DISTRICT MULTAN

PUNJAB - PAKISTAN

MULTI HAZARD VULNERABILITY & RISK ASSESSMENT (MHVRA)

Project Management Unit
National Diasaster Management Authority
Islamabad, Pakistan

DISTRICT MULTAN

PUNJAB - PAKISTAN

MULTI HAZARD VULNERABILITY & RISK ASSESSMENT (MHVRA)

National Disaster Management Authority,
Prime Minister's Office, 2nd Floor, Sector G-5/1
Constitution Avenue, Islamabad - Pakistan
www.ndma.gov.pk

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

Disclaimer

The designation employed and the presentations of material in this Atlas do not imply the expression of any opinion or official endorsement on the part of NDMA. While every effort has been made to ensure the accuracy and correctness of materials presented for this publication, the NDMA and its partners, disclaim any responsibility for the accuracy or correctness of the information and makes no representation of warranty as to information accuracy, and in particular, their accuracy in labeling, dimensions, contours, boundaries, or placement or location of any map features thereon. The areas depicted by maps are approximate, and are not necessarily accurate to surveying or engineering standards. The maps and tables shown here are for illustration purposes only and are not suitable for site-specific decision making. NDMA acknowledges and accepts all limitations, including the fact that the information and maps are dynamic and in a constant state of revision.

Copyright©

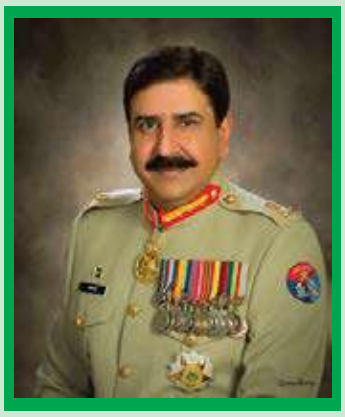
All rights reserved. No part of this publication may be reproduced, copied, stored in a retrieval system or transmitted in any form or by any means without the prior written permission of the copyright holder. Enquiries concerning the reproduction, distribution or translation should be made to the Project Management Unit (PMU), National Disaster Management Authority, Pakistan vide contact details given below.

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.

Contacts
Project Management Unit
National Disaster Management Authority
Prime Minister's Office, 2nd Floor, Sector G-5/1
Constitution Avenue, Post Code 44000, Islamabad, Pakistan
www.ndma.gov.pk
spm@ndma.gov.pk, dirimp@ndma.gov.pk

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 5th to 8th 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)

TABLE OF CONTENTS

MULTAN

		Page #.
1	Multan District Overview	01
2	Geology	05
3	Land Use and Land Cover	07
4	Elevation	09
5	Population Distribution	11
6	Population Density	13
7	Settlements	17
8	Building Distribution	19
9	Building Density	21
10	Transportation Network	25
11	Telecommunication	27
12	Health Facilities	29
13	Education	31
14	Irrigation Infrastructure	33
15	Major Industries	35
16	Livestock	37
17	Agriculture	38
18	Rescue 1122	41
19	Climatology	42

HAZARD ANALYSIS

		Page #.
20	Drought Hazard Assesment	45
	Drought Prone Union Councils	47
	Frequently Drought Prone Union Councils	48
21	Earthquake Hazard Assessment	49
	Earthquakes Hazard , 50 Years Return Period	50
	Earthquakes Hazard , 475 Years Return Period	51
22	Flood Hazard Assessment	53
	Flood Hazard , 10 Years Return Period	55
	Flood Hazard , 50 Years Return Period	56
	Flood Hazard , 100 Years Return Period	57

EXPOSURE ANALYSIS

		Page #.
23	Elements Exposed To Drought Hazard	59
	Settlements, Villages, Major Towns and Population Exposed to Drought	61
	Land Use & Land Cover Exposed to Drought	62
	Crop Exposed to Drought (Rabi Season)	63
	Crop Exposed to Drought (Kharif Season)	64

EXPOSURE ANALYSIS

		Page #.
24	Elements Exposed To Earthquake Hazard	65
	Built-up Area, Major Industries & critical Infrastructure Exposed to Earthquake 50 Years Return Period	67
	Built-up Area, Major Industries & critical Infrastructure Exposed to Earthquake 475 Years Return Period	68
	Schools, Health and Building Exposed to Earthquake 50 Year Return Period	69
	Schools, Health and Building Exposed to Earthquake 475 Year Return Period	70
	Communication Towers and Transportation Network Exposed to Earthquake 50 Year Return Period	71
	Communication Towers and Transportation Network Exposed to Earthquake 475 Year Return Period	72
	Settlements, Villages, Major Towns and Population Exposed to Earthquake Return Period 50 Years	73
	Settlements, Villages, Major Towns and Population Exposed to Earthquake Return Period 475 Years	74
25	Elements Exposed To Flood Hazard	75
	Land Use & Land Cover Exposed to Flood Return Period 10 Years	76
	Land Use & Land Cover Exposed to Flood Return Period 50 Years	77
	Land Use & Land Cover Exposed to Flood Return Period 100 Years	78
	Communication Towers and Transportation Network Exposed to Flood 10 Year Return Period	79
	Communication Towers and Transportation Network Exposed to Flood 50 Year Return Period	80
	Communication Towers and Transportation Network Exposed to Flood 100 Year Return Period	81
	Schools, Health and Building Exposed to Flood 10 Year Return Period	82
	Schools, Health and Building Exposed to Flood 50 Year Return Period	83
	Schools, Health and Building Exposed to Flood 100 Year Return Period	84
	Crop Exposed to Flood Return Period 10 Years (Kharif Season)	85
	Crop Exposed to Flood Return Period 50 Years (Kharif Season)	86
	Crop Exposed to Flood Return Period 100 Years (Kharif Season)	87

VULNERABILITY ASSESSMENT

		Page #.
26	Physical and Social Vulnerability Assessment	89
27	Food Security against Drought	90

RISK ASSESSMENT

		Page #.
27	Integrated Risk Assessment	95
28	Risk Assessment by Hazard Type	96
	Drought Risk	97
	Earthquake Risk	98
	Flood Risk	99
	Composite Risk	100

A BASELINE INFORMATION

1 MULTAN DISTRICT OVERVIEW

Multan is one of the most versatile districts of Pakistan having rich history, art, architecture, archeology, architecture, literature and culture. The District is situated along the banks of Chenab River and lies more or less at the geographic center of the Country. Its neighboring districts include Khanewal, Vehari, Lodhran and Muzaffargarh. The District covers geographical area of about 3647 km2 and has total population of 4.8 Million (2017 Census). It is composed of four tehsils namely Jalalpur Pirwala, Multan City, Multan Saddar, Shujabad and has total of 86 Union Councils and 532 Mouzas. The district is a commercial and financial hub of South Punjab with a versatile economic base ranging from cultural artifacts to modern day industry. Many fruits and vegetables are grown in the district with Mangoes known to be among the best and sweetest varieties produced globally.

i. Pre-Arabs Period (Up to 700 A.D)

The history of Multan in this period is little known. But there is evidence to suggest that the District originated thousands of years back in the past. It is nearly certain that Alexander passed through this area sometimes during B.C 325- 326. Early history by Arab Geographers indicates that Multan has also been capital of Sindh province, and was then ruled by Chach who remained in power till his death in A.D. 671.

II. Arab Rule (700-970 A.D)

The Arabs in 712 A.D defeated Raja Dahir and marched on towards Multan under the leadership of Muhammad Bin Qasim who paved the way for subsequent conquest of India. As the time passed on, the power of Caliphate began to weaken and by the end of the 9th century Multan was for all practical purposes independent of Baghdad.

III. Karmatians Period (970-1206 A.D.)

After their success in Syria, Basra, and Kufa, the Karmatians appeared gradually to have pushed themselves with their doctrine into the Indus Valley. At that time, Raja of the native Sumra family enjoyed full power backed by Karmatians. After remaining in their hands till two centuries, the Multan was ultimately delivered to Mahmood Ghori who in the course of his expeditions passed several times through Multan.

IV. Mughal Invasion (1206 - 1526 A.D)

In 1218 Chingiz invaded Western Turkestan and for next three hundred years the history of Multan remained under the rule of Mughal dynasty.

V. The Mughal Rule (1528-1752 A.D)

Multan enjoyed a long period of peace and entitled as 'Dar-ul-aman' during the strong centralized Mughal rule. For at least two hundred years from 1548 to 1748 there was no warfare in this part of Punjab. The cultivation remained for the most part confined to the riverain lands. The area immediately around and north of Multan was available for settlers in Shah Jehans reign and was colonized by men from all parts of North Western-India. Commerce seems to have flourished and Multan itself became a noted emporium for trade between Hindustan and Persian Empire.

VI. Pathan and Sikh Rule (1752-1843)

In 1752 Multan became a province and the loyalties of this province were with Afghan Kings of Kabul. The region was ruled for the most part by Governor of Pathan extraction under the rule of Soddazai family. In 1818 Raja Ranjit Singh stormed the Multan fort and took over Multan. In 1821 Diwan Sawan Mal was made the Governor of Multan and for next 13 years this area remained under the rule of Sawan Mal.

VII. Multan During British Rule (1845-1947)

By December 1848, the British had captured portions of Multan's outskirts, and destroyed the Multan Fort leading to the surrender of Mulraj and his forces to the British. The British conquest of the Sikh Empire was completed in February 1849, after the British victory at the Battle of Gujrat. Between the 1890s and 1920s, the British laid a vast network of canals in the Multan region, and throughout much of central and southern Punjab province.

Front view of old colonial building in British Raj.

Culture

The culture of Multan has some prominent elements that form its identity. Those elements include:

I. Traditional Dresses

Multan is famous for its multani dresses, mainly for women. The dresses are made with beautiful embroidery and have a very ethnic touch to them. The dress for men includes shalwar kamiz and lungi. Another element in its dress code includes the Multani Khussas: shoes that are the latest trends in streets of Pakistan. Nowadays, these khussas are in fashion and are demanded by women all over Pakistan. This demand has risen the price of this product and has made it slightly expensive than other regular khussas available in the market.

II. Food

The District produces one of the best mangoes in the world. There are many varieties of mangoes being produced and mango farms are undoubtedly the most common sight in the suburbs of Multan. Chaunsa, Langra, Anwar ratol, Dusairi, Fajri, Desi and Sindhri are some of the many mango varieties currently being cultivated in Multan.
Sohan Halwa (sweets) is another specialty of Multan and is popular throughout the Country. The district is also famous for the cultivation of wheat, cotton, rice and sugar cane as well as other fruits apart from mangoes such as citrus, guavas and pomegranates.

III. Multani Mitti

Multani sand is used as Clay for beauty mask for absorbing moisture. It is available in most of the cosmetics shops. It is demanded all over the country by different parlors' and skin care institutions.

IV. Language

Punjabi & Saraiki are the widely spoken local languages within the district while English and Urdu are the official languages being used in offices and educational institutions.

Traditional Crafts

- ✔ Mausoleum of Hazrat Bahu -ud- din Zakriya
- ✔ Mausoleum of Shah Shams Sabzwari
- ✔ Mausoleum of Shah Rukn-e-Alam
- ✔ Qila Kohna
- ✔ Qasim Bagh Stadium
- ✔ Ruins of Parhaland Temple in Fort Kohna Multan
- ✔ Ahmad Shah Abdali's Birthplace Monument
- ✔ Pak Gate
- ✔ Multan Fort
- ✔ Multan Museum
- ✔ Delhi Gate Multan
- ✔ International Cricket Stadium Multan
- ✔ Ghanta Ghar Multan

DISTRICT MULTAN AT A GLANCE

Geography

Location

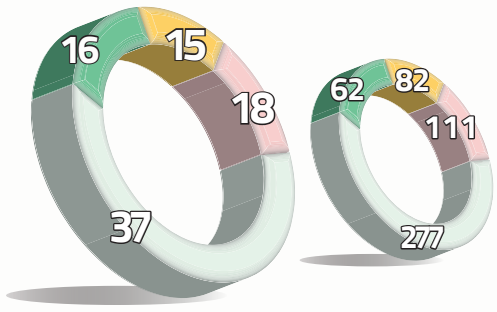
Lat: 30°27'46.99" - 29°20'17.73"
Long: 71°33'19.51" - 71°17'53.86"

Neighbouring Districts

- **North** — Khanewal District
- **East** — Lodhran District
- **West** — Muzaffargarh District
- **South** — Bahawalpur Districts

Administrative Setup

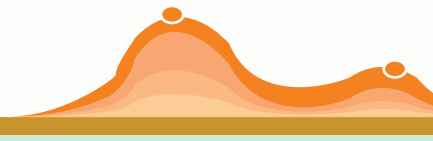
Area	3,647 sq.km
District Capital	Multan City
Language	Punjabi & Saraiki
Elevation to District	5000-7000 Year



Union Councils — Mouzas

Tehsils
- Jalalpur Pirwala
- Multan Saddar
- Multan City
- Shujabad

Tehsils	Union Councils	Mouzas
4	86	532



Population Distribution

Total Population in District		Population Density (Person per sq.km)	
3,116,851	1998 Census	853	1998 Census
4,745,109	2017 Census	1,301	2017 Census

Growth Rate

2.73%
(1998 Census)

Educational Facilities

Govt. Schools	Private Schools
1,439	1,923

Public Health Care Facilites
(Numbers)

179

Tourist Attractions

Picnic Resort
Jinnah Park and Shah Shams Park

Shrines
Baha-ud-din Zikaraya, Shah Shams Tabrez, Shah Rukn-e-Alam, Musa Pak Shaheed, Bibi Pak Daman and Muhammad Yousaf Gardezi

Forts
Multan Fort or Qilla Kohna, originally called Katochgarh

Historical Sites
Delhi Gate, Daulat Gate, Pak Gate, Haram Gate, Bohar Gate, Lohari Gate Multan, Parhaland Temple in Fort Kohna Multan, Sun Temple, Suraj Kund Temple and Jain Mandir in Bohar Gate

Agriculture

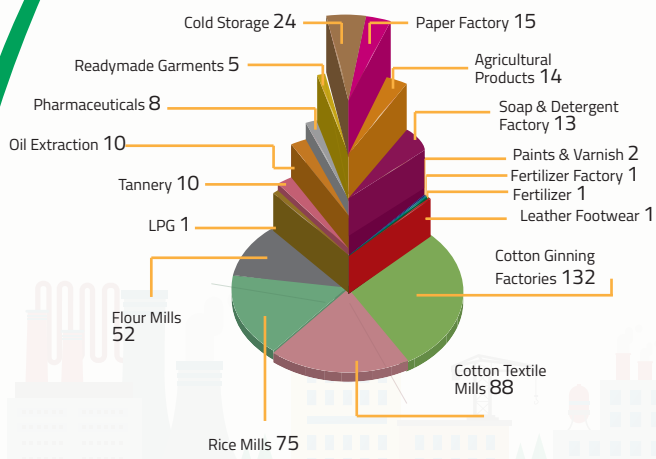
Major Crops
Wheat, Cotton & Sugarcane

Major Fruits
Mangos, Citrus, Guava & Pomegranates

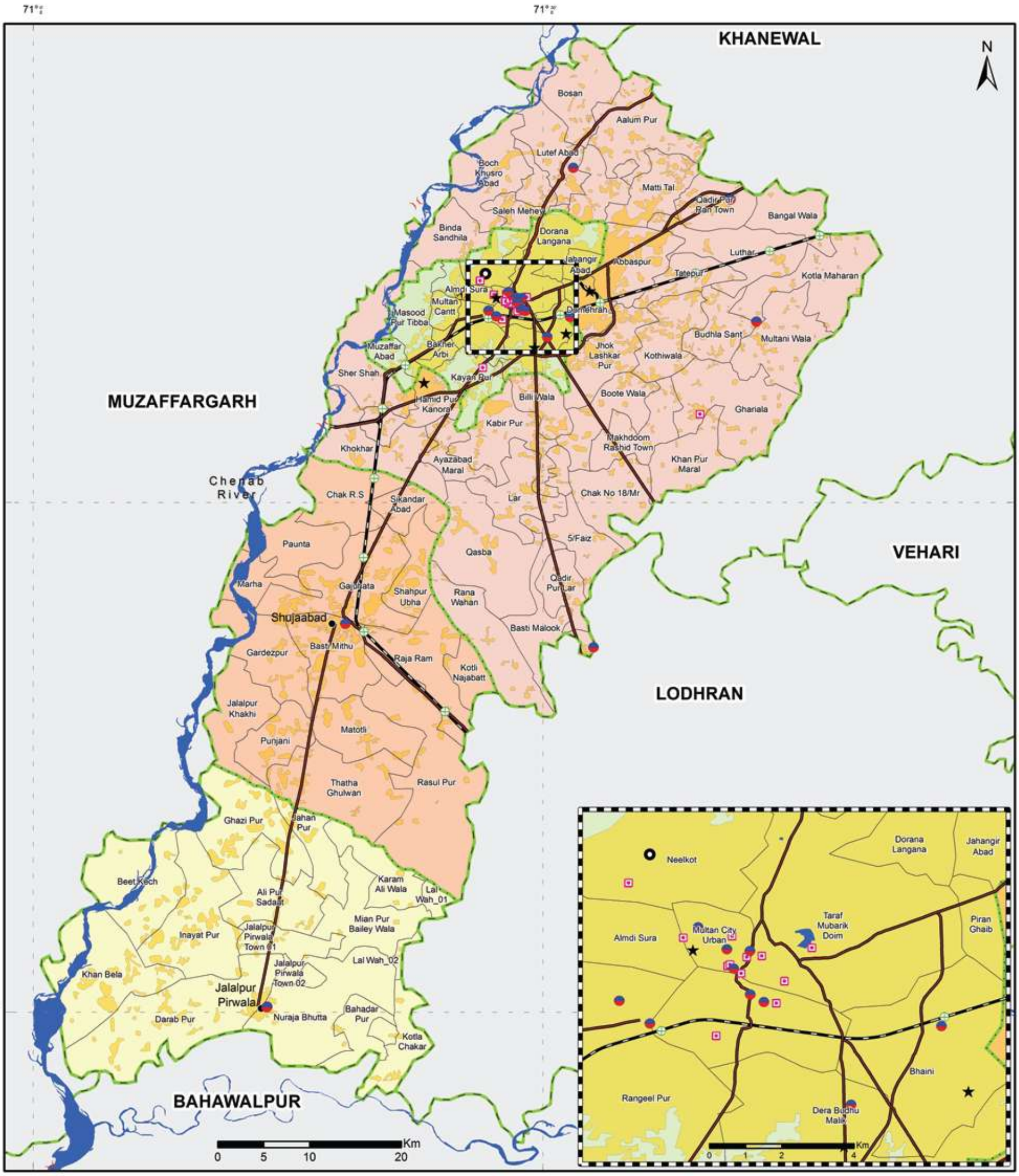
Major Vegetables
Potato, Onion & Cauliflower

Major Livestock
Buffalos, Cows, Sheep, Goats & Poultry

Major Industries



DISTRICT ADMINISTRATIVE MAP



Legend

- Rescue 1122
- Police Station
- Airport
- Air Field/Landing Strips
- Railway Station
- Archaeological Sites
- District Headquarter
- Tehsil Headquarter
- Bridge
- Motorway
- Trunk/Highway
- Broad Gauge Railway Track
- Other Gauge Railway Track
- River and Reservoir
- Builtup Area
- Abc Union Council Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Punjab Emergency Service - Rescue 1122
Punjab Police
Survey of Pakistan
National Highway Authority
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-001
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

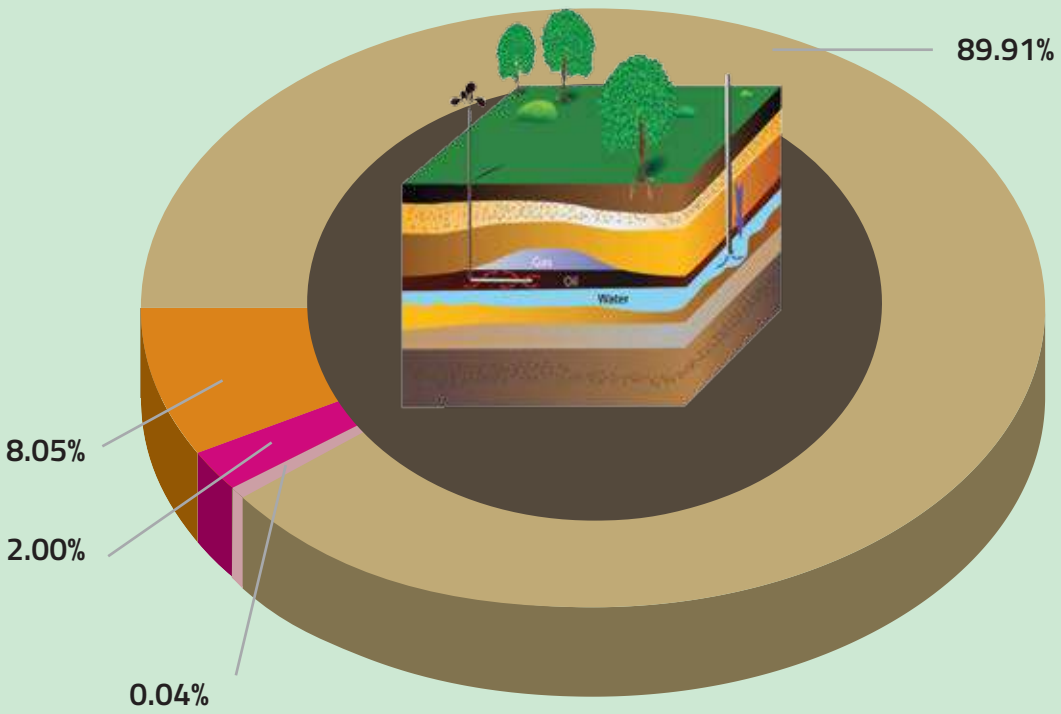
2 GEOLOGY

The surface geology of Multan is mainly consists of fluvial deposits which includes 89.9% of flood plain deposits of extinct streams whereas the remaining 10% comprise of present flood plain and river bed deposits with little amount of eolian deposits. The geological diversity of Multan can be seen through Table 1.

The Multan district lies in the Central Indus Platform Basin, also known as Punjab Platform. Geologically, Sargodha High lies in the north, Mari-Kandhkot High in the south whereas Sulaiman depression and fold belt in the west of Punjab Platform extending in the east toward Bikaner-Nagaur Basin of India. Punjab Platform is considered as a westerly dipping monocline toward the Sulaiman depression. Outcrops of sedimentary rocks are not exposed on surface throughout the platform region and mostly covered with alluvium and other recent fluvial deposits.

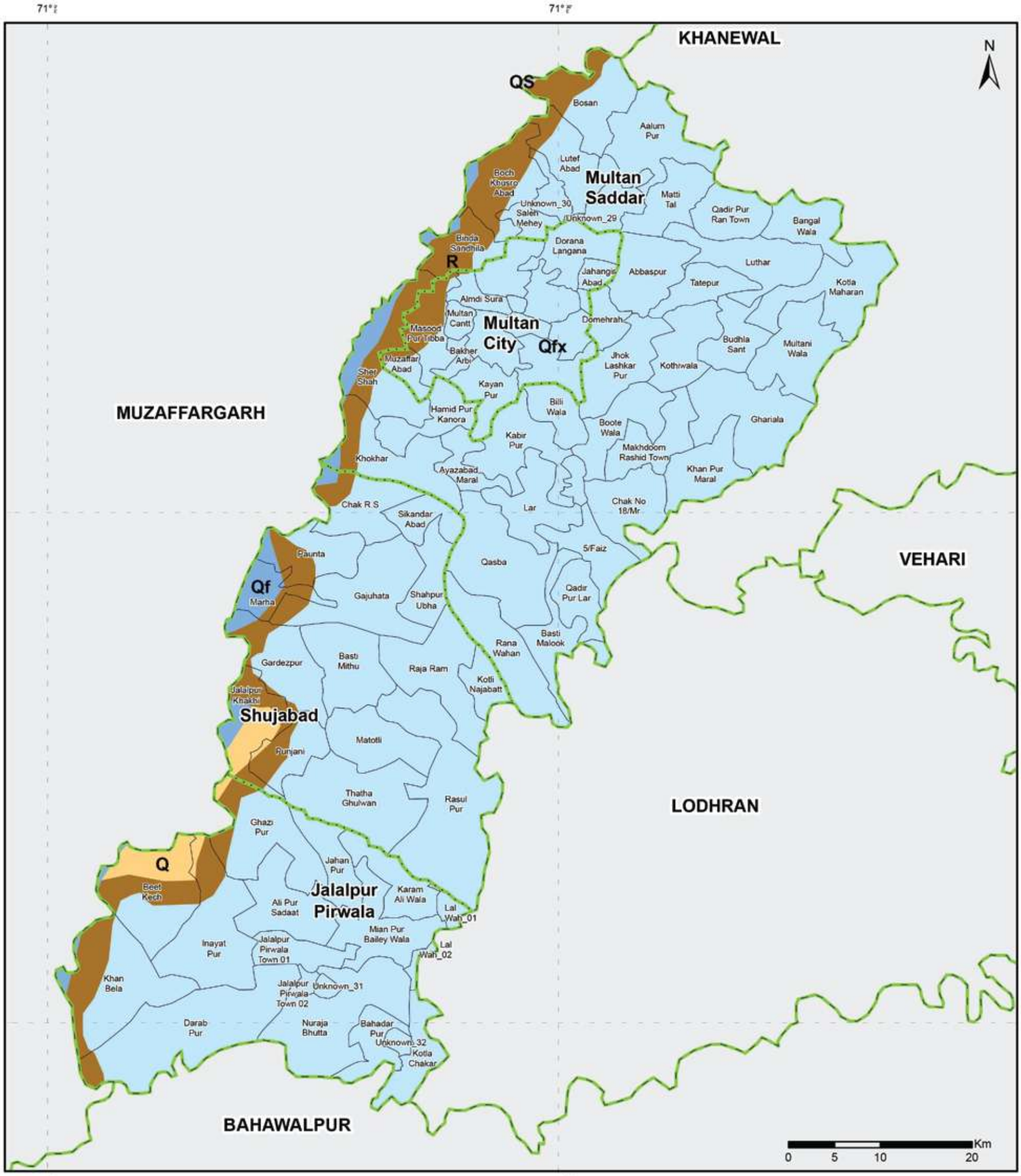
Geological Formation	Area (sq.km)	Composition
Deposits of Extinct Streams (Flood plain-Lower Terrace) (Qfx)	3189.5	89.91 %
Eolian Sand (Qs)	1.29	0.04 %
Flood-plain deposits (Qf)	70.96	2.00 %
Streambed and meander-belt deposits (Qm)	285.6	8.05 %

Geological Composition



- Deposits of Extinct Streams (Flood plain-Lower Terrace) (Qfx)
- Eolian Sand (Qs)
- Flood-plain deposits (Qf)
- Streambed and meander-belt deposits (Qm)

GEOLOGY MAP



Legend

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

Multi Hazard Vulnerability & Risk Assessment, Multan, 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-622-FEB-2016-GEN-NDMA-004
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

3 LAND COVER AND LAND USE

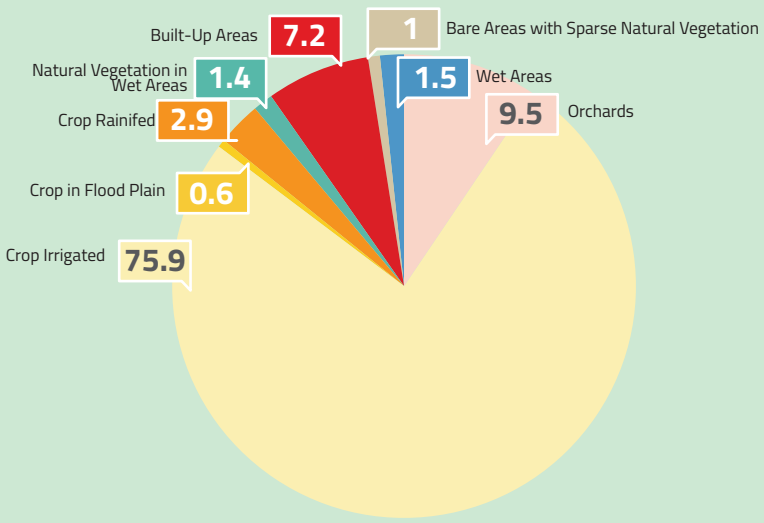
Land Cover (LC) is defined as the observed (bio) physical cover on the earth's surface, whereas Land Use (LU) is characterized by the arrangements, activities and inputs that people undertake in a certain land cover type in order to produce, change or maintain it. Knowledge of the LU/LC distribution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

Land Cover/ Land Use (LULC) processes are important to be monitored since they are the direct drivers of Climate & Ecosystem Change. For this study, LU/LC 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 settlement. 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.

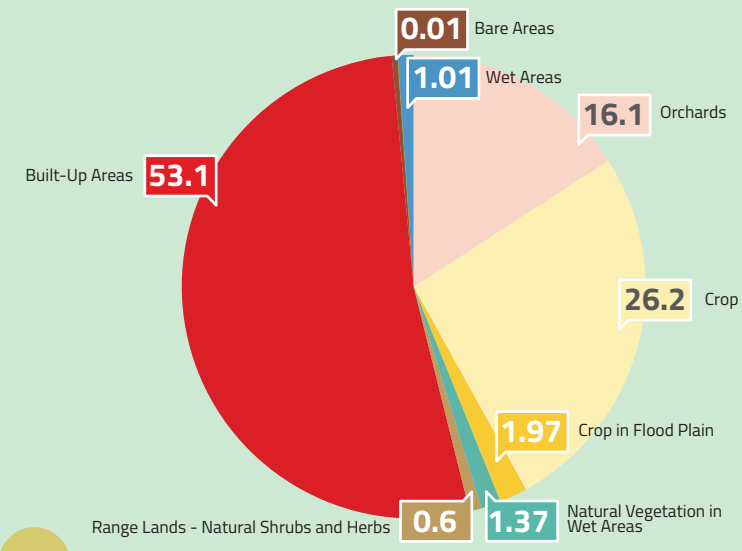
The geospatial database, prepared by SUPARCO, is used to provide basis for the development of an improved capacity for natural resources monitoring and management.

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 very high resolution satellite imagery. For this purpose, satellite images were segmented into homogeneous polygons and labeled using the LCCS classification system.

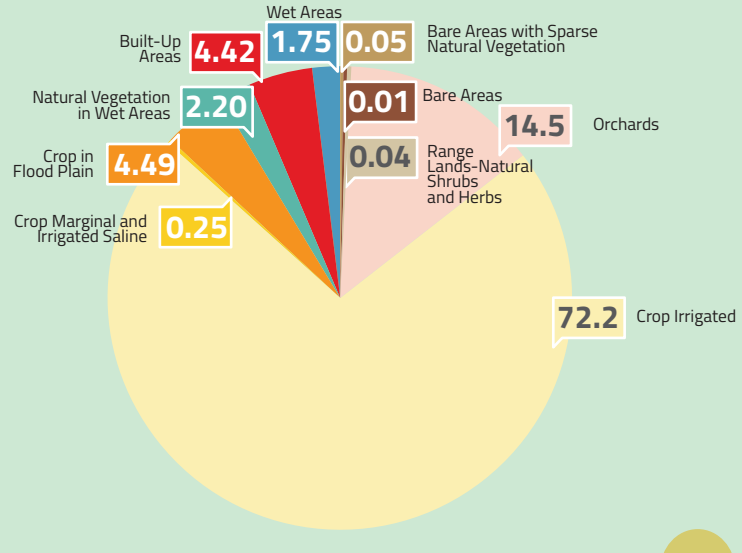
LAND COVER DISTRIBUTION
DISTRICT MULTAN (Percentage)



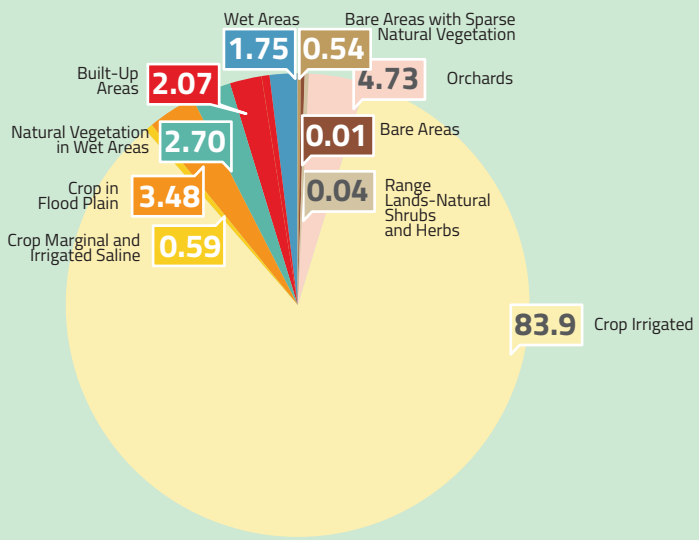
Tehsil Multan



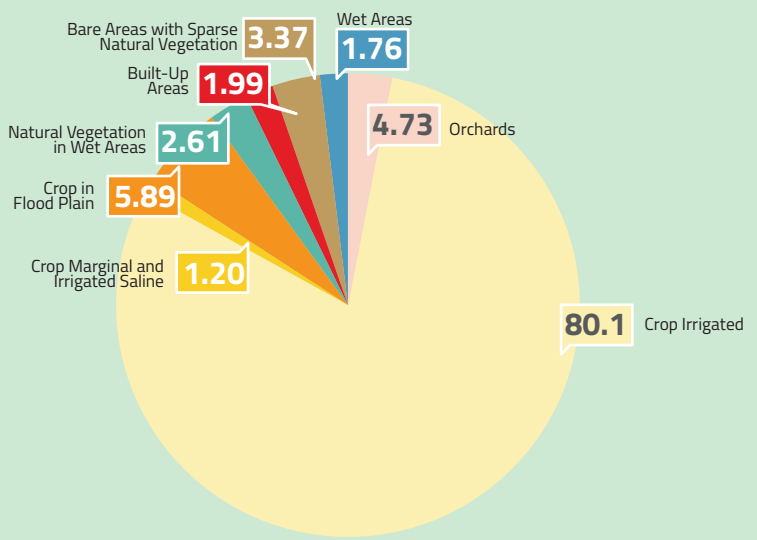
Multan Saddar



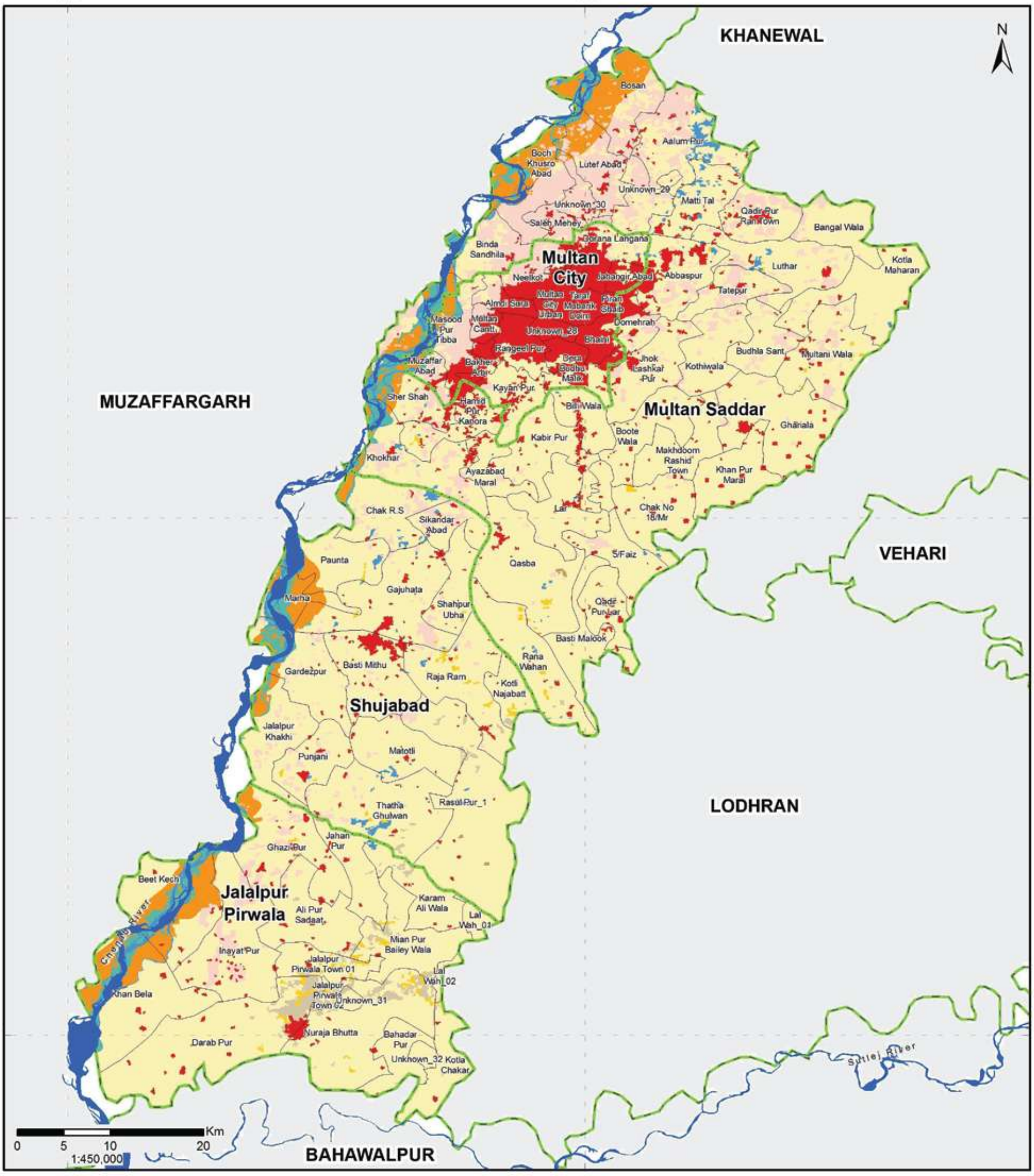
Shujabad



Jalalpur Pirwala



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, Multan, Punjab, Pakistan

United Nations World Food Programme

MAP INFORMATION

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

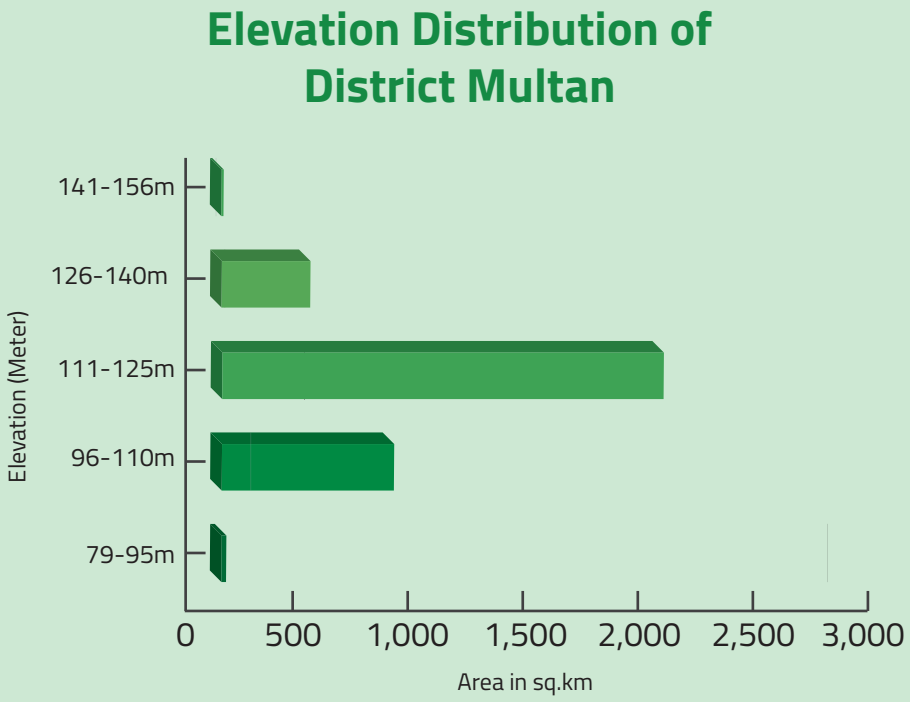
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-002
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

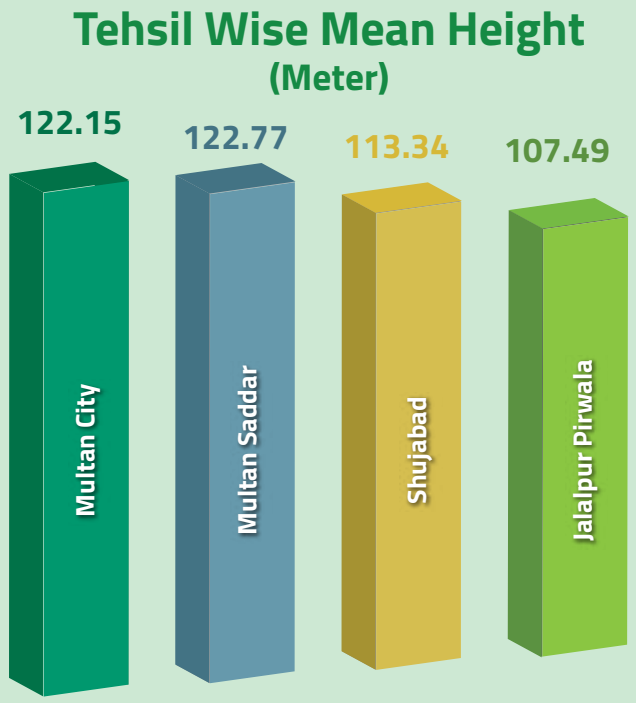
4 ELEVATION

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.

District Multan is relatively flat as geologically it is underlain by a gently sloping monocline toward the sulaiman ranges in the west.

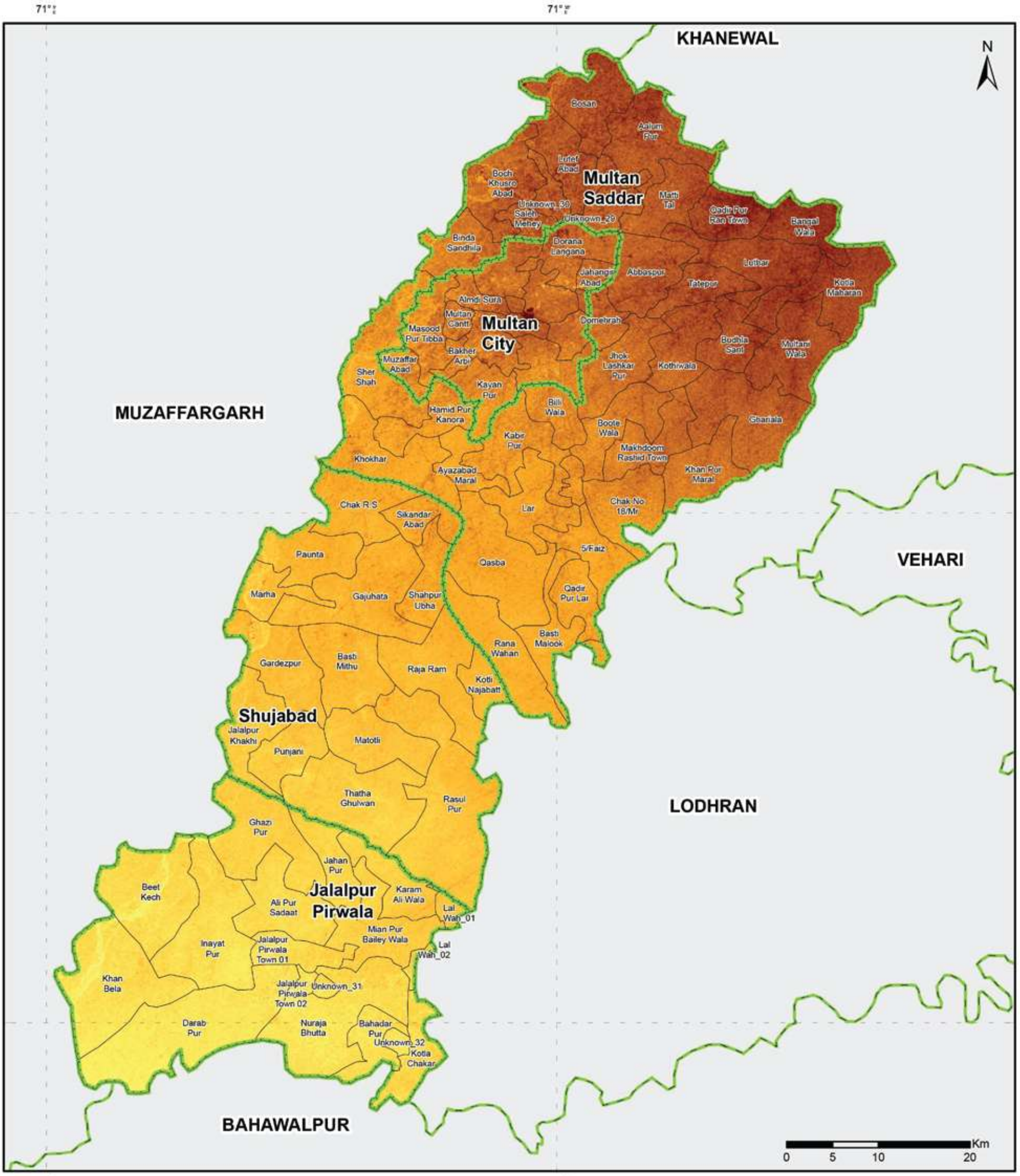
The elevation of the district is between 156m (High) to 79m (Low). It can be analyzed from the map that around 2150 Km2 (59%) of the district lies within elevation range of 111-125m. The average height of district is 116.92m, whereas the mean, maximum and minimum heights of the tehsils are shown in figure 9.





Elevation Bands	Tehsil Wise Area Coverage (sq.km)				District Total (sq.km)
	Multan City	Multan Saddar	Shujabad	Jalalpur Pirwala	
79-95m	0	0	0.011	0.09	0.101
96-110m	0.04	0.27	133.6	770.36	904.27
111-125m	252.74	1091.91	704.21	101.31	2150.17
126-140m	32.44	560.26	0.09	0.001	592.791
141-156m	0.12	0.06	0	0	0.18

ELEVATION MAP



Legend

Elevation (m)

High : 156

Low : 79

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

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

WFP United Nations World Food Programme

MAP INFORMATION

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

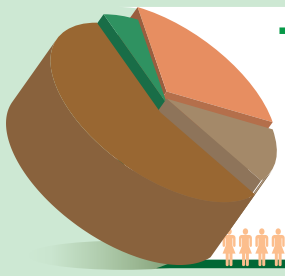
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-003
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

5 POPULATION DISTRIBUTION

As per the 1998 Census, the total population of district Multan was 3,116,851 with an annual growth rate of 2.73%. The total urban population was 1,314,748 and rural population of 1,802,103. For this study, projected population of 5,107,859 as of 2015 is used on inter census growth rate of 1981 and 1998.

Tehsil Wise Population

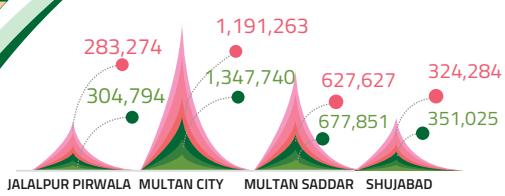


Total Population (Projected 2015)

10,215,718

Jalalpur Pirwala	Multan City	Multan Saddar	Shujabad
588,066	2,539,003	1,305,480	5,783,169

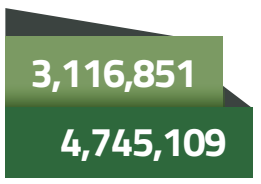
Tehsil Wise Gender Distribution



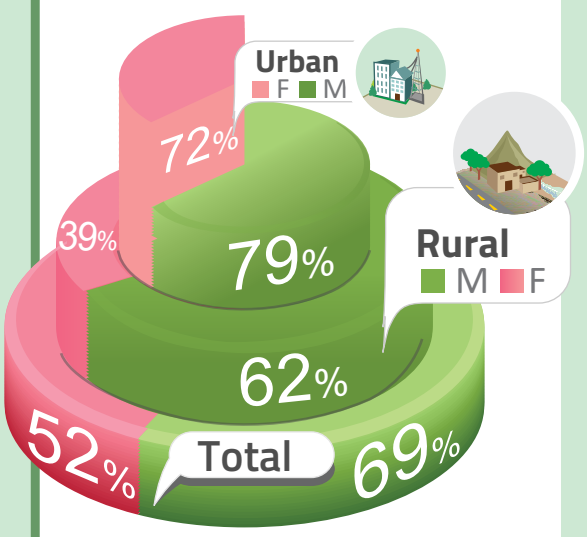
	MALE	FEMALE
Total	2,681,410	2,426,448

Population on Basis of Religion (1998)

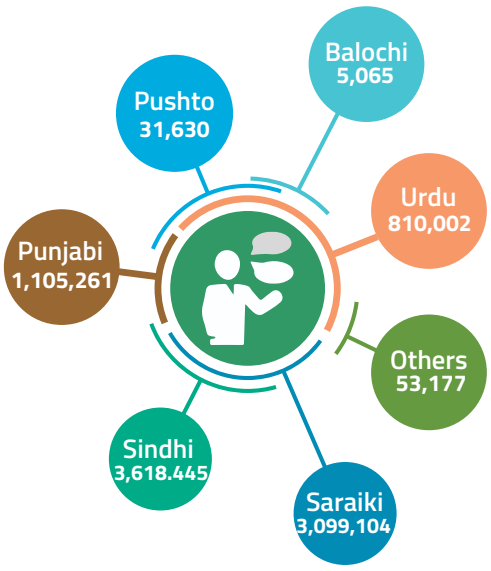
Muslims	Christians	Qadiani Ahmadi	Hindu / Jati	Others	Scheduled Castes
3,089,362	19,305	2,754	1,170	4,222	38



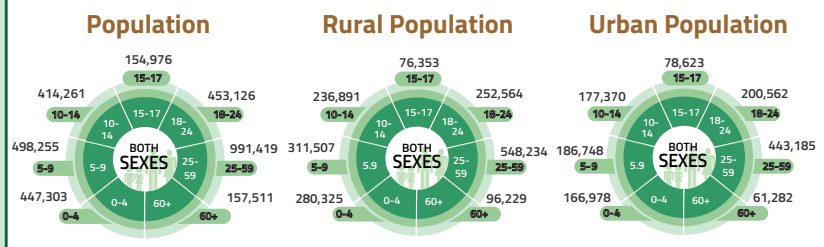
Literacy Rate (%) 2015



Mother Tongue



Age & Location Wise Disaggregated Population (1998 Census)



Age Group	Population FEMALE	Population MALE	Rural FEMALE	Rural MALE	Urban FEMALE	Urban MALE
	3,116,851		1,802,103		1,314,748	
0 to 4	219,082	228,221	137,288	143,037	81,794	85,184
5 to 9	239,833	258,422	149,584	161,923	90,249	96,499
10 to 14	196,620	217,641	111,312	125,579	85,308	92,062
15 to 17	75,255	79,721	36,024	40,329	39,231	39,392
18 to 24	218,034	235,092	123,880	128,684	94,154	106,408
25 to 59	462,529	528,890	264,117	284,117	198,412	244,773
60+	69,730	87,781	42,349	53,880	27,381	33,901
	1,481,083	1,635,768	864,554	937,549	698,219	616,529

Jalalpur Pirwala

	Union Councils	
18,982	Ali Pur Sadaat	17,851
17,580	Bahadar Pur	16,379
20,155	Beet Kech	19,154
20,869	Darab Pur	19,399
21,472	Ghazi Pur	20,212
17,026	Inayat Pur	15,724
21,719	Jahan Pur	20,022
23,516	Jalalpur Pirwala Town 01	21,993
19,226	Jalalpur Pirwala Town 02	18,644
18,203	Karam Ali Wala	16,928
15,522	Khan Bela	14,806
23,581	Kotla Chakar	21,638
14,343	Lal Wah_01	13,102
6,822	Lal Wah_02	6,058
23,491	Mian Pur Bailey Wala	20,692
22,287	Nuraja Bhutta	20,672

Multan City

	Union Councils	
23,902	Almdi Sura	21,638
17,414	Bakher Arbi	16,332
17,825	Bhaini	16,479
19,518	Dera Budhu Malik	17,449
18,383	Dorana Langana	17,127
21,759	Jahangir Abad	19,987
20,997	Kayan Pur	18,939
21,042	Masood Pur Tibba	18,998
120,940	Multan Cantt	79,420
951,852	Multan City Urban	861,461
17,501	Muzaffar Abad	15,478
21,915	Neelkot	20,006
32,765	Piran Ghaib	29,720
15,866	Rangeel Pur	14,438
26,061	Taraf Mubarik Doim	23,791
	Unknown_28	

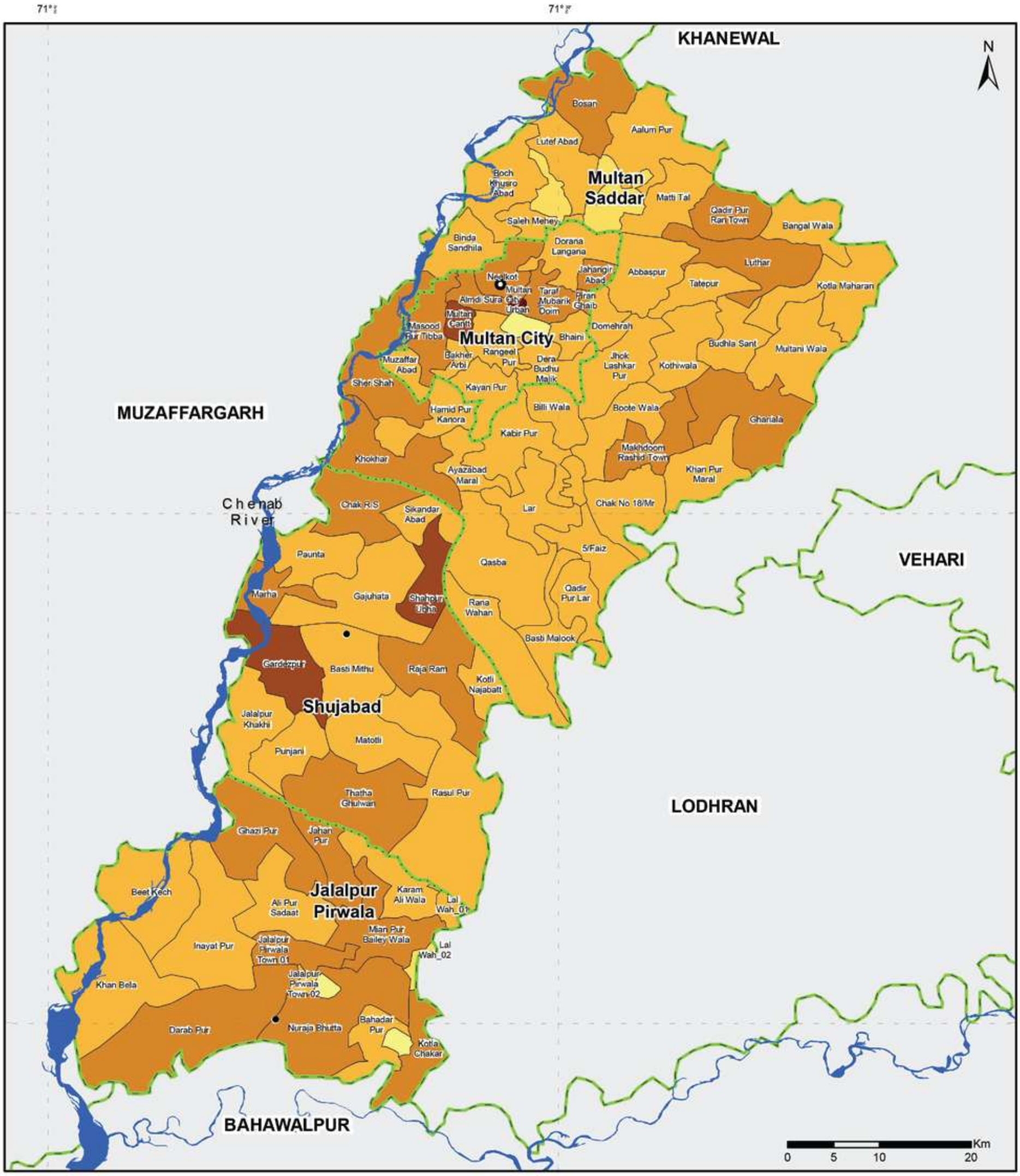
Multan Saddar

	Union Councils	
16,580	5/Faiz	16,108
20,075	Aalum Pur	18,045
16,542	Abbaspur	14,396
15,869	Ayazabad Maral	15,015
18,275	Bangal Wala	16,868
18,607	Basti Malook	17,606
15,392	Billi Wala	14,116
18,666	Binda Sandhila	17,022
17,016	Boch Khusro Abad	16,022
16,968	Boote Wala	15,853
21,085	Bosan	19,285
15,575	Budhla Sant	14,723
15,887	Chak No 18/Mr	14,912
19,963	Domehrah	18,039
21,757	Ghariala	20,532
18,185	Hamid Pur Kanora	16,771
18,421	Jhok Lashkar Pur	17,287
19,577	Kabir Pur	18,194
15,507	Khan Pur Maral	14,759
22,237	Khokhar	20,719
17,732	Kothiwala	16,769
19,371	Kotla Maharan	18,213
17,714	Lar	16,857
19,502	Lutef Abad	17,411
21,360	Luthar	20,019
28,992	Makhdoom Rashid Town	26,860
18,477	Matti Tal	16,987
15,142	Multani Wala	14,210
14,370	Qadir Pur Lar	12,985
34,604	Qadir Pur Ran Town	31,851
17,170	Qasba	16,134
16,486	Rana Wahan	15,230
16,403	Saleh Mehey	14,526
22,039	Sher Shah	20,219
19,532	Tatepur	18,118

Shujabad

	Union Councils	
20,750	Basti Mithu	19,209
23,541	Chak R.S	21,352
18,256	Gajuhata	16,724
45,253	Gardezpur	42,137
20,201	Jalalpur Khakhi	18,649
16,620	Kotli Najabatt	15,818
22,344	Marha	20,136
19,280	Matotli	17,975
16,055	Paunta	14,621
16,632	Punjani	15,479
22,039	Raja Ram	20,168
19,663	Rasul Pur	18,090
47,840	Shahpur Ubha	44,470
19,037	Sikandar Abad	17,859
23,514	Thatha Ghulwan	21,597

POPULATION DISTRIBUTION MAP



Legend

- District Headquarter
- Tehsil Headquarter

Population Distribution

- <= 10000
- 10001 - 20000
- 20001 - 40000
- 40001 - 80000
- 80001 - 240000
- >240000

- River and Reservoir
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

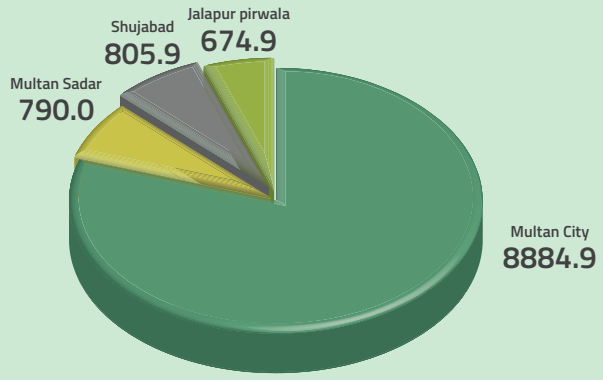
Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-005
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

6 POPULATION DENSITY

The average population density of Multan district was nearly 837.9 persons per sq.km as per 1998 which in 2015 has grown to 1400.5 persons per sq.km. The most densely populated Tehsil of the district is Multan City whereas Jalalpur Pirwala is the sparsely populated. Multan City Urban is the most densely populated union council of the District with density of 661463 persons/ sq. km.

Tehsil Wise Population Density
(Persons/sq.km)



Union Councils	Population	Male	Female	Area (sq km)	Density (Person / sq.km)
Tehsil Jalalpur Pirwala					
Ali Pur Sadaat	36,833	18,982	17,851	56.9	647.0
Bahadar Pur	33,958	17,580	16,379	27.3	1,243.0
Beet Kech	39,309	20,155	19,154	81.6	482.0
Darab Pur	40,268	20,869	19,399	131.1	307.0
Ghazi Pur	41,685	21,472	20,212	74.2	562.0
Inayat Pur	32,750	17,026	15,724	88.5	370.0
Jahan Pur	41,741	21,719	20,022	32.6	1,282.0
Jalalpur Pirwala Town 01	45,508	23,516	21,993	27.3	1,669.0
Jalalpur Pirwala Town 02	37,870	19,226	18,644	5.6	6,705.0
Karam Ali Wala	35,131	18,203	16,928	36.6	959.0
Khan Bela	30,328	15,522	14,806	98.7	307.0
Kotla Chakar	45,219	23,581	21,638	33.7	1,343.0
Lal Wah_01	27,445	14,343	13,102	8.2	3,334.0
Lal Wah_02	12,880	6,822	6,058	4.4	2,946.0
Mian Pur Bailey Wala	44,183	23,491	20,692	56.2	787.0
Nuraja Bhutta	42,958	22,287	20,672	98.1	438.0
Tehsil Total:	**588,066**	**304,794**	**283,274**	**871.3**	**674.9**
Tehsil Multan City					
Almdi Sura	45,540	23,902	21,638	14.0	3,261.0
Bakher Arbi	33,746	17,414	16,332	8.1	4,152.0
Bhaini	34,304	17,825	16,479	14.4	2,380.0
Dera Budhu Malik	36,967	19,518	17,449	29.8	1,240.0
Dorana Langana	35,510	18,383	17,127	36.4	975.0
Jahangir Abad	41,746	21,759	19,987	9.7	4,317.0
Kayan Pur	39,936	20,997	18,939	29.7	1,345.0
Masood Pur Tibba	40,040	21,042	18,998	34.8	1,149.0
Multan Cantt	200,359	120,940	79,420	9.5	21,122.0
Multan City Urban	1,813,314	951,852	861,461	2.7	661,463.0
Muzaffar Abad	32,979	17,501	15,478	14.0	2,352.0
Neelkot	41,921	21,915	20,006	25.1	1,668.0
Piran Ghaib	62,485	32,765	29,720	2.4	26,158.0
Rangeel Pur	30,304	15,866	14,438	24.3	1,248.0
Taraf Mubarik Doim	49,852	26,061	23,791	21.9	2,276.0
Tehsil Total:	**2,539,003**	**1,347,740**	**1,191,263**	**285.8**	**8,884.9**
Tehsil Multan Saddar					
5/Faiz	32,688	16,580	16,108	33.8	966.0
Aalum Pur	38,121	20,075	18,045	64.7	590.0
Abbaspur	30,938	16,542	14,396	49.9	621.0
Ayazabad Maral	30,883	15,869	15,015	22.2	1,393.0
Bangal Wala	35,143	18,275	16,868	35.5	990.0
Basti Malook	36,213	18,607	17,606	38.1	951.0
Billi Wala	29,507	15,392	14,116	35.3	837.0
Binda Sandhila	35,688	18,666	17,022	35.3	1,012.0
Boch Khusro Abad	33,038	17,016	16,022	54.6	605.0
Boote Wala	32,821	16,968	15,853	42.2	778.0
Bosan	40,370	21,085	19,285	60.9	663.0
Budhla Sant	30,298	15,575	14,723	32.6	930.0
Chak No 18/Mr	30,799	15,887	14,912	48.5	635.0
Domehrah	38,003	19,963	18,039	17.9	2,123.0
Ghariala	42,290	21,757	20,532	80.9	523.0
Hamid Pur Kanora	34,955	18,185	16,771	33.8	1,034.0
Jhok Lashkar Pur	35,708	18,421	17,287	48.2	741.0
Kabir Pur	37,771	19,577	18,194	52.8	716.0
Khan Pur Maral	30,266	15,507	14,759	43.3	699.0
Khokhar	42,956	22,237	20,719	63.7	674.0
Kothiwala	34,501	17,732	16,769	43.3	797.0
Kotla Maharan	37,585	19,371	18,213	65.8	571.0
Lar	34,571	17,714	1,657	45.4	761.0
Lutef Abad	36,913	19,502	17,411	40.4	914.0
Luthar	41,380	21,360	20,019	57.8	716.0
Makhdoom Rashid Town	55,852	28,992	26,860	41.1	1358.0
Matti Tal	35,464	18,477	16,987	39.2	9,04.0
Multani Wala	29,352	15,142	14,210	59.2	496.0
Qadir Pur Lar	27,355	14,370	12,985	27.7	989.0
Qadir Pur Ran Town	66,455	34,604	31,851	35.2	1,889.0
Qasba	33,304	17,170	16,134	87.4	381.0

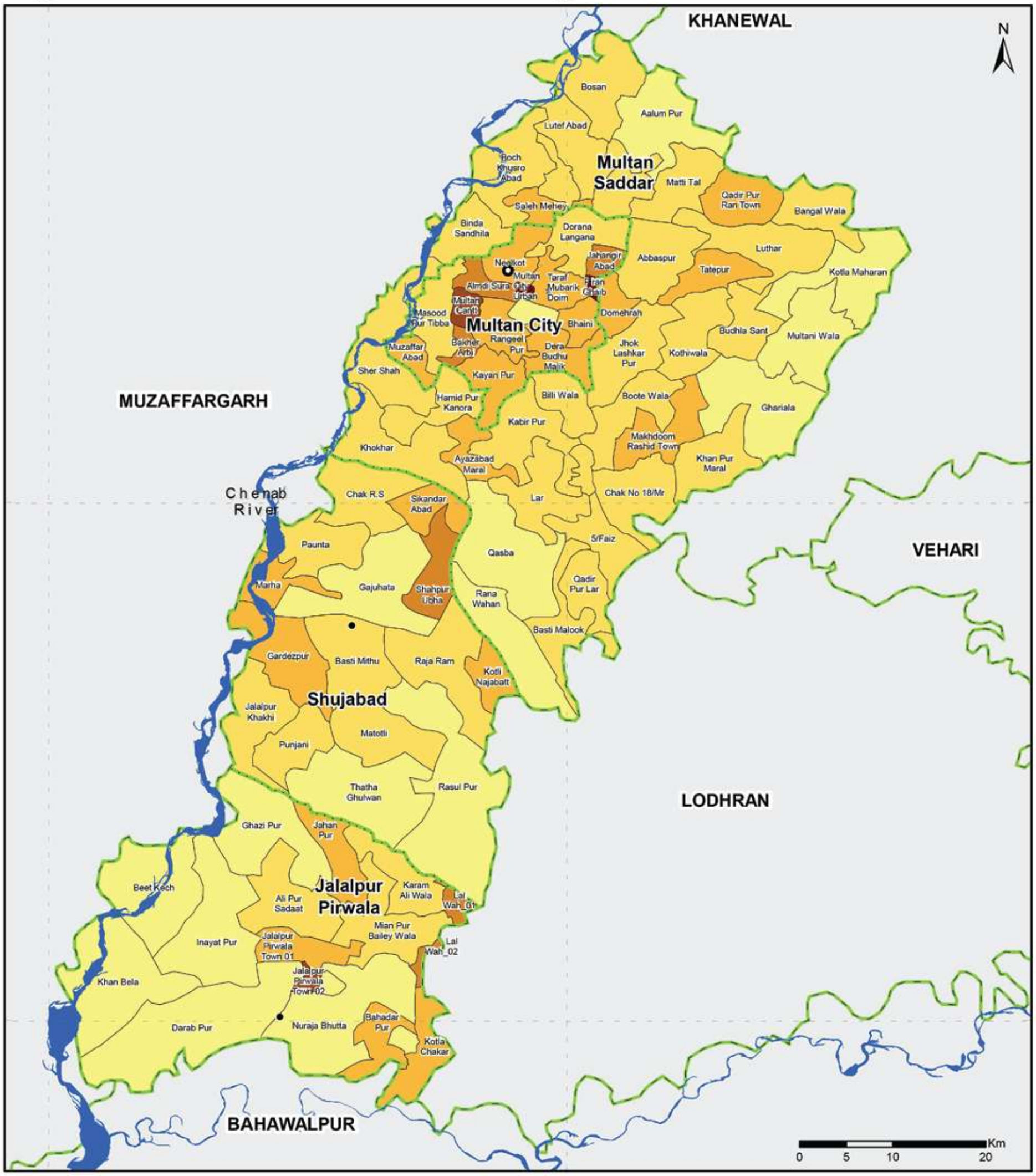
Rana Wahan	31,716	16,486	15,230	61.9	512.0	512.0
Saleh Mehey	30,929	16,403	14,526	14.8	2,083.0	2083.0
Sher Shah	42,258	22,039	20,219	67.4	627.0	627.0
Tatepur	37,650	19,532	18,118	27.9	1,350.0	1,350.0
Tehsil Total:	**1,305,480**	**677,851**	**627,627**	**1,652.5**	**790.0**	

Tehsil Shujabad

Basti Mithu	39,959	20,750	19,209	58.0	688.0	688.0
Chak R.S	44,894	23,541	21,352	52.0	863.0	863.0
Gajuhata	34,980	18,256	16,724	86.9	403.0	403.0
Gardezpur	87,390	45,253	42,137	58.0	1,507.0	1,507.0
Jalalpur Khakhi	38,849	20,201	18,649	49.7	782.0	782.0
Kotli Najabatt	32,438	16,620	15,818	20.3	1,601.0	1,601.0
Marha	42,480	22,344	20,136	26.5	1,600.0	1,600.0
Matotli	37,255	19,280	17,975	50.5	738.0	738.0
Paunta	30,677	16,055	14,621	45.8	670.0	670.0
Punjani	32,110	16,632	15,479	36.0	892.0	892.0
Raja Ram	42,208	22,039	20,168	70.3	601.0	601.0
Rasul Pur	37,753	19,663	18,090	137.4	275.0	275.0
Shahpur Ubha	92,310	47,840	44,470	31.6	2,919.0	2,919.0
Sikandar Abad	36,896	19,037	17,859	24.8	1,490.0	1,490.0
Thatha Ghulwan	45,111	23,514	21,597	90.3	500.0	500.0
Tehsil Total:	**675,310**	**351,025**	**324,284**	**837.9**	**805.9**	
District Total:	**5,107,859**	********	********	**3,647**	**1,400.5**	

Socio-Economics Statistics (2015)

POPULATION DENSITY (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Population Density (Person/Sq. Km.)

- Abc <= 600
- Abc 601 - 1200
- Abc 1201 - 2400
- Abc 2401 - 4800
- Abc 4801 - 26000
- Abc > 26000

- River and Reservoir
- Abc Tehsil Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

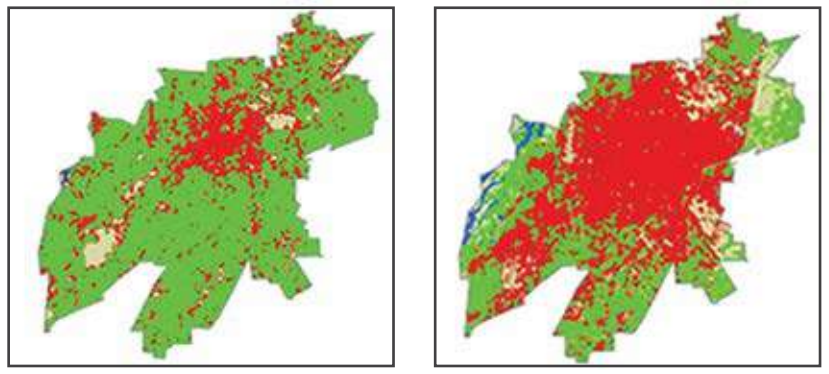
Data Source(s):
Pakistan Bureau of Statistics,
Survey of Pakistan

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-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 Multan district in to two forms i-e Urban Settlement and the Rural Settlement. The geographic distribution of settlements over the district is manifested in the Settlement Map.

Land Use Pattern (1981 & 2014)



Land Use Class	Area		Change
	Year 2000	Year 2013	
Built-Up Area	20.87	49.87	29 % ↑
Agriculture	73.63	32.24	-41.39% ↑
Water Bodies	0.13	1.47	-0.13% ↓
Barren	5.37	16.46	-13.04% ↓

Settlements Vulnerable to Riverine Flood on Basis of Inundation Frequency (2010 to 2017)

Tehsil Jalalpur Pirwala

- Jawayawali Basti
- Muhana Sandila
- Paunta
- Tibbi
- Bet Kesar
- Basti Bakley
- Ripri
- Raiyan di Basti
- Khanwala
- Jangwala
- Sat Burji Distributary
- Shahpur Lamma
- Kuliarwala
- Wachha Sandila
- Miani
- Muslim Chhajra
- Panjani Distributary
- Basti Aziz Qadria
- Mehr Bakhsh
- Basti Hafiz
- Kachcha Pakka
- Chhatren
- Dari
- Dhorewala
- Phund
- Rawan
- Umarpur
- Nowshehra
- Tibbi Khoranwali
- Panun
- Basti Mohanra
- Basti Salah Qadir
- Basti Kach Pak
- Quraishiwala
- Thatta Makhdumpur
- Jhangi Ahmad Khan
- Basira
- Khairawali
- Tharuwali
- Lar
- Malka
- Basti Khuda Bakhsh
- Basti Ranjha
- Muhammad Bakhshwali
- Nachke
- Basti Drigh
- Karmunwali
- Bhindi
- Kech Piran
- Bhand
- Derawali
- Khan Bela

Tehsil Multan City

- Kotla Ubai
- Laliwala
- Basti Baloch
- Banduqi Nala
- Chhitta
- Chhitta
- Shihni
- Drighan di Basti
- Shakkar Bela
- Rapri
- Sahlan
- Karim Bakhshwala
- Nakra Shahidwala
- Kachur Distributary
- Gagrah
- Chilwala
- Nawin Basti
- Akbarwala
- Chindewala
- Bhagwanpur
- Galluwala
- Jangal Kalranwala
- Mattithal Distributary
- Gil
- Basti Ghanta Ghar
- Chah Qadarpur
- Chah Wadhewala
- Binda Sandila
- Akhbar Distributary
- Kutemar
- Teri
- Noon Adhwana
- Sanbal
- Baqirabad Khakwani
- Malle ki Jhok
- Bharat Wahi
- Abuhta
- Kachur
- Walwat
- Sher Shah
- Akbarpur
- Garewala
- Sandila Hithar
- Nawabpur Escape
- Truapur
- Jhok Wains Parli
- Khair Din Hamyana
- Khair Din Sani
- Sarwani Bela
- Allahdadi
- Naurangabad

Tehsil Shujabad

- Dhillu
- Shah di Bheni
- Wigranwali Basti
- Nizamabad
- Amirpur Sahu
- Dera
- Basti Bandwali
- Betwala
- Wailan
- Shakr Bela
- Dudi
- Lelanwala
- Jhanbar
- Hamandpur
- Jhok Kutrian
- Rajapur
- Abuhatta
- Shaikhpur Shimali
- Lakwala
- Basti Arain
- Chah Vasawewala
- Said Alipur
- Tajpur
- Sandile ki Basti
- Khokhranwala
- Bagren Minor
- Loharanwala
- Khanpur Qazianwala
- Bulewahan
- Dhand Nala
- Basti Jhok
- Basti Jhabelan
- Bakwan
- Rattewala
- Sharafdinwala
- Jamhur
- Golwala
- Jalalpur Khakhi
- Mirwala
- Dullewala
- Mirzanpur
- Farid Bakhshwala
- Cheti
- Khorora
- Old Bed of Chenab River
- Jhok Mohanewala
- Mansarwala
- Gondal
- Gindiwali
- Lobechran
- Chah Tian

Tehsil Multan Saddar

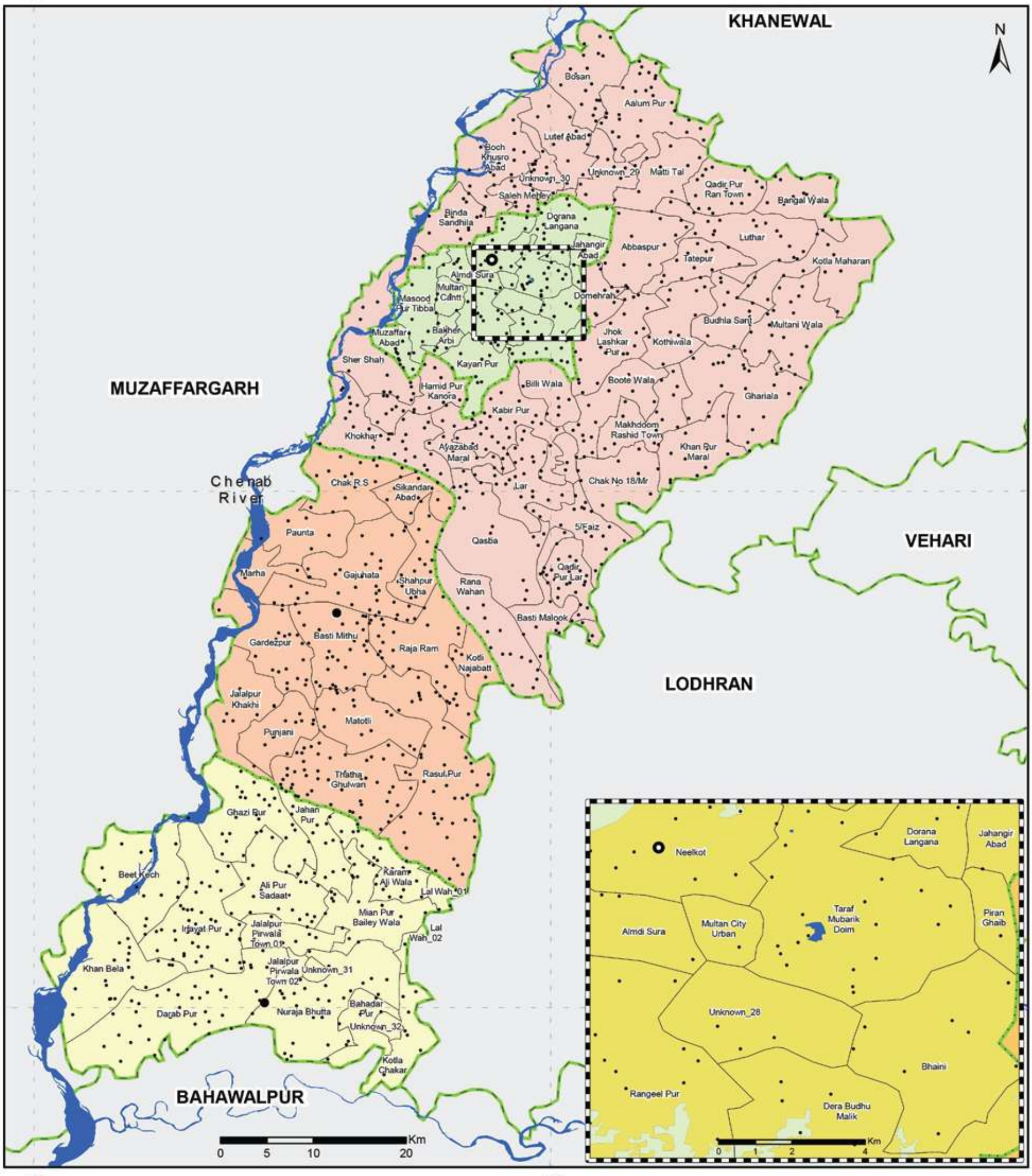
- Mahibwala
- Sandwan di Basti
- Seri
- Chonchan Sharif
- Amanullahpur
- Soman
- Kachchi Jai
- Pahorwali
- Thhol Mir Ali Shah Jhok
- Bhattiwala
- Jalalabad
- Sikandarabad Distributary
- Thatti Khawran
- Basti
- Murad Shahwala
- Hamrot
- Jhabiilan
- Bakhshwala
- Batwianwala
- Bhakri
- Jhakarpur
- Behli
- Wananwali Jhok
- Chinitti Nala

Legend:

Flood Inundation Frequency

1 2 3

SETTLEMENTS MAP



Legend

- District Headquarter
- Tehsil Headquarter
- Major Towns
- Settlements / Villages
- River and Reservoir
- Abc Union Council Boundary
- ABC District Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

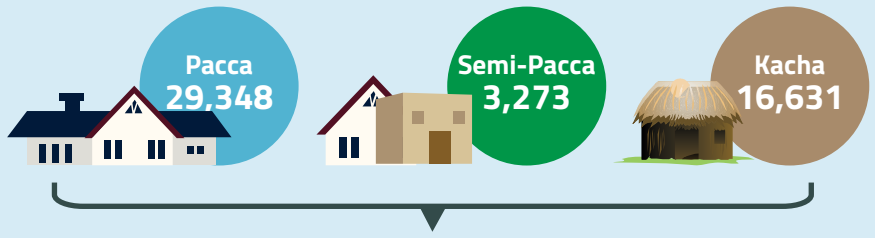
MAP INFORMATION

Data Source(s):
Punjab Emergency Service - Rescue 1122
Punjab Police
Survey of Pakistan
National Highway Authority
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-007
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

8 BUILDING DISTRIBUTION

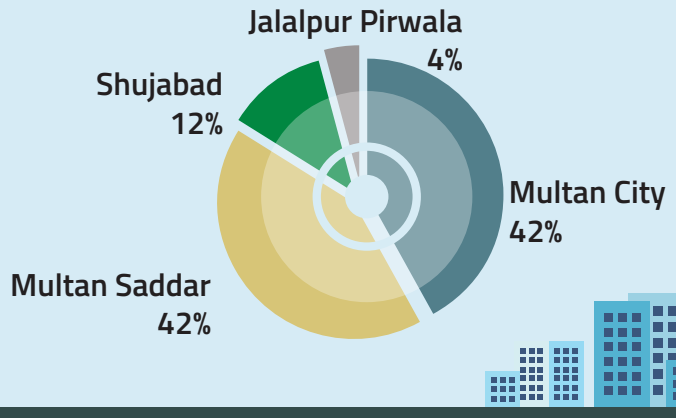
The distribution of building over different parts of the district is shown in the Building Distribution Map. Based on nature of building material used, buildings can be categorized as Kacha, Semi Pacca and Pacca as per Pakistan Bureau Statistics.

District Total

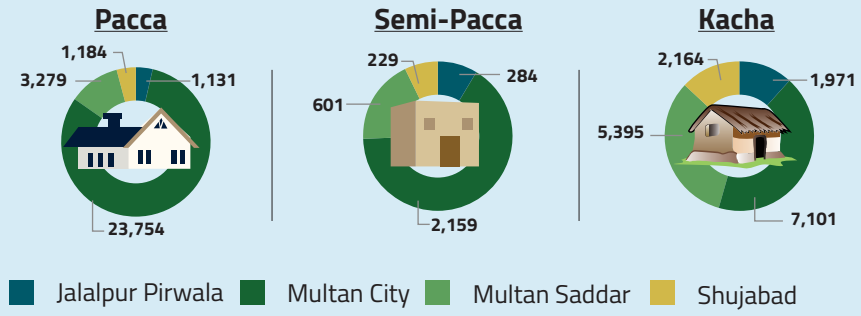


Total Buildings: 49,252

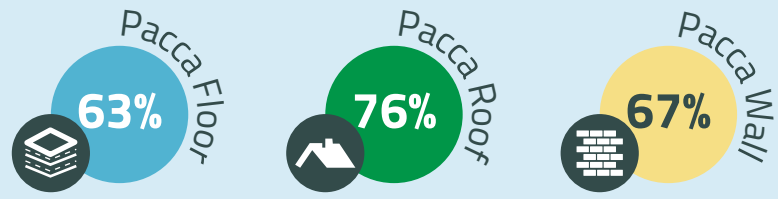
Tehsil Wise Building Distribution



Tehsil Wise Building Distribution by Type



House Hold Characteristics



UC Wise Building Distribution

Jalalpur pirwala

All Pur Sadaat	44	28	119
Bahadar Pur	54	25	119
Beet Kech	20	9	104
Darab Pur	16	9	91
Ghazi Pur	46	19	139
Inayat Pur	21	11	89
Jahan Pur	58	16	154
Jalalpur Pirwala Town 01	222	48	172
Jalalpur Pirwala Town 02	267	25	142
Karam Ali Wala	69	8	148
Khan Bela	14	8	72
Kotla Chakar	166	23	201
Lal Wah_01	24	15	82
Lal Wah_02	22	8	55
Mian Pur Balley Wala	41	13	144
Nuraja Bhutta	47	19	140

Multan city

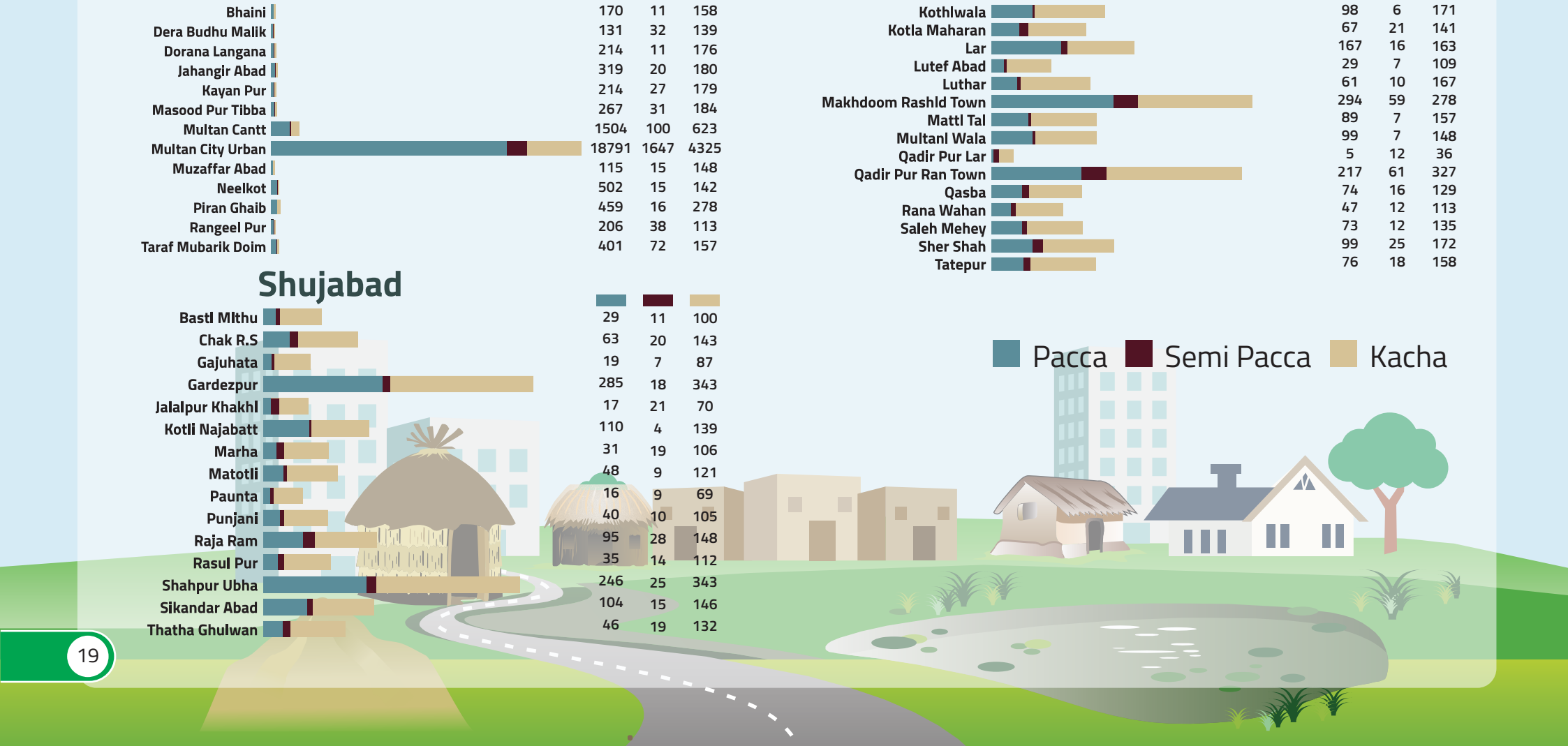
Almdi Sura	296	33	214
Bakher Arbi	165	91	85
Bhaini	170	11	158
Dera Budhu Malik	131	32	139
Dorana Langana	214	11	176
Jahangir Abad	319	20	180
Kayan Pur	214	27	179
Masood Pur Tibba	267	31	184
Multan Cantt	1504	100	623
Multan City Urban	18791	1647	4325
Muzaffar Abad	115	15	148
Neelkot	502	15	142
Piran Ghaib	459	16	278
Rangeel Pur	206	38	113
Taraf Mubarik Doim	401	72	157

Shujabad

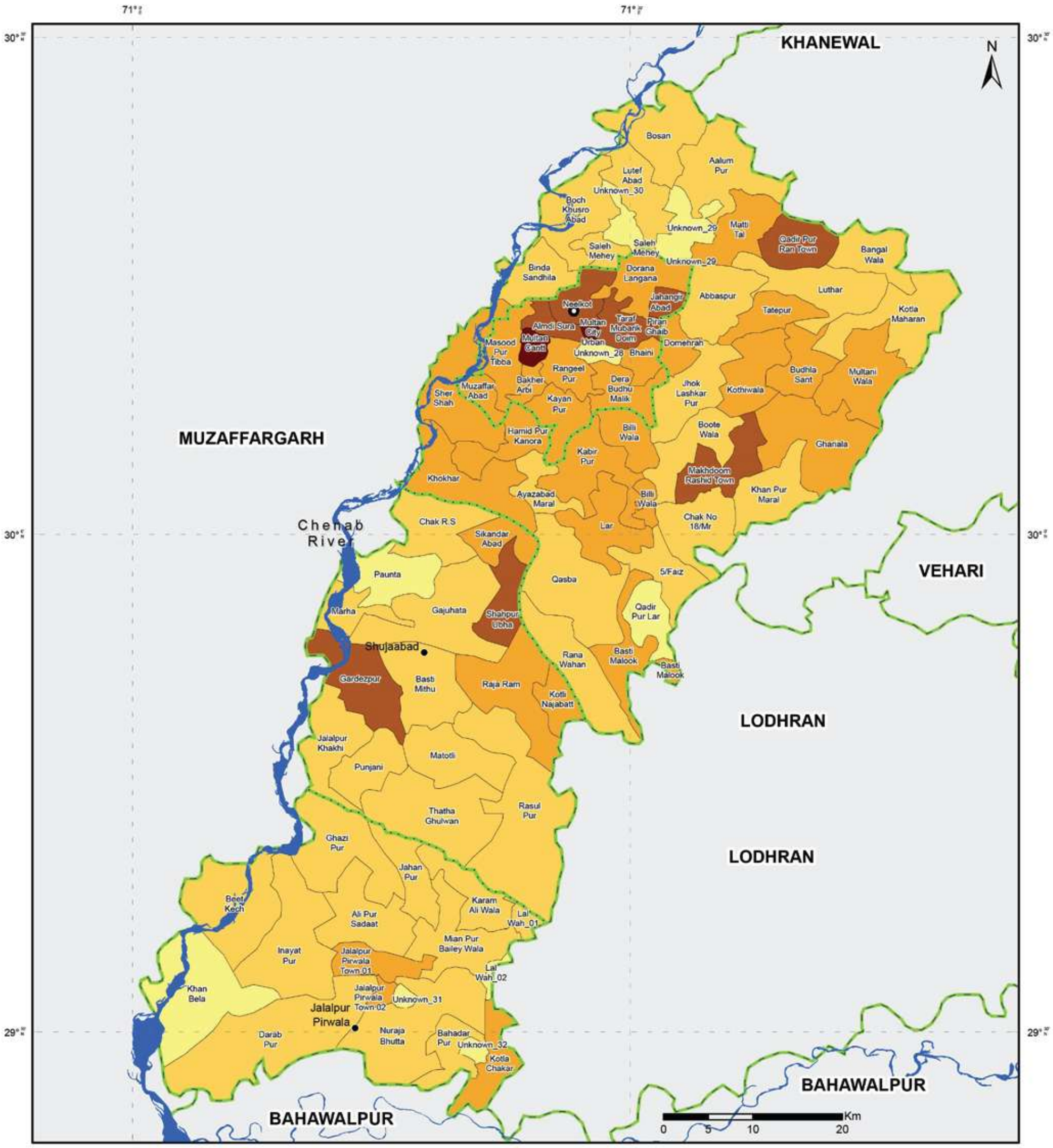
Basti MIthu	29	11	100
Chak R.S	63	20	143
Gajuhata	19	7	87
Gardezpur	285	18	343
Jalalpur Khakhl	17	21	70
Kotli Najabatt	110	4	139
Marha	31	19	106
Matotli	48	9	121
Paunta	16	9	69
Punjani	40	10	105
Raja Ram	95	28	148
Rasul Pur	35	14	112
Shahpur Ubha	246	25	343
Sikandar Abad	104	15	146
Thatha Ghulwan	46	19	132

Multan saddar

5/Faiz	78	22	126
Aalum Pur	53	7	149
Abbaspur	87	20	142
Ayazabad Maral	76	7	133
Bangal Wala	37	6	129
Bastl Malook	99	29	133
Billi Wala	127	8	137
Binda Sandhila	83	28	135
Boch Khusro Abad	40	18	108
Boote Wala	92	11	140
Bosan	40	8	141
Budhla Sant	114	10	139
Chak No 18/Mr	71	14	131
Domehrah	90	17	157
Gharlala	154	11	215
Hamid Pur Kanora	144	21	159
Jhok Lashkar Pur	81	23	139
Kabir Pur	134	3	183
Khan Pur Maral	61	14	122
Khokhar	84	28	158
Kothlwala	98	6	171
Kotla Maharan	67	21	141
Lar	167	16	163
Lutef Abad	29	7	109
Luthar	61	10	167
Makhdoom Rashid Town	294	59	278
Mattl Tal	89	7	157
Multanl Wala	99	7	148
Qadir Pur Lar	5	12	36
Qadir Pur Ran Town	217	61	327
Qasba	74	16	129
Rana Wahan	47	12	113
Saleh Mehey	73	12	135
Sher Shah	99	25	172
Tatepur	76	18	158



BUILDING DISTRIBUTION (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Building Distribution

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000

- River and Reservoir
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

United Nations World Food Programme

MAP INFORMATION

Data Source(s):

NDMA
Pakistan Bureau of Statistics

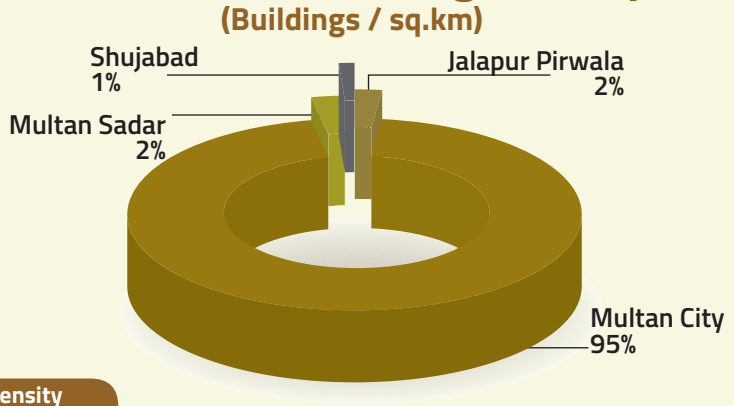
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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 Multan, covering residential, nonresidential, office and administrative buildings, which are located in areas with relatively favorable geo-physical and socio-economic conditions.

Tehsil Wise Building Density
(Buildings / sq.km)

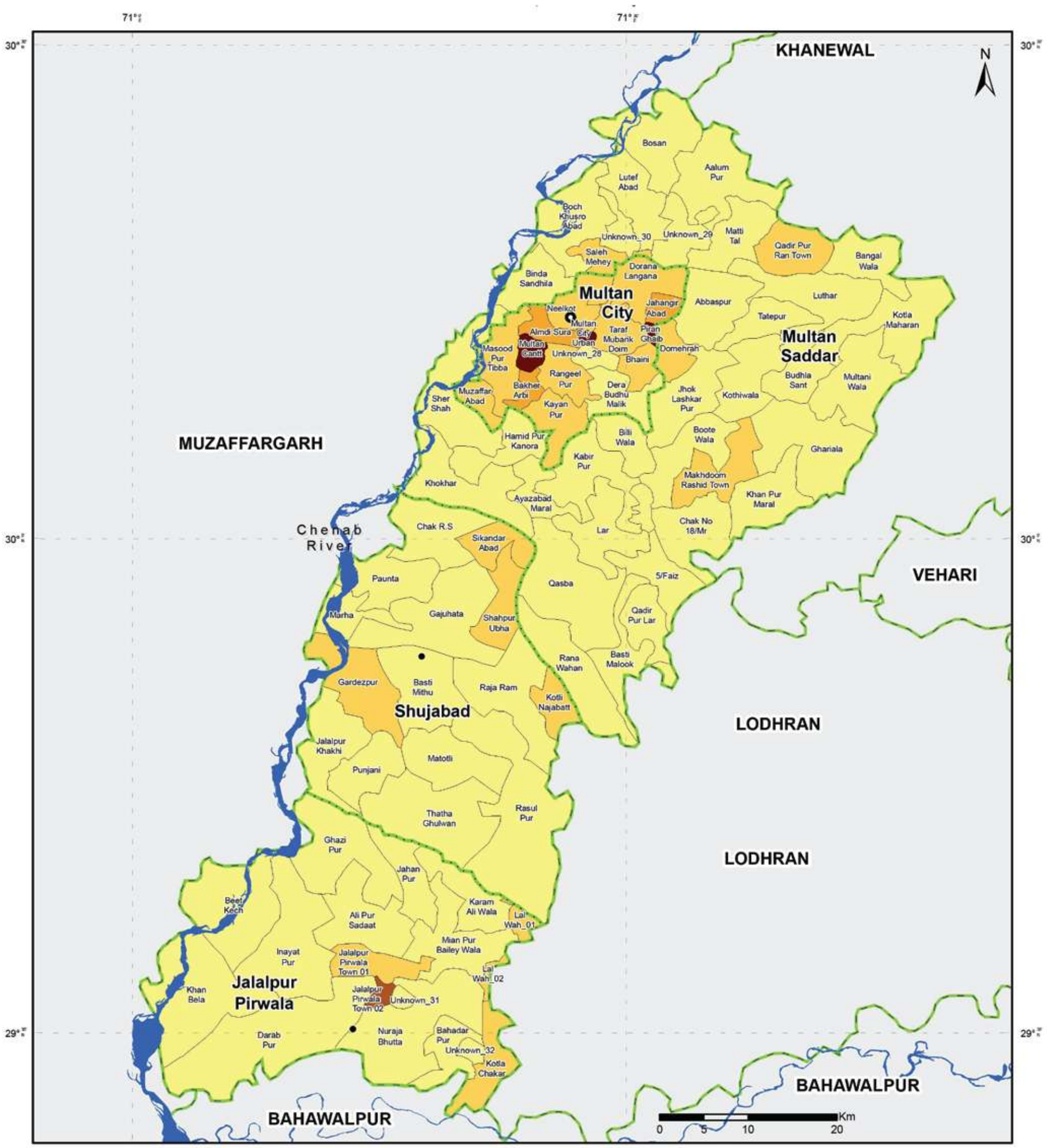


Union Council	Pacca	Semi Pacca	Kacha	Total Buildings	Area (sq.km)	Density (Buildings / sq.km)
Tehsil Jalalpur Pirwala						
Ali Pur Sadaat	44	28	119	191	56.9	3
Bahadar Pur	54	25	119	198	27.3	7
Beet Kech	20	9	104	133	81.6	2
Darab Pur	16	9	91	117	131.1	1
Ghazi Pur	46	19	139	204	74.2	3
Inayat Pur	21	11	89	121	88.5	1
Jahan Pur	58	16	154	228	32.6	7
Jalalpur Pirwala Town 01	222	48	172	442	27.3	16
Jalalpur Pirwala Town 02	267	25	142	434	5.6	77
Karam Ali Wala	69	8	148	225	36.6	6
Khan Bela	14	8	72	93	98.7	1
Kotla Chakar	166	23	201	390	33.7	12
Lal Wah_01	24	15	82	122	8.2	15
Lal Wah_02	22	8	55	84	4.4	19
Mian Pur Bailey Wala	41	13	144	198	56.2	4
Nuraja Bhutta	47	19	140	206	98.1	2
Tehsil Total:	**1,131**	**284**	**1,971**	**3,386**	**871.3**	**4**
Tehsil Multan City						
Almdi Sura	296	33	214	543	14.0	39
Bakher Arbi	165	91	85	342	8.1	42
Bhaini	170	11	158	339	14.4	24
Dera Budhu Malik	131	32	139	302	29.8	10
Dorana Langana	214	11	176	400	36.4	11
Jahangir Abad	319	20	180	518	9.7	54
Kayan Pur	214	27	179	419	29.7	14
Masood Pur Tibba	267	31	184	483	34.8	14
Multan Cantt	1,504	100	623	2,227	9.5	235
Multan City Urban	18,791	1,647	4,325	24,763	2.7	9,033
Muzaffar Abad	115	15	148	278	14.0	20
Neelkot	502	15	142	660	25.1	26
Piran Ghaib	459	16	278	753	2.4	315
Rangeel Pur	206	38	113	356	24.3	15
Taraf Mubarik Doim	401	72	157	630	21.9	29
Tehsil Total:	**23,754**	**2,159**	**7,101**	**33,013**	**286**	**116**
Tehsil Shujabad						
Basti Mithu	29	11	100	140	58.0	2
Chak R.S	63	20	143	226	52.0	4
Gajuhata	19	7	87	113	86.9	1
Gardezpur	285	18	343	645	58.0	11
Jalalpur Khakhi	17	21	70	108	49.7	2
Kotli Najabatt	110	4	139	252	20.3	12
Marha	31	19	106	156	26.5	6
Matotli	48	9	121	178	50.5	4
Paunta	16	9	69	94	45.8	2
Punjani	40	10	105	154	36.0	4
Raja Ram	95	28	148	271	70.3	4
Rasul Pur	35	14	112	160	137.4	1
Shahpur Ubha	246	25	343	614	31.6	19
Sikandar Abad	104	15	146	265	24.8	11
Thatha Ghulwan	46	19	132	197	90.3	2
Tehsil Total:	**3,279**	**601**	**5395**	**3,573**	**838**	**4**

Tehsil Multan Saddar

5/Faiz	78	22	126	226	33.8	7	7
Aalum Pur	53	7	149	209	64.7	3	3
Abbaspur	87	20	142	248	49.9	5	5
Ayazabad Maral	76	7	133	216	22.2	10	10
Bangal Wala	37	6	129	173	35.5	5	5
Basti Malook	99	29	133	261	38.1	7	7
Billi Wala	127	8	137	273	35.3	8	8
Binda Sandhila	83	28	135	246	35.3	7	7
Boch Khusro Abad	40	18	108	166	54.6	3	3
Boote Wala	92	11	140	244	42.2	6	6
Bosan	40	8	141	189	60.9	3	3
Budhla Sant	114	10	139	263	32.6	8	8
Chak No 18/Mr	71	14	131	216	48.5	4	4
Domehrah	90	17	157	265	17.9	15	15
Ghariala	154	11	215	379	80.9	5	5
Hamid Pur Kanora	144	21	159	323	33.8	10	10
Jhok Lashkar Pur	81	23	139	243	48.2	5	5
Kabir Pur	134	3	183	321	52.8	6	6
Khan Pur Maral	61	14	122	197	43.3	5	5
Khokhar	84	28	158	271	63.7	4	4
Kothiwala	98	6	171	274	43.3	6	6
Kotla Maharan	67	21	141	230	65.8	3	3
Lar	167	16	163	346	45.4	8	8
Lutef Abad	29	7	109	146	40.4	4	4
Luthar	61	10	167	239	57.8	4	4
Makhdoom Rashid Town	294	59	278	631	41.1	15	15
Matti Tal	89	7	157	254	39.2	6	6
Multani Wala	99	7	148	254	59.2	4	4
Qadir Pur Lar	5	12	36	53	27.7	2	2
Qadir Pur Ran Town	217	61	327	605	35.2	17	17
Qasba	74	16	129	219	87.4	3	3
Rana Wahan	47	12	113	171	61.9	3	3
Saleh Mehey	73	12	135	220	14.8	15	15
Sher Shah	99	25	172	296	67.4	4	4
Tatepur	76	18	158	252	27.9	9	9
Unknown_29	24	2	73	99	29.4	3	3
Unknown_30	15	5	42	61	14.4	4	4
Tehsil Total:	**33,013**	**2,159**	**7,101**	**9,279**	**1,653**	**6**	
District Total:	**51,918**	**5,203**	**21,568**	**49,251**	**3,647**	**14**	

BUILDING DENSITY (2015) MAP



Legend

- District Headquarter
- Tehsil Headquarter

Building Density (Buildings/Sq.km)

- < 10
- 10 - 30
- 30 - 60
- 60 - 100
- > 100

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

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

United Nations World Food Programme

MAP INFORMATION

Data Source(s):

NDMA
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-009
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

10 TRANSPORTATION NETWORK

Effective and efficient transportation system is one of the basic requirements for the protection of socio-economic wellbeing of a state. Roads and other means of transportation systems play a vital role in providing better employment opportunities, health services and accessibilities to markets and basic facilities. Besides these, transportation infrastructure also provide necessary link rendering response and relief assistance in case of any disastrous event.

District Multan has total metaled road-length of 1976.26 Kilometers. The metal road network connects Multan to the nearby districts of Khanewal, Lodhran and Muzaffargarh. Peshawar-Karachi railway line passes through Multan District. The district is linked with Muzaffargarh, Khanewal and Lodhran through railway network.

The main Peshawar – Karachi railway line passes through Multan district. An extensive railway network connects Multan with the neighboring Khanewal, Lodhran and Muzaffargarh Districts through railway net-work.

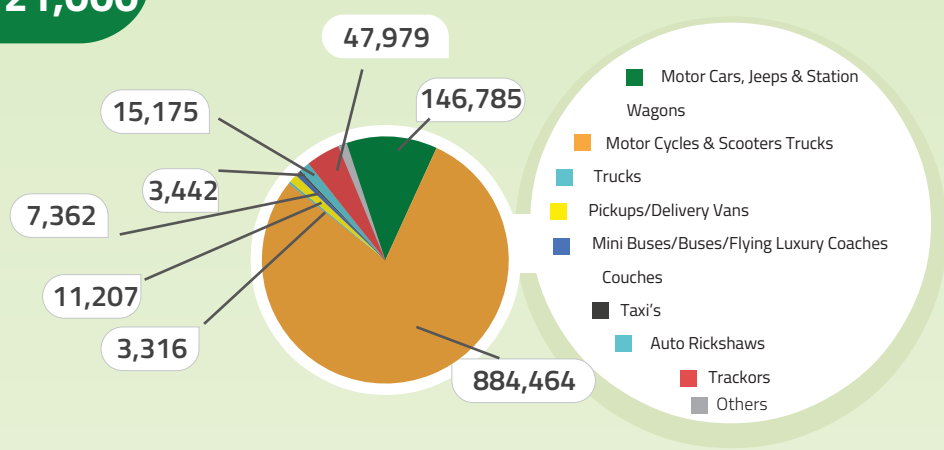
Road Length (km)

Motor Vehicles 'Registered'

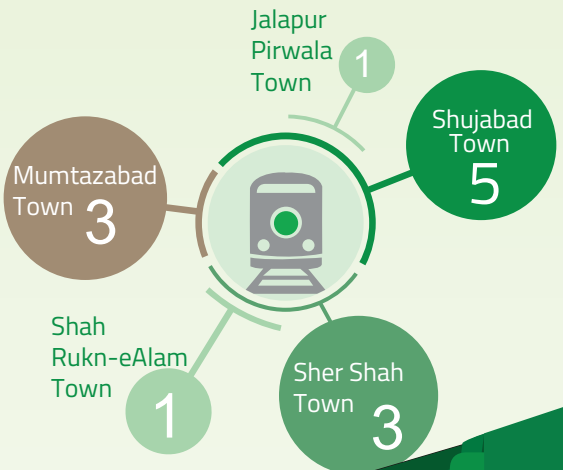
by Type as on 30th June, 2014

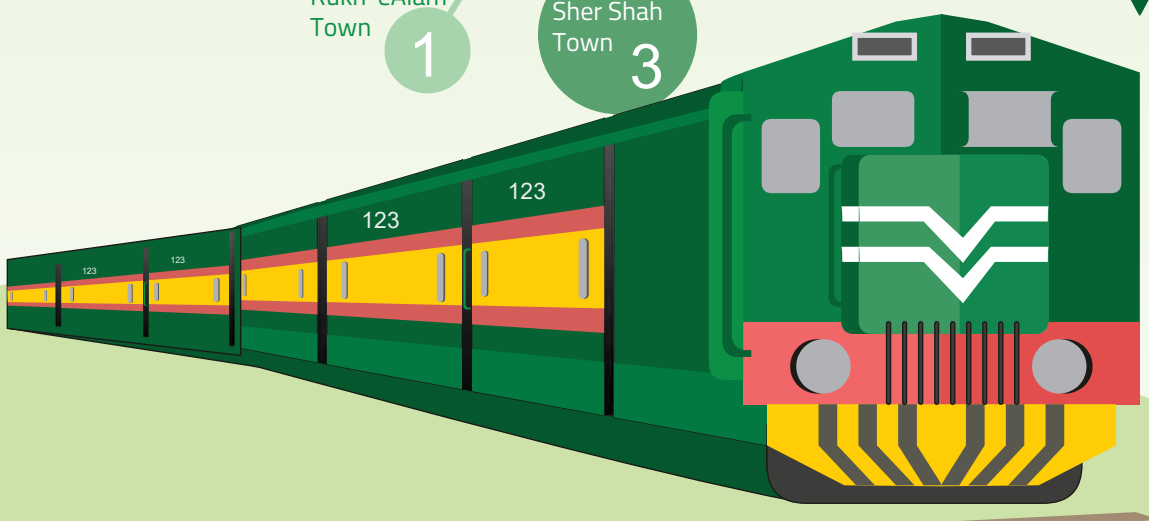
Mini Buses / Buses / Flying Luxury Coaches Couches	Motor Cars, Jeeps & Station Wagons	Pickups / Delivery Vans	Motor Cycles & Scooters	Trucks	Auto Rickshaws	Tractors	Taxi's	Others
7,362	146,785	11,207	884,464	3,316	15,175	47,979	3,442	1,270

Total: 1,121,000

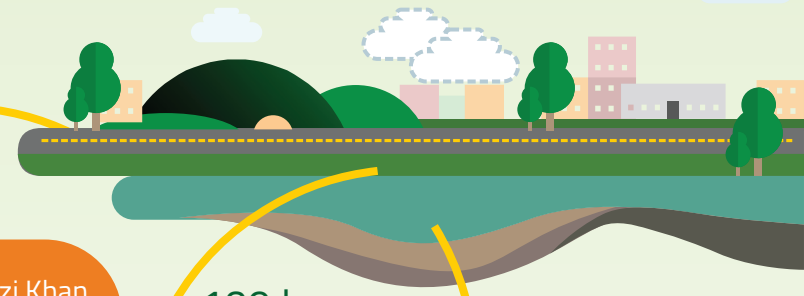


Number of Railway Stations





Nearest Major Airports from Multan City



TRANSPORTATION NETWORK MAP

Legend

- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Station
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- River and Reservoir
- Abc Union Council Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad
- ABC District Boundary

- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):
Survey of Pakistan
National Highway Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-010
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

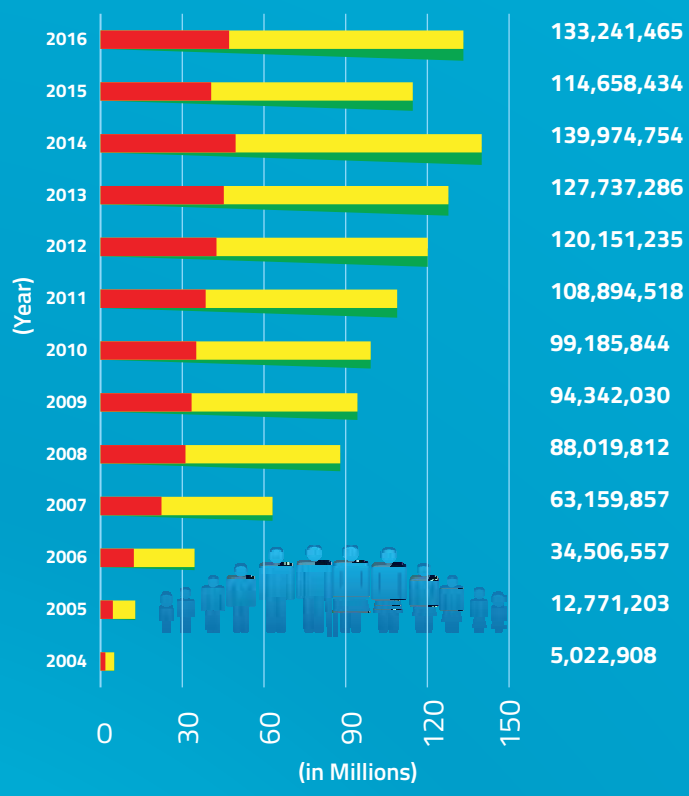
11 TELECOMMUNICATION

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.

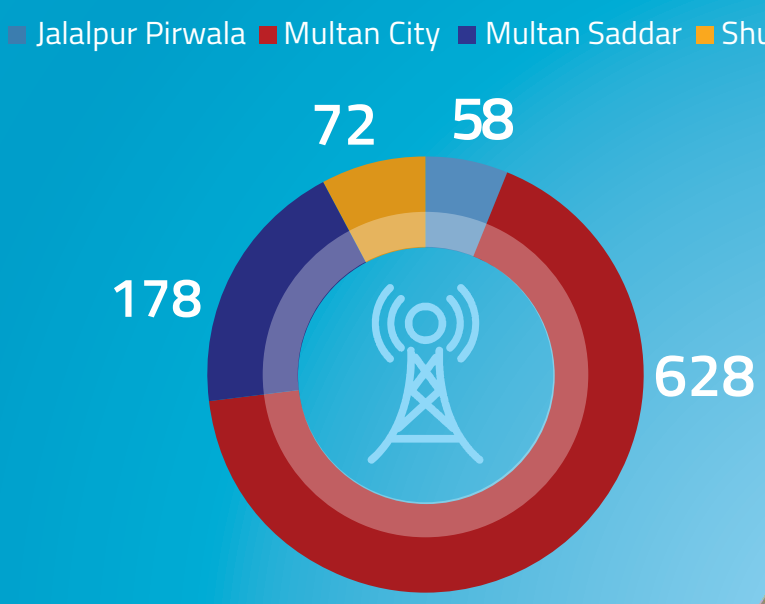
There are 28 telephone exchanges operating in the district, ranging in capacities from 50 lines to 34,000 lines. Cellular phone services are available in the district.

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.

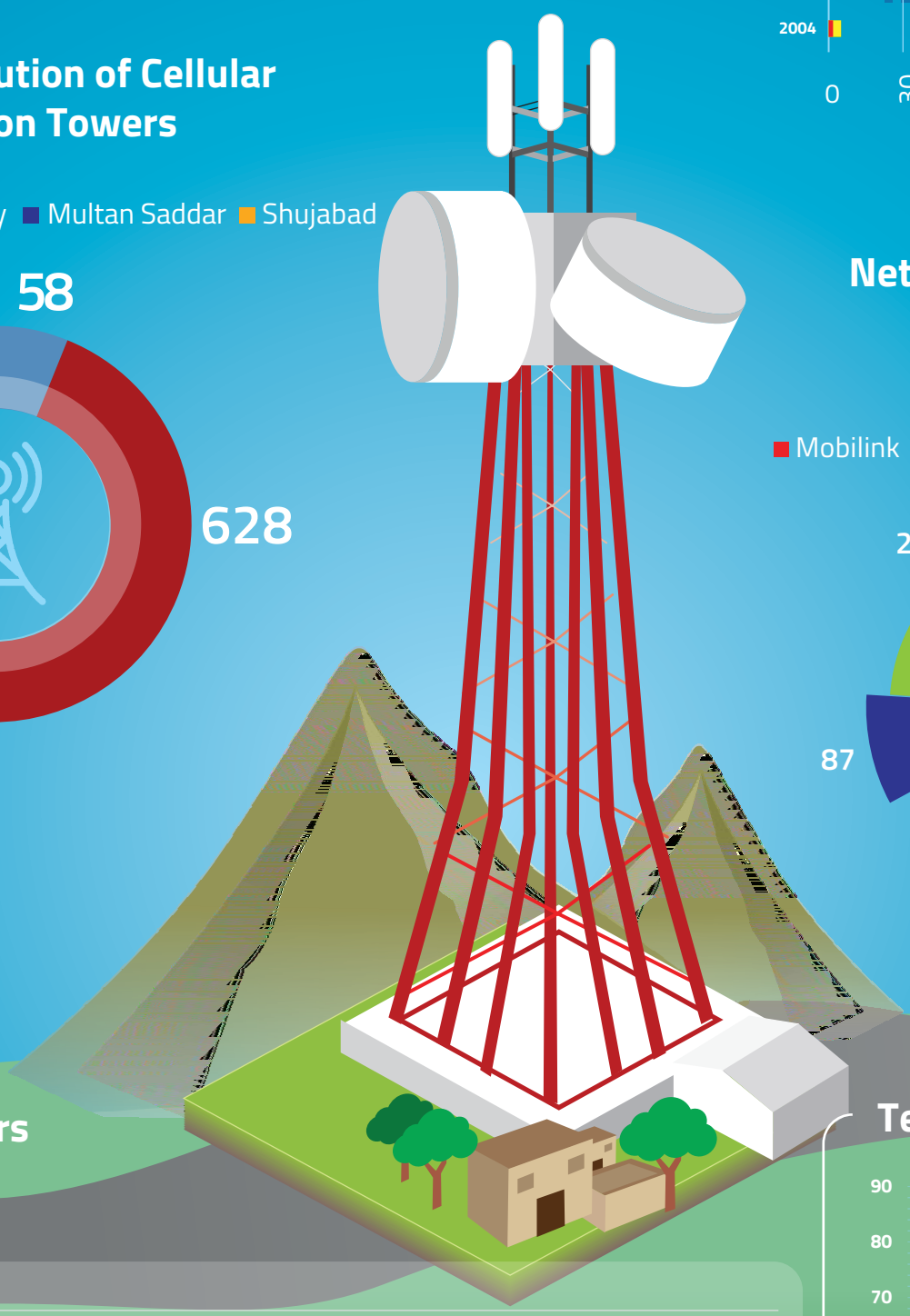
Cellular Subscribers in Pakistan



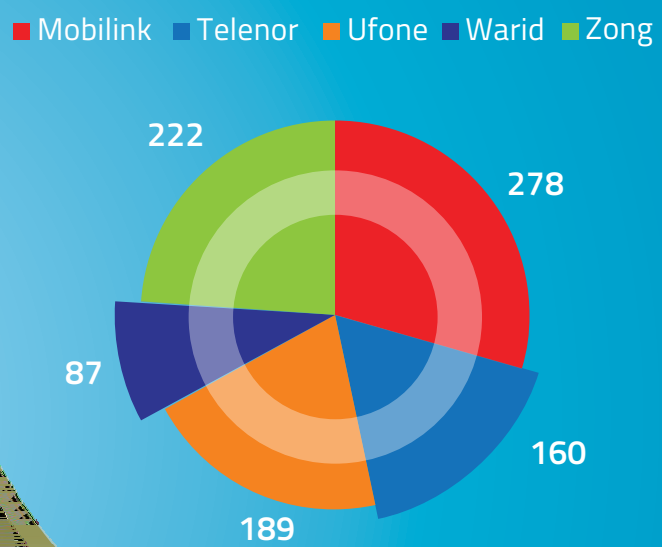
Tehsil Wise Distribution of Cellular Communication Towers



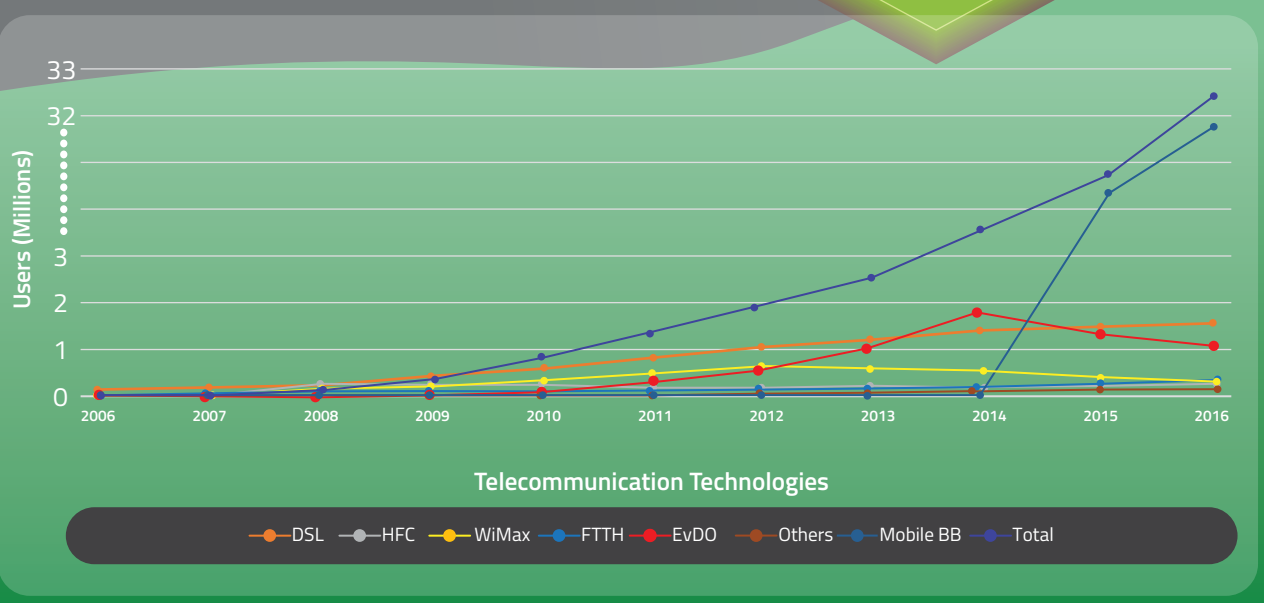
Total: 936



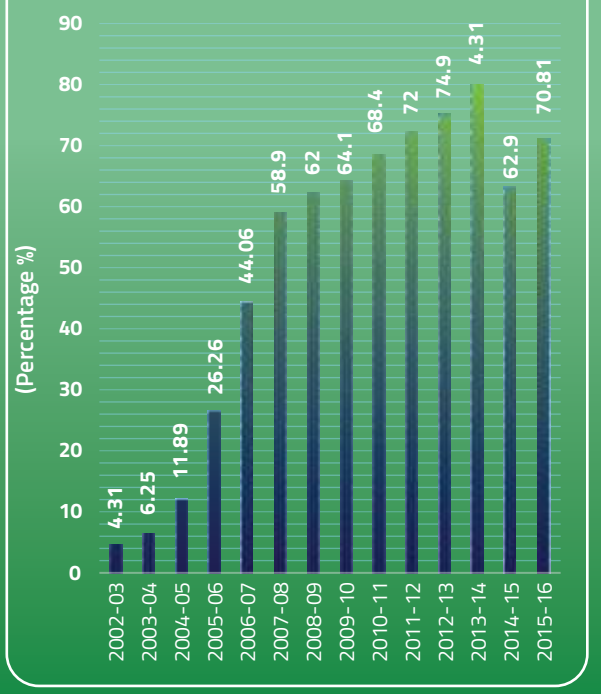
Network Wise Distribution of Cellular Towers (in Multan District)



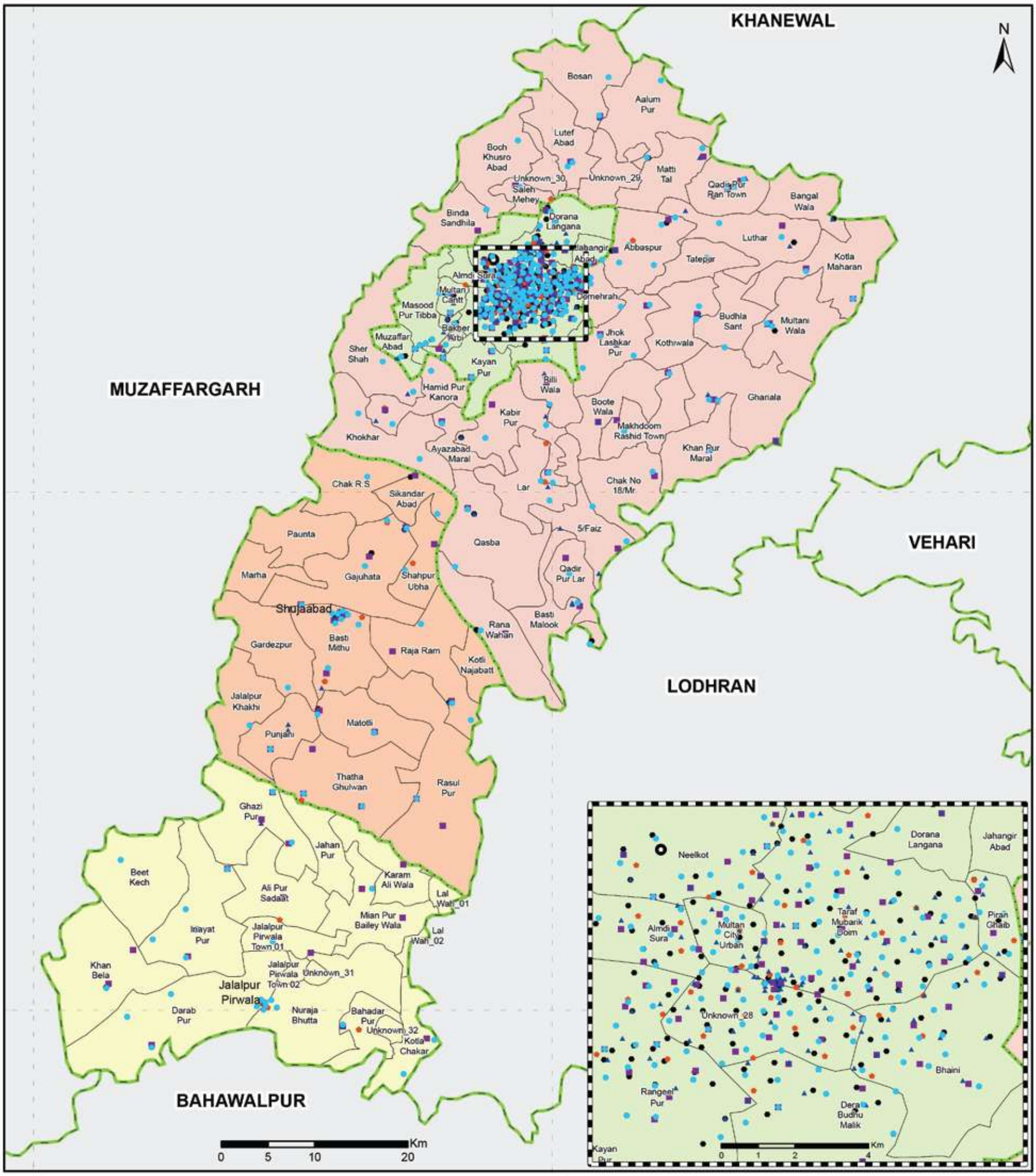
Internet Subscribers in Pakistan



Teledensity in Pakistan



COMMUNICATION TOWER MAP



Legend

- District Headquarter
- Tehsil Headquarter

Network

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

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

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

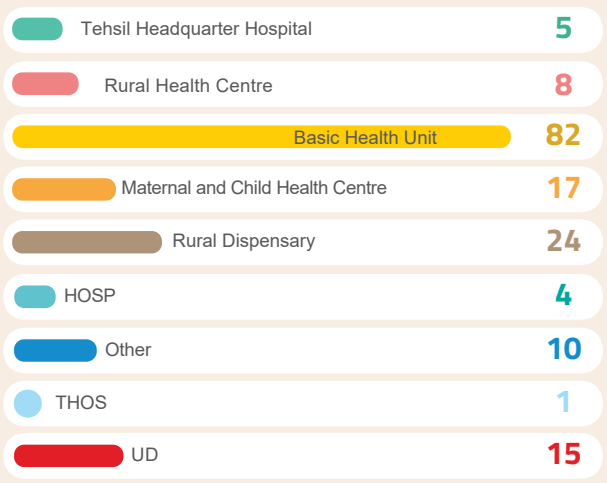
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-011
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

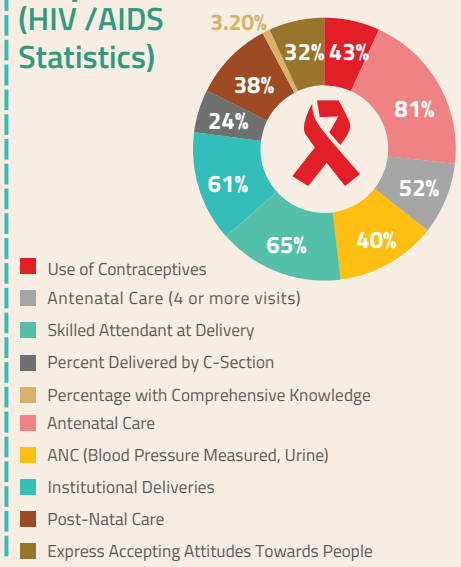
12 PUBLIC HEALTHCARE FACILITIES

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 centers. In district Multan, for 5,905 population there is one certified doctor available in public healthcare facilities.

Health Facilities by Type



Reproductive Health (HIV /AIDS Statistics)



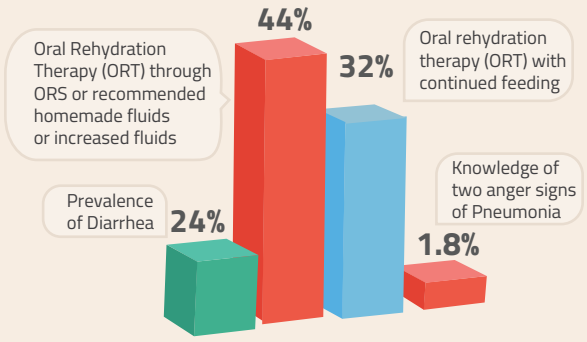
Primary Healthcare Sanctioned Staff

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)	82	1	8	1,799	158	504
RD	7	0	0	25	24	45
Rural Health Centre (RHC)	38	46	23	231	30	170
Maternal & Child Health (MCH)	0	0	0	56	0	20
UD	19	4	6	19	17	33
Others	10	8	8	37	9	46

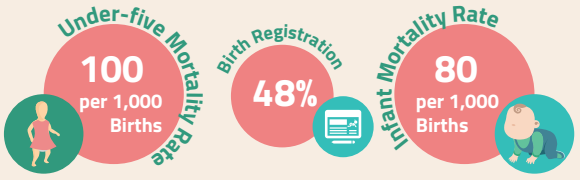
Secondary Healthcare Sanctioned Staff

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)	9	99	69	20	20	14	32	77	146	40	328
HOSP	6	95	0	2	11	9	63	273	0	14	306
THOS	22	267	0	51	29	13	45	525	3	55	2,815

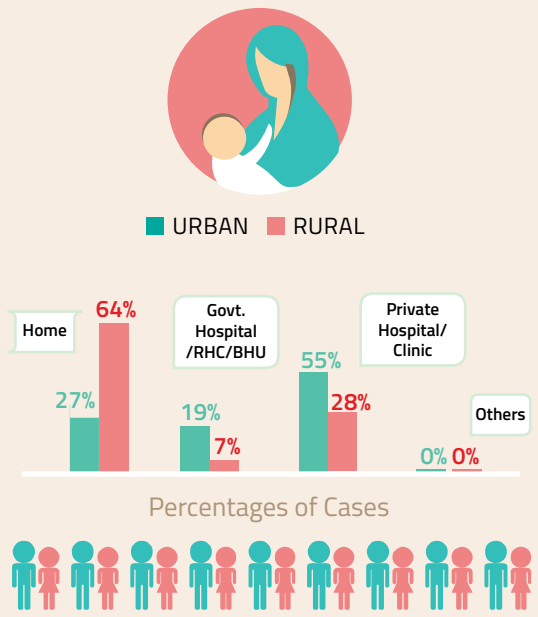
Statistics of Disease in Children



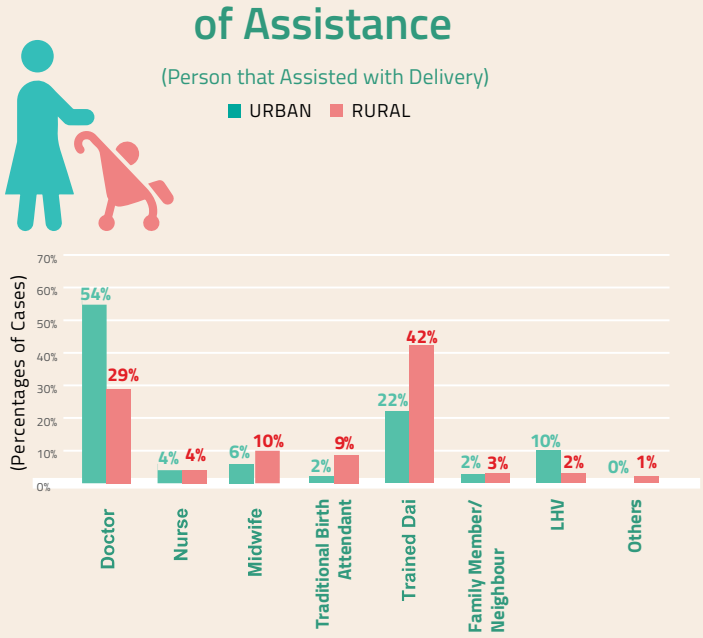
Child Mortality Statistics



Child Delivery by Location

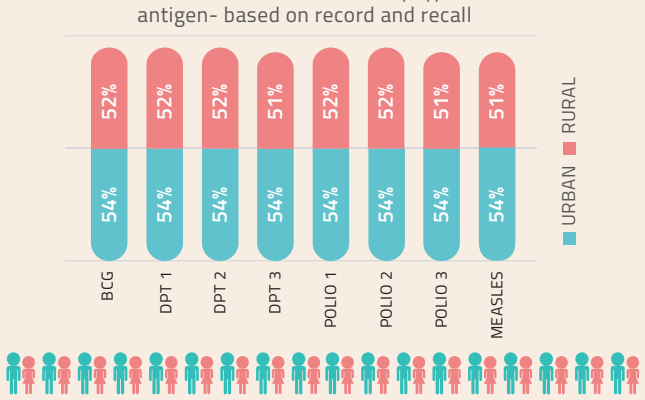


Child Delivery by Type of Assistance

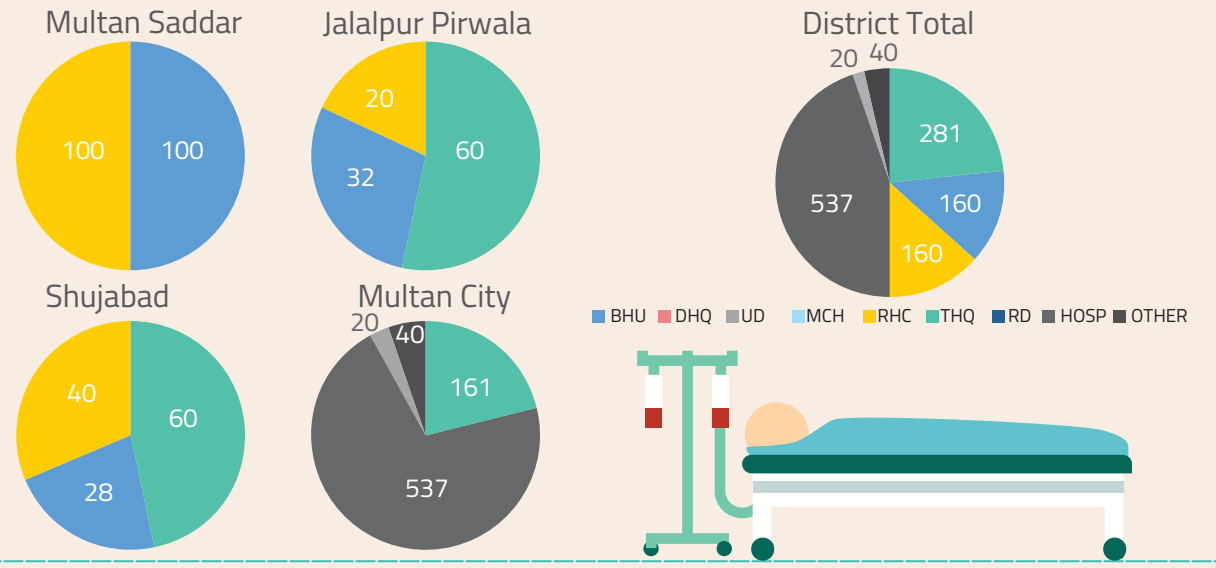


Children12-23 Months

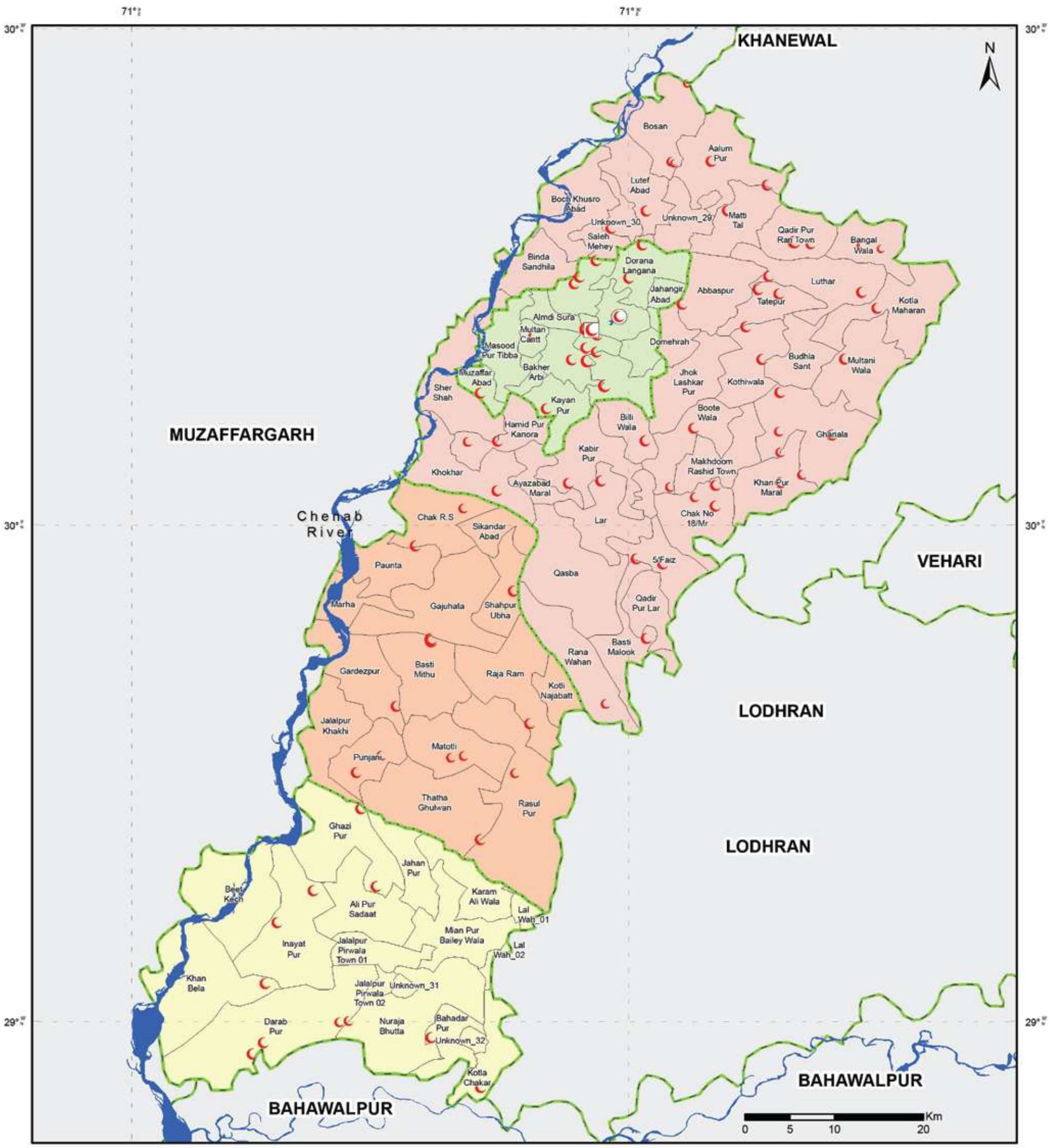
That have been immunized by type of antigen- based on record and recall



Tehsil Wise Bedding Capacity in Healthcare Facilities



HEALTH FACILITIES MAP



Legend

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

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

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

WFP United Nations World Food Programme

MAP INFORMATION

Data Source(s):

World Health Organization
Health Department Punjab

Datum: WGS 1984
Units: Degree

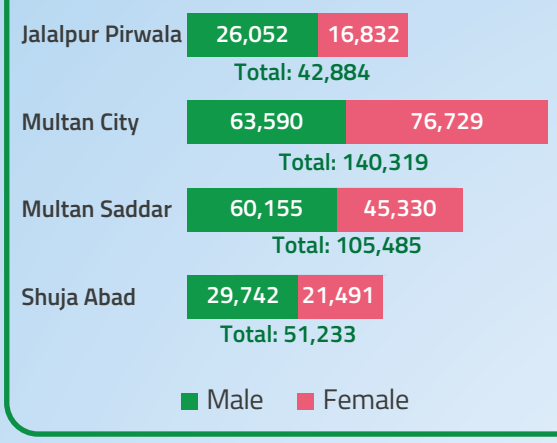
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-013
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

13 PUBLIC EDUCATION FACILITIES

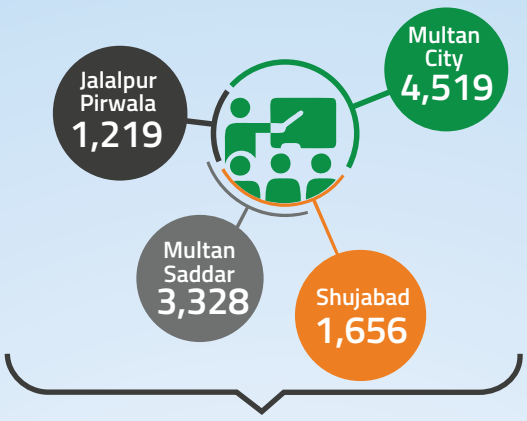
Education Facilities

Govt. Schools	Private Schools	Colleges	Universities
1,471	1,032	14	8

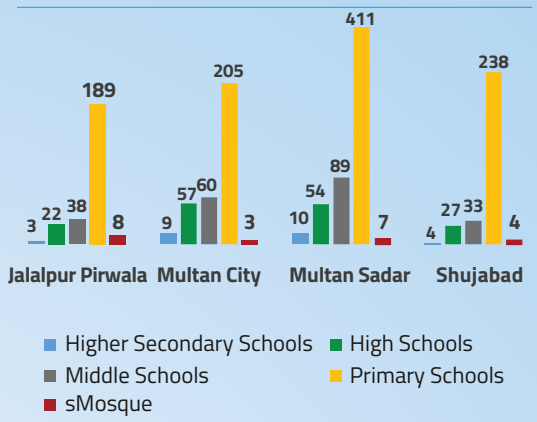
Total Enrollment by Gender



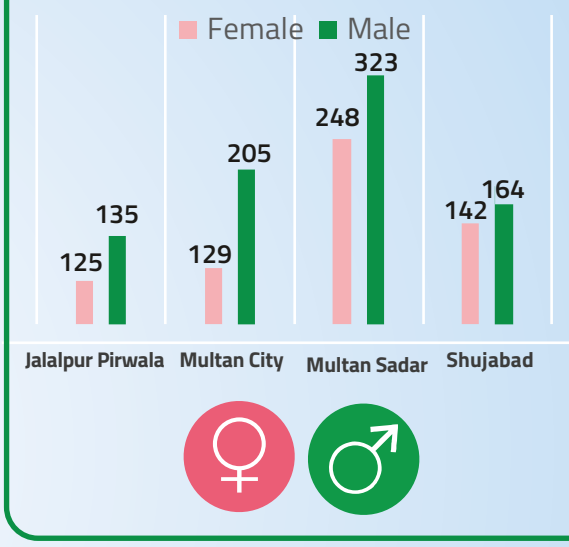
Number of Teachers



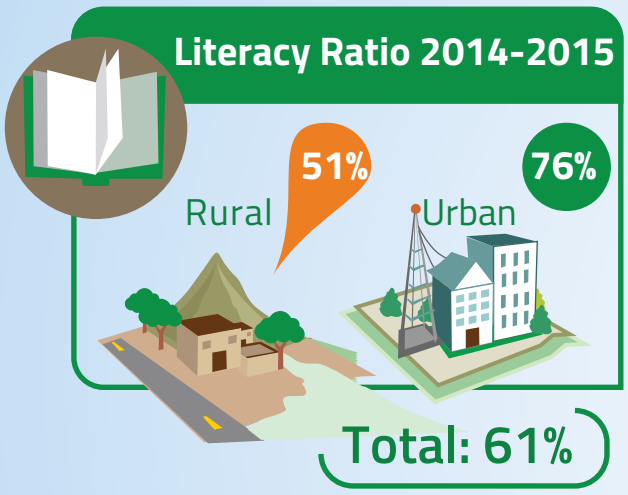
Tehsil Wise Govt. School by Type



Tehsil Wise Govt. School by Gender



Literacy Ratio 2014-2015



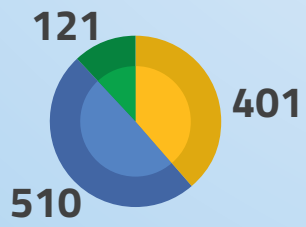
Total School Buildings

Tehsil Wise Govt. School by Building Type

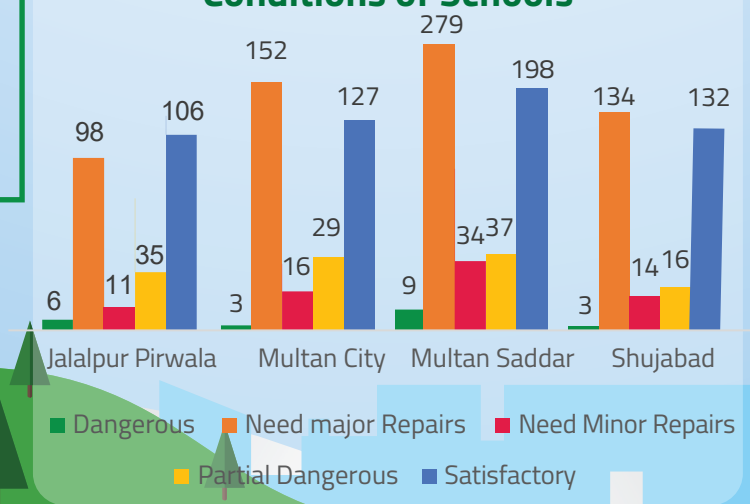
Tehsils	Kacha	Semi Pacca	Pacca	Total
Shuja Abad	19	14	266	299
Jalalpur Pirwala	17	3	236	256
Multan City	13	29	284	326
Multan Saddar	53	30	474	557
Total:	102	76	1,260	1,438

Tehsil Wise Facilities in Schools

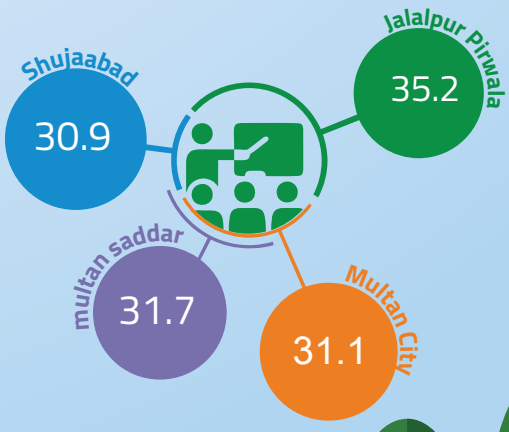
Private Education Facilities



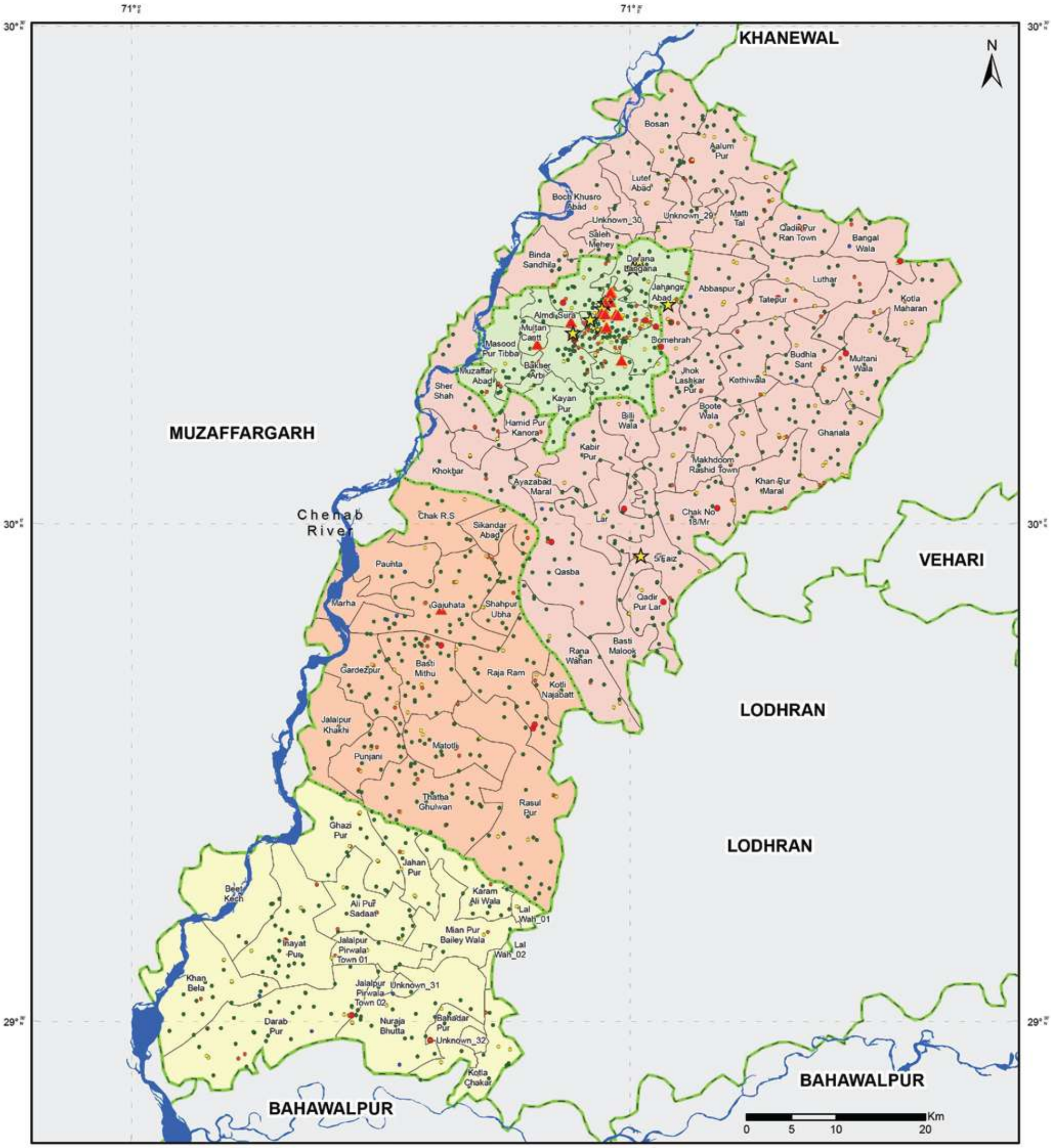
Tehsil Wise Building Conditions of Schools



Student to Teacher Ratio



EDUCATION FACILITIES MAP



Legend

- University
- College
- Higher Secondary School
- High School
- Middle School
- Primary School
- Masjib/Maktab School
- River and Water Body
- Union Council Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

Multi Hazard Vulnerability & Risk Assessment, Multan, 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-622-FEB-2016-GEN-NDMA-014
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

14 IRRIGATION INFRASTRUCTURE

Irrigation System plays a role of great importance in the increase of crop yield. The fact remains that the processes involved in irrigation control moisture in the soil for the growth of seeds and better crop production.

Canal System

Name	Length (km)
Major Canals	
Daud Sherwali Canal	16.7
Minor Canals	
Jagguwal Minor	10.5
Lutfpur Mnor	23.0
Qasbah Sub Minor	19.1
Shah Musa Sub Minor	8.8
Ali - ur - Minor	28.3
Butewala 12 Minor	4.5
Chatta Minor	53.2
Gharial 11 Minor	15.1
Gulzar Minor	7.5
Sahu Minor	49.3
Nagina Minor	12.1
Miani 18 Minor	15.2
Sharginan 19 Minor	28.2
Jandpur Minor	17.3
Hafizwala Minor	9.6
Hamldpur Minor	20.4
Rainl 17 Minor	24.5
Rasulpur Minor	8.0
Distributaries	
Mahmud Disty	18.5
Sikansarabad Disty	20.4
UpperBakhtu Disty	36.4
Rana Disty	32.4
Panjani Disty	73.7
Sat Burji Disty	30.5
Shujaabad Disty	27.9
Buch Disty	13.2
Rashida Distributary	18.9
Sher Shah Distributary	9.0
Ambal Disty	3.7
Khanpur Disty	11.0
Multan Disty	9.6
Shahpur Disty	14.3
Makhdam Rashid Disty	61.3
Muzffarabad Disty	3.7
Wali Muhammad Disty	56.4
Bahishti Distributary	22.2
Others	
Broken nala & Dry nala	68.5

Area Sown

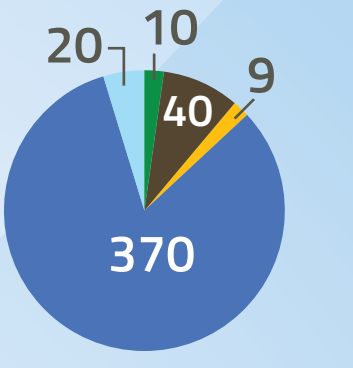
(Thousand Hectares)

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

- **Total Area** 451
  - **Unirrigated** 4
  - **Irrigated** 447
    - **Canals** 10
    - **Wells** 0
    - **Tube Wells** 40
    - **Canals Wells** 9
    - **Canals Tube Wells** 370
    - **Others** 20

Area Sown by Different Irrigation Techniques

(Thousand Hectares)



Tube Wells Installed by Energy Source (2013-14)

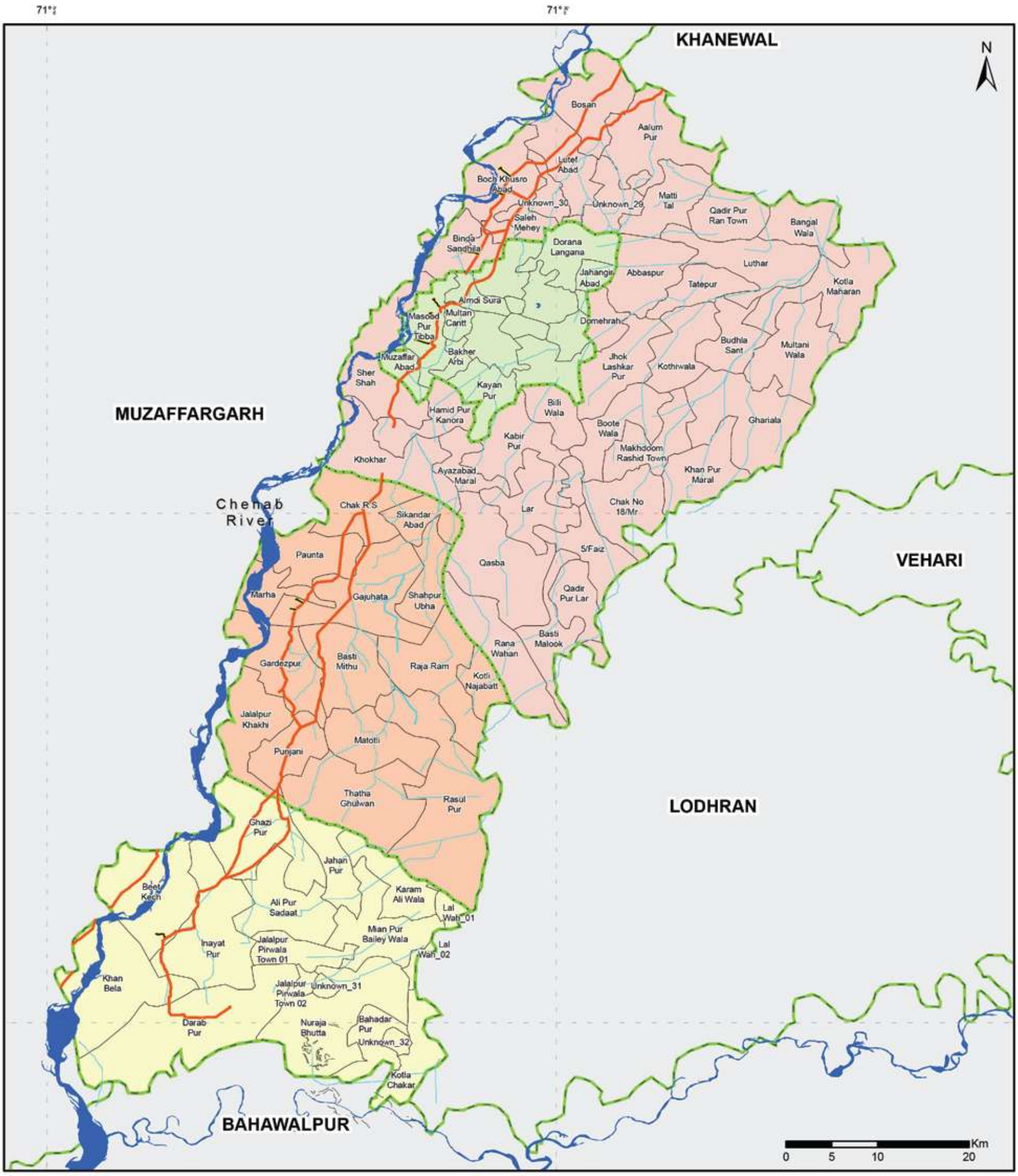
Total: 13,357

- Electric 3,511
- Diesel 9,846

Flood Protection Structures	Length (m)
Embankments	
Chenab Flood Bund	18,531.5
Second Defence Punjani Di	9,855.6
Shujabad Branch (II Defen)	29,458.8
Nawabpur Escape Bund Left	2,417.2
Nawabpur Escape Bund Right	2,439.5
Jalalpur Khaki Flood Bund	18,331.7
Satburji Flood Bund (II D)	16,425.2
Punjani Disty II Defence	3,853.7
SherShah Flood Bund	6,403.5
Akbar Flood Bund	6,587.3
Blachwah Flood Bund	18,399.3
Nagni Flood Bund RD 0-510	15,562.5
Gajju Hatta Branch Flood	4,885.3
Gardez Flood Bund RD 0-16	4,818.8
Satburji Flood Bund (I De)	5,500.6
Right Bank of Shujabad Br	14,340.0
Tie Flood Bund	1,671.9
Nawabpur Flood Bund	5,411.8

Flood Protection Structures	Length (m)
Embankments	
Gajju Hatta Flood Bund (I)	9,776.8
Muzaffarabad Flood Bund	3,904.9
Dhundu Flood Bund 0-26500	8,202.7
Shehar Sultan Flood Bund	13,620.3
Spurs	
JHead Spur at 42200	861.8
JHead Spur at RD 24800	1,401.7
JHead Spur at RD 920	1,376.2
MoleHead Spur at 45700	500.5
JHead Spur at RD 263000	1,619.0
JHead Spur at RD 14400	2,373.0
J-HeadSpur at RD 151800	1,759.1
JHead Spur at RD 25200	1,307.2
Sloping Spur at 10000	1,421.1

IRRIGATION MAP



Legend

- Main Canal
- Distributary
- Others
- Embankment
- Spur
- Dikes/Studs
- Dams & Reservoirs
- Headworks
- Pondage/Ditch
- River and Water Body
- Abc Union Council Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

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

WFP United Nations World Food Programme

MAP INFORMATION

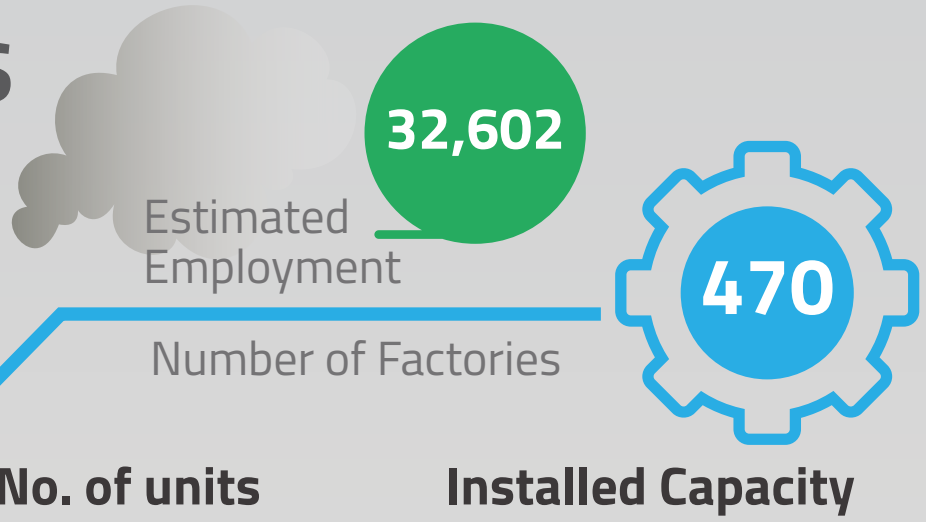
Data Source(s):
Irrigation Department, Punjab
Survey of Pakistan
SUPARCO

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-015
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

15 MAJOR INDUSTRIES

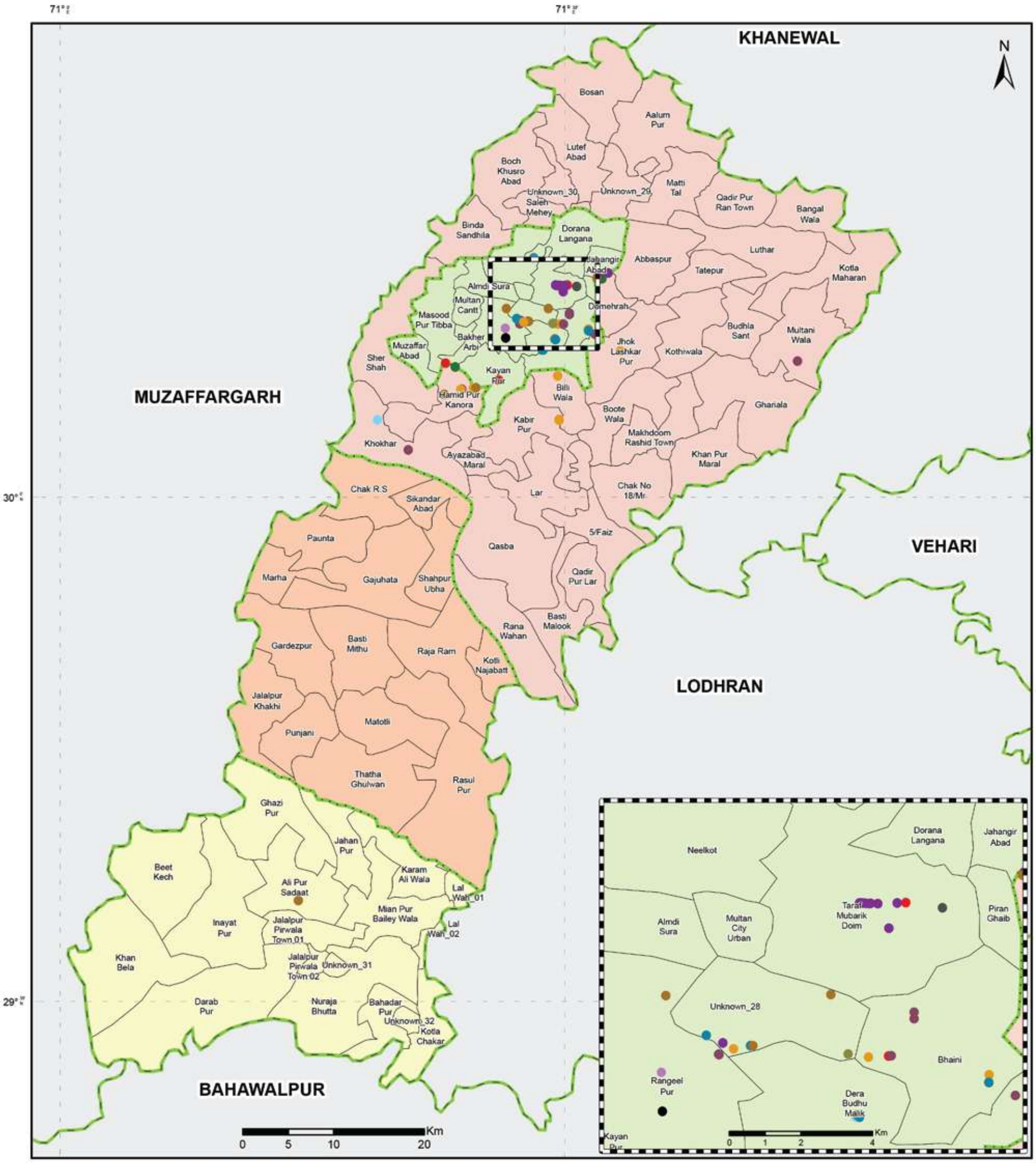
Number of Registered Factories & Employment Level

(As on 30th June 2014)



Industry	No. of units	Installed Capacity
Auto Parts	7	1,737 Th. Nos.
Beverage	5	22,200 Th. Crates
Chemical	4	2,800 Th. Litres
Chip/Straw Board	3	2,300 Th.Sq Ft.
Cold Storage	22	268 Th. Bags
Cotton Ginning & Pressing	126	600 Sawgins, 131 Press, 197 Expellers
Drugs & Pharmaceutical	10	
Fertilizer	1	92,400 M.Tons Urea, 450,000 M.Tons Can Urea, 304,500 M.Tons Np
Flour Mills	52	6,180 M.Tons/ Day
Fruit Juices	1	270 Th. Crates
Glass & Glass Products	2	5,500 Th.Nos.
Hosiery Products	6	2,525 Th.Dozen
Industrial /Burn Gases	10	38,690 M.Tons
Paper & Paper Board	8	38,300 M.Tons
Paper Cone	10	128,600 Th. Nos.
Pesticides & Insecticides	4	4,880 Th. Litres
Poultry Feed	7	226,680 M.Tons
Rice Mills	84	124 Hullers, 11 Shellers
Sizing Of Yarn	10	2,960 M.Tons
Solvent Oil Extraction	11	172,500 M.Tons
Tannery	9	4,589,720 Sq. Ft, 1,920,000
Textile Processing	12	21,900 Th. Meters
Textile Spinning	19	436,192 Spindles, 3,850 Rotors
Textile Weaving (Mill Sector)	24	2,125 Looms
Vegetable Ghee & Cooking Oil	11	253,100 M.Tons
Wool Scouring	4	3,850 M.Tons, 700 Spindles
Woollen Textile Spinning /Weaving	8	2,636 Spindles, 1,500 M.Tons, 5 Machines

INDUSTRIES MAP



Legend

- Chemical and Fertilizer Industry
- Cold Storage
- Flour Mill
- Food Products Industry
- Glass Manufacturing Industry
- Ice Factory
- Marble Factory
- Textile Industry
- Oil Mill
- Printing Press
- Rice Mill
- Solvent Plant
- Tannery

Abc Union Council Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

ABC District Boundary

Provincial Boundary

Line of Control

International Boundary

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

WFP United Nations World Food Programme

MAP INFORMATION

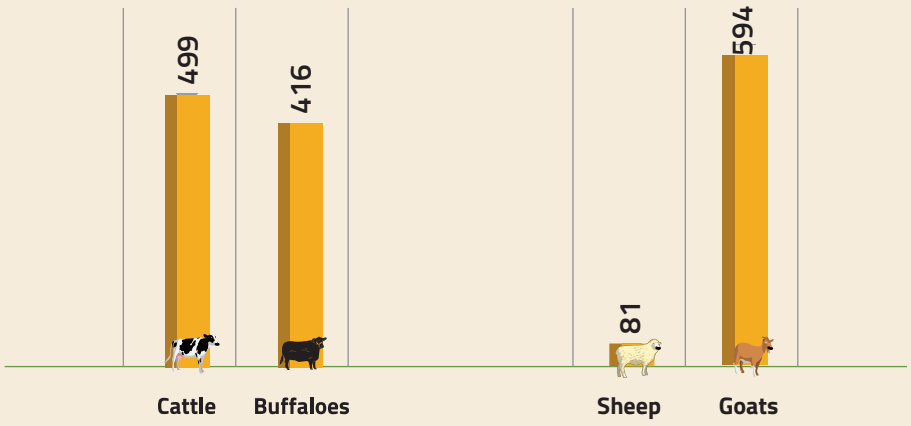
Data Source(s):
Punjab Agricultural Board, Government of Punjab
Survey of Pakistan
Pakistan Bureau of Statistics

Datum: WGS 1984
Units: Degree

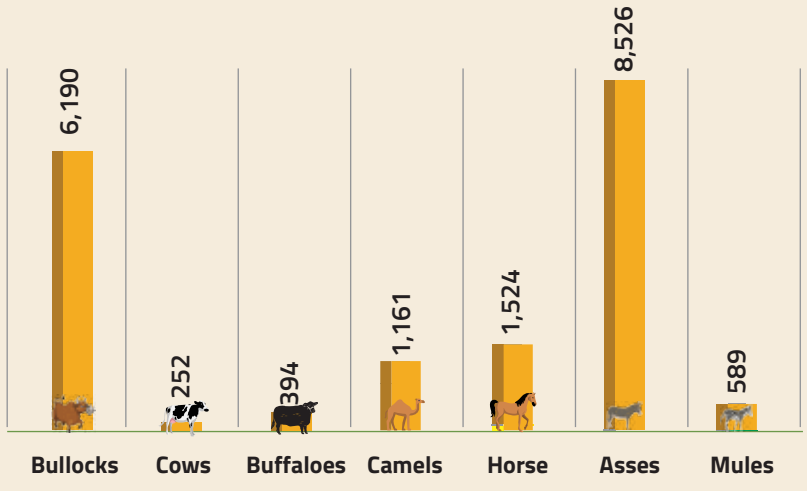
Map No: MHVRA-PUN-622-FEB-2016-GEN-NDMA-016
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

16 LIVESTOCK

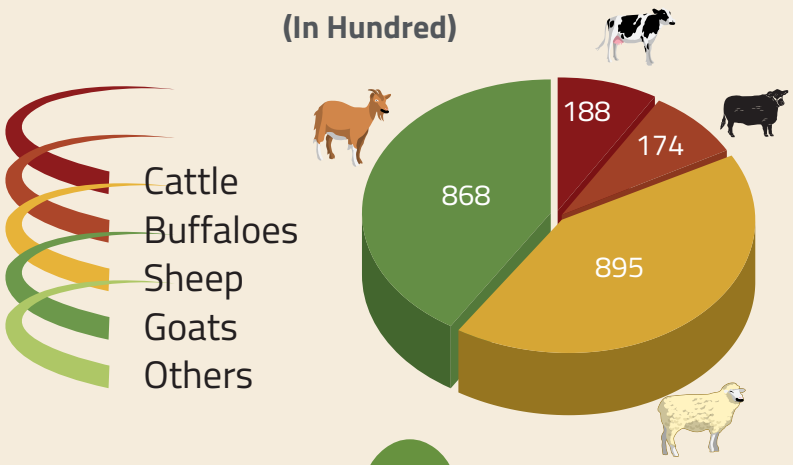
Number of Domestic Animals (2006)
(Thousand)

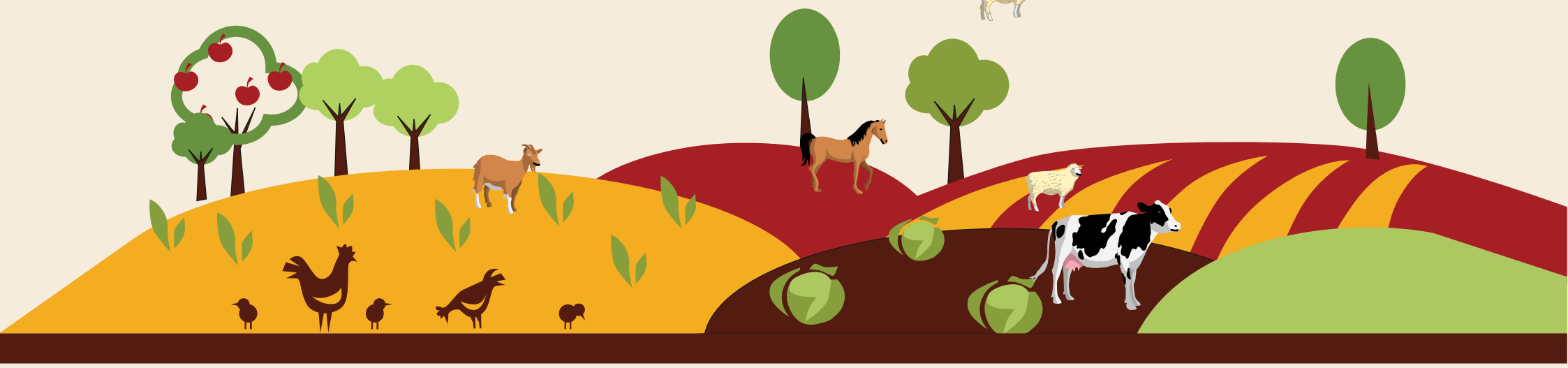


Number of Work Animals by Type (2006)
(Number)

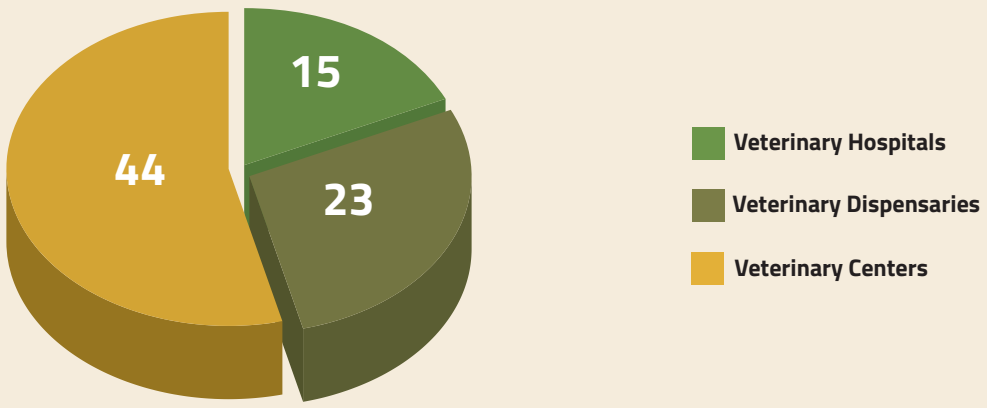


Animals Slaughtered in Recognized & Unrecognized Slaughter Houses by Type (2013-14)
(In Hundred)



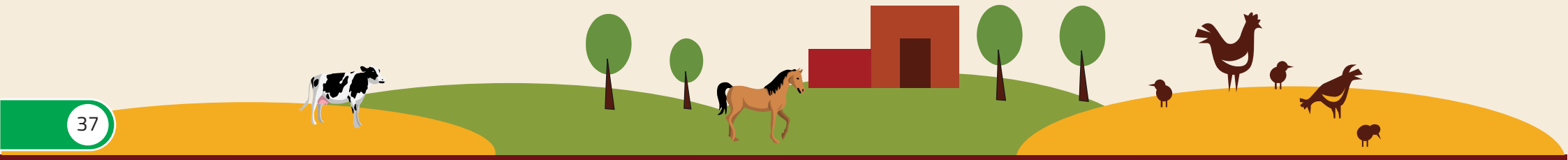


Veterinary Healthcare Facilities (2013-14)



Established Private Poultry Farms (2013-14)

	Broiler Farms	Layer Farms	Breeding Farms
Number	1,160	118	4
Capacity to Rear Birds per Annum (Thousand)	57,450	1,210	470



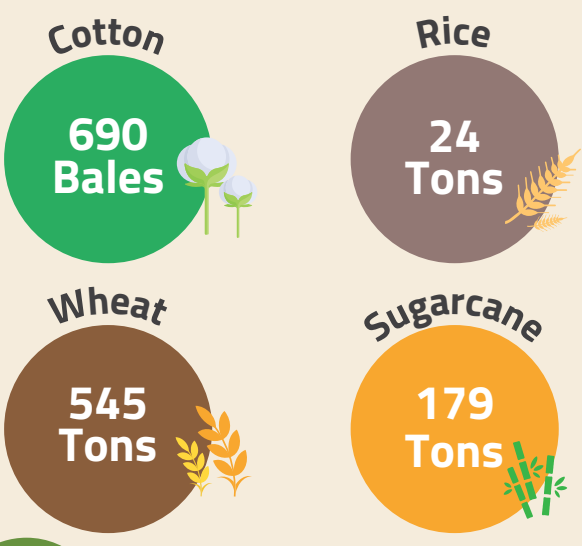
17 AGRICULTURE

Multan district has a plain surface made of alluvial soil sloping gently from North-East to South-West with a slight slope from North-West to South-East as well. This formation is recent, shaped by the ever changing course of River Chenab and River Ravi. River Ravi has changed multiple courses in past. Various canals from River Sutlej and River Chenab pass through Multan and its adjoining districts making the area fertile and very ideal for agriculture.

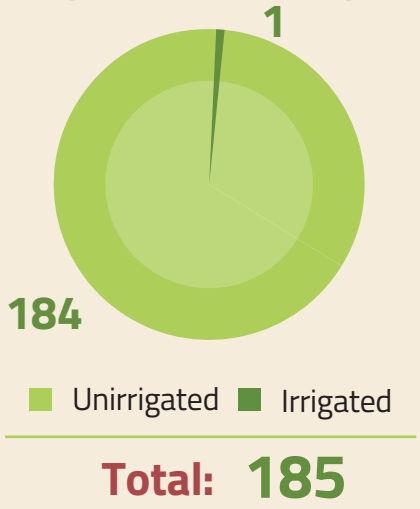
Major crops produced in the area include Cotton, Wheat and Sugarcane while crops grown in minor quantities include Rice, Maize, Jawar, Bajra, Moong, Tobacco, Masoor, Mash and oil seed such as Mustard/Rape and Sun Flower.

Mangoes of Multan are known to be among the best and sweetest varieties of mangoes produced globally. A large portion of mango cultivation is exported to different countries including Japan, Canada, England and Saudi Arabia. Besides Mangoes, Guava, Citrus, Pomegranate are also grown in major quantities while Dates, Banana, Phalsa, Jaman, and Pears are grown in minor quantities. In vegetables, Onion, Potatoes, Cauliflower, Carrot are majorly grown. Peas, Ladyfinger, Turnip, Bottle Gourd, Garlic, Chilies and Tomatoes are also grown in the district in minor quantities.

Major Crop Production
(2013-14)

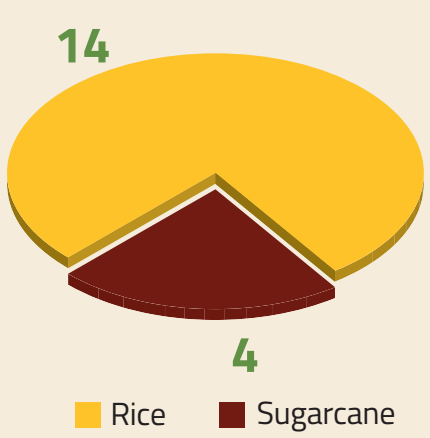


Total Area Sown
(Thousand Hectares)

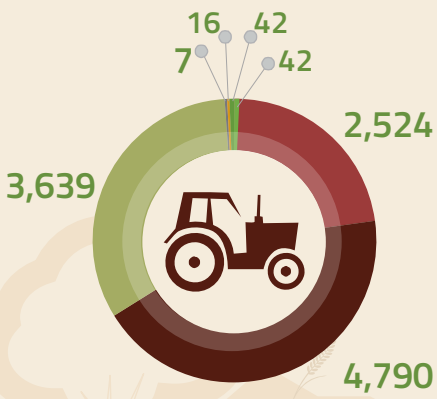


Total: 185

Area Sown Under Major Crops
(Thousand Hectares)

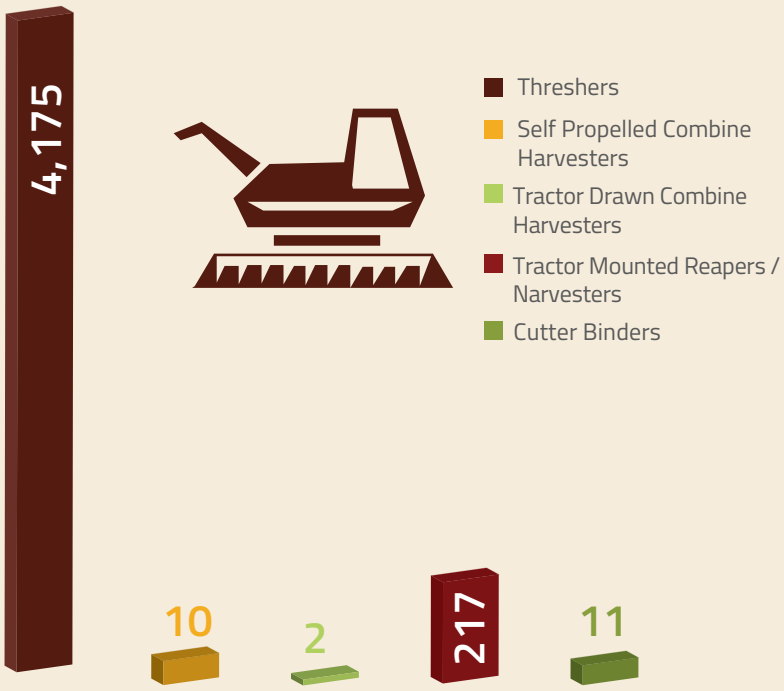


Tractors by Make (2012-13)



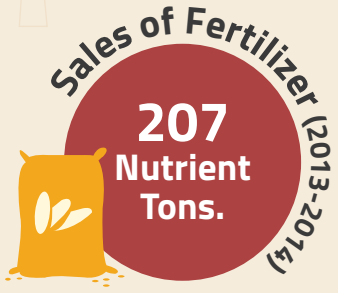
Total: 11,338

Threshers & Harvesters (2012-13)

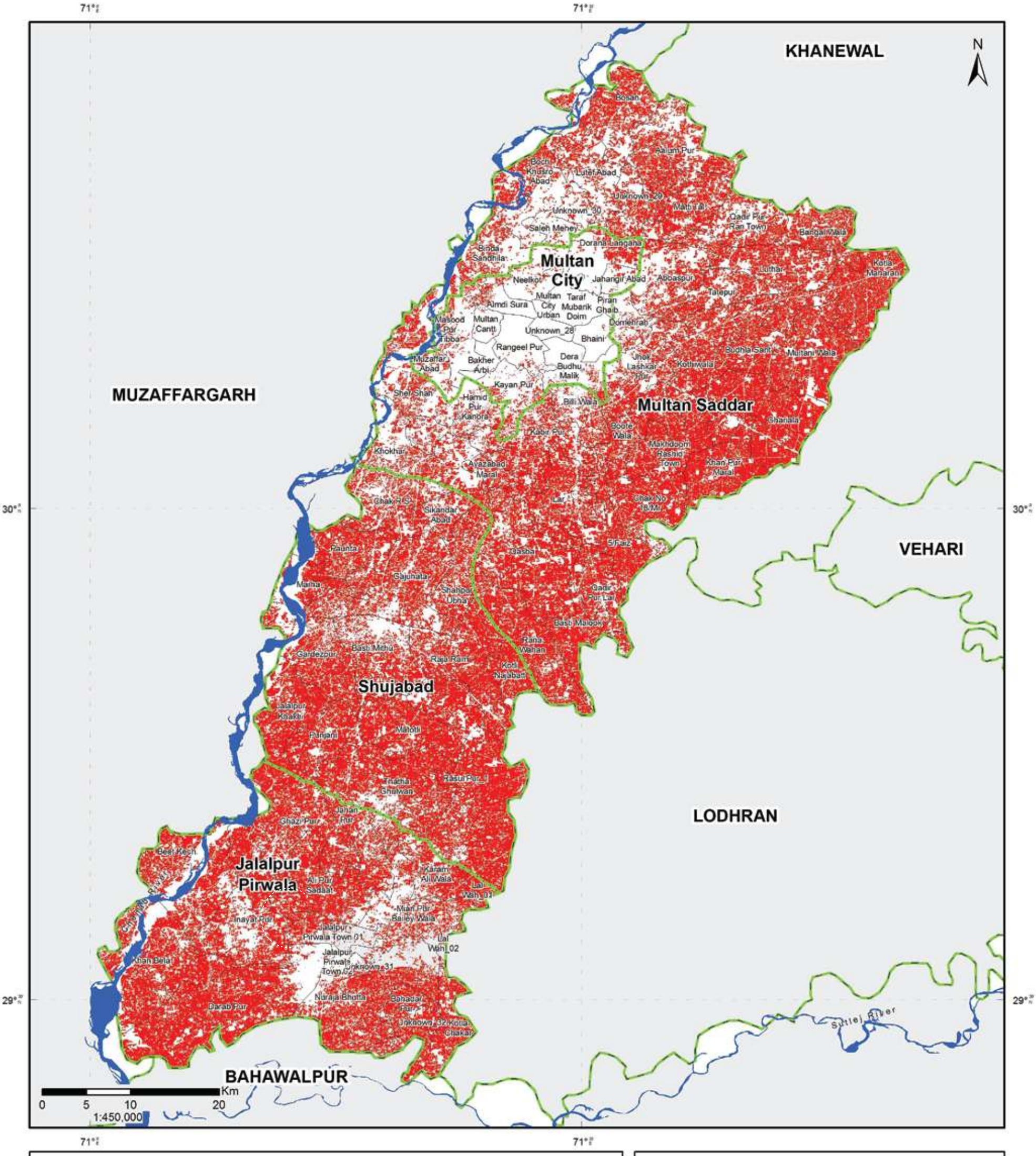


Total: 4,415

Sales of Fertilizer (2013-2014)



RABI CROP MAP (JUNE TO FEB)



Legend

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

Multi Hazard Vulnerability & Risk Assessment, Multan, 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-622-FEB-2016-GEN-NDMA-RB-012
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

KHARIF CROP MAP (AUG TO SEP)

Legend

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

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

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-622-FEB-2016-GEN-NDMA-KH-012
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

18 RESCUE 1122

Emergency Calls
(by Type)

Road Accidents 84,884	Drowning 238	Fire 5,415	Blast 43	Building Collapse 248
Medical 160,724	Crime Incidents 8,102	Patient Rescued 309,564	Fake Calls 174	Others 0

Total Call Received
4,723,534

Rescue Equipment

Fire Vehicle 10	Water Bowser 2	Ambulance 18	Truck 05 Ton 0
Rescue Vehicle 2	Recovery Vehicle 1	Ground Duty Vehicles (GDV) 1	Foam Vehicle 0
Water R.Van 1	Aerial Platform 0	Ladder 0	Boat Carrier Truck 0

Flood Resources

Boat 14	Scuba 0	Life Ring 10	Oars 22
On Board Motors (Obm) 14	Torch 0	Tents 10	Mosquito Net 0
Life Jacket 230	Life Guard 28	Plastic Mat 0	Dry Suit 2
	Nylon Rope 15	Carpet 0	

Human Resource
387 Persons

Address

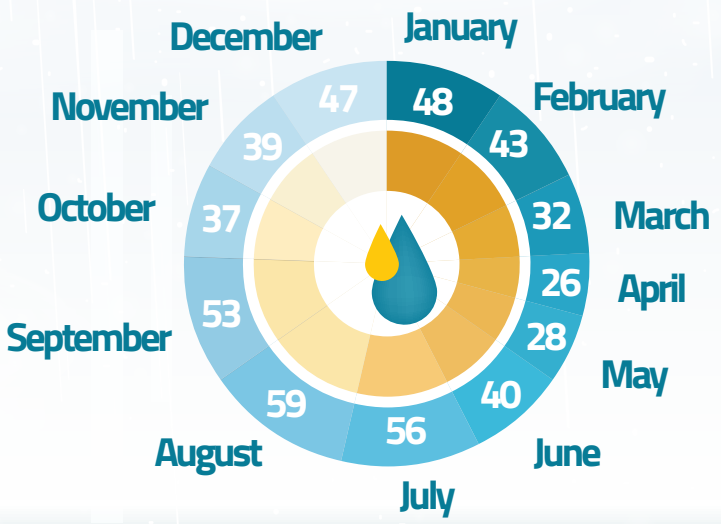
Central Station, Chowk Kumharan

Longitude : 71.55 **Latitude :** 30.21

19 CLIMATOLOGY

Multan District bears an extreme climate, being hot in summer and cold in winter. The temperature ranges generally from 28-43˚C in summer and 5-29˚C in winter. June is the hottest month with maximum temperature reaches at 42.2 °C while January is the coolest month where minimum temperature is around 6°C. Average maximum precipitation is in the range of 40-50mm and received during the months of July and August while the driest months are October and November. The total annual rainfall in the district is around 175mm.

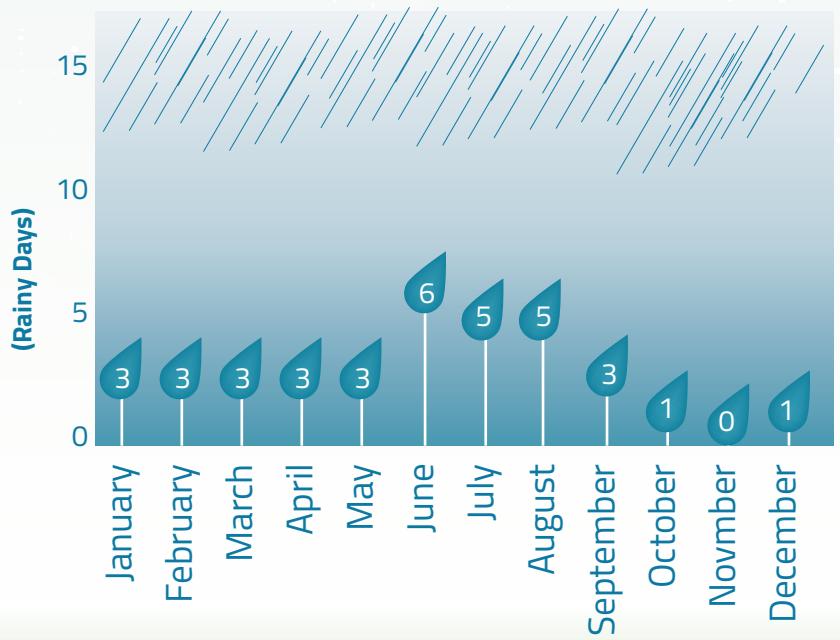
Relative Humidity (%)



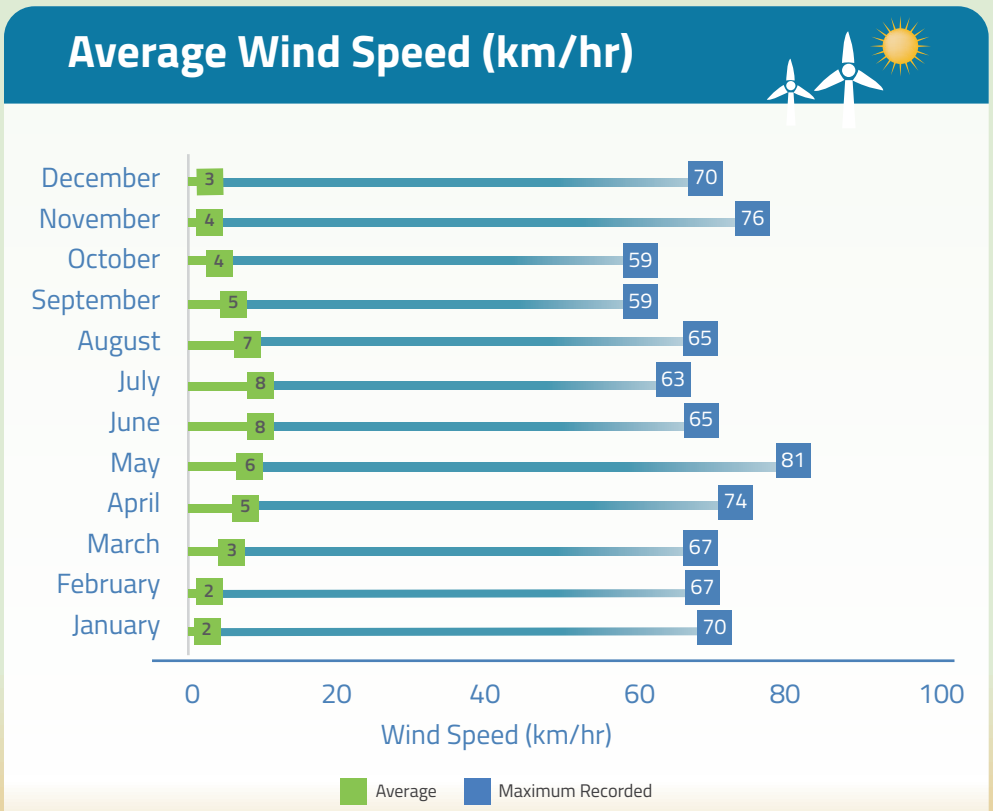
Average Precipitation (mm)

January	9	February	10	March	11
April	9	May	9	June	13
July	50	August	40	September	12
October	2	November	2	December	6

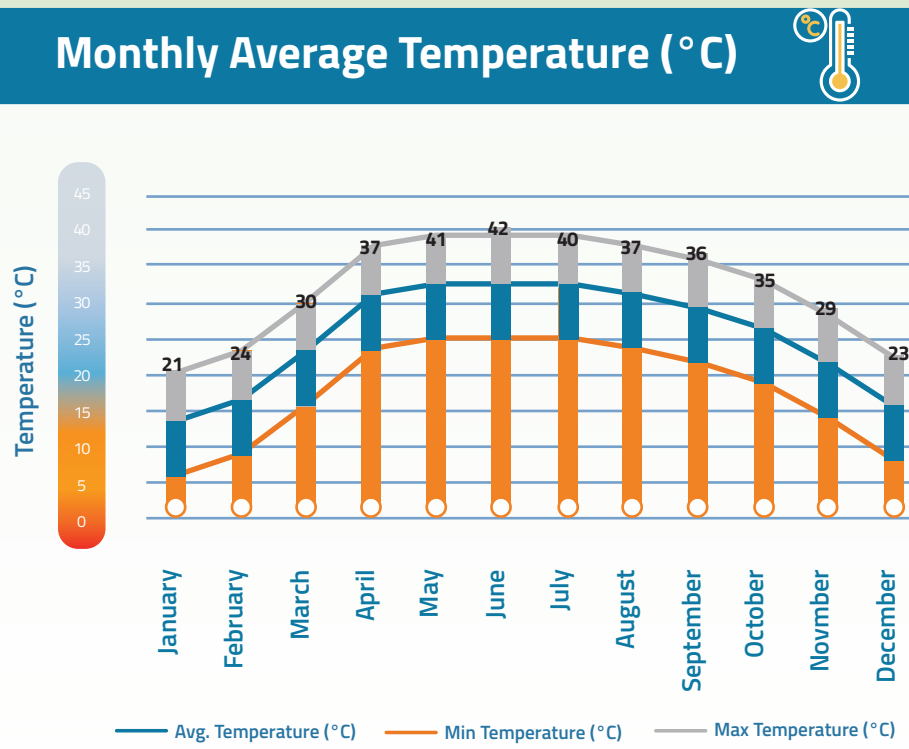
Average Rain Day (per month)



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 Jhang to a Union Council level.

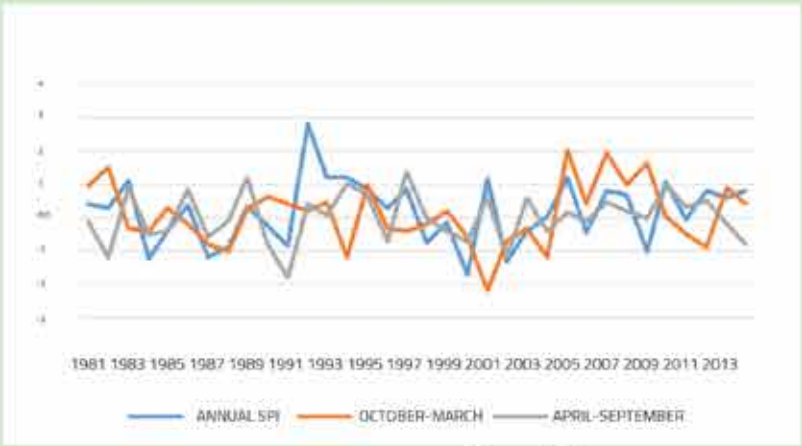
a. **Standard Precipitation Index (SPI)**
b. **Normalized Difference Vegetation Index (NDVI)**
c. **Drought Severity Index (DSI)**
d. **Temperature Condition Index (TCI)**
e. **Vegetation Condition Index (VCI)**
f. **Vegetation Health Index (VHI)**

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 Jhang 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

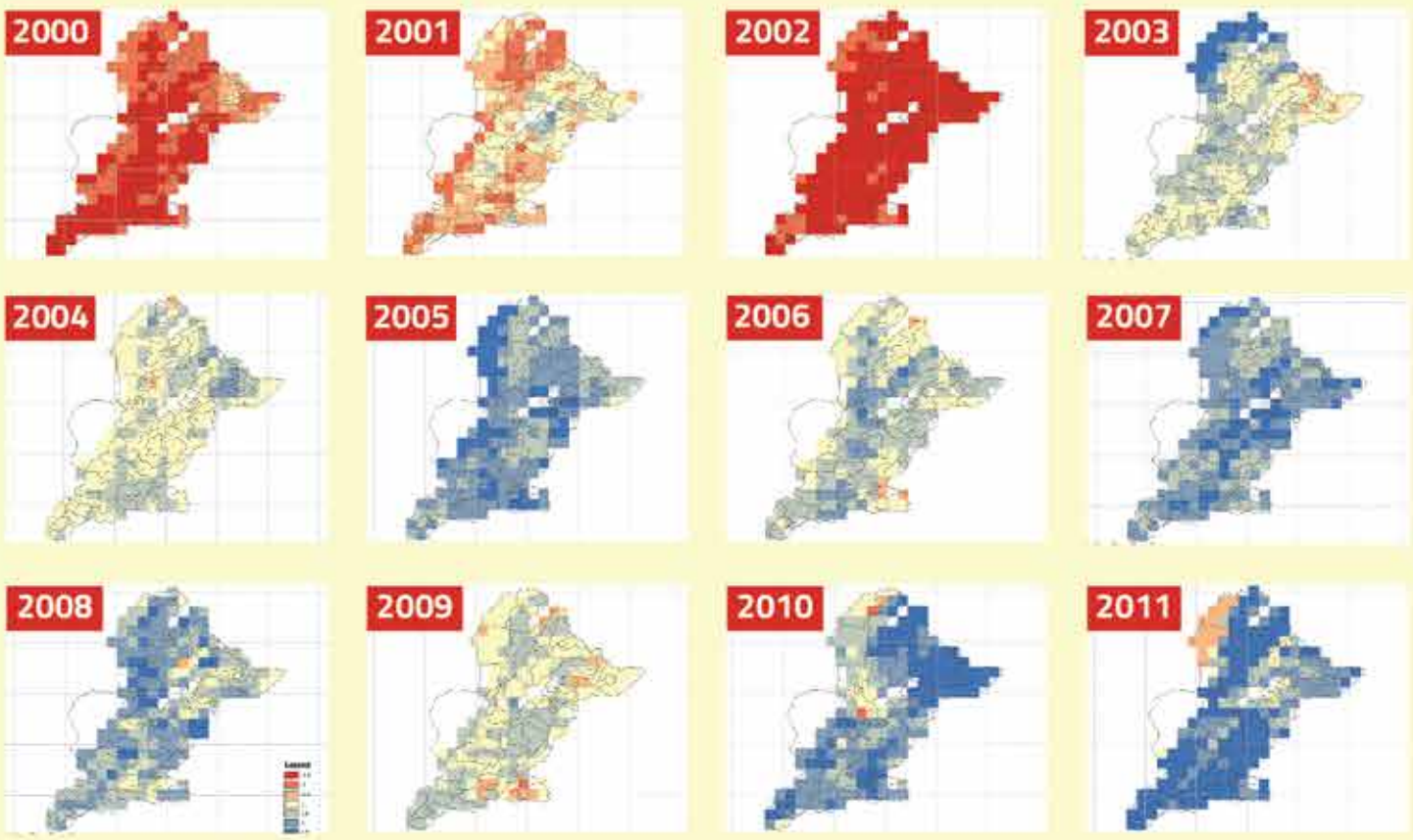


SPI Value	Conditions
2.0+	Extremely Wet
1.5 to 1.99	Very Wet
1.0 to 1.49	Moderately Wet
-0.99 to 0.99	Near Normal
-1.0 to -1.49	Moderately Dry
-1.5 to -1.99	Severely Dry
-2.0 and less	Extremely Dry

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) 2000-2011



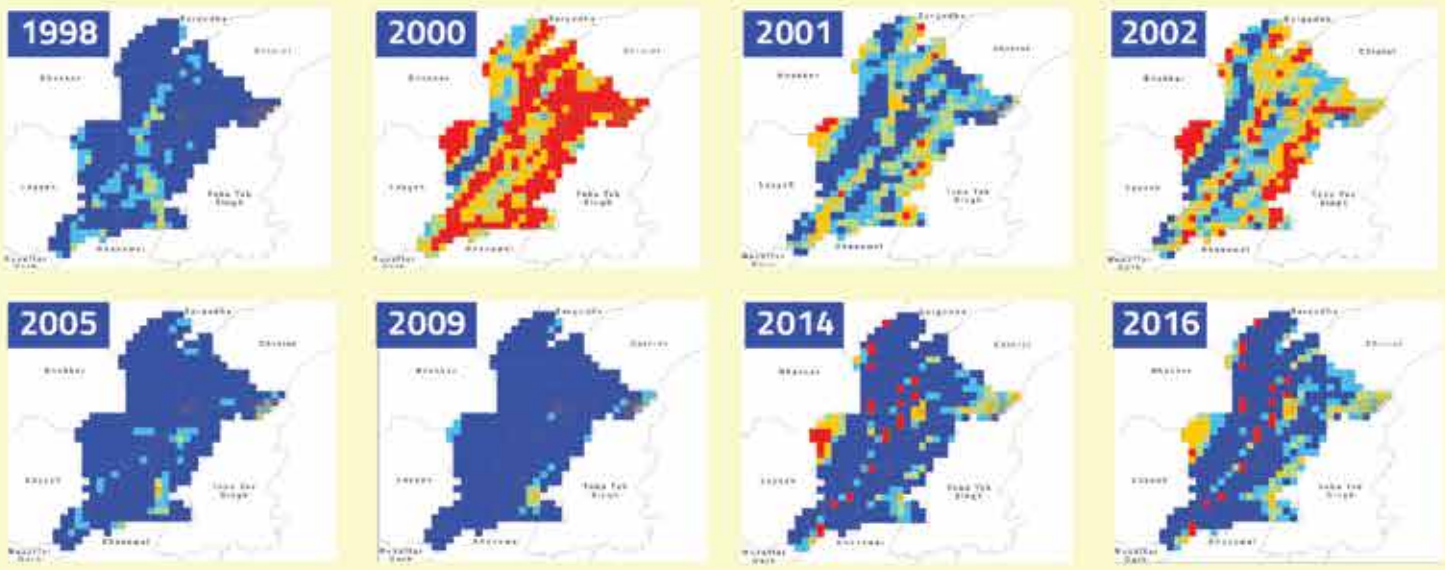
Legend:

- -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) 1998-2016



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) 1999-2016

2002

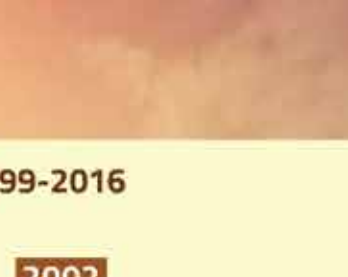
Legend:

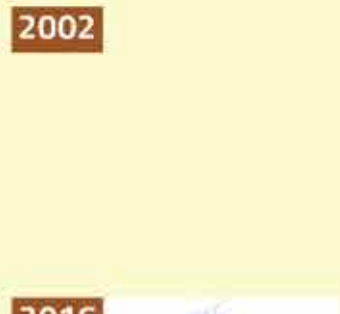
- <10 (Extreme Drought)
- <20 (Severe Drought)
- <30 (Moderate Drought)
- <10 (Mild Drought)
- <10 (No Drought)

Description:

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

Temperature Condition Index (TCI) 1997-2016





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)

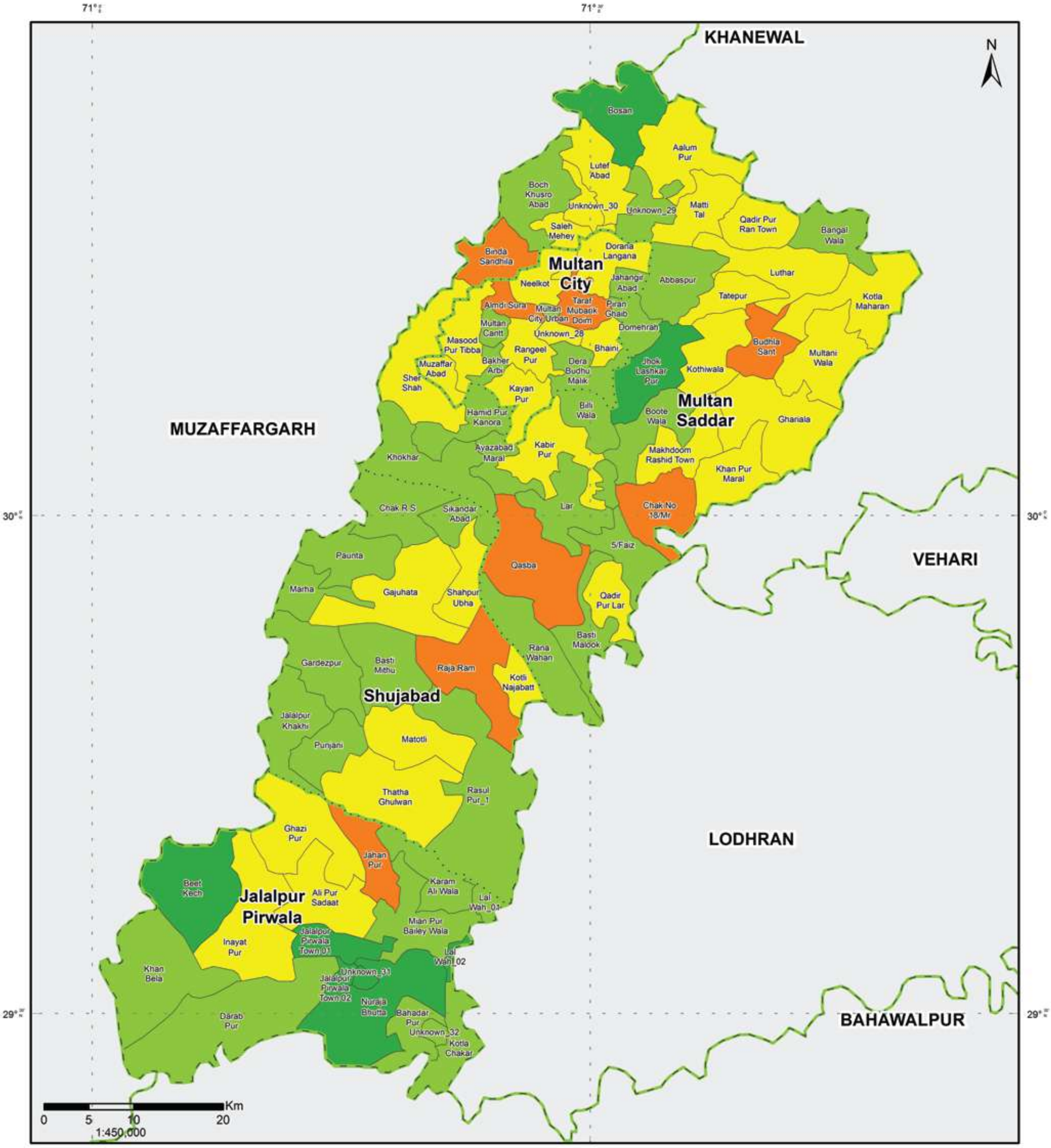
Legend:

- -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, Multan, Punjab, Pakistan

WFP United Nations World Food Programme

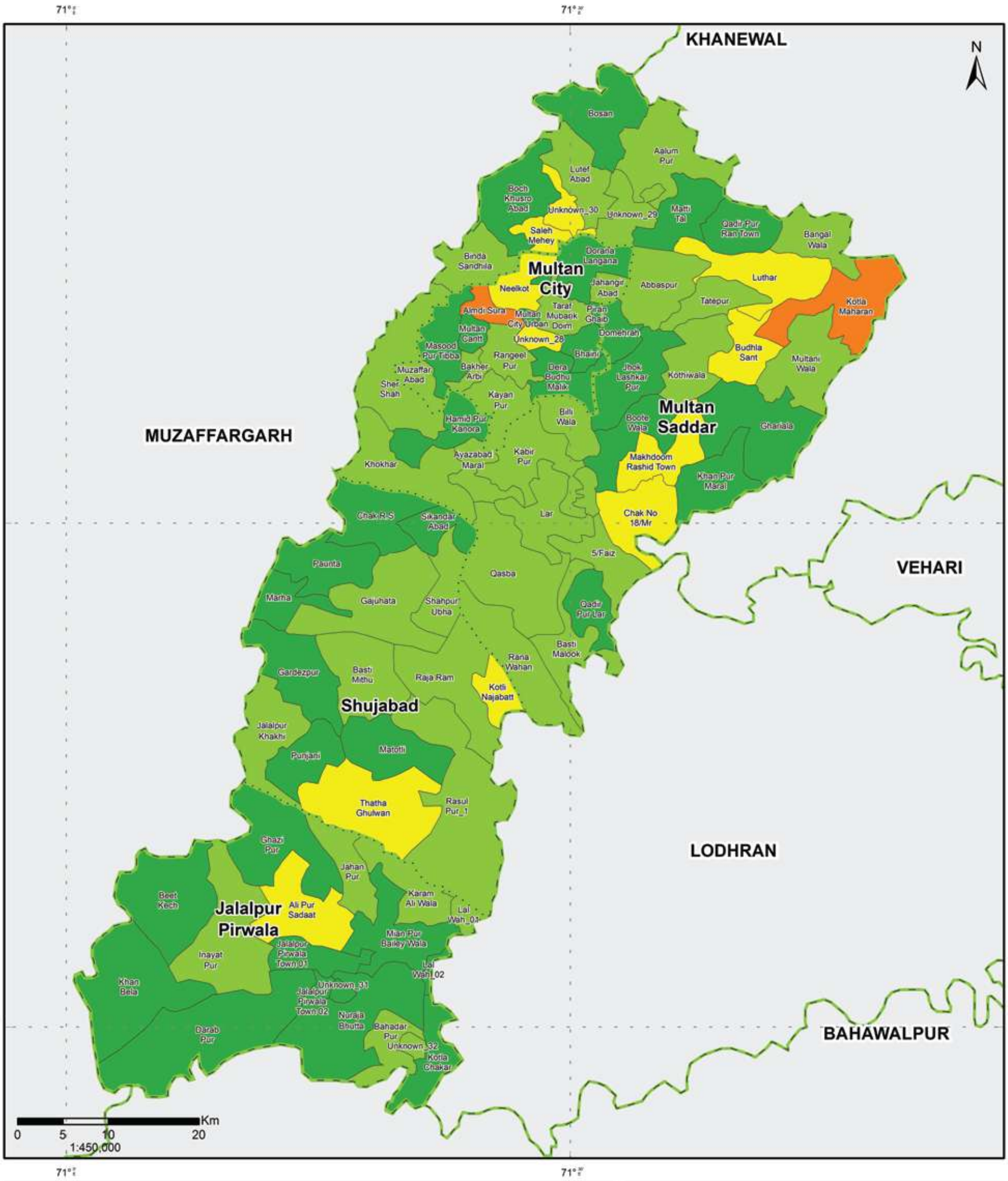
MAP INFORMATION

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

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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, Multan, Punjab, Pakistan

WFP United Nations World Food Programme

MAP INFORMATION

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

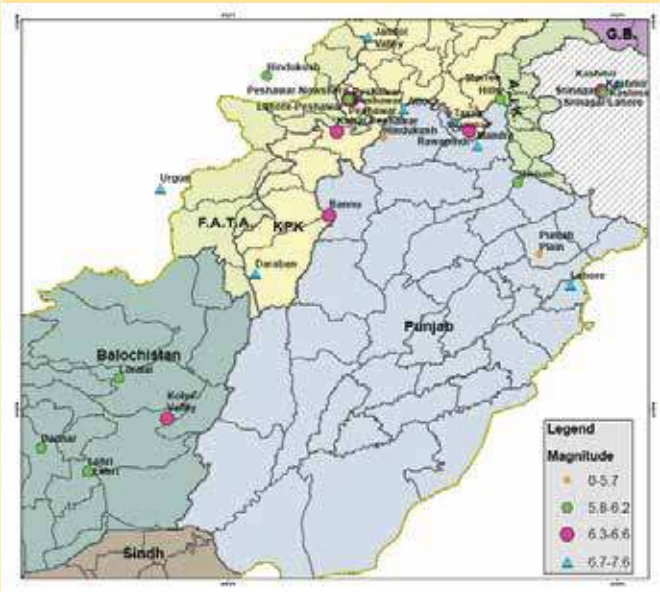
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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 Multan has no major fault line passing through it. According to the historical catalogues used in this assessment, area is not highly active in terms of seismic motion. The main findings of the probabilistic seismic hazard assessment were that the ground motions in District Multan lies in low seismic activity zones. The following table shows the PGA based values against each settlement type in District Multan. 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 designed in Table below:

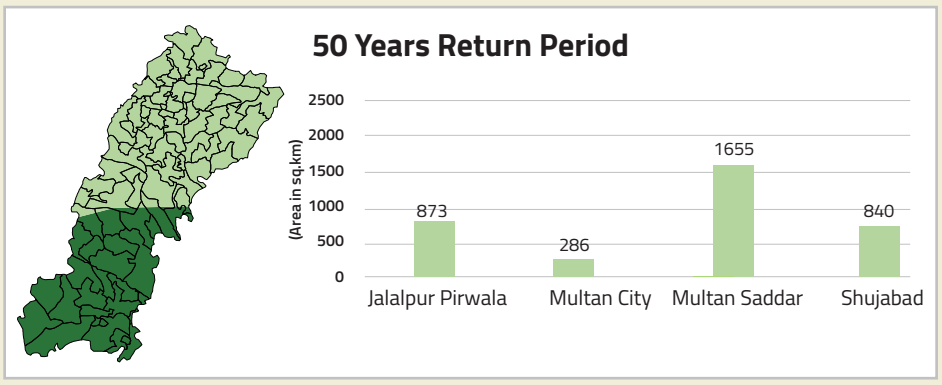
Zone	Intensity	Ground Motion (g)	PGA (g*)
1	Very Low	0.01 – 0.08	0.08
2A	Low	0.08 – 0.16	0.15
2B	Medium	0.16 – 0.24	0.20
3	High	0.24 – 0.32	0.30
4	Very High	> 0.32	0.40

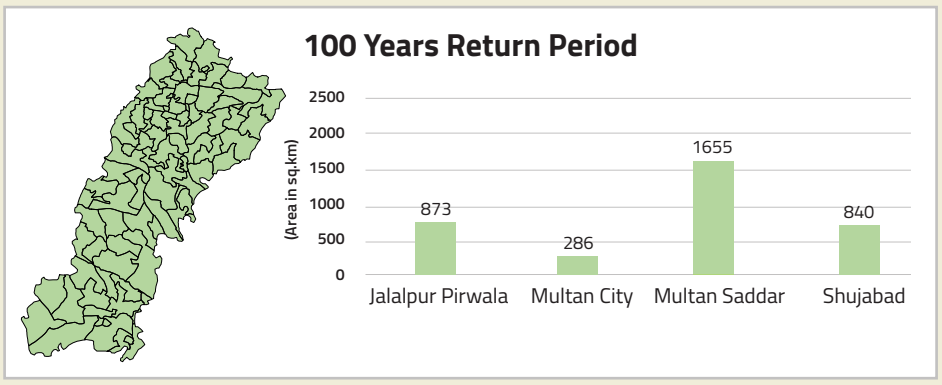
*Where g is acceleration due to gravity

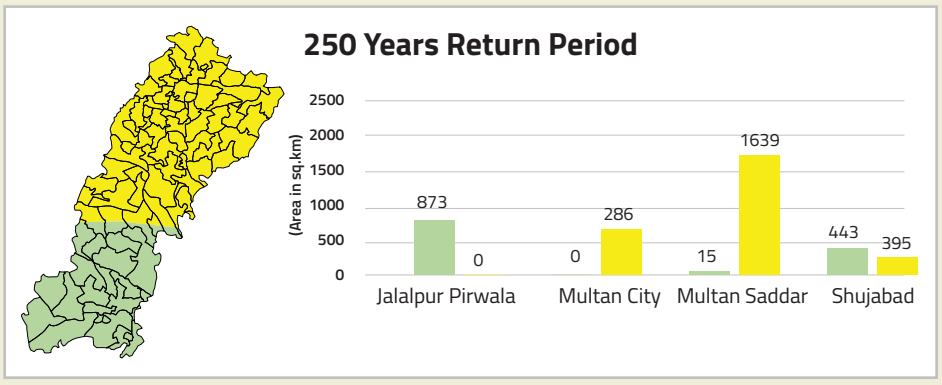
Methodology of Assessment

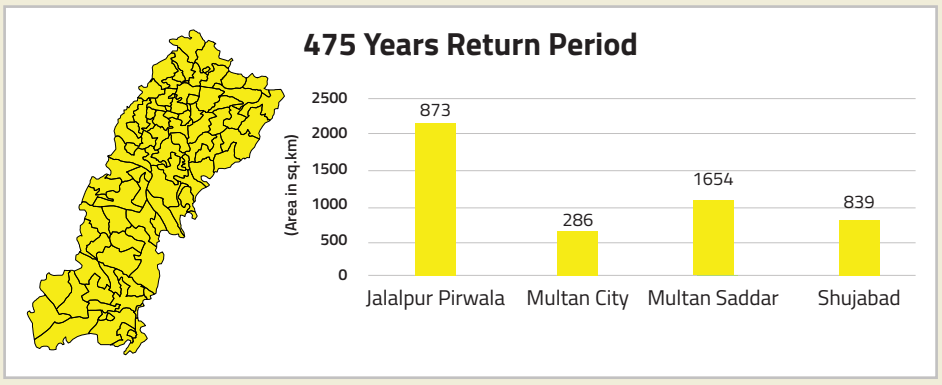
The first step was the definition of area of interest followed by the compilation of Earthquake Catalogue from different national and international sources. The catalogues were homogenized, declustered and checked for completeness. Ground Motion Prediction Equations (GMPEs) were selected and the data 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.

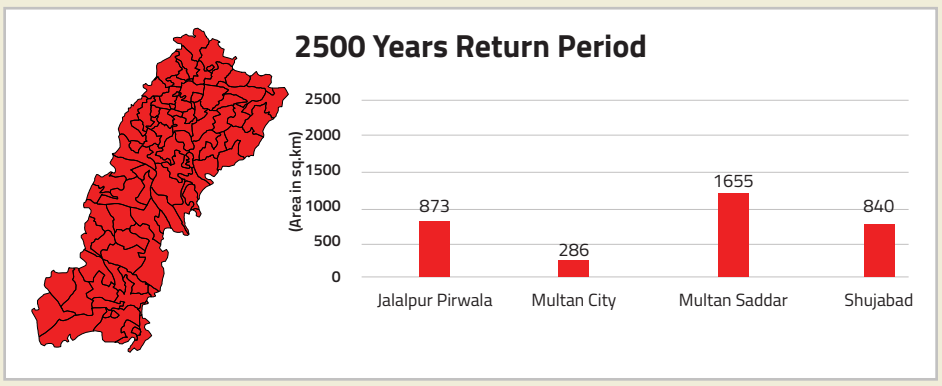
Seismic Hazard Maps Based on Return Periods (50,100,250,475 and 2500 Years)











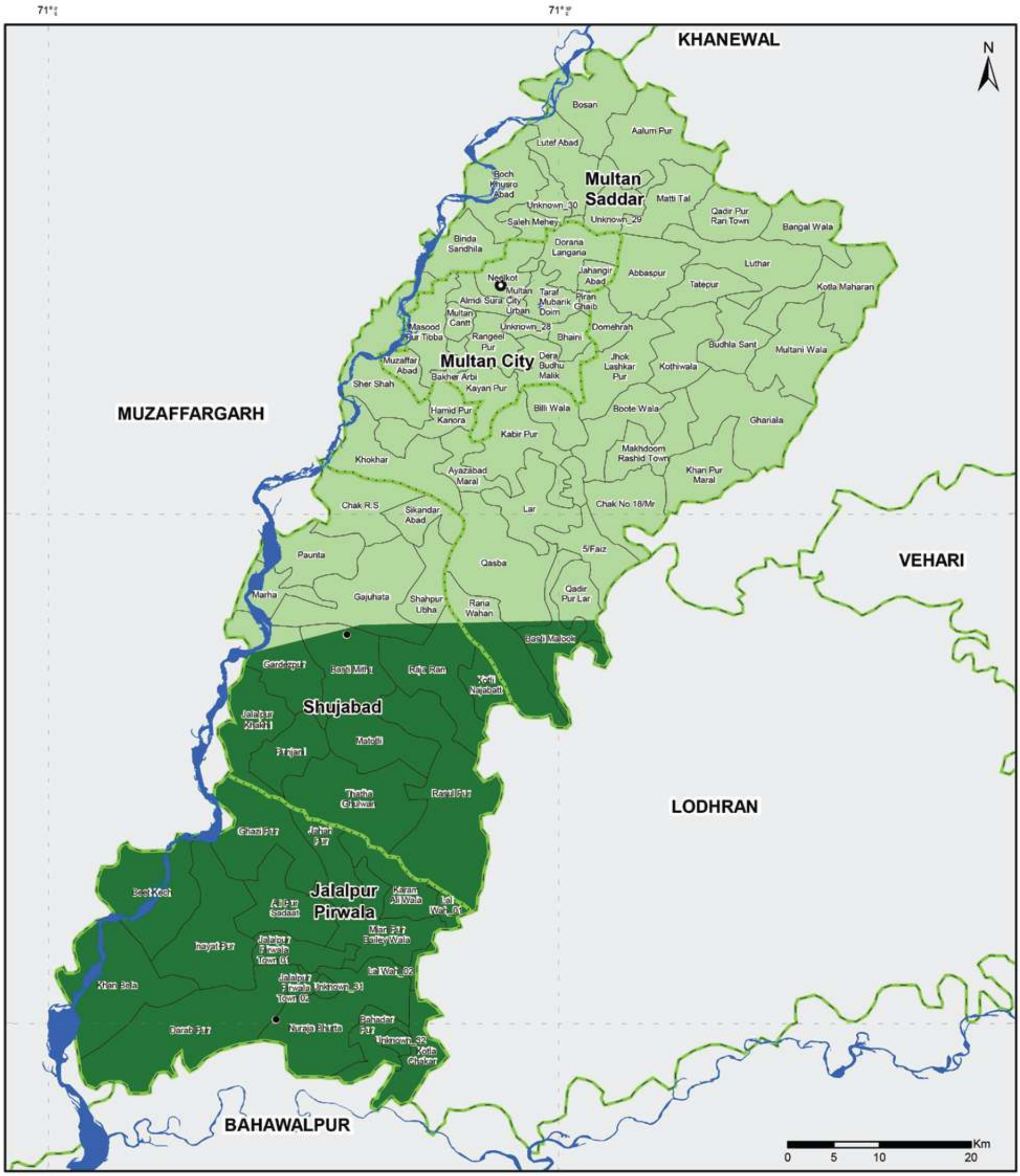
Hazard Zones (g)*

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

Discription:

Where return period is the reccurrence interval of an earthquake. 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 and Reservoir
- 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, Multan, Punjab, Pakistan

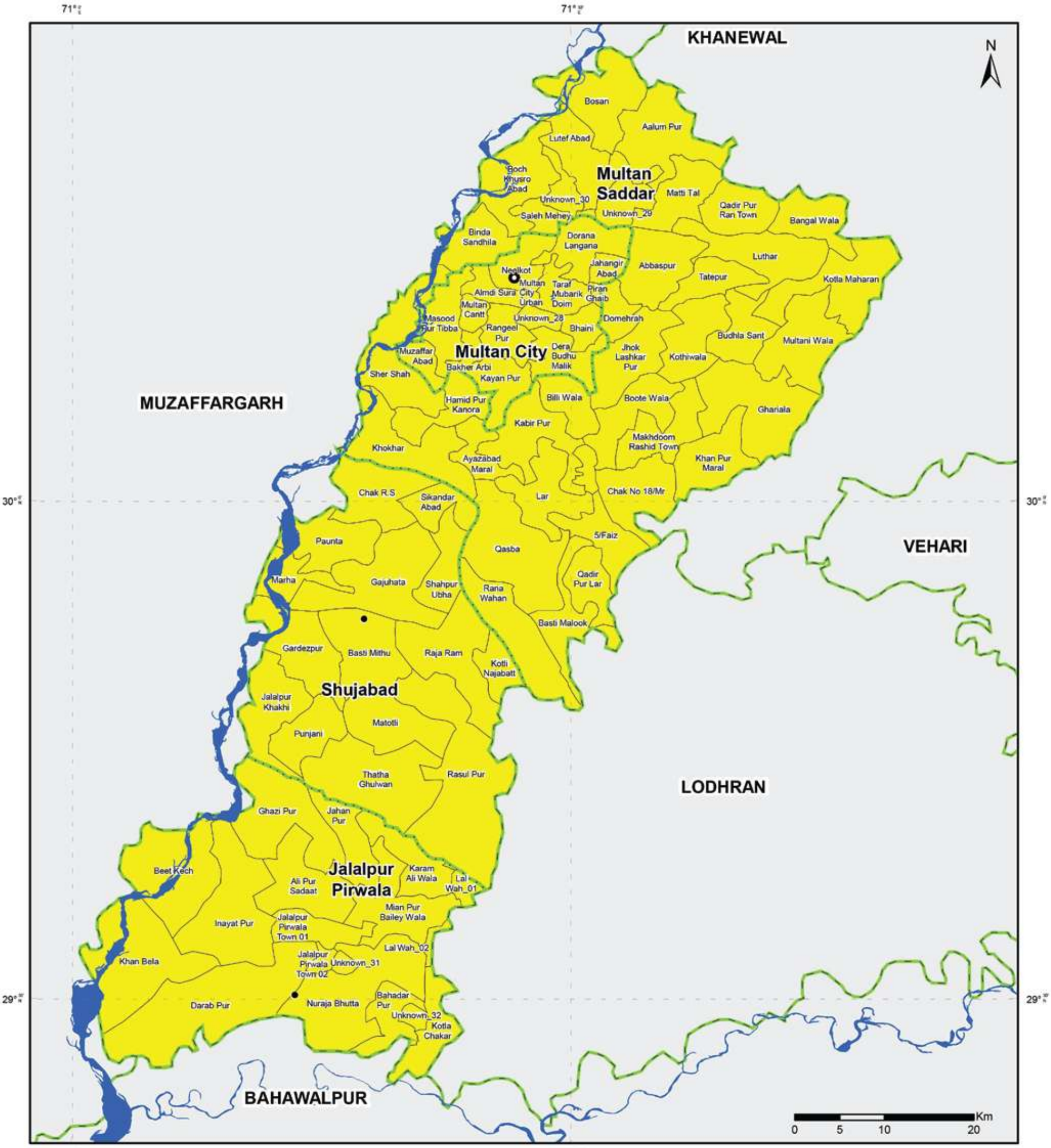
WFP United Nations World Food Programme

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 and Reservoir
- 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, Multan, Punjab, Pakistan

United Nations World Food Programme

MAP INFORMATION

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

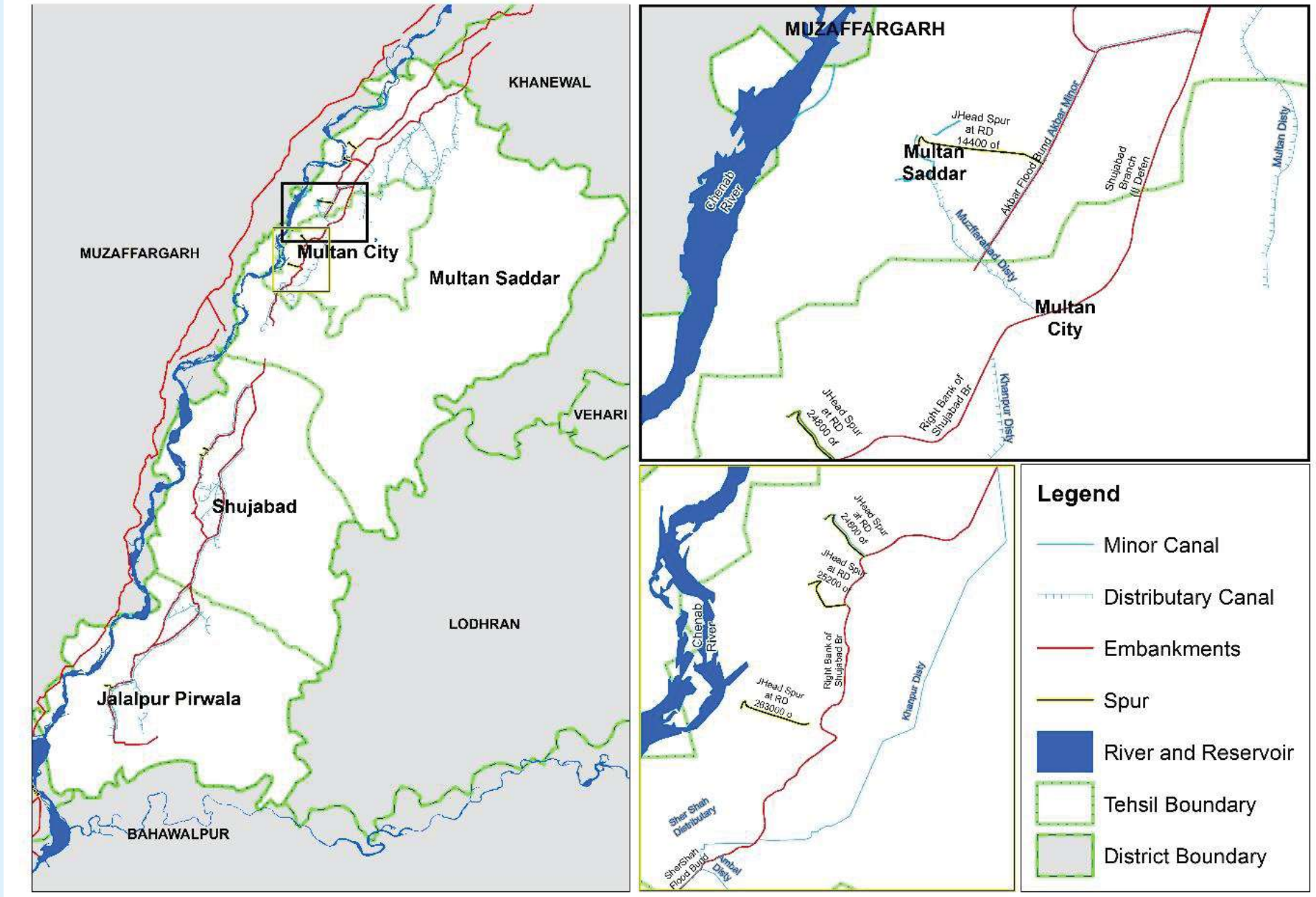
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-MAR-2016-HAZ-03-NDMA-475
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

22 FLOOD HAZARD ASSESSMENT

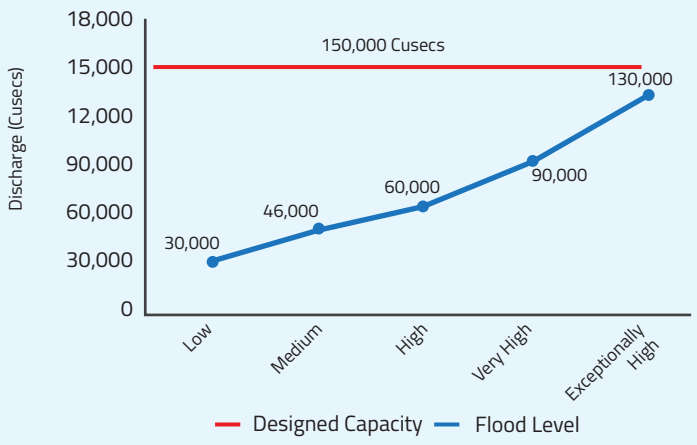
District Multan mainly has a flat topography with some hilly areas towards north. River Chenab flowing downstream district Jhang, enters into Multan through district Muzaffargarh, passes through the western part of the district and joins River Indus downstream at Mithankot. As part of flood mitigation, following flood protection structures have been put in place:

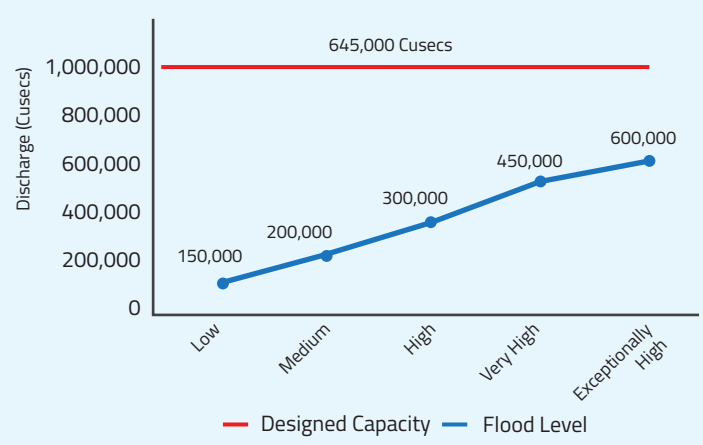
Flood Protection Structures			
First Line of Defense	• Fazal Shah Flood Bund • Chenab Flood Bund • Dhundu Flood Bund 0-26500 • Nawabpur Bund • Gardezpur Flood Bund RD 0-16	• Akbar Flood Bund • Jalapur Khaki Flood Bund • Shujabad Branch Bund • Muzaffarabad Flood Bund • Balochanwah Flood Bund	• Sher Shah Flood Bund • Nagni Flood Bund RD 0-510 • J-Head Spur RD-42200 of Nagni Flood Bund
Second Line of Defense	• Binda & Ilampur Sub Division Bund	• Panjani Disty Bund	• Gajju Hatta Branch Flood Bund

Flood Protection Structures



Flood Limits for Chenab (Trimmu Head) and Ravi (Sidhnai Head)



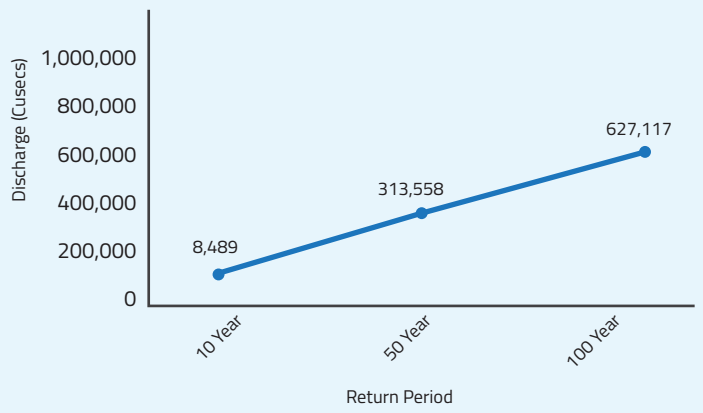


Early Warning & Response Time for Riverine Floods (in Hours)

	River Chenab				River Ravi	
Flood Intensity	**Marala to Trimmu**	**Trimmu to Head Muhammad Wala**	**Head Muhammad Wala to Shershah**	**Shershah to Punjnad**	**Balloki Headworks to Sidhnai Barrage**	**Sidhnai Barrage to Head Muhammad Wala**
Low	111	48	5	30	100	40
Medium	105	48	5	30	100	36
High	90	44	4	25	90	30
Exceptionally High	88	38	3	22	80	29

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.

Flood Limits Trimmu Headwork (Chenab)



District Multan is situated on eastern bank of River Chenab and northern bank of River Sutlej, and owing to this proximity to both rivers, it is prone to floods. The floods of 2014 damaged over 14,000 houses and over 94578 acres of crops. A detail of historical discharges is as under:

Early Warning & Response Time for Riverine Floods (in Hours)

At Sidhnai Headworks		At Trimmu Headworks	
Year	**Discharge (Cs)**	**Year**	**Discharge (Cs)**
1973	210,339	**1973**	863,249
1976	244,284	**1976**	704,635
1992	93,910	**1992**	982,027
1995	210,320	**1995**	859,881
2010	10,378	**2010**	333,404
2011	17,676	**2011**	133,090
2012	26,086	**2012**	67,694
2013	77,630	**2013**	267,609
2014	85,712	**2014**	626,006

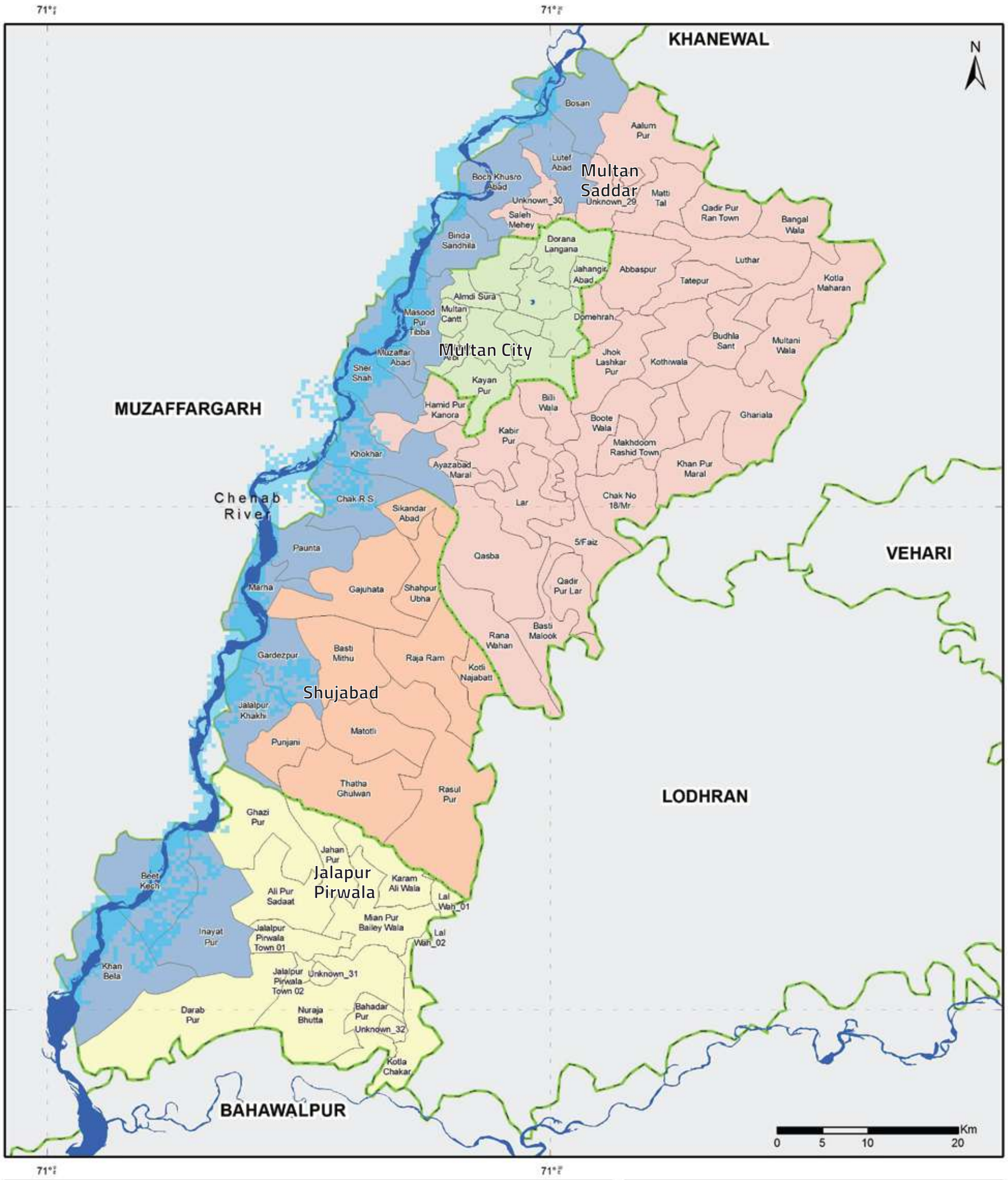
Settlements Vulnerable to Floods based on Historical Inundation Records

Tehsils	No. of Settlements Vulnerable to Floods Based on Inundation Frequency (2010-2015)			
	Low	**Medium**	**High**	**Very High**
Jalapur pirwala	26	31	5	1
Multan City	3	9	3	0
Multan Saddar	20	28	16	0
Shujabad	18	15	3	0

Assessment Methodology

The HEC-RAS hydraulic model has been used for hydraulic modelling of the area, with an average discharge value observed at Sidhnai Head for consecutive years 10, 50 and 100 years as per the return periods. 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.



Legend

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

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

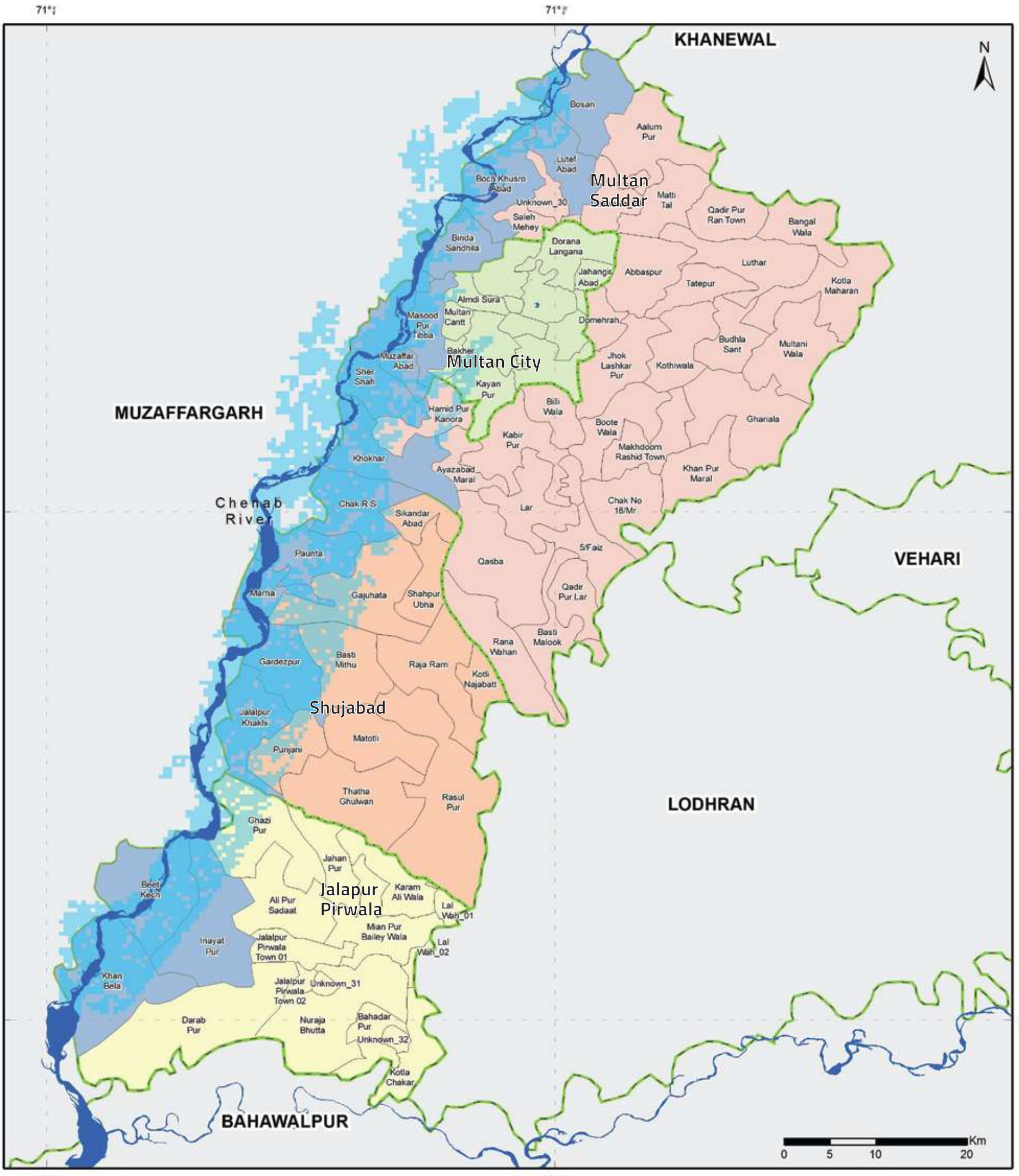
Multi Hazard Vulnerability & Risk Assessment, Multan, Punjab, Pakistan

MAP INFORMATION

Data Source(s):
NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-MAR-2016-HAZ-04-NDMA-002
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017



Legend

- Flood 50 Year Return Period
- Flood Exposed UCs
- River and Reservoir
- Abc Union Council Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

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

WFP United Nations World Food Programme

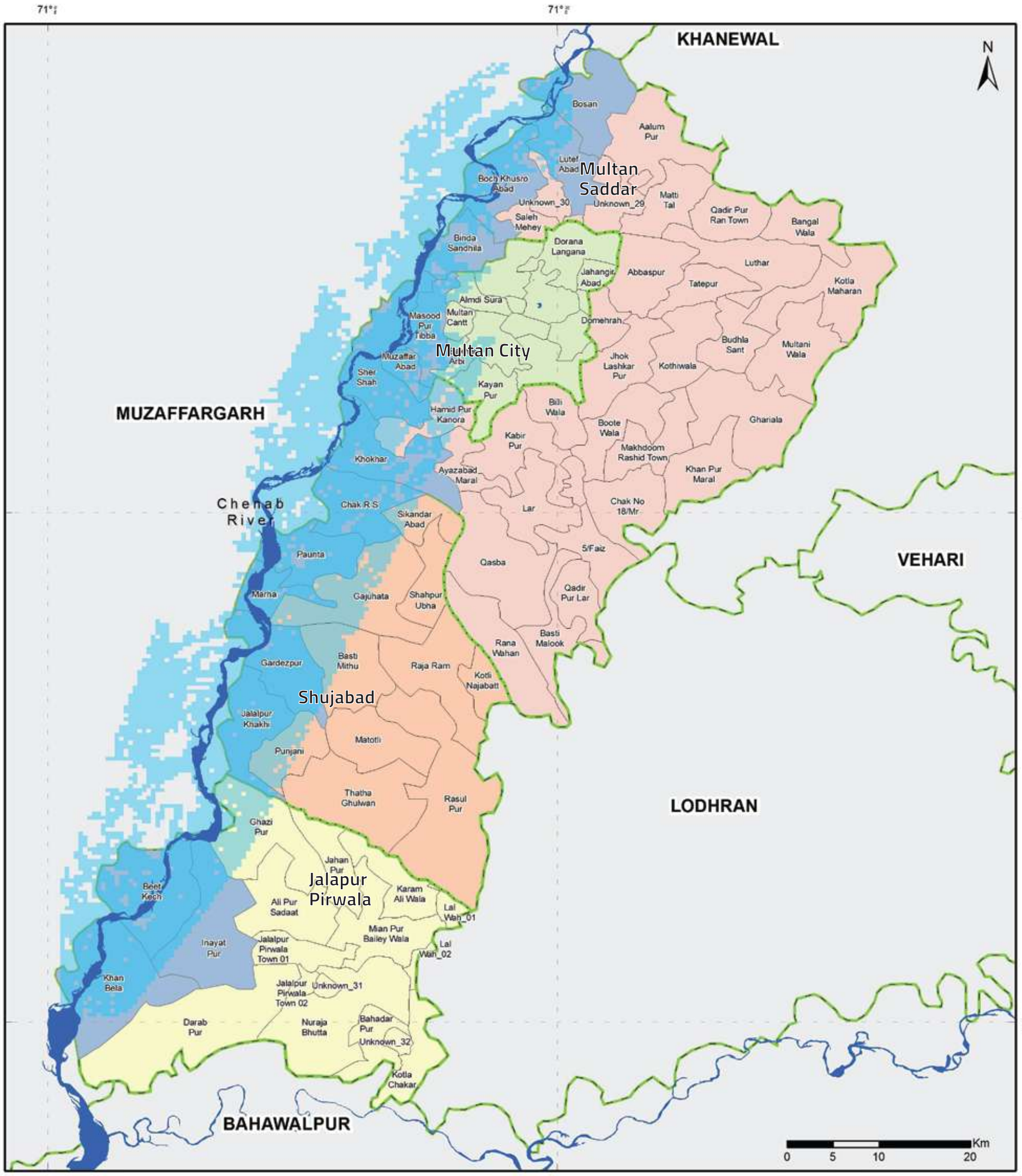
MAP INFORMATION

Data Source(s):

NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-MAR-2016-HAZ-04-NDMA-003
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017



Legend

- Flood 100 Year Return Period
- Flood Exposed UCs
- River and Reservoir
- Union Council Boundary (Abc)
- District Boundary (ABC)
- Provincial Boundary
- Line of Control
- International Boundary

Tehsil Boundary

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad

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

MAP INFORMATION

Data Source(s):
NDMA,
SUPARCO

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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 HA)					AGRICULTURE CROPS (AREA IN HA)			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		
JALALPUR PIRWALA	ALI PUR SADAAT	36,833	18,982	17,851	21	5,367	0	0	3	103	0	16	3,938	MO	MO
	BAHADAR PUR	33,958	17,580	16,379	7	2,687	0	0	0		0	0	1,964	MI	MI
	BEET KECH	39,309	20,155	19,154	18	3,422	2,612	0	0	204	8	0	4,219	NO	NO
	DARAB PUR	40,268	20,869	19,399	42	11,468	0	0	282	0	0	0	8,647	MI	NO
	GHAZI PUR	41,685	21,472	20,212	29	5,532	485	0	69	915	18	0	4,941	MO	NO
	INAYAT PUR	32,750	17,026	15,724	42	6,934	62	0	0	1,463	0	0	4,885	MO	MI
	JAHAN PUR	41,741	21,719	20,022	12	3,114	0	0	20	31	0	0	1,858	SE	MI
	JALALPUR PIRWALA TOWN 01	45,508	23,516	21,993	12	2,341	0	0	196	0	0	0	1,040	NO	NO
	JALALPUR PIRWALA TOWN 02	37,870	19,226	18,644	0	213	0	0	69	0	0	0	31	NO	NO
	KARAM ALI WALA	35,131	18,203	16,928	23	3,437	0	0	0	0	0	0	1,994	MI	MI
	KHAN BELA	30,328	15,522	14,806	20	2,127	1,969	0	0	0	0	0	5,771	MI	NO
	KOTLA CHAKAR	45,219	23,581	21,638	9	3,285	0	0	21	0	0	40	2,406	MI	NO
	LAL WAH_01	27,445	14,343	13,102	5	823	0	0	0	0	0	0	636	MI	MI
	LAL WAH_02	12,880	6,822	6,058	1	408	0	0	3	0	0	0	133	NO	NO
	MIAN PUR BAILEY WALA	44,183	23,491	20,692	20	5,107	0	0	159	0	0	0	2,083	MI	NO
	NURAJA BHUTTA	42,958	22,287	20,672	30	8,513	0	0	221	0	0	0	5,291	NO	NO
MULTAN CITY	ALMDI SURA	45,540	23,902	21,638	11	322	0	0	0	353	0	0	188	SE	SE
	BAKHER ARBI	33,746	17,414	16,332	7	119	0	0	0	26	0	0	8	MI	MI
	BHAINI	34,304	17,825	16,479	8	147	0	0	0	0	0	0	22	MO	NO
	DERA BUDHU MALIK	36,967	19,518	17,449	19	1,173	0	0	0	49	15	0	269	MI	NO
	DORANA LANGANA	35,510	18,383	17,127	17	1,233	0	0	0	539	0	7	836	MO	NO
	JAHANGIR ABAD	41,746	21,759	19,987	2	221	0	0	0	5	15	0	132	MI	MI
	KAYAN PUR	39,936	20,997	18,939	10	2,431	0	0	0	69	17	0	604	MO	MI
	MASOOD PUR TIBBA	40,040	21,042	18,998	11	808	446	0	0	1,294	0	10	666	MO	NO
	MULTAN CANTT	200,359	120,940	79,420	4	61	0	0	0	382	0	0	24	MI	NO
	MULTAN CITY URBAN	1,813,314	951,852	861,461	1	0	0	0	0	0	0		0	MI	NO
	MUZAFFAR ABAD	32,979	17,501	15,478	13	278	118	0	0	539	0	0	269	MO	MI
	NEELKOT	41,921	21,915	20,006	20	130	0	0	0	1,318	0	0	220	MO	MO
	PIRAN GHAIB	62,485	32,765	29,720	1	0	0	0	0	0	0	0	2	MI	NO
	RANGEEL PUR	30,304	15,866	14,438	16	583	0	0	0	13	0	0	70	MO	MI
	TARAF MUBARIK DOIM	49,852	26,061	23,791	21	0	0	0	0	3	0	0	5	SE	MI
MULTAN SADDAR	5/FAIZ	32,688	16,580	16,108	18	3,100	0	0	0	202	37	13	2,434	MI	MI
	AALUM PUR	38,121	20,075	18,045	32	3,374	0	0	0	2,314	2	0	3,208	MO	MI
	ABBASPUR	30,938	16,542	14,396	14	3,181	0	0	12	721	39	0	1,929	MI	MI
	AYAZABAD MARAL	30,883	15,869	15,015	13	1,971	0	0	0	106	84	39	1,118	MI	MI
	BANGAL WALA	35,143	18,275	16,868	16	3,213	0	0	0	337	10	6	2,228	MI	MI
	BASTI MALOOK	36,213	18,607	17,606	13	3,705	0	0	9	0	13	0	2,787	MI	MI
	BILLI WALA	29,507	15,392	14,116	9	3,295	0	0	0	0	119	0	1,618	MI	MI
	BINDA SANDHILA	35,688	18,666	17,022	17	1,392	87	0	1,550	0	0	0	1,089	SE	MI
	BOCH KHUSRO ABAD	33,038	17,016	16,022	19	118	2,165	0	0	2,535	8	0	1,918	MI	NO
	BOOTE WALA	32,821	16,968	15,853	15	4,068	0	0	13	34	163	0	2,952	MI	NO
	BOSAN	40,370	21,085	19,285	19	806	2,784	0	0	1,595	112	2	2,897	NO	NO
	BUDHLA SANT	30,298	15,575	14,723	13	2,727	0	0	0	491	100	0	2,181	SE	MO
	CHAK NO 18/MR	30,799	15,887	14,912	11	4,565	0	0	56	57	4	0	3,408	SE	MO
	DOMEHRAH	38,003	19,963	18,039	8	744	0	0	0	417	1	0	347	MI	NO
	GHARIALA	42,290	21,757	20,532	23	7,490	0	0	6	213	50	0	6,250	MO	NO
	HAMID PUR KANORA	34,955	18,185	16,771	18	2,381	0	0	43	232	26	18	909	MI	NO
	JHOK LASHKAR PUR	35,708	18,421	17,287	22	3,968	0	0	0	496	86	0	2,143	NO	NO
	KABIR PUR	37,771	19,577	18,194	30	4,881	0	0	0	93	212	0	2,936	MO	MI
	KHAN PUR MARAL	30,266	15,507	14,759	12	4,161	0	0	0	6	2	0	3,401	MO	NO
	KHOKHAR	42,956	22,237	20,719	30	4,054	199	0	0	1,129	57	229	2,192	MI	MI
	KOTHIWALA	34,501	17,732	16,769	12	3,796	0	0	0	498	98	0	2,828	MO	MI
	KOTLA MAHARAN	37,585	19,371	18,213	11	6,313	0	0	0	158	202	0	4,756	MO	SE
	LAR	34,571	17,714	16,857	24	4,373	0	0	0	44	133	0	2,978	MI	MI
	LUTEF ABAD	36,913	19,502	17,411	11	467	861	0	0	2,310	0	17	1,346	MO	MI
	LUTHAR	41,380	21,360	20,019	18	4,722	0	0	15	777	22	0	3,413	MO	MO
	MAKHDOOM RASHID TOWN	55,852	28,992	26,860	16	4,022	1	0	0	45	163	0	3,276	MO	MO
	MATTI TAL	35,464	18,477	16,987	7	3,311	0	0	0	111	64	19	2,331	MO	NO
	MULTANI WALA	29,352	15,142	14,210	19	4,945	0	0	70	685	162	0	4,140	MO	MI
	QADIR PUR LAR	27,355	14,370	12,985	23	2,567	0	0	7	21	13	0	1,770	MO	NO
	QADIR PUR RAN TOWN	66,455	34,604	31,851	16	2,128	0	0	0	1,064	0	0	1,578	MO	NO
	QASBA	33,304	17,170	16,134	20	8,318	0	0	77	98	206	0	5,790	SE	MI
	RANA WAHAN	31,716	16,486	15,230	15	5,903	0	0	108	0	45	0	4,607	MI	MI
	SALEH MEHEY	30,929	16,403	14,526	13	81	0	0	0	1,261	0	1	184	MO	MO
	SHER SHAH	42,258	22,039	20,219	16	1,770	1,261	0	0	1,105	3	42	2,128	MO	MI
	TATEPUR	37,650	19,532	18,118	15	1,729	0	0	1	653	49	13	1,430	MO	MI

SHUJABAD

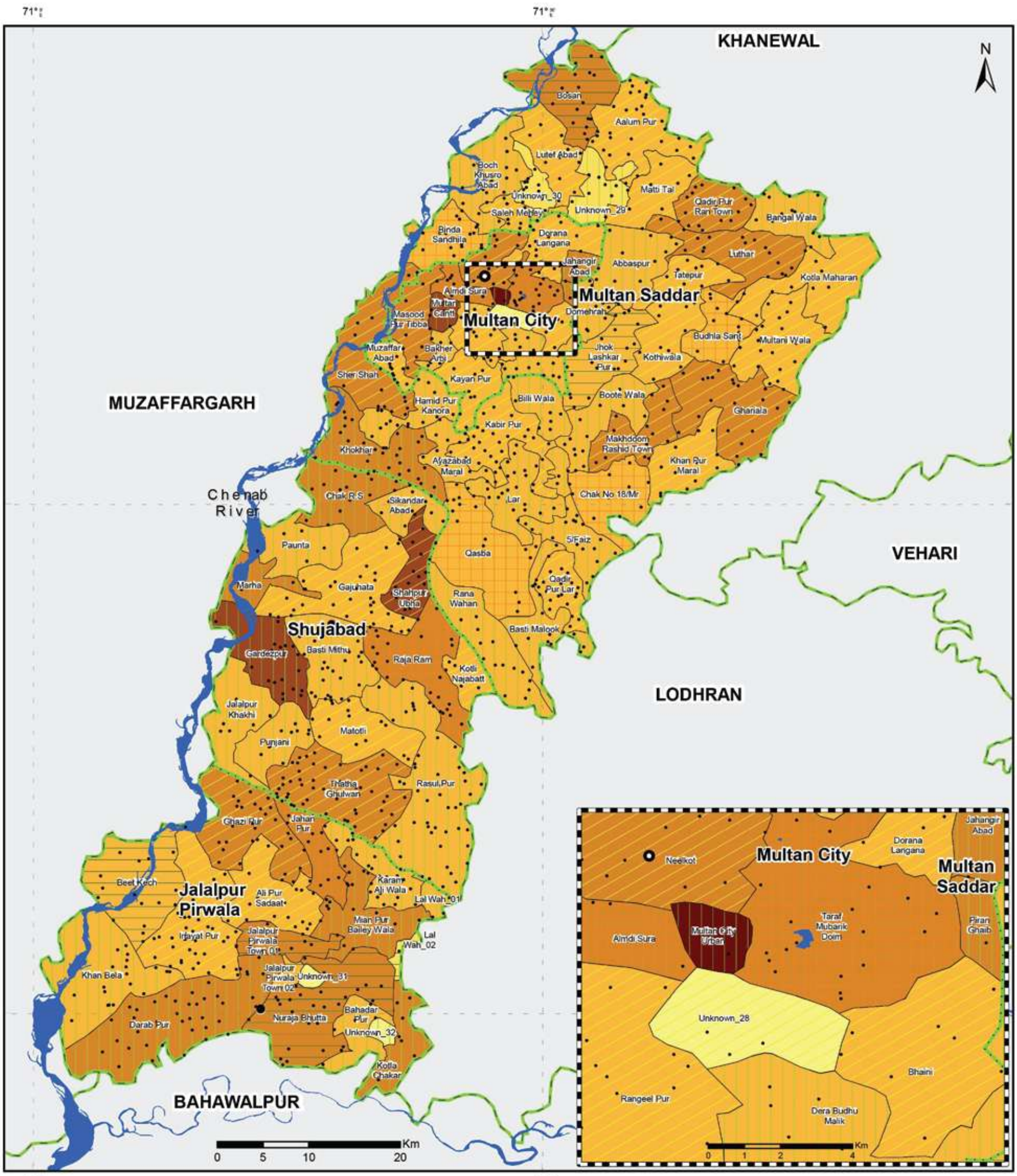
UNION COUNCILS	DEMOGRAPHICS				LAND USE AND LAND COVER TYPE (AREA IN HA)					AGRICULTURE CROPS (AREA IN HA)			DROUGHT PRONE	FREQUENTLY DROUGHT PRONE
										KHARIF CROP		RABI CROP		
	POPULATION	MALE	FEMALE	SETTLEMENTS	CROP IRRIGATED	CROP IN FLOOD PLAIN	CROP RAINFED	CROP MARGINAL & IRRIGATED SALINE	ORCHARDS	RICE	SUGARCANE	WHEAT		
BASTI MITHU	39,959	20,750	19,209	30	4,954	0	0	0	152	12	42	2,908	MI	MI
CHAK R.S	44,894	23,541	21,352	17	3,944	273	0	0	612	105	144	2,566	MI	NO
GAJUHATA	34,980	18,256	16,724	35	7,351	0	0	31	493	89	0	4,853	MO	MI
GARDEZPUR	87,390	45,253	42,137	18	4,259	288	0	0	267	7	1	3,281	MI	NO
JALALPUR KHAKHI	38,849	20,201	18,649	8	3,898	410	0	0	413	0	0	3,701	MI	MI
KOTLI NAJABATT	32,438	16,620	15,818	6	1,875	0	0	77	0	0	0	1,608	MO	MO
MARHA	42,480	22,344	20,136	3	361	1,036	0	9	130	0	0	1,109	MI	NO
MATOTLI	37,255	19,280	17,975	15	4,787	0	0	0	74	4	1	3,786	MO	NO
PAUNTA	30,677	16,055	14,621	6	3,328	493	0	32	56	142	11	2,869	MI	NO
PUNJANI	32,110	16,632	15,479	10	3,104	0	0	31	320	5	0	2,582	MI	NO
RAJA RAM	42,208	22,039	20,168	28	6,437	0	0	232	138	17	0	4,913	SE	MI
RASUL PUR	37,753	19,663	18,090	52	13,071	0	0	0	267	3	10	9,978	MI	MI
SHAHPUR UBHA	92,310	47,840	44,470	15	2,899	0	0	29	171	45	0	1,872	MO	MI
SIKANDAR ABAD	36,896	19,037	17,859	9	1,819	0	0	0	556	39	0	1,420	MI	NO
THATHA GHULWAN	45,111	23,514	21,597	51	8,218	0	0	57	312	0	0	6,093	MO	MO
DISTRICT TOTAL	5,107,859	2,681,410	2,426,448	1,370	263,067	15,605	0	3,510	33,380	2,828	732	199,572		

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	0	309,430	1,245,506	3,298,320	254,603	0	83,125	358,569	1,334,551	3,331,614
Settlements	0	133	599	536	102	0	22	185	661	502
Crop Irrigated	0	26,873	104,472	111,654	20,069	0	6,634	31,848	125,004	99,581
Crop in Flood plain	0	87	3,289	6,833	5,396	0	0	56	2,997	12,553
Crop Rainfed	0	0	0	0	0	0	0	0	0	0
Crop Marginal and Irrigated Saline	0	1,935	366	720	489	0	0	209	2,139	1,162
Orchards	0	1,172	19,747	10,155	2,295	0	511	5,494	15,250	12,124
Rice	0	327	1,216	1,078	207	0	202	289	1,468	868
Sugarcane	0	0	127	604	2	0	0	17	463	253
Wheat	0	19,431	79,915	84,323	15,903	0	4,944	24,598	89,390	80,640

SETTLEMENTS, VILLAGES, MAJOR TOWNS AND POPULATION



Legend

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

Population Distribution

- Abc <= 10000
- Abc 10001 - 20000
- Abc 20001 - 40000
- Abc 40001 - 80000
- Abc 80001 - 240000
- Abc >240000

Drought_FDP
Drought Prone Union Council

- No Drought
- Mild Drought
- Moderate
- Severe
- Extreme
- River and Reservoir
- Union Council Boundary
- Abc Tehsil Boundary
- ABC District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

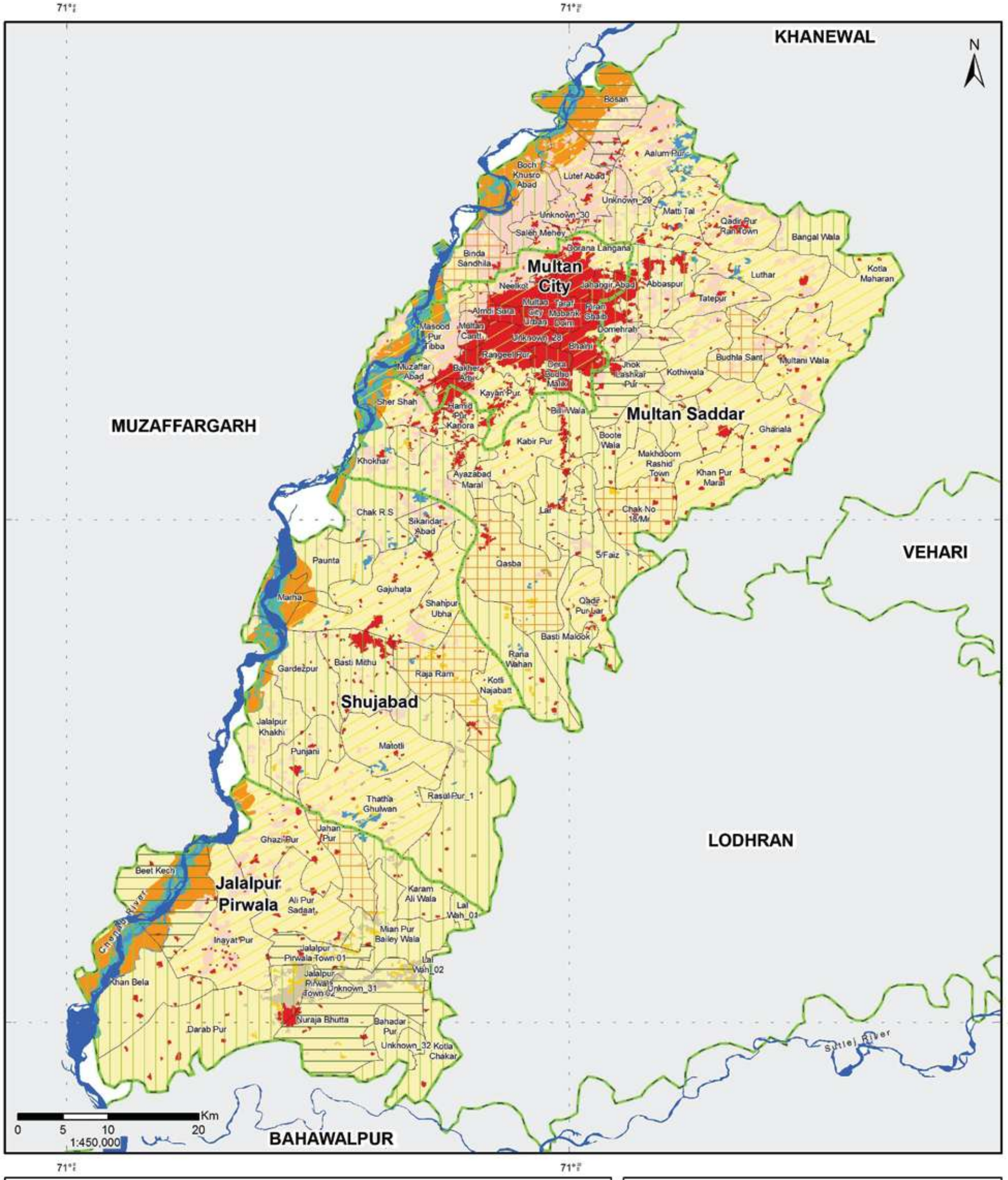
WFP United Nations World Food Programme

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

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
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provinvial Boundary
- Line of Control
- International Boundary

Drought Prone Union Council

- No Drought
- Mild
- Moderate
- Severe
- Extreme

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

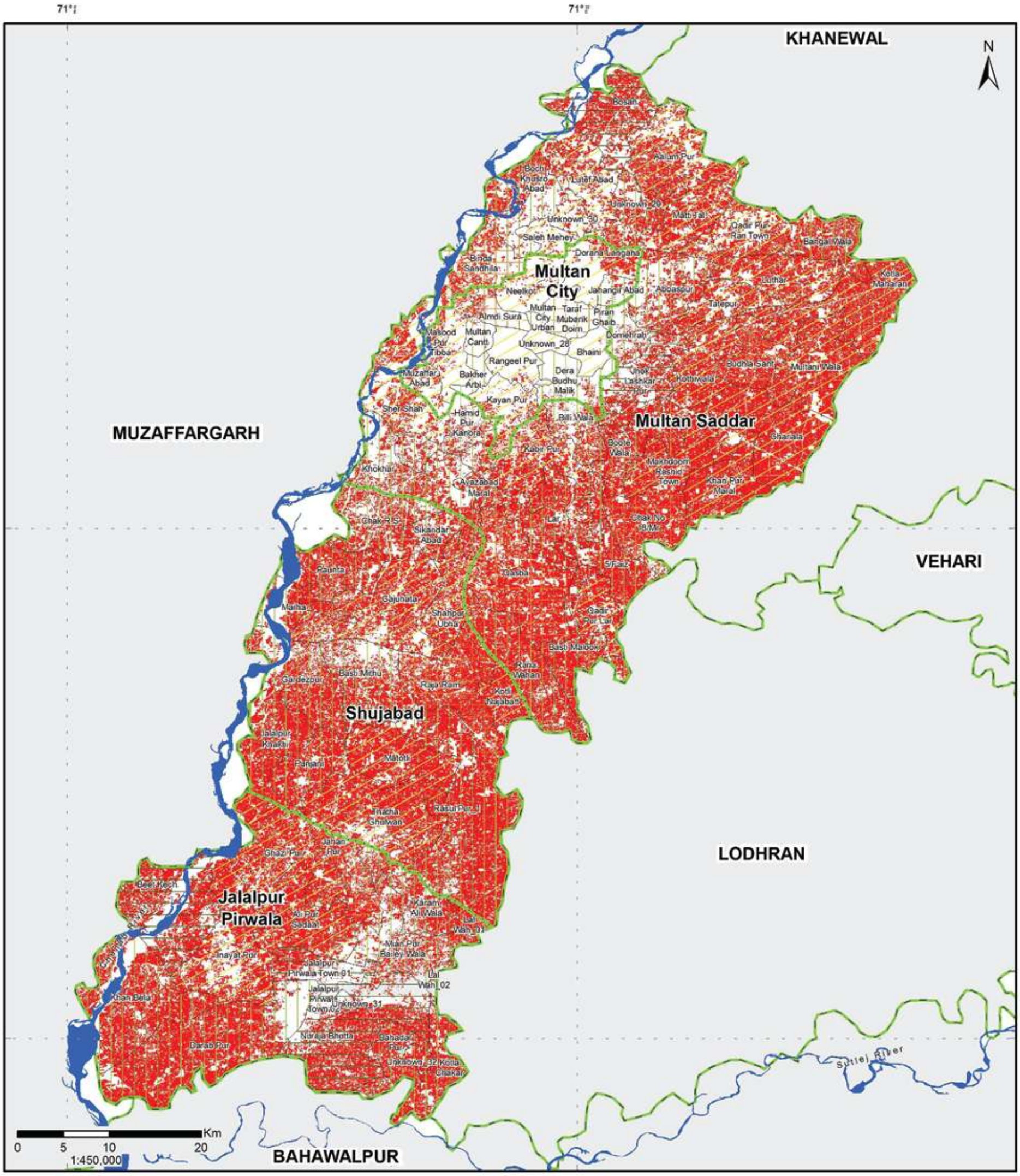
United Nations World Food Programme

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-622-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, Multan, 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-622-APR-2016-EXP-02-NDMA-DP-RB-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

CROP EXPOSED TO DROUGHT (KHARIF SEASON)

Legend

- Cotton
- Rice
- Sugarcane
- 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, Multan, 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

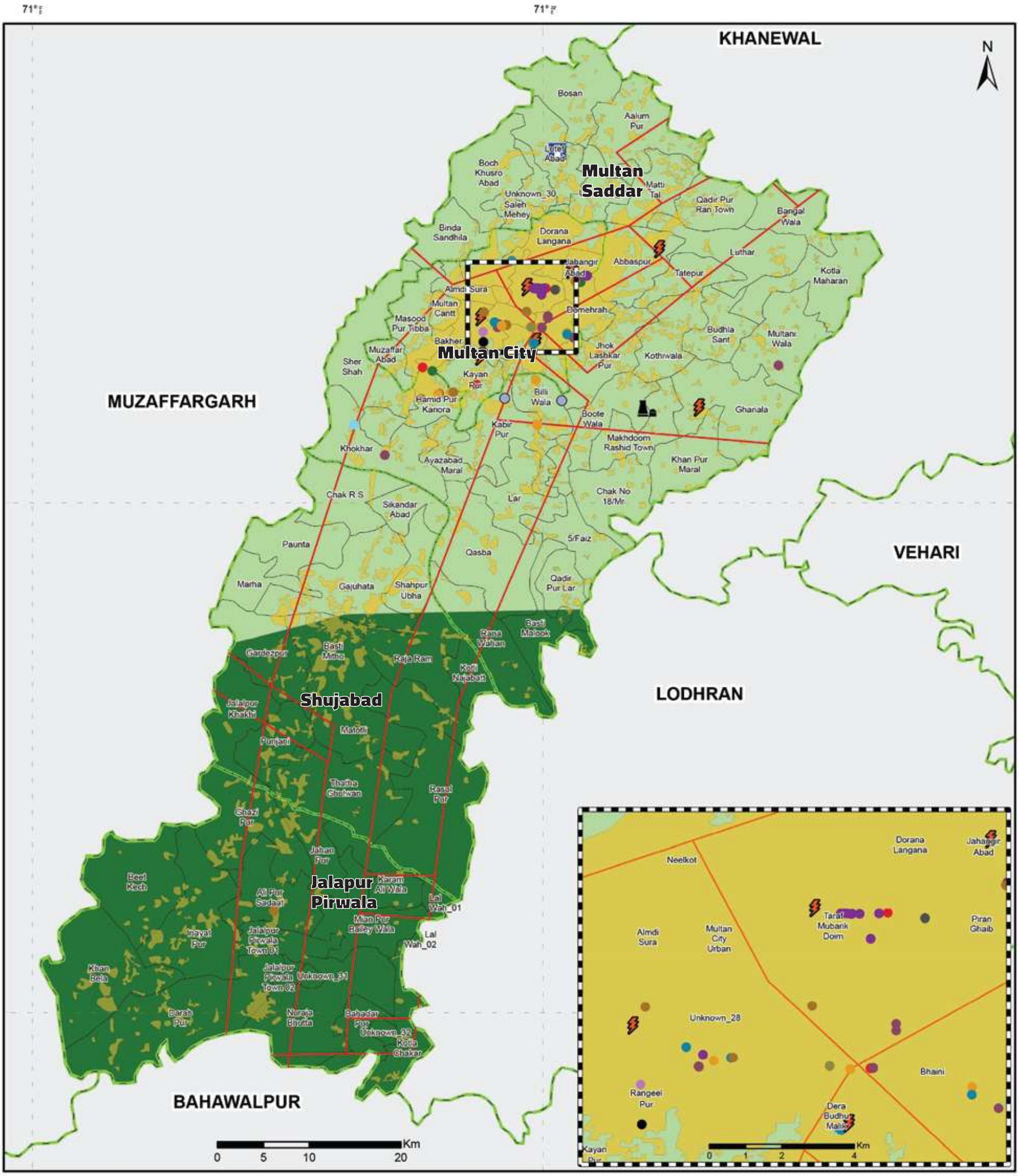
Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-APR-2016-EXP-02-NDMA-DP-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

23 ELEMENTS EXPOSED TO EARTHQUAKE HAZARD

		DEMOGRAPHICS					HOUSING & SETTLEMENTS																									TELECOMMUNICATION TOWERS					INDUSTRIAL UNITS					HEALTH FACILITIES				
		POPULATION					SETTLEMENTS					BUILDINGS (All Types)					PACCA BUILDINGS					SEMI PACCA BUILDINGS					KACHA BUILDINGS																			
	UNION COUNCILS	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
JALALPUR PIRWALA	ALI PUR SADAAT	0	0	36,833	0	0	0	0	21	0	0	0	0	191	0	0	0	0	44	0	0	0	0	28	0	0	0	0	119	0	0	0	0	7	0	0	0	0	1	0	0	0	0	0	0	0
	BAHADAR PUR	0	0	33,958	0	0	0	0	7	0	0	0	0	198	0	0	0	0	54	0	0	0	0	25	0	0	0	0	119	0	0	0	0	11	0	0	0	0	0	0	0	0	0	1	0	0
	BEET KECH	0	0	34,304	0	0	0	0	18	0	0	0	0	133	0	0	0	0	20	0	0	0	0	9	0	0	0	0	104	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	DARAB PUR	0	0	40,268	0	0	0	0	42	0	0	0	0	117	0	0	0	0	16	0	0	0	0	9	0	0	0	0	91	0	0	0	0	21	0	0	0	0	0	0	0	0	0	3	0	0
	GHAZI PUR	0	0	41,685	0	0	0	0	29	0	0	0	0	204	0	0	0	0	46	0	0	0	0	19	0	0	0	0	139	0	0	0	0	15	0	0	0	0	0	0	0	0	0	2	0	0
	INAYAT PUR	0	0	32,750	0	0	0	0	42	0	0	0	0	121	0	0	0	0	21	0	0	0	0	11	0	0	0	0	89	0	0	0	0	21	0	0	0	0	0	0	0	0	0	2	0	0
	JAHAN PUR	0	0	41,741	0	0	0	0	12	0	0	0	0	228	0	0	0	0	58	0	0	0	0	16	0	0	0	0	154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JALALPUR PIRWALA TOWN 01	0	0	38,849	0	0	0	0	12	0	0	0	0	442	0	0	0	0	222	0	0	0	0	48	0	0	0	0	172	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
	JALALPUR PIRWALA TOWN 02	0	0	45,508	0	0	0	0	0	0	0	0	0	434	0	0	0	0	267	0	0	0	0	25	0	0	0	0	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KARAM ALI WALA	0	0	35,131	0	0	0	0	23	0	0	0	0	225	0	0	0	0	69	0	0	0	0	8	0	0	0	0	148	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
	KHAN BELA	0	0	30,328	0	0	0	0	20	0	0	0	0	93	0	0	0	0	14	0	0	0	0	8	0	0	0	0	72	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1	0	0
	KOTLA CHAKAR	0	0	45,219	0	0	0	0	9	0	0	0	0	390	0	0	0	0	166	0	0	0	0	23	0	0	0	0	201	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0
	LAL WAH_01	0	0	27,445	0	0	0	0	5	0	0	0	0	122	0	0	0	0	24	0	0	0	0	15	0	0	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LAL WAH_02	0	0	12,880	0	0	0	0	1	0	0	0	0	84	0	0	0	0	22	0	0	0	0	8	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MIAN PUR BAILEY WALA	0	0	44,183	0	0	0	0	20	0	0	0	0	198	0	0	0	0	41	0	0	0	0	13	0	0	0	0	144	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	NURAJA BHUTTA	0	0	42,958	0	0	0	0	30	0	0	0	0	206	0	0	0	0	47	0	0	0	0	19	0	0	0	0	140	0	0	0	0	15	0	0	0	0	0	0	0	0	0	1	0	0
	TEHSIL TOTAL	0	0	597,048	0	0	0	0	292	0	0	0	0	3,386	0	0	0	0	1,131	0	0	0	0	284	0	0	0	0	1,971	0	0	0	0	117	0	0	0	0	2	0	0	0	0	11	0	0
MULTAN CITY	ALMDI SURA	0	0	45,540	0	0	0	0	11	0	0	0	0	543	0	0	0	0	296	0	0	0	0	33	0	0	0	0	214	0	0	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0
	BAKHER ARBI	0	0	35,143	0	0	0	0	7	0	0	0	0	342	0	0	0	0	165	0	0	0	0	91	0	0	0	0	85	0	0	0	0	49	0	0	0	0	0	0	0	0	0	0	0	0
	BHAINI	0	0	16,479	0	0	0	0	8	0	0	0	0	339	0	0	0	0	170	0	0	0	0	11	0	0	0	0	158	0	0	0	0	119	0	0	0	0	10	0	0	0	0	0	0	0
	DERA BUDHU MALIK	0	0	36,967	0	0	0	0	19	0	0	0	0	302	0	0	0	0	131	0	0	0	0	32	0	0	0	0	139	0	0	0	0	93	0	0	0	0	11	0	0	0	0	1	0	0
	DORANA LANGANA	0	0	35,510	0	0	0	0	17	0	0	0	0	400	0	0	0	0	214	0	0	0	0	11	0	0	0	0	176	0	0	0	0	68	0	0	0	0	1	0	0	0	0	2	0	0
	JAHANGIR ABAD	0	0	41,746	0	0	0	0	2	0	0	0	0	518	0	0	0	0	319	0	0	0	0	20	0	0	0	0	180	0	0	0	0	15	0	0	0	0	3	0	0	0	0	0	0	0
	KAYAN PUR	0	0	39,936	0	0	0	0	10	0	0	0	0	419	0	0	0	0	214	0	0	0	0	27	0	0	0	0	179	0	0	0	0	31	0	0	0	0	4	0	0	0	0	1	0	0
	MASOOD PUR TIBBA	0	0	40,040	0	0	0	0	11	0	0	0	0	483	0	0	0	0	267	0	0	0	0	31	0	0	0	0	184	0	0	0	0	25	0	0	0	0	1	0	0	0	0	0	0	0
	MULTAN CANTT	0	0	200,359	0	0	0	0	4	0	0	0	0	2,227	0	0	0	0	1,504	0	0	0	0	100	0	0	0	0	623	0	0	0	0	33	0	0	0	0	0	0	0	0	0	1	0	0
	MULTAN CITY URBAN	0	0	1,813,314	0	0	0	0	1	0	0	0	0	24,763	0	0	0	0	18,791	0	0	0	0	1,647	0	0	0	0	4,325	0	0	0	0	64	0	0	0	0	0	0	0	0	0	2	0	0
	MUZAFFAR ABAD	0	0	32,979	0	0	0	0	13	0	0	0	0	278	0	0	0	0	115	0	0	0	0	15	0	0	0	0	148	0	0	0	0	11	0	0	0	0	0	0	0	0	0	1	0	0
	NEELKOT	0	0	41,921	0	0	0	0	20	0	0	0	0	660	0	0	0	0	502	0	0	0	0	15	0	0	0	0	142	0	0	0	0	124	0	0	0	0	0	0	0	0	0	3	0	0
	PIRAN GHAIB	0	0	62,485	0	0	0	0	1	0	0	0	0	753	0	0	0	0	459	0	0	0	0	16	0	0	0	0	278	0	0	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0
	RANGEEL PUR	0	0	30,304	0	0	0	0	16	0	0	0	0	356	0	0	0	0	206	0	0	0	0	38	0	0	0	0	113	0	0	0	0	174	0	0	0	0	6	0	0	0	0	2	0	0
	TARAF MUBARIK DOIM	0	0	49,852	0	0	0	0	21	0	0	0	0	630	0	0	0	0	401	0	0	0	0	72	0	0	0	0	157	0	0	0	0	461	0	0	0	0	10	0	0	0	0	1	0	0
	TEHSIL TOTAL	0	0	2,522,575	0	0	0	0	164	0	0	0	0	33,013	0	0	0	0	23,754	0	0	0	0	2,159	0	0	0	0	7,101	0	0	0	0	1,606	0	0	0	0	54	0	0	0	0	17	0	0
MULTAN SADDAR	5/FAIZ	0	0	32,688	0	0	0	0	18	0	0	0	0	226	0	0	0	0	78	0	0	0	0	22	0	0	0	0	126	0	0	0	0	6	0	0	0	0	0	0	0	0	0	2	0	0
	AALUM PUR	0	0	38,121	0	0	0	0	32	0	0	0	0	209	0	0	0	0	53	0	0	0	0	7	0	0	0	0	149	0	0	0	0	8	0	0	0	0	0	0	0	0	0	2	0	0
	ABBASPUR	0	0	30,938	0	0	0	0	14	0	0	0	0	248	0	0	0	0	87	0	0	0	0	20	0	0	0	0	142	0	0	0	0	26	0	0	0	0	0	0	0	0	0	1	0	0
	AYAZABAD MARAL	0	0	30,883	0	0	0	0	13	0	0	0	0	216	0	0	0	0	76	0	0	0	0	7	0	0	0	0	133	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0
	BANGAL WALA	0	0	36,213	0	0	0	0	16	0	0	0	0	173	0	0	0	0	37	0	0	0	0	6	0	0	0	0	129	0	0	0	0	7	0	0	0	0	0	0	0	0	0	2	0	0
	BASTI MALOOK	0	0	39,959	0	0	0	0	13	0	0	0	0	261	0	0	0	0	99	0	0	0	0	29	0	0	0	0	133	0	0	0	0	11	0	0	0	0	0	0	0	0	0	1	0	0
	BILLI WALA	0	0	29,507	0	0	0	0	9	0	0	0	0	273	0	0	0	0	127	0	0	0	0	8	0	0	0	0	137	0	0	0	0	11	0	0	0	0	1	0	0	0	0	1	0	0
	BINDA SANDHILA	0	0	35,688	0	0	0	0	17	0	0	0	0	246	0	0	0	0	83	0	0	0	0	28	0	0	0	0	135	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
	BOCH KHUSRO ABAD	0	0	33,038	0	0	0	0	19	0	0	0	0	166	0	0	0	0	40	0	0	0	0	18	0	0	0	0	108	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	BOOTE WALA	0	0	32,821	0	0	0	0	15	0	0	0	0	244	0	0	0	0	92	0	0	0	0	11	0	0	0	0	140	0	0	0	0	11	0	0	0	0	0	0	0	0	0	2	0	0
	BOSAN	0	0	40,370	0	0	0	0	19	0	0	0	0	189	0	0	0	0	40	0	0	0	0	8	0	0	0	0	141	0	0	0	0	15	0	0	0	0	0	0	0	0	0	3	0	0
	BUDHLA SANT	0	0	30,298	0	0	0	0	13	0	0	0	0	263	0	0	0	0	114	0	0	0	0	10	0	0	0	0	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CHAK NO 18/MR	0	0	30,799	0	0	0	0	11	0	0	0	0	216	0	0	0	0	71	0	0	0	0	14	0	0	0	0	131	0	0	0	0	12	0	0	0	0	0	0	0	0	0	3	0	0
	DOMEHRAH	0	0	38,003	0	0	0	0	8	0	0	0	0	265	0	0	0	0	90	0	0	0	0	17	0	0	0	0	157	0	0	0	0	22	0	0	0	0	4	0	0	0	0	0	0	0
	GHARIALA	0	0	42,290	0	0	0	0	23	0	0	0	0	379	0	0	0	0	154	0	0	0	0	11	0	0	0	0	215	0	0	0	0	19	0	0	0	0	0	0	0	0	0	4	0	0
	HAMID PUR KANORA	0	0	34,955	0	0	0	0	18	0	0	0	0	323	0	0	0	0	144	0	0	0	0	21	0	0	0	0	159	0	0	0	0	15	0	0	0	0	12	0	0	0	0	2	0	0
	JHOK LASHKAR PUR	0	0	37,870	0	0	0	0	22	0	0	0	0	243	0	0	0	0	81	0	0	0	0	23	0	0	0	0	139	0	0	0	0	20	0	0	0	0	1	0	0	0	0	0	0	0
	KABIR PUR	0	0	37,771	0	0	0	0	30	0	0	0	0	321	0	0	0	0	134	0	0	0	0	3	0	0	0	0	183	0	0	0	0	25	0	0	0	0	4	0	0	0	0	1	0	0
	KHAN PUR MARAL	0	0	30,266	0	0	0	0	12	0	0	0	0	197	0	0	0	0	61	0	0	0	0	14	0	0	0	0	122	0	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0
	KHOKHAR	0	0	42,956	0	0	0	0	30	0	0	0	0	271	0	0	0	0	84	0	0	0	0	28	0	0	0	0	158	0	0	0	0	2	0	0	0	0	2	0	0	0	0	1	0	0
	KOTHIWALA	0	0	34,501	0	0	0	0	12	0	0	0	0	274	0	0	0	0	98	0	0	0	0	6	0	0	0	0	171	0	0	0	0	9	0	0	0	0	0	0	0	0	0	2	0	0
	KOTLA MAHARAN	0	0	37,585	0	0	0	0	11	0	0	0	0	230	0	0	0	0	67	0	0	0	0	21	0	0	0	0	141	0	0	0	0	8	0	0	0	0	0	0	0	0	0	1	0	0
	LAR	0	0	34,571	0	0	0	0	24	0	0	0	0	346	0	0	0	0	167	0	0	0	0	16	0	0	0	0	163	0	0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	0
	LUTEF ABAD	0	0	36,913	0	0	0	0	11	0	0	0	0	146	0	0	0	0	29	0	0	0	0	7	0	0	0	0	109	0	0	0	0	12	0	0	0	0	0	0	0	0	0	1	0	0
	LUTHAR	0	0	41,380	0	0	0	0	18	0	0	0	0	239	0	0	0	0	61	0	0	0	0	10	0	0	0	0	167	0	0	0	0	10	0	0	0	0	0	0	0	0	0	2	0	0
	MAKHDOOM RASHID TOWN	0	0	55,852	0	0	0	0	16	0	0	0	0	631	0	0	0	0	294	0	0	0	0	59	0	0	0	0	278	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
	MATTI TAL	0	0	35,464	0	0	0	0	7	0	0	0	0	254	0	0	0	0	89	0	0	0	0	7	0	0	0	0	157	0	0	0	0	8	0	0	0	0	0	0	0	0	0	1	0	0
	MULTANI WALA	0	0	29,352	0	0	0	0	19	0	0	0	0	254	0	0	0	0	99	0	0	0	0	7	0	0	0	0	148	0	0	0	0	12	0	0	0	0	1	0	0	0	0	1	0	0
	QADIR PUR LAR	0	0	27,355	0	0	0	0	23	0	0	0	0	53	0	0	0	0	5	0	0	0	0	12	0	0	0	0	36	0	0	0	0	4	0	0	0	0	0	0	0	0	0	2	0	0
	QADIR PUR RAN TOWN	0	0	66,455	0	0	0	0	16	0	0	0	0	605	0	0	0	0	217	0	0	0	0	61	0	0	0	0	327	0	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0	0
	QASBA	0	0	33,304	0	0	0	0	20	0	0	0	0	219	0	0	0	0	74	0	0	0	0	16	0	0	0	0	129	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0
	RANA WAHAN	0	0	42,208	0	0	0	0	15	0	0	0	0	171	0	0	0	0	47	0	0	0	0	12	0	0	0	0	113	0	0	0	0	9	0	0	0	0	0	0	0	0	0	1	0	0
	SALEH MEHEY	0	0	30,929	0	0	0	0	13	0	0	0	0	220	0	0	0	0	73	0	0	0	0	12	0	0	0	0	135	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
	SHER SHAH	0	0	42,258	0	0	0	0	16	0	0	0	0	296	0	0	0	0	99	0	0	0	0	25	0	0	0	0	172	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0
	TATEPUR	0	0	37,650	0	0	0	0	15	0	0	0	0	252	0	0	0	0	76	0	0	0	0	18	0	0	0	0	158	0	0	0	0	15	0	0	0	0	0	0	0	0	0	2	0	0
	TEHSIL TOTAL	0	0	1,309,942	0	0	0	0	611	0	0	0	0	9,279	0	0	0	0	3,279	0	0	0	0	601	0	0	0	0	5,395	0	0	0	0	388	0	0	0	0	25	0	0	0	0	42	0	0
MULTAN CITY	BASTI MITHU	0	0	39,309	0	0	0	0	30	0	0	0	0	140	0	0	0	0	29	0	0	0	0	11	0	0	0	0	100	0	0	0	0	57	0	0	0	0	0	0	0	0	0	2	0	0
	CHAK R.S	0	0	44,894	0	0	0	0	17	0	0	0	0	226	0	0	0	0	63	0	0	0	0	20	0	0	0	0	143	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0
	GAJUHATA	0	0	34,980	0	0	0	0	35	0	0	0	0	113	0	0	0	0	19	0	0	0	0	7	0	0	0	0	87	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0
	GARDEZPUR	0	0	87,390	0	0	0	0	18	0	0	0	0	645	0	0	0	0	285	0	0	0	0	18	0	0	0	0	343	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	JALALPUR KHAKHI	0	0	0	0	0	0	0	8	0	0	0	0	108	0	0	0	0	17	0	0	0	0	21	0	0	0	0	70	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	KOTLI NAJABATT	0	0	32,438	0	0	0	0	6	0	0	0	0	252	0	0	0	0	110	0	0	0	0	4	0	0	0	0	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MARHA	0	0	42,480	0	0	0	0	3	0	0	0	0	156	0	0	0	0	31	0	0	0	0	19	0	0	0	0	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MATOTLI	0	0	37,255	0	0	0	0	15	0	0	0	0	178	0	0	0	0	48	0	0	0	0	9	0	0	0	0	121	0	0	0	0	14	0	0	0	0	0	0	0	0	0	2	0	0
	PAUNTA	0	0	30,677	0	0	0	0	6	0	0	0	0	94	0	0	0	0	16	0	0	0	0	9	0	0	0	0	69	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	PUNJANI	0	0	32,110	0	0	0	0	10	0	0	0	0	154	0	0	0	0	40	0	0	0	0	10	0	0	0	0	105	0	0	0	0	6	0	0	0	0	0	0	0	0	0	2	0	0
	RAJA RAM	0	0	31,716	0	0	0	0	28	0	0	0	0	271	0	0	0	0	95	0	0	0	0	28	0	0	0	0	148	0	0	0	0	16	0	0	0	0	0	0	0	0	0	1	0	0
	RASUL PUR	0	0	37,753	0	0	0	0	52	0	0	0	0	160	0	0	0	0	35	0	0	0	0	14	0	0	0	0	112	0	0	0	0	7	0	0	0	0	0	0	0	0	0	1	0	0
	SHAHPUR UBHA	0	0	92,310	0	0	0	0	15	0	0	0	0	614	0	0	0	0	246	0	0	0	0	25	0	0	0	0	343	0	0	0	0	10	0	0	0	0	0	0	0	0	0	1	0	0
	SIKANDAR ABAD	0	0	36,896	0	0	0	0	9	0	0	0	0	265	0	0	0	0	104	0	0	0	0	15	0	0	0	0	146	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0
	THATHA GHULWAN	0	0	45,111	0	0	0	0	51	0	0	0	0	197	0	0	0	0	46	0	0	0	0	19	0	0	0	0	132	0	0	0	0	17	0	0	0	0	0	0	0	0	0	1	0	0
	TEHSIL TOTAL	0	0	625,319	0	0	0	0	303	0	0	0	0	3,573	0	0	0	0	1,184	0	0	0	0	229	0	0	0	0	2,164	0	0	0	0	169	0	0	0	0	0	0	0	0	0	13	0	0
	DISTRICT TOTAL	0	0	5,054,884	0	0	0	0	1,370	0	0	0	0	49,251	0	0	0	0	29,348	0	0	0	0	3,273	0	0	0	0	16,631	0	0	0	0	2,280	0	0	0	0	81	0	0	0	0	83	0	0

	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)					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
JALALPUR PIRWALA	ALI PUR SADAAT	0	0	5	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0	1,817	0	0	0	0	1143	0	0	0	0	90	0	0	0	0	10	0	0	0	0	0	0	0
	BAHADAR PUR	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1,569	0	0	0	0	782	0	0	0	0	72	0	0	0	0	12	0	0	0	0	0	0	0
	BEET KECH	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	0	256	0	0	0	0	346	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0
	DARAB PUR	0	0	6	0	0	0	0	46	0	0	0	0	22	0	0	0	0	0	0	0	0	0	37	0	0	0	0	4,064	0	0	0	0	3,109	0	0	0	0	224	0	0	0	0	6	0	0	0	0	0	0	0
	GHAZI PUR	0	0	6	0	0	0	0	11	0	0	0	0	12	0	0	0	0	0	0	0	0	0	16	0	0	0	0	1,577	0	0	0	0	1,253	0	0	0	0	97	0	0	0	0	9	0	0	0	0	0	0	0
	INAYAT PUR	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	29	0	0	0	0	3,139	0	0	0	0	1,854	0	0	0	0	148	0	0	0	0	6	0	0	0	0	0	0	0
	JAHAN PUR	0	0	2	0	0	0	0	4	0	0	0	0	7	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,181	0	0	0	0	770	0	0	0	0	63	0	0	0	0	8	0	0	0	0	0	0	0
	JALALPUR PIRWALA TOWN 01	0	0	3	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	1,111	0	0	0	0	923	0	0	0	0	62	0	0	0	0	3	0	0	0	0	0	0	0
	JALALPUR PIRWALA TOWN 02	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	51	0	0	0	0	51	0	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0
	KARAM ALI WALA	0	0	0	0	0	0	0	10	0	0	0	0	5	0	0	0	0	0	0	0	0	0	11	0	0	0	0	939	0	0	0	0	470	0	0	0	0	43	0	0	0	0	7	0	0	0	0	0	0	0
	KHAN BELA	0	0	0	0	0	0	0	5	0	0	0	0	24	0	0	0	0	0	0	0	0	0	20	0	0	0	0	2,055	0	0	0	0	1,148	0	0	0	0	90	0	0	0	0	0	0	0	0	0	0	0	0
	KOTLA CHAKAR	0	0	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	2,204	0	0	0	0	1,120	0	0	0	0	80	0	0	0	0	8	0	0	0	0	0	0	0
	LAL WAH_01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	536	0	0	0	0	198	0	0	0	0	22	0	0	0	0	4	0	0	0	0	0	0	0
	LAL WAH_02	0	0	0	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
	MIAN PUR BAILEY WALA	0	0	0	0	0	0	0	22	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0	0	0	0	479	0	0	0	0	323	0	0	0	0	26	0	0	0	0	17	0	0	0	0	0	0	0
	NURAJA BHUTTA	0	0	0	0	0	0	0	63	0	0	0	0	3	0	0	0	0	0	0	0	0	0	21	0	0	0	0	1,664	0	0	0	0	1,251	0	0	0	0	74	0	0	0	0	23	0	0	0	0	0	0	0
	TEHSIL TOTAL	0	0	22	0	0	0	0	251	0	0	0	0	87	0	0	0	0	0	0	0	0	0	219	0	0	0	0	22,902	0	0	0	0	14,874	0	0	0	0	1,115	0	0	0	0	116	0	0	0	0	0	0	0
MULTAN CITY	ALMDI SURA	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	676	0	0	0	0	1,503	0	0	0	0	66	0	0	0	0	4	0	0	0	0	0	0	0
	BAKHER ARBI	0	0	2	0	0	0	0	8	0	0	0	0	0	0	0	0	0	1	0	0	0	0	8	0	0	0	0	726	0	0	0	0	2,000	0	0	0	0	68	0	0	0	0	0	0	0	0	0	0	0	0
	BHAINI	0	0	8	0	0	0	0	0	0	0	0	0	3	0	0	0	0	4	0	0	0	0	11	0	0	0	0	804	0	0	0	0	1,719	0	0	0	0	78	0	0	0	0	8	0	0	0	0	0	0	0
	DERA BUDHU MALIK	0	0	17	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	4,982	0	0	0	0	7,070	0	0	0	0	347	0	0	0	0	12	0	0	0	0	0	0	0
	DORANA LANGANA	0	0	7	0	0	0	0	35	0	0	0	0	3	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1461	0	0	0	0	2,312	0	0	0	0	121	0	0	0	0	8	0	0	0	0	0	0	0
	JAHANGIR ABAD	0	0	2	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	654	0	0	0	0	1,471	0	0	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0
	KAYAN PUR	0	0	9	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	1,052	0	0	0	0	1,360	0	0	0	0	61	0	0	0	0	0	0	0	0	0	0	0	0
	MASOOD PUR TIBBA	0	0	4	0	0	0	0	17	0	0	0	0	3	0	0	0	0	4	0	0	0	0	17	0	0	0	0	4,365	0	0	0	0	3,501	0	0	0	0	220	0	0	0	0	6	0	0	0	0	0	0	0
	MULTAN CANTT	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	2,004	0	0	0	0	1,092	0	0	0	0	80	0	0	0	0	2	0	0	0	0	0	0	0
	MULTAN CITY URBAN	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	3,508	0	0	0	0	3,482	0	0	0	0	245	0	0	0	0	1	0	0	0	0	0	0	0
	MUZAFFAR ABAD	0	0	2	0	0	0	0	8	0	0	0	0	0	0	0	0	0	2	0	0	0	0	7	0	0	0	0	681	0	0	0	0	1,049	0	0	0	0	51	0	0	0	0	3	0	0	0	0	0	0	0
	NEELKOT	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	3,498	0	0	0	0	5,078	0	0	0	0	272	0	0	0	0	7	0	0	0	0	0	0	0
	PIRAN GHAIB	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	3,197	0	0	0	0	1,741	0	0	0	0	151	0	0	0	0	0	0	0	0	0	0	0	0
	RANGEEL PUR	0	0	6	0	0	0	0	31	0	0	0	0	0	0	0	0	0	4	0	0	0	0	28	0	0	0	0	6,605	0	0	0	0	11,004	0	0	0	0	494	0	0	0	0	0	0	0	0	0	0	0	0
	TARAF MUBARIK DOIM	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	0	0	0	0	20,995	0	0	0	0	22,594	0	0	0	0	1,596	0	0	0	0	2	0	0	0	0	0	0	0
	TEHSIL TOTAL	0	0	80	0	0	0	0	270	0	0	0	0	8	0	0	0	0	20	0	0	0	0	357	0	0	0	0	62,821	0	0	0	0	75,520	0	0	0	0	4,482	0	0	0	0	56	0	0	0	0	0	0	0
MULTAN SADDAR	5/FAIZ	0	0	2	0	0	0	0	11	0	0	0	0	5	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,794	0	0	0	0	1,360	0	0	0	0	89	0	0	0	0	1	0	0	0	0	0	0	0
	AALUM PUR	0	0	13	0	0	0	0	50	0	0	0	0	5	0	0	0	0	0	0	0	0	0	31	0	0	0	0	2,968	0	0	0	0	1,527	0	0	0	0	173	0	0	0	0	8	0	0	0	0	0	0	0
	ABBASPUR	0	0	12	0	0	0	0	46	0	0	0	0	0	0	0	0	0	5	0	0	0	0	15	0	0	0	0	1,506	0	0	0	0	1,169	0	0	0	0	86	0	0	0	0	15	0	0	0	0	0	0	0
	AYAZABAD MARAL	0	0	4	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	1,022	0	0	0	0	630	0	0	0	0	34	0	0	0	0	1	0	0	0	0	0	0	0
	BANGAL WALA	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	2	0	0	0	0	7	0	0	0	0	1,147	0	0	0	0	519	0	0	0	0	70	0	0	0	0	10	0	0	0	0	0	0	0
	BASTI MALOOK	0	0	4	0	0	0	0	15	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7	0	0	0	0	461	0	0	0	0	366	0	0	0	0	20	0	0	0	0	0	0	0	0	0	1	0	0
	BILLI WALA	0	0	4	0	0	0	0	27	0	0	0	0	2	0	0	0	0	0	0	0	0	0	15	0	0	0	0	850	0	0	0	0	1,331	0	0	0	0	61	0	0	0	0	8	0	0	0	0	0	0	0
	BINDA SANDHILA	0	0	0	0	0	0	0	21	0	0	0	0	6	0	0	0	0	0	0	0	0	0	9	0	0	0	0	545	0	0	0	0	759	0	0	0	0	44	0	0	0	0	3	0	0	0	0	1	0	0
	BOCH KHUSRO ABAD	0	0	0	0	0	0	0	29	0	0	0	0	5	0	0	0	0	0	0	0	0	0	3	0	0	0	0	552	0	0	0	0	281	0	0	0	0	19	0	0	0	0	0	0	0	0	0	1	0	0
	BOOTE WALA	0	0	3	0	0	0	0	38	0	0	0	0	1	0	0	0	0	0	0	0	0	0	15	0	0	0	0	1,975	0	0	0	0	1,261	0	0	0	0	105	0	0	0	0	9	0	0	0	0	0	0	0
	BOSAN	0	0	6	0	0	0	0	14	0	0	0	0	20	0	0	0	0	0	0	0	0	0	16	0	0	0	0	1,483	0	0	0	0	831	0	0	0	0	77	0	0	0	0	0	0	0	0	0	0	0	0
	BUDHLA SANT	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	689	0	0	0	0	566	0	0	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0
	CHAK NO 18/MR	0	0	5	0	0	0	0	21	0	0	0	0	7	0	0	0	0	0	0	0	0	0	17	0	0	0	0	2,294	0	0	0	0	1,481	0	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0
	DOMEHRAH	0	0	3	0	0	0	0	17	0	0	0	0	0	0	0	0	0	5	0	0	0	0	9	0	0	0	0	3,346	0	0	0	0	3,236	0	0	0	0	199	0	0	0	0	2	0	0	0	0	0	0	0
	GHARIALA	0	0	0	0	0	0	0	60	0	0	0	0	2	0	0	0	0	0	0	0	0	0	35	0	0	0	0	3,779	0	0	0	0	3,671	0	0	0	0	257	0	0	0	0	5	0	0	0	0	0	0	0
	HAMID PUR KANORA	0	0	12	0	0	0	0	24	0	0	0	0	0	0	0	0	0	7	0	0	0	0	6	0	0	0	0	1,437	0	0	0	0	404	0	0	0	0	43	0	0	0	0	0	0	0	0	0	1	0	0
	JHOK LASHKAR PUR	0	0	10	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	2,502	0	0	0	0	1,969	0	0	0	0	132	0	0	0	0	14	0	0	0	0	1	0	0
	KABIR PUR	0	0	6	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	2,402	0	0	0	0	2,355	0	0	0	0	127	0	0	0	0	15	0	0	0	0	0	0	0
	KHAN PUR MARAL	0	0	1	0	0	0	0	22	0	0	0	0	1	0	0	0	0	0	0	0	0	0	16	0	0	0	0	1,228	0	0	0	0	492	0	0	0	0	70	0	0	0	0	3	0	0	0	0	0	0	0
	KHOKHAR	0	0	7	0	0	0	0	41	0	0	0	0	4	0	0	0	0	6	0	0	0	0	12	0	0	0	0	977	0	0	0	0	626	0	0	0	0	40	0	0	0	0	6	0	0	0	0	1	0	0
	KOTHIWALA	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	1,368	0	0	0	0	1,046	0	0	0	0	99	0	0	0	0	5	0	0	0	0	0	0	0
	KOTLA MAHARAN	0	0	0	0	0	0	0	38	0	0	0	0	1	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1,627	0	0	0	0	1,213	0	0	0	0	102	0	0	0	0	0	0	0	0	0	0	0	0
	LAR	0	0	6	0	0	0	0	22	0	0	0	0	1	0	0	0	0	0	0	0	0	0	11	0	0	0	0	716	0	0	0	0	726	0	0	0	0	41	0	0	0	0	6	0	0	0	0	0	0	0
	LUTEF ABAD	0	0	12	0	0	0	0	13	0	0	0	0	5	0	0	0	0	0	0	0	0	0	12	0	0	0	0	1,442	0	0	0	0	877	0	0	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0
	LUTHAR	0	0	4	0	0	0	0	56	0	0	0	0	0	0	0	0	0	8	0	0	0	0	20	0	0	0	0	2,079	0	0	0	0	1,333	0	0	0	0	119	0	0	0	0	6	0	0	0	0	0	0	0
	MAKHDOOM RASHID TOWN	0	0	4	0	0	0	0	14	0	0	0	0	9	0	0	0	0	0	0	0	0	0	13	0	0	0	0	769	0	0	0	0	594	0	0	0	0	51	0	0	0	0	6	0	0	0	0	0	0	0
	MATTI TAL	0	0	1	0	0	0	0	38	0	0	0	0	2	0	0	0	0	0	0	0	0	0	13	0	0	0	0	1,342	0	0	0	0	1,103	0	0	0	0	77	0	0	0	0	10	0	0	0	0	0	0	0
	MULTANI WALA	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	1,548	0	0	0	0	1,562	0	0	0	0	131	0	0	0	0	0	0	0	0	0	0	0	0
	QADIR PUR LAR	0	0	7	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	2,119	0	0	0	0	1,407	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0
	QADIR PUR RAN TOWN	0	0	13	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	2,944	0	0	0	0	1,956	0	0	0	0	138	0	0	0	0	3	0	0	0	0	0	0	0
	QASBA	0	0	0	0	0	0	0	52	0	0	0	0	11	0	0	0	0	0	0	0	0	0	19	0	0	0	0	2,279	0	0	0	0	1,728	0	0	0	0	105	0	0	0	0	17	0	0	0	0	0	0	0
	RANA WAHAN	0	0	0	0	0	0	0	20	0	0	0	0	6	0	0	0	0	0	0	0	0	0	18	0	0	0	0	1,885	0	0	0	0	1,142	0	0	0	0	84	0	0	0	0	7	0	0	0	0	1	0	0
	SALEH MEHEY	0	0	2	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	1,167	0	0	0	0	1,286	0	0	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0
	SHER SHAH	0	0	7	0	0	0	0	14	0	0	0	0	0	0	0	0	0	4	0	0	0	0	15	0	0	0	0	1,949	0	0	0	0	1,492	0	0	0	0	92	0	0	0	0	5	0	0	0	0	0	0	0
	TATEPUR	0	0	0	0	0	0	0	27	0	0	0	0	1	0	0	0	0	7	0	0	0	0	9	0	0	0	0	1,281	0	0	0	0	1,056	0	0	0	0	89	0	0	0	0	8	0	0	0	0	1	0	0
	TEHSIL TOTAL	0	0	151	0	0	0	0	1,022	0	0	0	0	106	0	0	0	0	44	0	0	0	0	533	0	0	0	0	58,620	0	0	0	0	44,363	0	0	0	0	3,242	0	0	0	0	176	0	0	0	0	8	0	0
MULTAN CITY	BASTI MITHU	0	0	12	0	0	0	0	36	0	0	0	0	0	0	0	0	0	1	0	0	0	0	38	0	0	0	0	4,587	0	0	0	0	4,518	0	0	0	0	332	0	0	0	0	2	0	0	0	0	0	0	0
	CHAK R.S	0	0	1	0	0	0	0	23	0	0	0	0	4	0	0	0	0	6	0	0	0	0	9	0	0	0	0	802	0	0	0	0	509	0	0	0	0	33	0	0	0	0	7	0	0	0	0	0	0	0
	GAJUHATA	0	0	11	0	0	0	0	37	0	0	0	0	11	0	0	0	0	10	0	0	0	0	43	0	0	0	0	4,353	0	0	0	0	2,773	0	0	0	0	231	0	0	0	0	5	0	0	0	0	0	0	0
	GARDEZPUR	0	0	0	0	0	0	0	11	0	0	0	0	3	0	0	0	0	0	0	0	0	0	20	0	0	0	0	2,182	0	0	0	0	1,958	0	0	0	0	116	0	0	0	0	15	0	0	0	0	1	0	0
	JALALPUR KHAKHI	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	7	0	0	0	0	329	0	0	0	0	181	0	0	0	0	15	0	0	0	0	12	0	0	0	0	0	0	0
	KOTLI NAJABATT	0	0	0	0	0	0	0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	7	0	0	0	0	867	0	0	0	0	341	0	0	0	0	43	0	0	0	0	5	0	0	0	0	0	0	0
	MARHA	0	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	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
	MATOTLI	0	0	2	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	0	1,774	0	0	0	0	1,659	0	0	0	0	104	0	0	0	0	9	0	0	0	0	0	0	0
	PAUNTA	0	0	0	0	0	0	0	8	0	0	0	0	3	0	0	0	0	0	0	0	0	0	7	0	0	0	0	642	0	0	0	0	276	0	0	0	0	25	0	0	0	0	4	0	0	0	0	0	0	0
	PUNJANI	0	0	3	0	0	0	0	12	0	0	0	0	9	0	0	0	0	0	0	0	0	0	16	0	0	0	0	1,691	0	0	0	0	1,111	0	0	0	0	87	0	0	0	0	11	0	0	0	0	0	0	0
	RAJA RAM	0	0	11	0	0	0	0	33	0	0	0	0	5	0	0	0	0	13	0	0	0	0	22	0	0	0	0	2,795	0	0	0	0	1,610	0	0	0	0	133	0	0	0	0	15	0	0	0	0	0	0	0
	RASUL PUR	0	0	3	0	0	0	0	37	0	0	0	0	19	0	0	0	0	2	0	0	0	0	30	0	0	0	0	2,542	0	0	0	0	1,431	0	0	0	0	113	0	0	0	0	21	0	0	0	0	0	0	0
	SHAHPUR UBHA	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	1,385	0	0	0	0	1,937	0	0	0	0	109	0	0	0	0	1	0	0	0	0	0	0	0
	SIKANDAR ABAD	0	0	4	0	0	0	0	15	0	0	0	0	0	0	0	0	0	1	0	0	0	0	8	0	0	0	0	1,053	0	0	0	0	533	0	0	0	0	53	0	0	0	0	0	0	0	0	0	0	0	0
	THATHA GHULWAN	0	0	7	0	0	0	0	41	0	0	0	0	1	0	0	0	0	0	0	0	0	0	33	0	0	0	0	2,065	0	0	0	0	963	0	0	0	0	99	0	0	0	0	20	0	0	0	0	0	0	0
	TEHSIL TOTAL	0	0	54	0	0	0	0	297	0	0	0	0	63	0	0	0	0	33	0	0	0	0	278	0	0	0	0	27,067	0	0	0	0	19,800	0	0	0	0	1,493	0	0	0	0	127	0	0	0	0	1	0	0
	DISTRICT TOTAL	0	0	307	0	0	0	0	1,840	0	0	0	0	264	0	0	0	0	96	0	0	0	0	1,387	0	0	0	0	171,410	0	0	0	0	154,557	0	0	0	0	10,332	0	0	0	0	475	0	0	0	0	9	0	0

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



Legend

- Chemical and Fertilizer Industry
- Cold Storage
- Flour Mill
- Food Products Industry
- Glass Manufacturing Industry
- Ice Factory
- Marble Factory
- Textile Industry
- Oil Mill
- Printing Press
- Rice Mill
- Solvent Plant
- Tannery
- Purification Plant
- Oil Storage
- Grid Station
- Aviation Fueling Facility
- Sui Northern Gas Pipeline
- Builtup Area
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Hazard Zone (g)*

1	(0.05-0.08)	Very Low
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, Multan, Punjab, Pakistan

United Nations World Food Programme

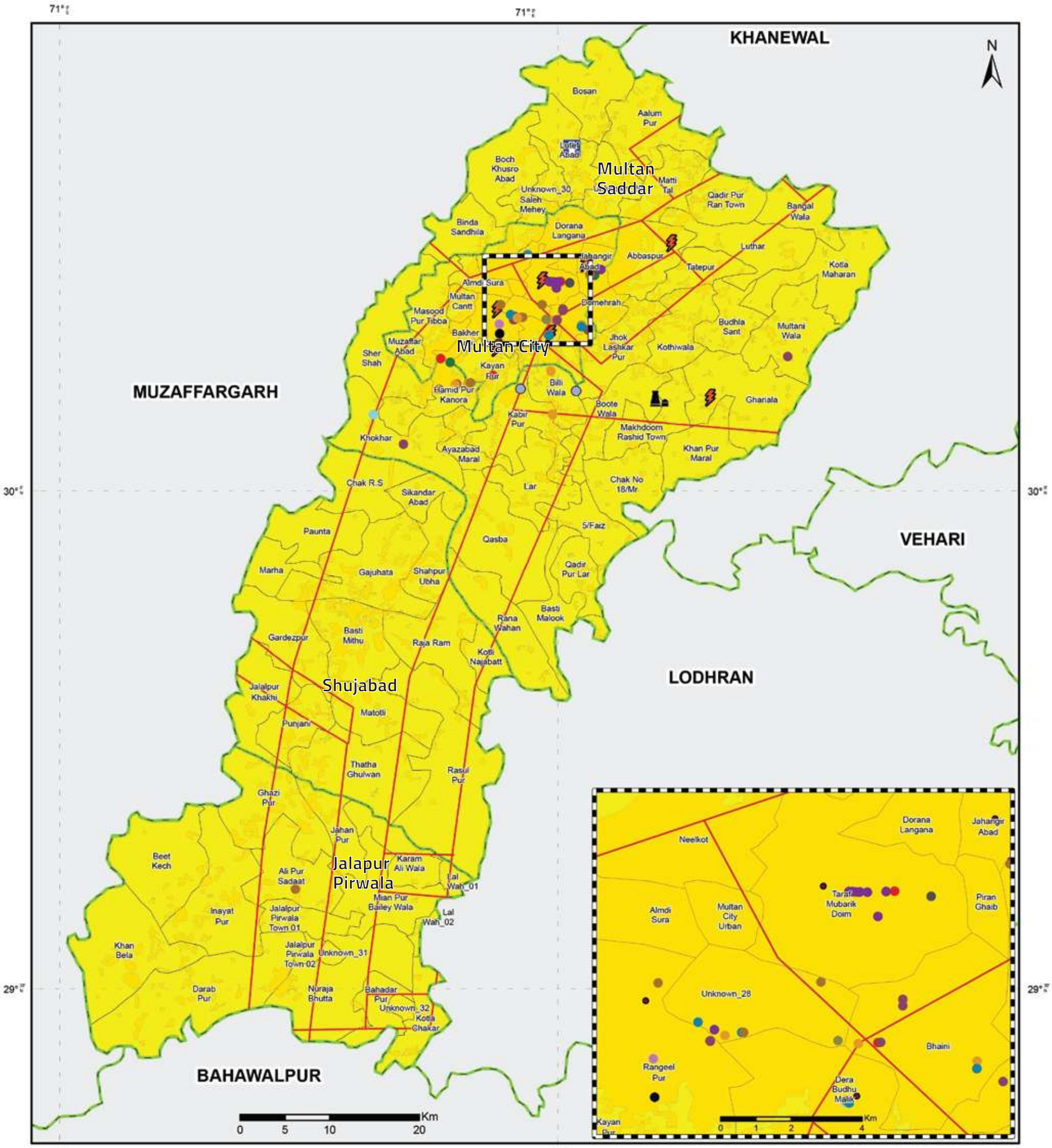
MAP INFORMATION

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

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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

- Chemical and Fertilizer Industry
- Cold Storage
- Flour Mill
- Food Products Industry
- Glass Manufacturing Industry
- Ice Factory
- Marble Factory
- Textile Industry
- Oil Mill
- Printing Press
- Rice Mill
- Solvent Plant
- Tannery
- Purification Plant
- Oil Storage
- Grid Station
- Aviation Feuling Facility
- Sui Northern Gas Pipeline
- Builtup Area
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International 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, Multan, Punjab, Pakistan

United Nations World Food Programme

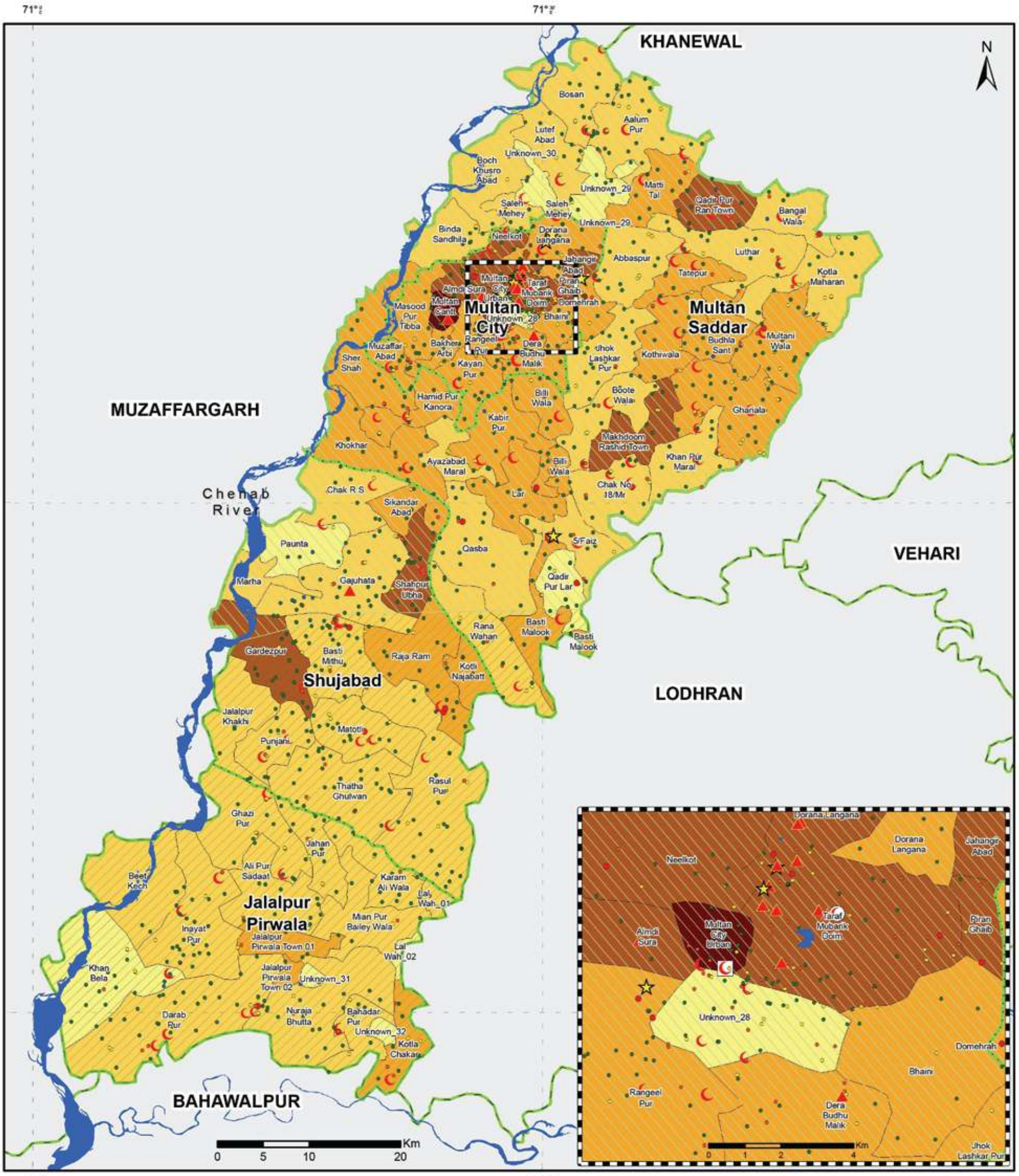
MAP INFORMATION

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

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-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
- Masjib/Maktab School

Building Distribution

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000

Return Period 50 Years

- Very Low (Zone 1)
- Low (Zone 2A)
- River and Water Body
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

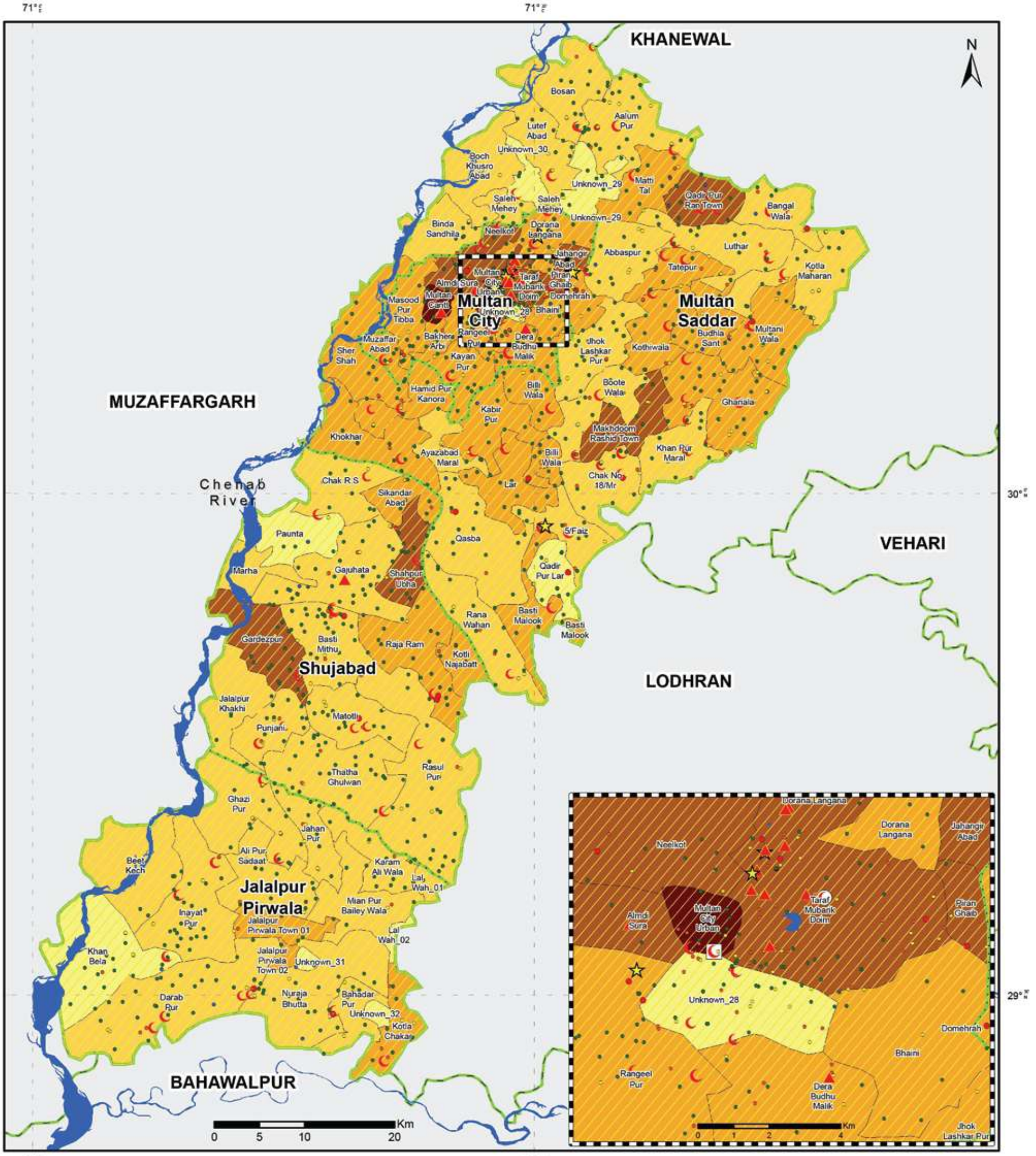
WFP United Nations World Food Programme

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-622-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 YEARS 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
- Masjib/Maktab School

Building Distribution

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000

Return Period 475 Years

- Moderate (Zone 2B)

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

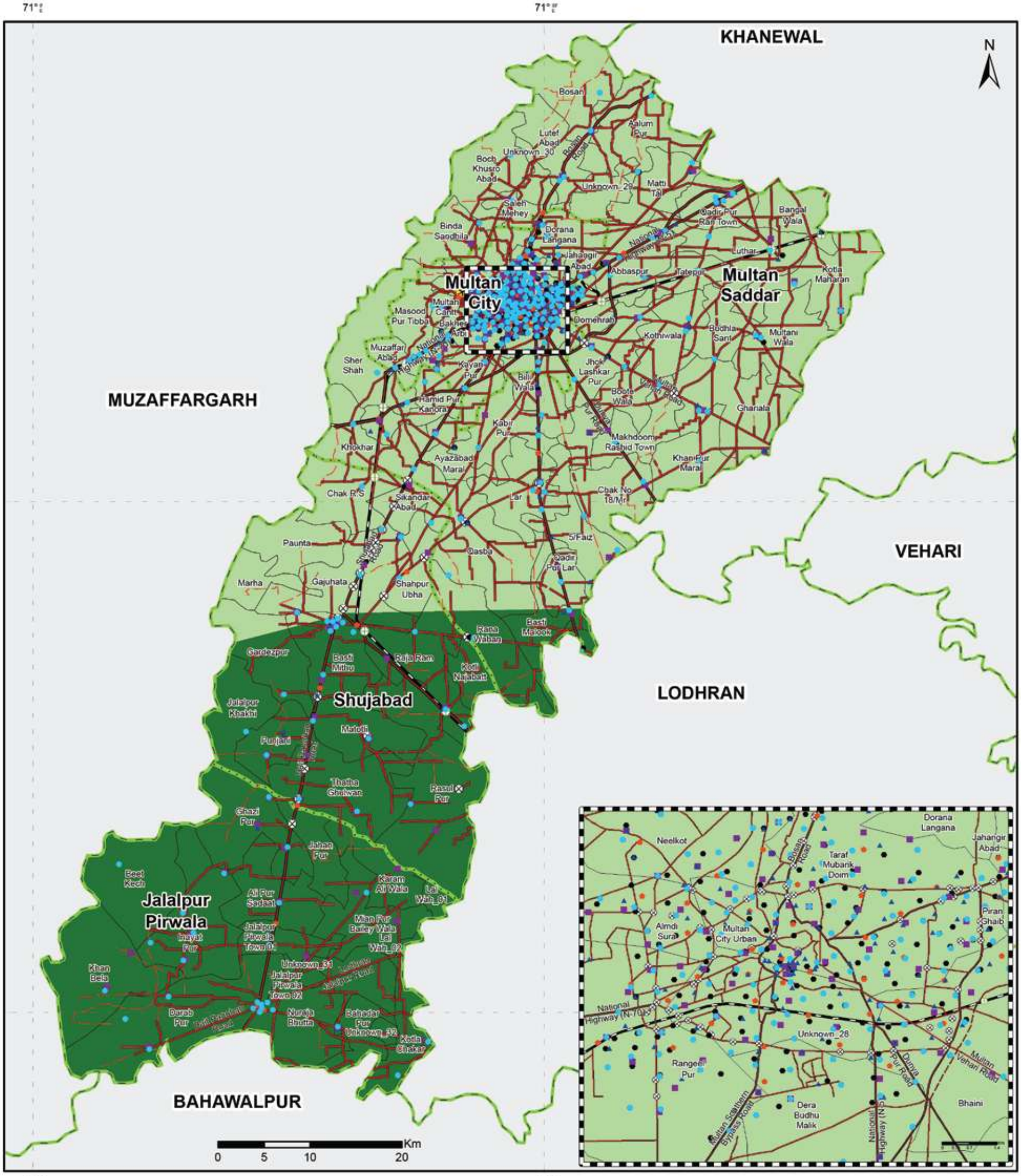
Multi Hazard Vulnerability & Risk Assessment, Multan, Punjab, Pakistan

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-622-APR-2016-EXP-03-NDMA-475-C(HF-EF-BD)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

COMMUNICATION TOWERS AND TRANSPORTATION NETWORK EXPOSED TO EARTHQUAKE 50 YEARS RETURN PERIOD



Legend

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Stop
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Return Period 50 Years

- Very Low (Zone 1)
- Low (Zone 2A)

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

WFP United Nations World Food Programme

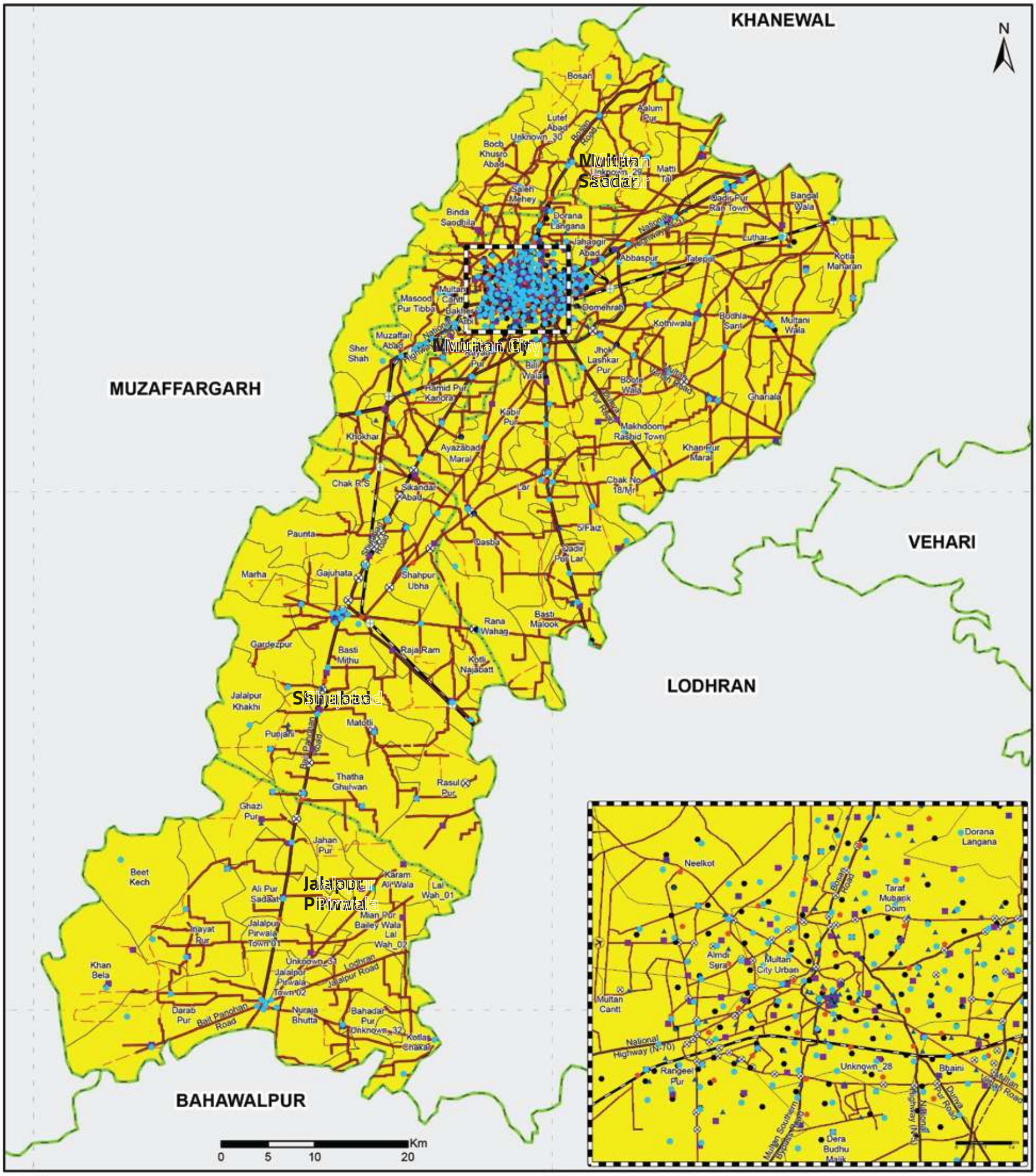
MAP INFORMATION

Data Source(s):
Survey of Pakistan
National Highway Authority
Pakistan Telecommunication Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-APR-2016-EXP-03-NDMA-50-C(TR-CT)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

COMMUNICATION TOWERS AND TRANSPORTATION NETWORK EXPOSED TO EARTHQUAKE 475 YEAR RETURN PERIOD



Legend

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Stop
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- Abc — Union Council Boundary
- Abc — Tehsil Boundary
- ABC — District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

Return Period 475 Years

- Moderate (Zone 2B)

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

WFP United Nations World Food Programme

MAP INFORMATION

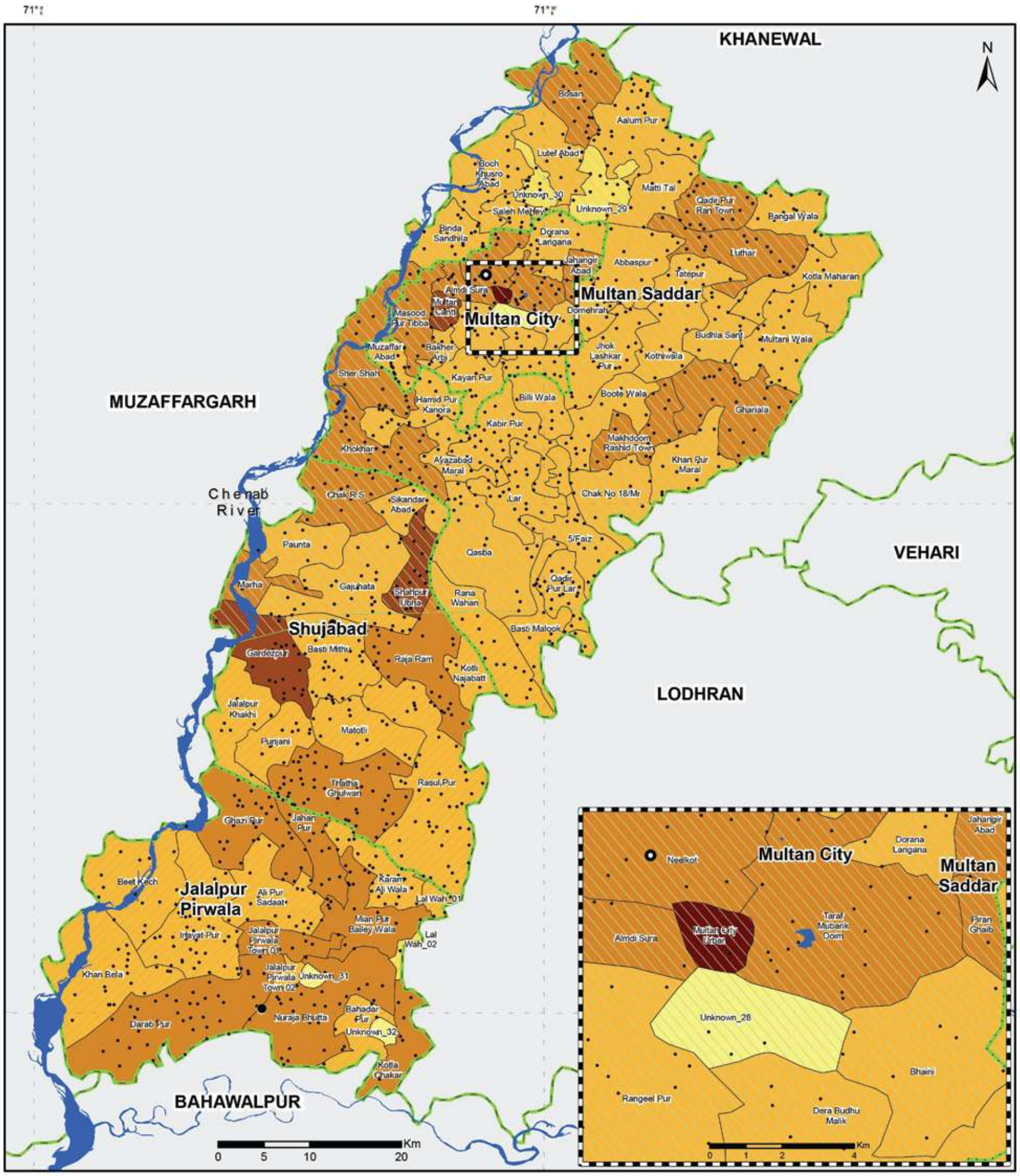
Data Source(s):

Survey of Pakistan
National Highway Authority
Pakistan Telecommunication Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-APR-2016-EXP-03-NDMA-475-C(TR-CT)
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 Towns
- Settlements / Villages

Population Distribution

- <= 10000
- 10001 - 20000
- 20001 - 40000
- 40001 - 80000
- 80001 - 240000
- >240000

- Very Low (Zone 1)
- Low (Zone 2A)
- River and Reservoir
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

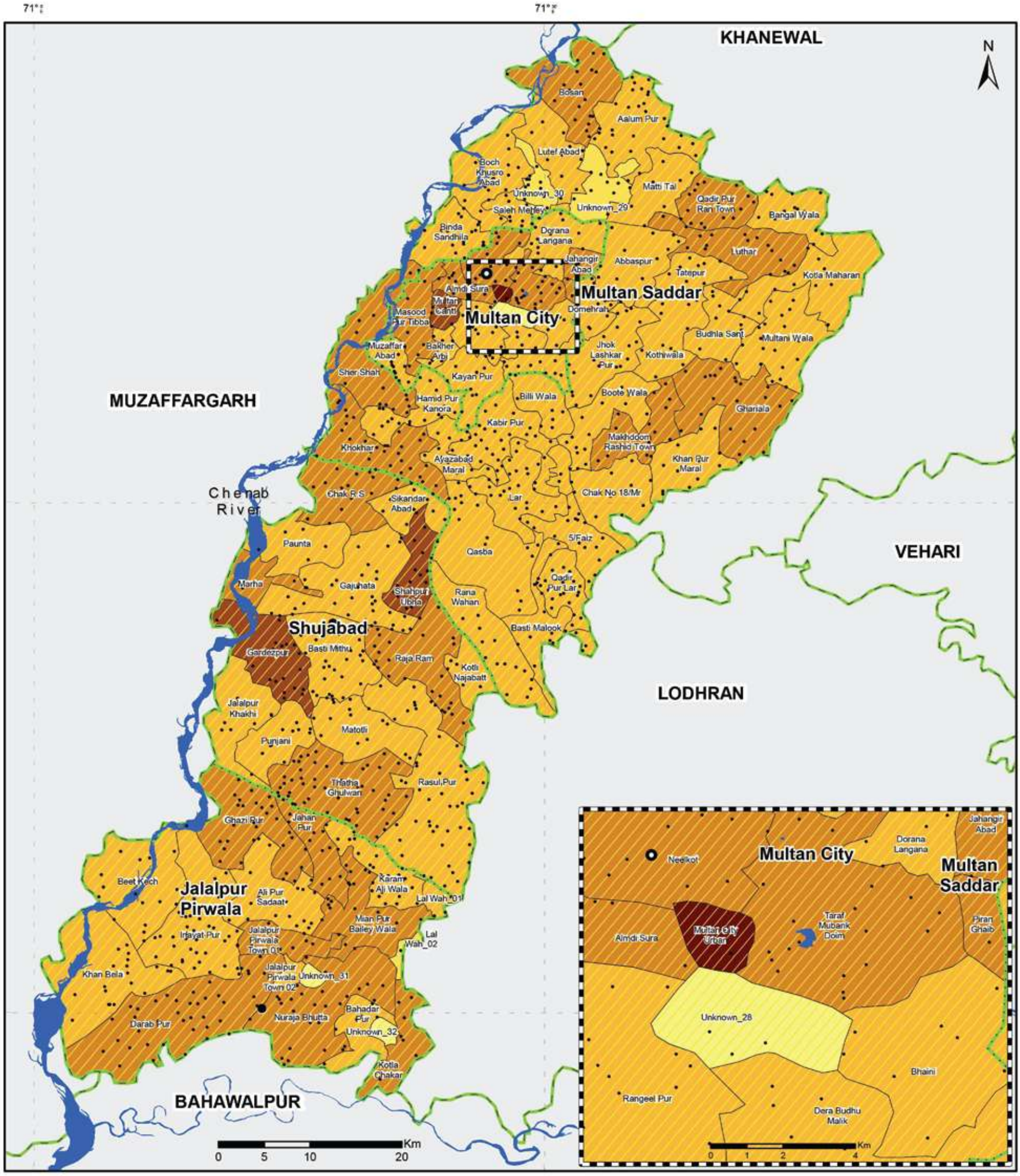
United Nations World Food Programme

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

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



Legend

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

Population Distribution

- <= 10000
- 10001 - 20000
- 20001 - 40000
- 40001 - 80000
- 80001 - 240000
- >240000

- Moderate (Zone 2B)
- River and Reservoir
- Union Council Boundary
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

United Nations World Food Programme

MAP INFORMATION

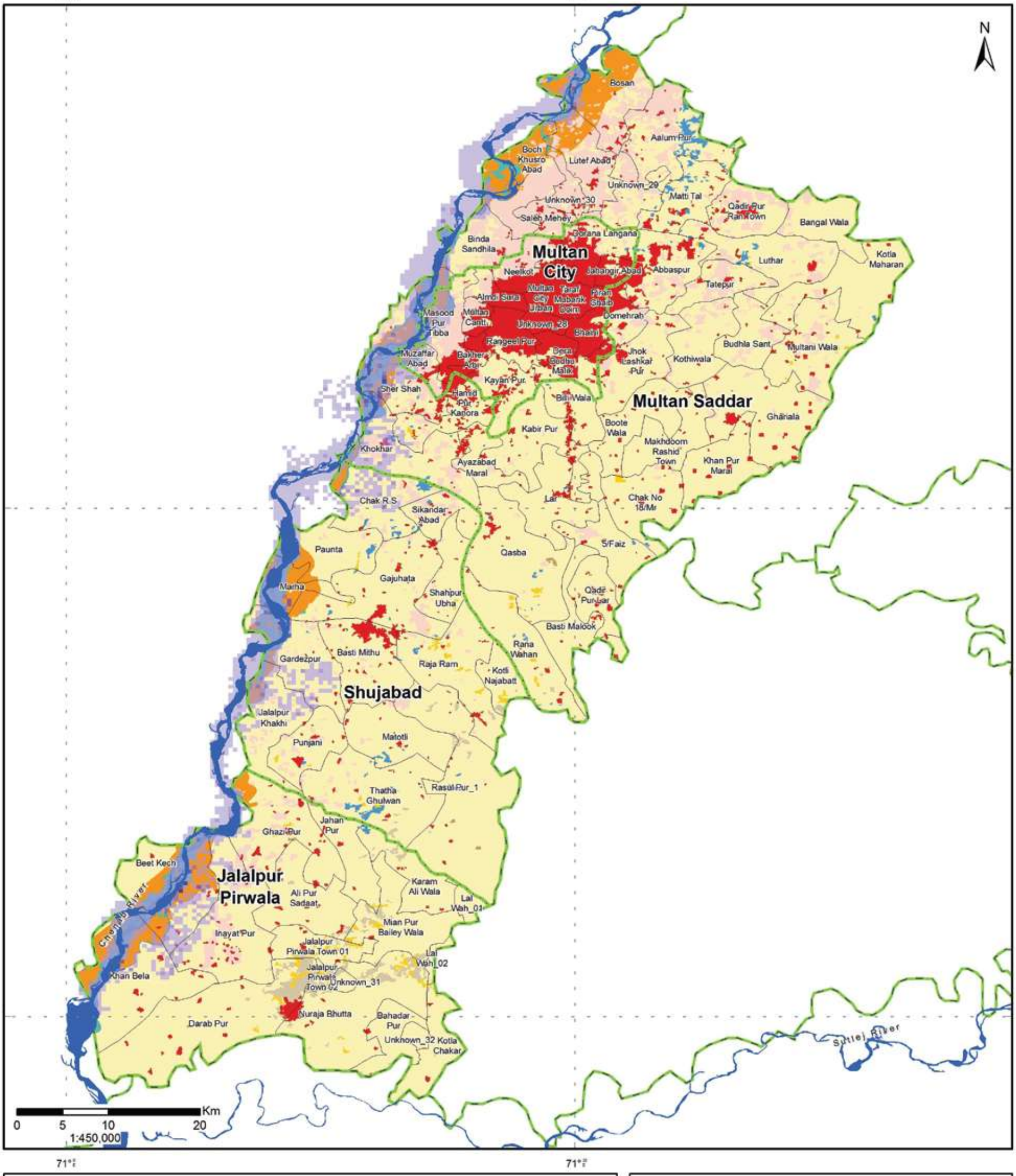
Data Source(s):
Pakistan Bureau of Statistics
Survey of Pakistan

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

ELEMENTS EXPOSED TO FLOOD HAZARD

	UNION COUNCILS	DEMOGRAPHICS			HOUSING & SETTLEMENTS					TELECOMMUNIATION TOWERS	INDUSTRIAL UNITS	TRANSPORTATION INFRASTRUCTURE (IN KM)				HEALTH FACILITIES	EDUCATION FACILITIES				CRITICAL INFRASTRUCTURE		LAND USE AND LAND COVER TYPE (AREA IN HECTARES)						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
JALALPUR PIRWALA	ALI PUR SADAAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BAHADAR 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
	BEET KECH	39,309	20,155	19,154	18	133	20	9	104	1	0	0	1	3	0	0	5	256	346	14	0	0	3,422	2,612	0	0	204	72	0	0
	DARAB PUR	0	0	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
	GHAZI PUR	41,685	21,472	20,212	29	204	46	19	139	15	0	6	11	12	0	2	16	1,577	1,253	97	9	0	5,532	485	0	69	915	295	18	0
	INAYAT PUR	32,750	17,026	15,724	42	121	21	11	89	21	0	0	37	9	0	2	29	3,139	1,854	148	6	0	6,934	62	0	0	1,463	249	0	0
	JAHAN 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
	JALALPUR PIRWALA TOWN 01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JALALPUR PIRWALA TOWN 02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KARAM ALI 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
	KHAN BELA	30,328	15,522	14,806	20	93	14	8	72	10	0	0	5	24	0	1	20	2,055	1,148	90	0	0	6,127	1,969	0	0	0	126	0	0
	KOTLA CHAKAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LAL WAH_01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LAL WAH_02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MIAN PUR BAILEY 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
	NURAJA BHUTTA	0	0	0	0	0	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:	144,072	74,175	69,896	109	551	101	47	404	47	0	6	53	48	0	8	70	7,027	4,601	349	16	0	22,014	5,128	0	69	2,582	742	18	0
Multan city	ALMDI SURA	45,540	23,902	21,638	11	543	296	33	214	76	0	0	0	30	0	0	8	676	1,503	66	4	0	322	0	0	0	353	722	0	0
	BAKHER ARBI	33,746	17,414	16,332	7	342	165	91	85	49	0	2	0	8	1	0	8	726	2,000	68	0	0	119	0	0	0	26	667	0	0
	BHAINI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DERA BUDHU MALIK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DORANA LANGANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	JAHANGIR ABAD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KAYAN PUR	39,936	20,997	18,939	10	419	214	27	179	31	4	9	29	0	0	1	13	1,052	1,360	61	0	0	2,431	0	0	0	96	441	17	0
	MASOOD PUR TIBBA	40,040	21,042	18,998	11	483	267	31	184	25	1	4	17	3	4	0	17	4,365	3,501	220	6	0	808	0	0	0	1,294	539	0	10
	MULTAN 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
	MULTAN CITY 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
	MUZAFFAR ABAD	32,979	17,501	15,478	13	278	115	15	148	0	0	2	8	0	2	1	7	681	1,049	51	3	0	278	118	0	0	539	200	0	0
	NEELKOT	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PIRAN GHAIB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RANGEEL PUR	30,304	15,866	14,438	16	356	206	38	113	174	6	6	31	0	4	2	28	6,605	11,004	494	0	0	583	0	0	0	13	1,834	0	0
	TARAF MUBARIK DOIM	0	0	0	0	0	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:	222,545	116,722	105,823	68	2,421	1,263	235	923	366	11	23	85	40	11	4	81	14,105	20,417	960	13	0	4,541	118	0	0	2,321	4,403	17	10
MULTAN SADDAR	5/FAIZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AALUM 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
	ABBASPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	AYAZABAD MARAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BANGAL 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
	BASTI MALOOK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BILLI 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
	BINDA SANDHILA	35,688	18,666	17,022	17	246	83	28	135	7	0	0	21	6	0	0	9	545	759	44	3	1	1,392	87	0	0	1,550	73	0	0
	BOCH KHUSRO ABAD	33,038	17,016	16,022	19	166	40	18	108	1	0	0	29	5	0	0	3	552	281	19	0	1	118	2,165	0	0	2,535	11	8	0
	BOOTE 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	163	0
	BOSAN	40,370	21,085	19,285	19	189	40	8	141	15	0	6	14	20	0	3	16	1,483	831	77	0	0	806	2,784	0	0	1,595	111	112	2
	BUDHLA SANT	0	0	0	0	0	0	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 18/MR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	DOMEHRAH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GHARIALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HAMID PUR KANORA	34,955	18,185	16,771	18	323	144	21	159	15	12	12	24		7	2	6	1,437	404	43	0	1	2,381	0	0	43	232	713	26	23
	JHOK LASHKAR 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	0
	KABIR 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	0
	KHAN PUR MARAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KHOKHAR	42,956	22,237	20,719	30	271	84	28	158	2	2	7	41	4	6	1	12	977	626	40	6	1	4,054	199	0	0	1,129	160	57	229
	KOTHIWALA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	KOTLA MAHARAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LUTEF ABAD	36,913	19,502	17,411	11	146	29	7	109	12	0	12	13	5	0	1	12	1,442	877	82	0	0	467	861	0	0	2,310	140	0	17
	LUTHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MAKHDOOM RASHID TOWN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MATTI TAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MULTANI 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	0
	QADIR PUR LAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	QADIR PUR RAN TOWN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	QASBA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RANA WAHAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SALEH MEHEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHER SHAH	42,258	22,039	20,219	16	296	99	25	172	6	0	7	14	0	4	0	15	1,949	1,492	92	5	0	1,770	1,261	0	0	1,105	264	3	42
	TATEPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	UNKNOWN_29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	UNKNOWN_30	0	0	0	0	0	0	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:	266,178	138,730	127,449	130	1,637	519	135	982	58	14	43	155	40	17	7	73	8,385	5,270	397	14	4	10,987	7,357	0	43	10,454	1,471	368	313
SHUJABAD	BASTI MITHU	39,959	20,750	19,209	30	140	29	11	100	57	0	12	36	0	1	2	38	4,587	4,518	332	2	0	4,954		0	0	152	673	12	42
	CHAK R.S	44,894	23,541	21,352	17	226	63	20	143	1	0	1	23	4	6	2	9	802	509	33	7	0	3,944	273	0	0	612	34	110	144
	GAJUHATA	34,980	18,256	16,724	35	113	19	7	87	29	0	11	37	11	10	0	43	4,353	2,773	231	5	0	7,351	418	0	31	493	324	89	0
	GARDEZPUR	87,390	45,253	42,137	18	645	285	18	343	1	0	0	11	3	0	1	20	2,182	1,958	116	15	1	4,259	288	0	0	267	43	7	1
	JALALPUR KHAKHI	38,849	20,201	18,649	8	108	17	21	70	1	0	0	0	3	0	0	7	329	181	15	12	0	3,898	410	0	0	413	10	0	0
	KOTLI NAJABATT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MARHA	42,480	22,344	20,136	3	156	31	19	106	0	0	0	1	4	0	0	0	0	0	0	1	0	361	1,036	0	9	130	0	0	0
	MATOTLI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PAUNTA	30,677	16,055	14,621	6	94	16	9	69	1	0	0	8	3	0	0	7	642	276	25	4	0	3,328	493	0	32	56	10	142	11
	PUNJANI	32,110	16,632	15,479	10	154	40	10	105	6	0	3	12	9	0	2	16	1,691	1,111	87	11	0	3,104	0	0	31	320	133	5	0
	RAJA RAM	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SHAHPUR UBHA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SIKANDAR ABAD	36,896	19,037	17,859	9	265	104	15	146	9	0	4	15	0	1	0	8	1,053	533	53	0	0	1,819	0	0		556	72	39	0
	THATHA GHULWAN	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	0	0	0
	TEHSIL TOTAL:	388,235	202,069	186,166	136	1,901	604	130	1,169	105	0	31	143	36	18	8	148	15,639	11,859	892	57	1	33,019	2,918	0	103	2,998	1,297	405	197
	DISTRICT TOTAL:	1,021,03	531,696	489,334	443	6,510	2,487	547	3,478	576	25	103	436	164	46	27	372	45,156	42,147	2,598	100	5	70,562	15,521	0	215	18,356	7,913	808	520

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



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, Multan, Punjab, Pakistan

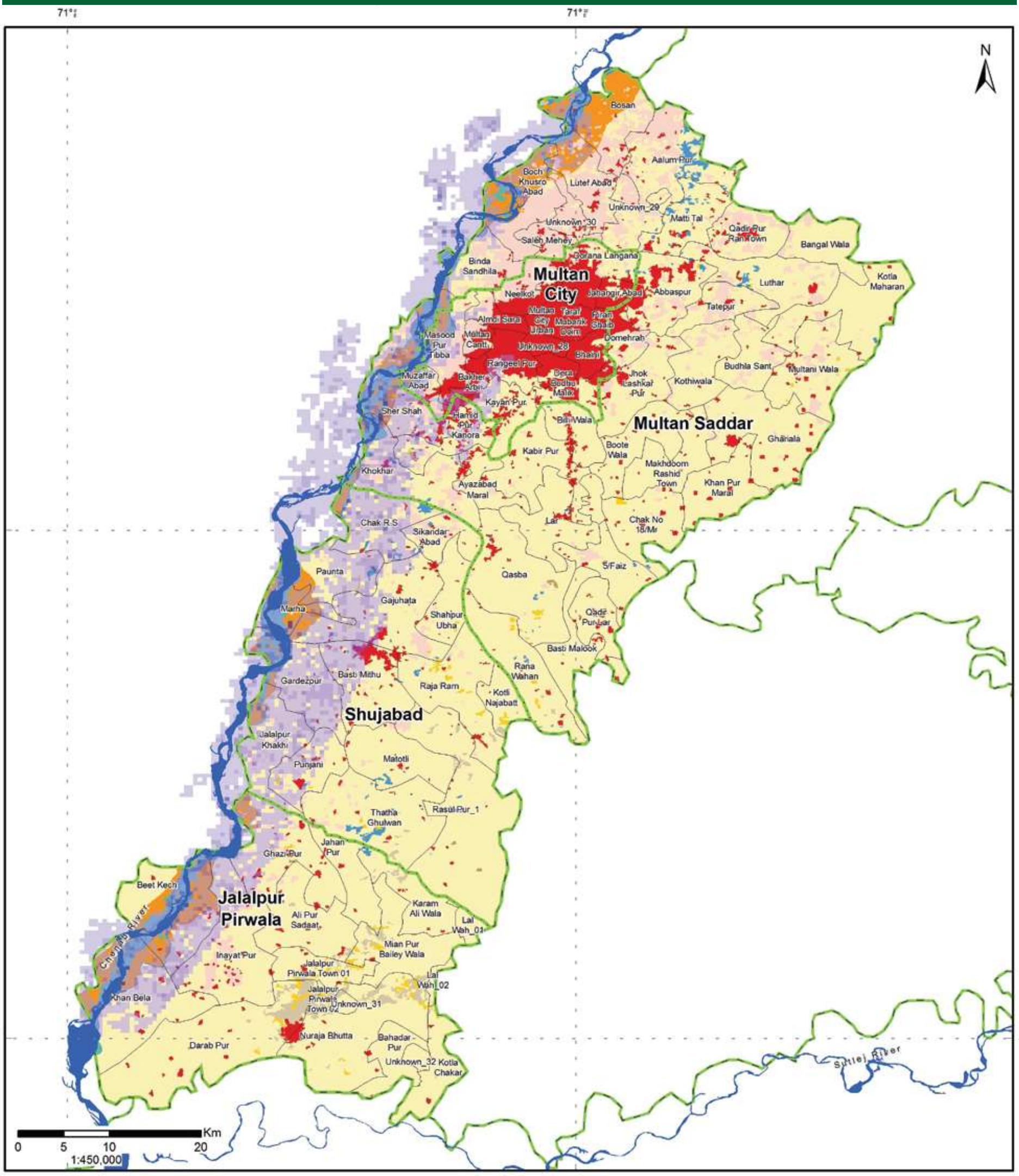
WFP United Nations World Food Programme

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-622-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 YEARS



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 50 Years

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

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

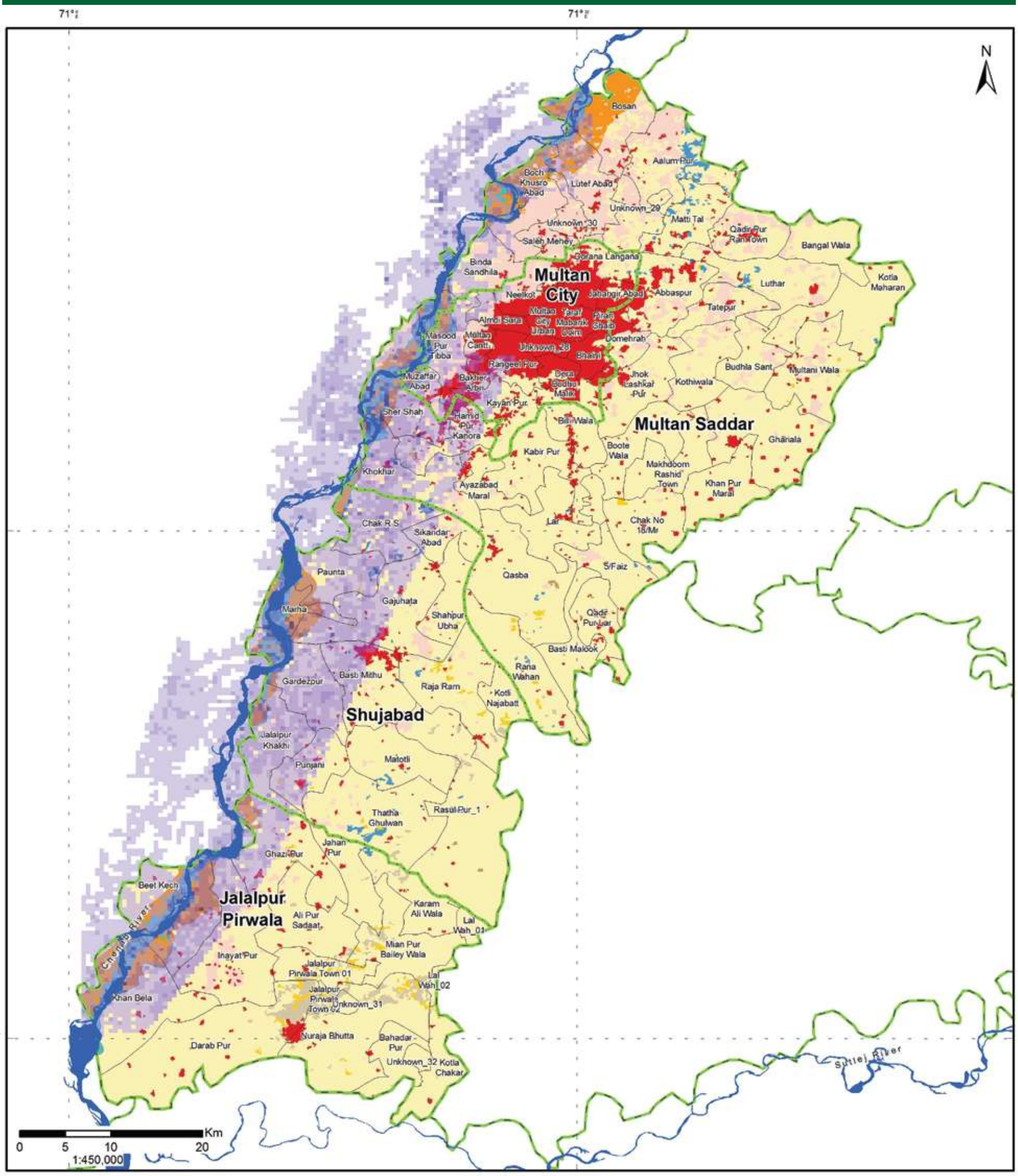
United Nations World Food Programme

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-622-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 YEARS



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 100 Years

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

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

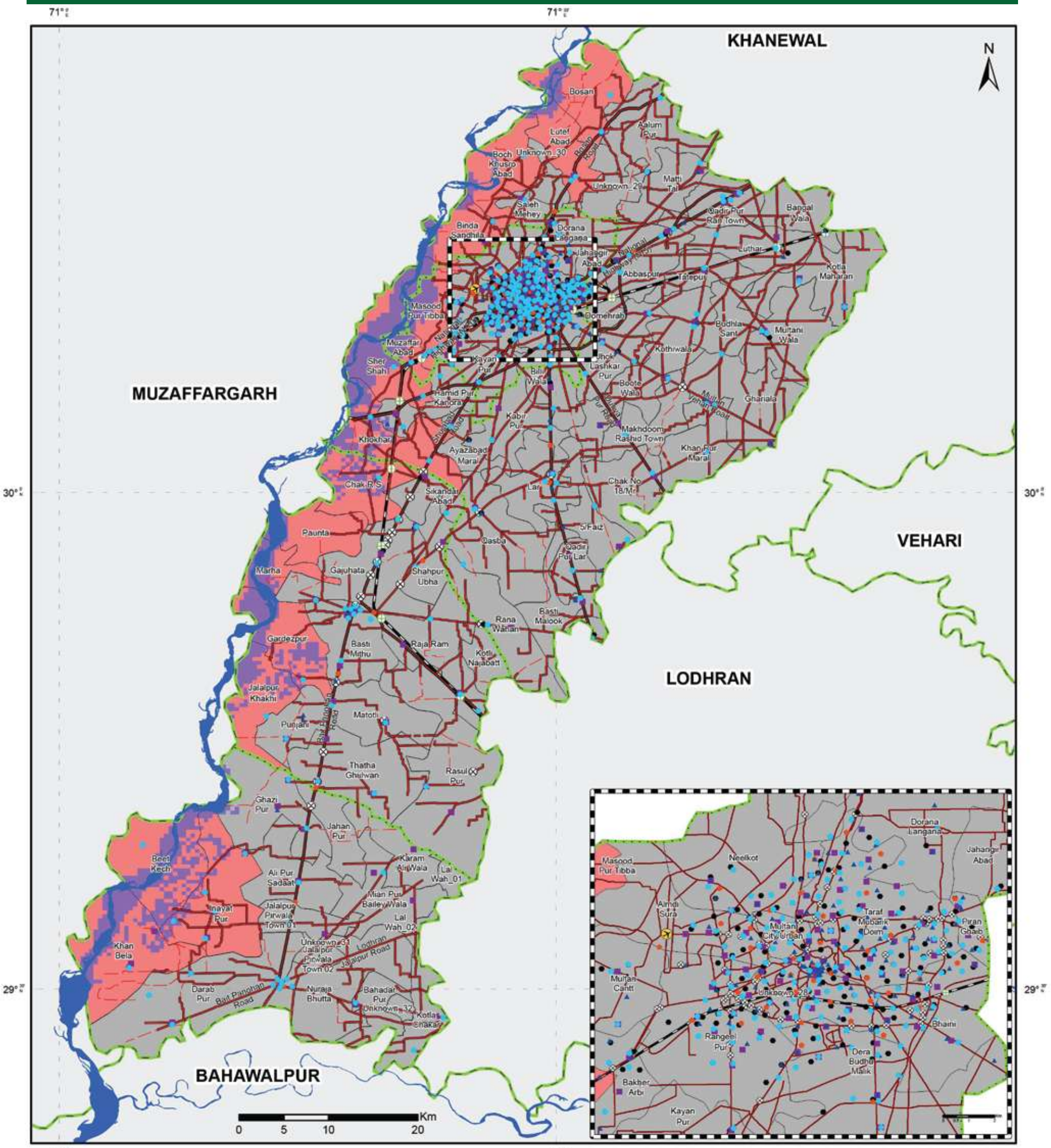
United Nations World Food Programme

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-622-APR-2016-EXP-04-NDMA-100-LULC
Prepared by: Project Management Unit, NDMA
Last Updated: 10th May, 2017

COMMUNICATION TOWERS AND TRANSPORTATION NETWORK EXPOSED TO FLOOD 10 YEARS RETURN PERIOD



Legend

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Stop
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- River and Reservoir
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

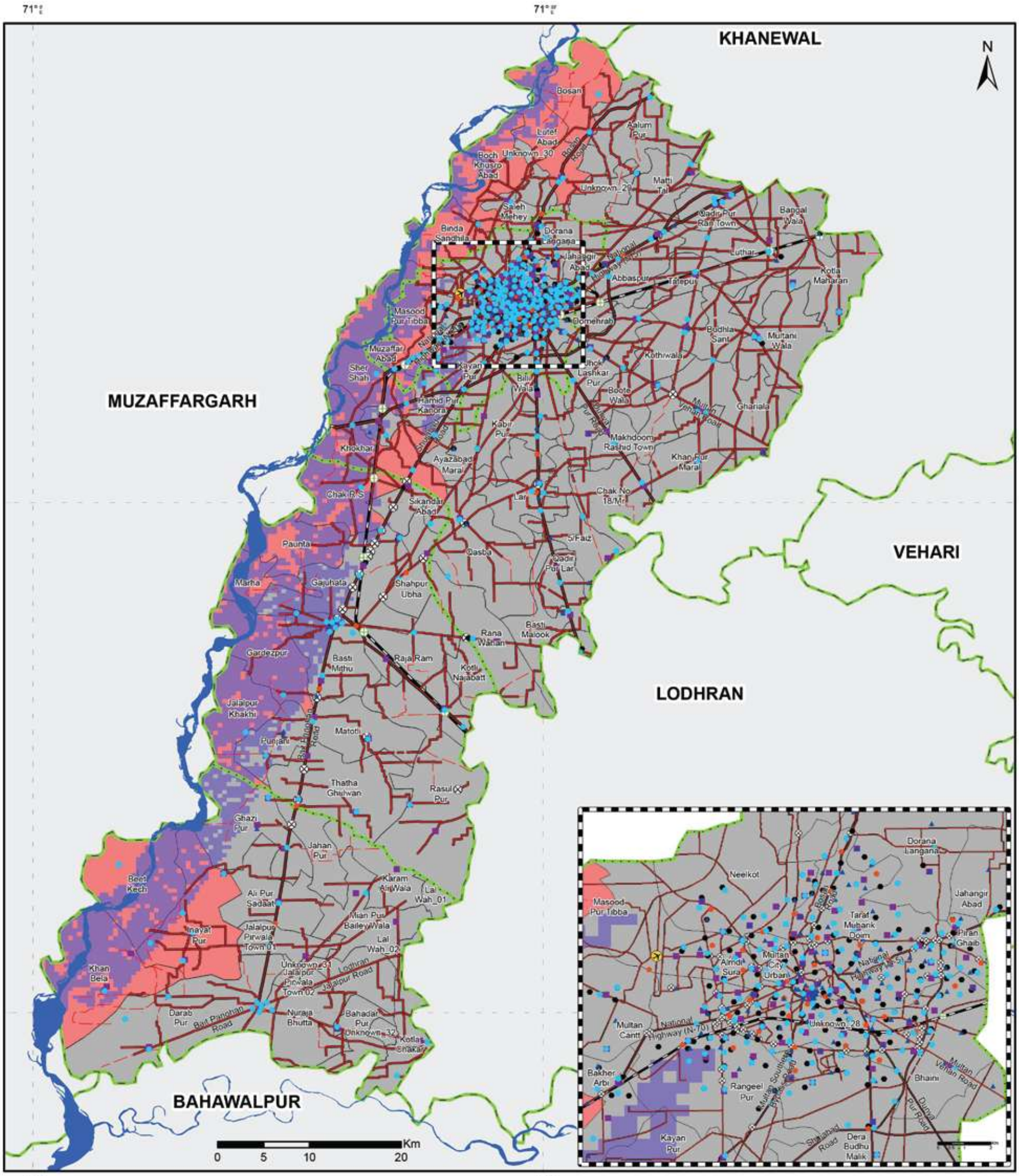
MAP INFORMATION

Data Source(s):
Survey of Pakistan
National Highway Authority
Pakistan Telecommunication Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-APR-2016-EXP-04-NDMA-10-C(TR-CT)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

COMMUNICATION TOWERS AND TRANSPORTATION NETWORK EXPOSED TO FLOOD 50 YEARS RETURN PERIOD



Legend

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Stop
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- River and Reservoir
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

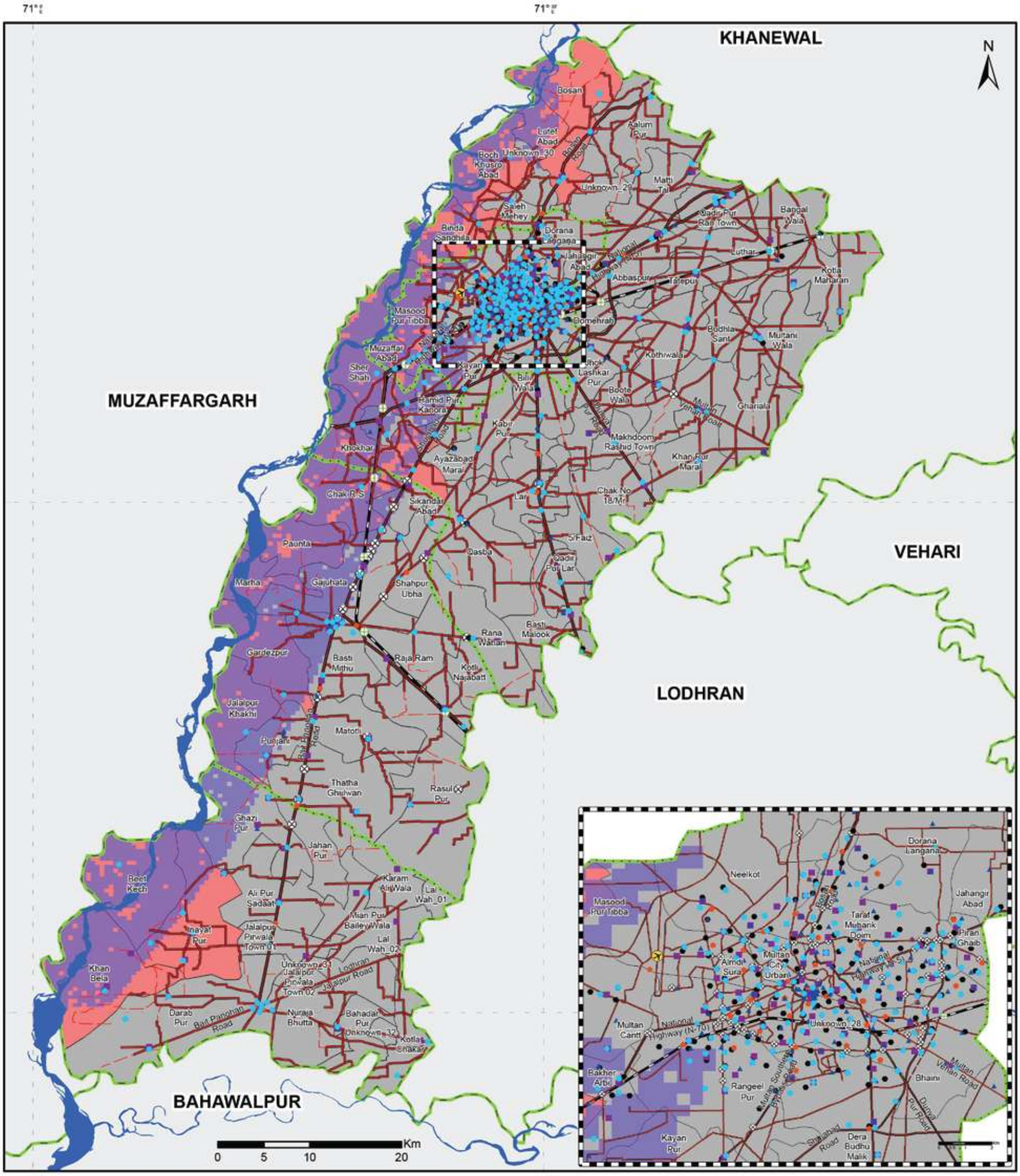
MAP INFORMATION

Data Source(s):
Survey of Pakistan
National Highway Authority
Pakistan Telecommunication Authority

Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-APR-2016-EXP-04-NDMA-50-C(TR-CT)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

COMMUNICATION TOWERS AND TRANSPORTATION NETWORK EXPOSED TO FLOOD 100 YEARS RETURN PERIOD



Legend

- Mobilink
- Telenor
- Ufone
- Warid
- Zong
- Airport
- Air Field/Landing Strips
- Railway Station
- Bus Stop
- Bridge
- Motorway
- Trunk/Highway
- Metalled Roads
- Unmetalled road
- Cart Track
- Broad Gauge Railway Track
- Other Gauge Railway Track
- River and Reservoir
- Exposed UCs
- Unexposed UCs
- Tehsil Boundary
- District Boundary
- Provincial Boundary
- Line of Control
- International Boundary

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

WFP United Nations World Food Programme

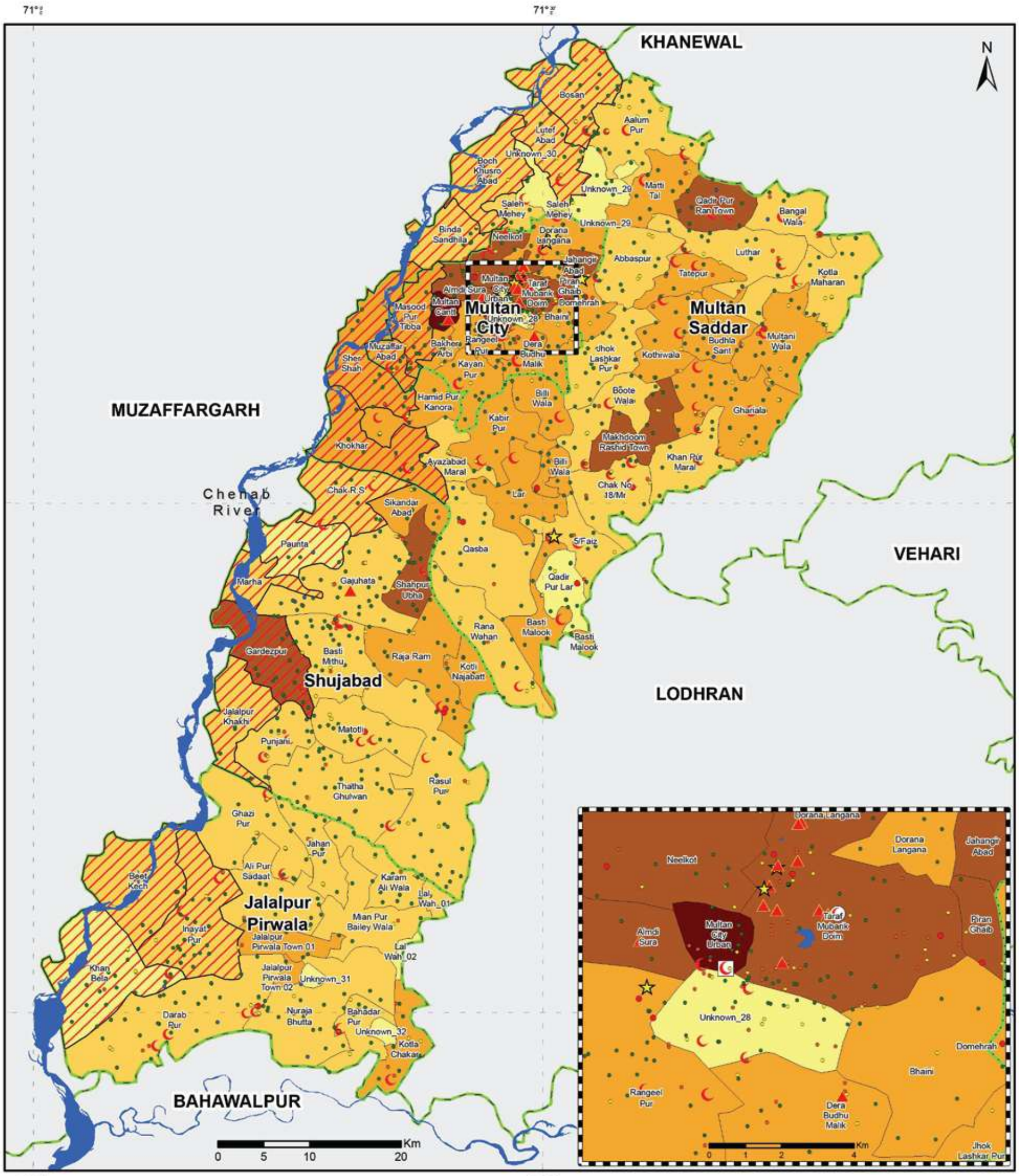
MAP INFORMATION

Data Source(s):
Survey of Pakistan
National Highway Authority
Pakistan Telecommunication Authority

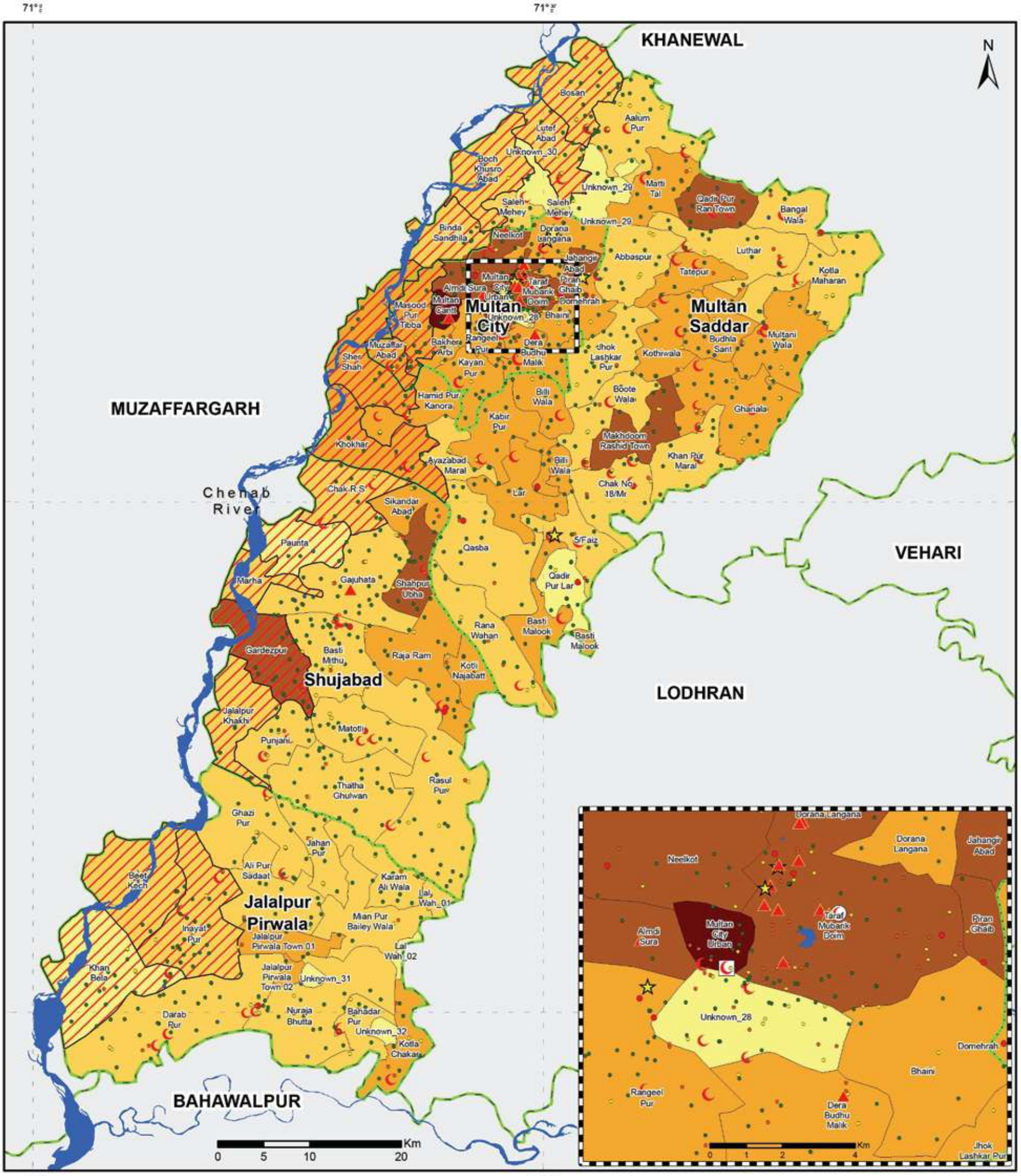
Datum: WGS 1984
Units: Degree

Map No: MHVRA-PUN-622-APR-2016-EXP-04-NDMA-100-C(TR-CT)
Prepared by: Project Management Unit, NDMA
Last Updated: 4th May, 2017

SCHOOLS, HEALTH AND BUILDING EXPOSED TO FLOOD 10 YRP



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
- Masjib/Maktab School

Building Distribution

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000
- Exposed UCs

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

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

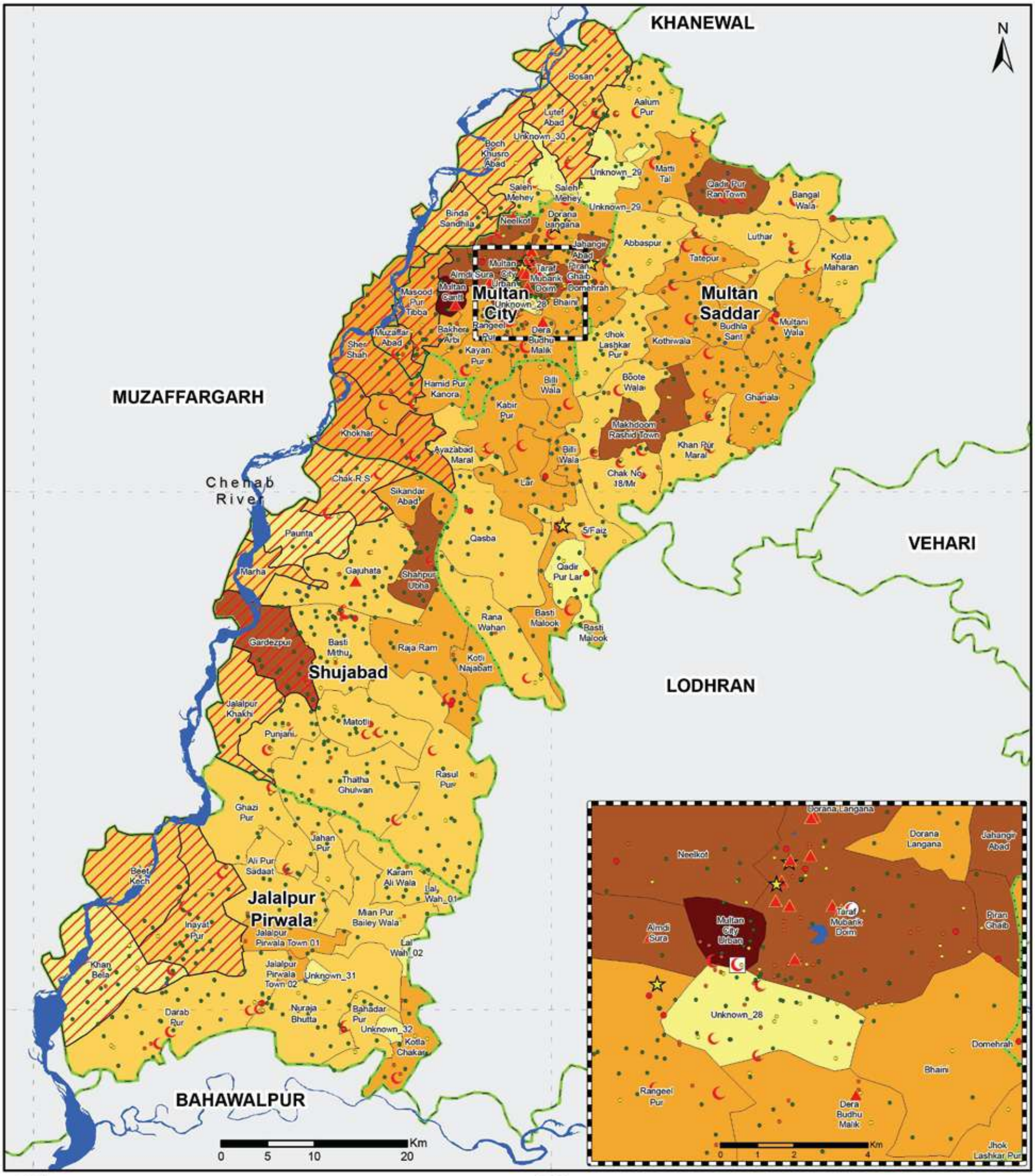
WFP United Nations World Food Programme

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-622-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
- Masjib/Maktab School

Building Distribution

- < 100
- 100 - 250
- 250 - 500
- 500 - 1000
- > 1000
- Exposed UCs

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

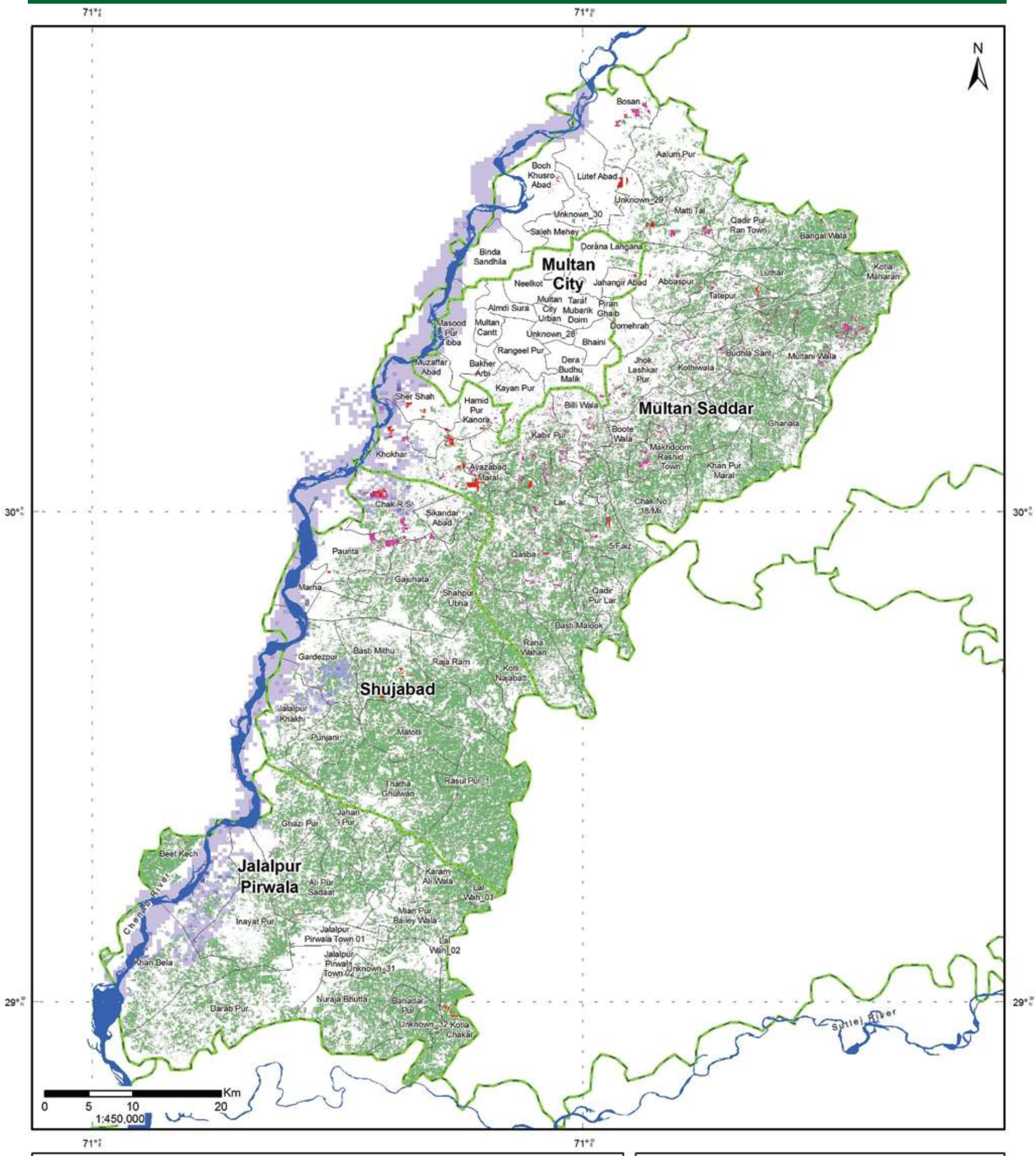
Multi Hazard Vulnerability & Risk Assessment, Multan, Punjab, Pakistan

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-622-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

- Cotton
- Rice
- Sugarcane
- 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, Multan, Punjab, Pakistan

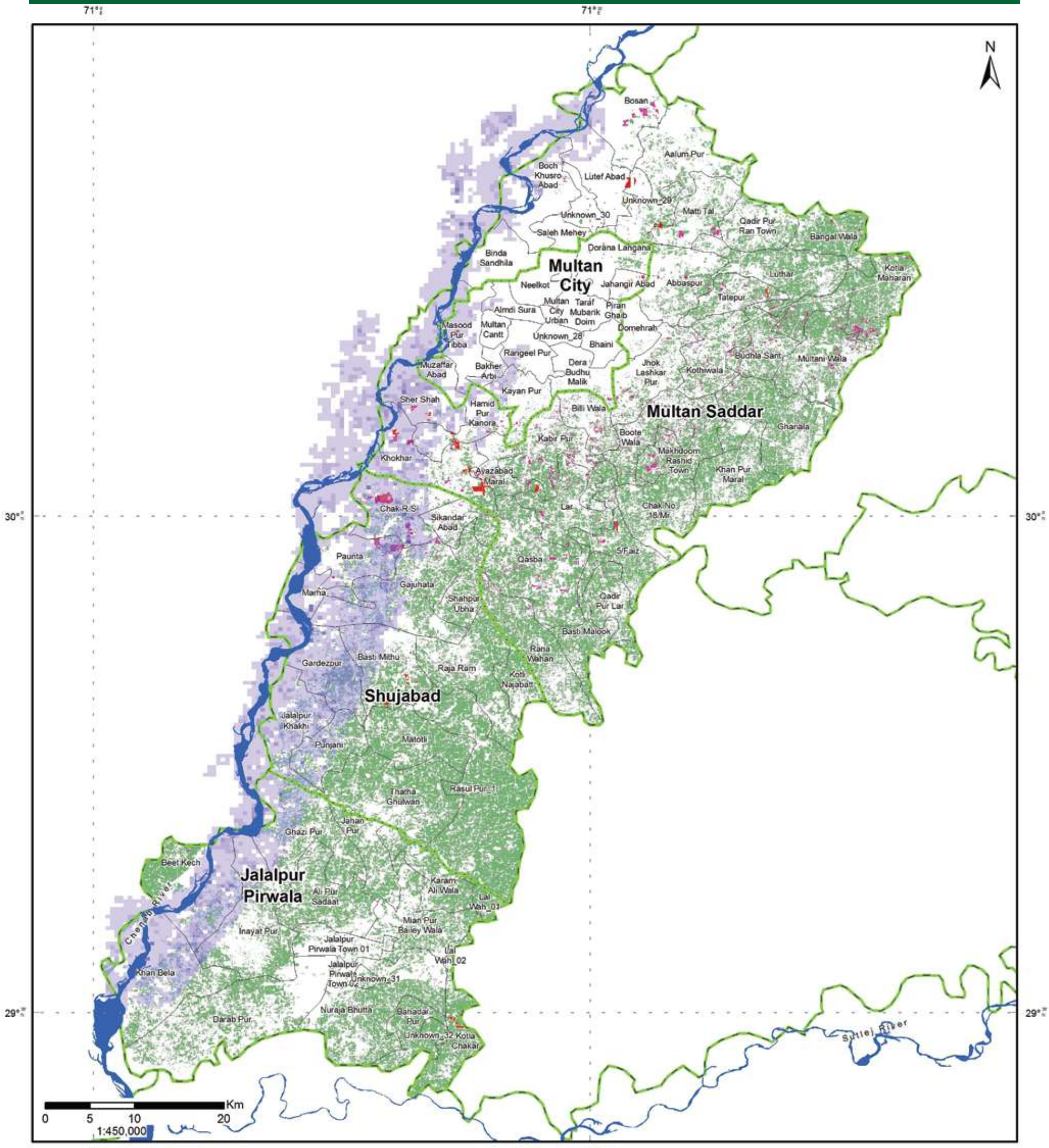
WFP United Nations World Food Programme

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-622-APR-2016-EXP-04-NDMA-10-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

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



Legend

- Cotton
- Rice
- Sugarcane
- 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, Multan, Punjab, Pakistan

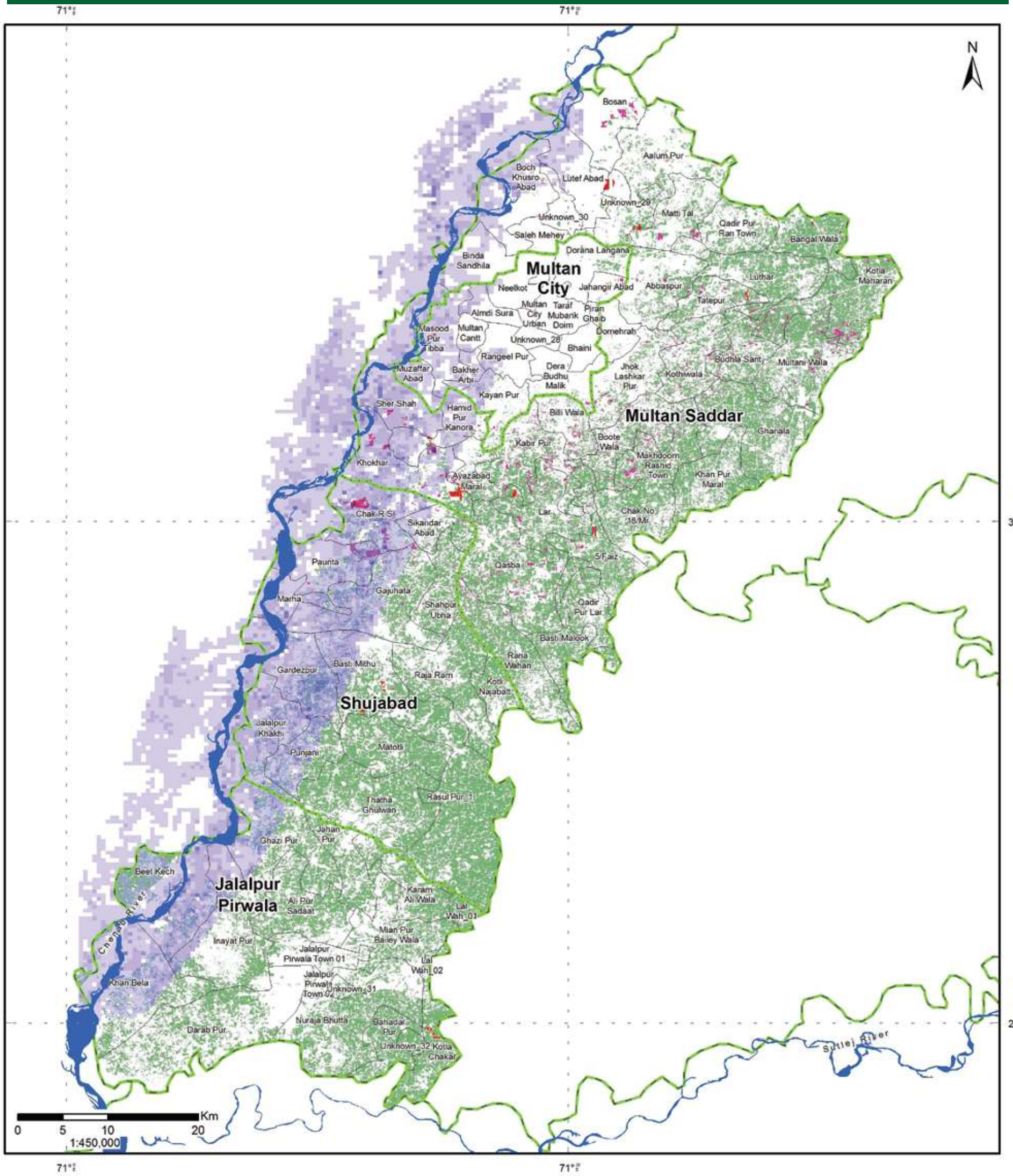
WFP United Nations World Food Programme

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-622-APR-2016-EXP-04-NDMA-50-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

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



Legend

- Cotton
- Rice
- Sugarcane
- 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, Multan, 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-622-APR-2016-EXP-04-NDMA-100-KH-CROPS
Prepared by: Project Management Unit, NDMA
Last Updated: 15th May, 2017

D VULNERABILITY ASSESSMENT

- SOCIAL VULNERABILITY
- FODD SECURITY

26 PHYSICAL AND 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

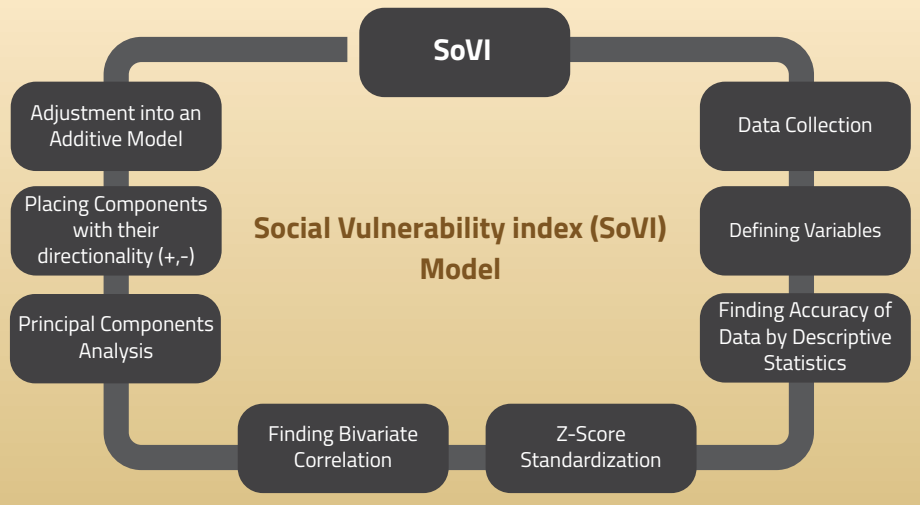
Social Vulnerability Assessment (SVA)

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 Multan 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



Social Vulnerability index (SoVI) Model

27 FOOD SECURITY AGAINST DROUGHT

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	Total Population Rural UCs (98 Census)	%age of Agri Dependent Population	Food Insecurity	Food Insecurity Ranking
Multan Saddar	Chak No 18/mr	4	48.55	46.78	96.36%	20,346	100	38,545	5
Shujabad	Raja Ram	4	70.41	68.07	96.68%	25,992	100	38,671	5
Jalalpur Pirwala	Jahan Pur	4	32.62	31.65	97.03%	26,904	100	38,813	5
Multan Saddar	Qasba	4	87.49	84.93	97.07%	22,001	100	38,829	5
Multan Saddar	Budhla Sant	4	32.62	32.18	98.66%	20,015	100	39,465	5
Multan Saddar	Saleh Mehey	3	14.87	13.43	90.28%	20,432	100	27,085	4
Multan Saddar	Qadir Pur Ran Town	3	35.20	31.92	90.67%	9,255	100	27,201	4
Multan Saddar	Kabir Pur	3	52.84	49.24	93.17%	24,952	100	27,952	4
Multan Saddar	Qadir Pur Lar	3	27.69	25.95	93.72%	18,071	100	28,115	4
Jalalpur Pirwala	Ghazi Pur	3	74.36	70.01	94.15%	26,868	100	28,246	4
Shujabad	Thatha Ghulwan	3	90.44	85.87	94.95%	27,780	100	28,486	4
Shujabad	Gajuhata	3	87.04	82.92	95.26%	21,541	100	28,579	4
Multan Saddar	Ghariala	3	80.93	77.09	95.26%	27,937	100	28,579	4
Multan Saddar	Luthar	3	57.86	55.14	95.30%	27,336	100	28,591	4
Jalalpur Pirwala	Inayat Pur	3	88.68	84.59	95.38%	21,109	100	28,615	4
Jalalpur Pirwala	Ali Pur Sadaat	3	57.05	54.72	95.92%	23,741	100	28,777	4
Shujabad	Matotli	3	50.59	48.61	96.08%	22,942	100	28,824	4
Multan Saddar	Tatepur	3	27.91	26.82	96.11%	24,872	100	28,833	4
Multan Saddar	Khan Pur Maral	3	43.36	41.67	96.11%	19,994	100	28,834	4
Multan Saddar	Multani Wala	3	59.27	57.00	96.16%	19,390	100	28,849	4
Shujabad	Kotli Najabatt	3	20.29	19.53	96.24%	19,976	100	28,871	4
Shujabad	Shahpur Ubha	3	31.67	30.98	97.80%	30,195	100	29,341	4
Multan Saddar	Kotla Maharan	3	65.88	64.71	98.23%	24,829	100	29,469	4
Multan Saddar	Makhdoom Rashid Town	3	41.17	40.68	98.80%	12,287	100	29,641	4
Multan Saddar	Kothiwala	3	43.35	42.95	99.07%	22,792	100	29,720	4
Multan Saddar	Binda Sandhila	4	35.32	30.28	85.74%	23,576	100	34,296	4
Multan Saddar	Sher Shah	3	67.53	41.36	61.25%	27,916	100	18,374	3
Shujabad	Chak R.S	2	52.09	48.30	92.71%	27,646	100	18,542	3
Multan Saddar	Billi Wala	2	35.31	32.95	93.32%	19,493	100	18,664	3
Multan Saddar	Ayazabad Maral	2	22.20	20.77	93.57%	20,402	100	18,714	3
Jalalpur Pirwala	Mian Pur Bailey Wala	2	56.28	52.66	93.58%	28,478	100	18,715	3
Jalalpur Pirwala	Karam Ali Wala	2	36.68	34.37	93.70%	22,644	100	18,739	3
Shujabad	Jalalpur Khakhi	2	49.78	47.21	94.84%	23,924	100	18,968	3
Shujabad	Sikandar Abad	2	24.81	23.75	95.73%	22,721	100	19,146	3
Shujabad	Punjani	2	36.07	34.55	95.77%	19,774	100	19,155	3
Multan City	Almdi Sura	4	13.99	6.75	48.23%	26,287	100	19,292	3
Multan Saddar	Rana Wahan	2	62.04	60.11	96.89%	20,952	100	19,377	3
Shujabad	Rasul Pur	2	137.59	133.38	96.94%	23,249	100	19,388	3
Multan Saddar	Lar	2	45.50	44.16	97.05%	22,838	100	19,410	3
Multan Saddar	Boote Wala	2	42.25	41.14	97.38%	21,682	100	19,475	3
Multan Saddar	Basti Malook	2	38.13	37.14	97.41%	23,923	100	19,481	3
Multan Saddar	5/faiz	2	33.88	33.02	97.45%	21,594	100	19,490	3
Jalalpur Pirwala	Kotla Chakar	2	33.74	33.06	98.01%	29,146	100	19,602	3
Jalalpur Pirwala	Bahadar Pur	2	27.38	26.87	98.13%	21,888	100	19,625	3
Jalalpur Pirwala	Lal Wah_01	2	8.25	8.23	99.83%	17,690	100	19,966	3
Multan City	Muzaffar Abad	3	14.05	9.35	66.59%	19,036	100	19,977	3
Multan Saddar	Bangal Wala	2	35.52	35.50	99.93%	23,216	100	19,986	3
Multan City	Masood Pur Tibba	3	34.90	25.49	73.02%	23,112	100	21,907	3
Multan City	Kayan Pur	3	29.73	25.27	85.01%	23,052	100	25,502	3
Multan Saddar	Matti Tal	3	39.28	34.23	87.14%	23,428	100	26,141	3
Multan Saddar	Aalum Pur	3	64.72	56.89	87.89%	25,183	100	26,368	3

Tehsil	Union Council	Drought Severity Score	Area of UC (sq.km)	Agricultural Land (sq.km)	%age of Agri to Total Land	Total Population Rural UCs (98 Census)	%age of Agri Dependent Population	Food Insecurity	Food Insecurity Ranking
Multan Saddar	Lutef Abad	3	40.46	36.38	89.93%	24,385	100	26,978	3
Multan Saddar	Jhok Lashkar Pur	1	48.26	44.64	92.51%	23,589	100	9,251	2
Jalalpur Pirwala	Jalalpur Pirwala Town 01	1	27.33	25.37	92.83%	6,257	100	9,283	2
Jalalpur Pirwala	Lal Wah_02	1	4.38	4.12	94.01%	8,302	100	9,401	2
Shujabad	Marha	2	26.60	15.36	57.73%	26,160	100	11,547	2
Multan Saddar	Domehrah	2	17.92	11.62	64.82%	25,105	100	12,963	2
Multan City	Dorana Langana	3	36.48	17.72	48.57%	20,497	100	14,572	2
Multan Saddar	Abbaspur	2	49.91	39.13	78.40%	20,438	100	15,680	2
Multan Saddar	Hamid Pur Kanora	2	33.86	26.56	78.43%	23,092	100	15,686	2
Jalalpur Pirwala	Khan Bela	2	98.94	80.95	81.82%	19,548	100	16,364	2
Shujabad	Gardezpur	2	58.12	48.15	82.84%	27,816	100	16,568	2
Multan Saddar	Khokhar	2	63.86	53.81	84.27%	28,377	100	16,854	2
Shujabad	Paunta	2	45.86	39.10	85.25%	18,891	100	17,051	2
Multan City	Neelkot	3	25.16	14.48	57.54%	24,198	100	17,261	2
Shujabad	Basti Mithu	2	58.15	51.06	87.80%	24,607	100	17,561	2
Multan Saddar	Boch Khusro Abad	2	54.73	48.18	88.03%	21,825	100	17,606	2
Jalalpur Pirwala	Darab Pur	2	131.44	117.49	89.39%	25,955	100	17,878	2
Multan City	Piran Ghaib	2	2.39	0.00	0.00%	36,068	100	0	1
Multan City	Taraf Mubarik Doim	4	21.94	0.03	0.16%	28,776	100	62	1
Multan City	Bhaini	3	14.43	1.47	10.17%	19,801	100	3,050	1
Multan City	Bakher Arbi	2	8.14	1.45	17.84%	19,479	100	3,568	1
Multan City	Jahangir Abad	2	9.68	2.26	23.33%	24,097	100	4,666	1
Jalalpur Pirwala	Jalalpur Pirwala Town 02	1	5.66	2.82	49.80%	941	100	4,980	1
Multan City	Rangeel Pur	3	24.33	5.95	24.46%	17,492	100	7,339	1
Jalalpur Pirwala	Beet Kech	1	81.80	62.38	76.27%	25,337	100	7,627	1
Multan City	Dera Budhu Malik	2	29.85	12.23	40.96%	21,338	100	8,192	1
Multan Saddar	Bosan	1	60.98	51.85	85.02%	26,669	100	8,502	1
Jalalpur Pirwala	Nuraja Bhutta	1	98.28	87.34	88.86%	27,689	100	8,886	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

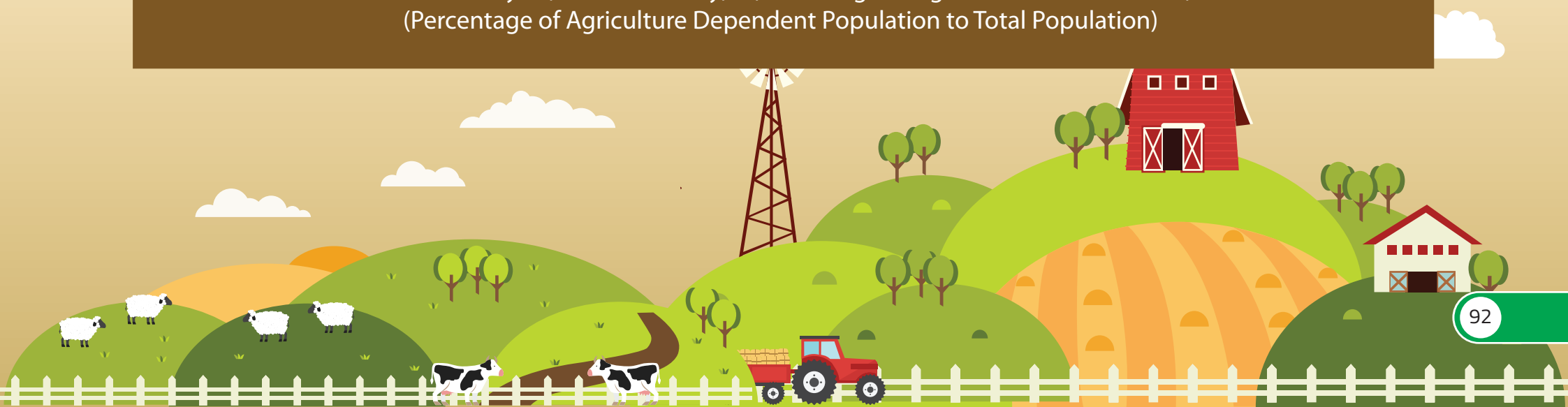
Tehsil	Union Council	Flood Hazard Score (Riverine + Flash)	Area of UC (sq.km)	Agricultural Land (sq.km)	Agricultural Area Exposed	Percentage Agricultural Land Exposed	Total Population (98 Census)	Food Insecurity	Food Insecurity Ranking
Multan Saddar	Sher Shah	4	67.53	41.36	37.29	90.17%	27,916	36,070	5
Shujabad	Paunta	4	45.86	39.10	35.53	90.87%	18,891	36,348	5
Shujabad	Marha	4	26.60	15.36	14.07	91.60%	26,160	36,639	5
Jalalpur Pirwala	Beet Kech	4	81.80	62.38	57.41	92.03%	25,337	36,812	5
Shujabad	Gardezpur	4	58.12	48.15	45.40	94.30%	27,816	37,719	5
Shujabad	Jalalpur Khakhi	4	49.78	47.21	45.81	97.04%	23,924	38,814	5
Multan Saddar	Hamid Pur Kanora	4	33.86	26.56	18.20	68.55%	23,092	27,420	4
Multan City	Bakher Arbi	3	8.14	1.45	1.39	95.79%	19,479	28,736	4
Multan City	Masood Pur Tibba	4	34.90	25.49	21.54	84.51%	23,112	33,806	4
Shujabad	Chak R.S	4	52.09	48.30	43.13	89.31%	27,646	35,722	4
Jalalpur Pirwala	Ghazi Pur	4	74.36	70.01	31.81	45.44%	26,868	18,174	3
Multan City	Almdi Sura	3	13.99	6.75	4.22	62.54%	26,287	18,761	3
Shujabad	Punjani	3	36.07	34.55	21.69	62.77%	19,774	18,830	3
Multan Saddar	Binda Sandhila	4	35.32	30.28	14.85	49.05%	23,576	19,620	3
Multan Saddar	Boch Khusro Abad	4	54.73	48.18	24.10	50.02%	21,825	20,008	3
Shujabad	Gajuhata	4	87.04	82.92	44.11	53.19%	21,541	21,278	3
Jalalpur Pirwala	Khan Bela	4	98.94	80.95	50.92	62.90%	19,548	25,160	3
Multan Saddar	Khokhar	4	63.86	53.81	34.31	63.75%	28,377	25,501	3
Multan City	Muzaffar Abad	3	14.05	9.35	7.98	85.28%	19,036	25,583	3
Shujabad	Basti Mithu	3	58.15	51.06	17.85	34.97%	24,607	10,490	2
Multan Saddar	Lutef Abad	4	40.46	36.38	11.32	31.12%	24,385	12,448	2
Shujabad	Thatha Ghulwan	3	90.44	85.87	0.20	0.24%	27,780	71	1
Multan Saddar	Ayazabad Maral	3	22.20	20.77	1.11	5.33%	20,402	1,600	1
Multan City	Neelkot	3	25.16	14.48	1.33	9.16%	24,198	2,748	1
Multan Saddar	Bosan	4	60.98	51.85	6.47	12.49%	26,669	4,994	1
Shujabad	Sikandar Abad	3	24.81	23.75	5.49	23.11%	22,721	6,932	1
Multan City	Kayan Pur	3	29.73	25.27	6.18	24.46%	23,052	7,338	1
Multan City	Rangeel Pur	3	24.33	5.95	1.48	24.86%	17,492	7,459	1
Jalalpur Pirwala	Inayat Pur	3	88.68	84.59	24.00	28.37%	21,109	8,512	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**		

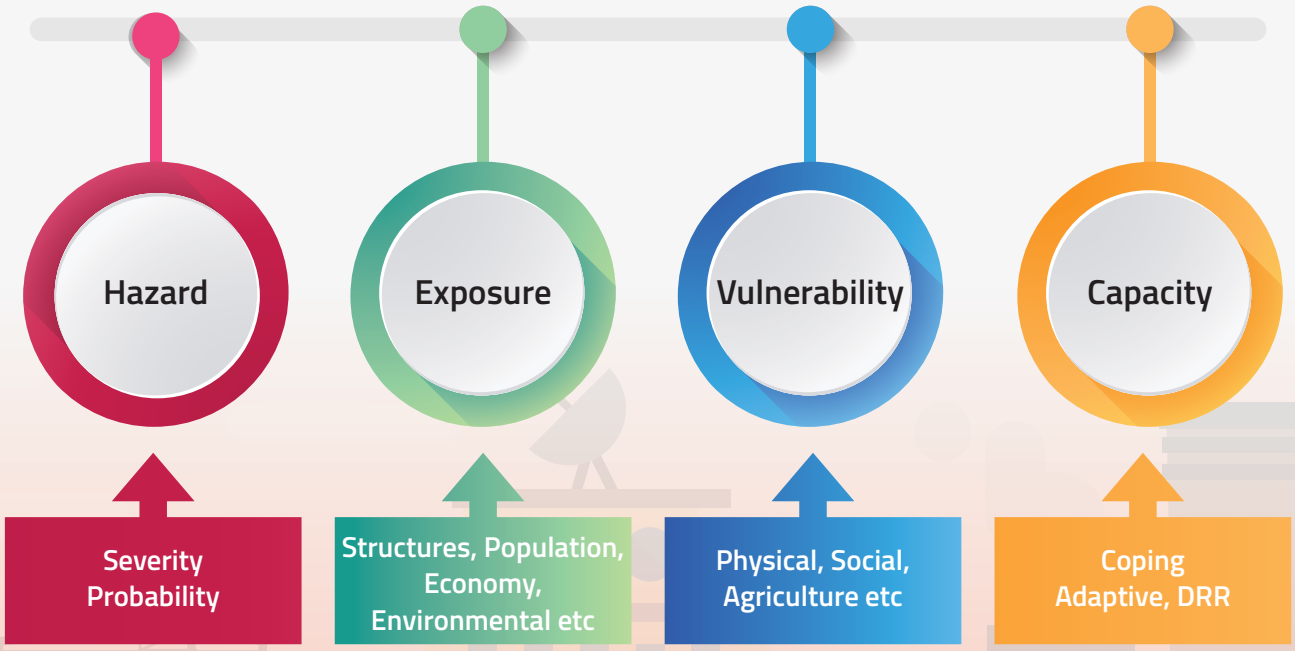
Drought Hazard Severity Score		
No Drought	1	Very Low
Mild	2	Low
Moderate	3	Medium
Severe	4	High
Extreme	5	Very High
0 represents **No Hazard**		

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

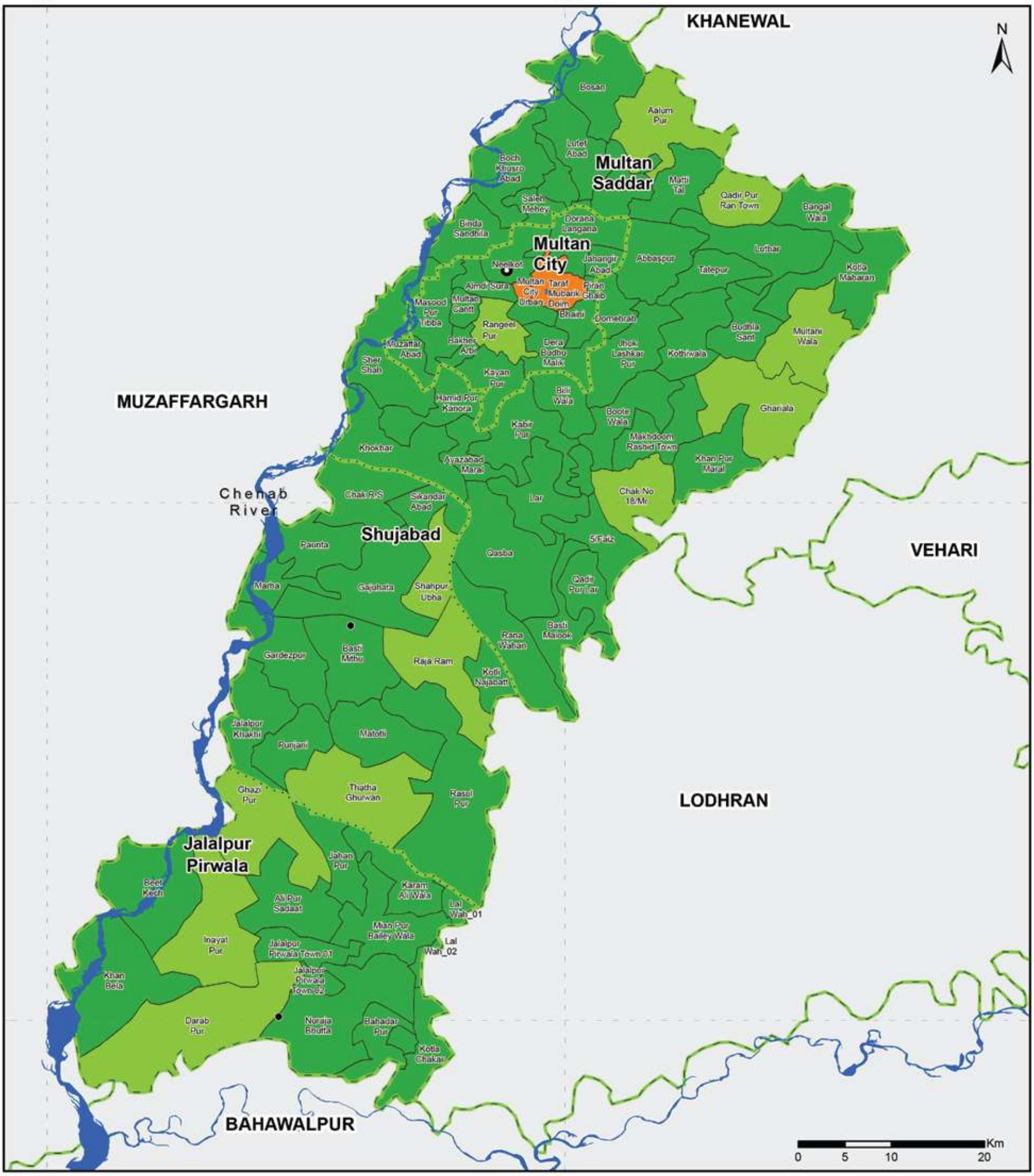


28 RISK ASSESSMENT BY HAZARD TYPE

UNION COUNCILS	HAZARD			EXPOSURE		VULNERABILTY			COPING CAPACITY	RISK			OVERALL
	FLOOD YRP 100	DROUGHT	EARTHQUAKE YRP 475	EXPOSURE RANKING FLOOD & EARTHQUAKEX	EXPOSURE RANKING DROUGHT	VULNERABILTY FLOOD RANKING	VULNERABILTY DROUGHT RANKING	VULNERABILTY EARTHQUAKE RANKING	Capacity	CAPACITIES-FLOOD	CAPACITIES-DROUGHT	CAPACITIES-EARTHQUAKE	
5/FAIZ	0	3	1	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
AALUM PUR	0	3	2	1.13	1.33	1.33	1.25	1.00	3.00	1	2	2	2
ABBASPUR	0	3	1	1.13	1.00	1.33	1.00	1.00	3.00	1	1	2	2
ALI PUR SADAAT	0	3	2	1.13	0.67	1.00	1.00	1.00	3.00	1	1	1	1
ALMDI SURA	1	3	3	0.88	0.67	1.00	1.50	1.00	3.00	1	1	1	1
AYAZABAD MARAL	0	3	1	0.75	0.67	1.33	1.25	1.00	3.00	1	1	1	1
BAHADAR PUR	0	3	1	1.13	1.00	1.00	0.75	1.00	3.00	1	1	1	1
BAKHER ARBI	1	3	1	0.75	0.67	1.00	1.50	1.00	3.00	1	1	1	1
BANGAL WALA	0	3	1	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
BASTI MALOOK	0	3	1	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
BASTI MITHU	2	3	1	1.13	1.33	1.33	1.50	1.00	3.00	3	1	2	2
BEET KECH	0	3	0	0.63	0.67	1.00	1.50	1.00	3.00	4	1	1	2
BHAINI	0	3	2	1.25	0.67	1.00	0.75	1.00	3.00	1	1	2	2
BILLI WALA	0	3	1	1.13	1.00	1.33	1.00	1.00	3.00	1	1	2	2
BINDA SANDHILA	2	3	3	0.88	0.67	1.33	1.75	1.00	3.00	3	1	1	2
BOCH KHUSRO ABAD	3	3	1	0.88	0.67	1.33	1.75	1.00	3.00	3	1	1	2
BOOTE WALA	0	3	1	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
BOSAN	1	3	0	0.88	1.00	1.33	1.75	1.00	3.00	2	1	1	2
BUDHLA SANT	0	3	3	0.63	0.67	1.33	1.00	1.00	3.00	1	1	1	1
CHAK NO 18/MR	0	3	3	0.88	1.00	1.33	1.00	1.00	3.00	1	2	1	2
CHAK R.S	4	3	1	1.00	1.00	1.33	1.50	1.00	3.00	5	1	1	3
DARAB PUR	0	3	1	1.00	1.33	1.00	1.50	1.00	3.00	1	2	1	2
DERA BUDHU MALIK	0	3	1	1.75	1.33	1.00	1.00	1.00	3.00	1	1	2	2
DOMEHRAH	0	3	1	1.00	0.67	1.33	1.00	1.00	3.00	1	1	1	1
DORANA LANGANA	0	3	2	1.13	1.00	1.00	1.25	1.00	3.00	1	1	2	2
GAJUHATA	4	3	2	1.00	1.00	1.33	1.50	1.00	3.00	5	1	1	3
GARDEZPUR	5	3	1	1.13	1.00	1.33	1.75	1.00	3.00	5	1	2	3
GHARIALA	0	3	2	1.25	1.67	1.33	1.00	1.00	3.00	1	2	2	2
GHAZI PUR	3	3	2	1.00	1.00	1.00	1.25	1.00	3.00	3	2	1	2
HAMID PUR KANORA	2	3	1	1.38	1.00	1.33	1.50	1.00	3.00	4	1	2	3
INAYAT PUR	3	3	2	1.13	1.33	1.00	1.25	1.00	3.00	3	2	1	2
JAHAN PUR	0	3	3	0.75	0.67	1.00	0.75	1.00	3.00	1	1	1	1
JAHANGIR ABAD	0	3	1	0.88	0.67	1.00	0.75	1.00	3.00	1	1	1	1
JALALPUR KHAKHI	5	3	1	0.75	0.67	1.33	1.75	1.00	3.00	5	1	1	3
JALALPUR PIRWALA TOWN 01	0	3	0	1.00	0.67	1.00	0.75	1.00	3.00	1	1	1	1
JALALPUR PIRWALA TOWN 02	0	3	0	0.63	0.67	1.00	0.75	1.00	3.00	1	1	1	1
JHOK LASHKAR PUR	0	3	0	1.13	0.67	1.33	1.00	1.00	3.00	1	1	2	2
KABIR PUR	0	3	2	1.25	1.00	1.33	1.00	1.00	3.00	1	1	2	2
KARAM ALI WALA	0	3	1	0.88	0.67	1.00	0.75	1.00	3.00	1	1	1	1
KAYAN PUR	1	3	2	1.00	1.00	1.33	1.75	1.00	3.00	1	1	1	1
KHAN BELA	5	3	1	0.75	1.00	1.00	1.50	1.00	3.00	5	1	1	3
KHAN PUR MARAL	0	3	2	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
KHOKHAR	4	3	1	1.13	1.00	1.33	1.50	1.00	3.00	5	1	2	3
KOTHIWALA	0	3	2	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
KOTLA CHAKAR	0	3	1	1.00	1.00	1.00	0.75	1.00	3.00	1	1	1	1
KOTLA MAHARAN	0	3	2	0.88	1.00	1.33	1.00	1.00	3.00	1	1	1	1
KOTLI NAJABATT	0	3	2	0.75	0.67	1.33	1.00	1.00	3.00	1	1	1	1
LAL WAH_01	0	3	1	0.50	0.67	1.00	0.75	1.00	3.00	1	1	1	1
LAL WAH_02	0	3	0	0.38	0.33	1.00	0.75	1.00	3.00	1	1	1	1
LAR	0	3	1	0.88	1.00	1.33	1.00	1.00	3.00	1	1	1	1
LUTEF ABAD	1	3	2	0.88	1.00	1.33	1.75	1.00	3.00	2	1	1	2
LUTHAR	0	3	2	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
MAKHDOOM RASHID TOWN	0	3	2	0.88	0.67	1.33	1.00	1.00	3.00	1	1	1	1
MARHA	2	3	1	0.38	0.33	1.33	1.75	1.00	3.00	2	1	1	2
MASOOD PUR TIBBA	2	3	2	1.00	0.67	1.33	1.75	1.00	3.00	3	1	1	2
MATOTLI	0	3	2	1.00	1.00	1.33	1.25	1.00	3.00	1	1	1	1
MATTI TAL	0	3	2	1.13	1.00	1.33	1.00	1.00	3.00	1	1	2	2
MIAN PUR BAILEY WALA	0	3	1	1.00	0.67	1.00	0.75	1.00	3.00	1	1	1	1
MULTAN CANTT	0	3	1	1.13	1.33	1.33	1.75	1.00	3.00	1	1	2	2
MULTAN CITY URBAN	0	3	1	1.88	2.33	4.00	3.00	5.00	3.00	1	4	5	4
MULTANI WALA	0	3	2	1.13	1.33	1.33	1.00	1.00	3.00	1	2	2	2
MUZAFFAR ABAD	1	3	2	1.00	1.00	1.33	1.75	1.00	3.00	2	1	1	2
NEELKOT	0	3	2	1.13	1.00	1.33	1.75	1.00	3.00	1	1	2	2
NURAJA BHUTTA	0	3	0	1.25	1.00	1.00	0.75	1.00	3.00	1	1	2	2
PAUNTA	4	3	1	0.88	0.67	1.33	1.75	1.00	3.00	5	1	1	3
PIRAN GHAIB	0	3	1	0.75	1.00	1.33	1.00	1.00	3.00	1	1	1	1
PUNJANI	2	3	1	1.13	1.00	1.33	1.75	1.00	3.00	3	1	2	2
QADIR PUR LAR	0	3	2	0.75	0.67	1.33	1.00	1.00	3.00	1	1	1	1
QADIR PUR RAN TOWN	0	3	2	1.00	1.00	1.67	1.25	1.50	3.00	1	2	2	2
QASBA	0	3	3	1.00	0.67	1.33	1.00	1.00	3.00	1	1	1	1
RAJA RAM	0	3	3	1.13	1.00	1.67	1.50	1.00	3.00	1	2	2	2
RANA WAHAN	0	3	1	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
RANGEEL PUR	1	3	2	1.38	1.33	1.33	1.50	1.00	3.00	1	2	2	2
RASUL PUR	0	3	1	1.38	1.33	1.67	1.25	1.00	3.00	1	1	2	2
SALEH MEHEY	0	3	2	0.75	0.67	1.33	1.50	1.00	3.00	1	1	1	1
SHAHPUR UBHA	0	3	2	0.88	1.00	1.67	1.25	1.00	3.00	1	2	1	2
SHER SHAH	5	3	2	0.88	0.67	1.33	1.75	1.00	3.00	5	1	1	3
SIKANDAR ABAD	1	3	1	0.75	0.67	1.67	1.50	1.00	3.00	1	1	1	1
TARAF MUBARIK DOIM	0	3	3	2.25	2.33	1.33	1.75	1.00	3.00	1	4	3	3
TATEPUR	0	3	2	1.00	1.00	1.33	1.00	1.00	3.00	1	1	1	1
THATHA GHULWAN	0	3	2	1.25	1.33	1.67	1.25	1.00	3.00	1	2	2	2

Risk = (Hazard x Exposure x Vulnerabilty/Capacity)

DROUGHT RISK



Legend

- District Headquarter
- Tehsil Headquarter

Drought Risk

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

- River and Reservoir
- District Boundary
- Tehsil Boundary
- Line of Control
- Provincial Boundary
- International Boundary

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

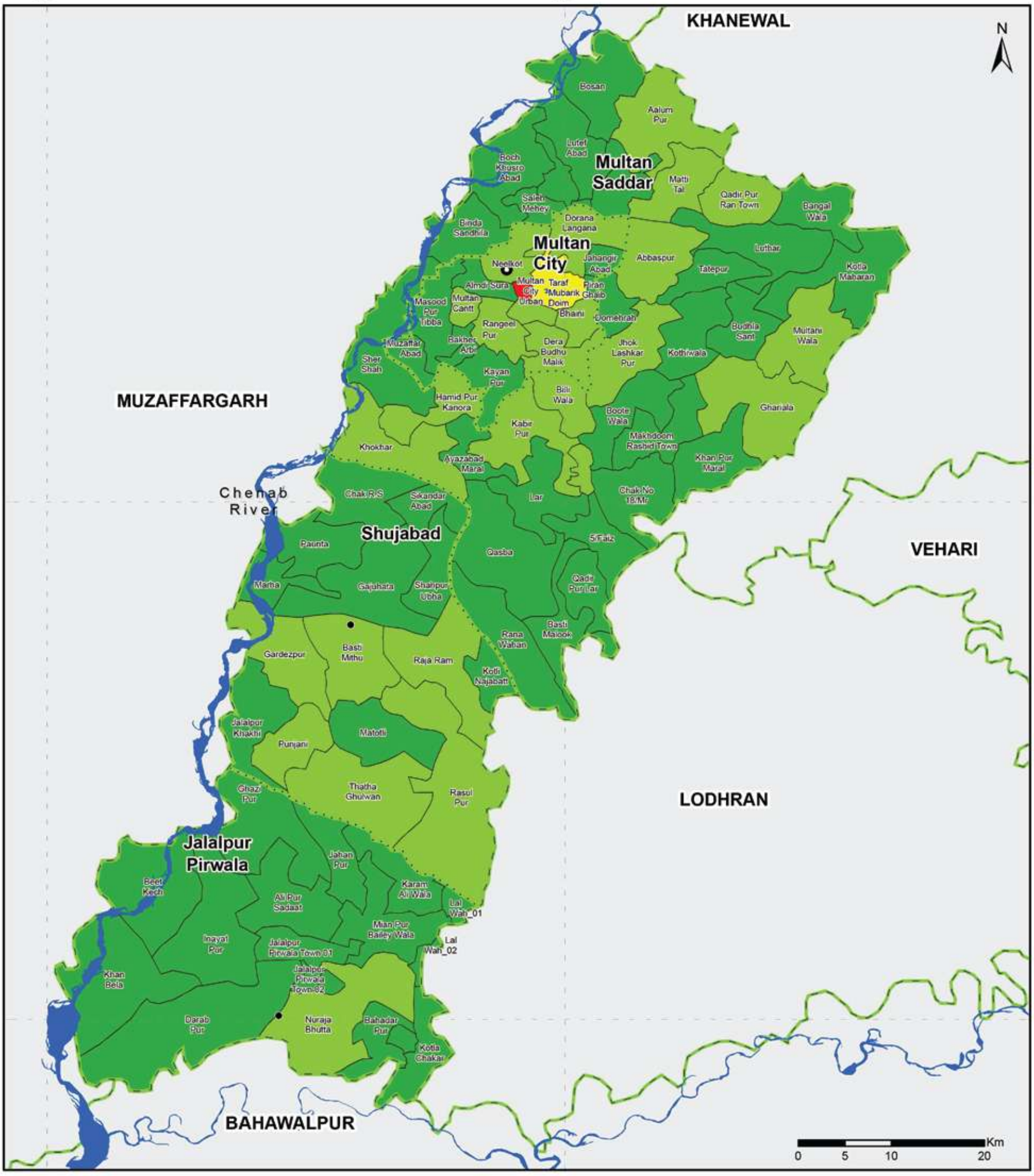
WFP United Nations World Food Programme

MAP INFORMATION

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

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-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 and Reservoir
- District Boundary
- Tehsil Boundary
- Line of Control
- Provincial Boundary
- International Boundary

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

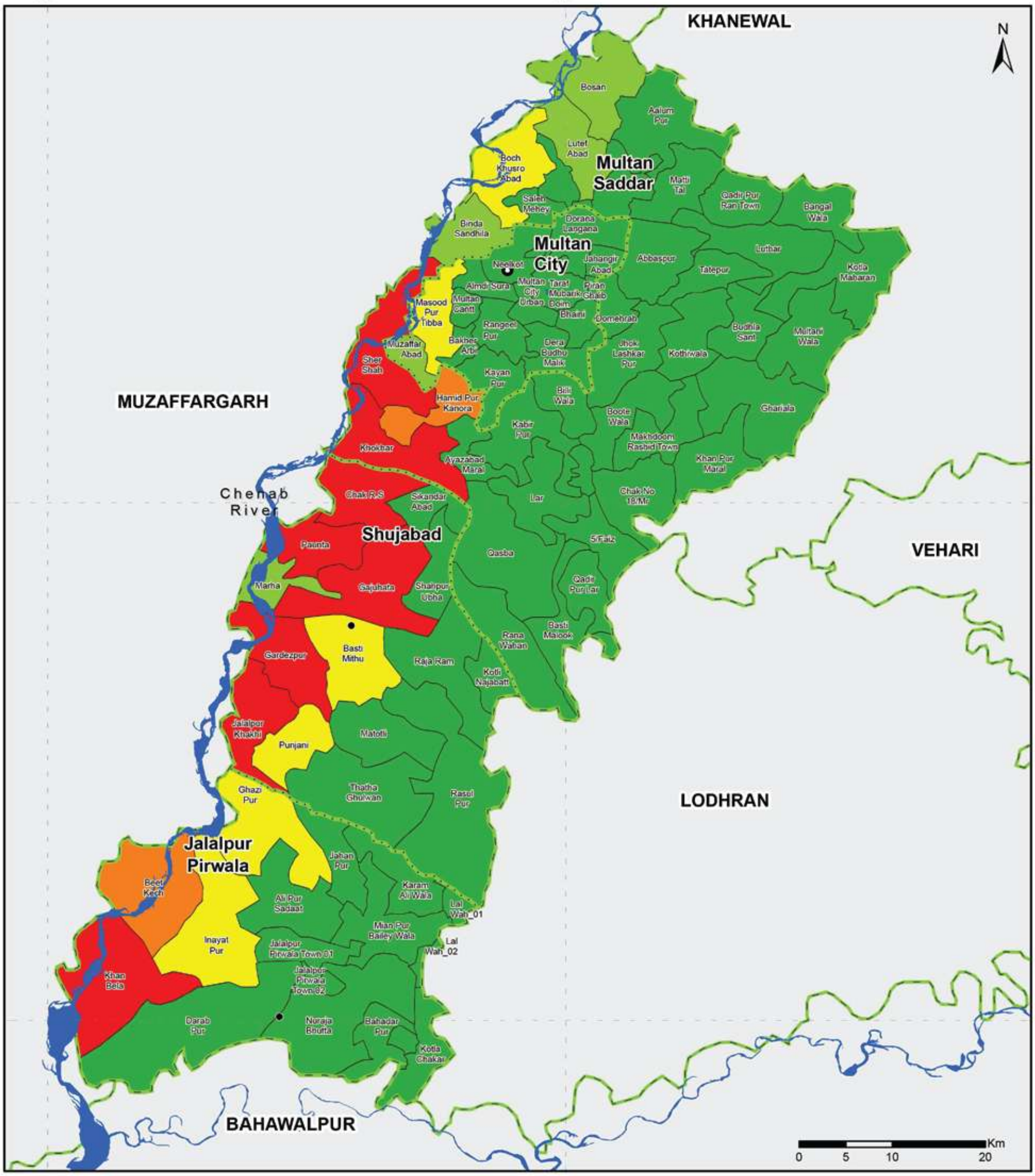
WFP United Nations World Food Programme

MAP INFORMATION

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

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-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 and Reservoir
- District Boundary
- Tehsil Boundary
- Line of Control
- Provincial Boundary
- International Boundary

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

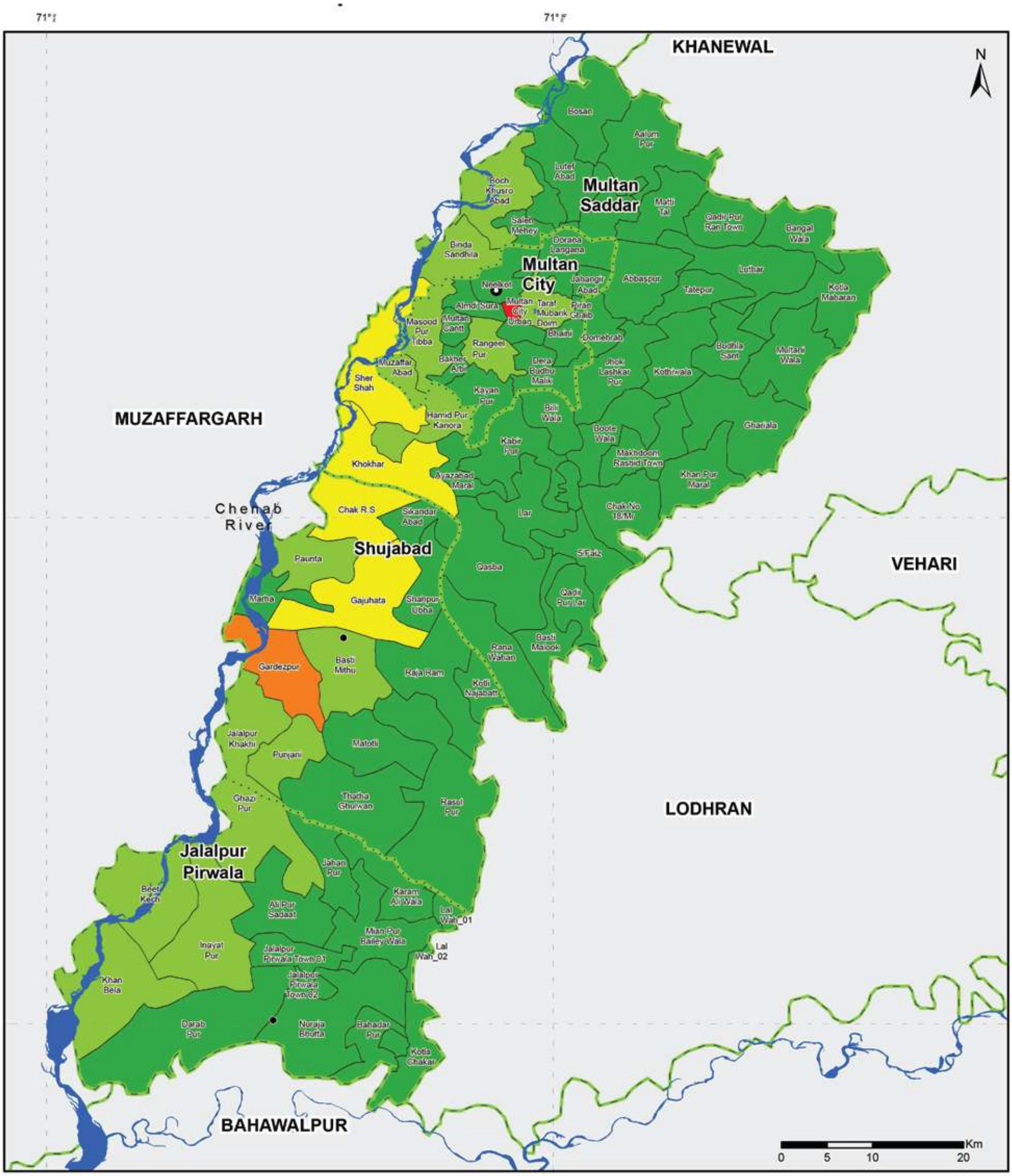
WFP United Nations World Food Programme

MAP INFORMATION

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

Datum: WGS 1984
Units: Degree
Map No: MHVRA-PUN-622-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 and Reservoir
- District Boundary
- Tehsil Boundary
- Line of Control
- Provincial Boundary
- International Boundary

Multi Hazard Vulnerability & Risk Assessment, Multan, 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-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/Multan/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), Multan
Key Indicators - Child Mortality Statistics	Multiple Indicator Cluster Survey (MICS) Punjab: 2011
Multan 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), Multan
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 Multan (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, Multan

Developed by

Project Management Unit (PMU),
National Disaster Management Authority,
Prime Minister's Office, 2nd Floor, Sector G-5/1
Constitution Avenue, Islamabad - Pakistan
www.ndma.gov.pk