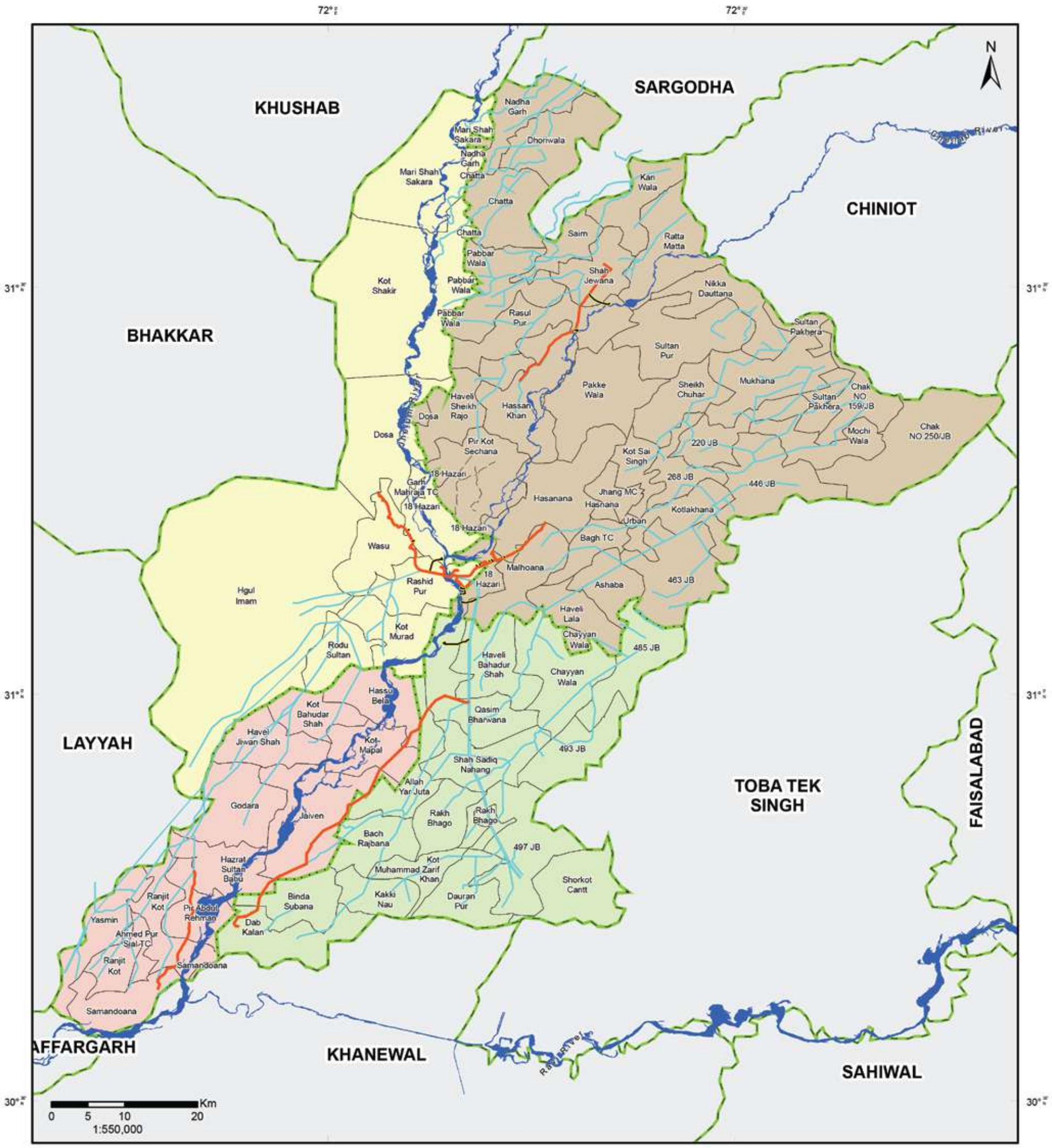
Tehsil Wise Land Use Classification



Flood Protection Structures	Length (m)
Embankments	
Breaching Section RD 1600	1,280.9
Trimmu Barrage	1,868.2
Rajbana Flood Bund	6,944.8
Dadal Flood Bund	36,397.2
Masson Flood Bund	20,593.9
Right Guide Bund	1,330.6
Guide Wall 2	3,498.9
Hassu Wali Flood Bund	43,872.2
Link Flood Bund	3,561.2
Lakhi Flood Bund	13,655.0
Guide Wall 1	1,792.9
Right Marginal Bund	16,460.1
Left Guide Bund	1,227.2
Left Marginal Bund	14,021.0
Colong Ring Bund	5,852.9

Flood Protection Structures	Length (m)
Spurs	
Spur AT 14900 of LMB	304.2
JHead Spur Makuri	3,453.9
Cross Spur AT RD 16900	474.7
Cross Spur at RD 23000	744.4
JHead Spur at RD 5500	5,936.0
J- Head Spur 1 of Massan	2,937.1
THead Spur T1 Head	243.3
Cross Spur AT 17900 at LM	584.1
Cross Spur at RD 28000	683.6
Cross Spur AT RD 11900	626.3
Thead Spur T1	1,205.9
Cross Spur at RD 28500	181.6
THead Spur T 2	1,838.8
Cross Spur at RD 33900	269.2
Cross Spur at RD 29000	286.0
J Head Spur 2	498.8
Cross Spur at 18600 of LM	266.4

IRRIGATION MAP



Legend

- Main Canal
- Minor Canal
- Others
- Embankments
- Spur
- Dikes/Studs
- Dams & Reservoirs
- Headworks
- Pondage/Ditch
- River & Water Body
- Union Council Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

MAP INFORMATION

Data Source(s):
Irrigation Department, Punjab
Survey of Pakistan
SUPARCO

Datum: WGS 1984
Units: Degree

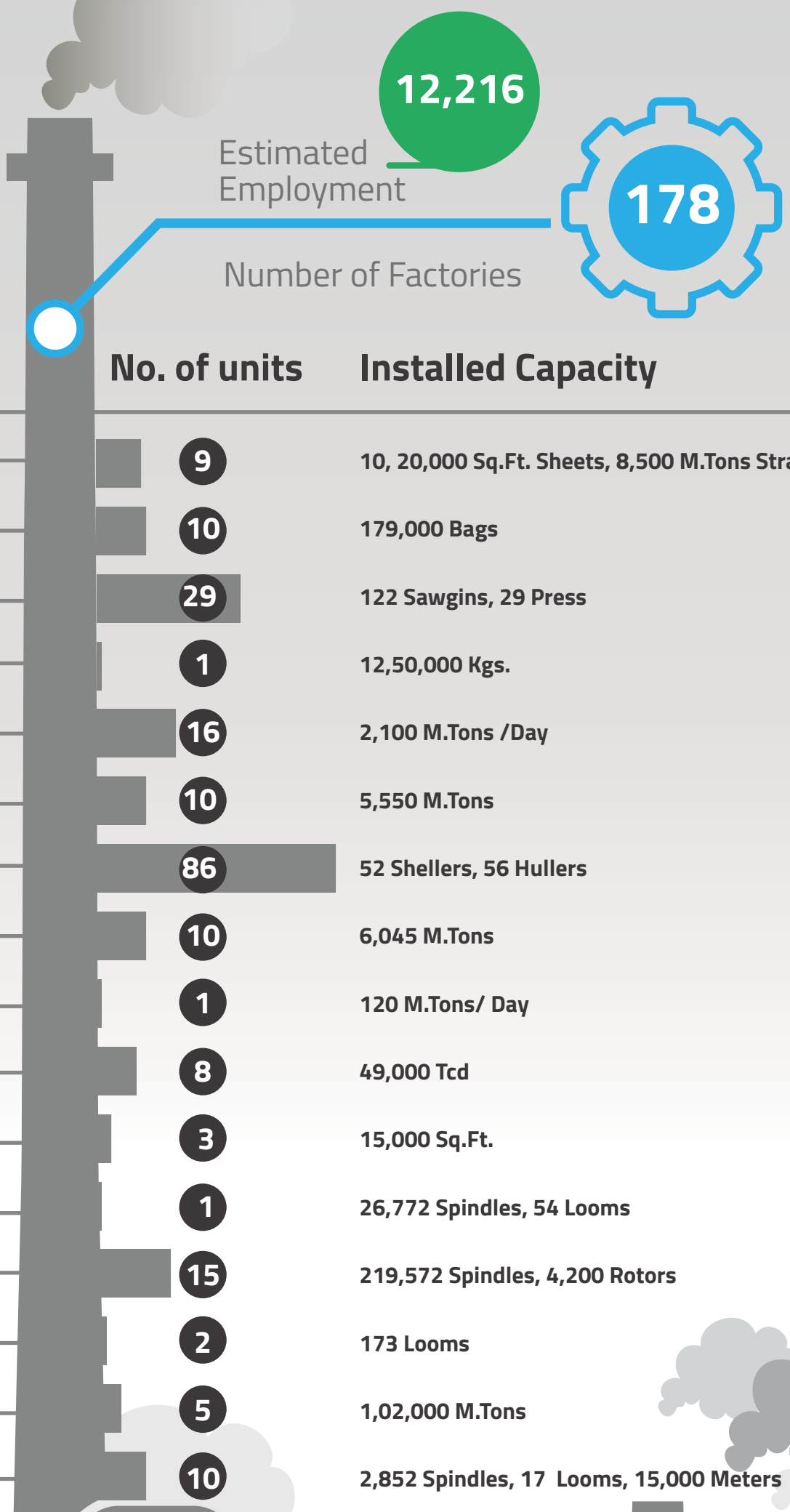
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-015
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

15 MAJOR INDUSTRIES

The industrial sector of District Jhang hosts a number of industries complementing its agricultural sector. There are around 86 rice mills, and many cotton ginning factories. Sugar and textile mills have also been set up for easy transport of raw material to factories.

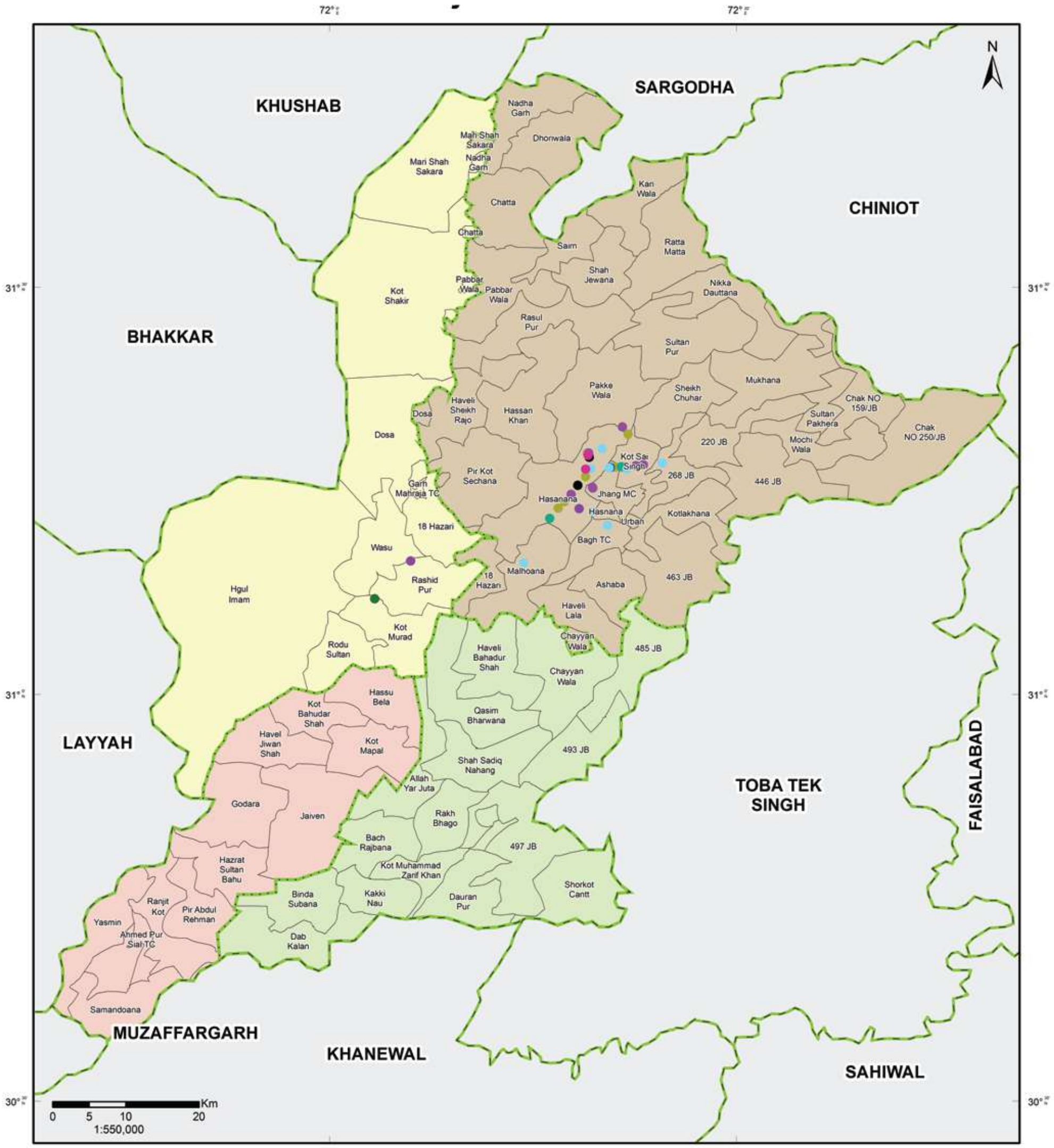
Number of Registered Factories & Employment Level

(As on 30th June 2014)



Industry	No. of units	Installed Capacity
Chip/Straw Board	9	10, 20,000 Sq.Ft. Sheets, 8,500 M.Tons Straw Board
Cold Storage	10	179,000 Bags
Cotton Ginning & Pressing	29	122 Sawgins, 29 Press
Dairy Products	1	12,50,000 Kgs.
Flour Mills	16	2,100 M.Tons /Day
Foundry Products	10	5,550 M.Tons
Rice Mills	86	52 Shellers, 56 Hullers
Sizing Of Yarn	10	6,045 M.Tons
Solvent Oil Extraction	1	120 M.Tons/ Day
Sugar	8	49,000 Tcd
Tannery	3	15,000 Sq.Ft.
Textile Composite	1	26,772 Spindles, 54 Looms
Textile Spinning	15	219,572 Spindles, 4,200 Rotors
Textile Weaving (Mill Sector)	2	173 Looms
Vegetable Ghee / Cooking Oil	5	1,02,000 M.Tons
Woollen Textile Spinning /Weaving	10	2,852 Spindles, 17 Looms, 15,000 Meters

INDUSTRIES MAP



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage

Abc Union Council Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

ABC District Boundary

- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Survey of Pakistan
Pakistan Bureau of Statistics

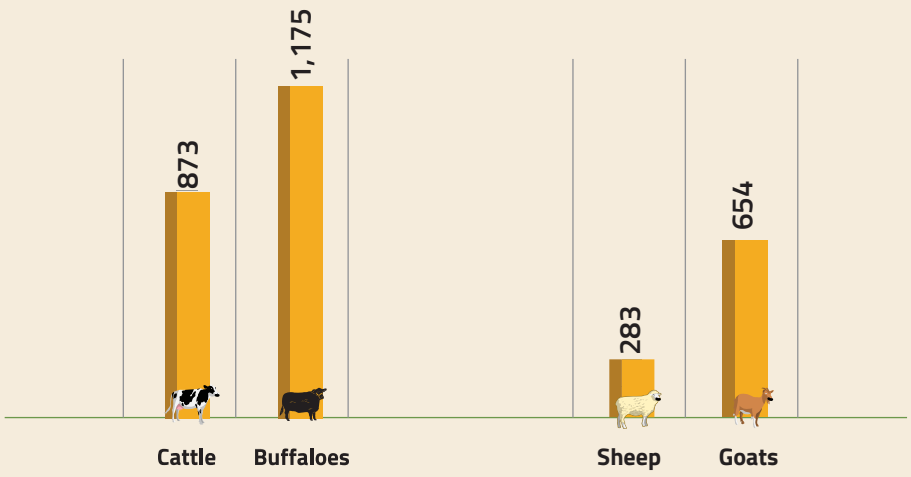
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-016
Prepared by: Project Management Unit, NDMA
Last Updated: 8th May, 2017

16 LIVESTOCK

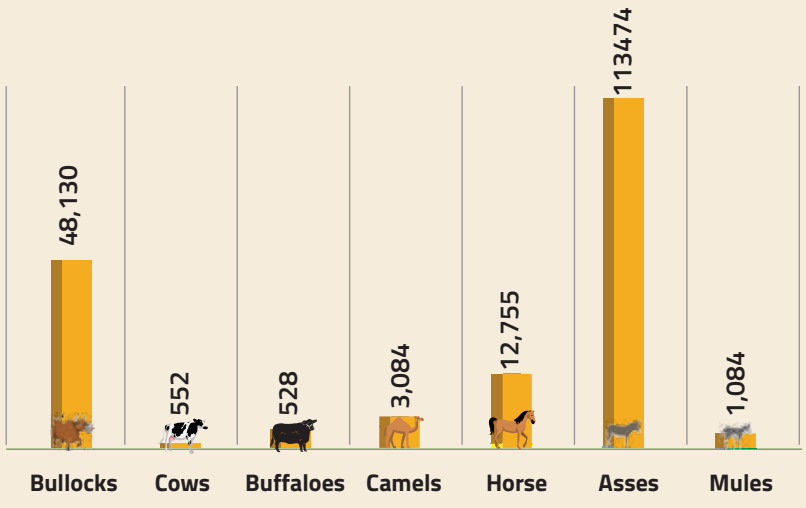
Number of Domestic Animals (2006)

(Thousand)



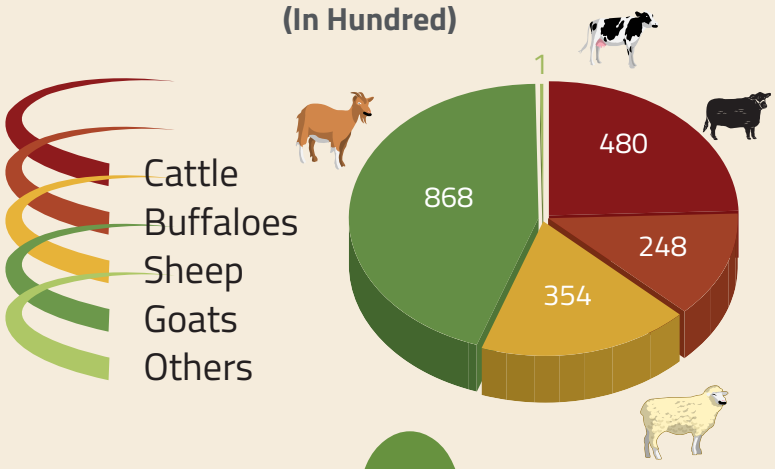
Number of Work Animals by Type (2006)

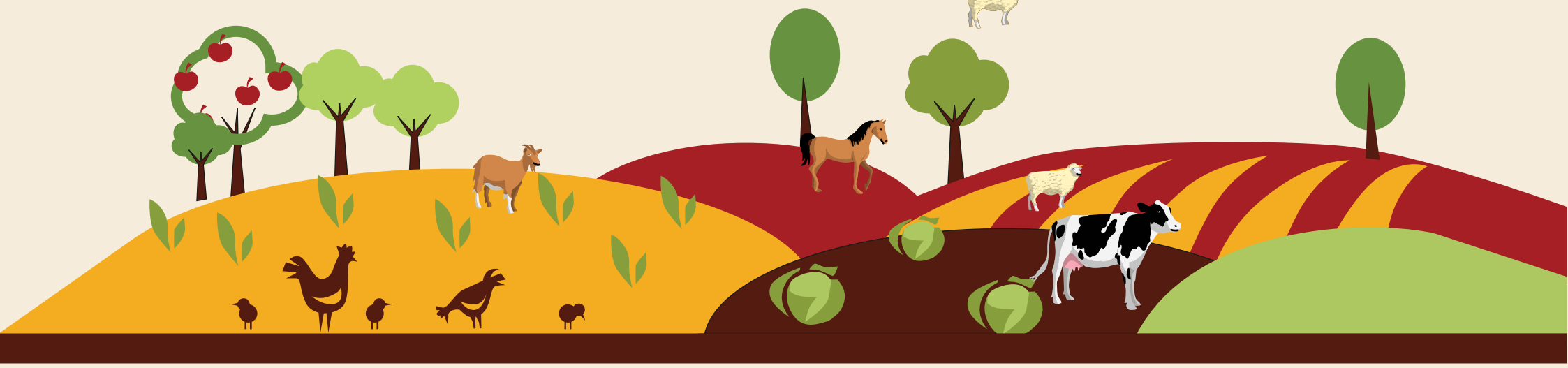
(Number)



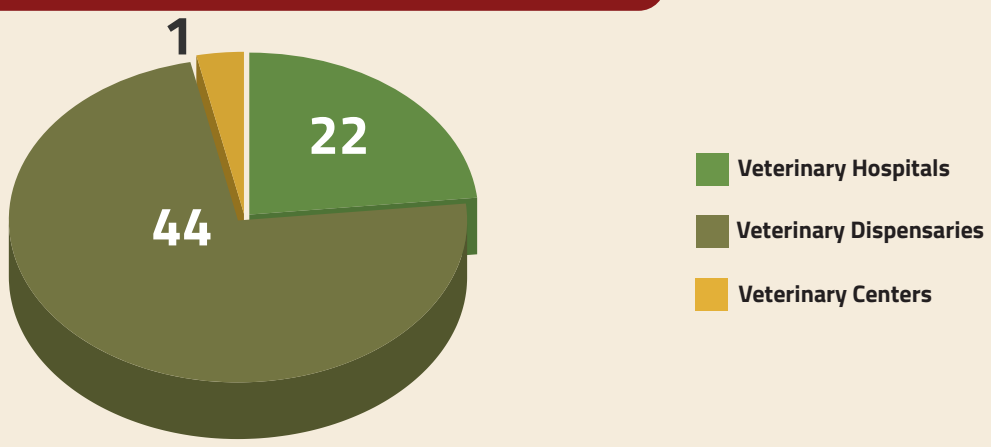
Animals Slaughtered in Recognized & Unrecognized Slaughter Houses by Type (2013-14)

(In Hundred)



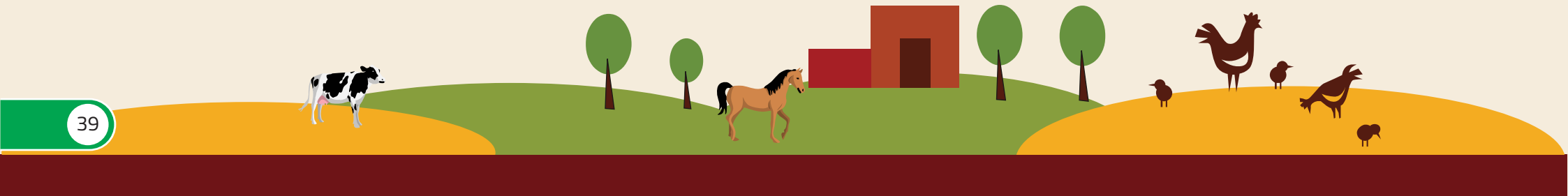


Veterinary Healthcare Facilities (2013-14)



Established Private Poultry Farms (2013-14)

	Broiler Farms	Layer Farms	Breeding Farms
Number	440	21	0
Capacity to Rear Birds per Annum (Thousand)	10,080	140	0

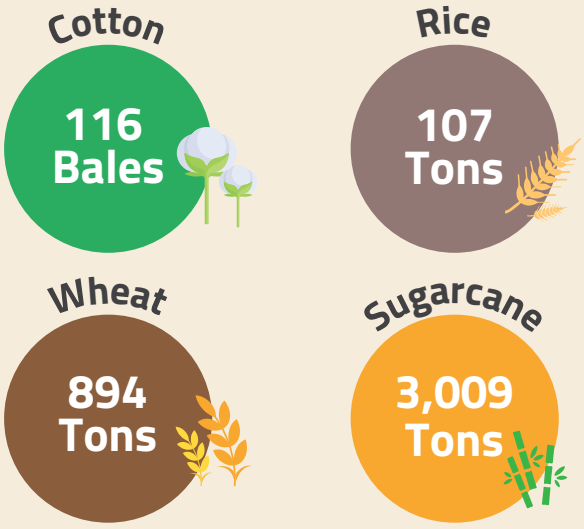


17 AGRICULTURE

The local economy the district Jhang is mainly driven by agriculture sector with a good yield of different cash crops along with production of fruits. The main crops of district are Sugarcane, Wheat, Cotton, Rice, Maize and Gram. The main fruits grown in the district include Citrus, Mangoes and Guavas. The main vegetables include Potatoes, Turnip, Onion, Cauliflower, Carrot, Ladyfinger and Peas.

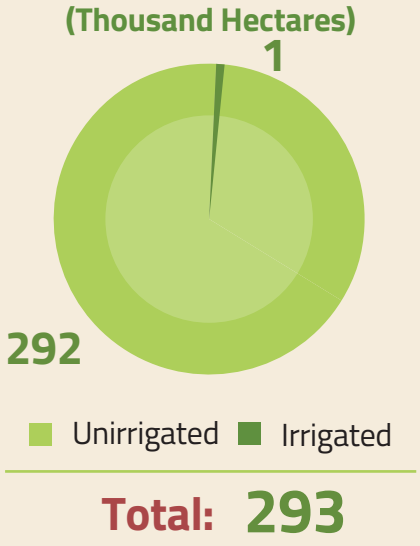
Major Crop Production

(2013-14)



Total Area Sown

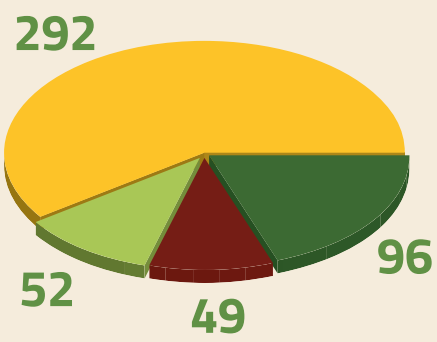
(Thousand Hectares)



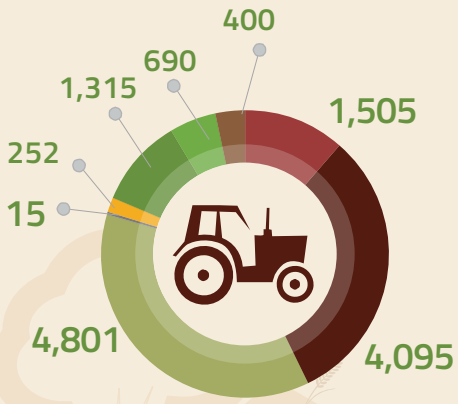
Total: 293

Area Sown Under Major Crops

(Thousand Hectares)



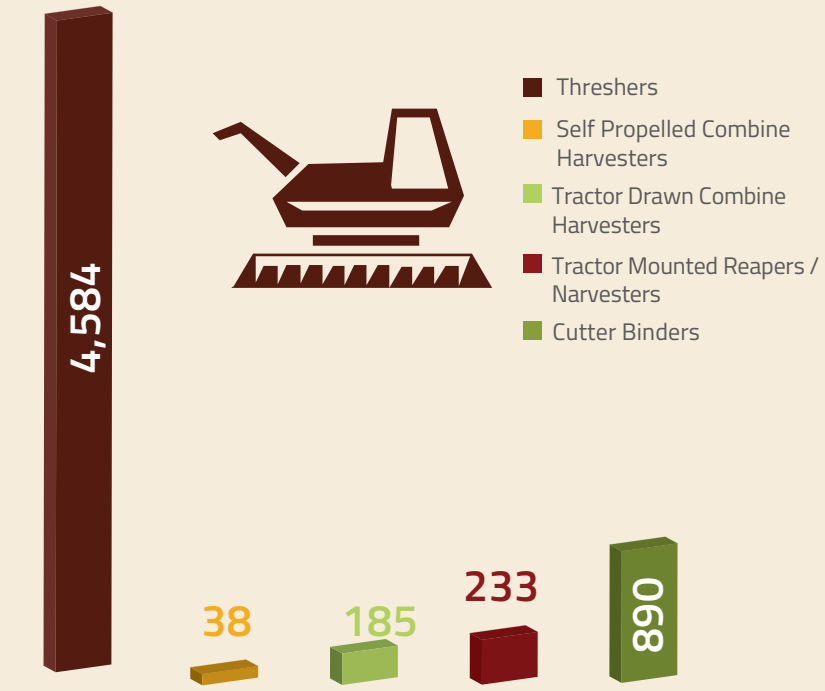
Tractors by Make (2012-13)



Total: 11,338

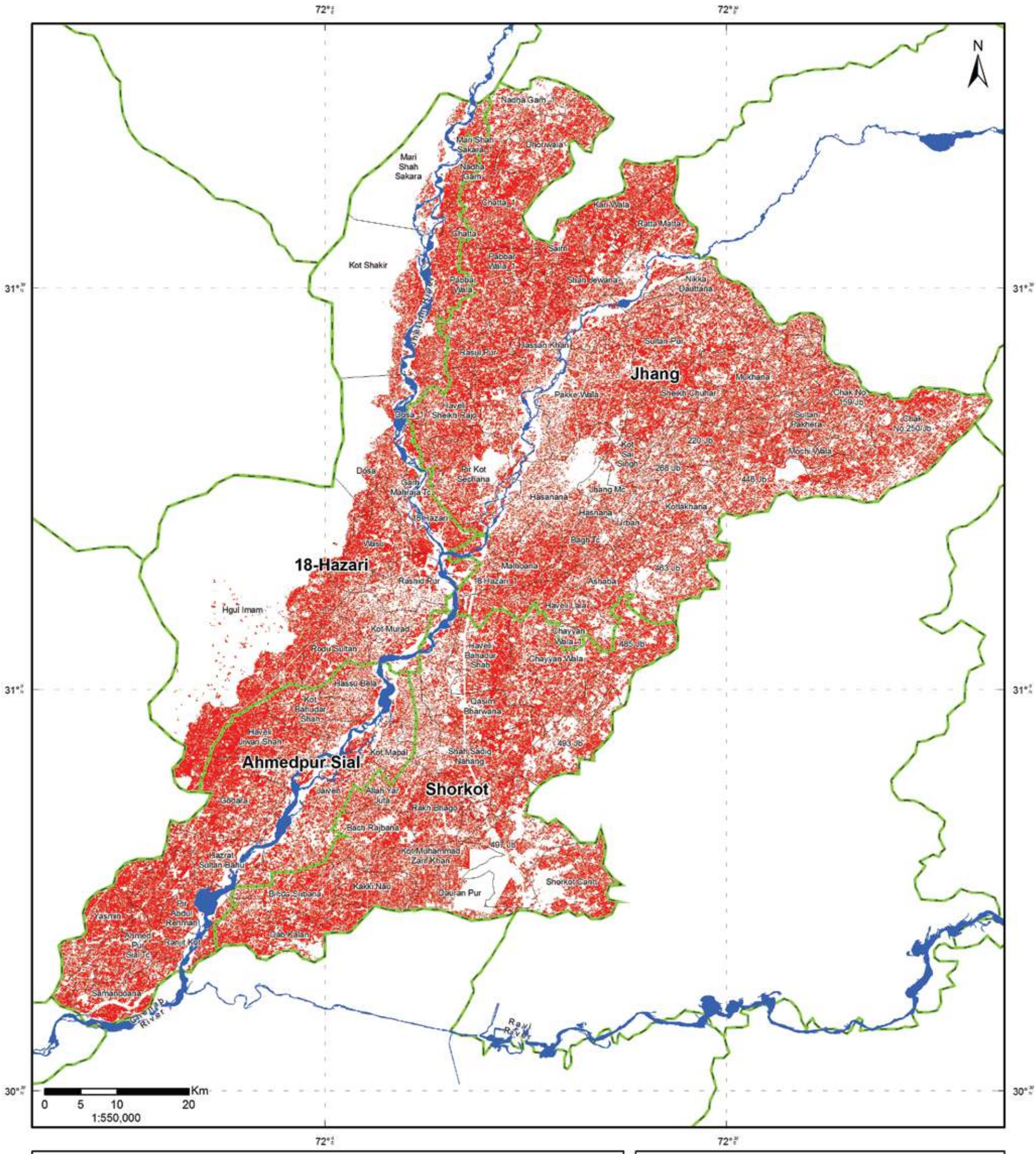
Sales of Fertilizer (2013-2014)

Threshers & Harvesters (2012-13)



Total: 4,415

RABI CROP MAP (JUNE TO FEB)



Legend

- Wheat
- River and Water Body
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

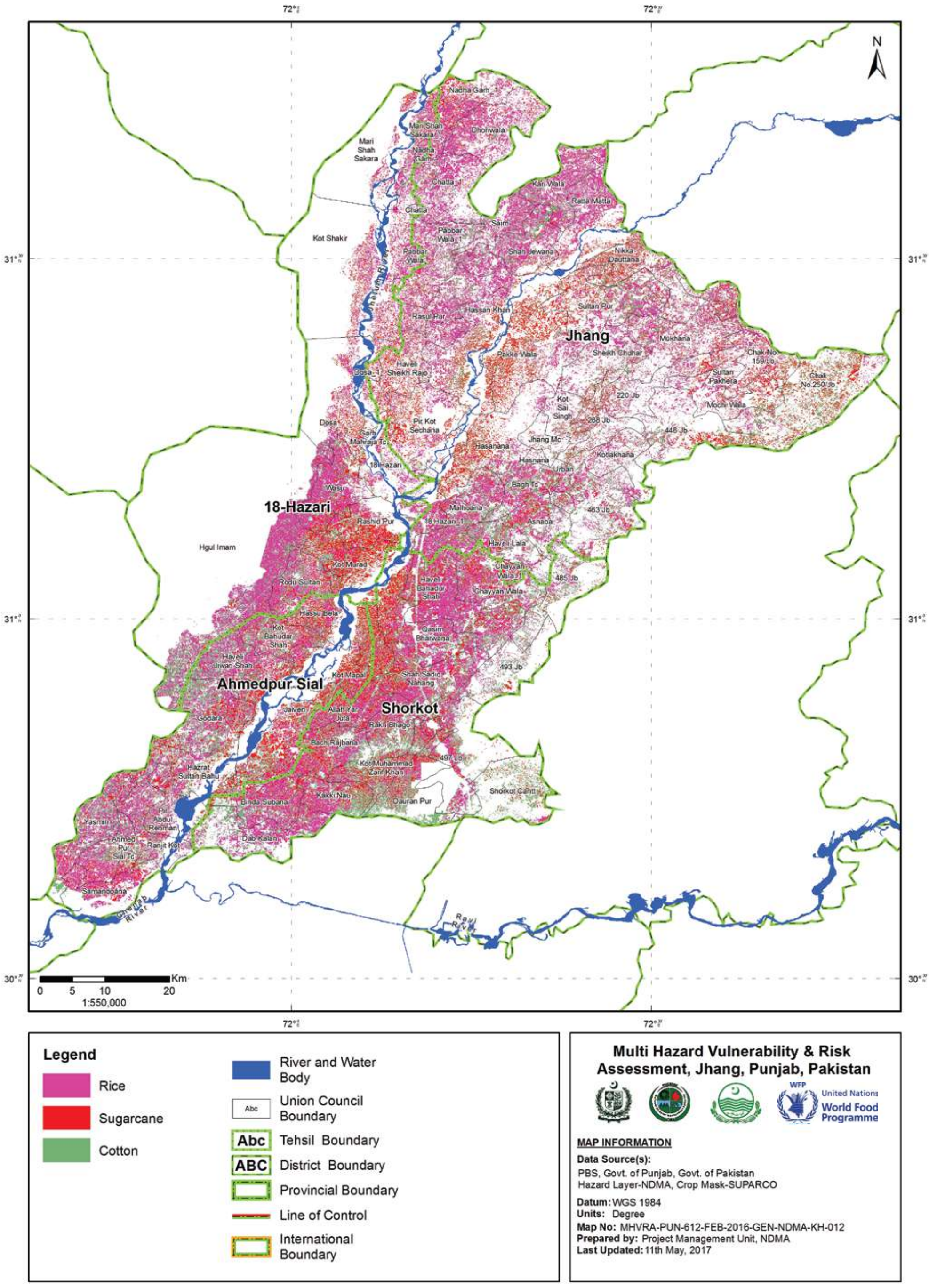
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-RB-012
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

KHARIF CROP MAP (AUG TO SEP)



Legend

- Rice
- Sugarcane
- Cotton
- River and Water Body
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-FEB-2016-GEN-NDMA-KH-012
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

18 RESCUE 1122

Emergency Calls
(by Type)

Road Accidents 25,926	Drowning 155	Fire 1,228	Blast 25	Building Collapse 210
Medical 58,296	Crime Incidents 4,258	Patient Rescued 159,804	Fake Calls 46	Others 0

Total Calls Received
1,698,141

Rescue Equipments

Fire Vehicle 2	Water Bowser 1	Ambulance 7	Truck 05 Ton 0
Rescue Vehicle 1	Recovery Vehicle 0	Ground Duty Vehicles (GDV) 1	Foam Vehicle 0
Water R.Van 0	Aerial Platform 0	Ladder 0	Boat Carrier Truck 0

Flood Resources

Boat 48	Scuba 0	Life Ring 51	Oars 31
On Board Motors (Obm) 36	Torch 10	Tents 0	Mosquito Net 0
Life Jacket 323	Life Guard 6	Plastic Mat 0	Dry Suit 2
	Nylon Rope 4	Carpet 0	

Human Resource
137 Persons

Address

Central Station, Faisalabad Road, Jhang Sadar

Longitude : 72.33 **Latitude :** 31.28

19 CLIMATOLOGY

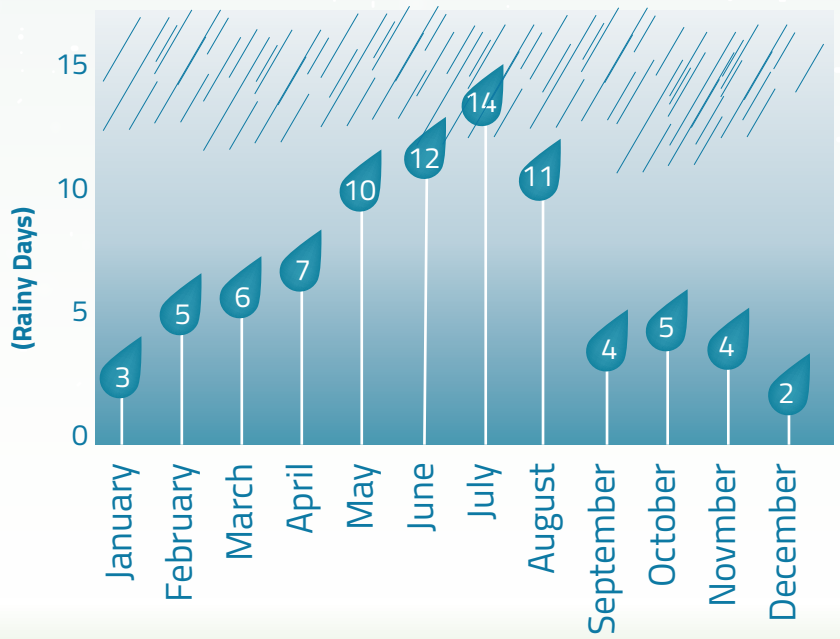
The climate of Jhang is hot and dry during summer and cold and dry in winter. The maximum temperature rises to 45°C while the minimum temperature falls to 3°C. The average rainfall in the district is 200mm.

Relative Humidity (%)

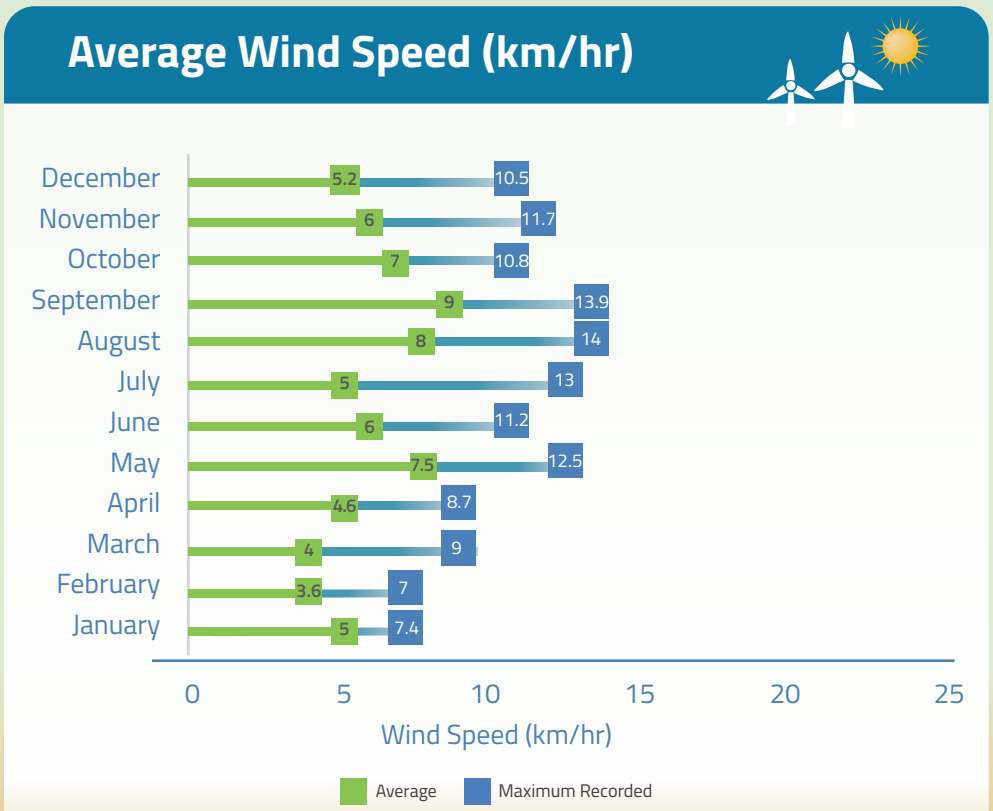
Average Precipitation (mm)

January	0	February	50	March	51
April	59	May	42	June	26
July	31	August	136	September	166
October	66	November	15	December	9

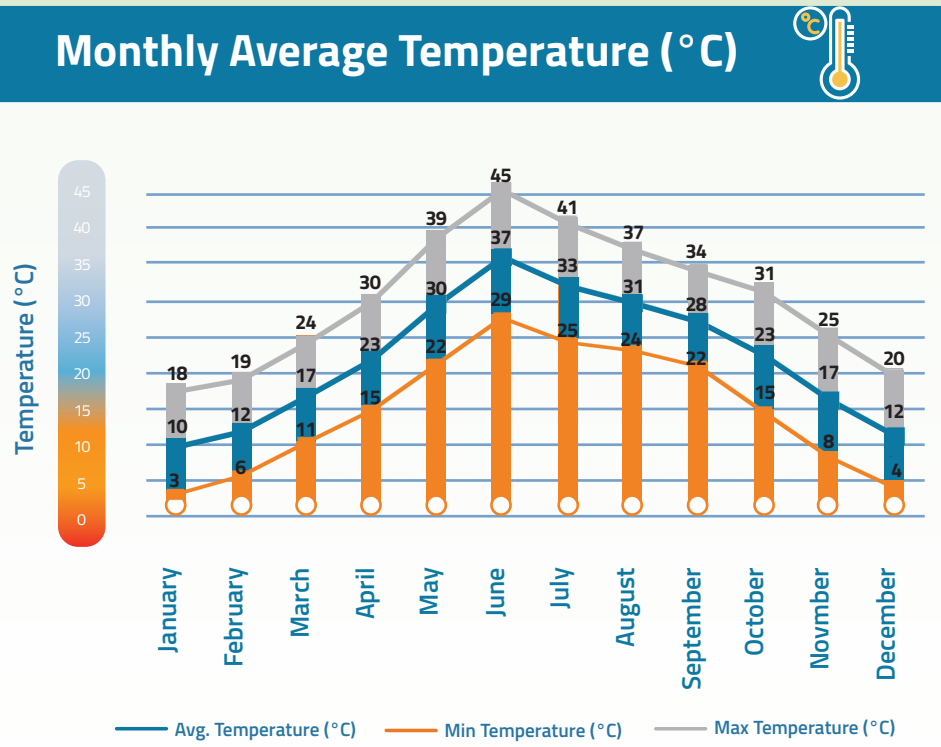
Average Rain Day (per month)



Average Wind Speed (km/hr)



Monthly Average Temperature (°C)



B | HAZARD ASSESSMENT

- DROUGHT
- EARTHQUAKE
- FLOOD

2 DROUGHT HAZARD ASSESSMENT

A large part of Pakistan faces severe effects of drought for most part of the year. Long-drawn-out presence of drought is a significant challenge to agriculture, human lives, livestock, forests, water resource management, urban planning and food security. Due to changing climatic patterns, the drought phenomenon is likely to increase in terms of recurrence, extent, and intensity, for which drought hazard assessment can provide scientific basis for planning interventions for DRR and land use planning. In this study following indices are used for assessment of drought hazard for District Multan to a Union Council level.

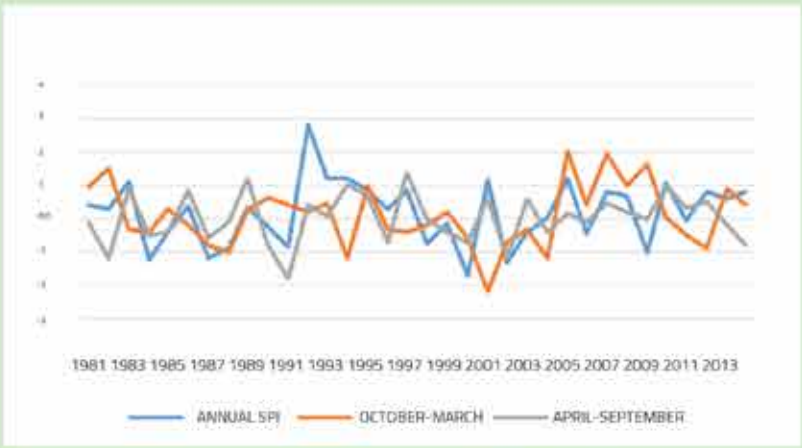
a. **Standard Precipitation Index (SPI)**
b. **Normalized Difference Vegetation Index (NDVI)**
c. **Drought Severity Index (DSI)**
d. **Temperature Condition Index (TCI)**
e. **Vegetation Condition Index (VCI)**
f. **Vegetation Health Index (VHI)**

Drought return period

A return period is the recurrence interval of a drought. It is statistical measurements, particularly based on previous data. Strategic planning and management of water resources under climate change and drought conditions often require the assessment of return periods of drought events categorized by high severities. Based on above mentioned 12-SPI, drought return period of 1951-2015 for district Multan is mentioned below.

Drought Occurrence (Years)	Most Severe Drought
1984, 1985, 1987, 1988, 1991, 1998, 2000, 2002, 2003, 2009	2000

Standard Precipitation Index (SPI) 1981-2014

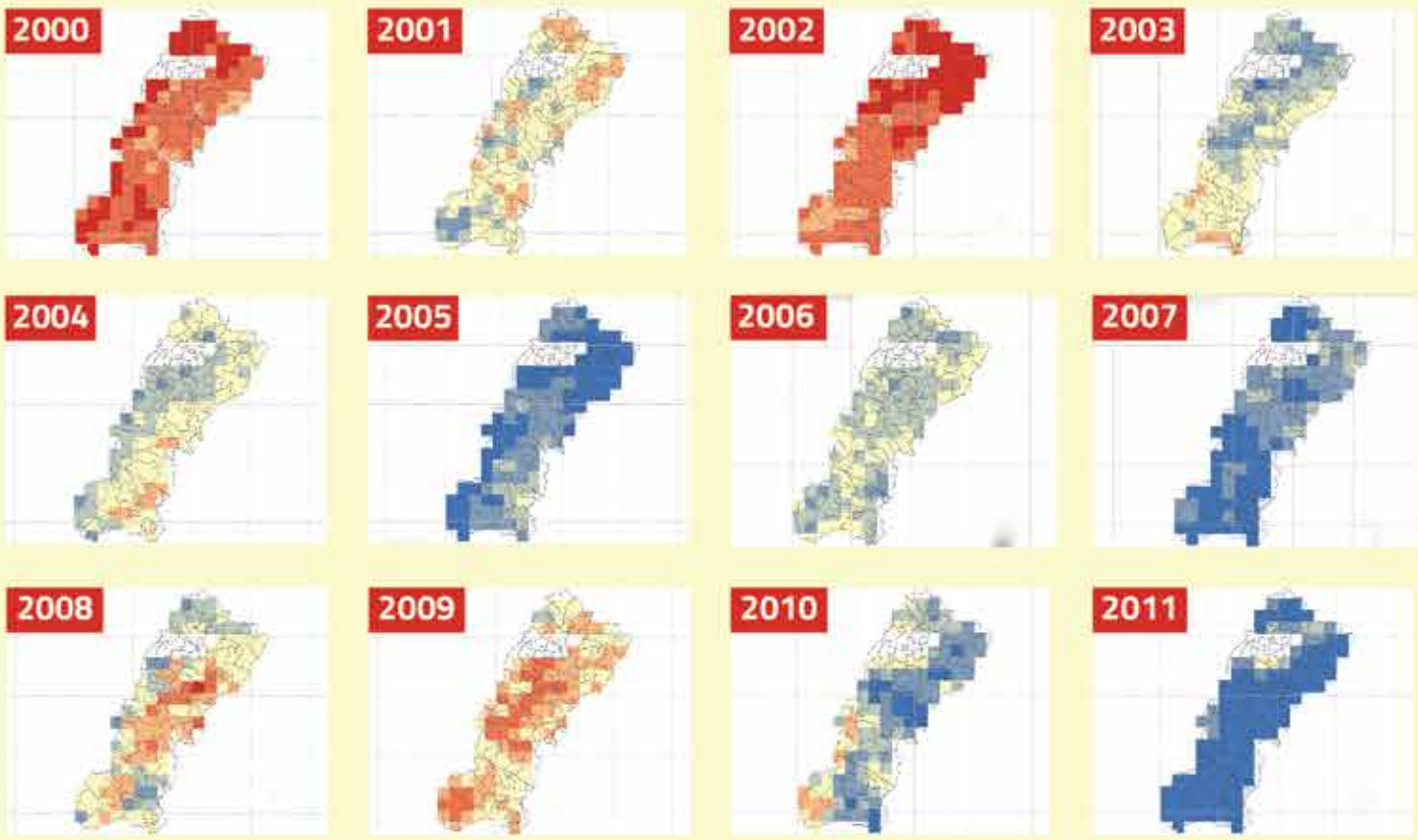


SPI Value	Conditions
2.0+	Extremely Wet
1.5 to 1.99	Very Wet
1.0 to 1.49	Moderately Wet
-0.99 to 0.99	Near Normal
-1.0 to -1.49	Moderately Dry
-1.5 to -1.99	Severely Dry
-2.0 and less	Extremely Dry

Description:

SPI is a tool to determine the severity of a drought at a given time scale (temporal resolution) of interest for any rainfall station with historic data (record of at least 30 years). Mathematically, the SPI is based on the cumulative probability of a given rainfall event occurring at a station.

Drought Severity Index (DSI)



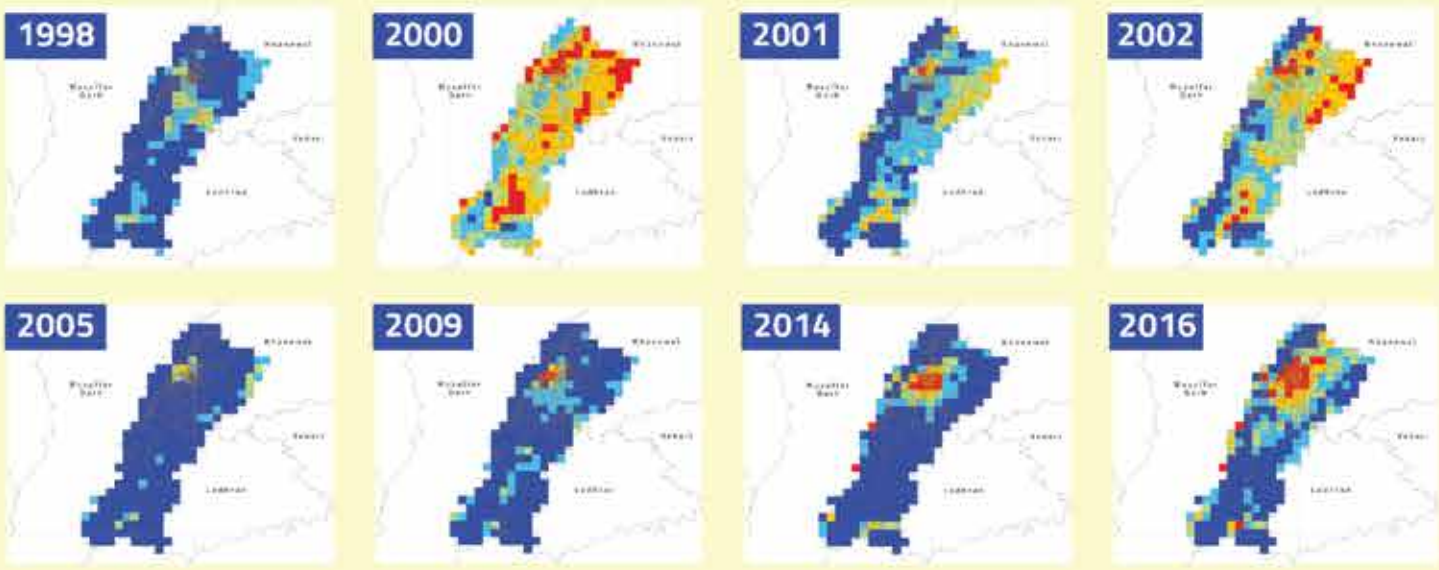
Legend:

- -1.5
- -0.5
- 0.5
- 1.5
- -1
- 0
- 1

Description:

DSI is an effective tool to estimate relative dryness of the land through using available temperature and precipitation data. It spans between the scales of -10 (dry) to +10 (wet).

Vegetation Condition Index (VCI)



Legend:

- <10 (Extreme Drought)
- <20 (Severe Drought)
- <30 (Moderate Drought)
- <10 (Mild Drought)
- <10 (No Drought)

Description:

VCI is used to identify drought situations and determine the onset, especially in areas where drought episodes are localized and ill defined.

Vegetation Health Index (VHI)

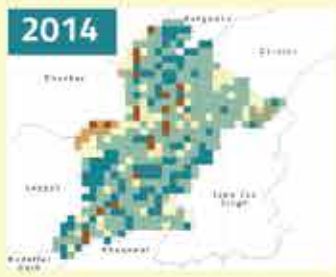
Legend:

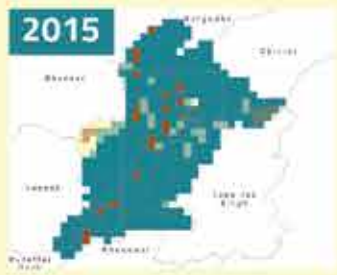
- <10 (Extreme Drought)
- <20 (Severe Drought)
- <30 (Moderate Drought)
- <10 (Mild Drought)
- <10 (No Drought)

Description:

VHI is used to identify and classify stress to vegetation due to drought.

Temperature Condition Index (TCI)





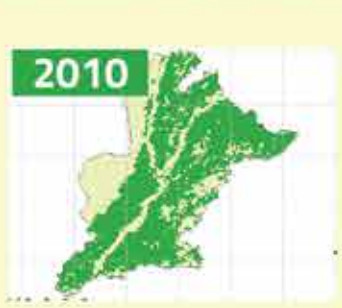
Legend:

- <10 (Extreme Drought)
- <20 (Severe Drought)
- <30 (Moderate Drought)
- <10 (Mild Drought)
- <10 (No Drought)

Description:

TCI is used to determine stress on vegetation caused by high temperatures and dryness.

Normalized Difference Vegetation Index (NDVI)



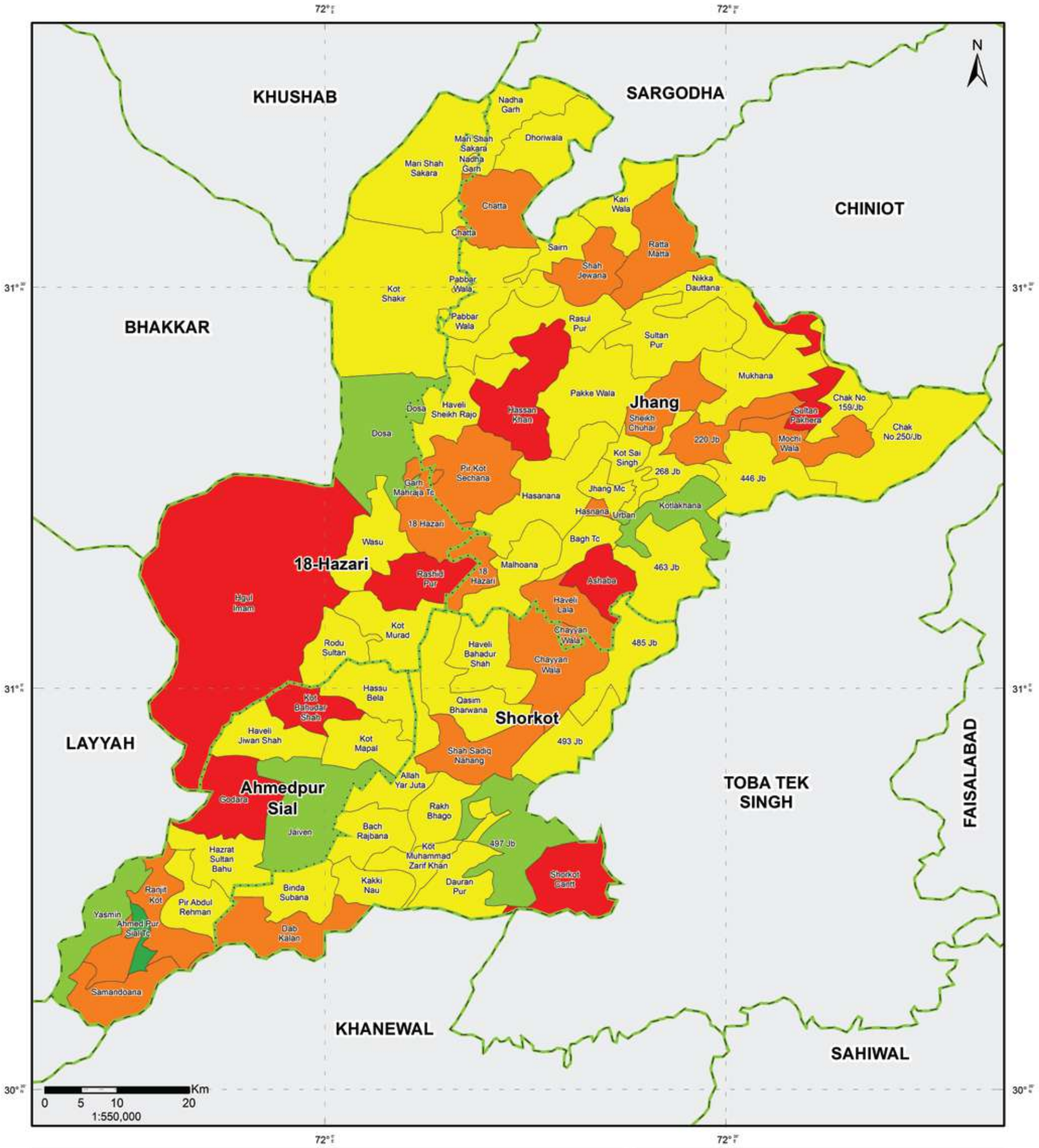
Legend:

- -0.3-0
- 0.01-0.1
- 0.11-0.3
- 0.31-0.6
- 0.61-0.9

Description:

The NDVI utilizes satellite imagery to evaluate variations in the normalized difference between the reflectance in near infrared (NIR) and visible red bands, which are responsive to changes in vegetation. Higher NDVI values reflect healthy vegetation, whereas lower NDVI values depict stress condition.

DROUGHT PRONE UNION COUNCILS



Legend

Drought Severity Index (DP)

- No Drought
- Mild Drought
- Moderate Drought
- Severe Drought
- Extreme Drought
- Abc — Union Council Boundary

- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

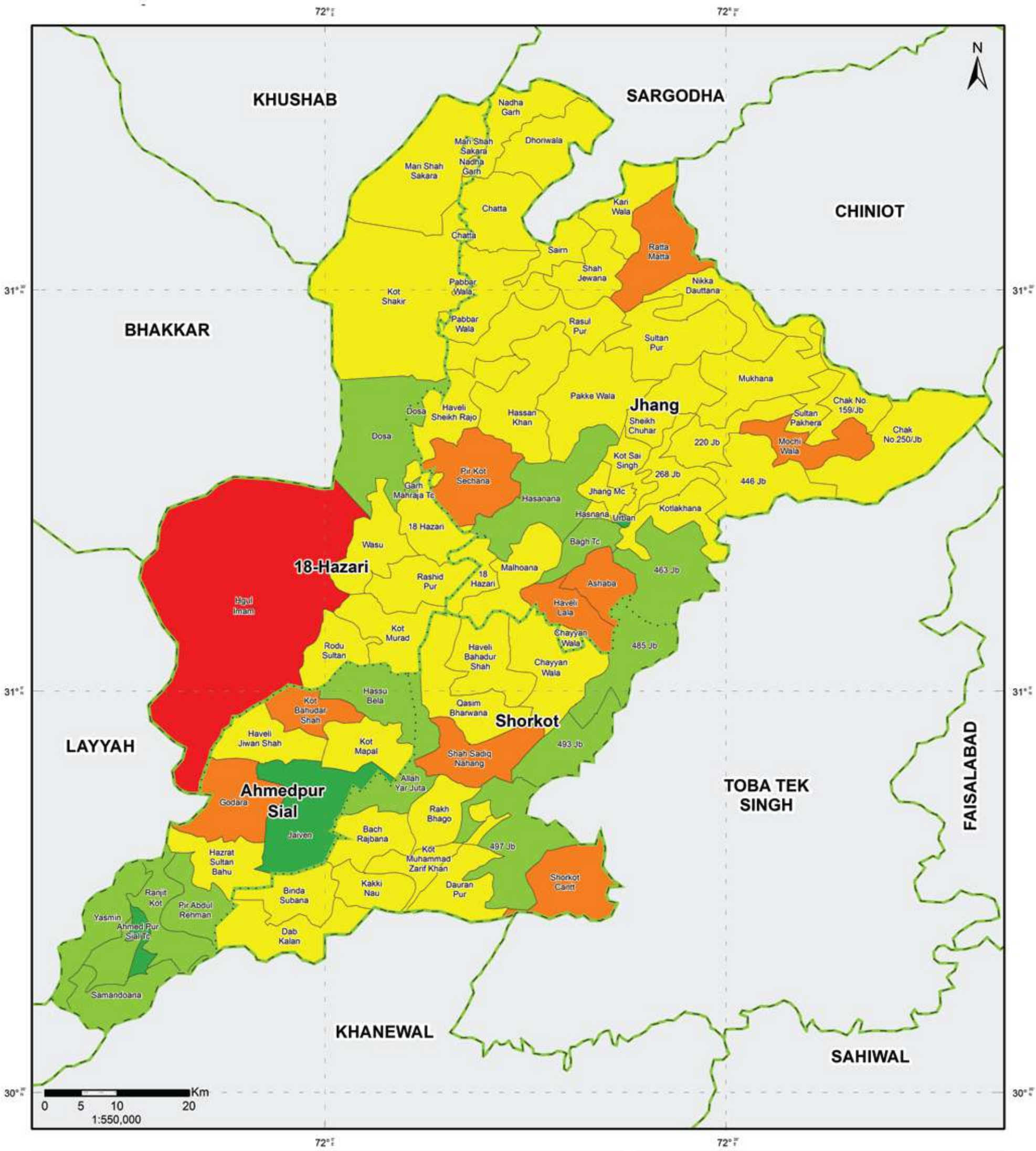
MAP INFORMATION

Data Source(s):
Pakistan Council of Research In Water Resources
SCARPs Monitoring Organization,WAPDA.

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-MAR-2016-HAZ-02-NDMA-001
Prepared by: Project Management Unit, NDMA
Last Updated: 7th March, 2017

FREQUENTLY DROUGHT PRONE UNION COUNCILS



Legend

Drought Severity Index (FDP)

- No Drought
- Mild Drought
- Moderate Drought
- Severe Drought
- Extreme Drought
- Abc — Union Council Boundary

- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Council of Research In Water Resources
SCARPs Monitoring Organization,WAPDA.

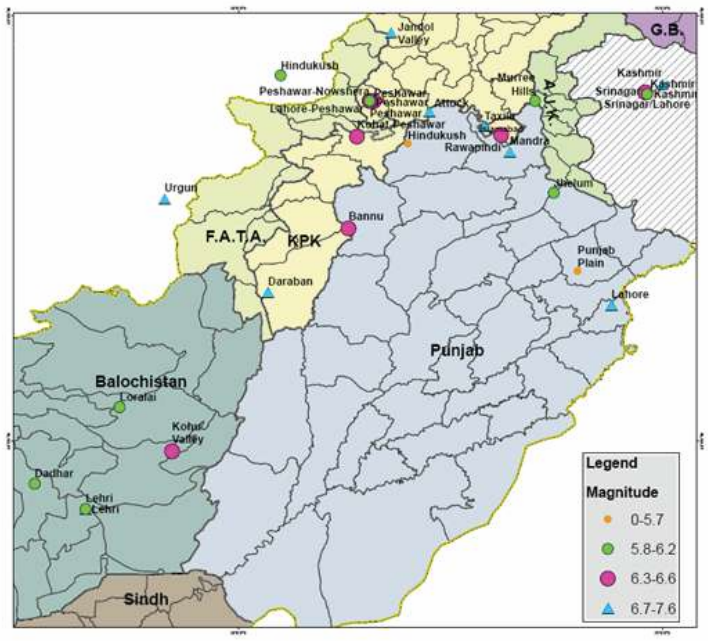
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-MAR-2016-HAZ-02-NDMA-002
Prepared by: Project Management Unit, NDMA
Last Updated: 7th March, 2017

21 EARTHQUAKE HAZARD ASSESSMENT

Earthquake is defined as shaking and vibration at the surface of the earth resulting from underground movement along a fault plan from volcanic activity, cryoseismic activity, the sudden cracking of frozen soil or rock or due to movement of plate boundaries of the Earth. Earthquakes hazard at a site is characterized by either probabilistic or deterministic seismic hazard analysis. Probabilistic seismic hazard analysis involves the quantification of rate of probability of exceedance taking into consideration all possible earthquakes. Deterministic analysis evaluates the site specific seismic hazard that is influenced by maximum hazard from controlling sources. The general Probabilistic seismic hazard analysis procedure involves quantifying the annualized rate of exceedance of specified ground motions of various intensities, which is transformed to obtain the probability of exceedance of ground motions within the lifetime of the structure and infrastructure of interests. District Jhang has a fault line, the Sargodha Fault passing through Jhang and 18-Hazari tehsil. According to the historical catalogues used in this assessment, this district has majorly experienced earthquakes in the range of magnitude 5-6. The main findings of the probabilistic seismic hazard assessment were that the ground motions in District Jhang show no significant spatial variability throughout the district when ground motions are mapped for tehsil levels. The following table shows the PGA based values against each settlement type in District Jhang. Some of the most important historical seismic events in the region are shown below.

Historical Seismic Events



For the purpose of seismic designs of buildings, Pakistan has been divided into 5 Zones. These Zones are based on Peak Ground Acceleration (PGA). Ranges are shown in Table below:

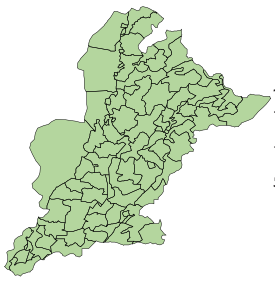
Zone	Intensity	Ground Motion (g)	PGA (g*)
1	Very Low	0.01 – 0.08	0.08
2A	Low	0.08 – 0.16	0.15
2B	Medium	0.16 – 0.24	0.20
3	High	0.24 – 0.32	0.30
4	Very High	> 0.32	0.40

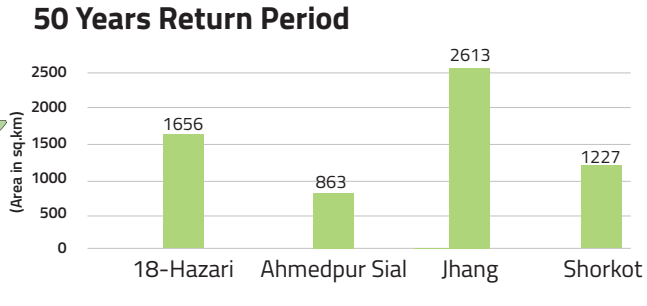
*Where g is acceleration due to gravity

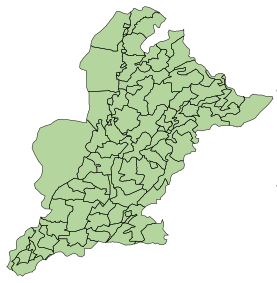
Methodology of Assessment

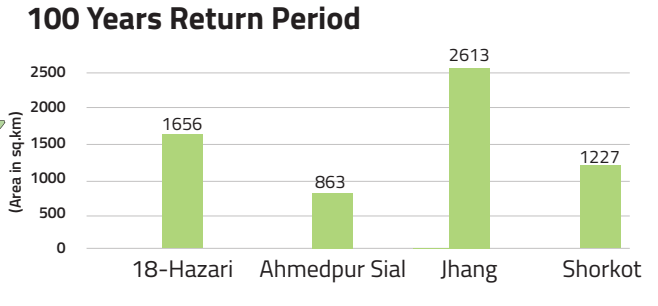
The first step was the definition of area of interest followed by the compilation of Earthquake Catalogue from different national and international sources. The catalogues were homogenized, declustered and checked for completeness. Ground Motion Prediction Equations (GMPEs) were selected and the data was processed in a hazard computation software (CRISIS). The output of the exercise was the probabilistic seismic hazard mapping on 50, 100, 250, 475 and 2500 years return periods. The next stage was Sensitivity Analysis of tools used in the study. The last step was Seismic Response Analysis of site soil using strong ground motions records using Deepsoil software. The final phase of assessment was the incorporation of site soil conditions for seismic microzonation to map site specific ground motions.

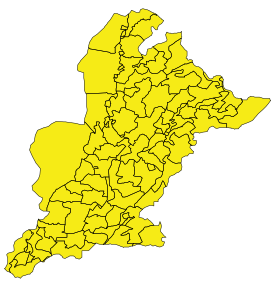
Seismic Hazard Maps Based on Return Periods (50,100,250,475 and 2500 Years)

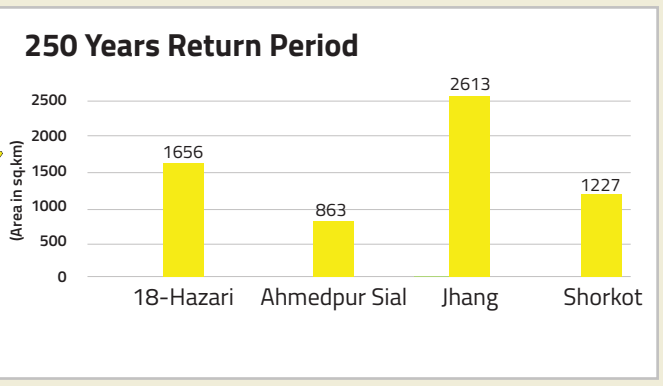


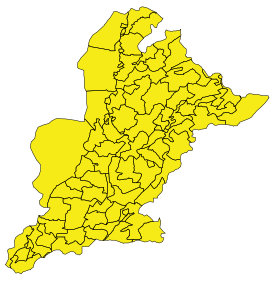


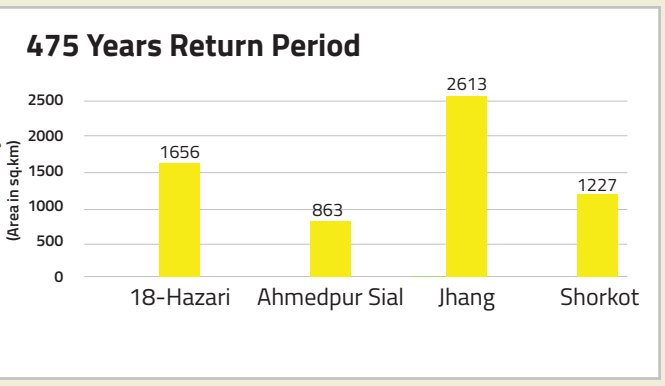


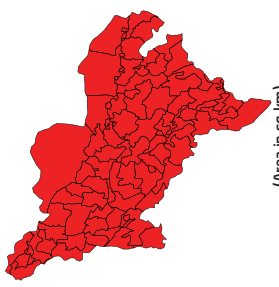


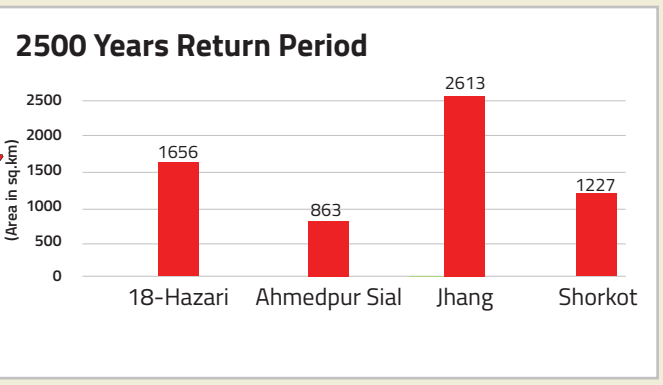












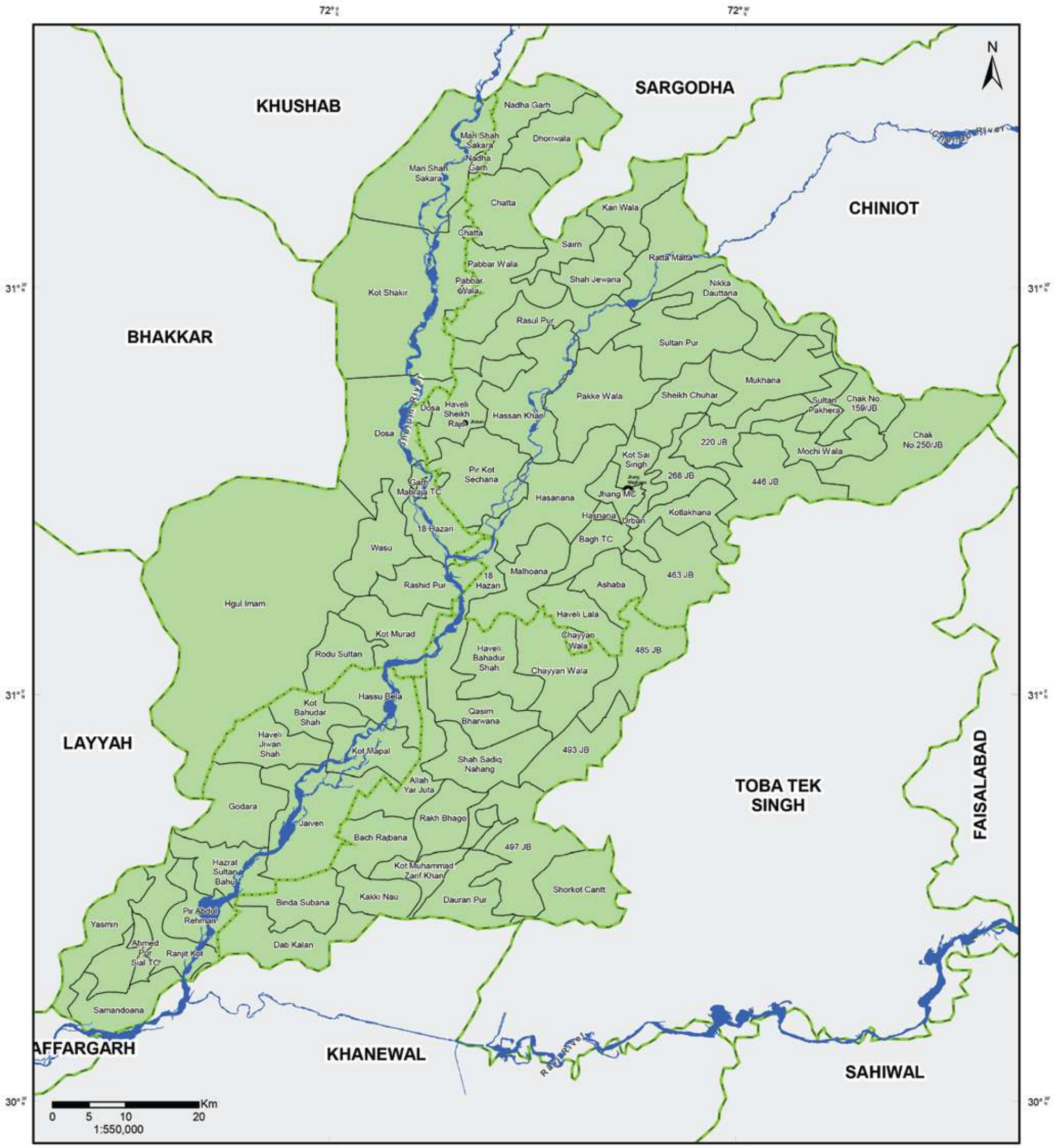
Hazard Zones (g)*

- Zone 1 (Very Low)
- Zone 2A (Low)
- Zone 2B (Medium)
- Zone 3 (High)
- Zone 4 (Very High)

Description:

Where return period is the recurrence interval of a flood. It is a statistical measurement particularly based on previous data.

EARTHQUAKE HAZARD 50 YEAR RETURN PERIOD



Legend

- District Headquarter
- Tehsil Headquarter

Hazard Zone*

1	(0.05-0.08g)	Very Low
2A	(0.08-0.16g)	Low
2B	(0.16-0.24g)	Medium
3	(0.24-0.32g)	High
4	(>0.32g)	Very High

- River & Water Body
- Abc Union Council Boundary
- Abc Tehsil Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

*Zones are categories as per classification of Pakistan Engineeringing Council. Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

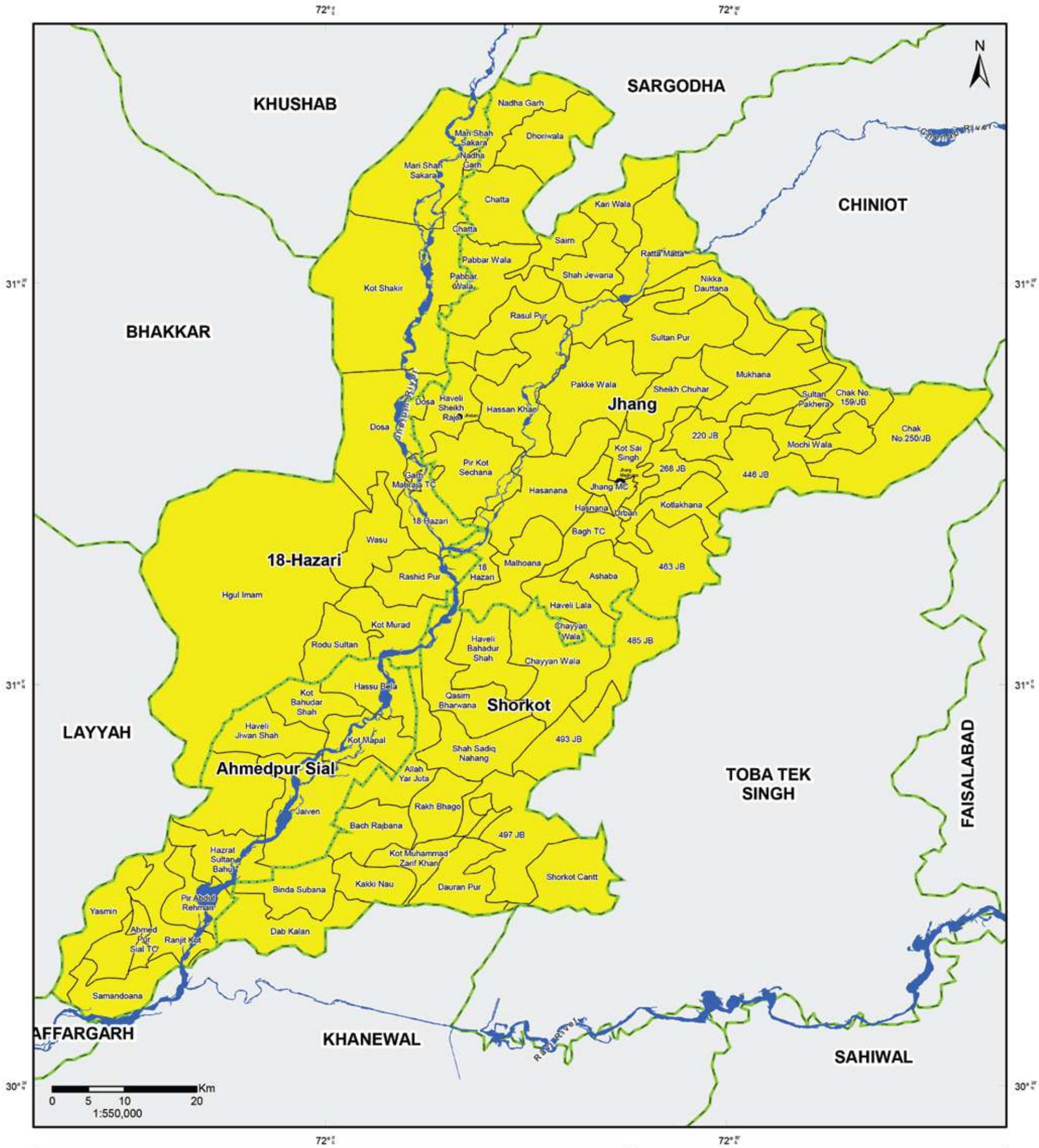
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-MAR-2016-HAZ-03-NDMA-50
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

EARTHQUAKE HAZARD 475 YEAR RETURN PERIOD



Legend

- District Headquarter
- Tehsil Headquarter

Hazard Zone*

1	(0.05-0.08g)	Very Low
2A	(0.08-0.16g)	Low
2B	(0.16-0.24g)	Medium
3	(0.24-0.32g)	High
4	(>0.32g)	Very High

- River & Water Body
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

*Zones are categories as per classification of Pakistan Engineeringing Council. Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-MAR-2016-HAZ-03-NDMA-475
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

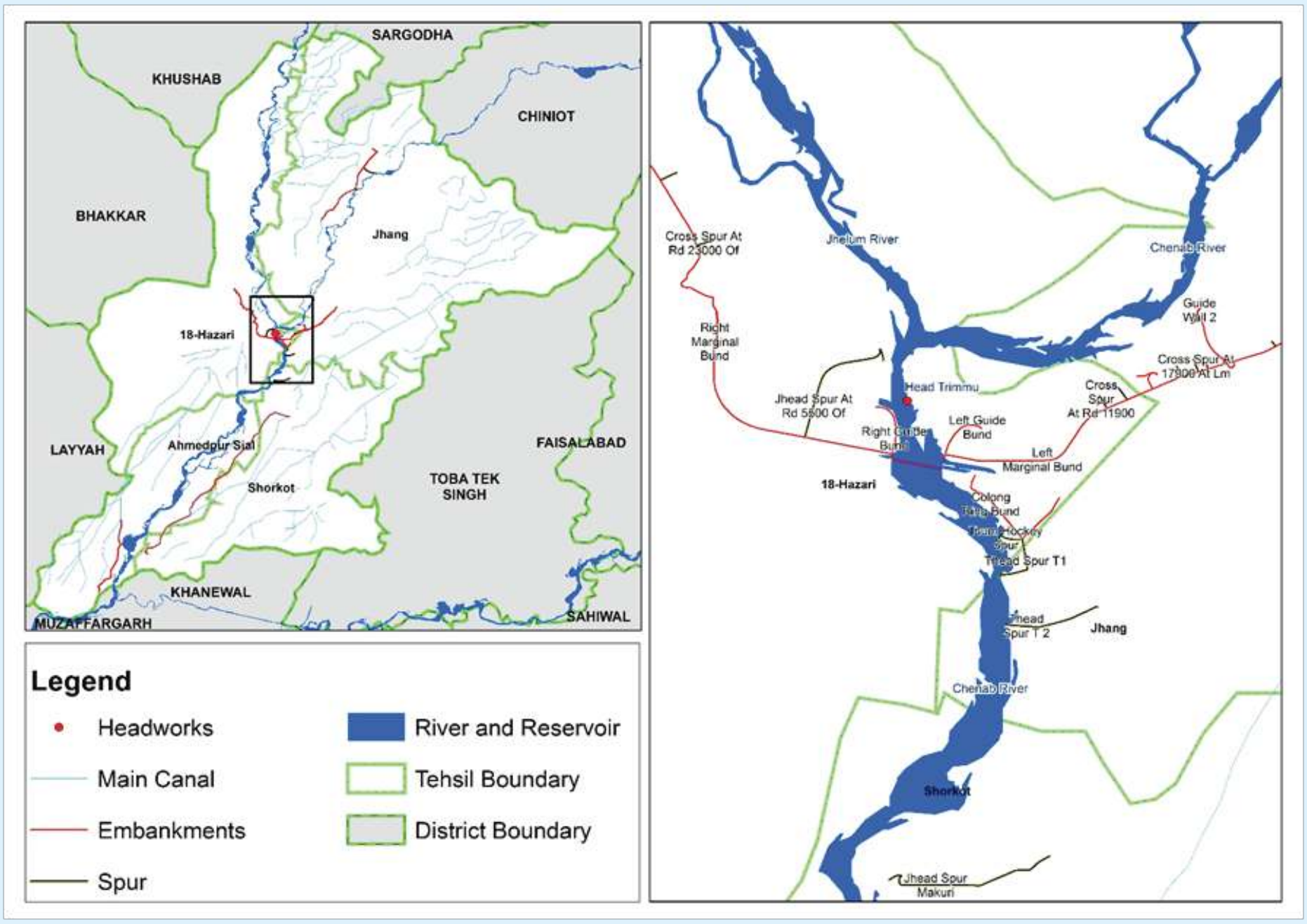
22 FLOOD HAZARD ASSESSMENT

District Jhang shares its boundaries with district Sargodha to its north, district Khanewal to its south, district Toba Tek Singh towards east and district Layyah and Bhakkar to its west. Flowing downstream through the district, River Jhelum joins River Chenab at Head Trimmu, which operates the water flow at the junction. As part of flood mitigation, following flood protection structures have been put in place:

Flood Protection Bunds

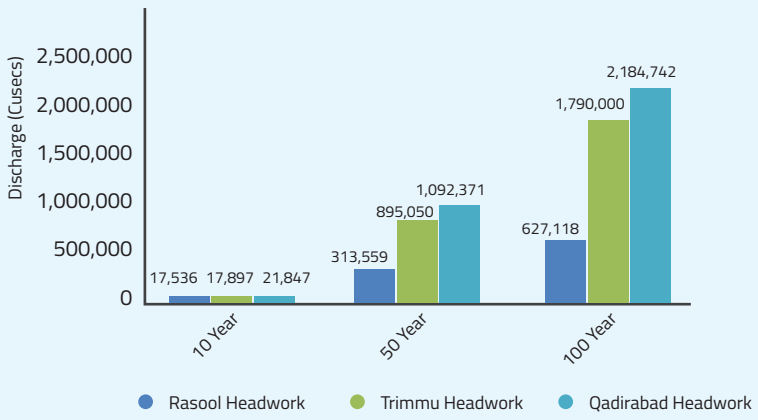
- Thatta Mahla Bund
- Jhang Flood Bund
- Loop Bund

Flood Protection Structures



In this study for flood hazard assessment, return periods of 10, 50 and 100 years have been taken in account based on probability of occurrence for the flood modelling. Discharge values for the respective return periods have been considered at 3 barrages/headworks namely Rasool, Qadirabad and Trimmu.

Discharge Values for Return Period 10,50,100 Years

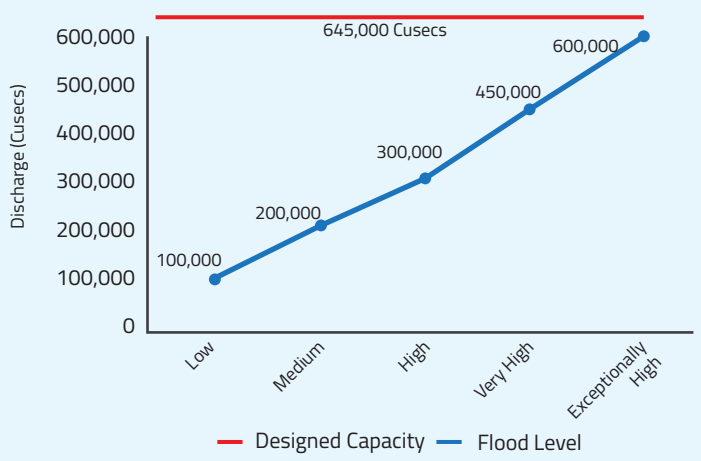


Time Lag of Floods

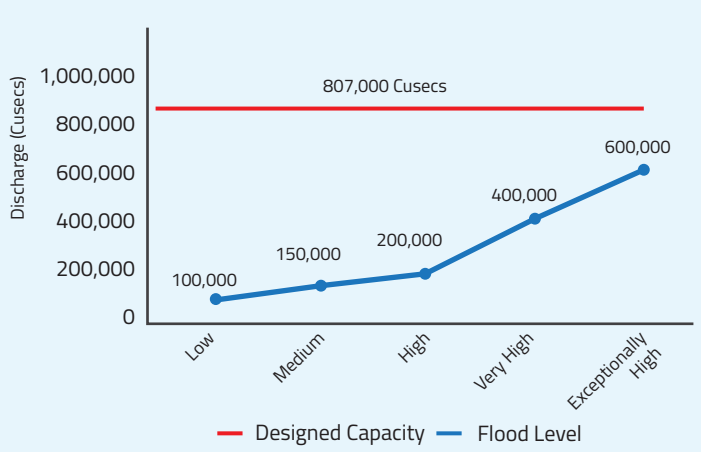
River Chenab (Sites)	Designed Capacity	Distance (km)	Time lag (Hours)
Marala	1,100,000	-	-
Khanki	800,000	56	12
Qadirabad	900,000	30	7
Trimmu	645,000	248	72
Panjnad	700,000	257	78

Flood Limits for Chenab (Trimmu Head) , Qadirabad Headwork (Chenab) and Rasul Headwork (Jhelum)

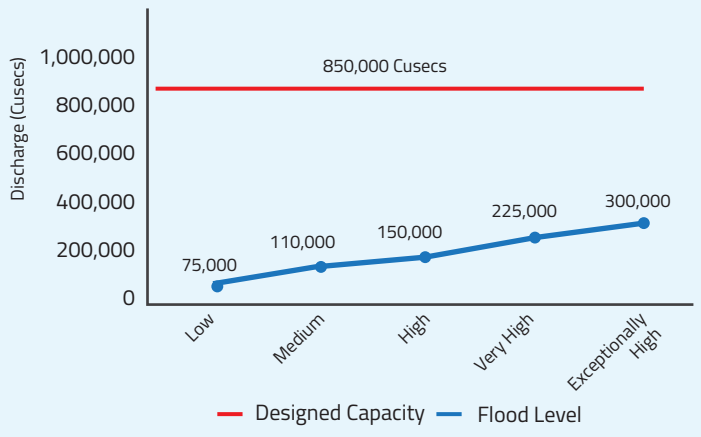
Flood Limits Trimmu Headwork (Chenab)



Flood Limits Qadirabad Headwork (Chenab)



Flood Limits Rasul Headwork (Jhelum)



Assessment Methodology

The HEC-RAS hydraulic model has been used for hydraulic modelling of the area, with an average discharge value observed at 3 headworks namely Rasool, Qadirabad and Trimmu for consecutive 10, 50 and 100 years. For model inputs, geometric data (stream centerline, flow paths, channel banks, cut lines and cross-sections) has been developed in HEC-GeoRAS. Aster-SRTM DEM has been preprocessed and used for conversion into TIN, to be used as the elevation input in modelling for generation of flood hazard maps.

Modelling results are then processed in ArcGIS for floodplain delineation. Flood hazard maps are then generated as the final result using inundation depth grid and satellite imagery. These maps show the severity of flood hazard at any given point in the area.

Historical Floods

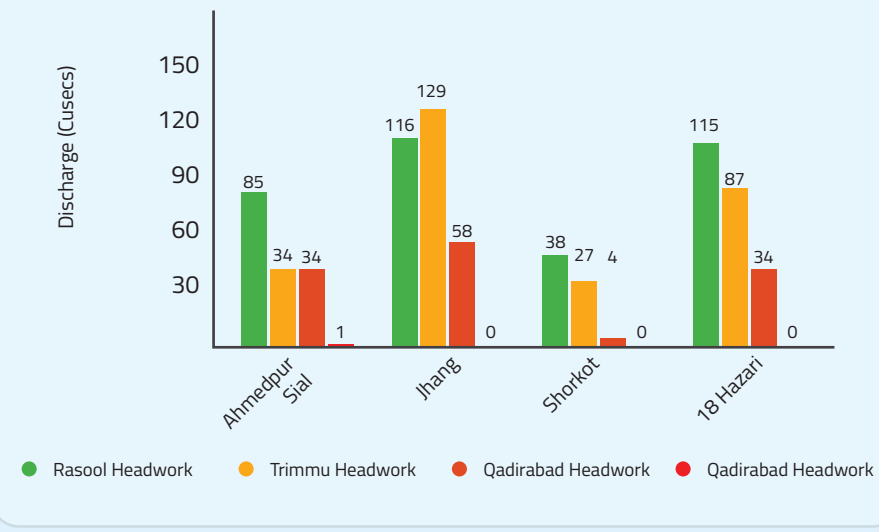
Year	Discharge (Cs)
2005	162,097
2006	266,270
2007	173,529
2008	132,220
2009	62,265
2010	323,026
2011	132,890
2012	82,794
2013	272,609
2014	626,006 to73000

Flood Loses 2014

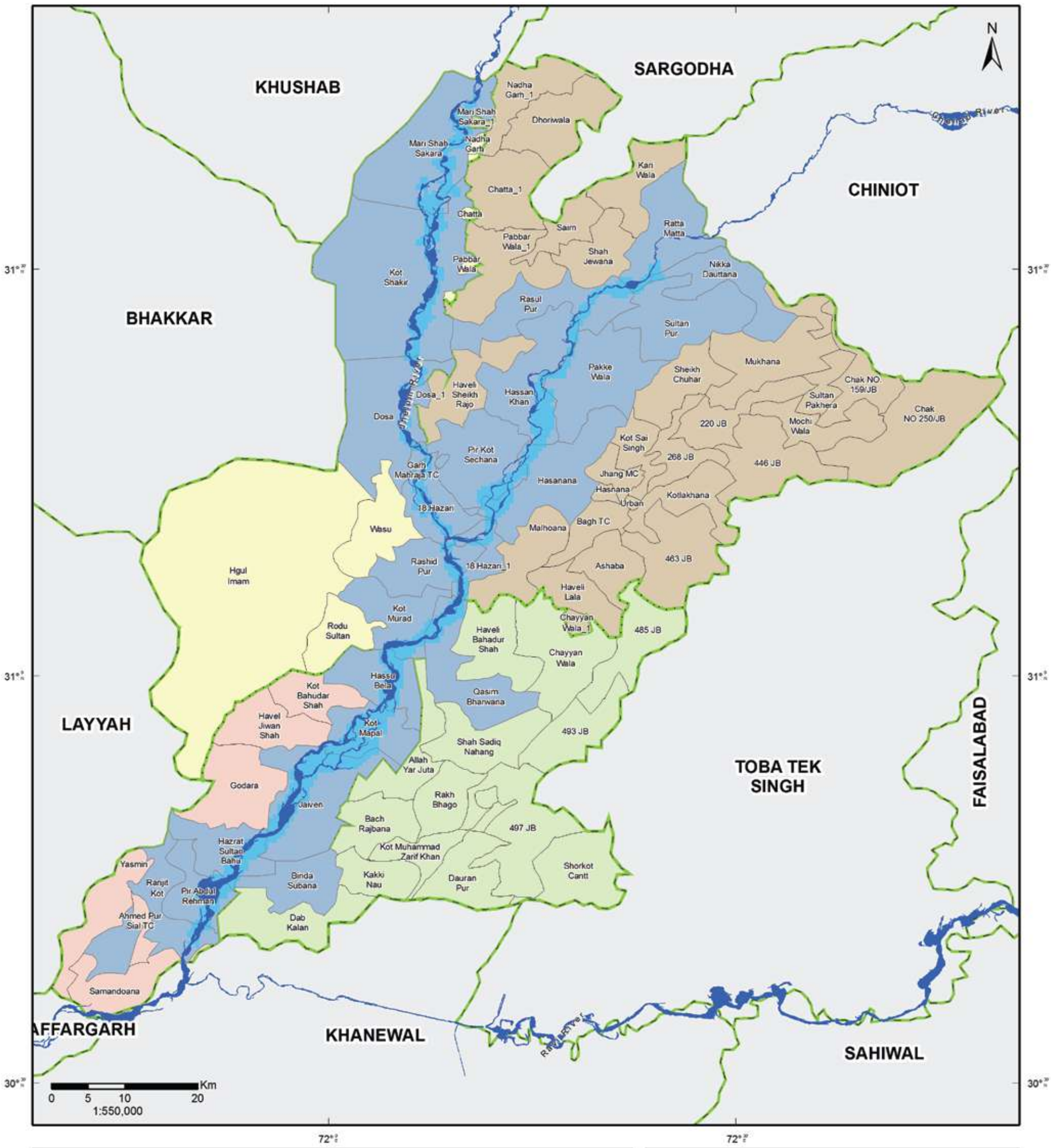
Flood	2014
Population Affected	598,242
Area Affected (Acres)	506,956
Completely Damaged Villages	272
Partially Damaged Villages	140

Settlements Vulnerable to Floods based on Past Inundation

Tehsilwise Distribution of Settlements Vulnerable to Floods Based on Inundation Frequency (2010-2015)



FLOOD HAZARD 10 YEAR RETURN PERIOD



Legend

- Flood 10 Year Return Period
- Flood Exposed UCs
- River & Water Body
- Union Council Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

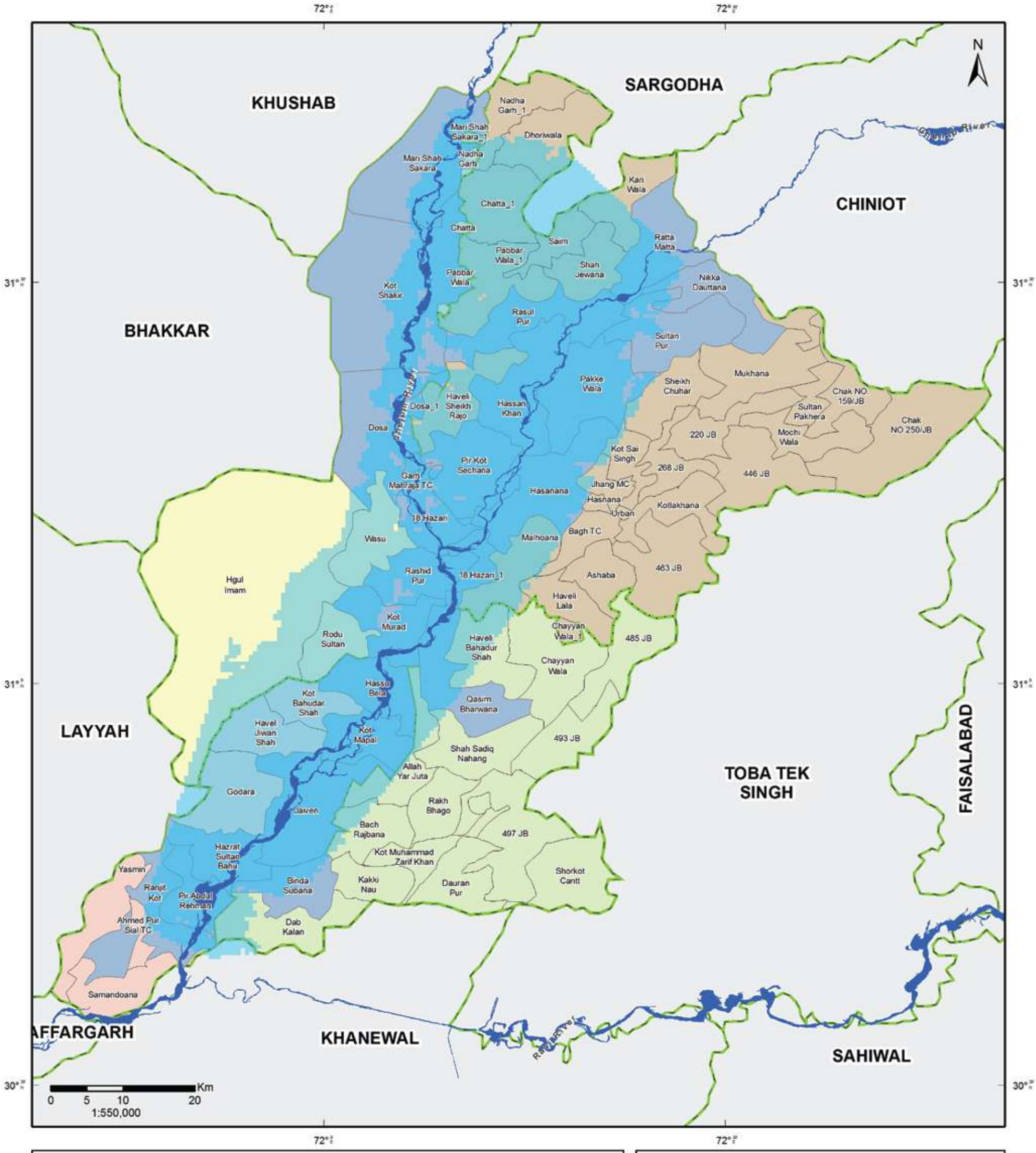
Data Source(s):
NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-MAR-2016-HAZ-04-NDMA-002
Prepared by: Project Management Unit, NDMA

Last Updated: 4th May, 2017

FLOOD HAZARD 50 YEAR RETURN PERIOD



Legend

- Flood 50 Year Return Period
- Flood Exposed UCs
- River & Water Body
- Union Council Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

MAP INFORMATION

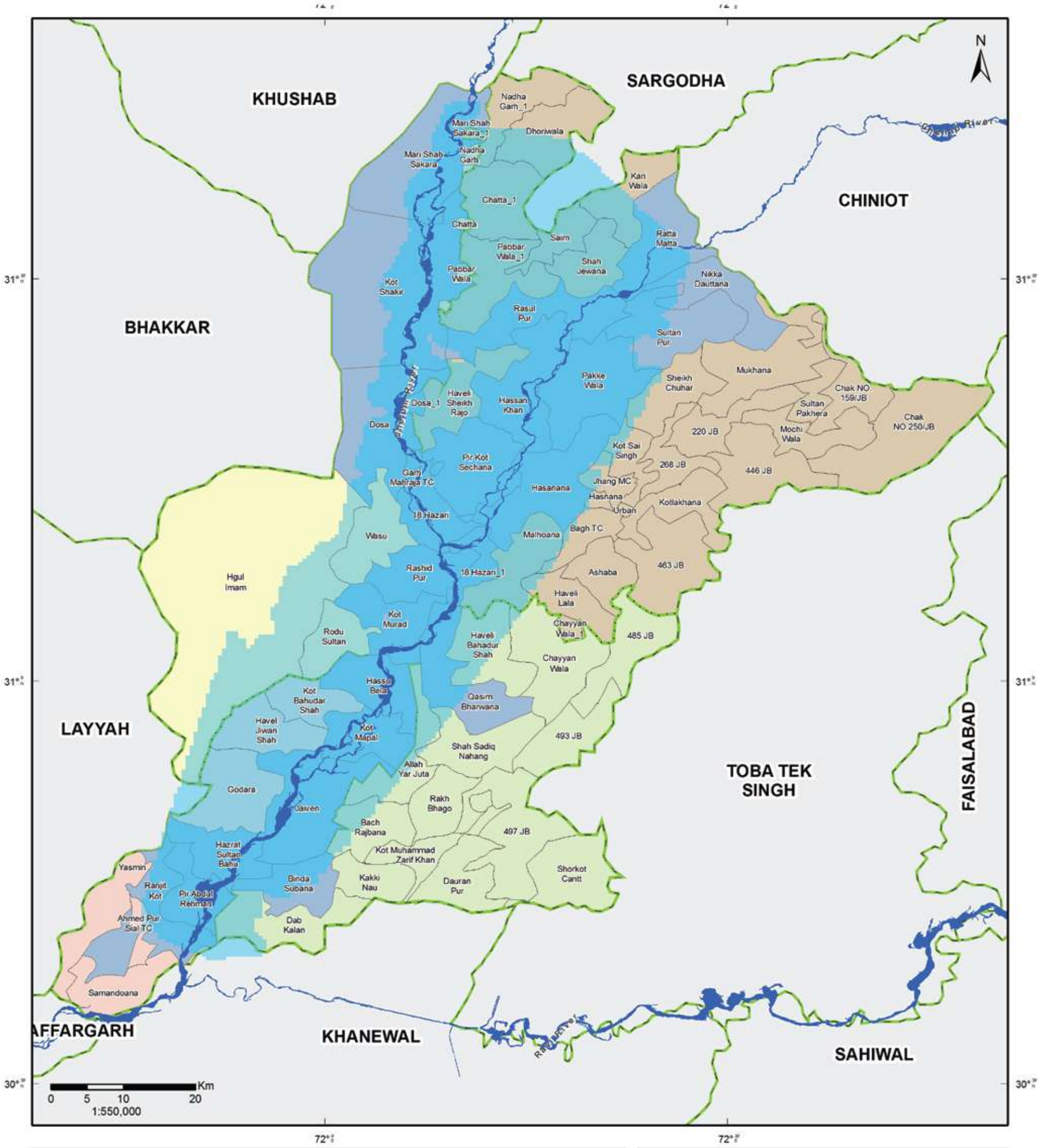
Data Source(s):
NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-MAR-2016-HAZ-04-NDMA-003
Prepared by: Project Management Unit, NDMA

Last Updated: 4th May, 2017

FLOOD HAZARD 100 YEAR RETURN PERIOD



Legend

- Flood 100 Year Return Period
- Flood Exposed UCs
- River & Water Body
- Union Council Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- 18-Hazari
- Ahmedpur Sial
- Jhang
- Shorkot

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

MAP INFORMATION

Data Source(s):
NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-MAR-2016-HAZ-04-NDMA-004
Prepared by: Project Management Unit, NDMA

Last Updated: 4th May, 2017

C

EXPOSURE ASSESSMENT

- DROUGHT
- EARTHQUAKE
- FLOOD

23 ELEMENTS EXPOSED TO DROUGHT HAZARD

	UNION COUNCILS	DEMOGRAPHICS			SETTLEMENTS	LAND USE AND LAND COVER TYPE (AREA IN HECTARES)					AGRICULTURE CROPS (AREA IN HECTARES)			DROUGHT PRONE	FREQUENTLY DROUGHT PRONE
											KHARIF CROP		RABI CROP		
		POPULATION	MALE	FEMALE		CROP IRRIGATED	CROP IN FLOOD PLAIN	CROP RAINFED	CROP MARGINAL & IRRIGATED SALINE	ORCHARDS	RICE	SUGARCANE	WHEAT		
18-HAZARI	18 HAZARI_1	34,324	17,819	16,505	18	2,015	2,223	0	0	0	578	376	2,682	SE	MO
	CHATTA_1	31,670	16,172	15,498	3	411	0	0	0	0	117	18	272	SE	MO
	DOSA_1	36,624	18,595	18,029	55	5,725	689	0	0	0	1,218	965	3,404	MI	MI
	GARH MAHRAJA TC	37,455	19,420	18,035	0	38	47	0	0	0	8	9	74	MI	MI
	HGUL IMAM	30,977	16,142	14,835	69	14,326	0	0	12	0	6,287	546	9,577	EX	EX
	KOT MURAD	38,248	19,822	18,426	18	6,233	140	0	0	50	715	2,481	2,311	MO	MO
	KOT SHAKIR	35,450	17,856	17,595	93	10,324	564	0	0	0	2,319	118	6,281	MO	MO
	MARI SHAH SAKARA_1	35,406	17,756	17,650	22	3,147	1,696	0	0	0	1,220	530	2,335	MO	MO
	NADHA GARH_1	28,837	14,548	14,289	2	401	0	0	0	0	181	41	233	MO	MO
	PABBAR WALA_1	32,226	16,790	15,436	0	500	0	0	0	0	158	37	295	MO	MO
	RASHID PUR	27,747	14,259	13,489	29	4,517	944	0	0	0	883	1,657	2,101	EX	MO
	RODU SULTAN	33,050	16,907	16,144	13	5,217	0	0	0	0	1,929	777	2,990	MO	MO
	WASU	36,891	18,825	18,066	44	7,238	104	0	0	0	3,313	1,014	4,511	MO	MO
AHMEDPUR SIAL	AHMED PUR SIAL TC	26,674	13,840	12,834	4	1,618	0	0	4	6	498	201	1,020	NO	NO
	GODARA	32,112	16,947	15,165	25	8,789	148	0	64	42	2,379	1,172	5,742	EX	SE
	HASSU BELA	37,458	19,316	18,143	24	4,900	411	0	0	0	880	1,593	2,280	MO	MI
	HAVELI JIWAN SHAH	1,519	780	740	21	6,625	7	0	5	8	2,472	625	4,701	MO	MO
	HAZRAT SULTAN BAHU	38,610	20,091	18,519	21	3,707	1,618	0	15	88	1,053	766	3,024	MO	MO
	JAIVEN	35,765	18,549	17,217	40	6,825	3,723	0	0	352	1,988	2,640	5,154	MI	NO
	KOT BAHUDAR SHAH	28,556	14,870	13,686	32	4,755	11	0	0	0	1,443	846	2,582	EX	SE
	KOT MAPAL	40,173	20,817	19,356	10	3,355	1,054	0	0	0	704	1,189	2,097	MO	MO
	PIR ABDUL REHMAN	34,329	17,795	16,534	9	3,170	1,131	0	27	8	1,051	419	2,966	MO	MI
	RANJIT KOT	32,520	17,024	15,496	39	7,684	738	0	0	116	3,085	787	5,898	SE	MI
	SAMANDOANA	33,744	17,570	16,174	30	3,236	2,321	0	22	72	1,760	525	3,760	SE	MI
	YASMIN	0	0	0	19	6,918	0	0	3	0	2,515	543	4,713	MI	MI
JHANG	18 HAZARI	0	0	0	17	1,567	1,275	0	0	0	742	295	1,540	SE	MO
	220 JB	34,782	18,139	16,642	24	5,593	0	0	15	0	769	432	2,833	SE	MO
	268 JB	27,165	14,275	12,890	19	3,926	0	0	0	0	374	373	1,596	MO	MO
	446 JB	31,008	16,381	14,627	22	8,513	0	0	44	0	610	650	4,161	MO	MO
	463 JB	34,447	18,096	16,351	29	9,171	0	0	321	15	1,409	483	4,389	MO	MI
	ASHABA	38,483	20,141	18,342	22	4,564	0	0	92	0	1,089	485	2,419	EX	SE
	BAGH TC	16,877	8,663	8,214	30	3,487	0	0	0	0	984	296	2,008	MO	MI
	CHAK NO. 159/JB	37,359	19,731	17,629	13	4,997	0	0	0	0	657	811	2,534	MO	MO
	CHAK NO.250/JB	36,197	18,902	17,295	47	14,783	0	0	17	35	472	1,804	7,264	MO	MO
	CHATTA	0	0	0	25	7,999	0	0	37	0	2,809	300	5,323	SE	MO
	CHAYYAN WALA_1	0	0	0	6	792	0	0	0	12	279	189	385	SE	MO
	DHORIWALA	31,976	16,257	15,718	28	8,055	0	0	102	317	2,632	570	4,569	MO	MO
	DOSA	0	0	0	2	528	63	0	0	0	65	119	303	MI	MI
	HASANANA	0	0	0	60	9,071	903	0	2	0	1,037	1,677	3,675	MO	MI
	HASNANA	33,212	17,283	15,929	6	452	0	0	0	0	35	18	232	SE	MO
	HASSAN KHAN	30,098	15,772	14,326	28	7,227	1,571	0	87	0	1,438	1,364	4,036	EX	MO
	HAVELI LALA	31,979	16,568	15,411	28	4,468	0	0	89	15	925	300	2,604	SE	SE
	HAVELI SHEIKH RAJO	31,952	16,462	15,490	25	7,195	244	0	11	0	1,496	1,149	4,644	MO	MO
	JHANG MC	448,004	233,837	214,167	14	1,696	0	0	18	0	123	57	670	MO	MO
	KARI WALA	26,256	13,620	12,636	21	6,199	0	0	87	12	2,911	316	4,023	MO	MO
	KOT SAI SINGH	34,713	18,111	16,602	14	3,202	0	0	19	0	363	231	1,420	MO	MO
	KOTLAKHANA	36,079	18,741	17,338	17	5,953	0	0	20	1	968	321	2,876	MI	MO
	MALHOANA	35,667	18,599	17,068	35	7,074	218	0	0	47	2,922	652	4,370	MO	MO
	MARI SHAH SAKARA	0	0	0	3	391	0	0	0	0	146	64	232	MO	MO
	MOCHI WALA	30,864	16,153	14,711	13	5,501	0	0	0	0	575	648	2,858	SE	SE
	MUKHANA	34,513	18,162	16,351	27	9,677	0	0	0	0	1,987	801	5,037	MO	MO
	NADHA GARH	0	0	0	24	6,221	0	0	77	0	1,948	854	2,536	MO	MO
	NIKKA DAUTTANA	5,199	2,702	2,497	17	7,167	39	0	0	0	1,009	1,166	3,356	MO	MO
	PABBAR WALA	0	0	0	24	9,518	0	0	28	0	3,006	543	6,089	MO	MO
	PAKKE WALA	26,338	13,733	12,605	43	11,279	395	0	0	0	958	2,516	5,293	MO	MO
	PIR KOT SECHANA	31,268	16,263	15,005	33	6,906	1,519	0	0	0	959	1,313	4,567	SE	SE
	RASUL PUR	31,277	16,286	14,992	19	7,121	1,708	0	54	0	2,415	800	5,193	MO	MO
	RATTA MATTA	27,735	14,605	13,130	17	5,472	1,854	0	572	11	2,294	572	4,025	SE	SE
	SAIRN	0	0	0	18	3,579	0	0	3	0	1,428	153	2,276	MO	MO
	SHAH JEWANA	30,591	15,824	14,766	17	5,283	208	0	43	165	2,084	359	3,400	SE	MO
	SHEIKH CHUHAR	34,516	18,120	16,396	27	6,377	0	0	0	0	1,127	260	3,922	SE	MO
	SULTAN PAKHERA	29,507	15,627	13,880	11	4,573	0	0	2	0	910	529	2,426	EX	MO
	SULTAN PUR	32,450	17,196	15,254	35	10,888	44	0	0	8	2,106	1,313	5,636	MO	MO
	URBAN	0	0	0	0	203	0	0	0	0	25	11	87	MI	NO

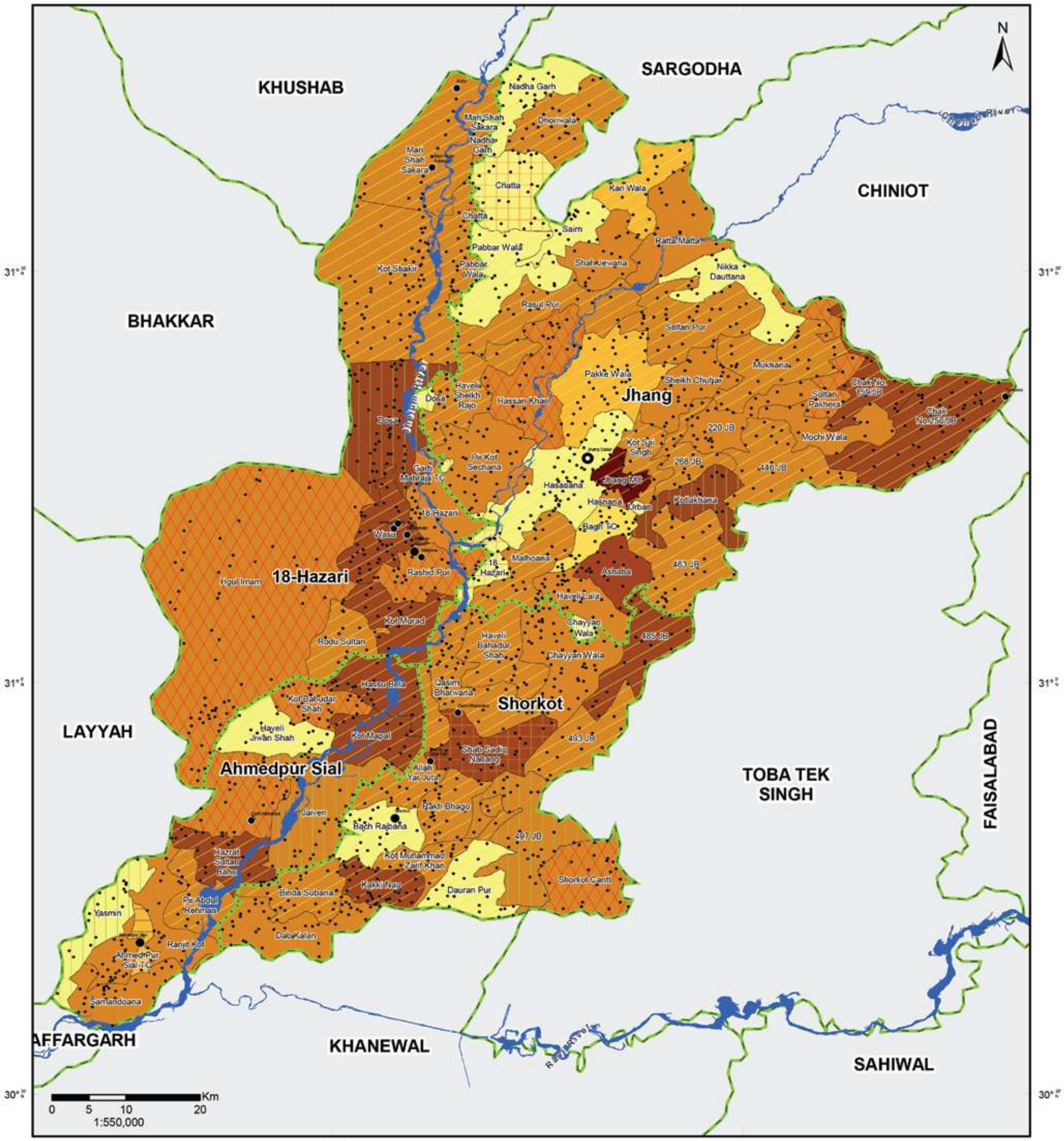
UNION COUNCILS	DEMOGRAPHICS				LAND USE AND LAND COVER TYPE (AREA IN HECTARES)					AGRICULTURE CROPS (AREA IN HECTARES)			DROUGHT PRONE	FREQUENTLY DROUGHT PRONE
										KHARIF CROP		RABI CROP		
	POPULATION	MALE	FEMALE	SETTLEMENTS	CROP IRRIGATED	CROP IN FLOOD PLAIN	CROP RAINFED	CROP MARGINAL & IRRIGATED SALINE	ORCHARDS	RICE	SUGARCANE	WHEAT		
SHORKOT														
485 JB	38,035	19,679	18,356	18	6,261	0	0	453	17	610	208	3,970	MO	MI
493 JB	32,314	16,826	15,488	12	5,314	0	0	397	248	426	153	2,941	MO	MI
497 JB	28,194	14,558	13,636	32	7,501	0	0	160	0	1,484	655	3,864	MI	MI
ALLAH YAR JUTA	33,772	17,377	16,395	23	6,338	20	0	5	0	1,934	2,093	2,793	MO	MI
BACH RAJBANA	0	0	0	26	5,519	0	0	0	63	1,934	2,093	2,967	MO	MO
BINDA SUBANA	34,913	18,021	16,892	25	6,082	0	0	0	78	2,634	847	3,651	MO	MO
CHAYYAN WALA	33,374	17,303	16,071	53	10,071	0	0	94	11	3,134	1,256	5,546	SE	MO
DAB KALAN	31,164	15,951	15,213	39	6,434	1,123	0	727	240	2,544	197	5,125	SE	MO
DAURAN PUR	0	0	0	20	4,298	0	0	0	0	562	575	2,104	MO	MO
HAVELI BAHADUR SHAH	32,168	16,760	15,408	22	7,224	187	0	138	0	3,744	1,112	4,177	MO	MO
KAKKI NAU	37,732	19,288	18,444	32	4,553	0	0	0	0	1,389	833	2,675	MO	MO
KOT MUHAMMAD ZARIF KHAN	29,706	15,502	14,204	19	4,257	0	0	0	0	799	1,040	2,235	MO	MO
QASIM BHARWANA	29,818	15,548	14,270	45	7,661	682	0	157	57	2,619	1,960	4,127	MO	MO
RAKH BHAGO	34,076	17,878	16,198	29	5,484	0	0	0	0	1,630	747	3,114	MO	MO
SHAH SADIQ NAHANG	38,567	19,725	18,842	27	7,641	0	0	9	8	2,706	1,339	4,200	SE	SE
SHORKOT CANTT	32,016	16,707	15,309	23	6,591	0	0	12	83	168	299	3,979	EX	SE
DISTRICT TOTAL:	2,556,726	1,327,882	1,228,849	1,945	449,571	29,622	0	4,054	2,192	115,156	60,071	263,280		

LEGEND: NO NO DROUGHT | MI MILD DROUGHT | MO MODERATE DROUGHT | SE SEVERE DROUGHT | EX EXTREME DROUGHT

Elements at Risk According to Drought Severity

Elements at Risk	Drought Prone					Frequently Drought Prone				
	EX	SE	MO	MI	NO	EX	SE	MO	MI	NO
Population	249,496	490,310	1,616,129	174,117	25,574	30,977	291,580	1,775,961	395,769	62,439
Settlements	239	422	1,115	165	4	69	220	1,230	382	44
Crop Irrigated	55,341	87,904	271,019	33,690	1,618	14,326	54,688	292,570	79,342	8,645
Crop in Flood plain	2,675	11,259	11,166	4,522	0	0	3,532	16,045	6,323	3,723
Crop Rainfed	0	0	0	0	0	0	0	0	0	0
Crop Marginal and Irrigated Saline	270	1,608	1,978	183	14	12	838	1,799	1,389	14
Orchards	125	650	1,050	353	16	0	159	1,190	475	367
Rice	14,596	26,523	65,268	8,272	498	6,287	12,537	75,353	18,468	2,511
Sugarcane	6,897	9,184	38,527	5,262	201	546	6,974	39,177	10,523	2,851
Wheat	32,682	59,170	149,751	20,476	1,020	9,577	32,975	167,425	47,039	6,262

SETTLEMENTS, VILLAGES, MAJOR TOWNS AND POPULATION EXPOSED TO DROUGHT



Legend

- District Headquarter
- Tehsil Headquarter
- Major Town
- Settlements / Villages

Union Council wise Population Distribution 2015

- <= 9000
- 9001 - 18000
- 18001 - 27000
- 27001 - 36000
- 36001 - 45000
- >45000

Drought Prone Union Council

- No Drought
- Mild Drought
- Moderate
- Severe
- Extreme
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

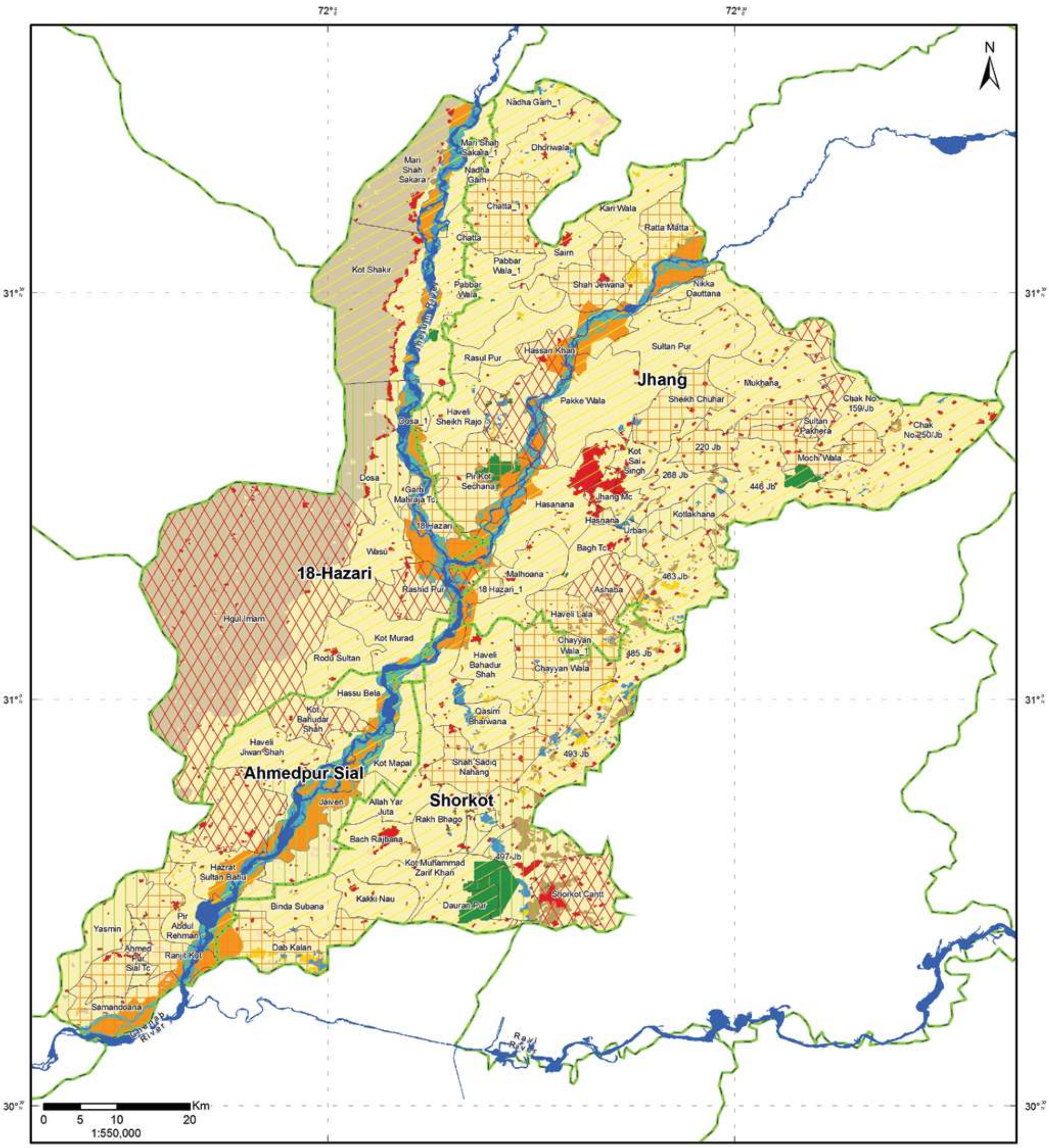
United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Meteorological Department
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-628-APR-2016-EXP-02-NDMA-DP-C(POP-SET)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

LAND USE & LAND COVER EXPOSED TO DROUGHT



Legend

- Bare Areas
- Bare Areas with Sparse Natural Vegetation
- Built-up
- Crop in Flood Plain
- Crop Marginal and Irrigated Saline
- Crop Rainfed
- Crop Irrigated
- Forest - Natural Trees and Mangroves
- Natural Vegetation in Wet Areas
- Orchards
- Range Lands - Natural Shrubs and Herbs
- Snow and Glaciers
- Wet Areas
- River and Water Body
- Abc Union Council Boundary
- Abc Tehsil Boundary
- ABC District Boundary
- Provinvial Boundary
- Line of Control
- International Boundary

Drought Prone Union Council

- No Drought
- Mild
- Moderate
- Severe
- Extreme

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

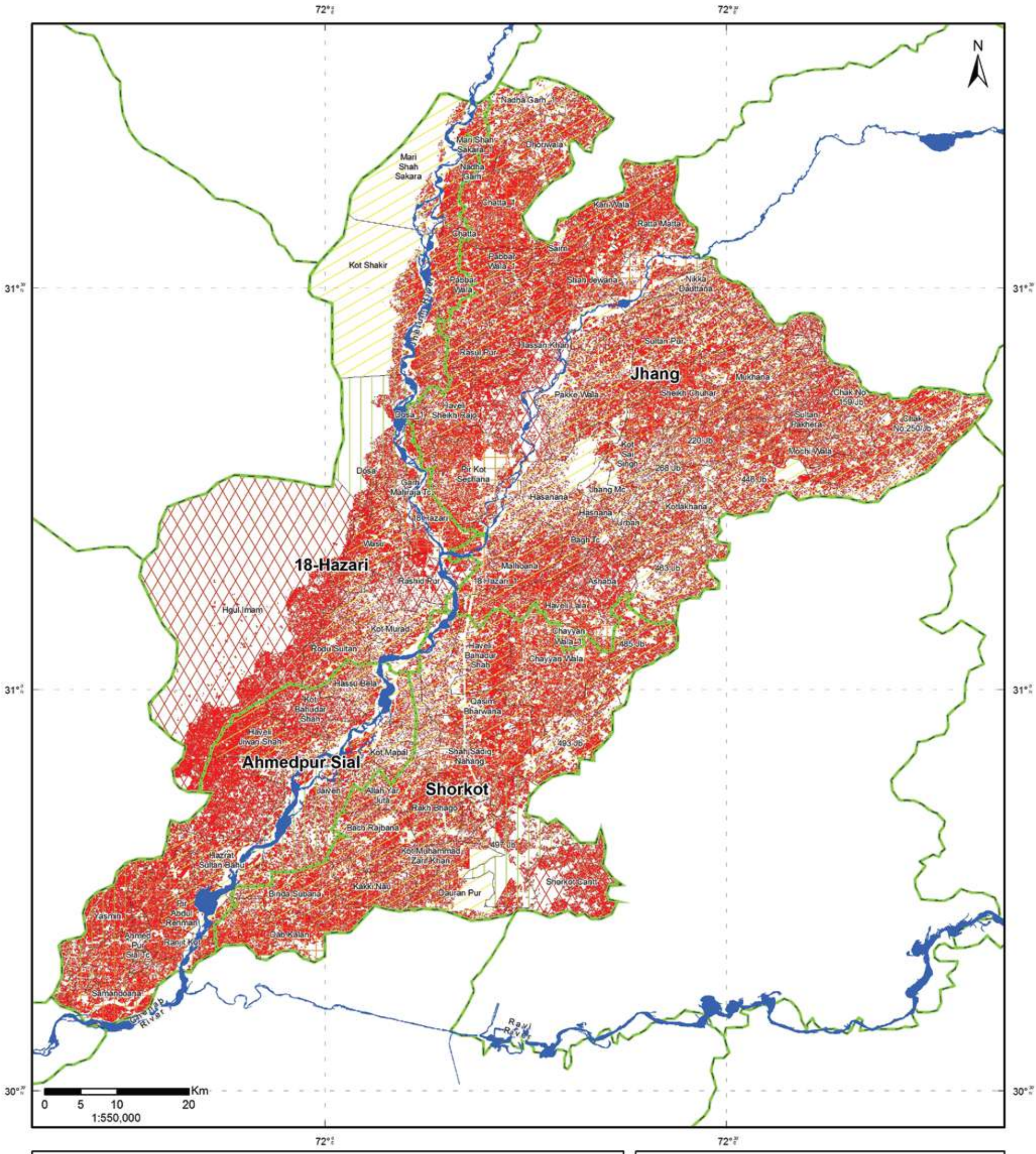
United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Landcover-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-02-NDMA-DP-LULC
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

CROP EXPOSED TO DROUGHT (RABI SEASON)



Legend

- Wheat
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Drought Prone Union Council

- No Drought
- Mild
- Moderate
- Severe
- Extreme

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

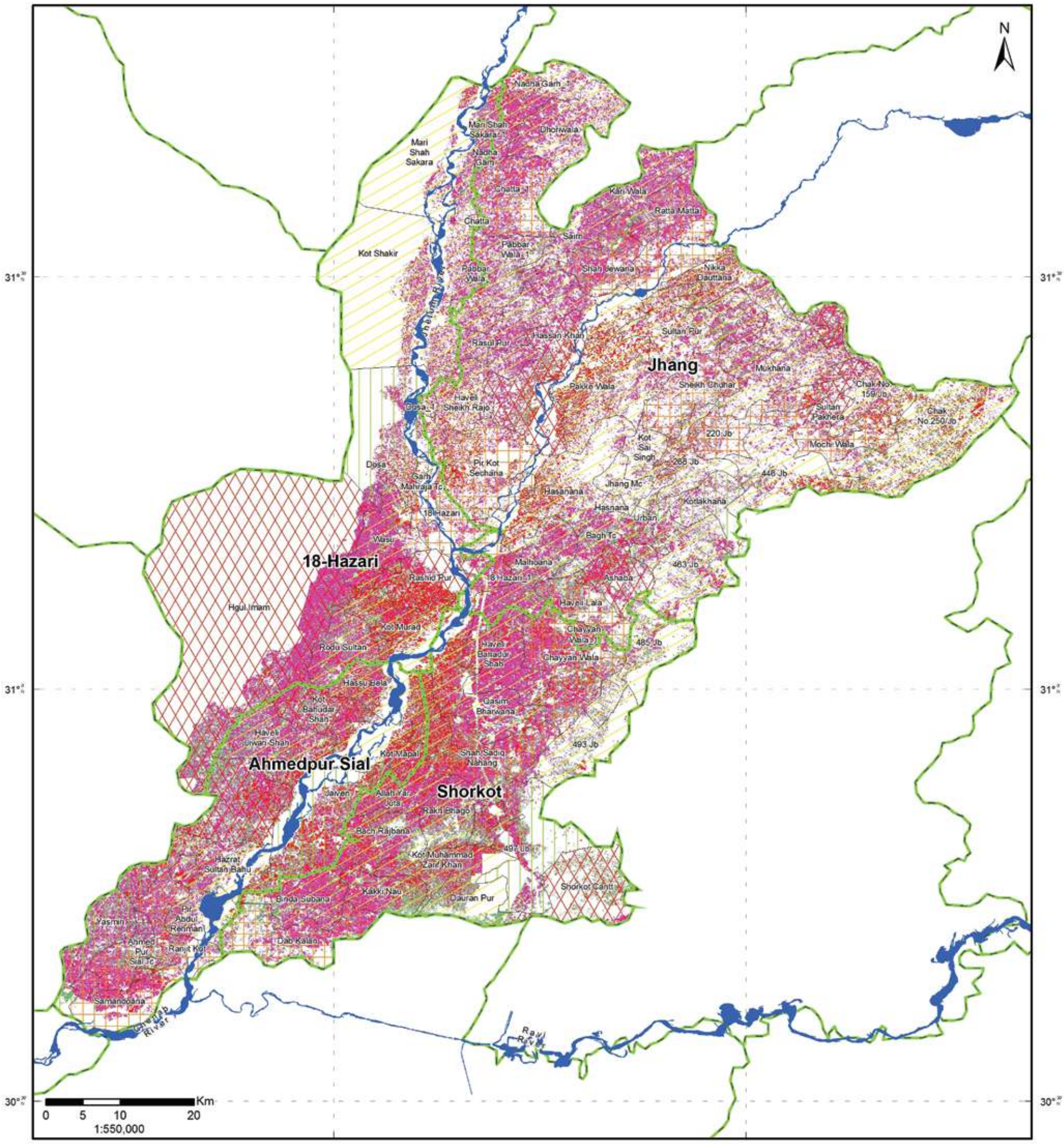
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-02-NDMA-DP-RB-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

CROP EXPOSED TO DROUGHT (KHARIF SEASON)



Legend

- Rice
- Sugarcane
- Cotton
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Drought Prone Union Council

- No Drought
- Mild
- Moderate
- Severe
- Extreme

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

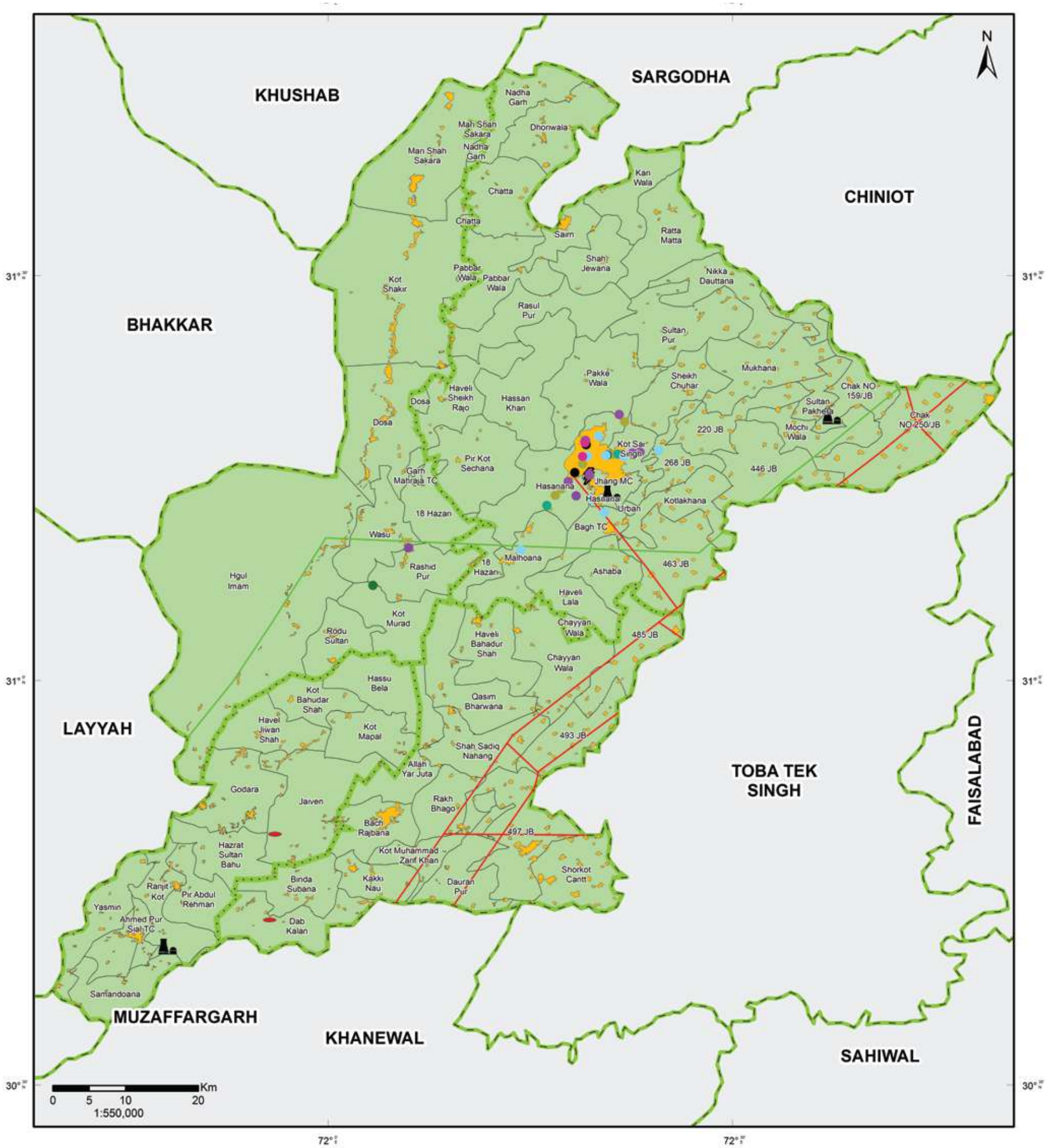
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-02-NDMA-DP-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

23 ELEMENTS EXPOSED TO EARTHQUAKE HAZARD

	UNION COUNCILS	DEMOGRAPHICS: POPULATION					HOUSING & SETTLEMENTS: SETTLEMENTS					BUILDINGS (All Types)					PACCA BULDINGS					SEMI PACCA BUILDINGS					KACHA BUILDINGS					TELECOMMUNICATION TOWERS					INDUSTRIAL UNITS					HEALTH FACILITIES				
		Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4
18-HAZARI	18 HAZARI_1	0	0	34,324	0	0	0	0	18	0	0	0	0	5,489	0	0	0	0	1,153	0	0	0	0	513	0	0	0	0	3,824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHATTA_1	0	0	31,670	0	0	0	0	3	0	0	0	0	5,065	0	0	0	0	808	0	0	0	0	602	0	0	0	0	3,655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DOSA_1	0	0	36,624	0	0	0	0	55	0	0	0	0	5,857	0	0	0	0	1,446	0	0	0	0	346	0	0	0	0	4,066	0	0	0	0	10	0	0	0	0	0	0	0	0	0	4	0	0
	GARH MAHRAJA TC	0	0	37,455	0	0	0	0	0	0	0	0	0	5,990	0	0	0	0	2,102	0	0	0	0	1,435	0	0	0	0	2,453	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HGUL IMAM	0	0	30,977	0	0	0	0	69	0	0	0	0	4,954	0	0	0	0	1,312	0	0	0	0	307	0	0	0	0	3,335	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0
	KOT MURAD	0	0	38,248	0	0	0	0	18	0	0	0	0	6,117	0	0	0	0	1,621	0	0	0	0	369	0	0	0	0	4,127	0	0	0	0	9	0	0	0	0	1	0	0	0	0	0	0	0
	KOT SHAKIR	0	0	35,450	0	0	0	0	93	0	0	0	0	5,669	0	0	0	0	2,066	0	0	0	0	96	0	0	0	0	3,508	0	0	0	0	11	0	0	0	0	0	0	0	0	0	3	0	0
	MARI SHAH SAKARA_1	0	0	35,406	0	0	0	0	22	0	0	0	0	5,662	0	0	0	0	1,196	0	0	0	0	475	0	0	0	0	3,992	0	0	0	0	8	0	0	0	0	0	0	0	0	0	2	0	0
	NADHA GARH_1	0	0	28,837	0	0	0	0	2	0	0	0	0	4,612	0	0	0	0	888	0	0	0	0	680	0	0	0	0	3,044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PABBAR WALA_1	0	0	32,226	0	0	0	0	0	0	0	0	0	5,154	0	0	0	0	779	0	0	0	0	376	0	0	0	0	3,999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RASHID PUR	0	0	27,747	0	0	0	0	29	0	0	0	0	4,437	0	0	0	0	1,509	0	0	0	0	936	0	0	0	0	1,993	0	0	0	0	13	0	0	0	0	1	0	0	0	0	2	0	0
	RODU SULTAN	0	0	33,050	0	0	0	0	13	0	0	0	0	5,286	0	0	0	0	2,704	0	0	0	0	165	0	0	0	0	2,417	0	0	0	0	17	0	0	0	0	0	0	0	0	0	2	0	0
	WASU	0	0	36,891	0	0	0	0	44	0	0	0	0	5,900	0	0	0	0	2,304	0	0	0	0	1,314	0	0	0	0	2,281	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1	0	0
	TEHSIL TOTAL:	0	0	438,905	0	0	0	0	366	0	0	0	0	70,192	0	0	0	0	19,888	0	0	0	0	7,614	0	0	0	0	42,694	0	0	0	0	94	0	0	0	0	2	0	0	0	0	14	0	0
AHMEDPUR SIAL	AHMED PUR SIAL TC	0	0	26,674	0	0	0	0	4	0	0	0	0	4,756	0	0	0	0	2,942	0	0	0	0	332	0	0	0	0	1,482	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GODARA	0	0	32,112	0	0	0	0	25	0	0	0	0	3,873	0	0	0	0	717	0	0	0	0	736	0	0	0	0	2,420	0	0	0	0	31	0	0	0	0	0	0	0	0	0	1	0	0
	HASSU BELA	0	0	37,458	0	0	0	0	24	0	0	0	0	4,662	0	0	0	0	1,226	0	0	0	0	548	0	0	0	0	2,888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI JIWAN SHAH	0	0	1,519	0	0	0	0	21	0	0	0	0	5,438	0	0	0	0	2,876	0	0	0	0	0	0	0	0	0	2,562	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0
	HAZRAT SULTAN BAHU	0	0	38,610	0	0	0	0	21	0	0	0	0	221	0	0	0	0	43	0	0	0	0	51	0	0	0	0	126	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	JAIVEN	0	0	35,765	0	0	0	0	40	0	0	0	0	5,606	0	0	0	0	971	0	0	0	0	748	0	0	0	0	3,887	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	KOT BAHUDAR SHAH	0	0	28,556	0	0	0	0	32	0	0	0	0	5,192	0	0	0	0	1,092	0	0	0	0	1,251	0	0	0	0	2,850	0	0	0	0	9	0	0	0	0	0	0	0	0	0	1	0	0
	KOT MAPAL	0	0	40,173	0	0	0	0	10	0	0	0	0	4,146	0	0	0	0	823	0	0	0	0	592	0	0	0	0	2,731	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	PIR ABDUL REHMAN	0	0	34,329	0	0	0	0	9	0	0	0	0	5,832	0	0	0	0	1,406	0	0	0	0	614	0	0	0	0	3,813	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RANJIT KOT	0	0	32,520	0	0	0	0	39	0	0	0	0	4,984	0	0	0	0	958	0	0	0	0	523	0	0	0	0	3,503	0	0	0	0	28	0	0	0	0	0	0	0	0	0	3	0	0
	SAMANDOANA	0	0	33,744	0	0	0	0	30	0	0	0	0	4,721	0	0	0	0	1,243	0	0	0	0	306	0	0	0	0	3,172	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	YASMIN	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
	TEHSIL TOTAL:	0	0	341,460	0	0	0	0	274	0	0	0	0	49,431	0	0	0	0	14,297	0	0	0	0	5,701	0	0	0	0	29,434	0	0	0	0	78	0	0	0	0	0	0	0	0	0	10	0	0
JHANG	18 HAZARI	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
	220 JB	0	0	34,782	0	0	0	0	24	0	0	0	0	5,562	0	0	0	0	1,467	0	0	0	0	736	0	0	0	0	3,360	0	0	0	0	6	0	0	0	0	0	0	0	0	0	2	0	0
	268 JB	0	0	27,165	0	0	0	0	19	0	0	0	0	4,344	0	0	0	0	1,768	0	0	0	0	650	0	0	0	0	1,926	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0
	446 JB	0	0	31,008	0	0	0	0	22	0	0	0	0	4,959	0	0	0	0	1,464	0	0	0	0	562	0	0	0	0	2,933	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0
	463 JB	0	0	34,447	0	0	0	0	29	0	0	0	0	5,509	0	0	0	0	1,175	0	0	0	0	567	0	0	0	0	3,767	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0
	ASHABA	0	0	38,483	0	0	0	0	22	0	0	0	0	6,154	0	0	0	0	2,006	0	0	0	0	570	0	0	0	0	3,579	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	BAGH TC	0	0	16,877	0	0	0	0	30	0	0	0	0	2,699	0	0	0	0	1,279	0	0	0	0	517	0	0	0	0	903	0	0	0	0	10	0	0	0	0	1	0	0	0	0	2	0	0
	CHAK NO. 159/JB	0	0	37,359	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	CHAK NO.250/JB	0	0	36,197	0	0	0	0	47	0	0	0	0	5,789	0	0	0	0	1,455	0	0	0	0	856	0	0	0	0	3,478	0	0	0	0	12	0	0	0	0	0	0	0	0	0	4	0	0
	CHATTA	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	1	0	0
	CHAYYAN WALA_1	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	DHORIWALA	0	0	31,976	0	0	0	0	28	0	0	0	0	5,114	0	0	0	0	1,050	0	0	0	0	1,102	0	0	0	0	2,962	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	DOSA	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASANANA	0	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	203	0	0	0	0	18	0	0	0	0	7	0	0
	HASNANA	0	0	33,212	0	0	0	0	6	0	0	0	0	5,311	0	0	0	0	2,053	0	0	0	0	783	0	0	0	0	2,475	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	HASSAN KHAN	0	0	30,098	0	0	0	0	28	0	0	0	0	4,813	0	0	0	0	1,153	0	0	0	0	746	0	0	0	0	2,914	0	0	0	0	7	0	0	0	0	0	0	0	0	0	2	0	0
	HAVELI LALA	0	0	31,979	0	0	0	0	28	0	0	0	0	5,114	0	0	0	0	1,984	0	0	0	0	225	0	0	0	0	2,906	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
	HAVELI SHEIKH RAJO	0	0	31,952	0	0	0	0	25	0	0	0	0	5,110	0	0	0	0	1,106	0	0	0	0	213	0	0	0	0	3,791	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0
	JHANG MC	0	0	448,004	0	0	0	0	14	0	0	0	0	4,657	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0	0	7	0	0	0	0	1	0	0
	KARI WALA	0	0	26,256	0	0	0	0	21	0	0	0	0	6,417	0	0	0	0	776	0	0	0	0	832	0	0	0	0	4,809	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	KOT SAI SINGH	0	0	34,713	0	0	0	0	14	0	0	0	0	5,770	0	0	0	0	3,449	0	0	0	0	600	0	0	0	0	1,720	0	0	0	0	26	0	0	0	0	5	0	0	0	0	0	0	0
	KOTLAKHANA	0	0	36,079	0	0	0	0	17	0	0	0	0	4,199	0	0	0	0	1,786	0	0	0	0	326	0	0	0	0	2,087	0	0	0	0	7	0	0	0	0	0	0	0	0	0	2	0	0
	MALHOANA	0	0	35,667	0	0	0	0	35	0	0	0	0	5,551	0	0	0	0	2,126	0	0	0	0	209	0	0	0	0	3,216	0	0	0	0	11	0	0	0	0	1	0	0	0	0	1	0	0
	MARI SHAH SAKARA	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MOCHI WALA	0	0	30,864	0	0	0	0	13	0	0	0	0	5,510	0	0	0	0	1,913	0	0	0	0	600	0	0	0	0	2,997	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1	0	0
	MUKHANA	0	0	34,513	0	0	0	0	27	0	0	0	0	4,936	0	0	0	0	1,089	0	0	0	0	512	0	0	0	0	3,335	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
	NADHA GARH	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	NIKKA DAUTTANA	0	0	5,199	0	0	0	0	17	0	0	0	0	5,520	0	0	0	0	1,331	0	0	0	0	139	0	0	0	0	4,049	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	PABBAR WALA	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAKKE WALA	0	0	26,338	0	0	0	0	43	0	0	0	0	831	0	0	0	0	277	0	0	0	0	142	0	0	0	0	413	0	0	0	0	22	0	0	0	0	2	0	0	0	0	0	0	0
	PIR KOT SECHANA	0	0	31,268	0	0	0	0	33	0	0	0	0	4,212	0	0	0	0	457	0	0	0	0	217	0	0	0	0	3,537	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	RASUL PUR	0	0	31,277	0	0	0	0	19	0	0	0	0	5,450	0	0	0	0	1,253	0	0	0	0	745	0	0	0	0	3,452	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
	RATTA MATTA	0	0	27,735	0	0	0	0	17	0	0	0	0	5,002	0	0	0	0	644	0	0	0	0	679	0	0	0	0	3,679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SAIRN	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	0
	SHAH JEWANA	0	0	30,591	0	0	0	0	17	0	0	0	0	4,436	0	0	0	0	1,170	0	0	0	0	722	0	0	0	0	2,544	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	SHEIKH CHUHAR	0	0	34,516	0	0	0	0	27	0	0	0	0	4,892	0	0	0	0	1,854	0	0	0	0	518	0	0	0	0	2,521	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0
	SULTAN PAKHERA	0	0	29,507	0	0	0	0	11	0	0	0	0	5,520	0	0	0	0	1,012	0	0	0	0	812	0	0	0	0	3,696	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	SULTAN PUR	0	0	32,450	0	0	0	0	35	0	0	0	0	4,719	0	0	0	0	908	0	0	0	0	380	0	0	0	0	3,431	0	0	0	0	10	0	0	0	0	0	0	0	0	0	3	0	0
	URBAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	1,310,512	0	0	0	0	860	0	0	0	0	138,100	0	0	0	0	38,005	0	0	0	0	14,960	0	0	0	0	80,480	0	0	0	0	465	0	0	0	0	35	0	0	0	0	37	0	0
SHORKOT	485 JB	0	0	38,035	0	0	0	0	18	0	0	0	0	5,522	0	0	0	0	1,859	0	0	0	0	752	0	0	0	0	2,911	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0
	493 JB	0	0	32,314	0	0	0	0	12	0	0	0	0	4,691	0	0	0	0	1,375	0	0	0	0	117	0	0	0	0	3,200	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
	497 JB	0	0	28,194	0	0	0	0	32	0	0	0	0	4,093	0	0	0	0	1,483	0	0	0	0	291	0	0	0	0	2,319	0	0	0	0	32	0	0	0	0	0	0	0	0	0	2	0	0
	ALLAH YAR JUTA	0	0	33,772	0	0	0	0	23	0	0	0	0	4,903	0	0	0	0	597	0	0	0	0	655	0	0	0	0	3,651	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0
	BACH RAJBANA	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	2	0	0
	BINDA SUBANA	0	0	34,913	0	0	0	0	25	0	0	0	0	5,583	0	0	0	0	1,103	0	0	0	0	267	0	0	0	0	4,214	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	CHAYYAN WALA	0	0	33,374	0	0	0	0	53	0	0	0	0	4,845	0	0	0	0	810	0	0	0	0	555	0	0	0	0	3,480	0	0	0	0	5	0	0	0	0	0	0	0	0	0	2	0	0
	DAB KALAN	0	0	31,164	0	0	0	0	39	0	0	0	0	4,524	0	0	0	0	731	0	0	0	0	528	0	0	0	0	3,265	0	0	0	0	7	0	0	0	0	0	0	0	0	0	3	0	0
	DAURAN PUR	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	HAVELI BAHADUR SHAH	0	0	32,168	0	0	0	0	22	0	0	0	0	4,670	0	0	0	0	1,825	0	0	0	0	364	0	0	0	0	2,481	0	0	0	0	17	0	0	0	0	0	0	0	0	0	1	0	0
	KAKKI NAU	0	0	37,732	0	0	0	0	32	0	0	0	0	5,478	0	0	0	0	1,762	0	0	0	0	731	0	0	0	0	2,985	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	KOT MUHAMMAD ZARIF KHAN	0	0	29,706	0	0	0	0	19	0	0	0	0	4,313	0	0	0	0	1,192	0	0	0	0	361	0	0	0	0	2,760	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
	QASIM BHARWANA	0	0	29,818	0	0	0	0	45	0	0	0	0	4,329	0	0	0	0	916	0	0	0	0	473	0	0	0	0	2,941	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
	RAKH BHAGO	0	0	34,076	0	0	0	0	29	0	0	0	0	5,001	0	0	0	0	3,267	0	0	0	0	1,538	0	0	0	0	196	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	SHAH SADIQ NAHANG	0	0	38,567	0	0	0	0	27	0	0	0	0	5,599	0	0	0	0	1,377	0	0	0	0	499	0	0	0	0	3,724	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1	0	0
	SHORKOT CANTT	0	0	32,016	0	0	0	0	23	0	0	0	0	4,512	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	465,849	0	0	0	0	445	0	0	0	0	68,063	0	0	0	0	18,297	0	0	0	0	7,131	0	0	0	0	38,127	0	0	0	0	153	0	0	0	0	0	0	0	0	0	13	0	0
	DISTRICT TOTAL:	0	0	2,556,726	0	0	0	0	1,945	0	0	0	0	325,786	0	0	0	0	90,487	0	0	0	0	35,406	0	0	0	0	190,735	0	0	0	0	790	0	0	0	0	37	0	0	0	0	74	0	0

Tehsil	Union Councils	TRANSPORTATION & INFRASTRUCTURE: Motorway/Highway/ Grand Trunk Road					Secondary Roads (Metalled)					Unmetalled Road/Cart Track/Pack Track					Railway Track					EDUCATION FACILITIES: Schools					Number of Students: Boys					Number of Students: Girls					Number of Teachers					CRITICAL INFRASTRUCTURE: SNGPL (Gas Pipeline)					PARCO					Other Infrastructure				
		Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4	Zone 1	Zone 2A	Zone 2B	Zone 3	Zone 4
18-HAZARI	18 HAZARI_1	0	0	0	0	0	0	0	4	0	0	0	0	12	0	0	0	0	0	0	0	0	0	2	0	0	0	0	50	0	0	0	0	16	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
	CHATTA_1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	0	340	0	0	0	0	337	0	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DOSA_1	0	0	0	0	0	0	0	59	0	0	0	0	51	0	0	0	0	0	0	0	0	0	4	0	0	0	0	19	0	0	0	0	33	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GARH MAHRAJA TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HGUL IMAM	0	0	0	0	0	0	0	105	0	0	0	0	344	0	0	0	0	0	0	0	0	0	4	0	0	0	0	269	0	0	0	0	99	0	0	0	0	7	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0
	KOT MURAD	0	0	0	0	0	0	0	24	0	0	0	0	19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	12	0	0	0	0	45	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOT SHAKIR	0	0	0	0	0	0	0	63	0	0	0	0	151	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,150	0	0	0	0	943	0	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MARI SHAH SAKARA_1	0	0	0	0	0	0	0	23	0	0	0	0	142	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1,746	0	0	0	0	875	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NADHA GARH_1	0	0	0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PABBAR WALA_1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RASHID PUR	0	0	0	0	0	0	0	32	0	0	0	0	26	0	0	0	0	0	0	0	0	0	5	0	0	0	0	492	0	0	0	0	66	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RODU SULTAN	0	0	0	0	0	0	0	33	0	0	0	0	32	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1,533	0	0	0	0	924	0	0	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WASU	0	0	0	0	0	0	0	44	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	0	0	0	0	0	388	0	0	0	0	812	0	0	0	0	0	0	0	0	0	69	0	0	0	0	5,611	0	0	0	0	3,338	0	0	0	0	307	0	0	0	0	0	0	0	0	0	47	0	0	0	0	0	0	0
AHMEDPUR SIAL	AHMED PUR SIAL TC	0	0	0	0	0	0	0	14	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5	0	0	0	0	331	0	0	0	0	109	0	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GODARA	0	0	0	0	0	0	0	53	0	0	0	0	33	0	0	0	0	0	0	0	0	0	47	0	0	0	0	4,803	0	0	0	0	4,576	0	0	0	0	287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASSU BELA	0	0	0	0	0	0	0	17	0	0	0	0	17	0	0	0	0	0	0	0	0	0	7	0	0	0	0	432	0	0	0	0	338	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI JIWAN SHAH	0	0	0	0	0	0	0	44	0	0	0	0	29	0	0	0	0	0	0	0	0	0	18	0	0	0	0	1,558	0	0	0	0	1,462	0	0	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAZRAT SULTAN BAHU	0	0	0	0	0	0	0	23	0	0	0	0	15	0	0	0	0	0	0	0	0	0	12	0	0	0	0	2,048	0	0	0	0	473	0	0	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JAIVEN	0	0	0	0	0	0	0	22	0	0	0	0	44	0	0	0	0	0	0	0	0	0	21	0	0	0	0	1,982	0	0	0	0	949	0	0	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	KOT BAHUDAR SHAH	0	0	0	0	0	0	0	42	0	0	0	0	7	0	0	0	0	0	0	0	0	0	29	0	0	0	0	3,033	0	0	0	0	2,417	0	0	0	0	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOT MAPAL	0	0	0	0	0	0	0	7	0	0	0	0	8	0	0	0	0	0	0	0	0	0	4	0	0	0	0	803	0	0	0	0	341	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PIR ABDUL REHMAN	0	0	0	0	0	0	0	18	0	0	0	0	18	0	0	0	0	0	0	0	0	0	8	0	0	0	0	520	0	0	0	0	510	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RANJIT KOT	0	0	0	0	0	0	0	59	0	0	0	0	46	0	0	0	0	0	0	0	0	0	50	0	0	0	0	4,799	0	0	0	0	4,326	0	0	0	0	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	SAMANDOANA	0	0	0	0	0	0	0	2	0	0	0	0	14	0	0	0	0	0	0	0	0	0	21	0	0	0	0	1,435	0	0	0	0	1,051	0	0	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	YASMIN	0	0	0	0	0	0	0	26	0	0	0	0	47	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,293	0	0	0	0	599	0	0	0	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	0	0	0	0	0	327	0	0	0	0	281	0	0	0	0	0	0	0	0	0	237	0	0	0	0	23,037	0	0	0	0	17,151	0	0	0	0	1,212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
JHANG	18 HAZARI	0	0	0	0	0	0	0	8	0	0	0	0	11	0	0	0	0	0	0	0	0	0	10	0	0	0	0	454	0	0	0	0	1,177	0	0	0	0	49	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0
	220 JB	0	0	0	0	0	0	0	40	0	0	0	0	21	0	0	0	0	0	0	0	0	0	27	0	0	0	0	2,863	0	0	0	0	1,231	0	0	0	0	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	268 JB	0	0	0	0	0	0	0	39	0	0	0	0	19	0	0	0	0	0	0	0	0	0	13	0	0	0	0	1,706	0	0	0	0	872	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	446 JB	0	0	0	0	0	0	0	50	0	0	0	0	29	0	0	0	0	0	0	0	0	0	27	0	0	0	0	2,344	0	0	0	0	1,997	0	0	0	0	138	0	0	0	0	1	0	0	0	0	9	0	0	0	0	0	0	0
	463 JB	0	0	0	0	0	0	0	60	0	0	0	0	22	0	0	0	0	0	0	0	0	0	28	0	0	0	0	1,901	0	0	0	0	1,200	0	0	0	0	121	0	0	0	0	16	0	0	0	0	11	0	0	0	0	0	0	0
	ASHABA	0	0	0	0	0	0	0	37	0	0	0	0	15	0	0	0	0	0	0	0	0	0	20	0	0	0	0	1,540	0	0	0	0	1,343	0	0	0	0	86	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
	BAGH TC	0	0	0	0	0	0	0	37	0	0	0	0	5	0	0	0	0	8	0	0	0	0	22	0	0	0	0	4,143	0	0	0	0	3,152	0	0	0	0	217	0	0	0	0	5	0	0	0	0	3	0	0	0	0	0	0	0
	CHAK NO. 159/JB	0	0	0	0	0	0	0	23	0	0	0	0	5	0	0	0	0	0	0	0	0	0	12	0	0	0	0	1,112	0	0	0	0	681	0	0	0	0	46	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0
	CHAK NO.250/JB	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	108	0	0	0	0	228	0	0	0	0	8	0	0	0	0	30	0	0	0	0	1	0	0	0	0	0	0	0
	CHATTA	0	0	0	0	0	0	0	40	0	0	0	0	30	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1,959	0	0	0	0	1,320	0	0	0	0	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAYYAN WALA_1	0	0	0	0	0	0	0	6	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	35	0	0	0	0	230	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DHORIWALA	0	0	0	0	0	0	0	33	0	0	0	0	39	0	0	0	0	0	0	0	0	0	17	0	0	0	0	1,418	0	0	0	0	921	0	0	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DOSA	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	7	0	0	0	0	11	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASANANA	0	0	0	0	0	0	0	73	0	0	0	0	28	0	0	0	0	13	0	0	0	0	129	0	0	0	0	16,981	0	0	0	0	16,884	0	0	0	0	1,070	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0
	HASNANA	0	0	0	0	0	0	0	7	0	0	0	0	2	0	0	0	0	0	0	0	0	0	10	0	0	0	0	705	0	0	0	0	630	0	0	0	0	43	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	HASSAN KHAN	0	0	0	0	0	0	0	28	0	0	0	0	32	0	0	0	0	8	0	0	0	0	19	0	0	0	0	1,900	0	0	0	0	1,119	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI LALA	0	0	0	0	0	0	0	30	0	0	0	0	17	0	0	0	0	4	0	0	0	0	21	0	0	0	0	1,311	0	0	0	0	2,032	0	0	0	0	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI SHEIKH RAJO	0	0	0	0	0	0	0	43	0	0	0	0	20	0	0	0	0	0	0	0	0	0	29	0	0	0	0	2,248	0	0	0	0	1,800	0	0	0	0	129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JHANG MC	0	0	0	0	0	0	0	20	0	0	0	0	4	0	0	0	0	2	0	0	0	0	39	0	0	0	0	3,196	0	0	0	0	3,664	0	0	0	0	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	KARI WALA	0	0	0	0	0	0	0	43	0	0	0	0	19	0	0	0	0	0	0	0	0	0	6	0	0	0	0	272	0	0	0	0	342	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOT SAI SINGH	0	0	0	0	0	0	0	40	0	0	0	0	2	0	0	0	0	0	0	0	0	0	30	0	0	0	0	1,769	0	0	0	0	3,214	0	0	0	0	167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOTLAKHANA	0	0	0	0	0	0	0	40	0	0	0	0	4	0	0	0	0	0	0	0	0	0	16	0	0	0	0	1,013	0	0	0	0	642	0	0	0	0	53	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	MALHOANA	0	0	0	0	0	0	0	62	0	0	0	0	22	0	0	0	0	0	0	0	0	0	28	0	0	0	0	2,504	0	0	0	0	1,707	0	0	0	0	133	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0
	MARI SHAH SAKARA	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	157	0	0	0	0	136	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MOCHI WALA	0	0	0	0	0	0	0	35	0	0	0	0	13	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,362	0	0	0	0	1,037	0	0	0	0	87	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0
	MUKHANA	0	0	0	0	0	0	0	70	0	0	0	0	38	0	0	0	0	0	0	0	0	0	42	0	0	0	0	3,516	0	0	0	0	3,019	0	0	0	0	204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NADHA GARH	0	0	0	0	0	0	0	21	0	0	0	0	62	0	0	0	0	0	0	0	0	0	14	0	0	0	0	1,062	0	0	0	0	980	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NIKKA DAUTTANA	0	0	0	0	0	0	0	33	0	0	0	0	33	0	0	0	0	0	0	0	0	0	20	0	0	0	0	1,042	0	0	0	0	756	0	0	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PABBAR WALA	0	0	0	0	0	0	0	46	0	0	0	0	37	0	0	0	0	3	0	0	0	0	25	0	0	0	0	2,168	0	0	0	0	1,386	0	0	0	0	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAKKE WALA	0	0	0	0	0	0	0	67	0	0	0	0	22	0	0	0	0	11	0	0	0	0	38	0	0	0	0	2,089	0	0	0	0	2,338	0	0	0	0	161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PIR KOT SECHANA	0	0	0	0	0	0	0	28	0	0	0	0	43	0	0	0	0	0	0	0	0	0	26	0	0	0	0	2,352	0	0	0	0	1,566	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RASUL PUR	0	0	0	0	0	0	0	24	0	0	0	0	52	0	0	0	0	3	0	0	0	0	9	0	0	0	0	1,218	0	0	0	0	501	0	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RATTA MATTA	0	0	0	0	0	0	0	29	0	0	0	0	27	0	0	0	0	0	0	0	0	0	7	0	0	0	0	919	0	0	0	0	287	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SAIRN	0	0	0	0	0	0	0	29	0	0	0	0	18	0	0	0	0	6	0	0	0	0	16	0	0	0	0	2,056	0	0	0	0	1,662	0	0	0	0	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHAH JEWANA	0	0	0	0	0	0	0	51	0	0	0	0	21	0	0	0	0	3	0	0	0	0	15	0	0	0	0	1,528	0	0	0	0	1,318	0	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHEIKH CHUHAR	0	0	0	0	0	0	0	30	0	0	0	0	18	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1,803	0	0	0	0	1,503	0	0	0	0	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SULTAN PAKHERA	0	0	0	0	0	0	0	24	0	0	0	0	18	0	0	0	0	0	0	0	0	0	28	0	0	0	0	2,061	0	0	0	0	1,074	0	0	0	0	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SULTAN PUR	0	0	0	0	0	0	0	50	0	0	0	0	42	0	0	0	0	0	0	0	0	0	21	0	0	0	0	2,994	0	0	0	0	2,224	0	0	0	0	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	URBAN	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	0	0	0	0	0	1,309	0	0	0	0	798	0	0	0	0	60	0	0	0	0	829	0	0	0	0	77,816	0	0	0	0	66,184	0	0	0	0	4,588	0	0	0	0	57	0	0	0	0	56	0	0	0	0	1	0	0
SHORKOT	485 JB	0	0	0	0	0	0	0	27	0	0	0	0	25	0	0	0	0	0	0	0	0	0	18	0	0	0	0	2,368	0	0	0	0	1,467	0	0	0	0	125	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0
	493 JB	0	0	0	0	0	0	0	30	0	0	0	0	7	0	0	0	0	5	0	0	0	0	10	0	0	0	0	632	0	0	0	0	835	0	0	0	0	50	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0
	497 JB	0	0	0	0	0	0	0	31	0	0	0	0	41	0	0	0	0	14	0	0	0	0	49	0	0	0	0	6,414	0	0	0	0	4,683	0	0	0	0	332	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0
	ALLAH YAR JUTA	0	0	0	0	0	0	0	32	0	0	0	0	30	0	0	0	0	0	0	0	0	0	17	0	0	0	0	1,405	0	0	0	0	960	0	0	0	0	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BACH RAJBANA	0	0	0	0	0	0	0	38	0	0	0	0	31	0	0	0	0	0	0	0	0	0	38	0	0	0	0	5,887	0	0	0	0	4,882	0	0	0	0	302	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BINDA SUBANA	0	0	0	0	0	0	0	24	0	0	0	0	25	0	0	0	0	0	0	0	0	0	50	0	0	0	0	1,634	0	0	0	0	354	0	0	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAYYAN WALA	0	0	0	0	0	0	0	63	0	0	0	0	52	0	0	0	0	11	0	0	0	0	50	0	0	0	0	3,794	0	0	0	0	2,033	0	0	0	0	208	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	DAB KALAN	0	0	0	0	0	0	0	16	0	0	0	0	24	0	0	0	0	0	0	0	0	0	18	0	0	0	0	1,565	0	0	0	0	1,349	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	DAURAN PUR	0	0	0	0	0	0	0	8	0	0	0	0	18	0	0	0	0	0	0	0	0	0	12	0	0	0	0	1,219	0	0	0	0	937	0	0	0	0	61	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI BAHADUR SHAH	0	0	0	0	0	0	0	41	0	0	0	0	44	0	0	0	0	3	0	0	0	0	13	0	0	0	0	1,489	0	0	0	0	1,349	0	0	0	0	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KAKKI NAU	0	0	0	0	0	0	0	15	0	0	0	0	25	0	0	0	0	0	0	0	0	0	12	0	0	0	0	2,654	0	0	0	0	2,975	0	0	0	0	124	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0
	KOT MUHAMMAD ZARIF KHAN	0	0	0	0	0	0	0	25	0	0	0	0	24	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,164	0	0	0	0	1,122	0	0	0	0	68	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	QASIM BHARWANA	0	0	0	0	0	0	0	51	0	0	0	0	31	0	0	0	0	2	0	0	0	0	14	0	0	0	0	2,739	0	0	0	0	1,648	0	0	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RAKH BHAGO	0	0	0	0	0	0	0	35	0	0	0	0	17	0	0	0	0	0	0	0	0	0	18	0	0	0	0	1,655	0	0	0	0	1,161	0	0	0	0	86	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	SHAH SADIQ NAHANG	0	0	0	0	0	0	0	34	0	0	0	0	53	0	0	0	0	4	0	0	0	0	18	0	0	0	0	3,428	0	0	0	0	1,945	0	0	0	0	137	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
	SHORKOT CANTT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	0	0	0	0	0	0	0	470	0	0	0	0	448	0	0	0	0	39	0	0	0	0	352	0	0	0	0	38,047	0	0	0	0	27,700	0	0	0	0	1,894	0	0	0	0	111	0	0	0	0	0	0	0	0	0	1	0	0
	DISTRICT TOTAL:	0	0	0	0	0	0	0	2,493	0	0	0	0	2,340	0	0	0	0	99	0	0	0	0	1,487	0	0	0	0	144,511	0	0	0	0	114,373	0	0	0	0	8,001	0	0	0	0	168	0	0	0	0	103	0	0	0	0	4	0	0

BUILT UP, MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO EARTHQUAKE 50 YEAR RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Refined Oil Pipeline
- Builtup Area
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Hazard Zone (g)*

2A (0.08-0.16) Low

Zones are categories as per classification of Pakistan Engineeringing Council.
Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

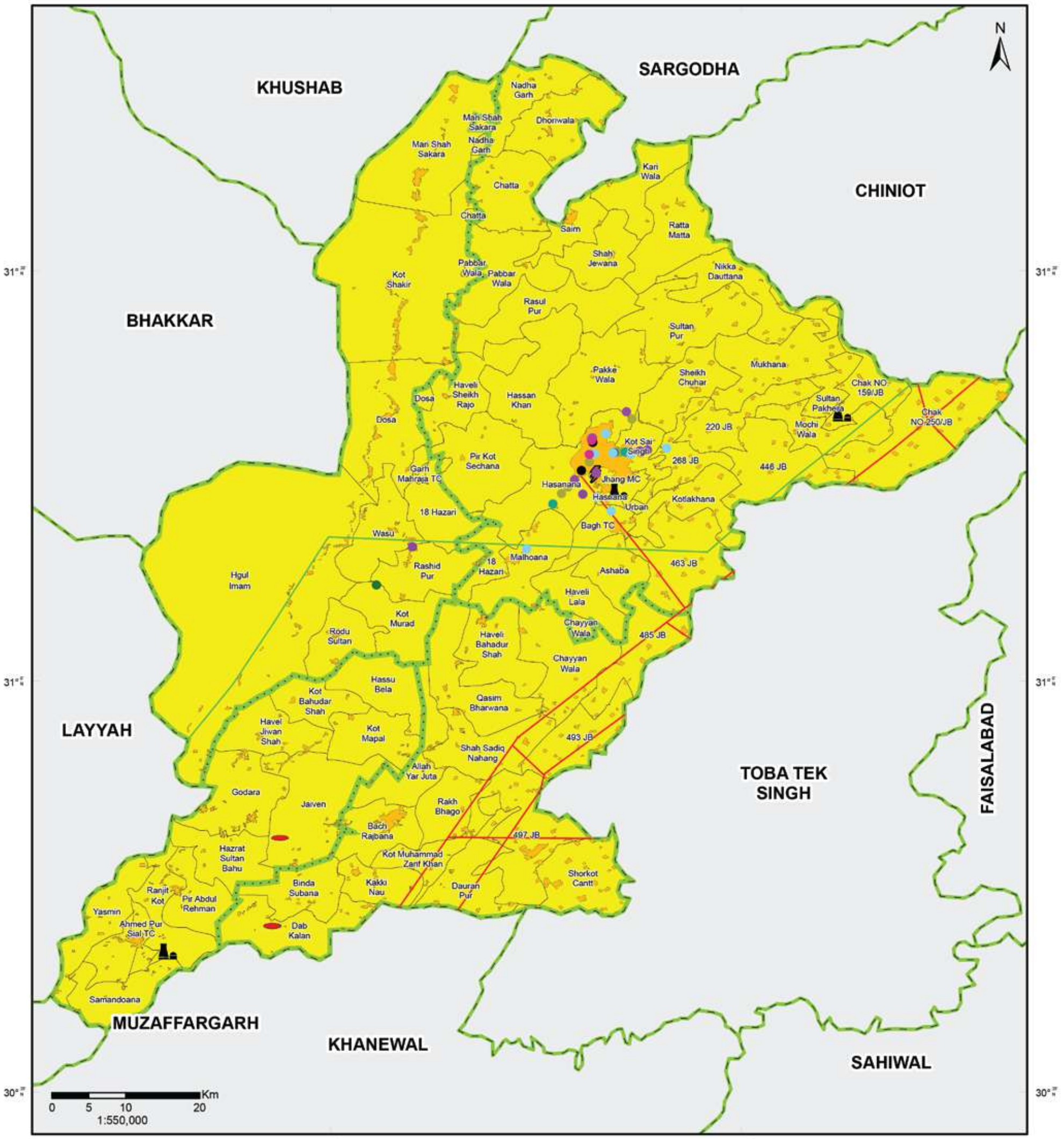
MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-50-C(BU-MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

BUILT UP, MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO EARTHQUAKE 475 YEAR RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Refined Oil Pipeline
- Builtup Area
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary

Hazard Zone (g)*

- 2B (0.16-0.24) Medium

Zones are categories as per classification of Pakistan Engineeringing Council.
Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

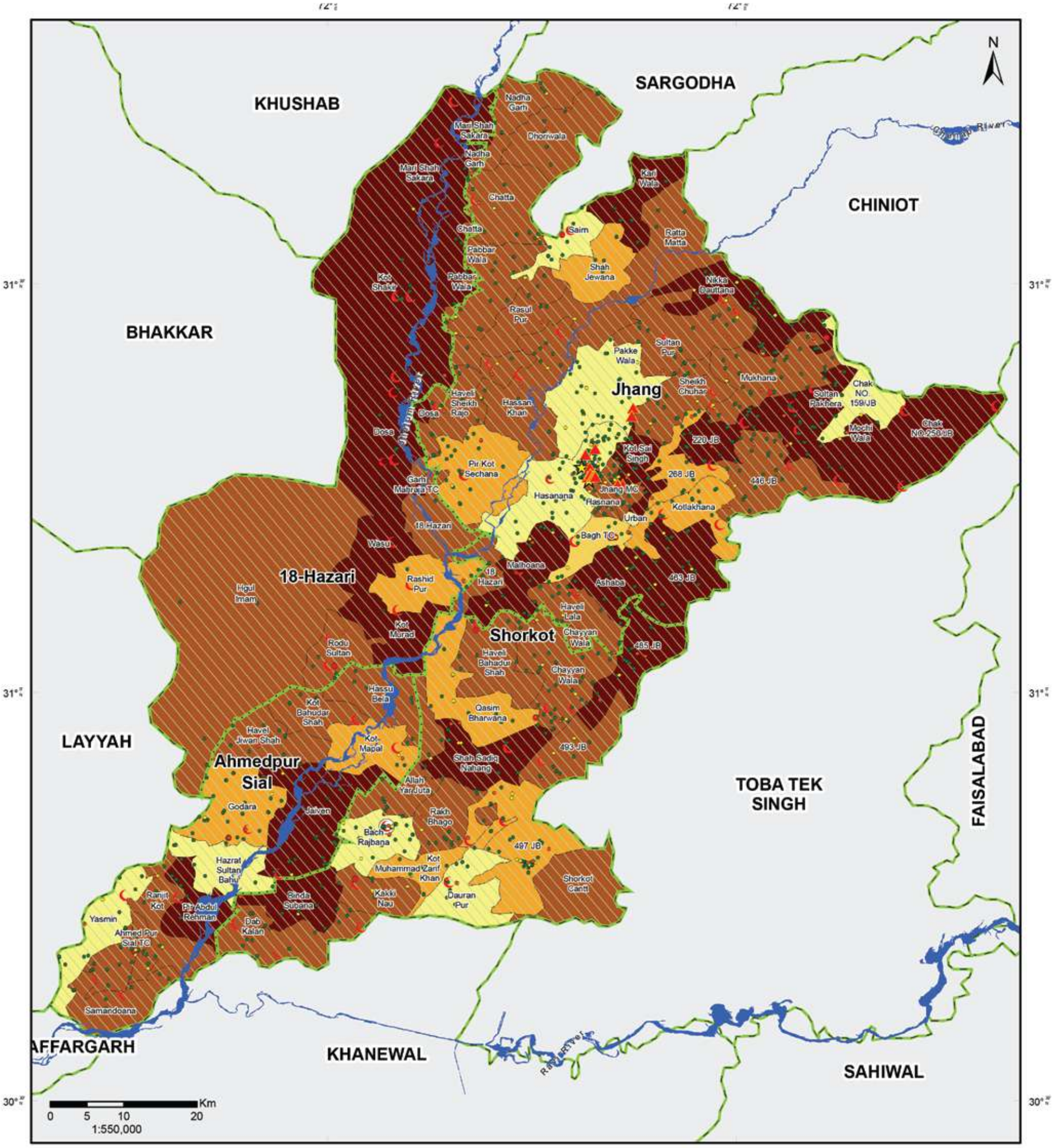
MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-475-C(BU-MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO EARTHQUAKE 50 YEAR RETURN PERIOD



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

Return Period 50 Years

- Low (Zone 2A)
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

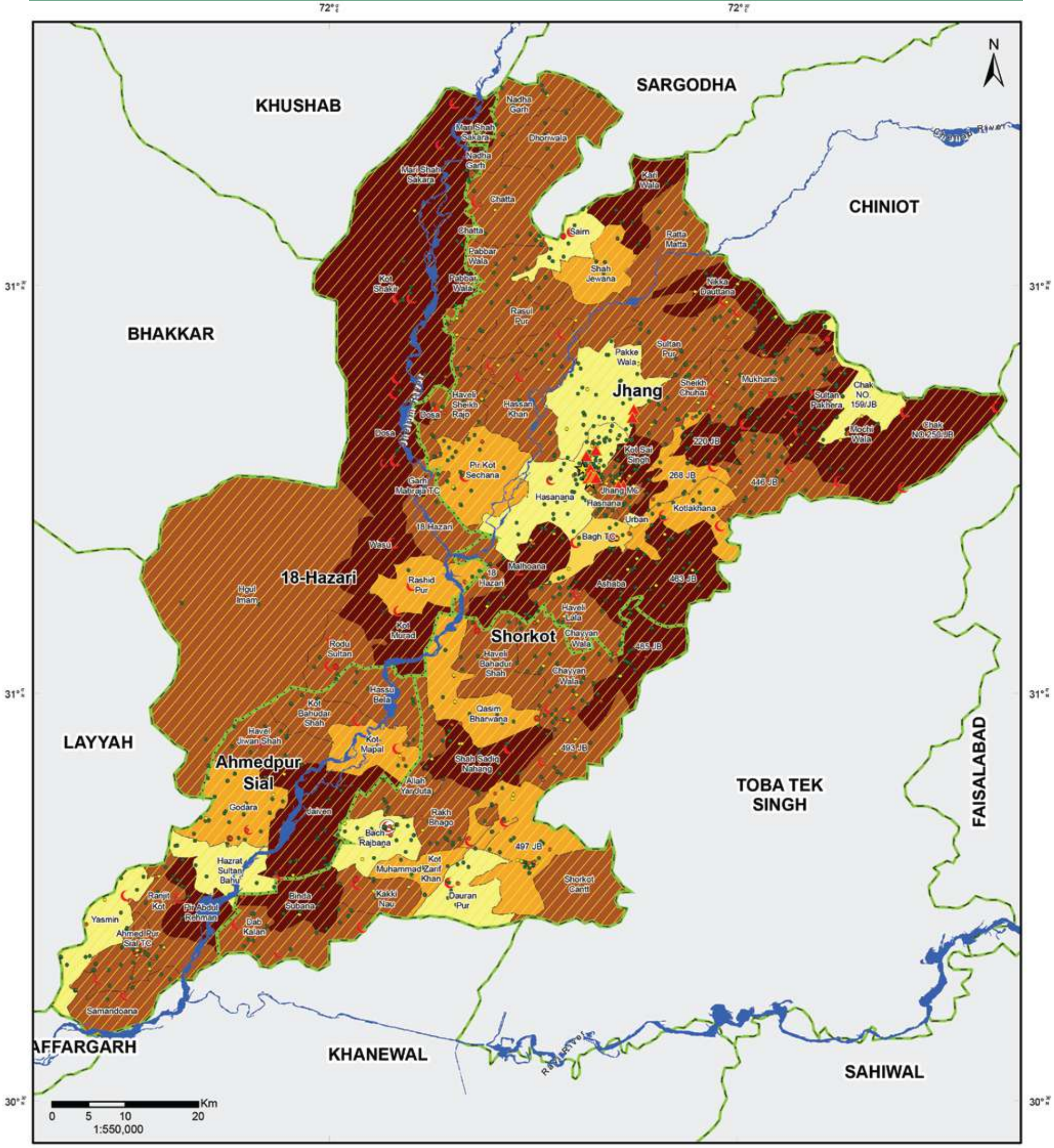
Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics
School Education Department
World Health Organization
Health Department Punjab
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-50-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO EARTHQUAKE 475 YEAR RETURN PERIOD- MULTAN



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

Return Period 475 Years

- Moderate (Zone 2B)
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

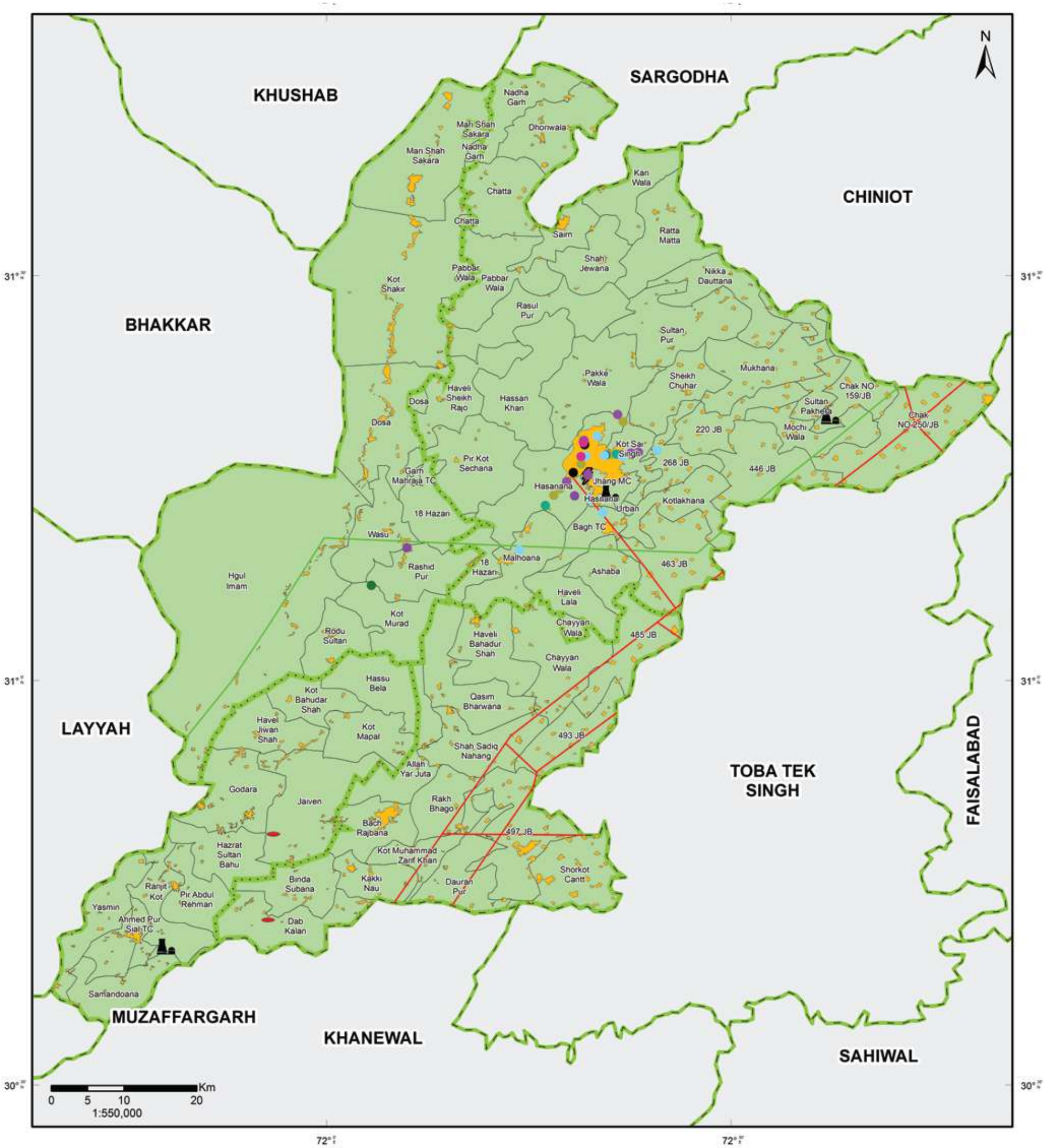
Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics
School Education Department
World Health Organization
Health Department Punjab
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-475-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

BUILT UP AREAS, MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO EARTHQUAKE 50 YEARS RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Refined Oil Pipeline
- Builtup Area
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Hazard Zone (g)*

2A (0.08-0.16) Low

Zones are categories as per classification of Pakistan Engineeringing Council.
Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

United Nations World Food Programme

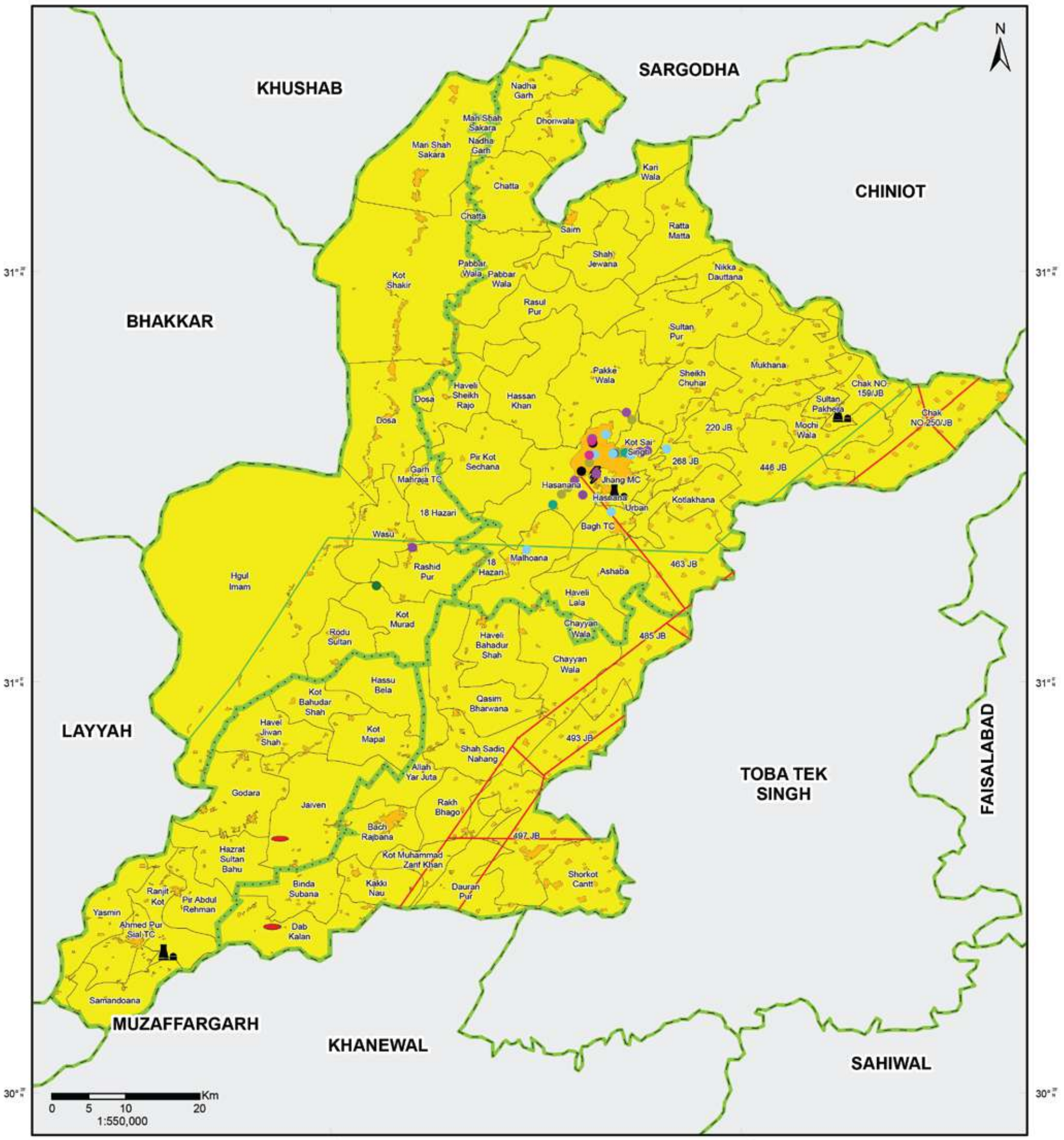
MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-50-C(BU-MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

BUILT UP AREAS, MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO EARTHQUAKE 475 YEARS RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Refined Oil Pipeline
- Builtup Area
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary

Hazard Zone (g)*

- 2B (0.16-0.24) Medium

Zones are categories as per classification of Pakistan Engineeringing Council.
Symbol "(g)" represent Gravitational Acceleration

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

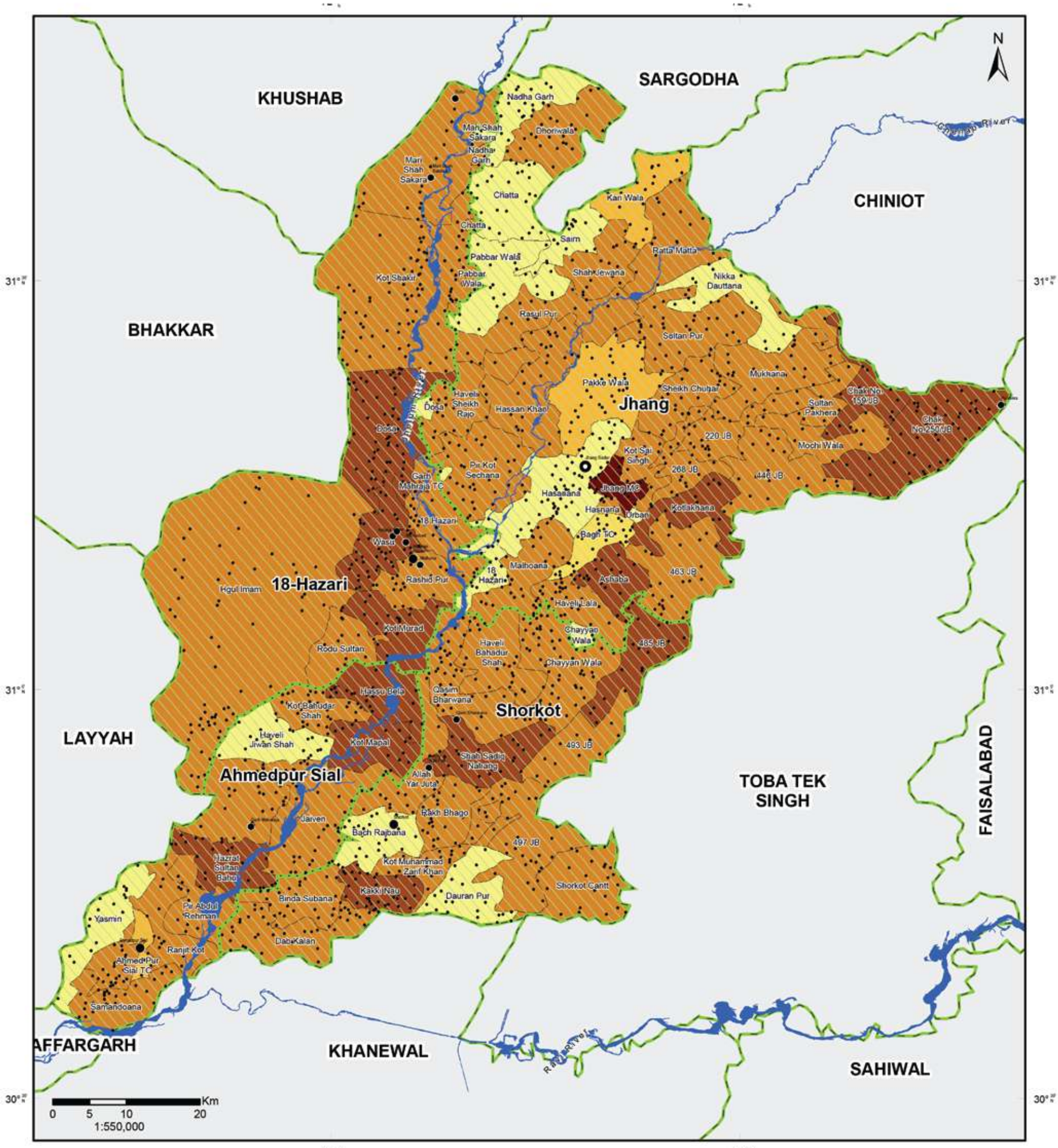
MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-03-NDMA-475-C(BU-MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SETTLEMENTS, VILLAGES, MAJOR TOWNS AND POPULATION EXPOSED TO EARTHQUAKE RETURN PERIOD 50 YEARS



Legend

- District Headquarter
- Tehsil Headquarter
- Major Town
- Settlements / Villages

Population Distribution

- <= 9000
- 9001 - 18000
- 18001 - 27000
- 27001 - 36000
- 36001 - 45000
- >45000

- Low (Zone 2A)
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

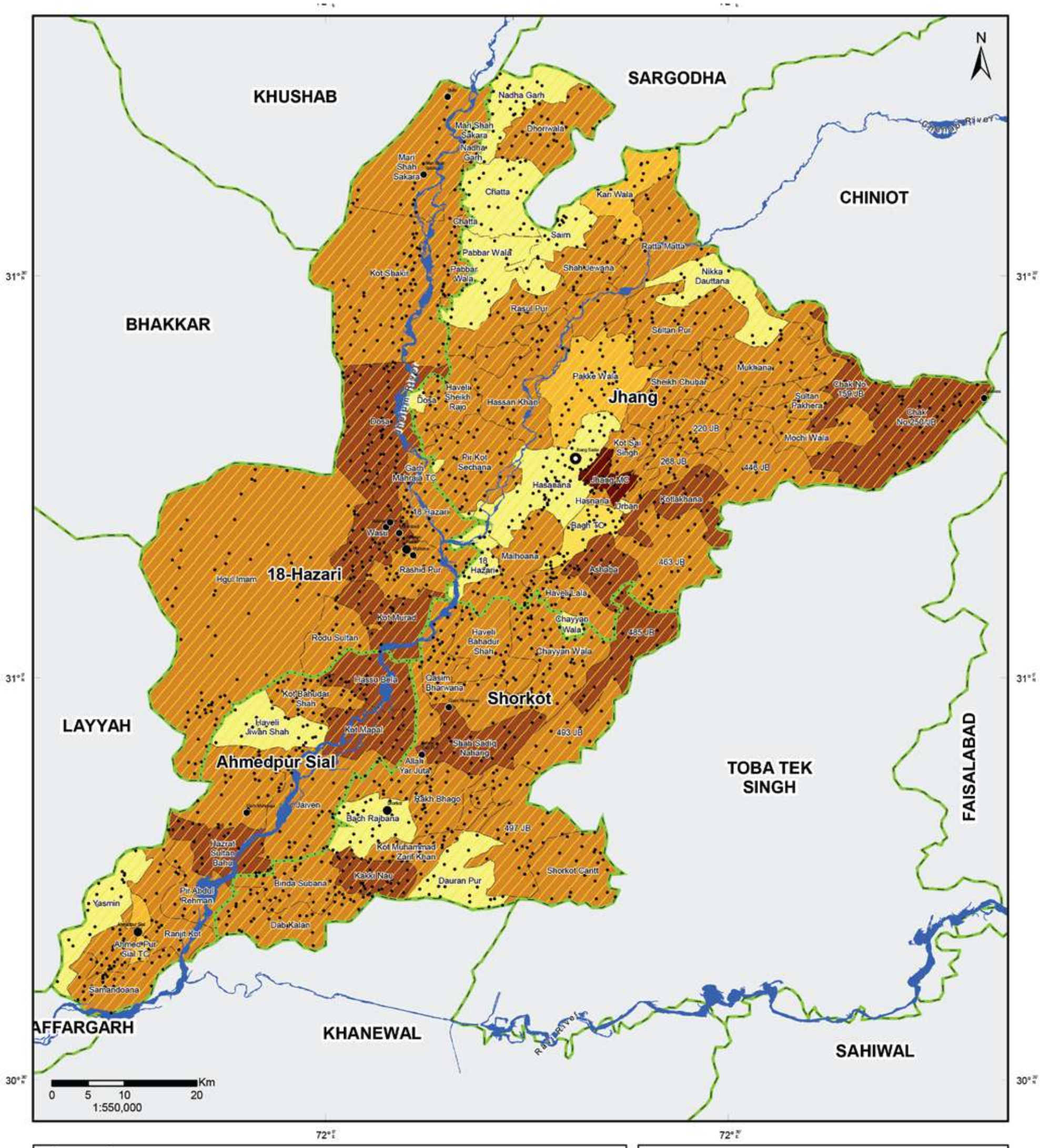
MAP INFORMATION

Data Source(s):

Pakistan Meteorological Department
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-628-APR-2016-EXP-03-NDMA-50-C(POP-SET)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SETTLEMENTS, VILLAGES, MAJOR TOWNS AND POPULATION EXPOSED TO EARTHQUAKE RETURN PERIOD 475 YEARS



Legend

- District Headquarter
- Tehsil Headquarter
- Major Town
- Settlements / Villages

Union Council wise Population Distribution 2015

- <= 9000
- 9001 - 18000
- 18001 - 27000
- 27001 - 36000
- 36001 - 45000
- >45000

- Moderate (Zone 2B)
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

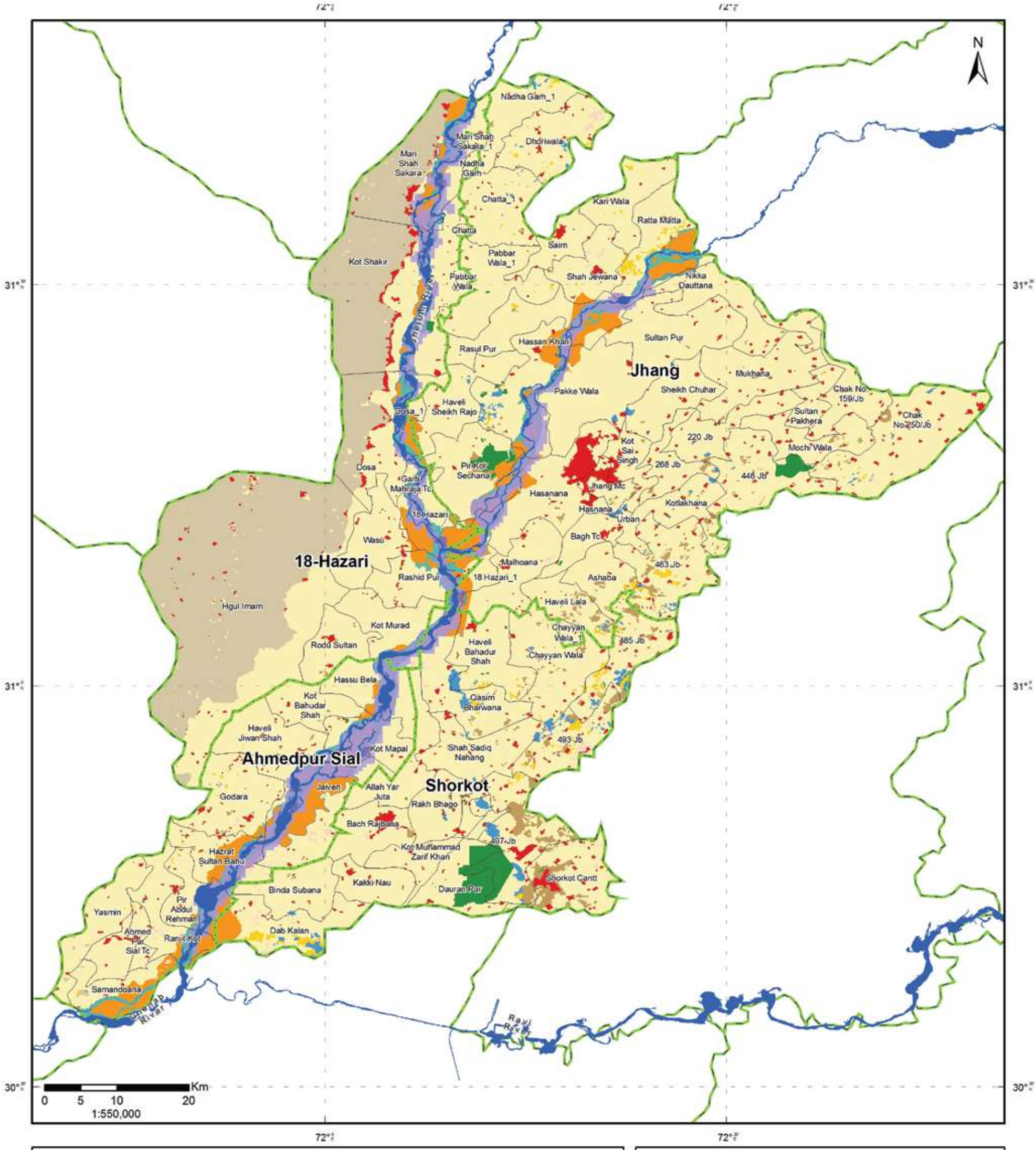
Pakistan Meteorological Department
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-628-APR-2016-EXP-03-NDMA-475-C(POP-SET)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

UNION COUNCILS		DEMOGRAPHICS			HOUSING & SETTLEMENTS					TELECOMMUNIATION TOWERS	INDUSTRIAL UNITS	TRANSPORTATION INFRASTRUCTURE (IN CM)				HEALTH FACILITIES	EDUCATION FACILITIES				CRITICAL INFRASTRUCTURE		LAND USE AND LAND COVER TYPE (AREA IN CM)						MAJOR CROPS (AREA IN HECTARES)	
		POPULATION	MALE	FEMALE	SETTLEMENTS	BUILDINGS (ALL TYPES)	PACCA BUILDING	SEMI PACCA BUILDING	KACHA BUILDING			MOTORWAY /HIGHWAY/ GRAND TRUNK ROAD	SECONDARY ROADS (METALLED)	UNMETALLED ROAD/CART TRACK/PACK TRACK	RAILWAY TRACK		SCHOOLS	NUMBER OF STUDENTS BOYS	NUMBER OF STUDENTS GIRLS	NUMBER OF TEACHER	SNGPL (GAS PIPELINE)	OTHER INFRAST-RUCTURE	CROP IRRIGATED	CROP IN FLOOD PLAIN	CROP RAINFED	CROP MARGINAL AND IRRIGATED SALINE	ORCHARDS	BUILT UP	RICE	SUGARCANE
18-HAZARI	18 HAZARI_1	34,324	17,819	16,505	17	5,489	1,153	513	3,824	0	0	0	4	12	0	0	2	50	16	2	0	0	2,015	2,223	0	0	0	0	578	376
	CHATTA_1	31,670	16,172	15,498	25	5,065	808	602	3,655	0	0	0	0	3	0	0	5	340	337	24	0	0	411	0	0	0	0	14	117	18
	DOSA_1	36,624	18,595	18,029	2	5,857	1,446	346	4,066	10	0	0	59	51	0	4	4	19	33	2	0	0	5,725	689	0	0	0	520	1,218	965
	GARH MAHRAJA TC	37,455	19,420	18,035	0	5,990	2,102	1,435	2,453	0	0	0	0	0	0	0	0	0	0	0	0	0	38	47	0	0	0	0	8	9
	HGUL IMAM	30,977	16,142	14,835	69	4,954	1,312	307	3,335	16	0	0	105	344	0	0	4	269	99	7	0	0	14,326	0	0	12	0	443	6,287	546
	KOT MURAD	38,248	19,822	18,426	18	6,117	1,621	369	4,127	9	1	0	24	19	0	0	1	12	45	2	0	0	6,233	140	0	0	50	37	715	2,481
	KOT SHAKIR	35,450	17,856	17,595	93	5,669	2,066	96	3,508	11	0	0	63	151	0	3	15	1,150	943	74	0	0	10,324	564	0	0	0	836	2,319	1,118
	MARI SHAH SAKARA_1	35,406	17,756	17,650	3	5,662	1,196	475	3,992	8	0	0	23	142	0	2	22	1,746	875	81	0	0	3,147	1,696	0	0	0	502	1,220	530
	NADHA GARH_1	28,837	14,548	14,289	24	4,612	888	680	3,044	1	0	0	1	5	0	0	0	0	0	0	0	0	401	0	0	0	0	6	181	41
	PABBAR WALA_1	32,226	16,790	15,436	24	5,154	779	376	3,999	0	0	0	0	3	0	0	0	0	0	0	0	0	500	0	0	0	0	3	158	37
	RASHID PUR	27,747	14,259	13,489	29	4,437	1,509	936	1,993	13	1	0	32	26	0	2	5	492	66	31	0	0	4,517	944	0	0	0	140	883	1,657
	RODU SULTAN	33,050	16,907	16,144	13	5,286	2,704	165	2,417	17	0	0	33	32	0	2	11	1,533	924	84	0	0	5,217	0	0	0	0	126	1,929	777
	WASU	36,891	18,825	18,066	44	5,900	2,304	1,314	2,281	10	0	0	44	23	0	1	0	0	0	0	0	0	7,238	104	0	0	0	137	3,313	1,014
	TEHSIL TOTAL:	438,905	224,911	213,997	361	70,192	19,888	7,614	42,694	95	2	0	388	812	0	14	69	5,611	3,338	307	0	0	60,091	6,407	0	12	50	2,765	18,924	9,568
AHMEDPUR SIAL	AHMED PUR SIAL TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GODARA	32,112	16,947	15,165	25	3,873	717	736	2,420	31	0	0	53	33	0	1	47	4,803	4,576	287	0	0	8,789	148	0	64	42	300	2,379	1,172
	HASSU BELA	37,458	19,316	18,143	24	4,662	1,226	548	2,888	0	0	0	17	17	0	0	7	432	338	14	0	0	4,900	411	0	0	0	10	880	1,593
	HAVELI JIWAN SHAH	1,519	780	740	21	5,438	2,876	0	2,562	5	0	0	44	29	0	1	18	1,558	1,462	84	0	0	6,625	7	0	5	8	86	2,472	625
	HAZRAT SULTAN BAHU	38,610	20,091	18,519	21	221	43	51	126	2	0	0	23	15	0	0	12	2,048	473	69	0	0	3,707	1,618	0	15	88	89	1,053	766
	JAIVEN	35,765	18,549	17,217	40	5,606	971	748	3,887	0	0	0	22	44	0	1	21	1,982	949	82	0	1	6,825	3,723	0	0	352	104	1,988	2,640
	KOT BAHUDAR SHAH	28,556	14,870	13,686	32	5,192	1,092	1,251	2,850	9	0	0	42	7	0	1	29	3,033	2,417	136	0	0	4,755	11	0	0	0	49	1,443	846
	KOT MAPAL	40,173	20,817	19,356	10	4,146	823	592	2,731	0	0	0	7	8	0	1	4	803	341	34	0	0	3,355	1,054	0	0	0	53	704	1,189
	PIR ABDUL REHMAN	34,329	17,795	16,534	9	5,832	1,406	614	3,813	0	0	0	18	18	0	0	8	520	510	31	0	0	3,170	1,131	0	27	8	45	1,051	419
	RANJIT KOT	32,520	17,024	15,496	39	4,984	958	523	3,503	28	0	0	59	46	0	3	50	4,799	4,326	299	0	1	7,684	738	0	0	116	277	3,085	787
	SAMANDOANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	YASMIN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	281,042	146,189	134,856	221	39,954	10,112	5,063	24,780	75	0	0	285	217	0	8	196	19,978	15,392	1,036	0	2	49,809	8,841	0	111	612	1,014	15,054	10,036
JHANG	18 HAZARI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	220 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	268 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	446 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	463 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ASHABA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BAGH TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAK NO. 159/JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAK NO.250/JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHATTA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAYYAN WALA_1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DHORIWALA	31,976	16,257	15,718	28	5,114	1,050	1,102	2,962	9	0	0	33	39	0	0	17	1,418	921	85	0	0	8,055	0	0	102	317	247	2,632	570
	DOSA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASANANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASNANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HASSAN KHAN	30,098	15,772	14,326	28	4,813	1,153	746	2,914	7	0	0	28	32	8	2	19	1,900	1,119	95	0	0	7,227	1,571	0	87	0	130	1,438	1,364
	HAVELI LALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI SHEIKH RAJO	31,952	16,462	15,490	25	5,110	1,106	213	3,791	1	0	0	43	20	0	2	29	2,248	1,800	129	0	0	7,195	244	0	11	0	58	1,496	1,149
	JHANG MC	448,004	233,837	214,167	14	4,657	0	0	0	52	7	0	20	4	2	1	39	3,196	3,664	249	0	1	1,696	0	0	18	0	657	123	57
	KARI WALA	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOT SAI SINGH	34,713	18,111	16,602	14	5,770	3,449	600	1,720	26	5	0	40	2	0	0	30	1,769	3,214	167	0	0	3,202	0	0	19	0	421	363	231
	KOTLAKHANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MALHOANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MARI SHAH SAKARA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MOCHI WALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MUKHANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NADHA GARH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NIKKA DAUTTANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PABBAR WALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAKKE WALA	26,338	13,733	12,605	43	831	277	142	413	22	2	0	67	22	11	0	38	2,089	2,338	161	0	0	11,279	395	0	0	0	142	958	2,516
	PIR KOT SECHANA	31,268	16,263	15,005	33	4,212	457	217	3,537	0	0	0	28	43	0	1	26	2,352	1,566	100	0	0	6,906	1,519	0	0	0	32	960	1,313
	RASUL PUR	31,277	16,286	14,992	19	5,450	1,253	745	3,452	4	0	0	24	52	3	0	9	1,218	501	52	0	0	7,121	1,708	0	54	0	18	2,415	800
	RATTA MATTA	27,735	14,605	13,130	17	5,002	644	679	3,679	0	0	0	29	27	0	0	7	919	287	34	0	0	5,472	1,854	0	572	11	93	2,294	572
	SAIRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHAH JEWANA	30,591	15,824	14,766	17	4,436	1,170	722	2,544	9	0	0	51	20	3	0	15	1,528	1,318	74	0	0	5,283	208	0	43	165	150	2,084	359
	SHEIKH CHUHAR	34,516	18,120	16,396	27	4,892	1,854	518	2,521	4	0	0	30	21	0	1	22	1,803	1,503	111	0	0	6,377	0	0	0	0	121	1,127	260
	SULTAN PAKHERA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SULTAN PUR	32,450	17,196	15,254	35	4,719	908	380	3,431	10	0	0	50	42	0	3	28	2,994	2,224	180	0	0	10,888	44	0	0	8	172	2,106	1,313
	URBAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	790,918	412,466	378,451	300	55,006	13,321	6,064	30,964	146	14	0	441	323	27	10	279	23,434	20,455	1,437	0	1	80,701	7,542	0	906	502	2,240	17,997	10,503
SHORKOT	485 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	493 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	497 JB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ALLAH YAR JUTA	33,772	17,377	16,395	23	4,903	597	655	3,651	11	0	0	32	30	0	0	17	1,405	960	51	0	0	6,338	20	0	0	5	78	1,934	2,093
	BACH RAJBANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BINDA SUBANA	34,913	18,021	16,892	25	5,583	1,103	267	4,214	1	0	0	24	25	0	0	10	1,634	354	58	0	0	6,082	0	0	0	78	40	2,634	847
	CHAYYAN WALA	33,374	17,303	16,071	53	4,845	810	555	3,480	3	0	0	63	52	11	2	50	3,794	2,033	208	0	0	10,071	0	0	94	11	160	3,134	1,256
	DAB KALAN	31,164	15,951	15,213	39	4,524	731	528	3,265	7	0	0	16	24	0	3	18	1,565	1,349	71	0	1	6,434	1,123	0	727	240	97	2,544	197
	DAURAN PUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAVELI BAHADUR SHAH	32,168	16,760	15,408	22	4,670	1,825	364	2,481	17	0	0	41	44	3	1	13	1,489	1,349	91	0	0	7,224	187	0	138	0	128	3,744	1,112
	KAKKI NAU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOT MUHAMMAD ZARIF KHAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	QASIM BHARWANA	29,818	15,548	14,270	45	4,329	916	473	2,941	5	0	0	51	31	2	0	14	2,739	1,648	130	0	0	7,661	682	0	157	57	140	2,619	1,960
	RAKH BHAGO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHAH SADIQ NAHANG	38,567	19,725	18,842	27	5,599	1,377	499	3,724	10	0	0	34	53	4	1	18	3,428	1,945	137	13	0	7,641	0	0	9	8	229	2,706	1,339
	SHORKOT CANTT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TEHSIL TOTAL:	233,776	120,685	113,091	234	34,453	7,359	3,341	23,756	54	0	0	261	259	20	7	140	16,054	9,638	746	13	1	51,452	2,012	0	1,126	398	873	19,316	8,803
DISTRICT TOTAL:		1,744,641	904,251	840,395	1,116	199,605	50,680	22,082	122,194	370	16	0	1,375	1,611	47	39	684	65,077	48,823	3,526	13	4	242,052	24,801	0	2,154	1,562	6,892	71,291	38,910

* Sui Northern Gas Pipelines Limited (SNGPL), Pakistan

LAND USE & LAND COVER EXPOSED TO FLOOD RETURN PERIOD 10 YEAR



Legend

- Bare Areas
- Bare Areas with Sparse Natural Vegetation
- Built-up
- Crop in Flood Plain
- Crop Marginal and Irrigated Saline
- Crop Rainfed
- Crop Irrigated
- Forest - Natural Trees and Mangroves
- Natural Vegetation in Wet Areas
- Orchards
- Range Lands - Natural Shrubs and Herbs
- Snow and Glaciers
- Wet Areas
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provinvial Boundary
- Line of Control
- International Boundary

Return Period 10 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

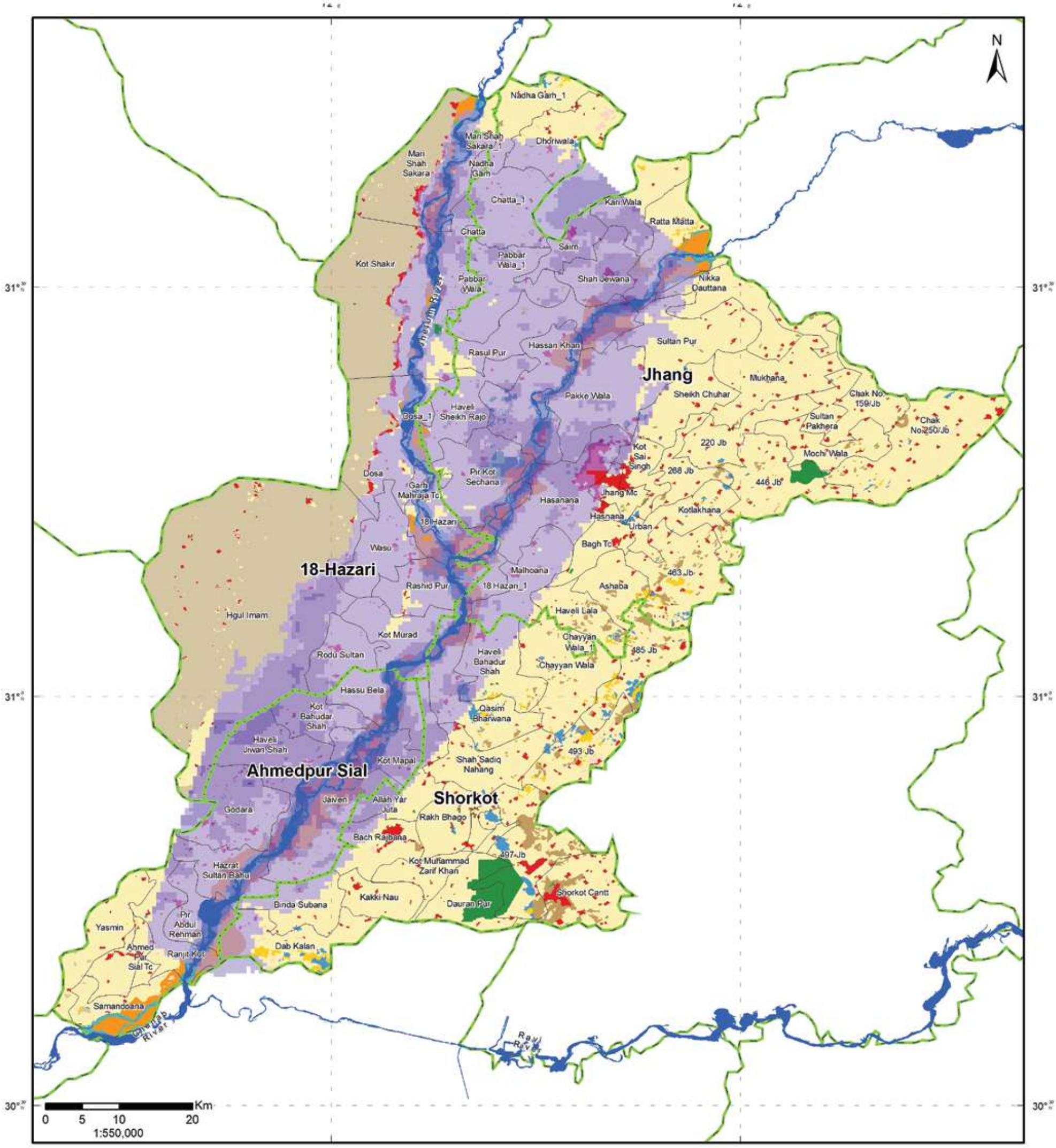
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Landcover-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-10-LULC
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

LAND USE & LAND COVER EXPOSED TO FLOOD
RETURN PERIOD 50 YEAR



Legend

- Bare Areas
- Bare Areas with Sparse Natural Vegetation
- Built-up
- Crop in Flood Plain
- Crop Marginal and Irrigated Saline
- Crop Rainfed
- Crop Irrigated
- Forest - Natural Trees and Mangroves
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- Wet Areas
- River and Water Body
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provinvial Boundary
- Line of Control
- International Boundary

Return Period 50 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

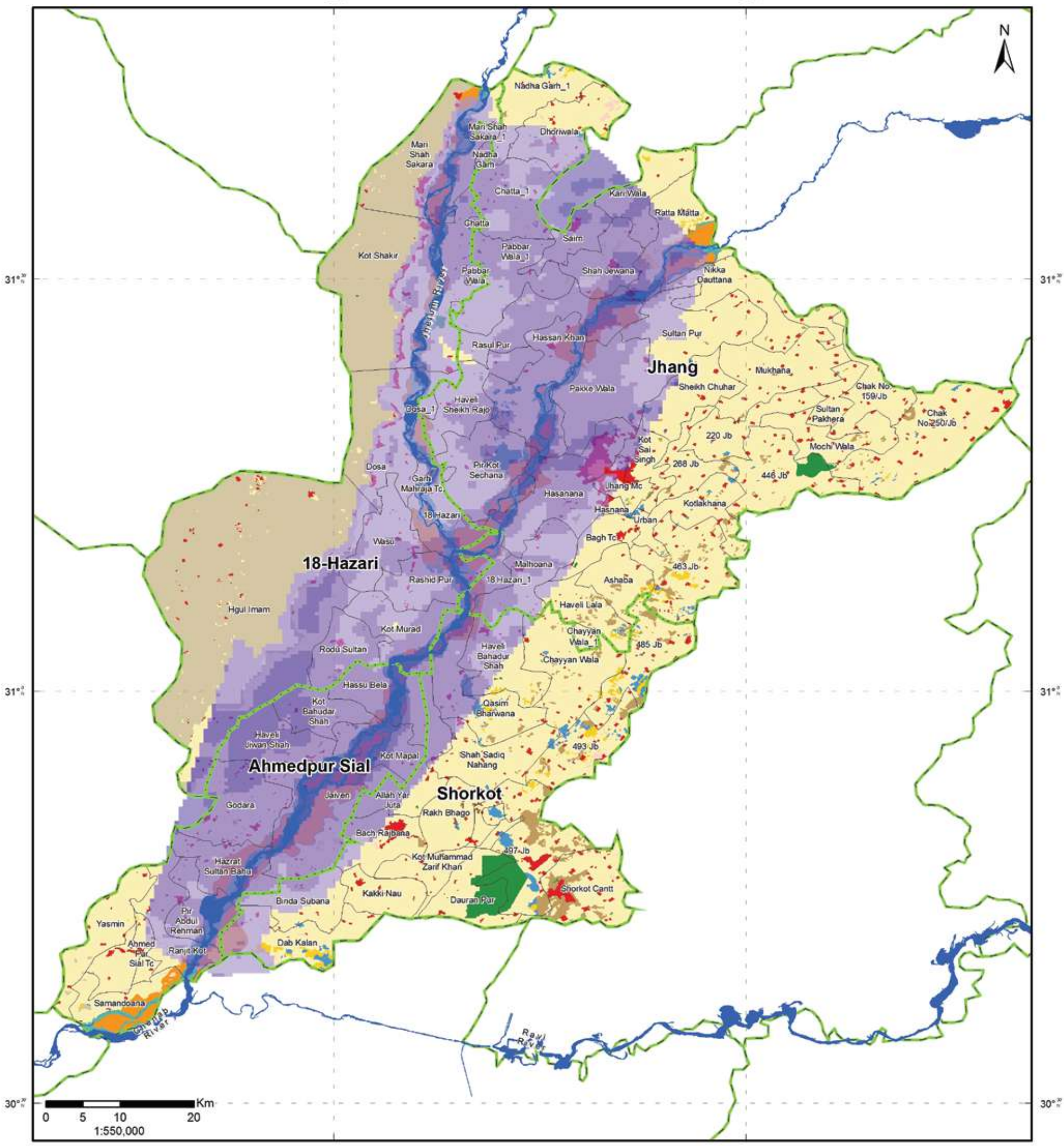
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Landcover-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-50-LULC
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

LAND USE & LAND COVER EXPOSED TO FLOOD RETURN PERIOD 100 YEAR



Legend

- Bare Areas
- Bare Areas with Sparse Natural Vegetation
- Built-up
- Crop in Flood Plain
- Crop Marginal and Irrigated Saline
- Crop Rainfed
- Crop Irrigated
- Forest - Natural Trees and Mangroves
- Natural Vegetation in Wet Areas
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- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provinvial Boundary
- Line of Control
- International Boundary

Return Period 100 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

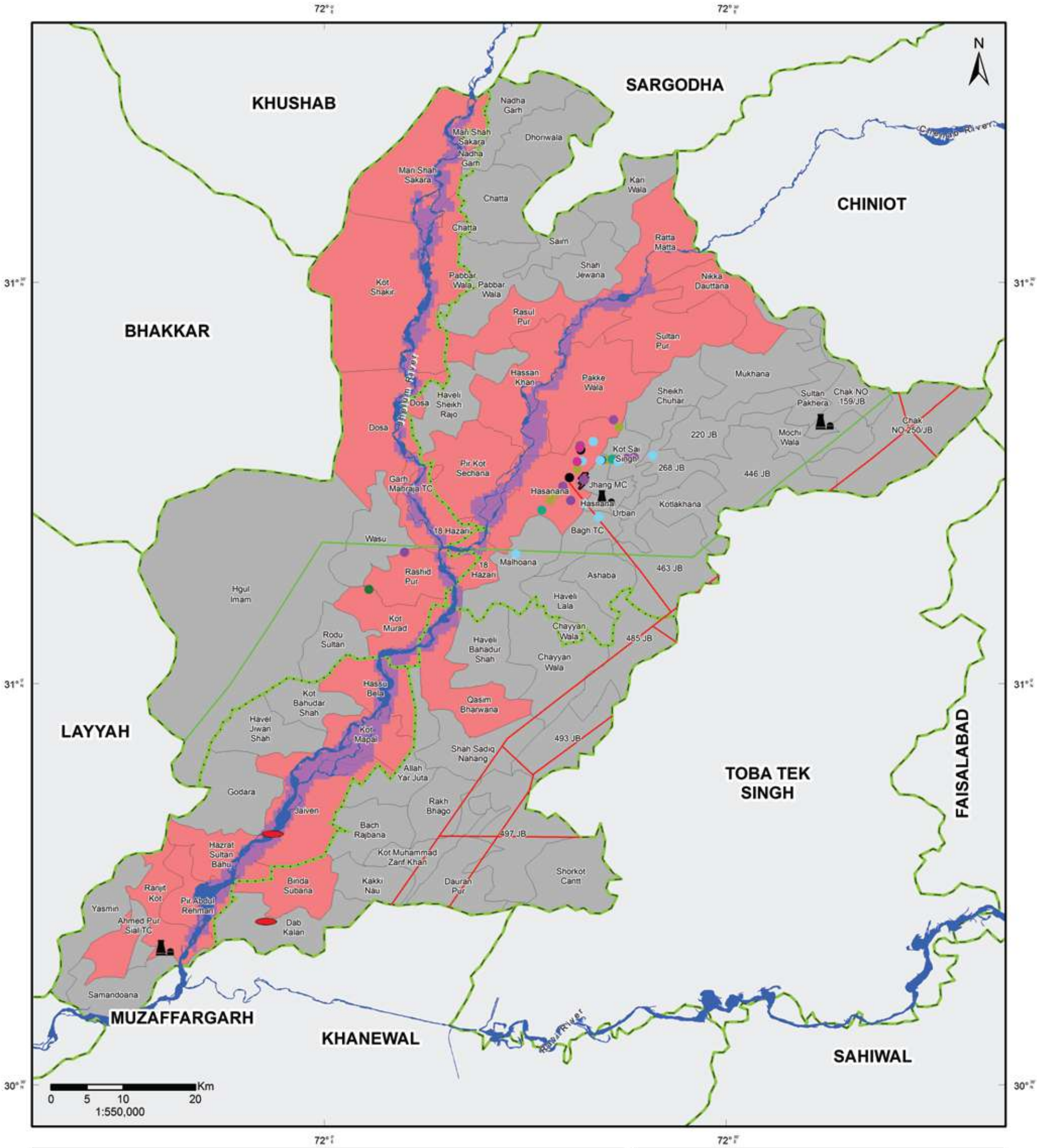
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Landcover-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-100-LULC
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO FLOOD - 10 YEAR RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Oil Refinery
- River & Water Body
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

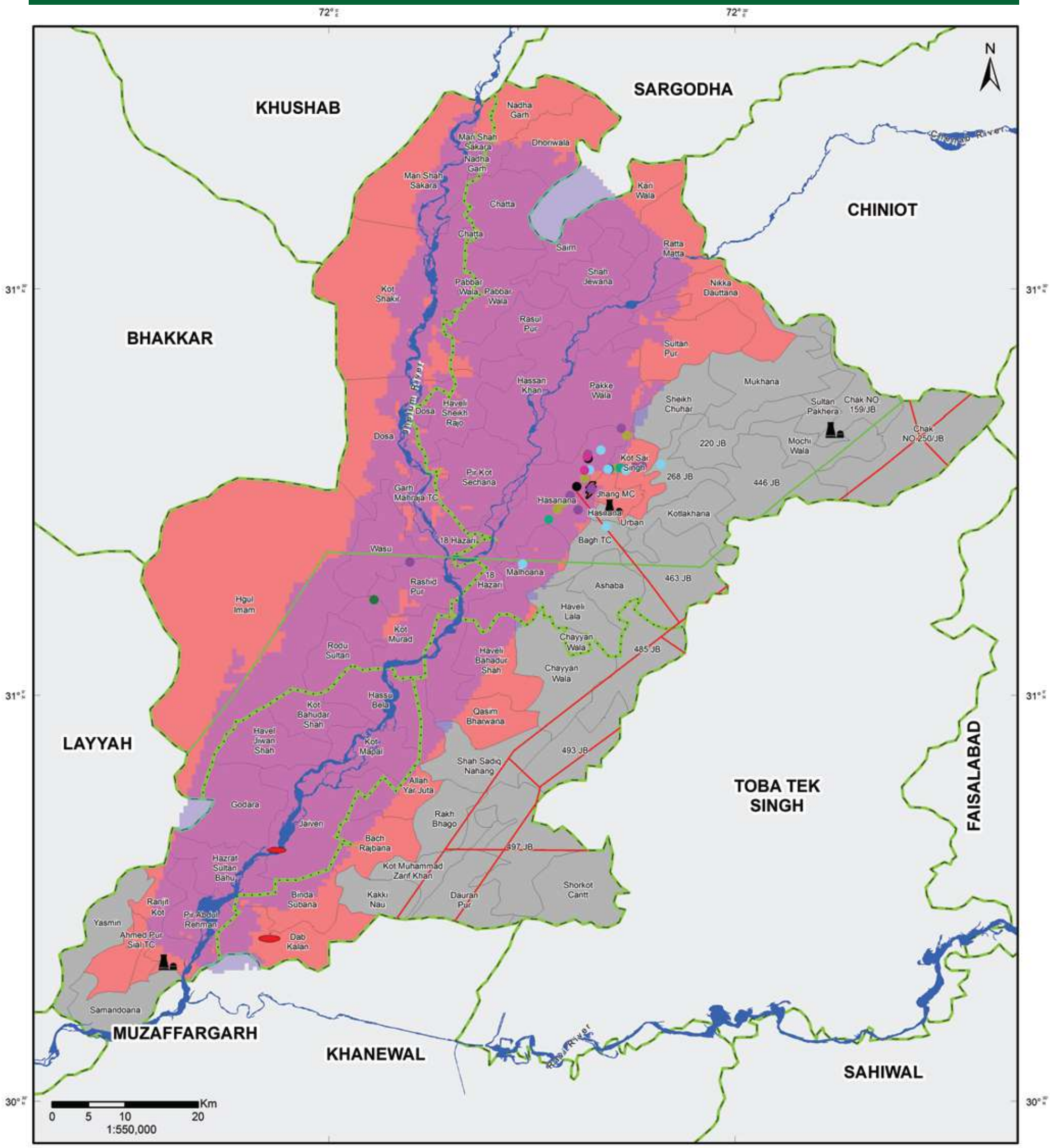
MAP INFORMATION

Data Source(s):
Punjab Agricultural Board, Government of Punjab
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-10-C(MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO FLOOD - 50 YEAR RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Oil Refinery
- River & Water Body
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

MAP INFORMATION

Data Source(s):
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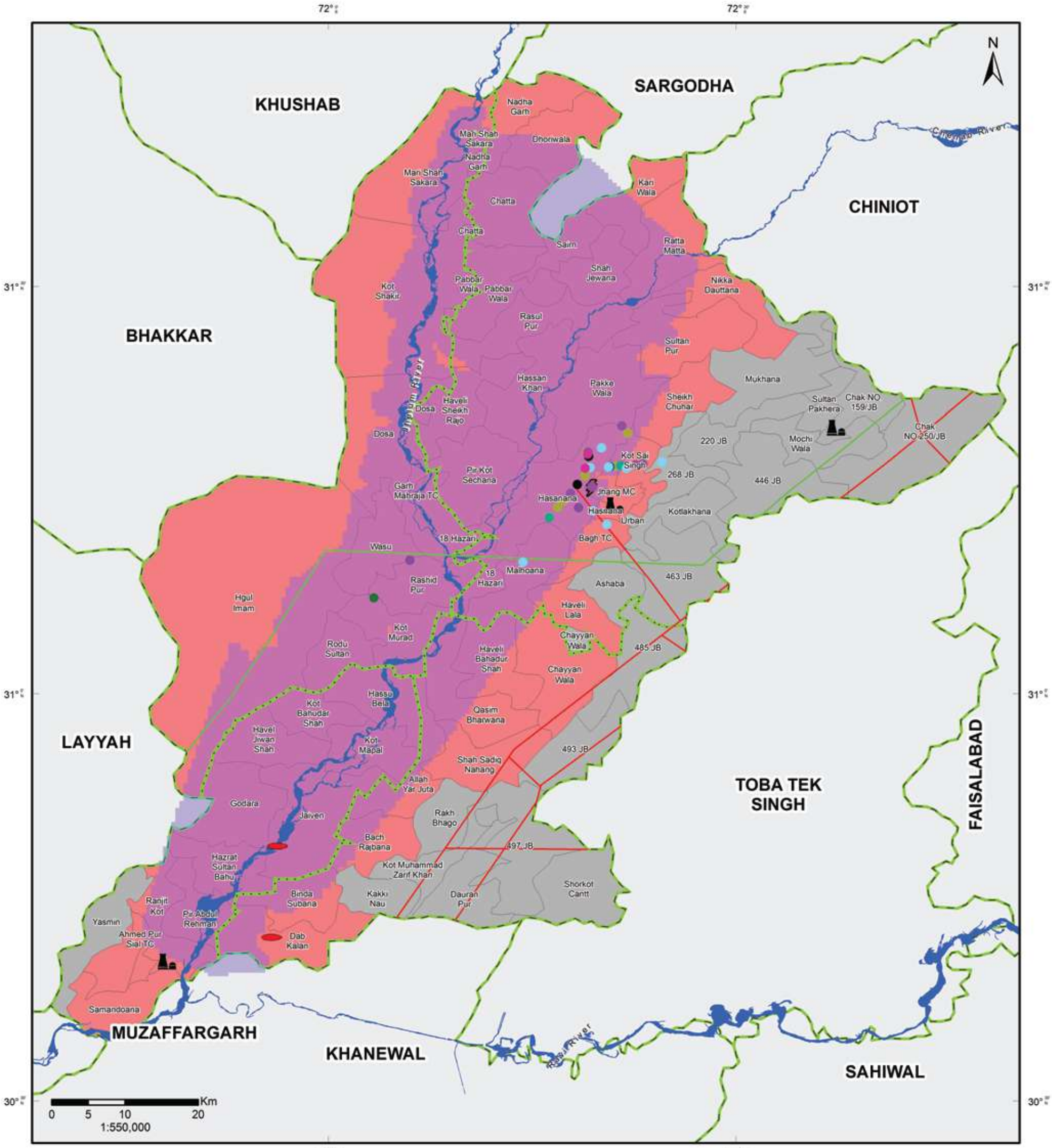
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-50-C(MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

MAJOR INDUSTRIES & CRITICAL INFRASTRUCTURE EXPOSED TO FLOOD - 100 YEAR RETURN PERIOD



Legend

- Flour Mill
- Rice Mill
- Oil Mill
- Cotton Factory
- Sugar Mill
- Water Purification Plant
- Agriculture based Industry
- Ceramic Industry
- Cold Storage
- Purification Plant
- Grid Station
- Gas Field
- Sui Northern Gas Pipeline
- Oil Refinery
- River & Water Body
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
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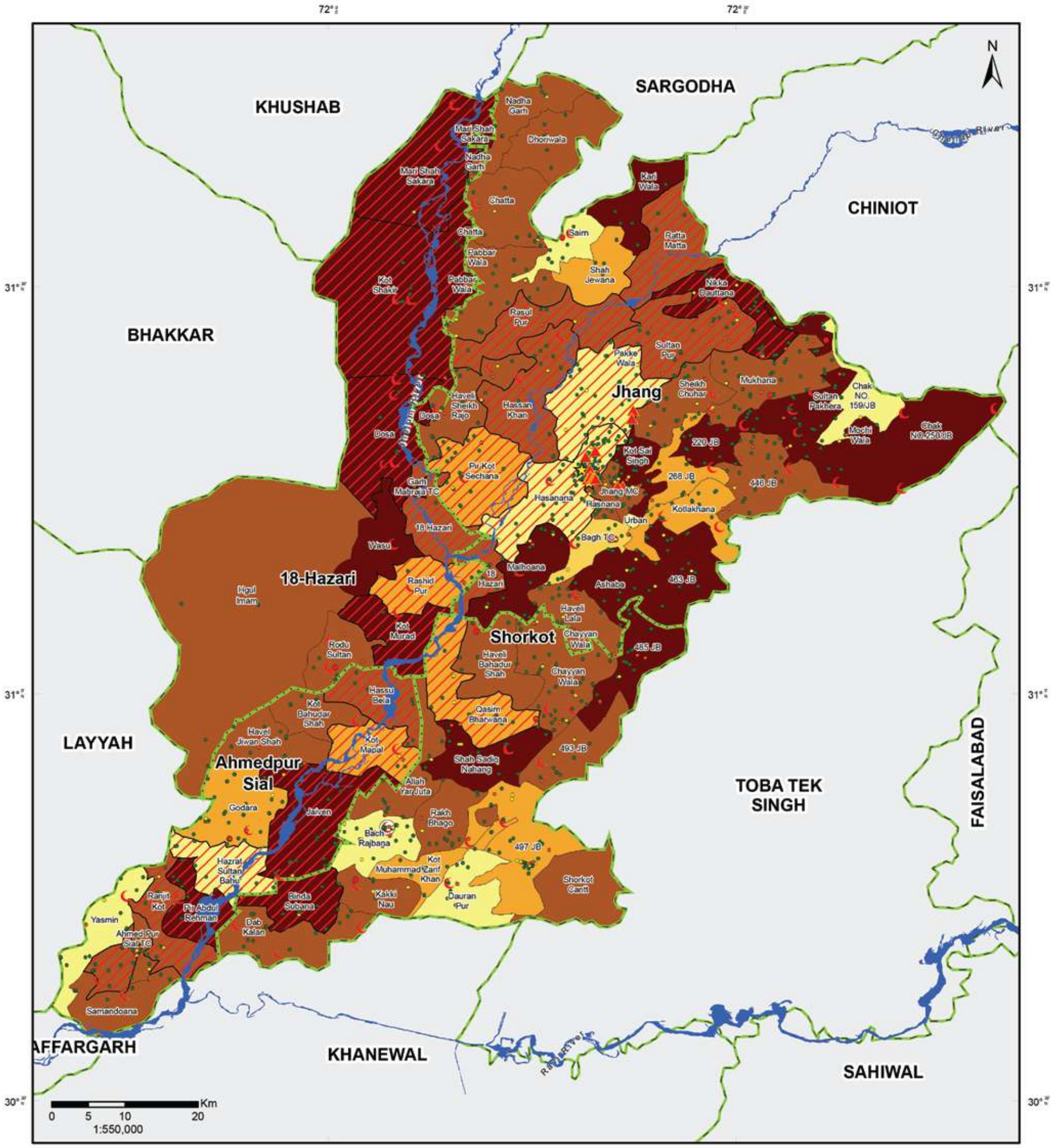
Directorate General of Petroleum Concessions

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-100-C(MI-CI)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO FLOOD 10 YRP



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

- Exposed UCs
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

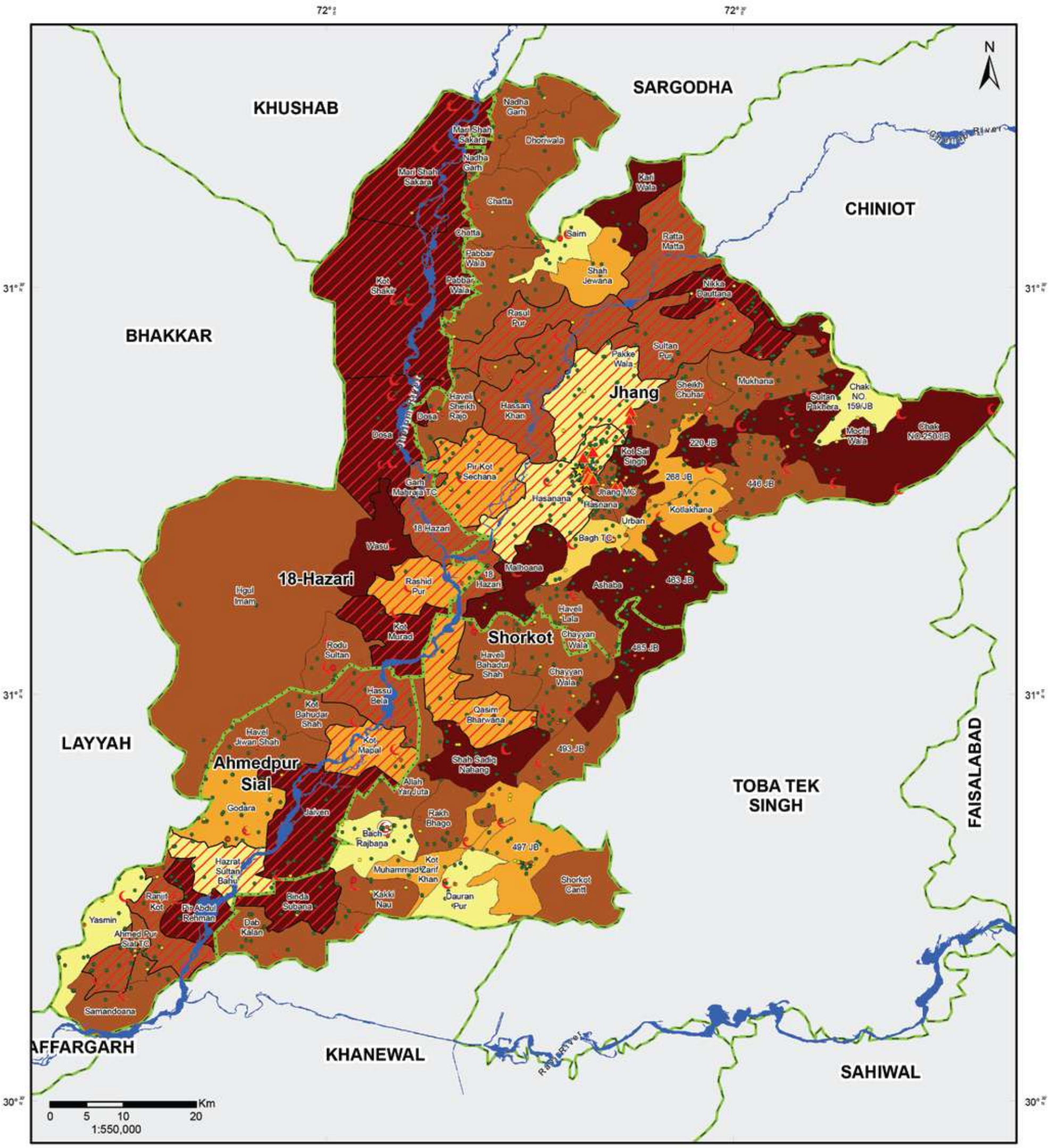
Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics
School Education Department
World Health Organization
Health Department Punjab
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-10-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO FLOOD 50 YRP



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

- Exposed UCs
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

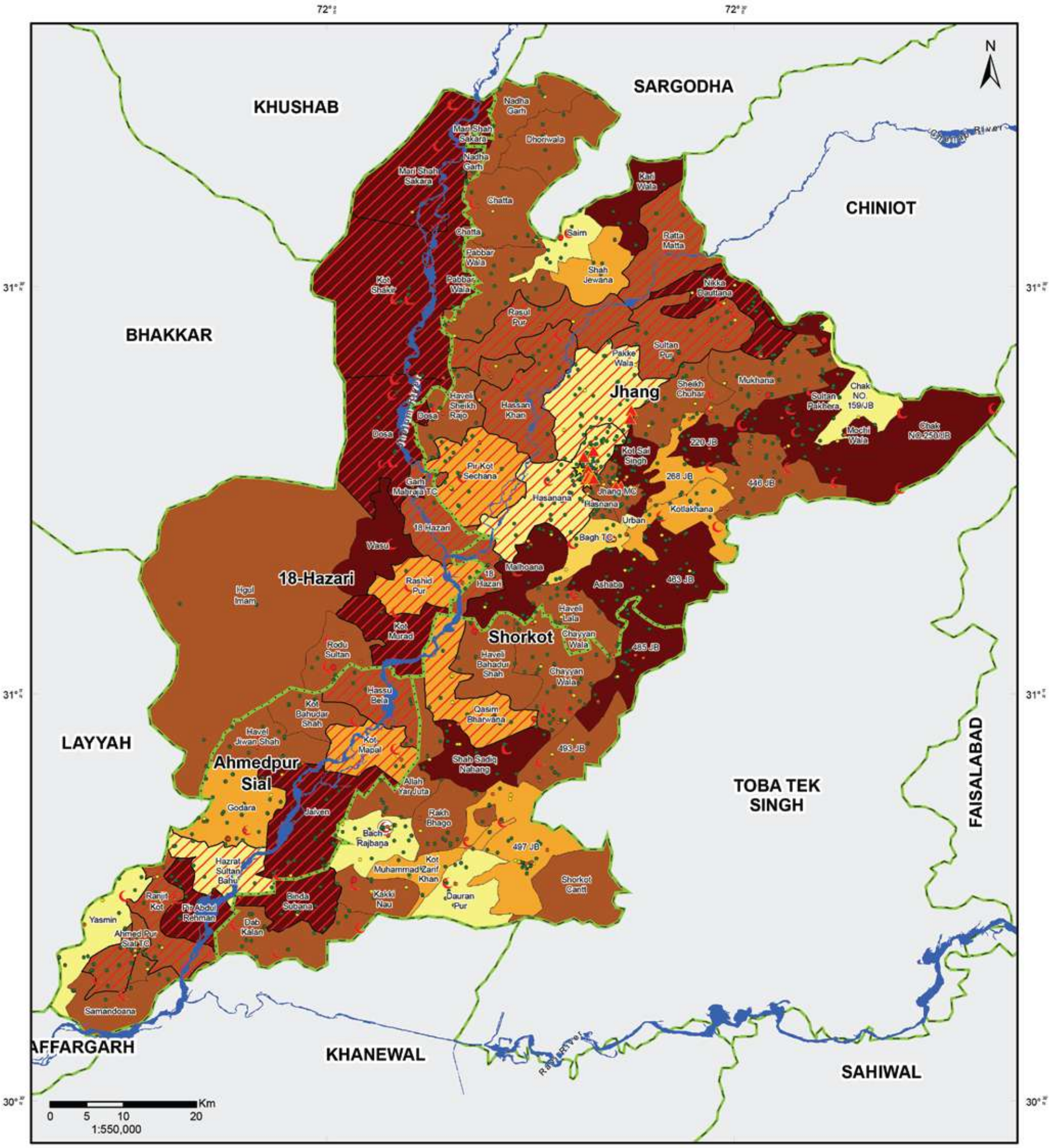
Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics
School Education Department
World Health Organization
Health Department Punjab
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-50-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO FLOOD 100 YRP



Legend

- District Headquarter Hospital
- Tehsil Headquarter Hospital
- Civil Hospital & Tuberculosis Clinic
- Basic Health Unit
- Rural Health Centre
- Maternal/Child Health Centre/Dispensary
- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School

Building Distribution

- < 2500
- 2500 - 3500
- 3500 - 4500
- 4500 - 5500
- > 5500

- Exposed UCs
- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

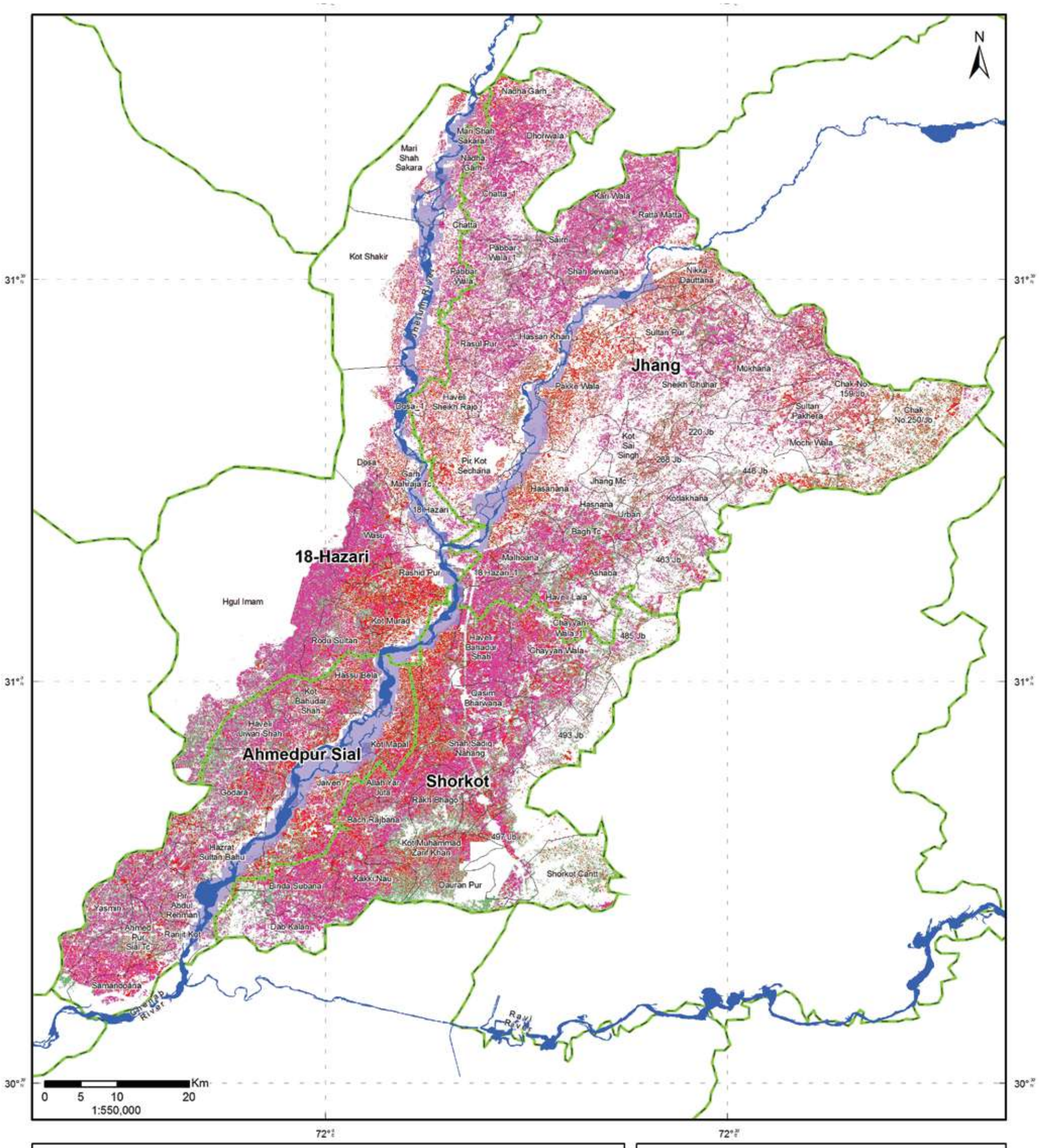
Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics
School Education Department
World Health Organization
Health Department Punjab
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-100-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

CROP EXPOSED TO FLOOD RETURN PERIOD 10 YEARS (KHARIF SEASON)



Legend

- Rice
- Sugarcane
- Cotton
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Return Period 10 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

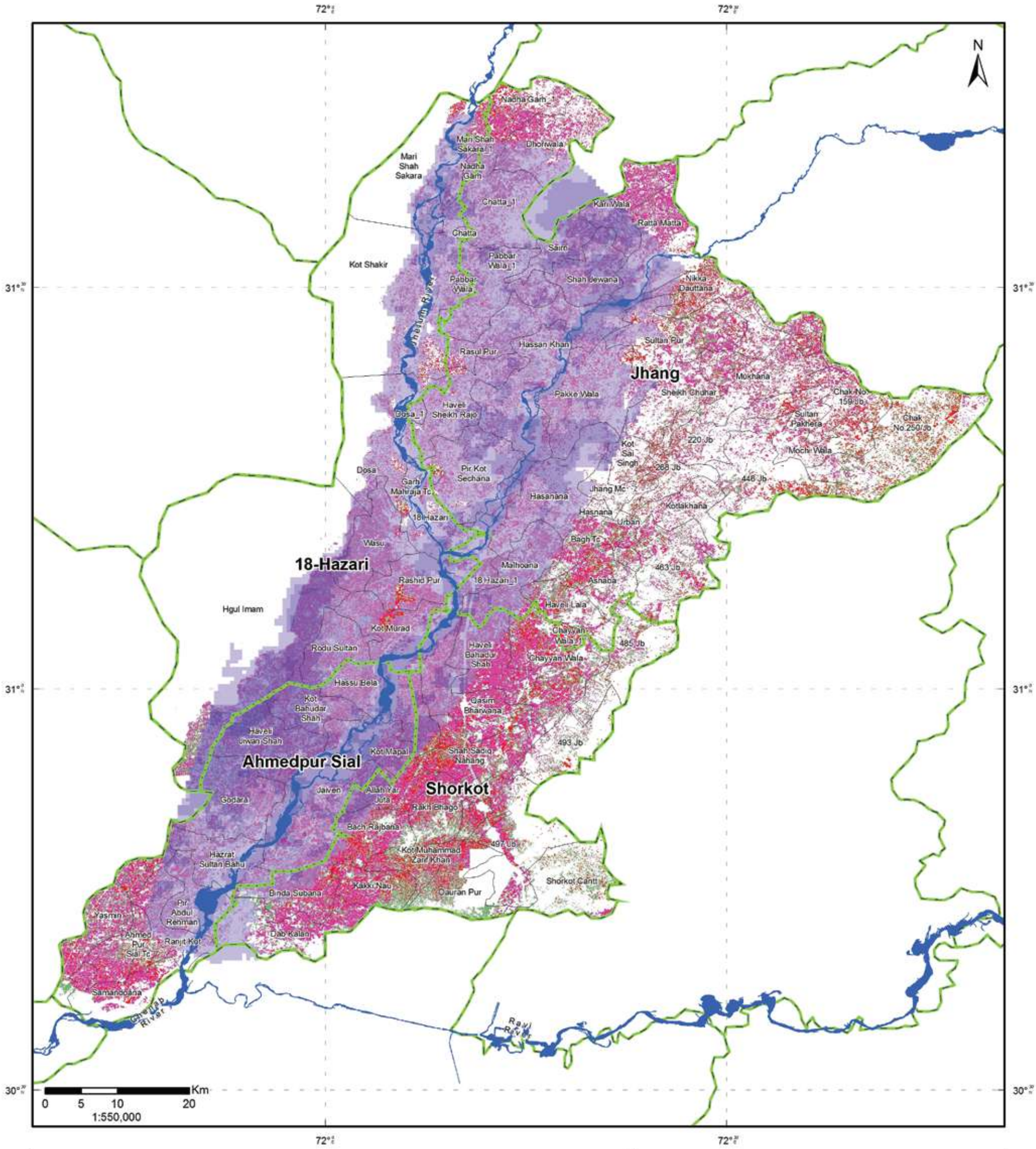
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-10-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

CROP EXPOSED TO FLOOD RETURN PERIOD 50 YEARS (KHARIF SEASON)



Legend

- Rice
- Sugarcane
- Cotton
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Return Period 50 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

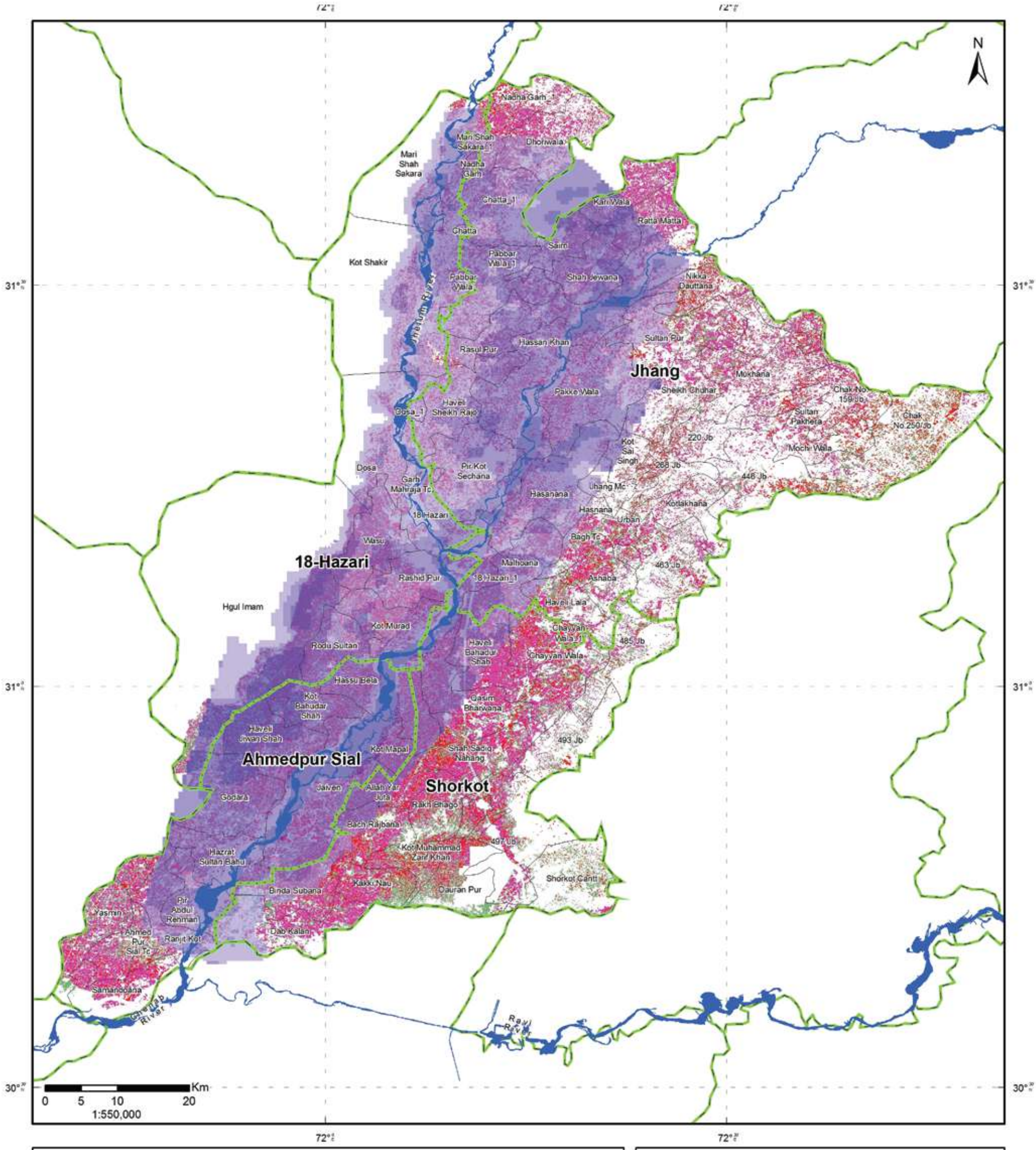
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-50-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

CROP EXPOSED TO FLOOD RETURN PERIOD 100 YEARS (KHARIF SEASON)



Legend

- Rice
- Sugarcane
- Cotton
- River and Water Body
- Union Council Boundary (Abc)
- Tehsil Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Return Period 100 Years

- No Flood
- Low
- Medium
- High
- Very High

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
PBS, Govt. of Punjab, Govt. of Pakistan
Hazard Layer-NDMA, Crop Mask-SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-APR-2016-EXP-04-NDMA-100-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 11th May, 2017

D VULNERABILITY ASSESSMENT

- SOCIAL VULNERABILITY
- FODD SECURITY

26 SOCIAL VULNERABILITY ASSESSMENT

Vulnerability Assessment has been undertaken in terms of:

(a) Physical Dimension (b) Social Aspects (c) Agro based Food Security

Exposure is defined as the interaction of element at risk and hazard. The hazard severity, extent or magnitude of various return periods indicates the degree to which the elements at risk are exposed to a particular hazard. Primary and secondary sources were used for exposure analysis and it was performed by overlaying hazard information with elements at risk. Elements at risks were considered in the dimensions of population, building, essential & critical infrastructures and livelihood.

Physical Vulnerability Analysis (PVA)

For fragility analysis of buildings the structures are classified into engineered and non-engineered constructions. The engineered structured are analyzed by conducting laboratory experiments on building constituent materials such as brick units, mortar, brick assemblages, brick panels and brick walls for masonry structures and concrete cylinders, reinforcing steel bars, structural beam-column members for reinforced concrete structures. However, the complexity of non-engineered buildings, that depend solely on material properties are not reliable owing to the complexity of structure for modeling On National scale the construction typologies in Pakistan are primarily based on the type of material used in the construction of walls, floors and roof, and the overall construction quality of a structure typology.

Based on the type used according to EMS-98 the building vulnerability scoring for earthquake and flood hazard are given below where fragility against earthquake is calculated using shake table test and numerical analysis approach, while flood vulnerabilty scoring is based on historical damage statistics.

Building Vulnerability Scoring

Building Types	EMS-98	Vulnerability Score	
		Floods	Earthquakes
Reinforced Concrete	RC1	2.5	3.09
Stone Masonry	M1	5.4	5.56
Mud/Adobe Masonry	M2	7.14	7.14
Brick Masonry	M5	3.66	3.79
Wood/Bamboo Traditional	M7	4.82	2.50
Block Masonry	M8	4.24	5.00
Others Undefined	00	5	6.25

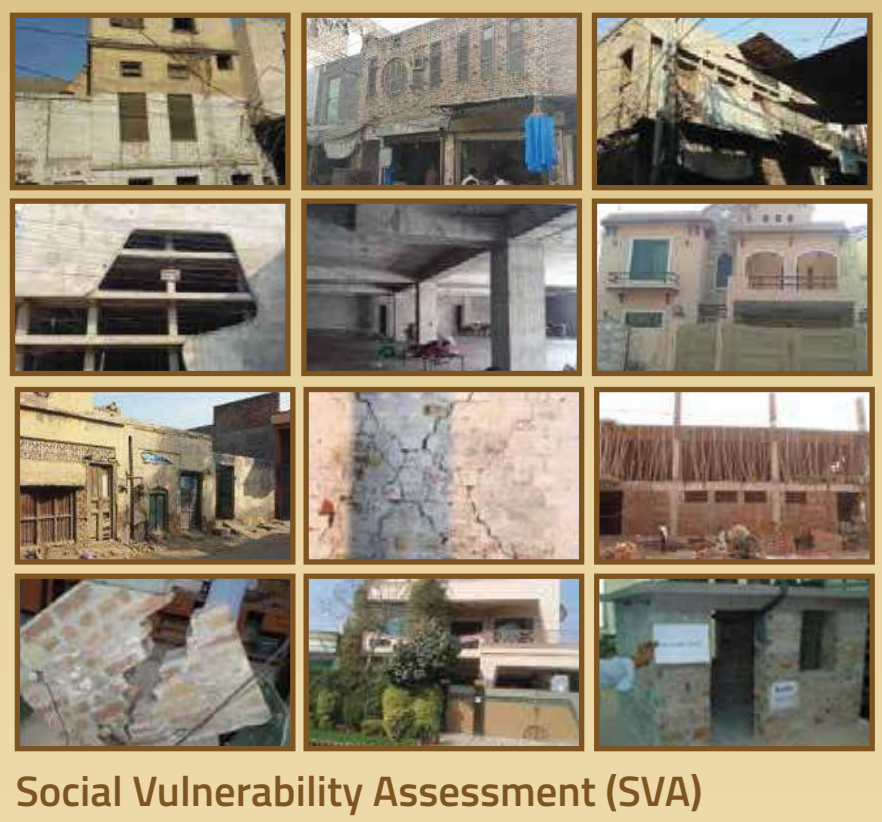
Building Vulnerability Scoring as per PBS Classification

Building Types	Floods	Earthquakes
Kaccha	6.5	7
Semi-Pacca	5.0	6
Pacca	2.5	3

The damage state of building material based on the repair cost ratio i.e. the ratio of the cost of repair to the total building cost is given below.

Damage State	Repair Cost Ratio
Slight	0 - 5%
Moderate	5 - 20%
Heavy	20 - 50%
Severe	50 - 100%

Buildings Surveyed for Physical Vulnerability Assessment



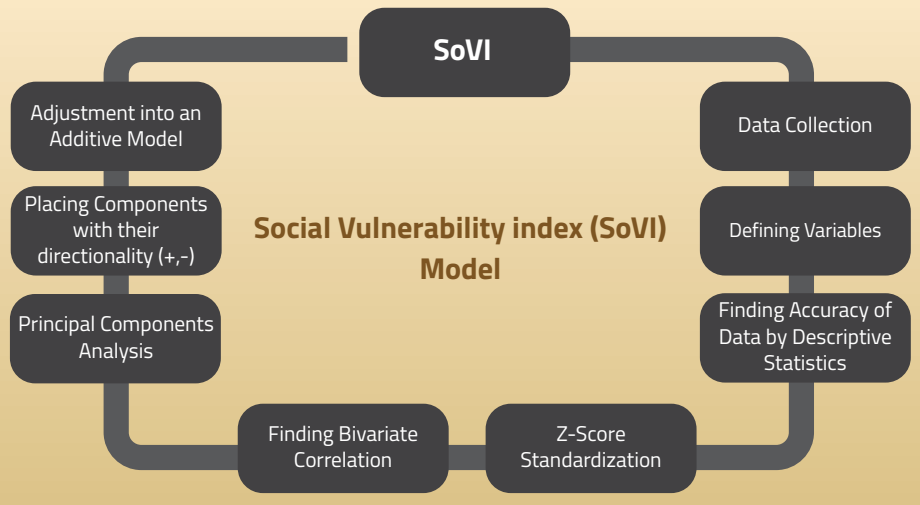
Social Vulnerability Assessment (SVA)

The Social Vulnerability Assessment focuses on the vulnerability characterization of communities, considering both the vulnerabilities of physical systems and the social conditions that can increase or decrease the impact of disasters in the considered area. The assessment is based on susceptibility of populations to loss, which is quantified using the methodology known as Social Vulnerability Index (SoVI). The SoVI for District Khushab is given in the table below.

Factors	Component	Directionality	Variance Observed(%)
1	Age, Education, Health Outcome, Socioeconomic Status	Positive	29.76%
2	Rural Farm Populations	Positive	12.5%
3	Information Access	Negative	6.9%
4	Children with Disabilities	Positive	5.99%
5	Social Benefits	Negative	5.66%
6	Infant safety	Negative	5.61%
7	Low income laborers	Positive	5.31%
8	Poverty/Need for External Income Source	Positive	5.22%
9	Preventative Health Measures	Negative	5%

To obtain a final composite score of social vulnerability, the factors were added to obtain the aggregated factor i.e. the Social Vulnerability Index for each of the District:

SoVI Score = Factor 1 + Factor 2 + Factor 3 + Factor 4 + Factor 5 + Factor 6 + Factor 7 + Factor 8 + Factor 9



27 FOOD SECURITY

FOOD SECURITY AGAINST DROUGHT

Tehsil	Union Council	Drought Severity Score	Area of UC (sq.km)	Agricultural Land (sq.km)	%age of Agri to Total Land	Food Insecurity	Food Insecurity Ranking
Shorkot	Chayyan Wala	4	107.57	101.76	94.59%	37,838	5
Jhang	Mochi Wala	4	58.08	55.01	94.72%	37,889	5
Shorkot	Dab Kalan	4	89.68	85.24	95.05%	38,021	5
Shorkot	Shah Sadiq Nahang	4	80.50	76.58	95.13%	38,054	5
Jhang	Hassan Khan	5	116.02	88.85	76.58%	38,292	5
Jhang	220 Jb	4	58.40	56.07	96.01%	38,404	5
18-hazari	Chatta	4	4.27	4.11	96.27%	38,509	5
Jhang	Sheikh Chuhar	4	66.03	63.77	96.58%	38,631	5
Jhang	Chatta	4	82.94	80.36	96.89%	38,756	5
Jhang	Chayyan Wala	4	8.27	8.03	97.10%	38,842	5
Jhang	Shah Jewana	4	58.62	56.98	97.22%	38,887	5
18-hazari	Rashid Pur	5	67.74	54.61	80.61%	40,306	5
Jhang	Ashaba	5	49.50	46.56	94.06%	47,032	5
Jhang	Sultan Pakhera	5	47.93	45.75	95.46%	47,729	5
Ahmedpur Sial	Godara	5	94.44	90.43	95.76%	47,878	5
Ahmedpur Sial	Kot Bahudar Shah	5	48.32	47.65	98.62%	49,309	5
18-hazari	18 Hazari	4	62.44	42.38	67.88%	27,151	4
Shorkot	Bach Rajbana	3	61.43	55.81	90.85%	27,256	4
Jhang	268 Jb	3	42.57	39.26	92.23%	27,668	4
Jhang	Chak No.250/jb	3	159.49	148.35	93.01%	27,904	4
Shorkot	Haveli Bahadur Shah	3	80.70	75.49	93.54%	28,062	4
Shorkot	Rakh Bhago	3	58.61	54.84	93.57%	28,072	4
Jhang	Sairn	3	37.84	35.81	94.64%	28,391	4
Jhang	Pakke Wala	3	122.15	116.74	95.57%	28,672	4
Jhang	Dhoriwala	3	88.56	84.74	95.69%	28,706	4
Jhang	Mari Shah Sakara	3	4.09	3.91	95.70%	28,709	4
Jhang	Nadha Garh	3	65.29	62.98	96.46%	28,937	4
18-hazari	Rodu Sultan	3	54.06	52.17	96.52%	28,956	4
Jhang	Chak No. 159/jb	3	51.69	49.97	96.68%	29,003	4
Jhang	Nikka Dauttana	3	74.32	72.06	96.97%	29,090	4
Shorkot	Kot Muhammad Zarif Khan	3	43.87	42.57	97.05%	29,115	4
Jhang	Mukhana	3	99.58	96.77	97.18%	29,154	4
Shorkot	Kakki Nau	3	46.82	45.53	97.25%	29,174	4
Jhang	Malhoana	3	75.47	73.39	97.25%	29,176	4
Ahmedpur Sial	Haveli Jiwan Shah	3	68.10	66.45	97.57%	29,271	4
18-hazari	Wasu	3	74.89	73.42	98.03%	29,409	4
Jhang	Haveli Sheikh Rajo	3	75.84	74.50	98.24%	29,471	4
Shorkot	Allah Yar Juta	3	64.72	63.63	98.32%	29,496	4
Jhang	Sultan Pur	3	111.20	109.40	98.38%	29,515	4
18-hazari	Nadha Garh	3	4.07	4.01	98.56%	29,568	4
Shorkot	Binda Subana	3	62.33	61.60	98.82%	29,646	4
Jhang	Kari Wala	3	63.58	62.97	99.05%	29,714	4
Jhang	Pabbar Wala	3	96.23	95.46	99.20%	29,760	4
18-hazari	Pabbar Wala	3	5.03	5.00	99.43%	29,830	4
Jhang	Hasnana	4	5.94	4.52	76.20%	30,481	4
Jhang	Pir Kot Sechana	4	106.29	84.25	79.26%	31,705	4
Jhang	18 Hazari	4	35.59	28.43	79.87%	31,949	4
Jhang	Ratta Matta	4	98.07	79.09	80.65%	32,259	4
Ahmedpur Sial	Samandoana	4	69.10	56.52	81.78%	32,713	4
Ahmedpur Sial	Ranjit Kot	4	97.37	85.38	87.68%	35,074	4
Jhang	Haveli Lala	4	51.40	45.73	88.97%	35,587	4

FOOD SECURITY AGAINST DROUGHT

Tehsil	Union Council	Drought Severity Score	Area of UC (sq.km)	Agricultural Land (sq.km)	%age of Agri to Total Land	Food Insecurity	Food Insecurity Ranking
Jhang	Kotlakhana	2	64.06	59.74	93.26%	18,651	3
Shorkot	Dauran Pur	3	67.99	42.98	63.22%	18,966	3
Ahmedpur Sial	Yasmin	2	71.27	69.22	97.11%	19,422	3
Jhang	Dosa	2	6.03	5.91	98.00%	19,600	3
Ahmedpur Sial	Kot Mapal	3	64.62	44.09	68.22%	20,467	3
Ahmedpur Sial	Hassu Bela	3	69.63	53.10	76.27%	22,880	3
Ahmedpur Sial	Pir Abdul Rehman	3	56.09	43.36	77.30%	23,190	3
Ahmedpur Sial	Hazrat Sultan Bahu	3	68.67	54.28	79.04%	23,713	3
Jhang	Hasanana	3	125.72	99.76	79.36%	23,807	3
Shorkot	493 Jb	3	71.08	59.59	83.83%	25,150	3
Shorkot	485 Jb	3	80.11	67.30	84.02%	25,205	3
Shorkot	Qasim Bharwana	3	99.63	85.57	85.89%	25,766	3
Jhang	Kot Sai Singh	3	37.20	32.21	86.58%	25,975	3
18-hazari	Kot Murad	3	73.84	64.23	86.99%	26,096	3
Jhang	446 Jb	3	98.15	85.57	87.19%	26,156	3
Jhang	463 Jb	3	107.74	95.07	88.24%	26,472	3
Jhang	Rasul Pur	3	98.92	88.82	89.79%	26,936	3
18-hazari	Kot Shakir	3	315.39	108.87	34.52%	10,356	2
18-hazari	Hgul Imam	5	670.61	143.39	21.38%	10,691	2
Shorkot	497 Jb	2	122.57	76.61	62.50%	12,500	2
Ahmedpur Sial	Jaiven	2	138.46	108.99	78.72%	15,743	2
18-hazari	Mari Shah Sakara	3	173.75	48.43	27.87%	8,362	1
18-hazari	Dosa	2	147.40	64.14	43.52%	8,703	1

Drought Hazard Severity Score	
No Drought	1
Mild	2
Moderate	3
Severe	4
Extreme	5

Food Insecurity Index	
Food Secure	1
Mild Food Secure	2
Moderatly Food Insecure	3
Highly Food Insecure	4
Severly Food Insecure	5

FOOD SECURITY AGAINST FLOOD

Tehsil	Union Council	Flood Hazard Score (Riverine + Flash)	Area of UC (sq.km)	Agricultural Land (sq.km)	Agricultural Area Exposed	Percentage Agricultural Land Exposed	Food Insecurity	Food Insecurity Ranking
Jhang	Rasul Pur	4	98.92	88.8177	86.93	97.87%	39,150	5
Jhang	Hasanana	4	125.72	99.76	99.76	100.00%	40,000	5
Ahmedpur Sial	Haveli Jiwan Shah	4	68.10	66.45	66.45	100.00%	40,000	5
Ahmedpur Sial	Jaiven	4	138.46	108.99	108.99	100.00%	40,000	5
Ahmedpur Sial	Kot Bahudar Shah	4	48.32	47.65	47.65	100.00%	40,000	5
Ahmedpur Sial	Kot Mapal	4	64.62	44.09	44.09	100.00%	40,000	5
Ahmedpur Sial	Godara	4	94.44	90.43	90.43	100.00%	40,000	5
18-hazari	Kot Shakir	3	315.39	108.87	106.06	97.41%	29,224	4
18-hazari	Dosa	3	147.40	64.14	63.05	98.29%	29,487	4
Jhang	Haveli Sheikh Rajo	3	75.84	74.50	73.76	99.01%	29,702	4
Jhang	Malhoana	3	75.47	73.39	72.73	99.09%	29,726	4
18-hazari	Kot Murad	3	73.84	64.23	63.92	99.52%	29,857	4
Ahmedpur Sial	Hazrat Sultan Bahu	3	68.67	54.28	54.13	99.72%	29,916	4
Jhang	Pakke Wala	3	122.15	116.7431	116.44	99.74%	29,923	4
Jhang	Mari Shah Sakara	3	4.09	3.91	3.91	100.00%	29,999	4
18-hazari	Rashid Pur	3	67.74	54.6106	54.61	100.00%	30,000	4
Jhang	Shah Jewana	3	58.62	56.9845	56.98	100.00%	30,000	4
Jhang	Chatta	3	82.94	80.36	80.36	100.00%	30,000	4
18-hazari	Pabbar Wala	3	5.03	5.00	5.00	100.00%	30,000	4
18-hazari	Rodu Sultan	3	54.06	52.1747	52.17	100.00%	30,000	4
18-hazari	18 Hazari	3	62.44	42.38	42.38	100.00%	30,000	4
18-hazari	Chatta	3	4.27	4.11	4.11	100.00%	30,000	4
Ahmedpur Sial	Hassu Bela	3	69.63	53.10	53.10	100.00%	30,000	4
Jhang	Pir Kot Sechana	3	106.29	84.2485	84.25	100.00%	30,000	4
Jhang	Sairn	3	37.84	35.8145	35.81	100.00%	30,000	4
18-hazari	Wasu	3	74.89	73.4161	73.42	100.00%	30,000	4
Jhang	Pabbar Wala	3	96.23	95.46	95.46	100.00%	30,000	4
Jhang	Hassan Khan	3	116.02	88.85	88.85	100.00%	30,000	4
Ahmedpur Sial	Pir Abdul Rehman	3	56.09	43.3586	43.36	100.00%	30,000	4
Jhang	18 Hazari	3	35.59	28.43	28.43	100.00%	30,000	4
18-hazari	Nadha Garh	3	4.07	4.01	4.01	100.00%	30,001	4
Shorkot	Haveli Bahadur Shah	3	80.70	75.49	45.64	60.46%	18,138	3
Jhang	Dosa	2	6.03	5.91	5.91	100.00%	20,000	3
Jhang	Ratta Matta	4	98.07	79.0893	39.86	50.40%	20,161	3
Jhang	Kari Wala	4	63.58	62.97	31.99	50.81%	20,323	3
Shorkot	Allah Yar Juta	3	64.72	63.63	45.26	71.14%	21,341	3
18-hazari	Mari Shah Sakara	3	173.75	48.43	39.46	81.48%	24,443	3
18-hazari	Hgul Imam	3	670.61	143.39	126.72	88.38%	26,513	3
Jhang	Jhang Mc	3	24.44	17.14	5.59	32.59%	9,778	2
Shorkot	Dab Kalan	3	89.68	85.24	32.25	37.83%	11,349	2
Shorkot	Bach Rajbana	3	61.43	55.81	22.87	40.98%	12,294	2
Jhang	Dhoriwala	3	88.56	84.74	37.97	44.81%	13,443	2
Ahmedpur Sial	Ranjit Kot	3	97.37	85.378	39.47	46.23%	13,868	2
Jhang	Sultan Pur	4	111.20	109.4012	38.73	35.40%	14,160	2
Shorkot	Qasim Bharwana	3	99.63	85.5681	46.26	54.06%	16,219	2
Shorkot	Binda Subana	3	62.33	61.60	34.42	55.88%	16,763	2

FOOD SECURITY AGAINST FLOOD

Tehsil	Union Council	Flood Hazard Score (Riverine + Flash)	Area of UC (sq.km)	Agricultural Land (sq.km)	Agricultural Area Exposed	Percentage Agricultural Land Exposed	Food Insecurity	Food Insecurity Ranking
Shorkot	Kakki Nau	2	46.82	45.53	0.03	0.08%	15	1
Ahmedpur Sial	Samandoana	3	69.10	56.5158	0.77	1.37%	411	1
Shorkot	Chayyan Wala	3	107.57	101.76	2.44	2.39%	718	1
Shorkot	Shah Sadiq Nahang	3	80.50	76.5822	3.94	5.14%	1,542	1
Jhang	Haveli Lala	2	51.40	45.73	4.35	9.52%	1,905	1
Jhang	Hasnana	3	5.94	4.52	0.55	12.25%	3,676	1
Jhang	Nikka Dauttana	3	74.32	72.06	10.22	14.18%	4,255	1
Jhang	Nadha Garh	3	65.29	62.98	10.85	17.23%	5,170	1
Jhang	Sheikh Chuhar	4	66.03	63.7701	8.95	14.03%	5,613	1
Jhang	Kot Sai Singh	3	37.20	32.21	7.12	22.09%	6,628	1

Flood Hazard Severity Score	
0.3	1
3.1 - 6	2
6.1 - 9	3
9.1 - 12t	4
> 12	5

Food Insecurity Index	
Food Secure	1
Mild Food Secure	2
Moderatly Food Insecure	3
Highly Food Insecure	4
Severly Food Insecure	5

Cumulative Severity of both Riverine and Hill torrents/ Flashfloods has been taken in account for the assessment.

Food Insecurity= (Hazard Severity) * (Percentage of Agriculture to Total Land) * (Percentage of Agriculture Dependent Population to Total Population)

E | RISK ASSESSMENT

Population Density

Building Density

Health Facilities

Communication Towers

Major Industries

Roads

Education Facilities

Railway

Critical Infrastructure

28 INTEGRATED RISK ASSESSMENT

The given study has employed Integrated Risk Assessment Model, as shown in the figure below, for the cumulative risk assessment of study district. The Model takes into account both quantitative and qualitative risk assessment approaches. The methodology is based on multi criteria evaluation as well as analytical hierarchy process. For this purpose, set of indicators for each risk factors have been carefully taken based on the availability as well as the specific context of the study district. In the given methodology four separate dimensions of risk are considered as "factor Components" i.e. hazard, exposure, vulnerability and capacity. To analyze the value of factor components, a combination of quantitative, qualitative and contextual indicators have be assigned to each factor component. Each factor consists of a sets of indicators which cover several aspects of risk. The Risk Index considered a total of 52 indicators to cover physical, economic, demographic, social, environmental and economic dimensions of risk. Specific weights have been assigned to each indicator in order to acutely calculate its impact on risk. The maximum sum of all the elements of weights and indicators can have minimize value of 100, whereas the minimum sum is 0. The risk formula used in the Study is given below:

Risk= (Hazard x Vulnerability x Exposure / Capacity)

Five classes have been devised to categorize risk between "No to Very Low" Risk to "Very High Risk".

Risk Score	Risk State
>4.1	Extremely High
3.1-4.0	High to very High
2.1-3.0	Moderate to High
1.1-2.0	Low to moderate
0-1.0	No to very Low

Earthquake Hazard Severity Score		
3.0 - 3.9 Richter Scale	1	Very Low
4.0 - 4.9 Richter Scale	2	Low
5.0 - 5.9 Richter Scale	3	Moderate
6.0 - 6.9 Richter Scale	4	High
7 more Richter Scale	5	Very High
0 represents **No Hazard**		

Flood Hazard Severity Score		
0.3	1	Very Low
3.1 - 6	2	Low
6.1 - 9	3	Moderate
9.1 - 12t	4	High
> 12	5	Very High
0 represents **No Hazard**		

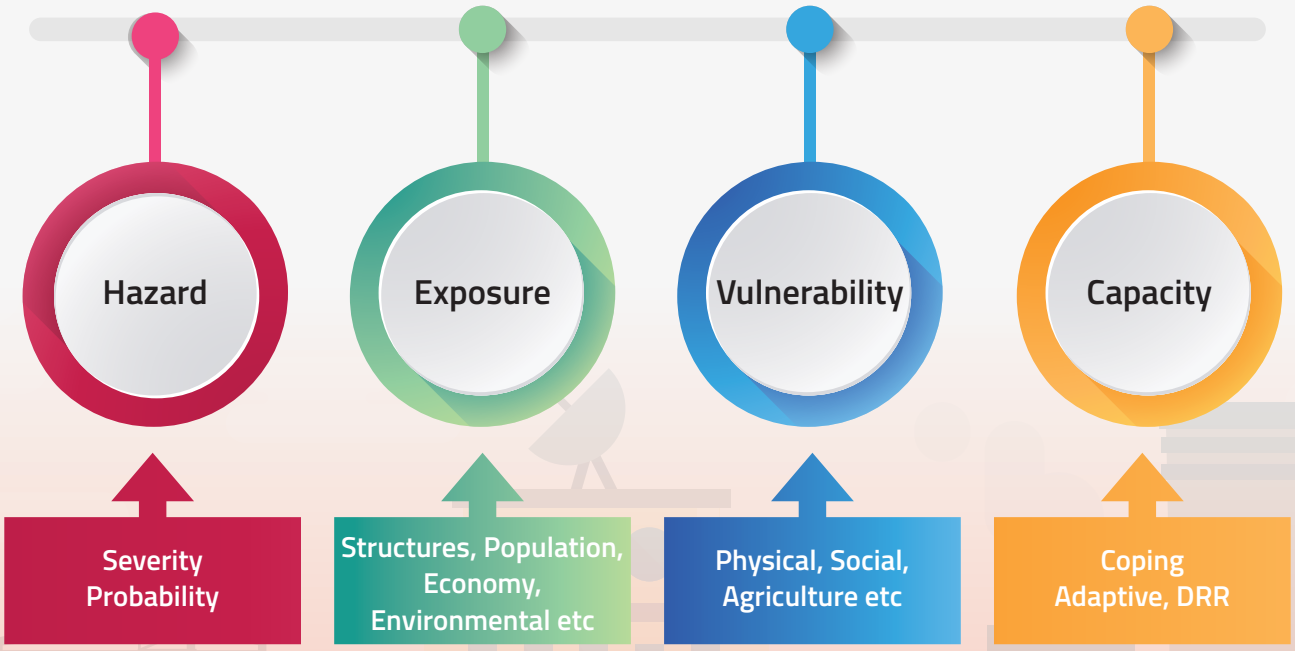
Drought Hazard Severity Score		
No Drought	1	Very Low
Mild	2	Low
Moderate	3	Medium
Severe	4	High
Extreme	5	Very High
0 represents **No Hazard**		

Exposure Scoring Scale	
1	No to Negligible
2	Low
3	Medium
4	High
5	Extremely High

Vulnerabilty Scoring Scale	
1	No to Negligible
2	Low
3	Medium
4	High
5	Extremely High

Capacity Scoring Scale	
1	No to Negligible
2	Low
3	Medium
4	High
5	Extremely High

Disaster Risk Impact Factor

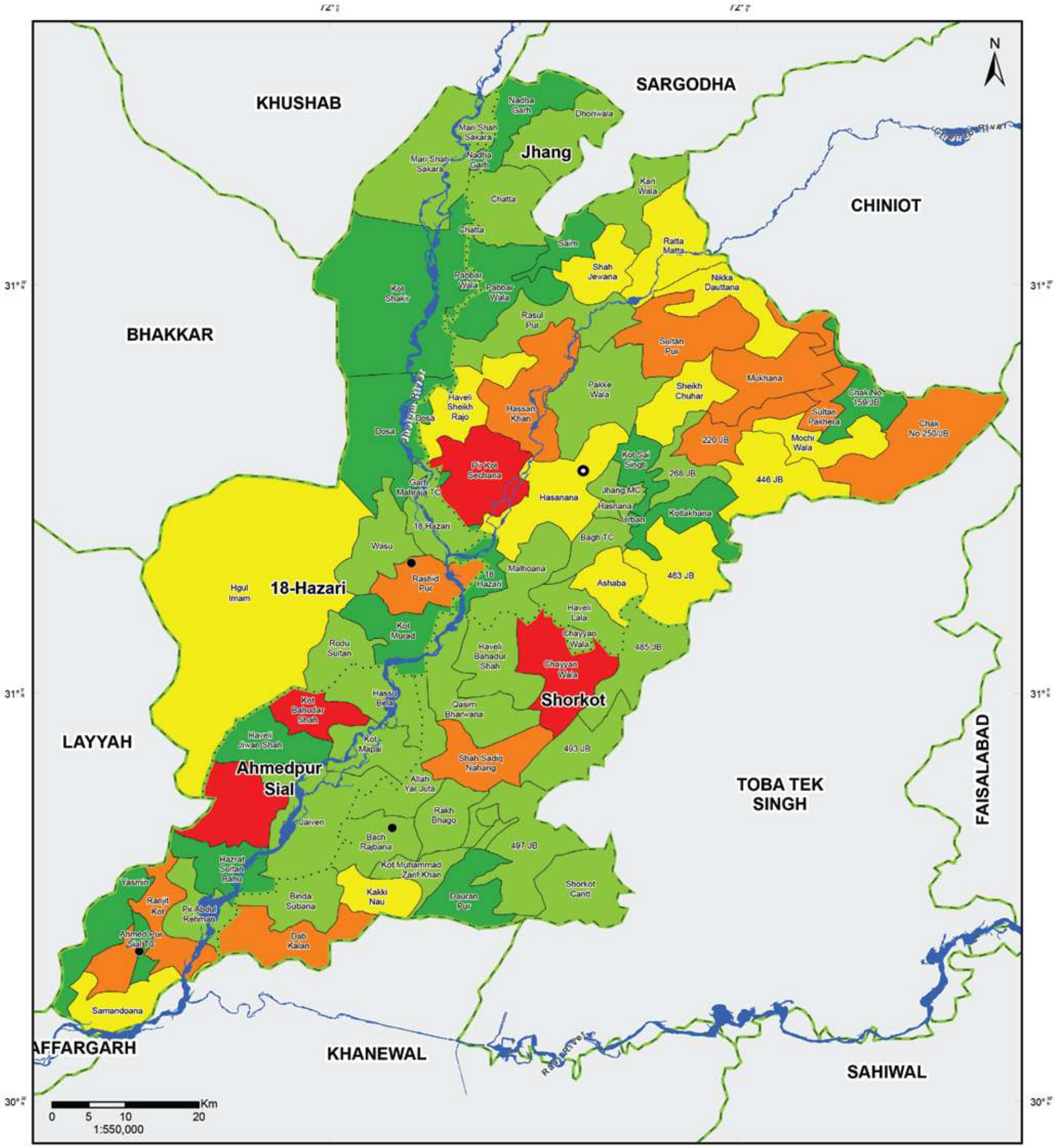


28 RISK ASSESSMENT BY HAZARD TYPE

UNION COUNCILS	HAZARD			EXPOSURE		VULNERABILTY			COPING CAPACITY	RISK			
	FLOOD YRP 100	DROUGHT	EARTHQUAKE YRP 475	FLOOD	EXPOSURE	FLOOD	DROUGHT	EARTHQUAKE	CAPACITY	FLOOD	DROUGHT	EARTHQUAKE	OVERALL
18 HAZARI	2.00	3.00	3.00	0.63	0.67	2.25	2.50	3.50	3	4	1	3	3
18 HAZARI	1.00	3.00	3.00	0.63	0.33	2.25	2.50	3.50	3	4	2	3	3
220 JB	0.00	3.00	3.00	1.00	1.33	2.25	3.00	3.50	3	1	4	4	3
268 JB	0.00	2.00	3.00	1.00	1.00	1.75	2.50	2.50	3	1	2	3	2
446 JB	0.00	2.00	3.00	1.13	1.33	2.25	3.00	3.50	3	1	3	4	3
463 JB	0.00	2.00	3.00	1.25	1.00	2.50	3.50	4.00	3	1	3	5	3
485 JB	0.00	2.00	3.00	1.00	0.67	2.50	3.50	3.50	3	1	2	4	3
493 JB	0.00	2.00	3.00	1.13	1.00	2.00	3.00	2.50	3	1	2	3	2
497 JB	0.00	1.00	3.00	1.38	1.33	1.75	2.50	2.00	3	1	2	3	2
AHMED PUR SIAL TC	1.00	0.00	3.00	0.63	0.67	1.25	1.50	1.00	3	1	1	1	1
ALLAH YAR JUTA	2.00	2.00	3.00	0.75	0.67	3.25	4.00	4.50	3	5	2	4	4
ASHABA	0.00	4.00	3.00	0.88	0.67	2.25	3.00	3.50	3	1	3	4	3
BACH RAJBANA	1.00	2.00	3.00	0.75	1.00	1.50	2.00	1.00	3	2	2	1	2
BAGH TC	1.00	2.00	3.00	1.13	1.00	1.75	2.00	2.00	3	1	2	3	2
BINDA SUBANA	1.00	2.00	3.00	0.75	0.67	2.75	3.50	3.50	3	3	2	3	3
CHAK NO. 159/JB	0.00	2.00	3.00	0.75	0.67	1.00	1.50	1.00	3	1	1	1	1
CHAK NO.250/JB	0.00	2.00	3.00	1.38	1.33	2.75	3.50	4.50	3	1	4	5	4
CHATTA	2.00	3.00	3.00	0.38	0.67	2.50	3.00	4.00	3	1	2	3	2
CHATTA	1.00	3.00	3.00	0.63	0.67	2.50	3.00	4.00	3	1	2	3	2
CHAYYAN WALA	1.00	3.00	3.00	1.13	1.33	3.00	4.00	4.00	3	1	2	2	2
CHAYYAN WALA	0.00	3.00	3.00	0.38	0.33	2.75	4.00	4.00	3	1	5	2	3
DAB KALAN	1.00	3.00	3.00	0.88	1.00	3.00	4.00	4.00	3	3	4	4	4
DAURAN PUR	0.00	2.00	3.00	0.75	0.67	1.25	2.00	1.00	3	1	1	1	1
DHORIWALA	1.00	2.00	3.00	0.75	0.67	3.00	3.50	4.50	3	4	2	4	4
DOSA	2.00	1.00	3.00	0.75	0.67	2.25	2.50	3.50	3	1	1	2	2
DOSA	1.00	1.00	3.00	0.50	1.00	2.25	2.50	3.50	3	5	1	2	3
GARH MAHRAJA TC	1.00	1.00	3.00	0.25	0.33	2.75	3.00	4.50	3	1	1	2	2
GODARA	3.00	4.00	3.00	1.00	1.33	2.50	3.00	3.50	3	5	5	4	5
HASANANA	4.00	2.00	3.00	2.25	2.67	1.25	1.50	1.00	3	5	3	3	4
HASNANA	1.00	3.00	3.00	0.75	0.67	2.00	2.50	2.50	3	1	2	2	2
HASSAN KHAN	4.00	4.00	3.00	0.88	1.00	2.50	3.00	3.50	3	5	4	4	5
HASSU BELA	3.00	2.00	3.00	0.63	0.67	2.50	3.00	3.50	3	5	2	3	4
HAVELI BAHADUR SHAH	1.00	2.00	3.00	0.88	1.00	2.00	2.50	2.00	3	5	2	2	3
HAVELI JIWAN SHAH	3.00	2.00	3.00	0.88	1.00	1.25	1.50	1.00	3	5	1	1	3
HAVELI LALA	1.00	3.00	3.00	0.88	1.00	1.75	2.00	2.00	3	1	2	2	2
HAVELI SHEIKH RAJO	2.00	2.00	3.00	1.00	1.33	2.50	3.00	3.50	3	5	3	4	4
HAZRAT SULTAN BAHU	2.00	2.00	3.00	0.75	0.67	1.25	1.50	1.00	3	5	1	1	3
HGUL IMAM	5.00	4.00	3.00	1.38	0.67	2.00	2.50	3.00	3	5	3	5	5
JAIVEN	4.00	1.00	3.00	0.88	1.00	3.00	3.50	4.50	3	5	2	4	4
JHANG MC	1.00	2.00	3.00	1.50	1.67	1.25	1.50	1.00	3	1	2	2	2
KAKKI NAU	1.00	2.00	3.00	1.00	1.00	2.75	3.50	3.50	3	5	3	4	4
KARI WALA	0.00	2.00	3.00	0.75	0.67	3.00	3.50	5.00	3	1	2	4	3
KOT BAHUDAR SHAH	2.00	4.00	3.00	1.00	1.33	3.00	3.50	4.50	3	5	5	5	5
KOT MAPAL	3.00	2.00	3.00	0.75	1.00	2.50	3.00	3.50	3	5	2	3	4
KOT MUHAMMAD ZARIF KHAN	0.00	2.00	3.00	0.88	0.67	2.25	3.50	2.50	3	1	2	3	2
KOT MURAD	2.00	2.00	3.00	0.88	0.67	1.50	1.00	2.00	3	5	1	2	3
KOT SAI SINGH	1.00	2.00	3.00	1.00	1.00	1.25	1.50	1.00	3	1	1	1	1
KOT SHAKIR	0.00	2.00	3.00	0.88	1.00	1.25	1.50	2.00	3	1	1	2	2
KOTLAKHANA	3.00	1.00	3.00	1.00	1.00	1.75	2.00	2.00	3	5	1	2	3
MALHOANA	2.00	2.00	3.00	1.25	1.33	1.75	2.00	2.00	3	5	2	3	4
MARI SHAH SAKARA	2.00	2.00	3.00	0.75	0.67	2.50	3.00	3.50	3	1	2	2	2
MARI SHAH SAKARA	1.00	2.00	3.00	0.50	0.67	2.75	3.50	4.00	3	5	2	2	3
MOCHI WALA	0.00	3.00	3.00	1.00	1.00	2.25	3.00	3.00	3	1	3	3	3
MUKHANA	0.00	2.00	3.00	0.88	1.33	2.50	3.50	3.50	3	1	4	4	3
NADHA GARH	1.00	2.00	3.00	0.50	0.33	2.75	3.50	4.00	3	1	1	2	2
NADHA GARH	1.00	2.00	3.00	0.50	0.33	2.75	3.50	4.00	3	1	1	2	2
NIKKA DAUTTANA	1.00	2.00	3.00	0.75	1.00	2.75	3.50	3.50	3	1	3	3	3
PABBAR WALA	2.00	2.00	3.00	0.38	0.33	2.75	3.50	4.00	3	1	1	1	1
PABBAR WALA	1.00	2.00	3.00	0.25	0.33	2.75	3.50	4.00	3	5	1	1	3
PAKKE WALA	3.00	2.00	3.00	1.00	1.00	1.50	2.00	1.00	3	5	2	1	3
PIR ABDUL REHMAN	2.00	2.00	3.00	0.63	0.67	2.50	3.00	3.50	3	5	2	3	4
PIR KOT SECHANA	3.00	3.00	3.00	0.88	1.33	2.75	3.50	3.50	3	5	5	4	5
QASIM BHARWANA	2.00	2.00	3.00	0.75	0.67	3.00	4.00	3.50	3	5	2	3	4
RAKH BHAGO	0.00	2.00	3.00	0.88	0.67	1.75	2.50	1.50	3	1	2	2	2
RANJIT KOT	1.00	3.00	3.00	1.13	1.33	2.50	3.00	3.50	3	5	4	4	5
RASHID PUR	2.00	4.00	3.00	1.00	1.00	2.50	3.00	3.50	3	5	4	4	5
RASUL PUR	3.00	2.00	3.00	0.75	0.67	3.00	4.00	4.00	3	5	2	3	4
RATTA MATTA	2.00	3.00	3.00	0.63	0.67	3.25	4.00	4.50	3	5	3	3	4
RODU SULTAN	2.00	2.00	3.00	0.88	1.00	2.00	3.00	2.50	3	5	2	3	4
SAIRN	2.00	2.00	3.00	0.63	0.67	1.50	2.00	1.00	3	3	1	1	2
SAMANDOANA	1.00	3.00	3.00	0.75	1.00	2.00	2.50	2.50	3	1	3	2	2
SHAH JEWANA	2.00	3.00	3.00	0.75	0.67	2.75	3.50	3.50	3	5	3	3	4
SHAH SADIQ NAHANG	1.00	3.00	3.00	1.13	1.00	3.00	4.00	3.50	3	1	4	4	3
SHEIKH CHUHAR	1.00	3.00	3.00	0.88	1.00	2.25	3.00	2.50	3	2	3	3	3
SHORKOT CANTT	0.00	4.00	3.00	0.38	0.33	1.50	2.50	1.00	3	1	2	1	2
SULTAN PAKHERA	0.00	4.00	3.00	0.75	0.67	3.00	4.00	4.50	3	1	4	4	3
SULTAN PUR	1.00	2.00	3.00	1.00	1.33	2.75	3.50	3.50	3	5	4	4	5
URBAN	0.00	1.00	3.00	0.00	0.00	1.50	2.00	1.50	3	1	1	1	1
WASU	2.00	2.00	3.00	0.88	0.67	2.50	3.00	3.50	3	5	2	4	4
YASMIN	0.00	1.00	3.00	0.63	0.67	1.00	1.50	1.00	3	1	1	1	1

Risk = (Hazard x Exposure x Vulnerabilty/Capacity)

DROUGHT RISK



Legend

- District Headquarter
- Tehsil Headquarter

Drought Risk

- Very Low
- Low
- Medium
- High
- Very High

- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

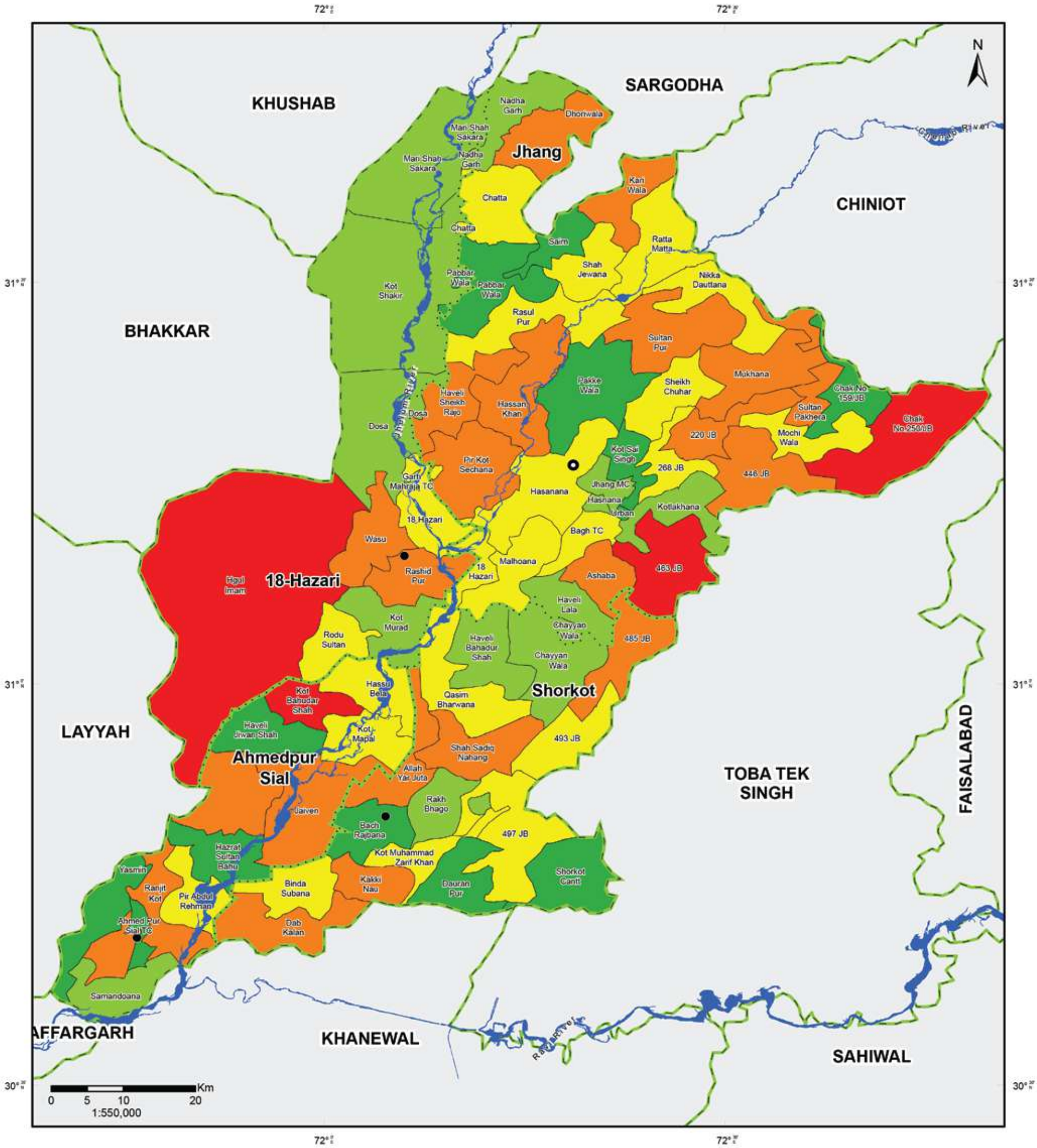
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-MAY-2016-RSK-NDMA-DROUGHT
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

EARTHQUAKE RISK



Legend

- District Headquarter
- Tehsil Headquarter

Earthquake Risk

- Very Low
- Low
- Medium
- High
- Very High

- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

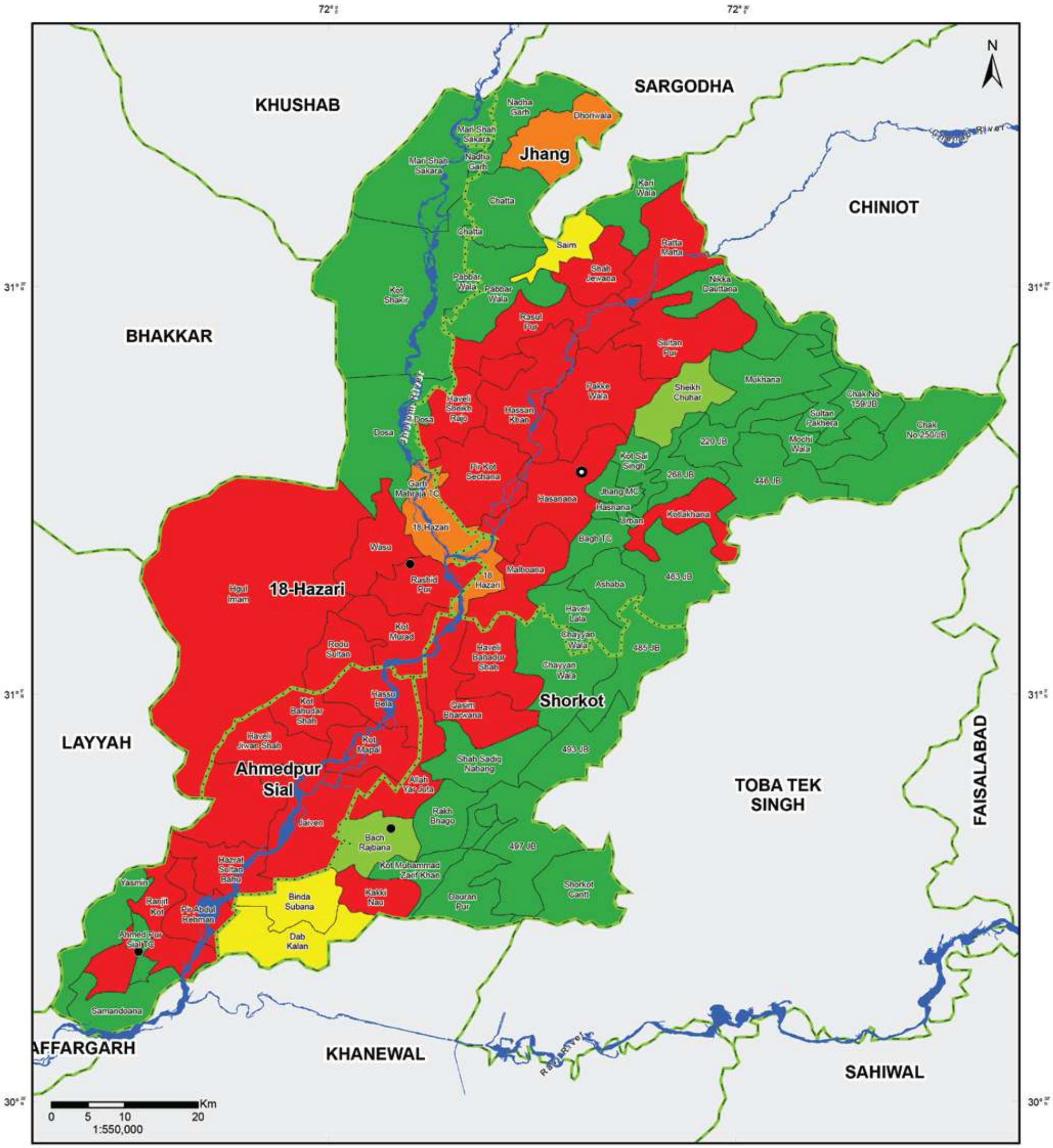
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-MAY-2016-RSK-NDMA-EQ
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

FLOOD RISK



Legend

- District Headquarter
- Tehsil Headquarter

Flood Risk

- Very Low
- Low
- Medium
- High
- Very High

- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

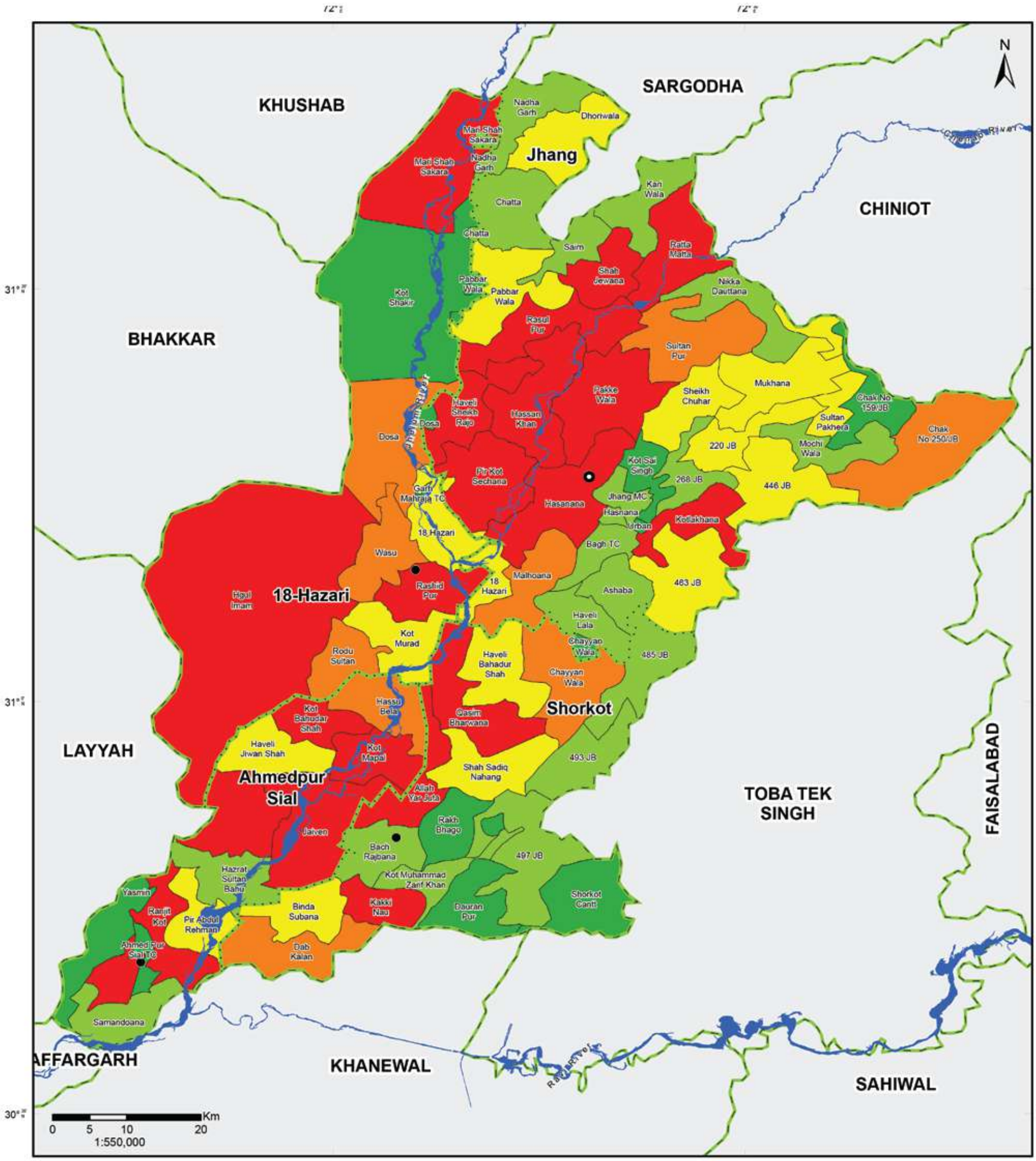
WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-MAY-2016-RSK-NDMA-FLOOD
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

COMPOSITE RISK



Legend

- District Headquarter
- Tehsil Headquarter

Composite Risk

- Very Low
- Low
- Medium
- High
- Very High

- River & Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Jhang, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-612-MAY-2016-RSK-NDMA-COMPOSITE
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

DATA SOURCES

DATA TYPE	DATA SOURCE
Agriculture Based Industries	Directorate of Agriculture, Crop Reporting Service, Punjab, Lahore x(Development Statistics-2015)
Animals Slaughtered in Recognized and Un-recognized Slaughter Houses by Type in the District	Directorate of Livestock and Dairy Development (Ext.) Punjab,Lahore
Annual Cellular Subscribers	Pakistan Telecommunication Authority (PTA)
Area Sown under Wheat, Rice, Cotton and Sugarcane in the District	Directorate of Agriculture, Crop Reporting Service, Punjab, Lahore.
Area Sown by Mode of Irrigation	Bureau of Statistics, Punjab, Lahore (2013-2014)
Birth Registration	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Broadband Subscribers by Technology	Pakistan Telecommunication Authority (PTA)
Building Distribution	PBS
Canal System	Agriculture Department Punjab
Cellular Communication Towers	Pakistan Telecommunication Authority (PTA)
Child Delivery - Location and Type of Assistance	Pakistan Social and Living Standard Measurement (PSLM): 2013-2014
Child Statistics	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Climatology	http://www.Myweather2.Com/City-Town/Pakistan/Khushab/Climate-Profile.Aspx http://en.Climate-Data.Org/Location/3077/
Diesel and Electric Tube wells Installed by Ownership	Directorate of Agriculture Crop Reporting Service, Punjab, Lahore.
Distribution Of Land Use/ Land Cover (LU/LC)	Space and Upper Atmosphere Research Commission (SUPARCO)
Education Facilities	School Education Department, Government of Punjab
Elevation Bands	National Aeronautics and Space Administration (NASA)
Establishment of Private Poultry Farms in the District (2013-14)	Directorate of Poultry Research Institute, Punjab, Rawalpindi
Flood Inundation Frequency	National Disaster Management Authority (NDMA)
Geology	Geological Survey of Pakistan (GSP)
Health Facilities	Health Department Punjab/ District Health Information System Punjab (Government Of Punjab)
Household Characteristics	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Industries	District Officer (E&IP), Khushab
Key Indicators - Child Mortality Statistics	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Khushab City Land Use Map 2013	NDMA
Landline Service	District Pre-Investment Study – 2012, Directorate Of Industries, Punjab Poonch House, Multan Road, Lahore.
Literacy Rate- 2015	2015 Projected

DATA TYPE	DATA SOURCE
Literacy Ratio	Pakistan Social and Living Standard Measurement (PSLM): 2014-2015
Major Industries	District Officer(E&IP), Khushab
Metaled Roads Length By Type Zone and District	Planning & Design Directorate, Punjab Highway Department, Lahore.
Mineral Productions	Directorate General, Mines and Minerals, Punjab, Lahore. (Development Statistics-2015)
Motor Vehicles 'Registered' By Type	Additional Director General, Excise & Taxation, Punjab, Lahore.
Number of Cattle, Sheep and Buffaloes in the District	Source:-Census of Agriculture 2000 & 2010- Census of Livestock 1996 & 2006
Number of Registered Factories & Employment Level	Bureau of Statistics, Punjab, Lahore
Number of Work Animals by Type in the District (2006)	2006 Census of Livestock, Agricultural Census Organization, Pakistan Bureau of Statistics
Percentage of children that have been immunized by Type of Antigen- Based on record and recall	Pakistan Social And Living Standard Measurement Survey (PSLM) 2013-2014
Population	Population Census 1998, Population Census Organization, Government of Pakistan. Projections were calculated on the basis of the Inter-Census Growth Rate for the two Censuses Of 1981 And 1998, and do not factor in changing Fertility And Migration Patterns.
Population by Age Group, Gender and Rural /Urban	Population Census 1998
Population by Mother Tongue- 2015	2015 Projected
Population Distribution	Pakistan Bureau Of Statistics (Population Census 1998, Population Census Organization, Government Of Pakistan. Projections Were Calculated On The Basis Of The Inter-Census Growth Rate For The Two Censuses Of 1981 And 1998, And Do Not Factor In Changing Fertility Patterns)
Population on Basis of Religion-1998	1998 Census
Post-Natal consultations of the District	Pakistan Social and Living Standard Measurement (PSLM): 2013-2014
Railway Network	Punjab Development Statistics 2011 / Respective District Offices
Sales of Fertilizer by year 2013-2014	Director General Agriculture, Punjab, Lahore
Socio-Economic Statistics of The District Khushab (In Percentage)	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Threshers and Harvesters in the District (2012-13)	Directorate of Agriculture Crop Reporting Service, Punjab, Lahore.
Total tractors in the District by 2004 Census	2004 Agricultural Census Wing & Pakistan Bureau of Statistics, Government of Pakistan, Lahore)
Tractors by Make in District (2012-13)	Directorate of Agriculture Crop Reporting Service, Punjab, Lahore
Types Of Health Facility	Health Department Punjab
Veterinary Institution in the District	Department Of Livestock & Dairy Development, Khushab

Developed by

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