

LAND COVER ATLAS OF PAKISTAN

The Sindh Province

A joint publication by FAO, SUPARCO and Crop Reporting Service, Government of Sindh



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FOREWORD

The Government of Pakistan, with support from its cooperating partners, has initiated a comprehensive program to address the improvement in agricultural statistical reporting utilizing auxiliary data from Earth Observation satellites.

The project: *Agricultural Information System - Building Provincial Capacity in Pakistan for Crop Estimation, Forecasting, and Reporting based on the integral use of Remotely Sensed Data; GCP/PAK/125/USA* focuses on enhancing and improving current systems based the integral use of remotely sensed data into the existing data collection, analysis, and dissemination systems; as well as the development of complementary systems to validate the use of satellite remotely-sensed data for area estimation and yield forecasting.

In this respect, the land cover mapping aspect was considered as a critical component of the area frame development and evolution. Many agricultural applications require detailed, updated, reliable and accurate baseline on land cover to support spatial monitoring and to evaluate ecosystem and landscape dynamics. Particularly in agriculture, a reliable land cover model of the present status at land utilization can significantly assist the development and support statistical applications. Due to its importance the project supported the development of a harmonized land cover database and land cover atlas of each of the two provinces of Punjab and Sindh and the series will be continued to provide a complete coverage of the country.

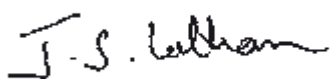
The Area Frame development provides a statistical robust, cost-effective tool to monitor agriculture in the country at Federal and provincial level. FAO with the project partners, the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) and the Crop Reporting Services (CRS), have successfully developed and integrated the land cover database information, derived from remote sensing, into a procedure for crop area estimation (Area Frame Sampling).

The process involves critical key steps:

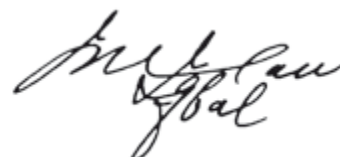
- STRATIFICATION: The land is divided into homogeneous entities or strata using the updated land cover database, generated using the FAO Land Cover Classification System (LCCS).
- MULTI-STACK/PHASE SAMPLING: Within each stratum, the land is further divided into sampling units or segments and a sample of segments selected for a field survey.
- ANALYSIS: Statistical analysis is conducted based on several decisions (e.g. land cover strata definitions, number of substrata, size of the sampling units, the allocation of the sample to the strata and the method of selecting the sample) are taken. These decisions will have an appreciable impact on the statistical and cost efficiency of the final result.

Moreover, the land cover assessment and monitoring of its dynamics, whilst critical for area frame development, are also essential requirements for the sustainable management of natural resources and represent a fundamental baseline to support the government institutions in developing several activities linked to the improved monitoring and management of agricultural land. The multipurpose land cover database so produced, is an important and harmonized baseline of agriculture in the country.

The Provincial land cover database of Sindh is created using a number of data sources ranging from remote sensing satellite imagery (at 5 meters resolution or better), available historical digital datasets and in-situ data. The FAO Land Cover Classification System (LCCS) was used for the creation of the national legend in consultation and inputs from the national experts. The FAO methodology for land cover change mapping was implemented using FAO land cover change mapping toolbox. FAO provided substantive technical assistance to the national experts to undertake a consistent assessment of the land cover in Pakistan.



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ACKNOWLEDGEMENTS

The publication of the *Land Cover Atlas of Pakistan - The Sindh Province* is the result of the outstanding efforts of many institutions and individuals working in close partnership. The following paragraphs attempt to acknowledge everyone who supported and contributed to this atlas.

The *Land Cover Atlas of Pakistan - The Sindh Province* was made possible by the contributions (financial and in-kind) of the partner organizations involved in the project *Agricultural Information System - Building Provincial Capacity in Pakistan for Crop Estimation, Forecasting, and Reporting based on the integral use of Remotely Sensed Data; GCP/PAK/125/USA* the Government of Pakistan, the Food and Agriculture Organization of the United Nations (FAO) and the United States Department of Agriculture (USDA), which funds the Project.

This activity was implemented in collaboration with SUPARCO, Directorate Crop Reporting Service Sindh, and other relevant stakeholders in Pakistan. The national experts from SUPARCO and the CRS were trained on the methodology and tools to create, manage and analyse the land cover changes database.

FAO has worked closely with the Pakistan partners to:

- produce a detailed and harmonized national land cover database, which provides reliable and updated information on the distribution of the land cover classes to support a multiplicity of applications but in particular it will foster an improvement in the area frame development, improved sample selection and allocation and refinement of the sample size as it implicitly creates a stratification of the province suitable for rationalization of the sampling strategy;
- strengthen the national capacity to undertake land cover and land change analysis using standards, remote sensing and GIS technology and integrate in-situ data with the earth observation data;
- prepare the draft and final Atlas of Sindh land cover; and
- use the outputs of these activities to support informed decision making at various levels.

We acknowledge the cooperation of the following institutions and experts for their support in the process of development of the Pakistan land cover (image interpretation and classification, field verification, dissemination and uptake, image processing, photo-interpretation, database creation and map production). The SUPARCO team involved in the project led by Imran Iqbal comprises Shafiq Ahmed, Jawed Ali Qureshi, Arshad Ali, Saadia Naeem, Raheel Ahmad, Atif Shahzad, Zafar Jamil, Hasan Shahab and Syed Farhan Ahmed Khalil. The Pakistan FAO representative, Kevin Gallagher and subsequently Patrick Evans, the FAO office in Pakistan supported the implementation of the on-site training workshops for land cover mapping project. The FAO HQs team was led by John Latham, with support of Renato Cumani, Ugo Leonardi, Antonio Di Gregorio, Ilaria Rosati, Emmanuela De Leo. The contribution of all of the above, along with input from many other unnamed people, has been vital for the success of this project. The preparation of the land cover atlas for publication has been led by Ane Louise Gaudert (Graphic Design) and Mario Bloise (Database).

The effort of the photo-interpreters group and of the fieldwork team from SUPARCO and CRS that undertook field validation activities travelling extensively under difficult circumstances in the most remote areas of Pakistan is highly appreciated.

Thanks are also due to the staff of SUPARCO who generously allowed access to their high resolution imagery.

The entire land cover update would have been very difficult, if not impossible, without the leadership and oversight of Imran Iqbal (SUPARCO) and John Latham (FAO).

INTRODUCTION

This *Land Cover Atlas of Pakistan - The Sindh Province* provides a comprehensive description of the biotic and abiotic resources of the province 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. The LCCS approach also captures the physiographic characteristics of the region.

Twenty four officials from the Crop Reporting Services of Punjab and Sindh provinces, as well as SUPARCO staff attended the training, from the 12th to the 23rd February 2012, at the SUPARCO Islamabad office, by FAO to appraise all the stakeholders of the significant benefit of the LCCS approach and to train Pakistani counterparts. At the conclusion of the training, and in consultation with all the stakeholders, it was decided to adopt the LCCS methodology. It was determined that the land cover database would assist not only the development of a robust statistical area frame methodology but would also be the basis for the development of an improved capacity for natural resources monitoring and management in Pakistan.

The legend has 13 main land cover classes which have been further subdivided into 36 classes, which have been mapped based on the analysis, interpretation and validation of SPOT -5 very high resolution satellite data (5 metre). The SPOT-5 satellite images were segmented into homogeneous polygons and labeled using the LCCS classification system and adopting the FAO methodology and its land cover toolbox. A seamless and detailed land cover database has been created that lays the foundation of future detailed land cover monitoring strategies in the country.

In addition to agricultural statistics and agricultural monitoring other thematic beneficiary areas are expected to include forestry, environment, irrigation, disasters, hazard monitoring, planning & development, geological surveys and wild life habitat assessment.

This volume of the national atlas pertains to the province of Sindh, Pakistan. The atlas is illustrated at a district level, providing land cover information in aggregated and cartographic form as well as tabular statistics per class per district and for the province as a whole.

BACKGROUND

SUPARCO, in collaboration with FAO, undertook land cover mapping of Pakistan to assess the extent of cultivated land and their associated changes over time. Land cover maps of Punjab and Sindh provinces have been produced using the FAO Land Cover Classification System (LCCS), which is an important component of FAO's land cover initiative designed to create a harmonized and extensive representation of land cover features of a single country and between countries.

The main objective of land cover mapping is to respond to the need for standardized and harmonized land cover data, for developing a common integrated approach in conformance with UNCED (United Nation Conference on Environment and Development) agenda.

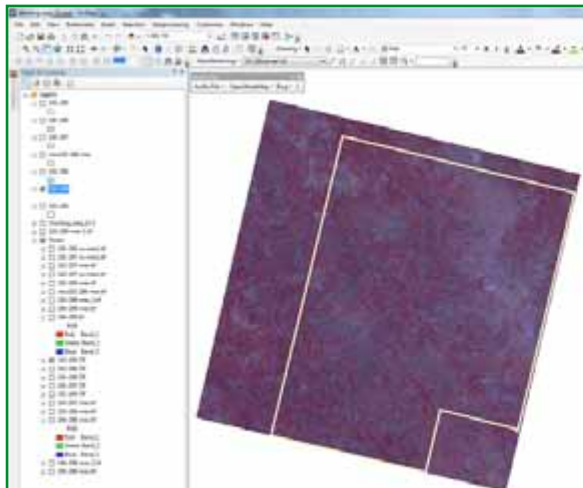


Figure 1: Sub-setting of image according to the extent of working area

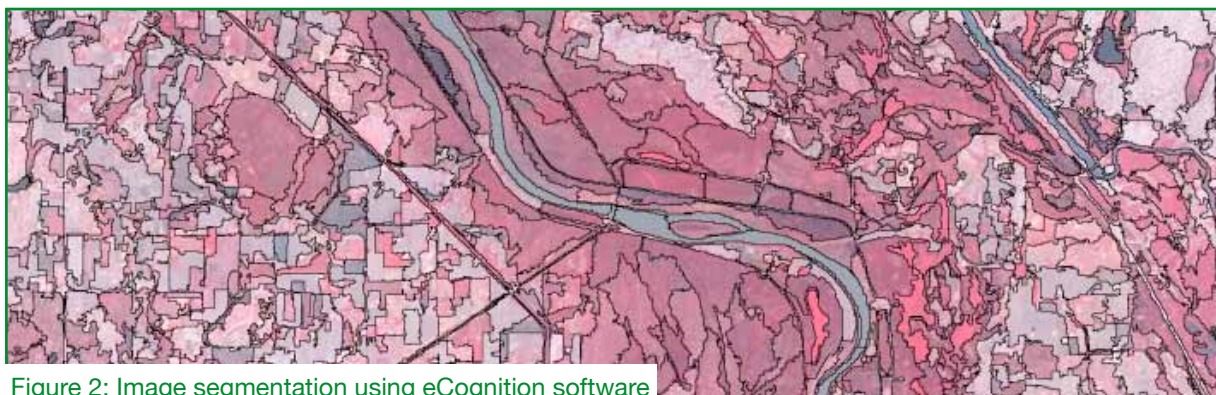
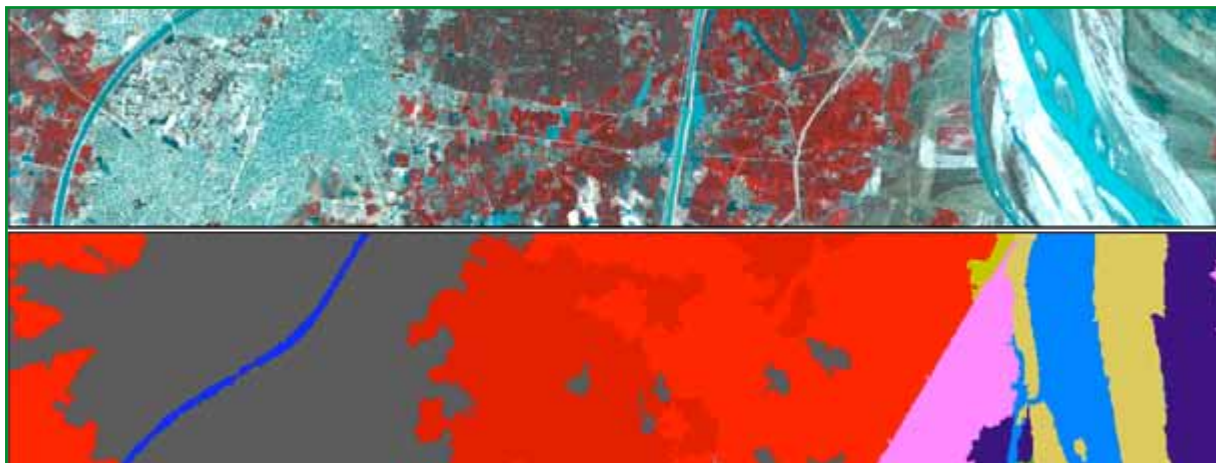


Figure 2: Image segmentation using eCognition software



2. Image Processing and Interpretation

2.1 Segmentation

Segmentation is the process of grouping pixels to simplify the image into meaningful pixel groups (*i.e.* segments or objects). Image segmentation provides a layer of polygons based on spatially continuous and spectrally homogenous regions or objects. Each segment represents regions with similar pixel values with respect to some characteristics such as colour, intensity or texture. For land cover mapping, segmentation helps in developing cluster pixels that belong to same land cover class.

For the purpose of the Land Cover Atlas development, segmentation was performed using Definiens Software. A multi-resolution segmentation approach was implemented to perform the segmentation at the scale ranged between 35 to 55 m depending on the complexity of image. In addition, compactness was set to 0.9 and shape to 0.1 to get more homogenous segments.

2.2 Image Interpretation

Image interpretation is the process of identifying and delineating useful spatial information and the labeling of the image object using land cover legends, and ancillary information. The FAO tool - Mapping Device Change Analysis Tool (MADCAT) was used for the creation of land cover database using the remote sensing imagery and the LCCS legend to assign the land cover class label of each polygon.

In order to assure interpretation consistency inside the same mosaic, a block of contiguous scenes (a sub-mosaic) was assigned to each interpreter. Photo-interpretation of the scenes was carried out at 1:25,000 scale, taking care of the matching between scenes belonging to the same sub-mosaic. Topology was checked and confirmed after completion of interpretation. Subsequently, the original segmentation of interpreted scenes was dissolved while keeping a copy of the full resolution interpretation.

Figure 3: Image interpretation using MadCat software

METHODOLOGY

Satellite Remote Sensing (SRS) offers a flexible, cost effective and an efficient means for monitoring and mapping natural resources and man-made infrastructure. Significant improvements in the spatial, spectral and temporal resolutions of satellite data in recent decades have significantly enhanced the usefulness of this technology for land cover mapping and its subsequent utilization.

The methodology for the production of maps is based on a detailed methodology including:

1. Image Acquisition and Pre-Processing

SPOT-5 imagery was utilized to map the land cover of Pakistan. The imagery was analyzed with respect to cloud cover percentage and image quality. Initially it was decided that images from 2011 would be used but owing to flood damages, it was considered appropriate to use pre-monsoon imagery of 2010 to map the land cover of Sindh province.

All images were geometrically corrected to a UTM projection following which ortho-rectification was performed. The images were then subdivided into desired area of interest and re-projected to Mercator projection. Subsequently, the images were pan-sharpened to 5 m spatial resolution for land cover mapping.

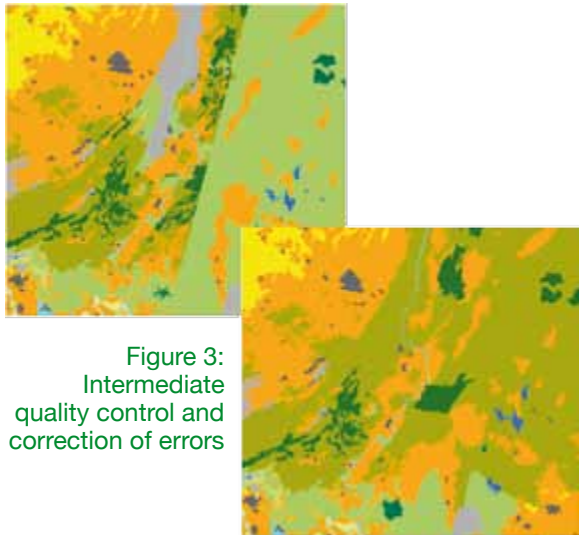


Figure 3:
Intermediate
quality control and
correction of errors

2.3 Intermediate Supervision Process - Quality Control

A team of two photo interpreters undertook an independent quality control of the database. The team check the dissolved segments of each working area and highlighted the errors. Where errors were identified or where the interpretation did not attain a minimum standard and/or contain non coded polygons, the quality control supervisor was tasked to reject/send back the scene/mosaic for re-photo-interpretation.

After the errors were removed by the photo-interpreter, the corrected interpretation was again submitted to a Quality Control supervisor for quality check. The process was repeated in case errors still existed.

After the quality check, edge matching of the dissolved tiles was carried out between the same sub-mosaic and bordering mosaics.

2.4 Field validation

On completion of the interpretation phase, field surveys were conducted by SUPARCO officials to validate the image interpretation and to remove the ambiguities related to land cover classes based on detailed field surveys. For each survey point, the land cover types and the coordinates were recorded using GPS systems.

2.5 Evaluation

After the completion of the interpretation, a quality check and final edge matching was undertaken and final products were submitted to FAO, HQs for a final evaluation of the land cover database.

2.6 Data Harmonization and Final Database Generation

As a final step, the land cover data was thoroughly reviewed and harmonized to create a consistent land cover database, minimizing differences from the subjectivity of different interpreters.

Finally, detailed topology rules were applied to correct inconsistencies and to remove slivers or voids in the database.

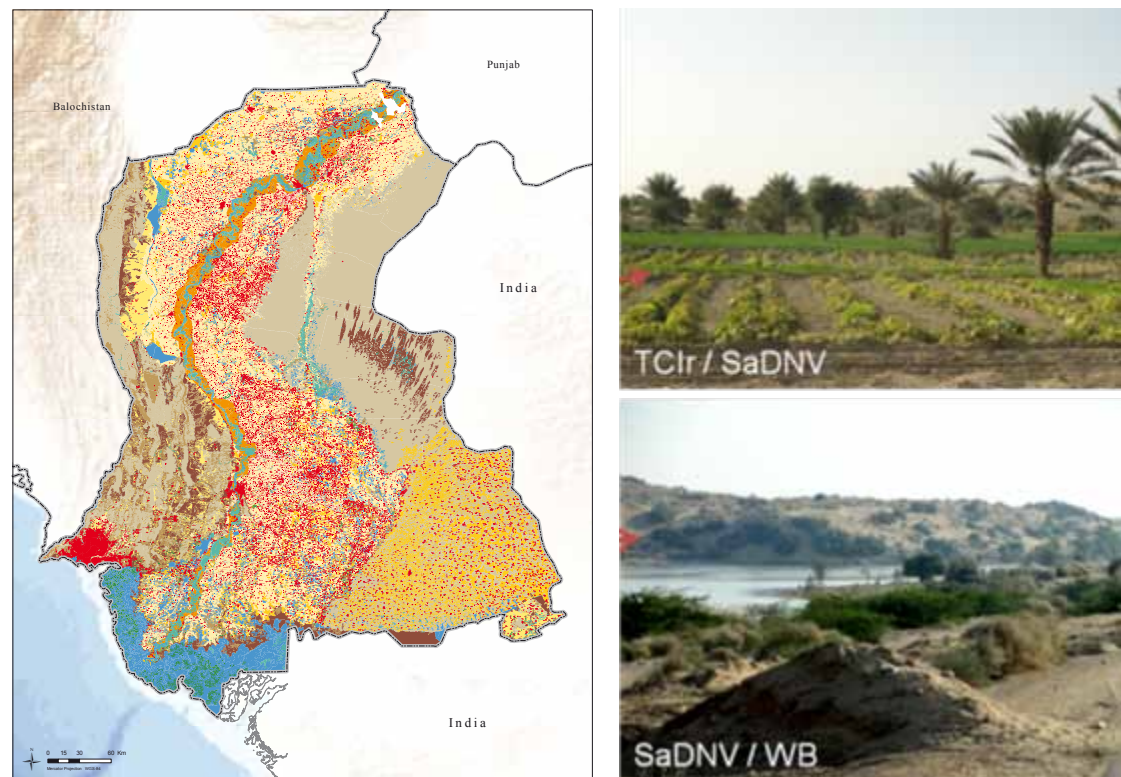


Figure 5: Field validation of Sindh Province



Figure 6: Removal of gaps
and overlaps errors

LEGEND

The legend for land cover mapping was created by FAO in consultation with SUPARCO and representatives of the Crop Reporting Services. The Photo-keys of different land cover types were developed and which serve to illustrate the aspect on the ground (texture, tone, colour and reflectance) of the land cover units, present in the images.

The final version of the legend is composed of 36 land cover classes aggregated into 13 main classes. The main 13 classes are as follows:

1. Orchard

Orchards are the cultivated or maintained areas for the production of fruits, nuts, berries, or ornamentals. Orchards are divided into two subclasses on the bases of growth form namely tree orchards and shrub orchards. Orchards are always found in the agricultural irrigated area. An herbaceous crop could be present beneath the trees.

2. Crop Irrigated

Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton. This class also includes all land being actively tilled. The differentiation of this class with rain fed crops is made on the basis of presence of channels, geographic location and local knowledge. Herbaceous crop irrigated and Herbaceous crop surrounded by Tree orchards are included in crop irrigated.

3. 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 marginal and irrigated include herbaceous crop irrigated saline fields and herbaceous crop rainfed in desert area. Herbaceous crop rainfed in desert areas are mostly found in the southern part of Sindh province, where the arid climate and the consequent shortage of rainwater allow crops

to take place only when the occasional rainfall occurs and hence fields are sporadically active. Differentiation of this class with the class crop rainfed is made on the basis of geographic location and local knowledge. Herbaceous crops in saline area can resemble as reflectance to the class saline area. Its discrimination with saline area can be done on the basis of clear field's pattern.

4. Crop in Flood Plain

Herbaceous crop located only in proximity of the river bed is termed as crop in floodplain. The water supply is provided either by irrigation or by the annual floods. Crop in floodplain includes herbaceous crop irrigated in flood plain and herbaceous crop post-flooding.

5. Crop Rainfed

The term rainfed agriculture is used to describe farming practices that rely only on rainfall for water. Crop rainfed includes herbaceous crop rainfed and herbaceous crop rainfed in sloping land. The differentiation of this class with irrigated crops is made on the basis of the absence of channels, geographic location and local knowledge. Herbaceous crop rainfed in sloping land can be found only in the sloping mountainous areas of Hindu Kush and Himalayan region.

6. Forest

Forest is described as area characterized by tree cover natural or semi-natural woody vegetation, generally greater than 6 meters tall. Forest includes both natural and planted forest. In this class trees forest plantation, trees Closed, trees Open and mangroves are considered as subclasses. Tree forest plantation refers to governmental plantation. This class can be identified with large area and regular shape. Tree closed are a type of vegetation with tree percentage cover of more than 60%. The class closed trees occur in different parts of the country. It has woody natural vegetation, found both in broad as well as in needle leaves. Open trees are the type of vegetation with mandatory presence of trees and herbaceous growth forms with percentage cover varying from 10 to 60%.

Mangroves are forest type exclusively found in the coastal areas.

7. Natural vegetation in wet areas

The subclasses include river bank, wetlands, shrubs closed to open in wetland, tree closed in wetland and tree open in wetland. The subclasses are derived on the bases of soil and vegetation type. River bank is part of the river bed flooded during the rainy season (flood plain), the bed of the seasonal rivers is also included in this class. Wetlands are herbaceous vegetation with cover ranging from 60% to 100% found in flooded/wet areas, sometimes associated with shrubs. Shrubs, closed to open, in wetland are found along the rivers and associated flooded areas in the vegetated portion of the river bank, made of shrubs with cover 20 - 100%. Tree closed in wetland are woody vegetation occurring along the rivers and associated flooded areas, with cover from 60 to 100%. Tree open in wetlands are the woody vegetation with cover ranging from 10 to 60%.

8. Range Lands - Natural Shrubs and Herbs

Rangelands are vast natural landscapes of grasslands, shrublands and woodlands. Areas characterized by natural or semi-natural woody and herbaceous vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking. These areas are not subject to intensive management such as tilling, but can be utilized for grazing. Shrub closed, shrubs open and herbaceous closed to open are the subclasses that are included in rangelands. Shrubs with a cover from 60 to 100% are considered as shrub closed. A layer of trees sparse (1-10%) could be present with shrub closed. Open shrubs are natural or semi-natural vegetation with shrubs ranging from 10 to 60 % and trees ranging from 1 to 10 %. They are found mainly on the hills of Pakistan, with both varieties of broad and needle leaves. Herbaceous closed to open is a type of vegetation where mandatory presence of herbaceous growth forms varies from 10 to 100% and optional presence of trees and shrubs of up to 10% of cover.

9. Built-up Area

It defines all built-up 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.

10. Bare Areas

This class describes areas that have very less natural and manmade vegetative cover. The subclasses include sand dunes and barren land. Barren land is bare soil area with very low density of shrubs and no agriculture activity. Sand dunes are made of low ridges or hillocks of drifted sand mainly moved by wind. The shifting sand is not covered by vegetation and, if present is negligible.

11. Bare Areas with Sparse Natural Vegetation

Sand Dunes with natural vegetation, bare rocks (with sparse vegetation) and desert flat plain are included in this class. These are areas where sparse vegetation could be present but the percentage coverage would be less than 10%. Sand dunes with natural vegetation are dunes that have permanent vegetation cover ranges from 1 to 40%. The vegetation cover causes a process of dune stabilization. According to the amount of vegetation cover, dunes are stabilized or semi-stabilized. Bare rocks (with sparse vegetation) are a class that contains less than 10% of growth forms. This class is based on the geographical location of the area that is declared as desert other than sand dunes.

12. Wet Areas

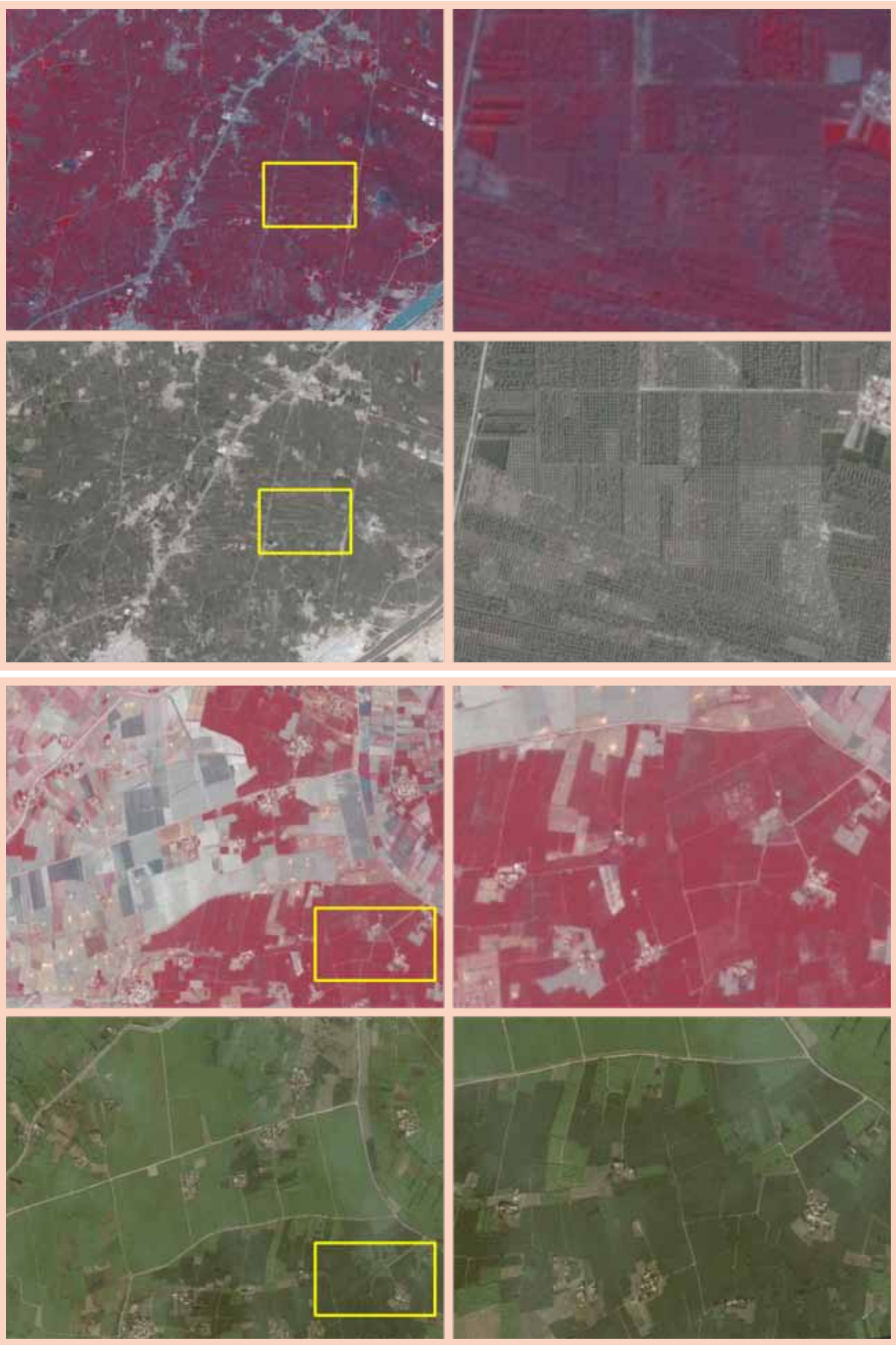
Areas which are naturally covered with fresh or saline water such as river and lakes are grouped in this class. Wet areas are characterized by drainage and the consequent presence of sluggishly moving or standing water saturating the soil with sparse natural vegetation. The subclasses include mud flats, river perennial, salt lake, water bodies, saline area and water logged bare areas. The classes are derived on the basis of presence of water above surface. Mud flats are area with wet sand in proximity of mangroves forest and coastal area. River perennial is a part of the riverbed where there is a constant presence

of flowing water throughout the year. Saline lakes are water bodies located near the coast where the water is brackish or saline. Lake shore is also included in the classes of water bodies and saline lake. Saline areas can show up as reflectance to the class herbaceous crop irrigated saline fields. In this case the field pattern is absent. Water logged bare area is low level land generally filled with a high water table. It must be always surrounded by agricultural area.

13. Snow and Glaciers

Snow permanent is the area characterized by year-long surface cover of ice and/or snow. Glaciers are permanent solid moving under its own gravity; it forms where the accumulation of snow exceeds its ablation (melting and sublimation) over many years, often centuries.

PHOTO KEYS



1. ORCHARDS

Orchads - tree crop

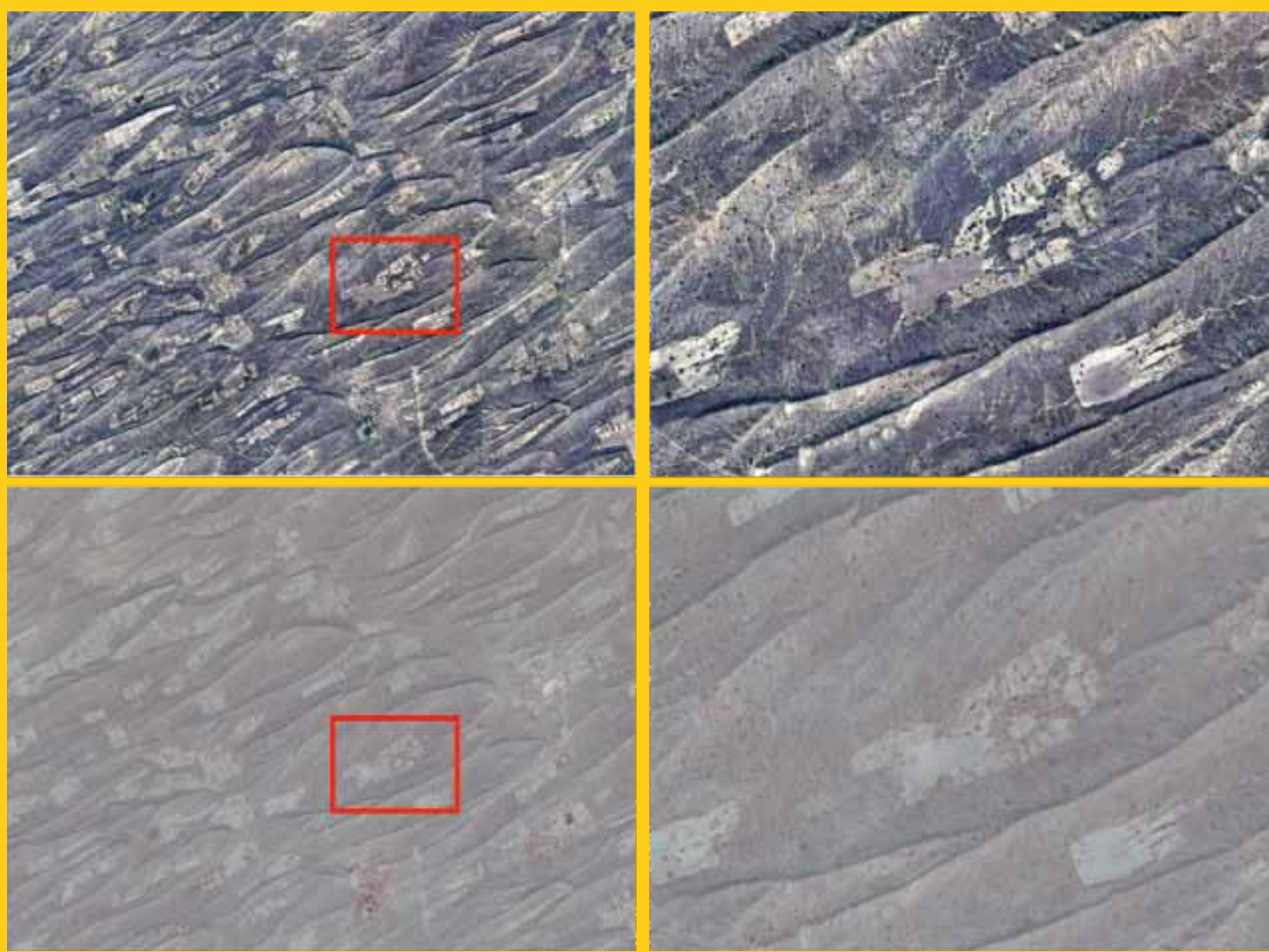
Orchads - shrub crop

2. CROP IRRIGATED



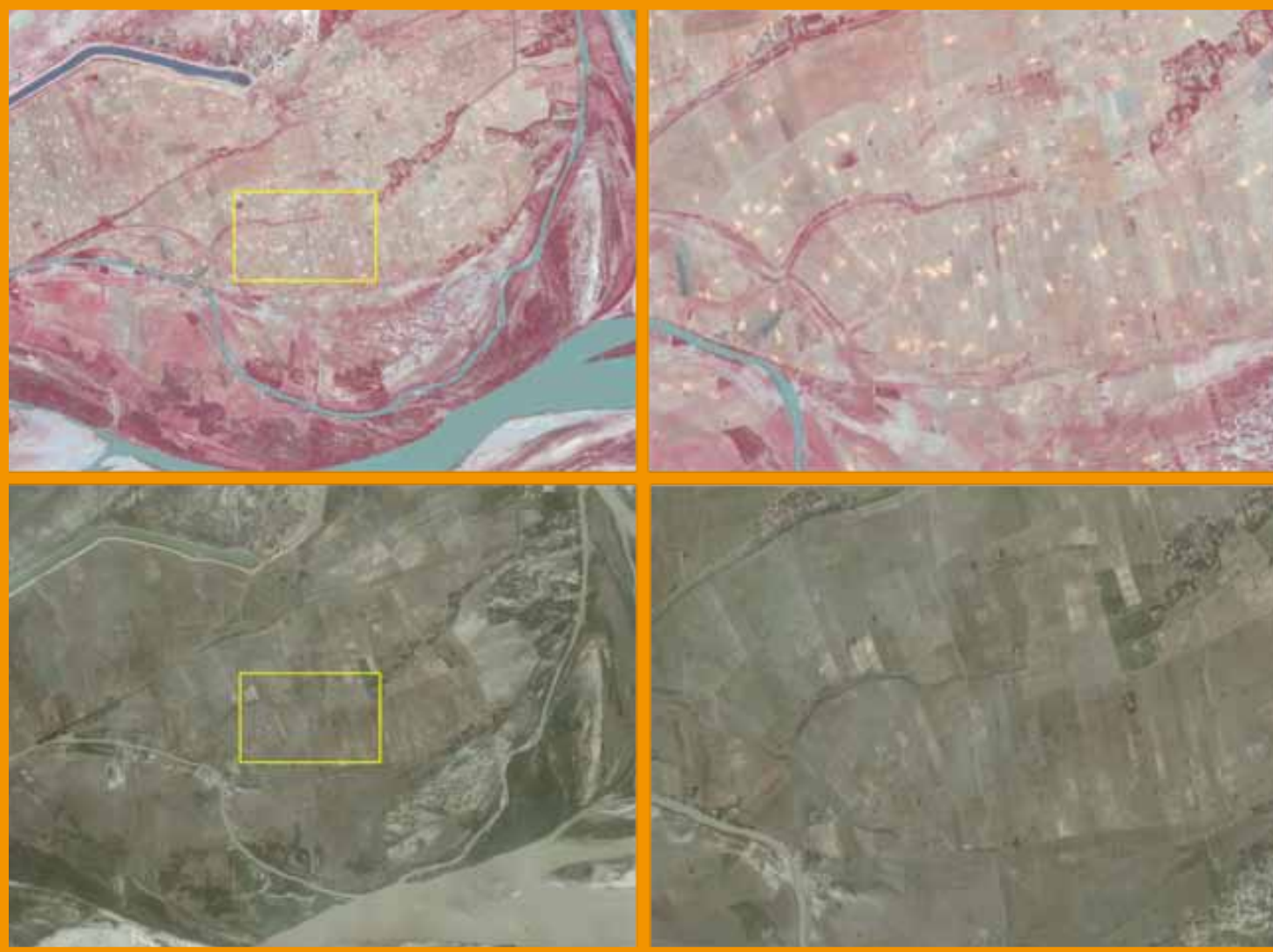
Crop irrigated -
herbaceous crop
irrigated

3. CROP MARGINAL AND IRRIGATED SALINE



Crop marginal and
irrigated saline -
herbaceous crop rainfed
in desert area

4. CROP IN FLOODPLAIN



Crop rainfed in flood plain - herbaceous crop irrigated in flood plain

5. CROP RAINFED



Crop rainfed - herbaceous crop rainfed

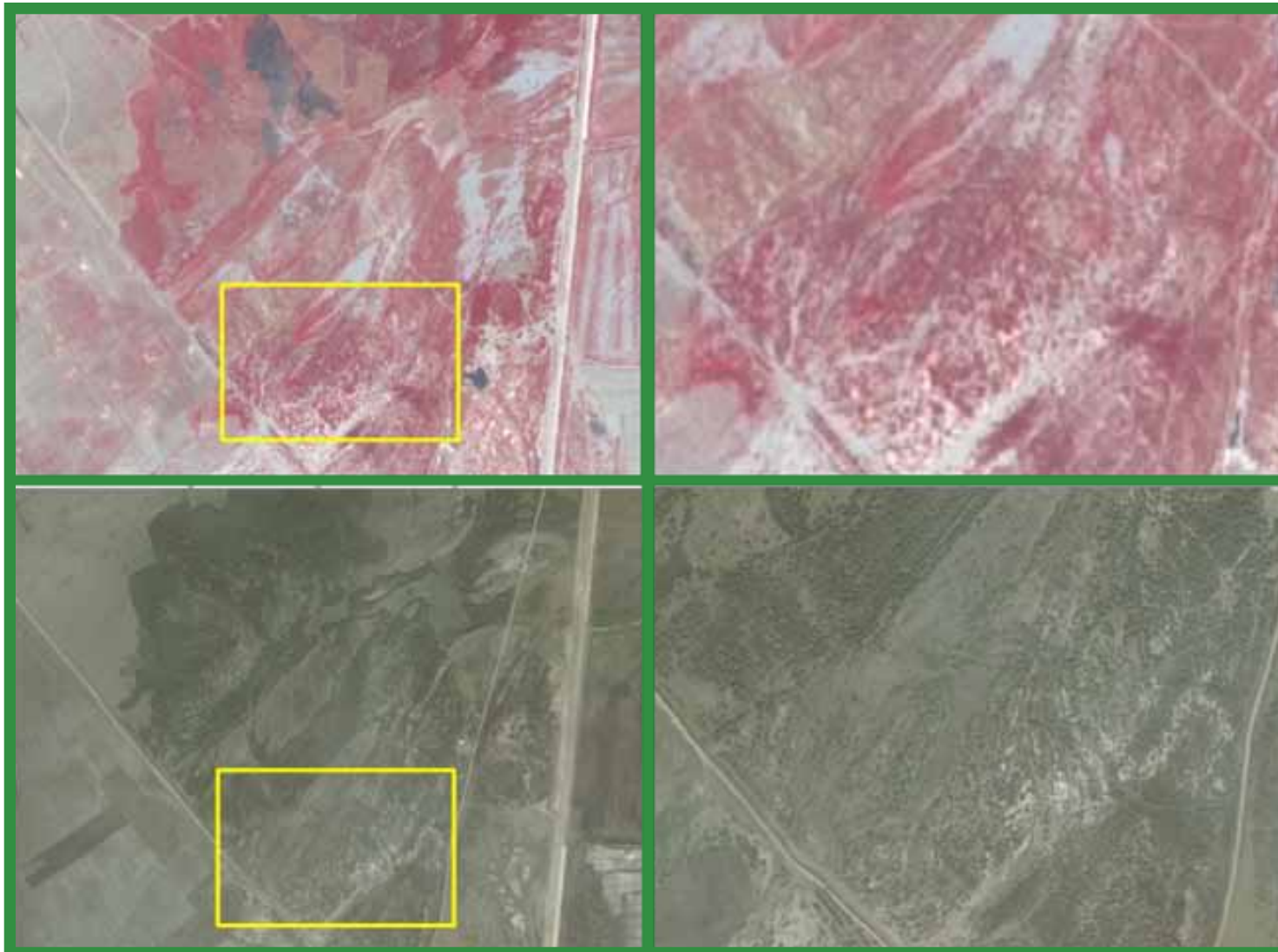
6. FOREST



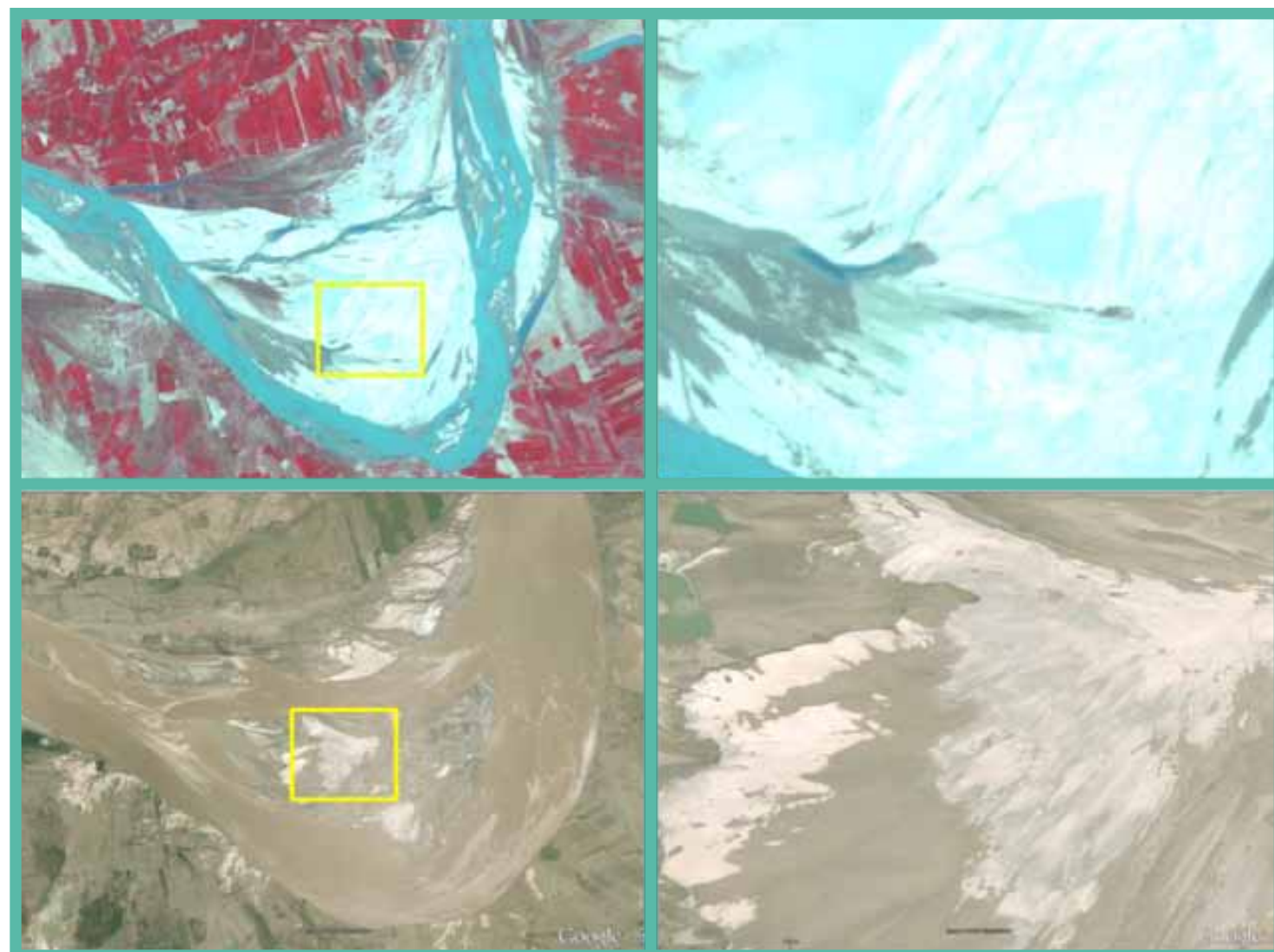
Forest - tree forest
plantation



Forest - trees
closed

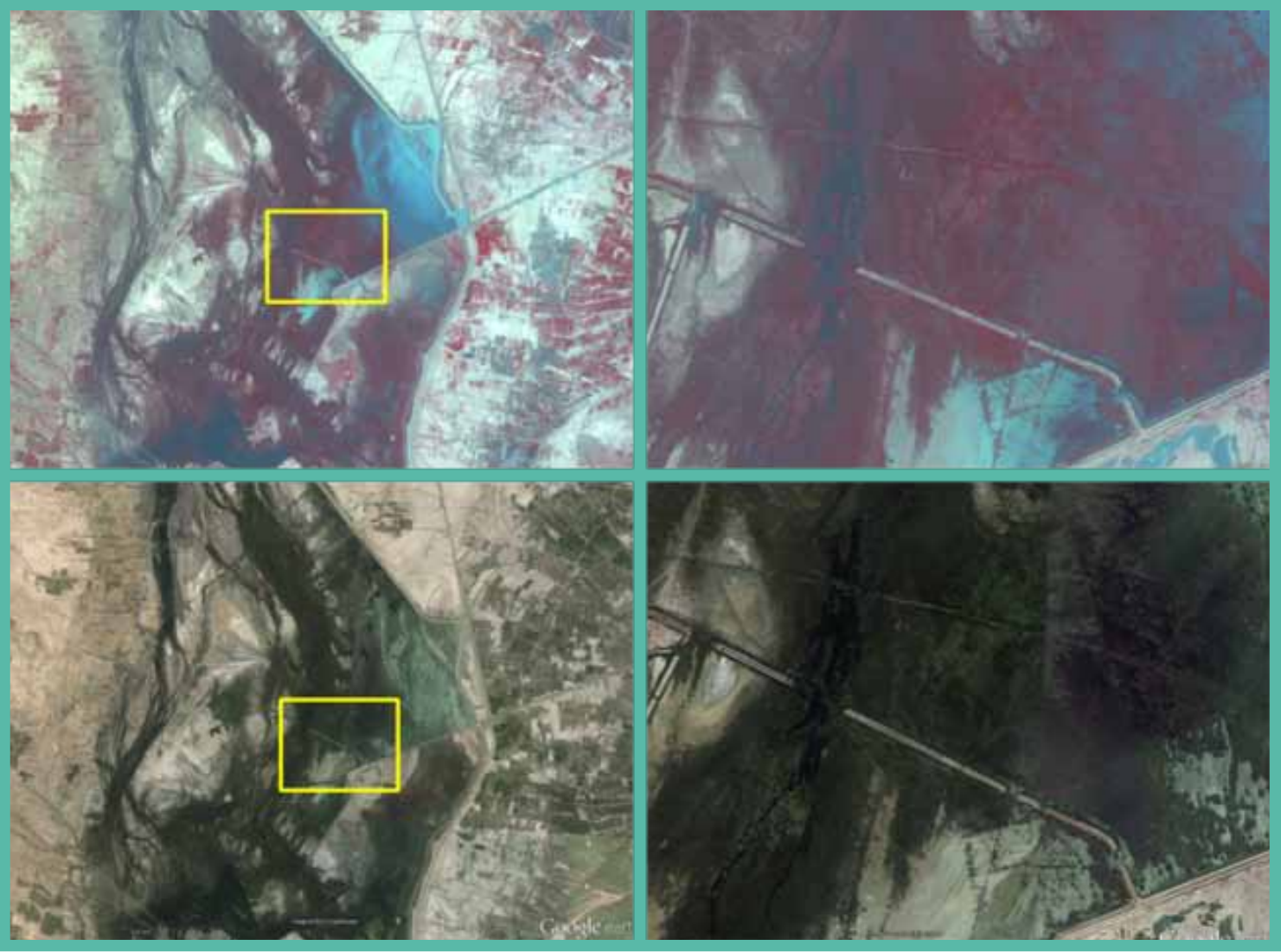


Forest - trees open



7. NATURAL VEGETATION IN
WET AREAS

Natural vegetation
- river bank



Natural vegetation
- Wetland

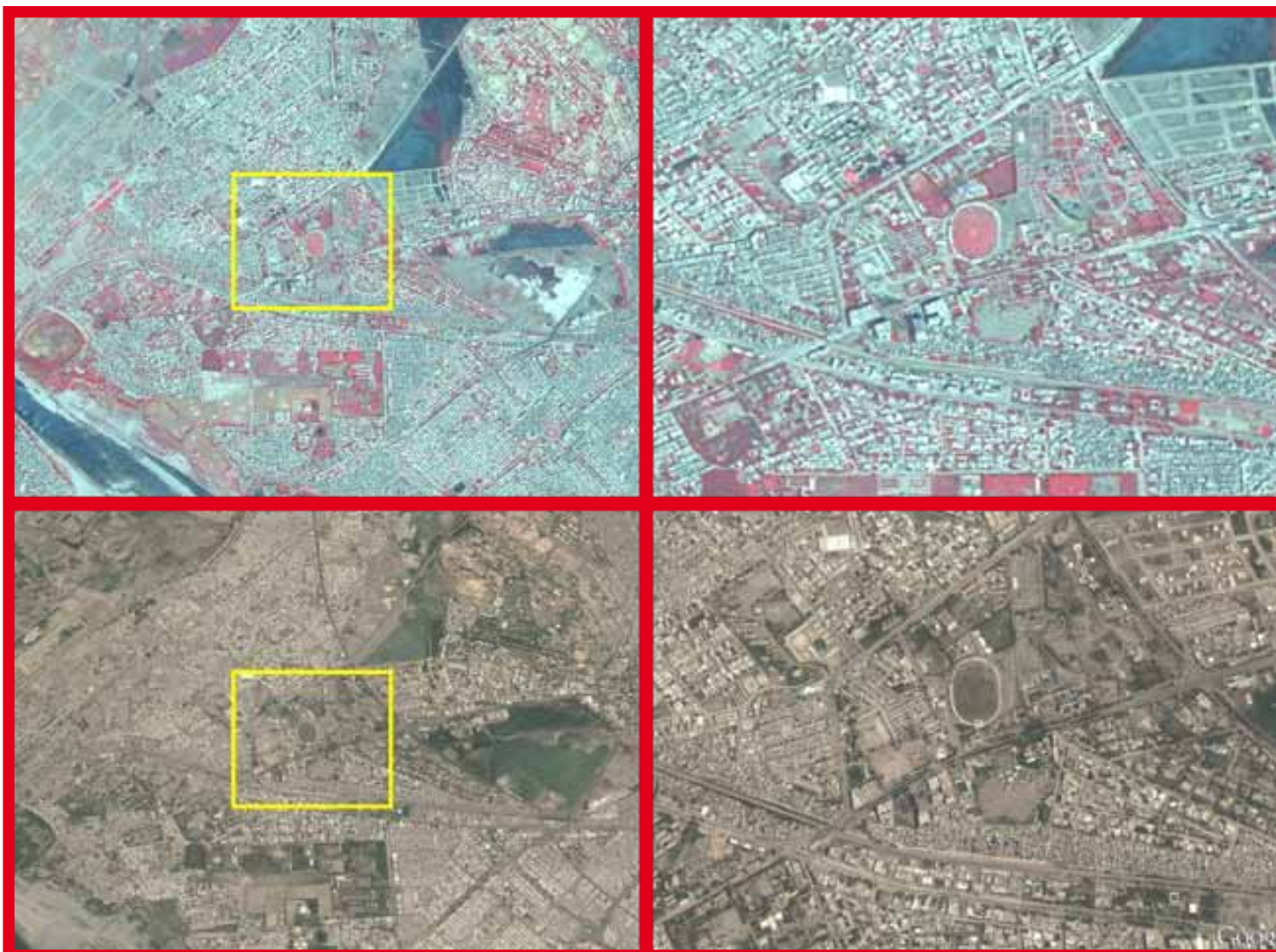


8. RANGE LANDS -
NATURAL SHRUBS AND
HERBS

Range lands -
shrub closed

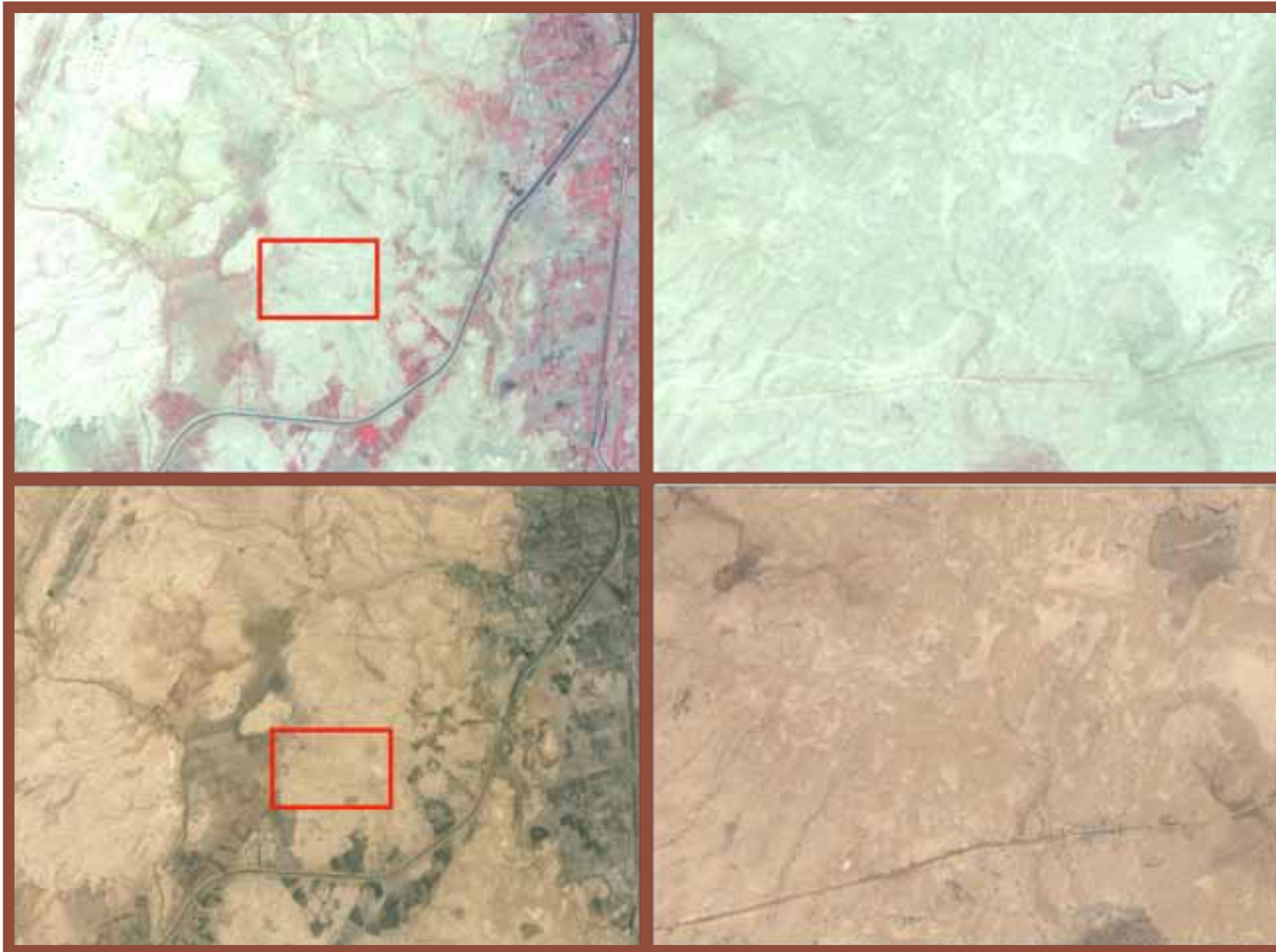


Range lands -
shrubs open



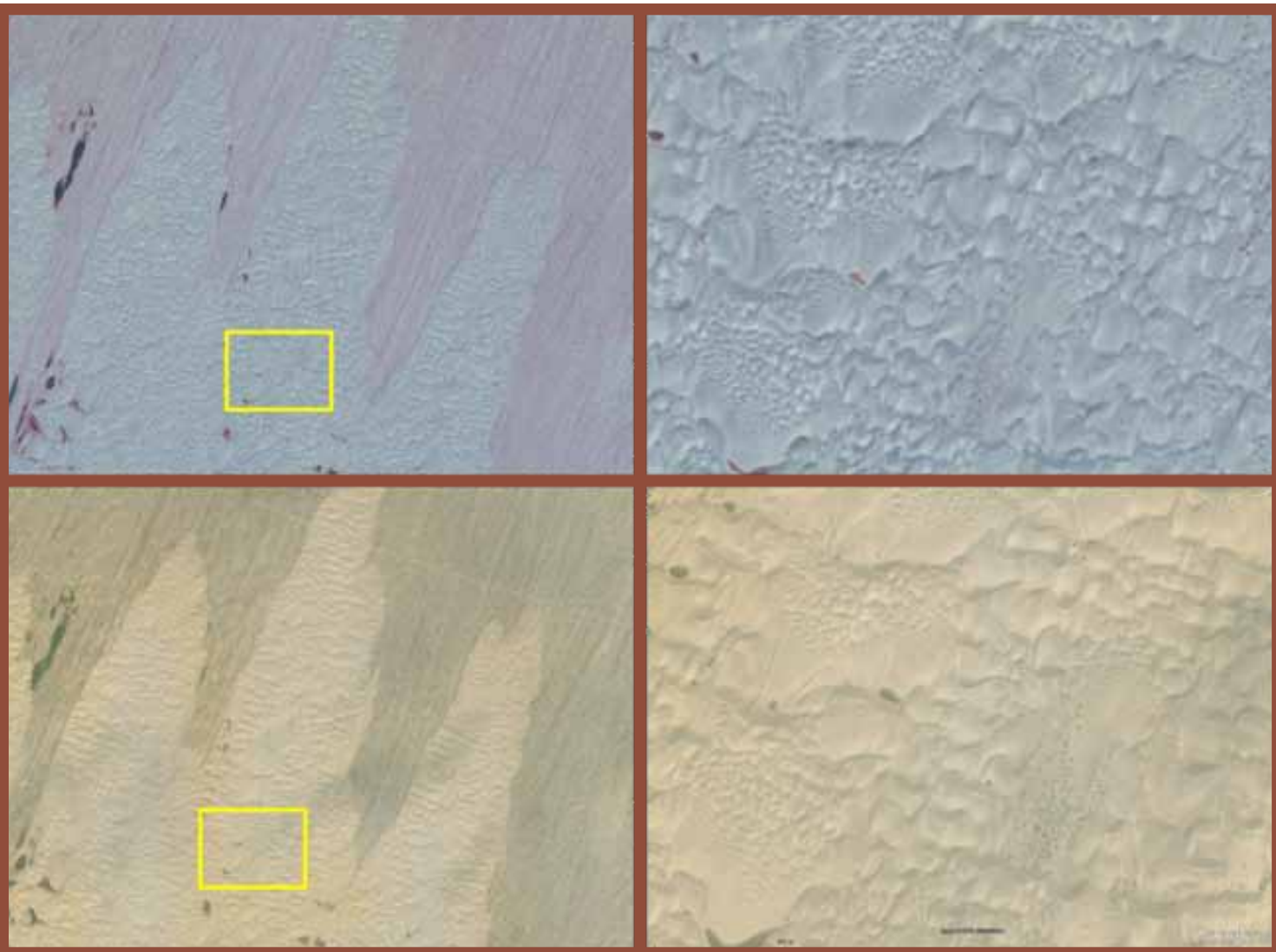
9. BUILT-UP AREA

Built-up area



Bare areas - barren
land

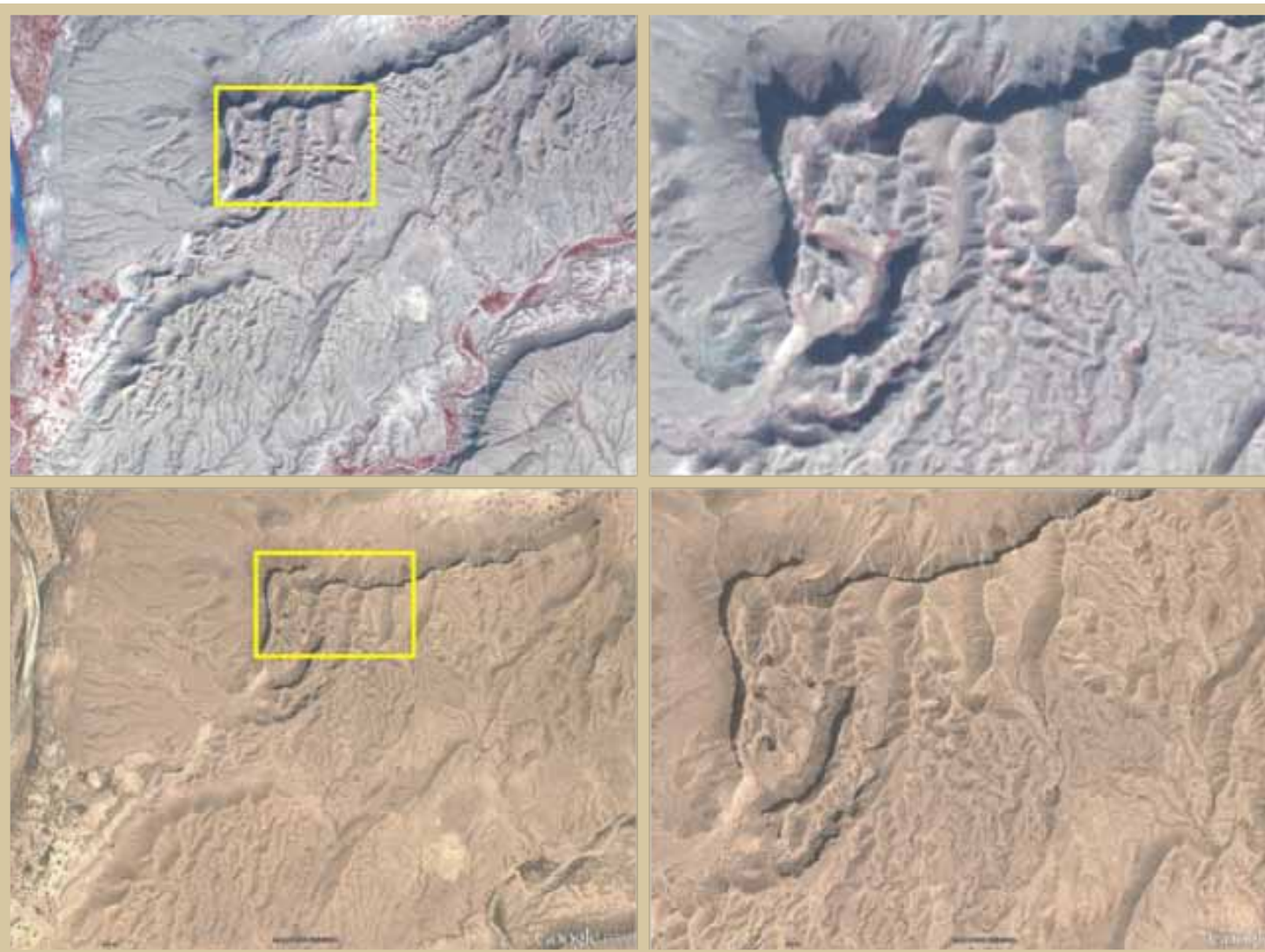
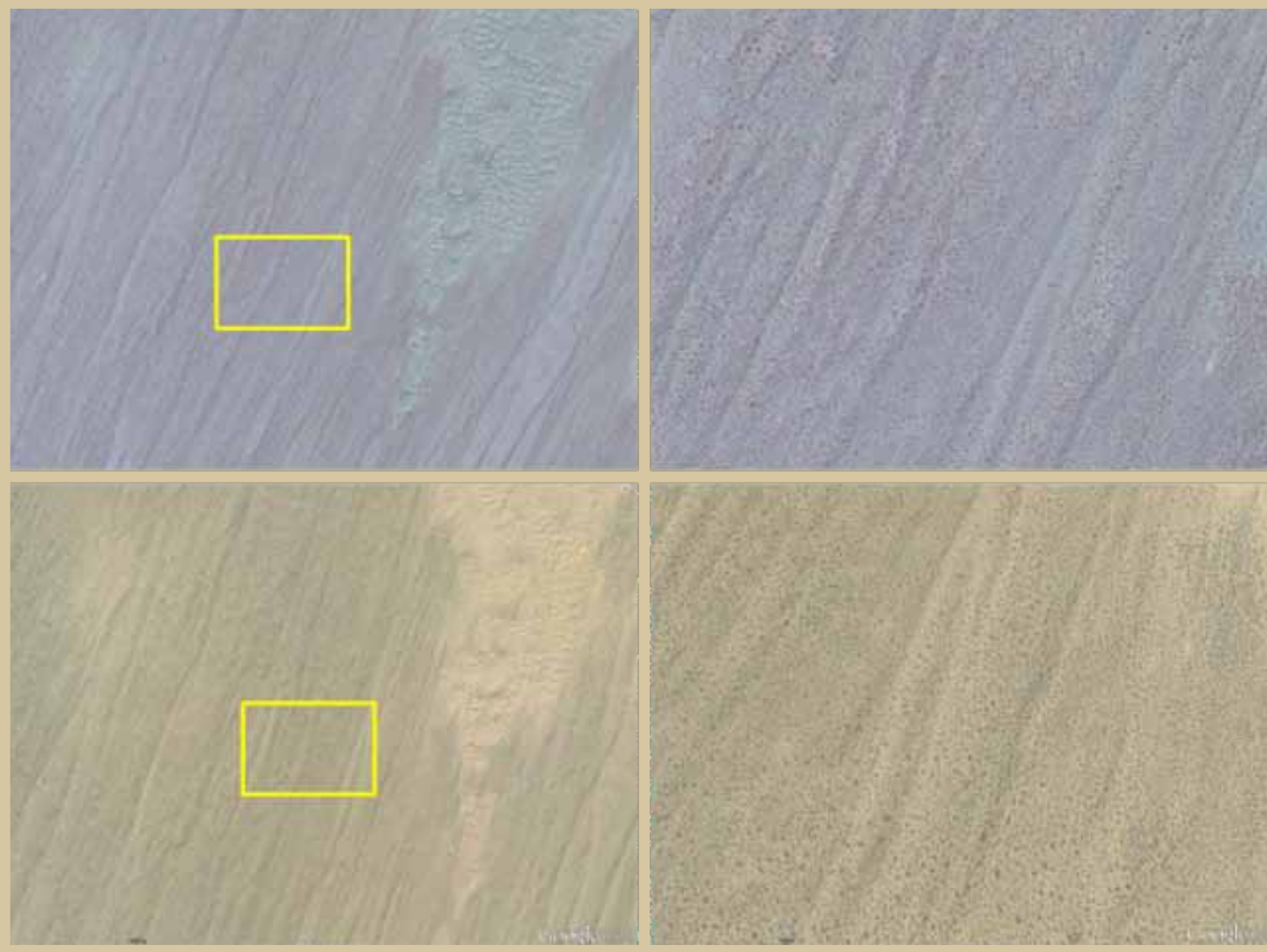
10. BARE AREAS



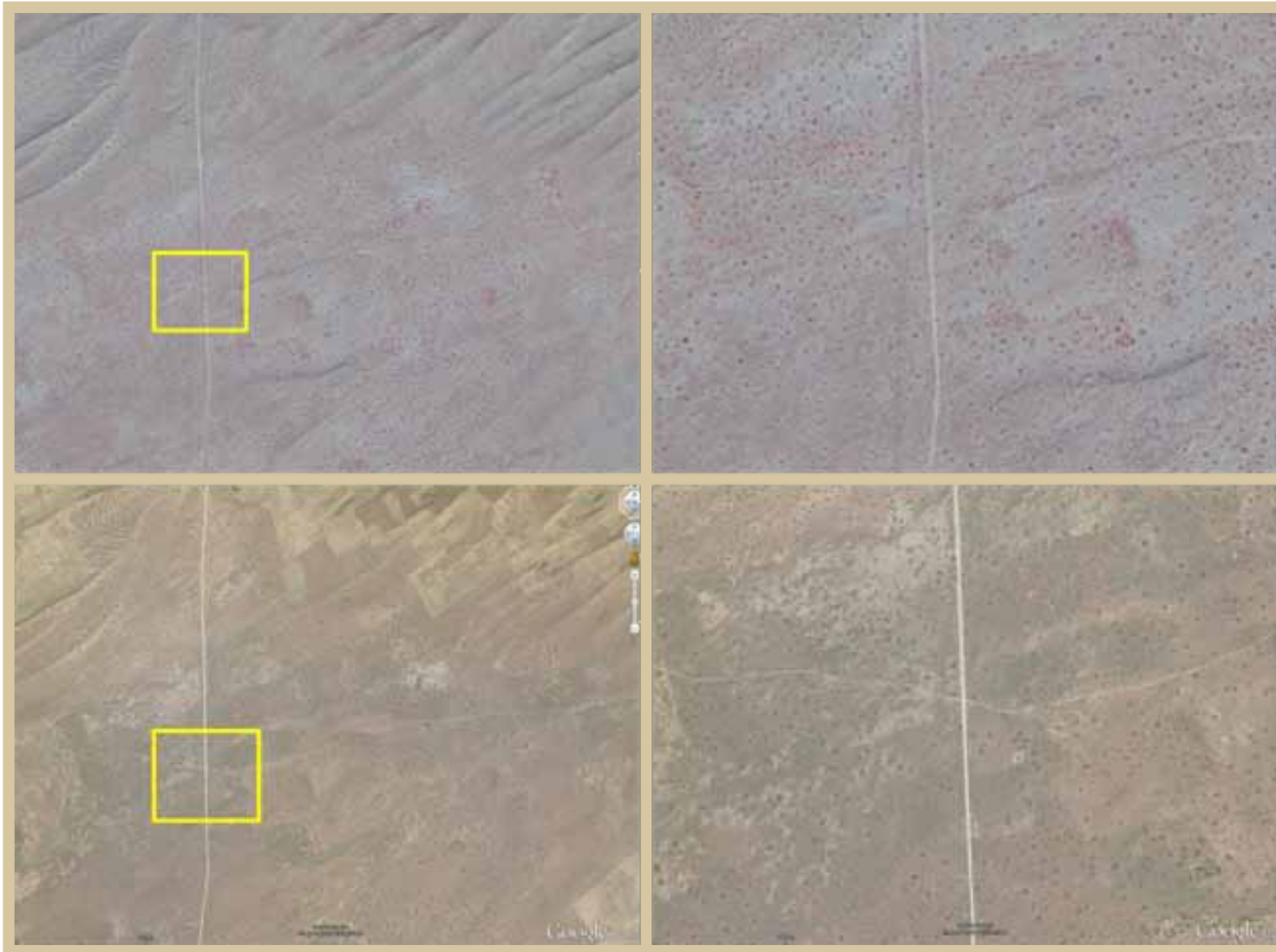
Bare areas - sand
dunes

11. BARE AREAS WITH
SPARSE NATURAL
VEGETATION

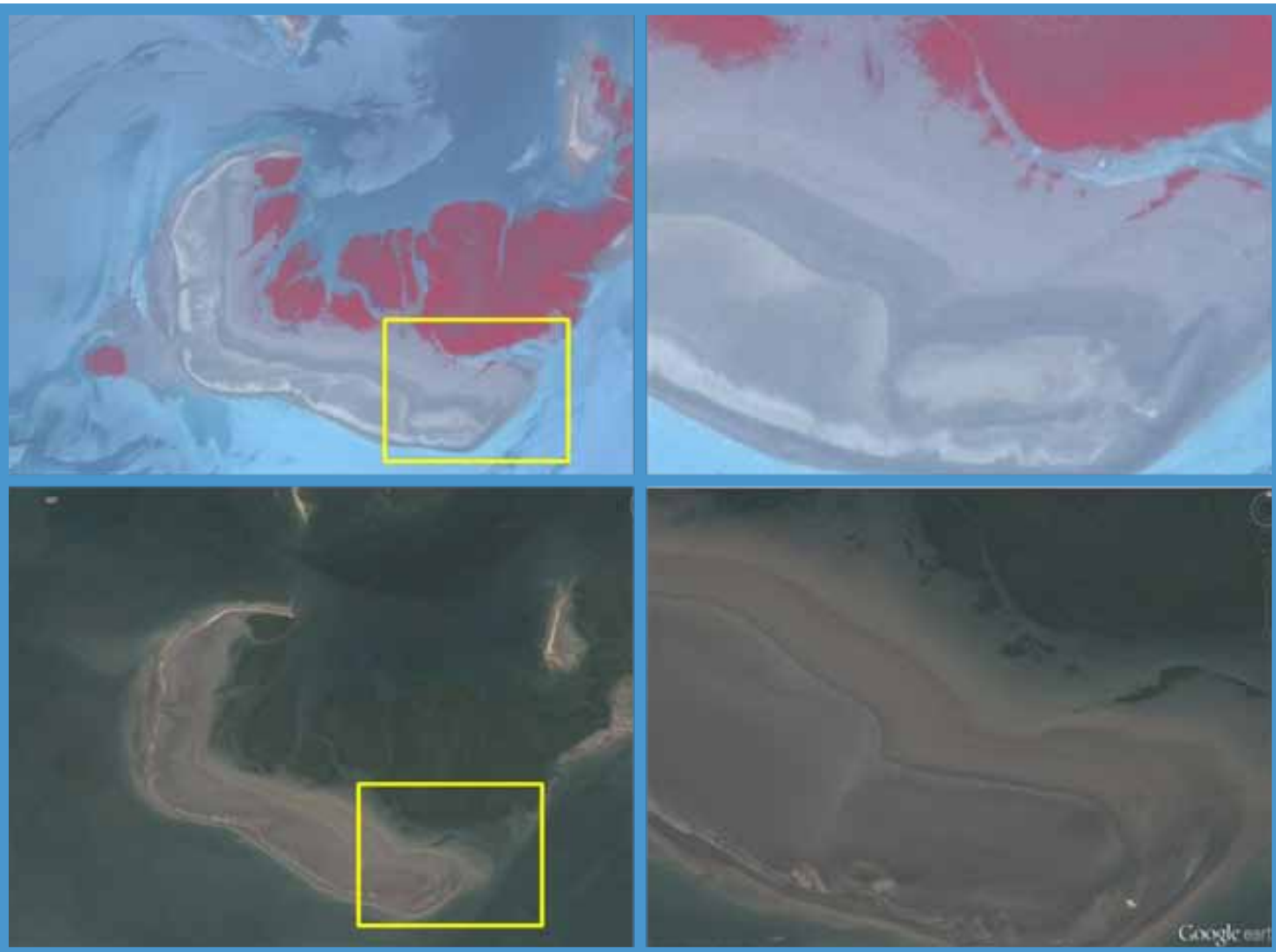
Bare areas sparse
- sand dunes with
natural vegetation



Bare areas sparse
- bare rocks (with
sparse vegetation)



Bare areas sparse
- desert flat plain



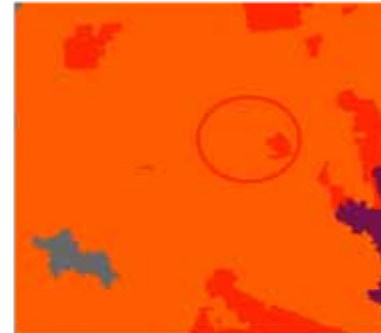
12. WET AREAS

Wet areas - mud
flats

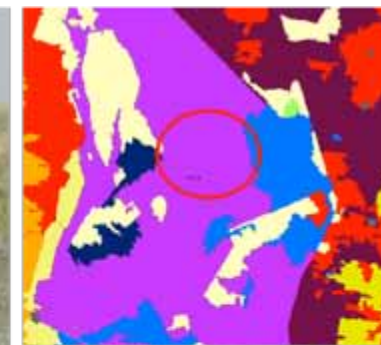


Wet areas - river
perennial

FIELD VALIDATION



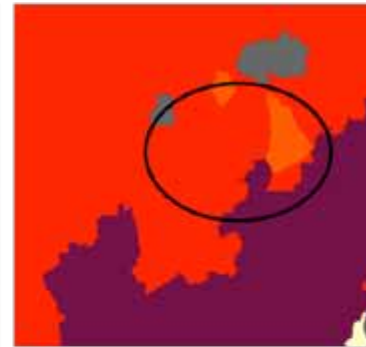
Forest - tree crop



Wet areas - wetland



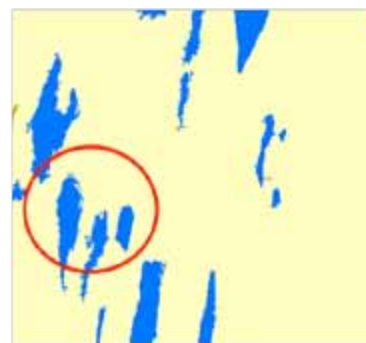
Crop irrigated



Crop irrigated -
saline fields



Natural vegetation
- tree open in
wetland



Wet areas - water
body



MAPS & STATISTICS
The Sindh Province

SINDH PROVINCE

Sindh is the second largest province of Pakistan in terms of population; with its capital at Karachi. Sindh is famed as Bab-ul-Islam (gateway to Islam) as it was captured by a Muslim conqueror, Muhammad bin Qasim, in 712 AD. Sindh is basically an agrarian province; River Indus being the most important river.. Classical name of the river was Sindhu (Sanskrit for an ocean) and the Sindh province was created and sustained by the river; without which, it would have been a desert. Sindh, traditionally, has been rich in wildlife heritage and hosts;Kirthar National Park, is located about 70 km north west of Karachi.

Owing to its prevalent aridity, the climate of Sindh is typically hot and variable. The average temperature during summer is

35°C and in winter, drops to 16°C. However, the temperature even rises to 45°C, and occasionally to 50°C, in summers making the summer heat very variable. The highest temperature recorded in northern Sindh has been 52°C.

Sindh has three barrages across Indus River namely Guddu, Sukkur, and Kotri. irrigating large areas. Cotton, rice, wheat and sugarcane are the main crops produced in Sindh. Rice is grown in the annually inundated lands within the Indus delta with a finer quality of rice produced in the Larkana district. Rice is also cultivated in Jacobabad, Sukkur, Badin, Thatta and Dadu districts. Cotton is produced mainly in Sanghar, Nawabshah, and Hyderabad. Sugarcane is another important crop which is grown mainly in the

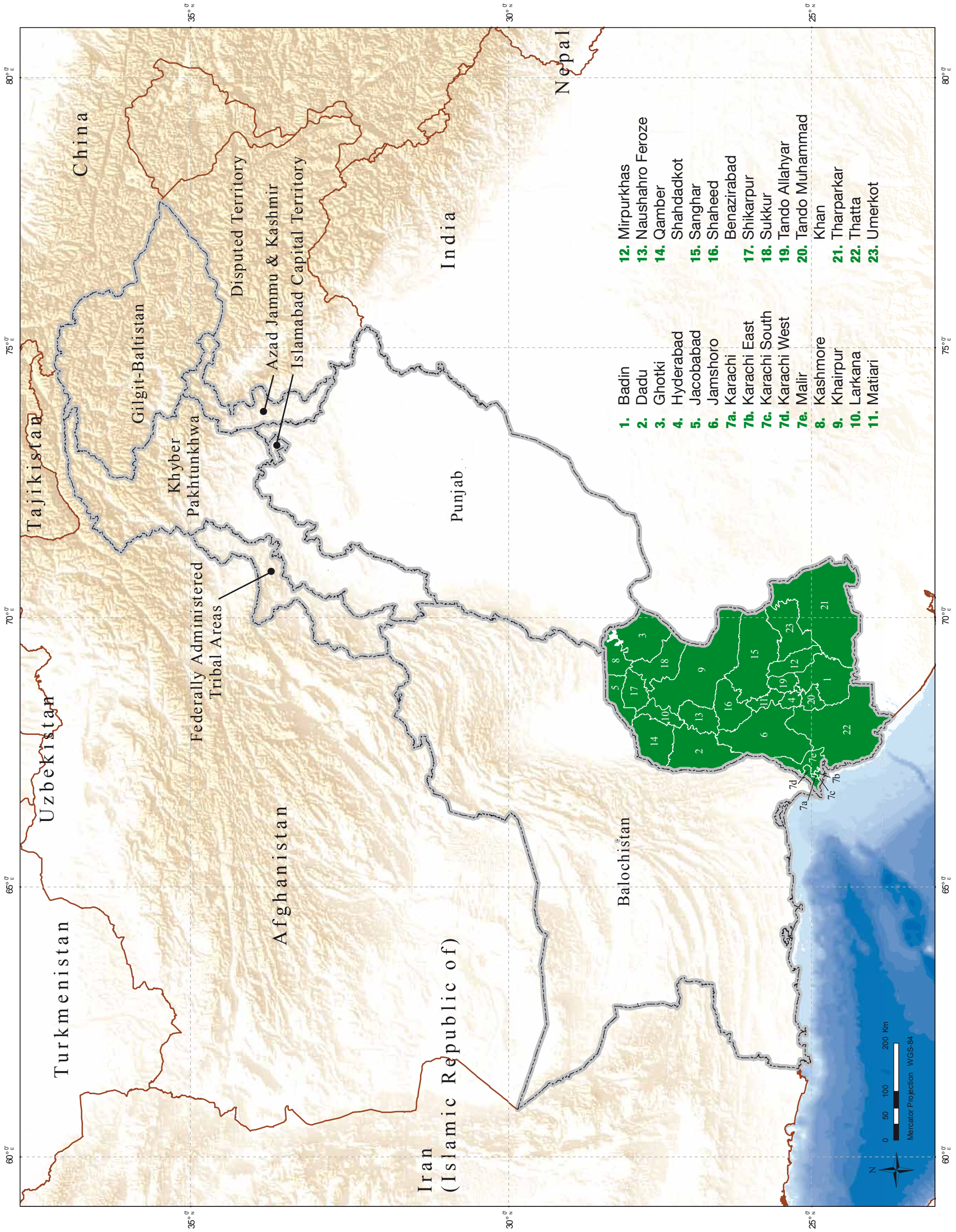
Kotri Barrage zone. Bananas and mangoes orchards are also famous in the region. Despite the agricultural activities, this region is also famous for its seafood production. Some of the famous aquatic species found in the region are surmai, pomfret, lobsters and shrimps. Fresh water fish species also exist in the sweet waters of the Indus River, Manchar, Keenjhar, Haleji and other lakes.

Karachi is the financial and commercial capital of Pakistan and nerve center of Pakistan's economy with major industrial activities. Its primary fields of industry are textiles, pharmaceuticals, steel and automobiles.

Sindh comprises of 27 districts which are discussed separately.

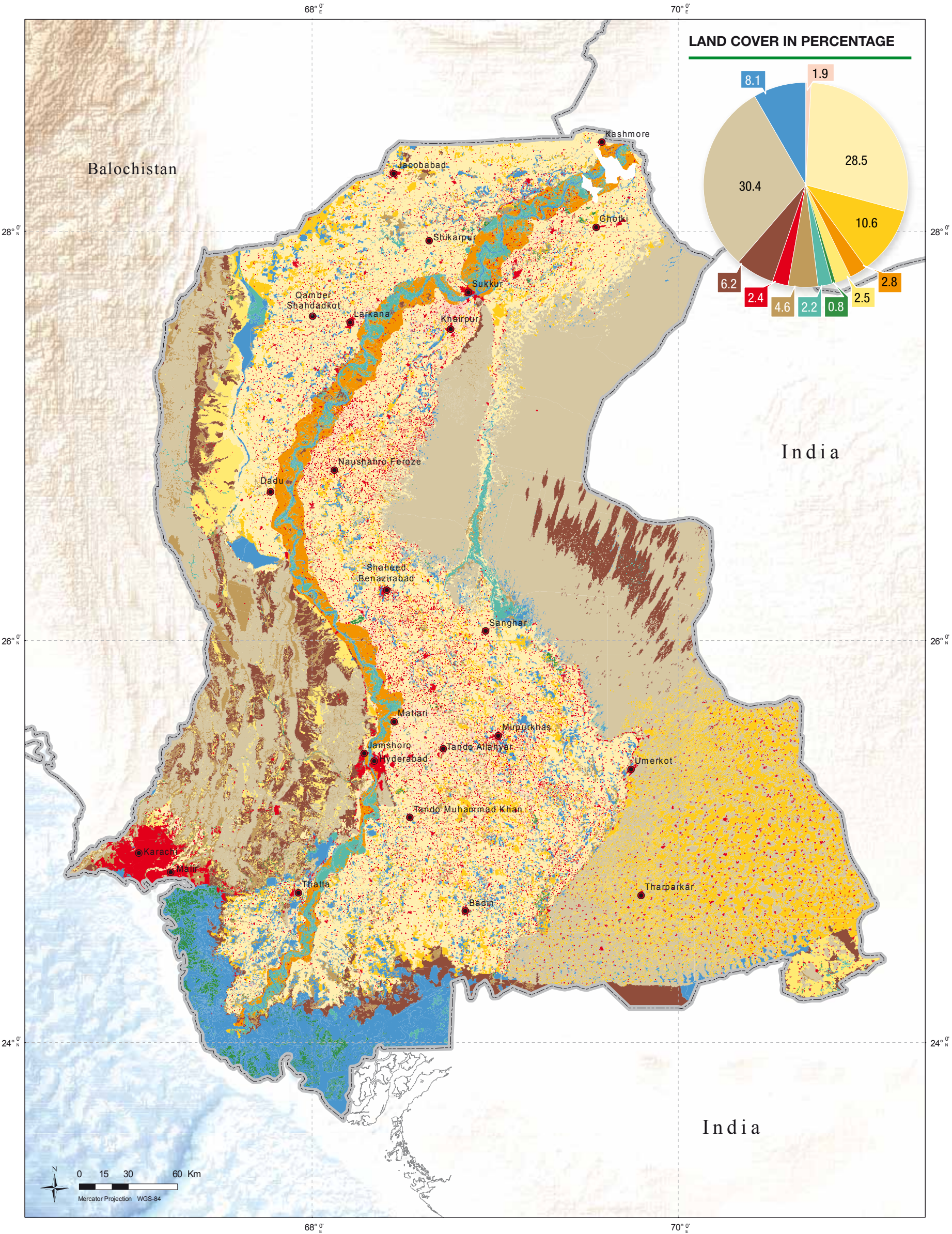


Source: SUPARCO



DISTRIBUTION OF LAND COVER IN THE PROVINCE OF SINDH IN KM²

District	Orc	Clr	Cls	Cfp	CRa	NtM	NvW	Rsh	Bui	Bar	Bav	Wet	Snw
Badin	15.74	4,587.36	881.89	0	0	11.66	0.04	168.87	137.80	353.94	42.84	456.00	0
Dadu	1.16	2,081.66	265.97	273.32	1,104.01	6.55	79.52	854.11	71.82	611.94	2,209.92	242.79	0
Ghotki	21.19	2,550.67	329.06	196.46	0	16.20	54.87	37.90	85.22	3.11	3,101.34	178.81	0
Hyderabad	108.93	501.87	35.55	48.43	3.08	7.50	23.89	26.54	114.07	16.63	90.82	32.21	0
Jacobabad	0.31	1,822.08	531.09	0	0	2.54	0	64.99	52.15	31.48	4.70	172.13	0
Jamshoro	8.96	354.08	61.26	365.09	830.96	3.69	168.31	1,915.61	105.44	2,159.68	5,100.53	210.45	0
Karachi	0	0	0	0	0	0	0	0	66.63	0	0	0	0
Karachi East	0.45	8.72	0	0	0	0	0	8.72	144.55	0.36	0	0	0
Karachi South	0	0	0	0	0	0	0	0.06	79.03	0.03	0	0.93	0
Karachi West	5.88	56.12	0	0	50.70	16.24	0.57	259.70	372.57	68.97	143.34	39.36	0
Kashmore	0.42	1,392.80	204.84	333.63		14.80	284.09	93.18	55.91	18.33	6.12	268.70	0
Khairpur	283.51	2,317.36	226.35	411.95	0.04	6.19	343.65	118.63	166.05	1,890.50	9,637.07	295.08	0
Larkana	25.40	1,072.56	108.73	240.02		0.12	186.13	10.65	85.27	30.20	0.00	188.76	0
Malir	9.82	169.56	0	0	106.87	12.40	0.05	642.58	377.77	220.88	730.76	25.41	0
Matiali	124.40	805.07	33.00	253.11	0	4.26	78.23	9.43	50.81	4.00	3.32	49.52	0
Mirpurkhas	97.02	2,047.15	379.55	0	0.00	5.44	0	60.29	111.51	0.48	27.27	228.94	0
Naushahro Feroze	118.70	1,692.13	256.11	449.08	0	4.03	219.82	39.29	112.43	35.94	25.32	147.91	0
Qamber Shahdadkot	4.81	2,310.16	570.71	0	257.90	3.50	117.12	425.06	86.94	241.16	951.93	514.13	0
Sanghar	49.42	3,956.99	574.67	0	0	23.10	258.09	118.51	187.64	326.77	4,850.30	421.83	0
Shaheed Benazirabad	47.63	2,189.85	265.23	370.74	0	25.64	104.33	39.21	104.08	12.95	959.50	267.37	0
Shikarpur	2.31	1,743.84	136.27	192.20	0	19.47	184.11	164.93	56.13	3.94	0.01	166.01	0
Sukkur	81.21	994.19	217.78	359.32	0	5.45	245.80	37.47	96.31	40.41	2,666.27	112.72	0
Tando Allahyar	167.98	1,111.59	94.81	0	0	2.68	0	75.04	52.16	0.72	1.16	33.46	0
Tando Muhammad Khan	16.48	1,202.72	116.01	21.13	0	2.75	24.17	26.87	38.29	2.81	2.30	110.22	0
Tharparkar	1.12	102.84	7,844.27	0	747.93	23.69	43.37	76.06	286.75	823.09	9,233.71	358.48	0
Thatta	30.69	3,377.83	634.88	474.45	375.60	934.51	752.87	1,052.20	120.76	1,779.38	1,018.55	6,720.96	0
Umerkot	26.24	1,757.03	1,194.71	0	0	2.39	0.08	140.19	100.58	9.60	2,115.35	240.21	0
Total in km²	1,249.77	40,206.23	14,962.74	3,988.94	3,477.11	1,154.83	3,169.11	6,466.09	3,318.66	8,687.30	42,922.42	11,482.40	0
Total in %	0.9	28.5	10.6	2.8	2.5	0.8	2.2	4.6	2.4	6.2	30.4	8.1	0
Grand total	141,085.60												



BADIN

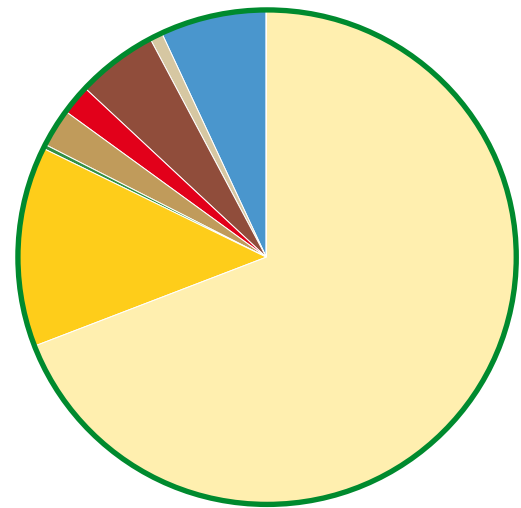
Badin district lies in east of the Indus River. District Badin hosts numerous shrines of sufi saints including that of Saman Shah. The region is swampy and fertile for growing rice. Some oil fields are also located near the seasonally inundated Rann of Kutch region. Rice, wheat, sugarcane, oil seeds and seasonal vegetables are the major crops of district Badin. The major towns of the district are Badin, Matli, Shaheed Fazil Rahu, Talhar and Tando Bago. District headquarter is situated at Badin.

INDEX MAP



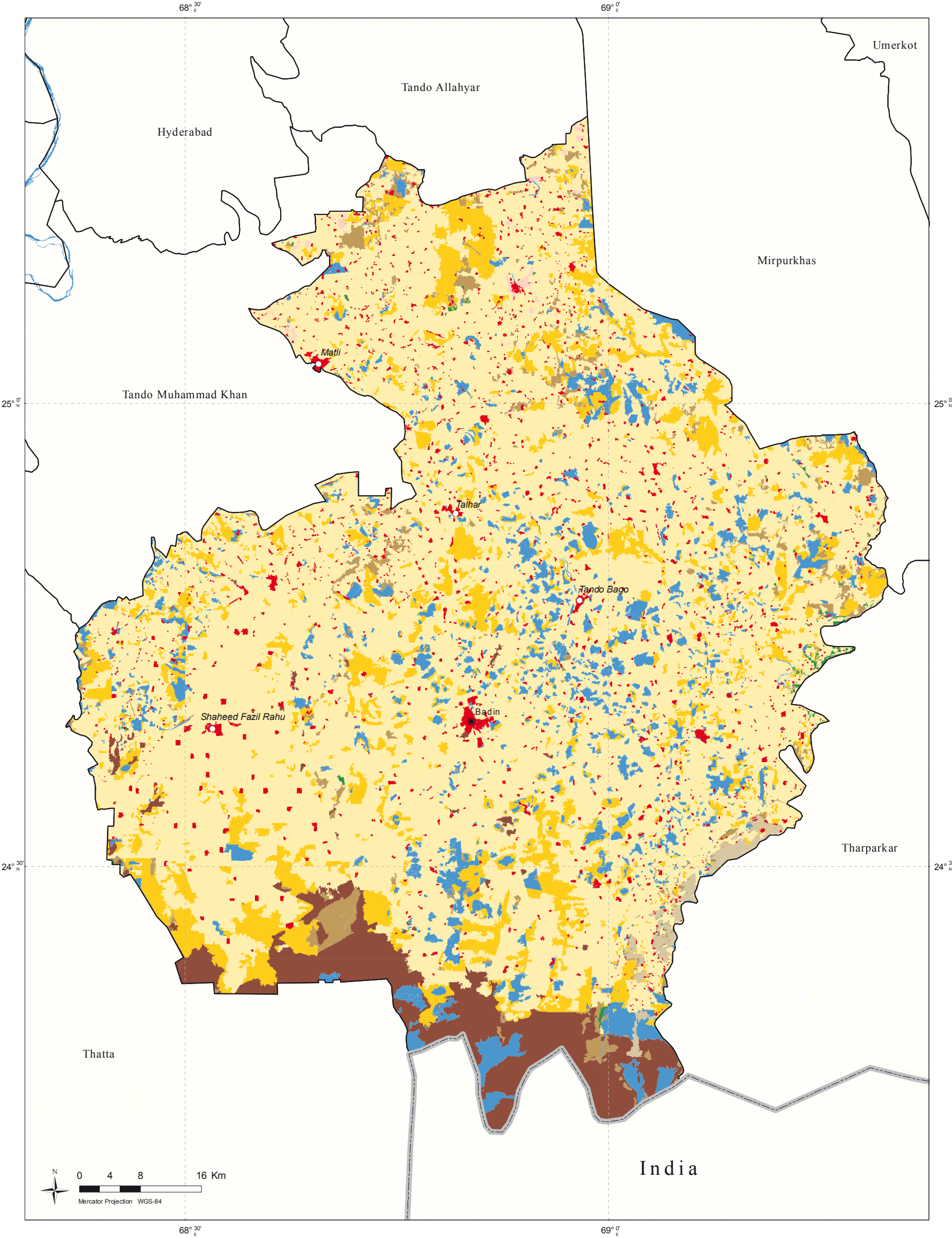
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	15.74	0.2
Crop Irrigated	4,587.36	68.9
Crop Marginal and Irrigated Saline	881.89	13.2
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	11.66	0.2
Natural Vegetation in Wet Areas	0.04	0.0
Range Lands - Natural Shrubs and Herbs	168.87	2.5
Built-up	137.80	2.1
Bare Areas	353.94	5.3
Bare Areas with Sparse Natural Vegetation	42.84	0.6
Wet Areas	456.00	6.9
Snow and Glaciers	0.00	0.0
Grand Total	6,656.14	



DADU

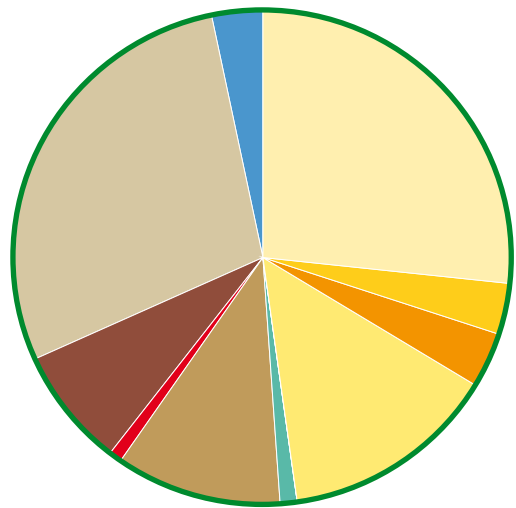
Dadu district is located on the western side of Indus River. The district is famous for Gorakh; a hill station at an altitude of 1,734 meters. Gorakh hill station is located on one of the highest plateaus of Sindh, spread over 2,500 acres. Owing to its surroundings, Gorakh is a unique adventure point for nature lovers. Rice, wheat, sugarcane, and vegetables are the major crops of the district. The major towns of the district are Mehar, Khairpur Nathan Shah, Dadu and Johi. District headquarter is at Dadu.

INDEX MAP



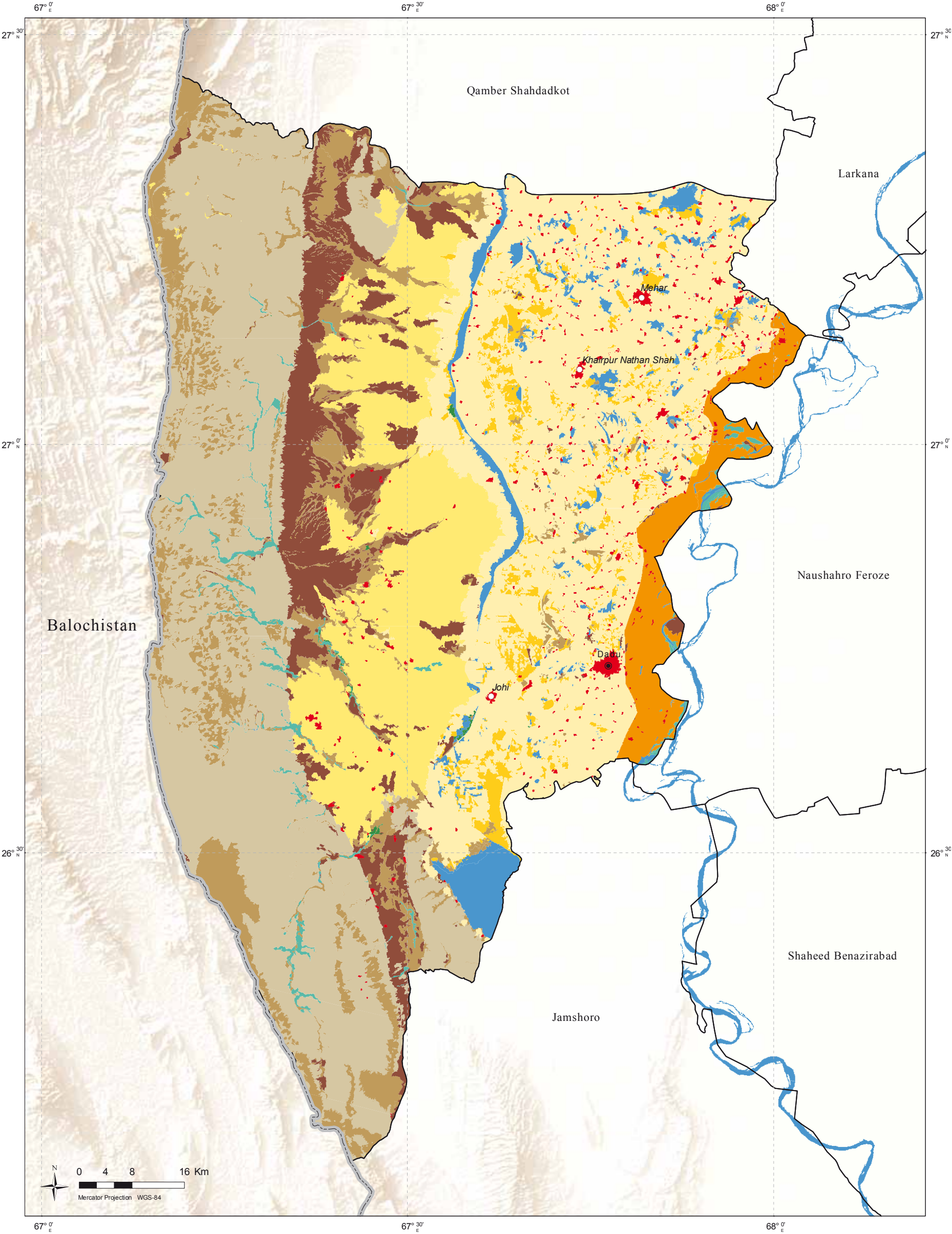
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km ²	%
Orchards	1.16	0.0
Crop Irrigated	2,081.66	26.7
Crop Marginal and Irrigated Saline	265.97	3.4
Crop in Flood Plain	273.32	3.5
Crop Rainfed	1,104.01	14.1
Forest - Natural Trees and Mangroves	6.55	0.1
Natural Vegetation in Wet Areas	79.52	1.0
Range Lands - Natural Shrubs and Herbs	854.11	10.9
Built-up	71.82	0.9
Bare Areas	611.94	7.8
Bare Areas with Sparse Natural Vegetation	2,209.92	28.3
Wet Areas	242.79	3.1
Snow and Glaciers	0.00	0.0
Grand Total	7,802.77	



GHOTKI

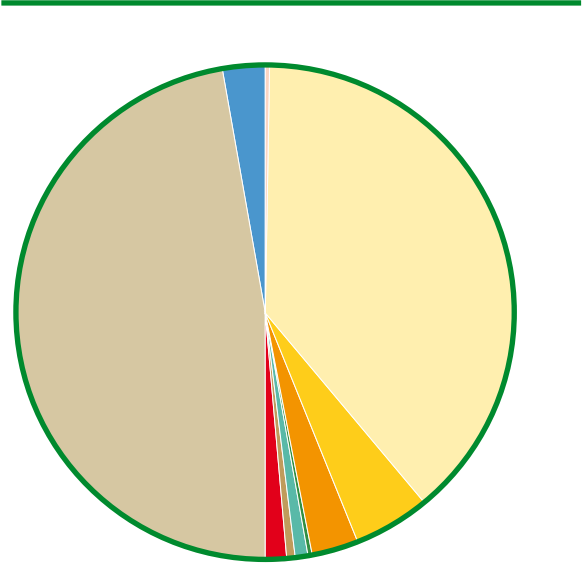
Ghotki is located in northern Sindh, and is the bordering district between Sindh and Punjab. There is a historical grand mosque in Ghotki; Jamia Masjid Ghotki. Ghotki has very fertile land and the main crops are cotton, wheat, sugarcane, rice and tobacco. Majority of the people in the district are engaged in agriculture. Ghotki is also famous for mangoes and vegetables; date trees are also in abundance. Major towns of the district are Daharki, Ghotki, Mirpur Mathelo, Ubauro and Khangarh. District headquarter is situated at Mirpur Mathelo.

INDEX MAP



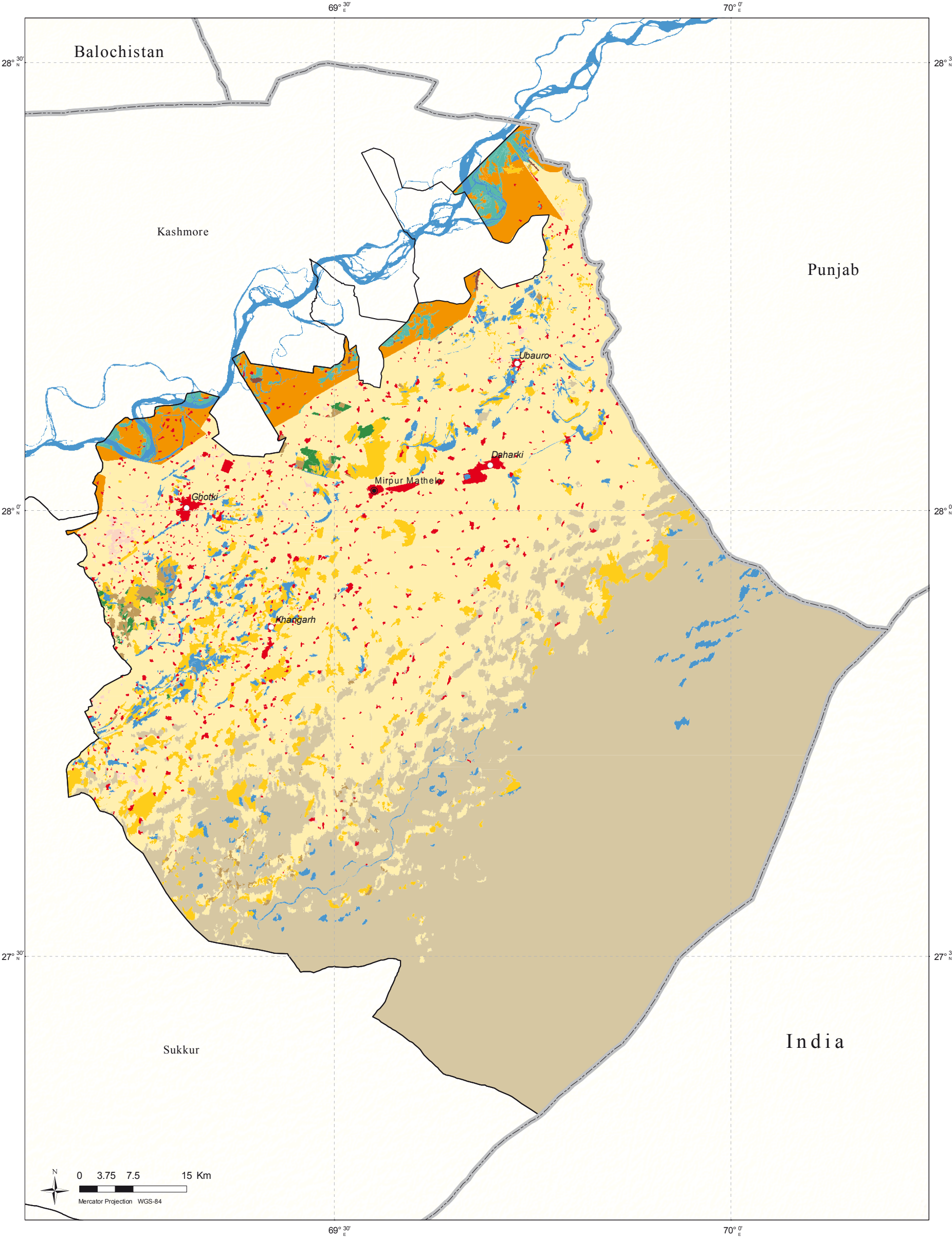
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

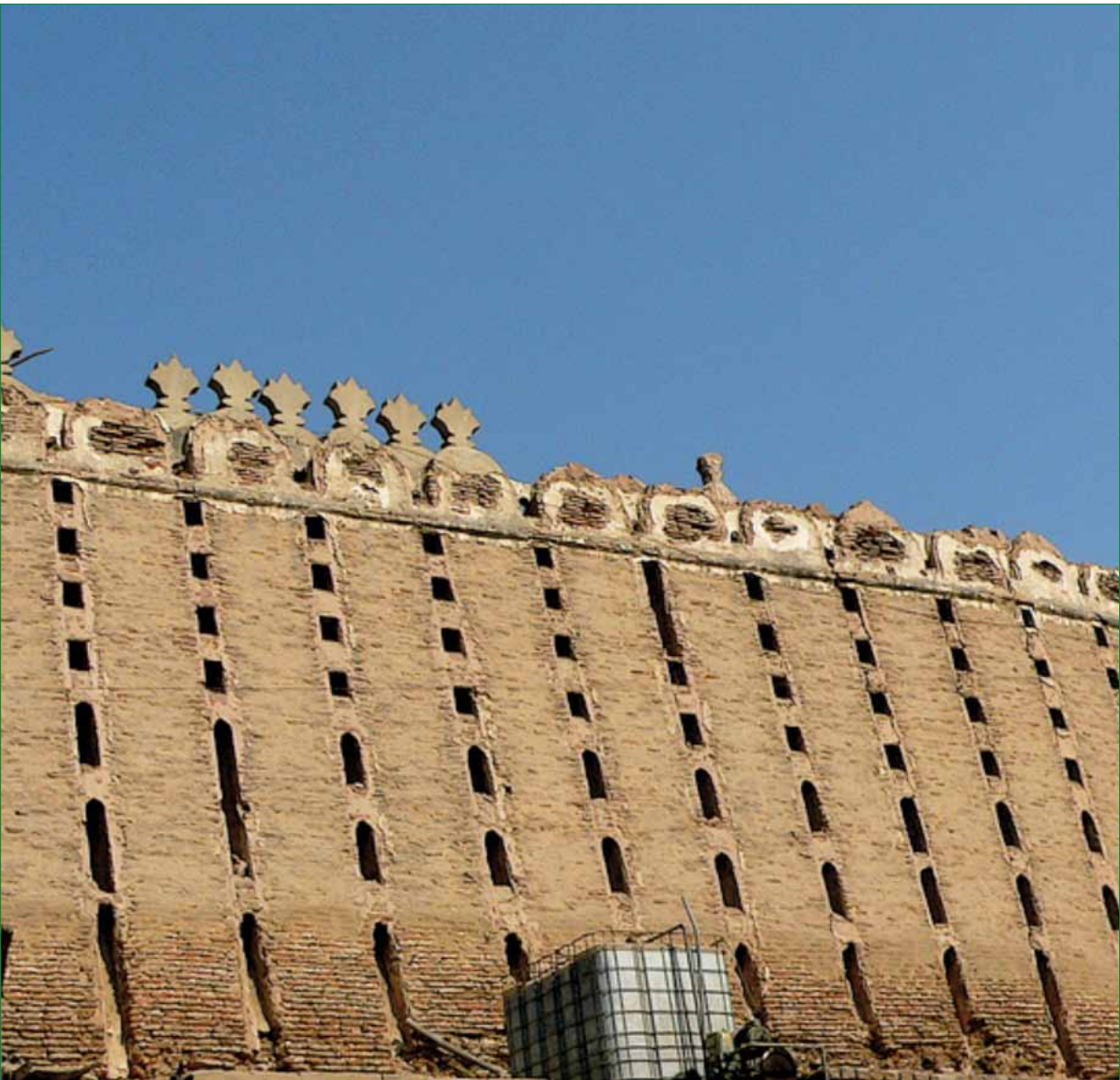
Legend	km ²	%
Orchards	21.19	0.3
Crop Irrigated	2,550.67	38.8
Crop Marginal and Irrigated Saline	329.06	5.0
Crop in Flood Plain	196.46	3.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	16.20	0.2
Natural Vegetation in Wet Areas	54.87	0.8
Range Lands - Natural Shrubs and Herbs	37.90	0.6
Built-up	85.22	1.3
Bare Areas	3.11	0.0
Bare Areas with Sparse Natural Vegetation	3,101.34	47.2
Wet Areas	178.81	2.7
Snow and Glaciers	0.00	0.0
Grand Total	6,574.84	



HYDERABAD

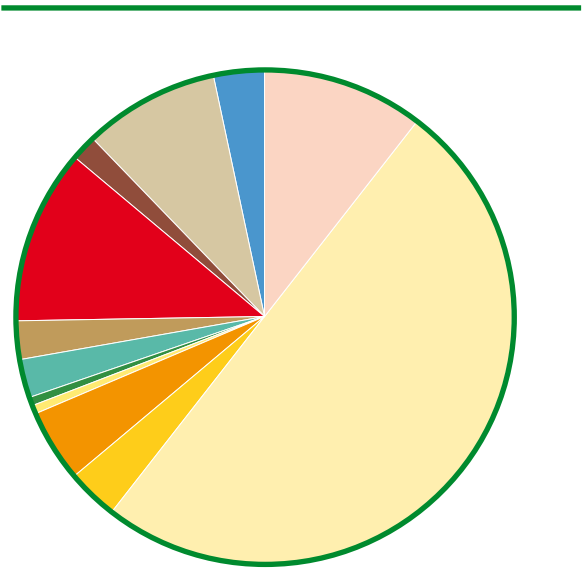
Hyderabad is located on the eastern side of River Indus. The city is known as the largest bangle producer in the world. There are two famous forts located in Hyderabad, Pakka (strong) and Kacha (weak) fort. Rice, wheat, sugarcane, and vegetables are the major crops of Hyderabad. The major towns of the district are Hyderabad City, Hyderabad Rural, Latifabad and Qasimabad. District headquarter is located at Hyderabad.

INDEX MAP



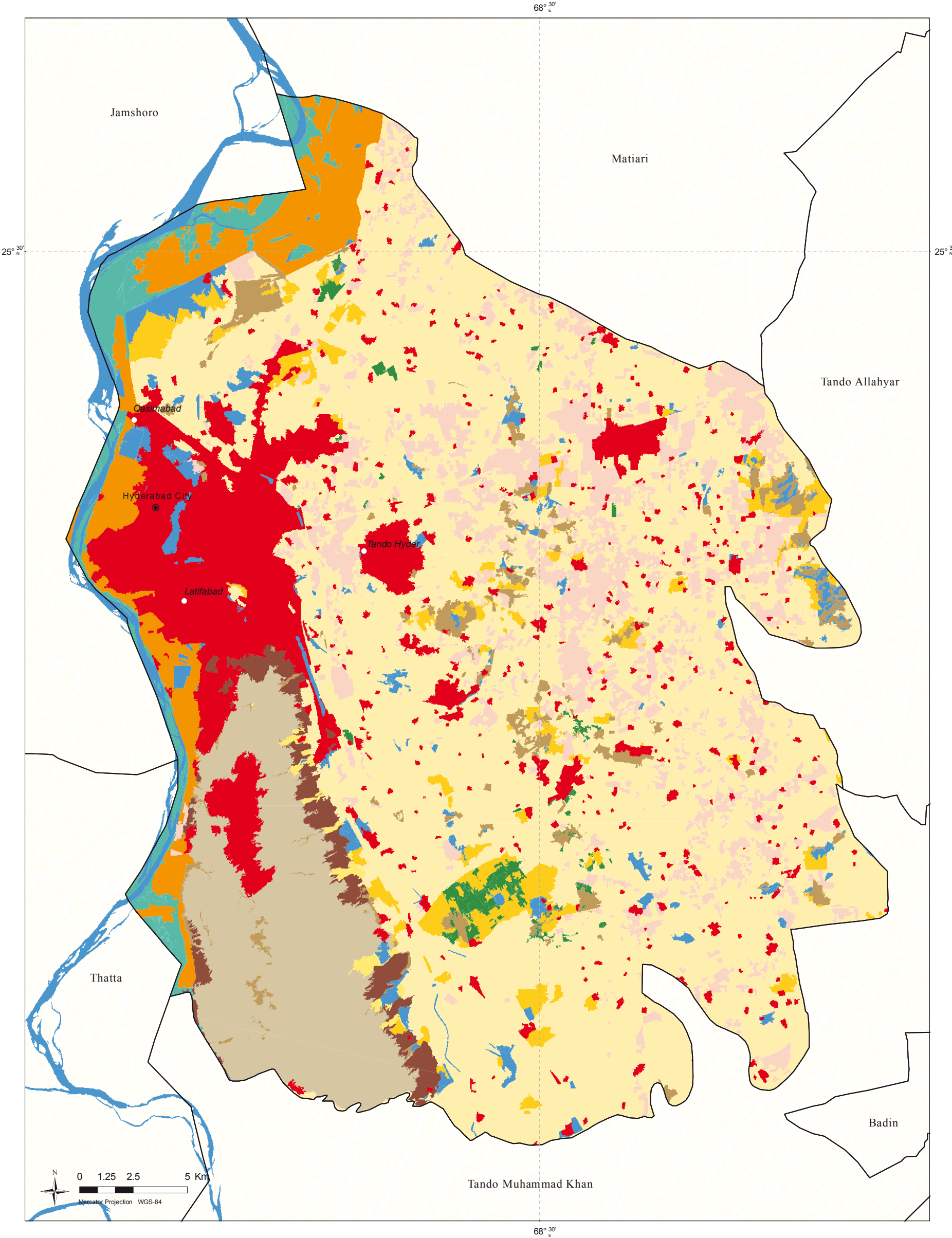
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km ²	%
Orchards	108.93	10.8
Crop Irrigated	501.87	49.7
Crop Marginal and Irrigated Saline	35.55	3.5
Crop in Flood Plain	48.43	4.8
Crop Rainfed	3.08	0.3
Forest - Natural Trees and Mangroves	7.50	0.7
Natural Vegetation in Wet Areas	23.89	2.4
Range Lands - Natural Shrubs and Herbs	26.54	2.6
Built-up	114.07	11.3
Bare Areas	16.63	1.6
Bare Areas with Sparse Natural Vegetation	90.82	9.0
Wet Areas	32.21	3.2
Snow and Glaciers	0.00	0.0
Grand Total	1,009.50	



JACOBABAD

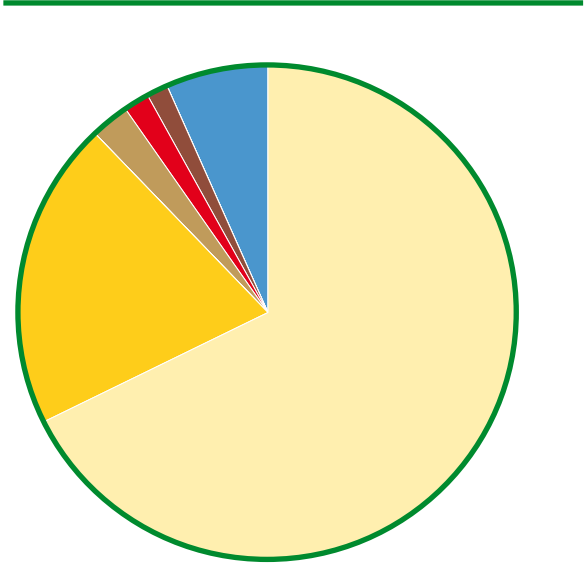
Jacobabad was founded in 1847 by General John Jacob, Commandant of the Sindh Horse, British Army. His memorial still exists at the Victoria Tower in the heart of the city. Rice, oil seeds, and vegetables are the major crops of Jacobabad district. Major towns of the district are Ghari Khairo, Jacobabad and Thul. District headquarter is located in Jacobabad.

INDEX MAP



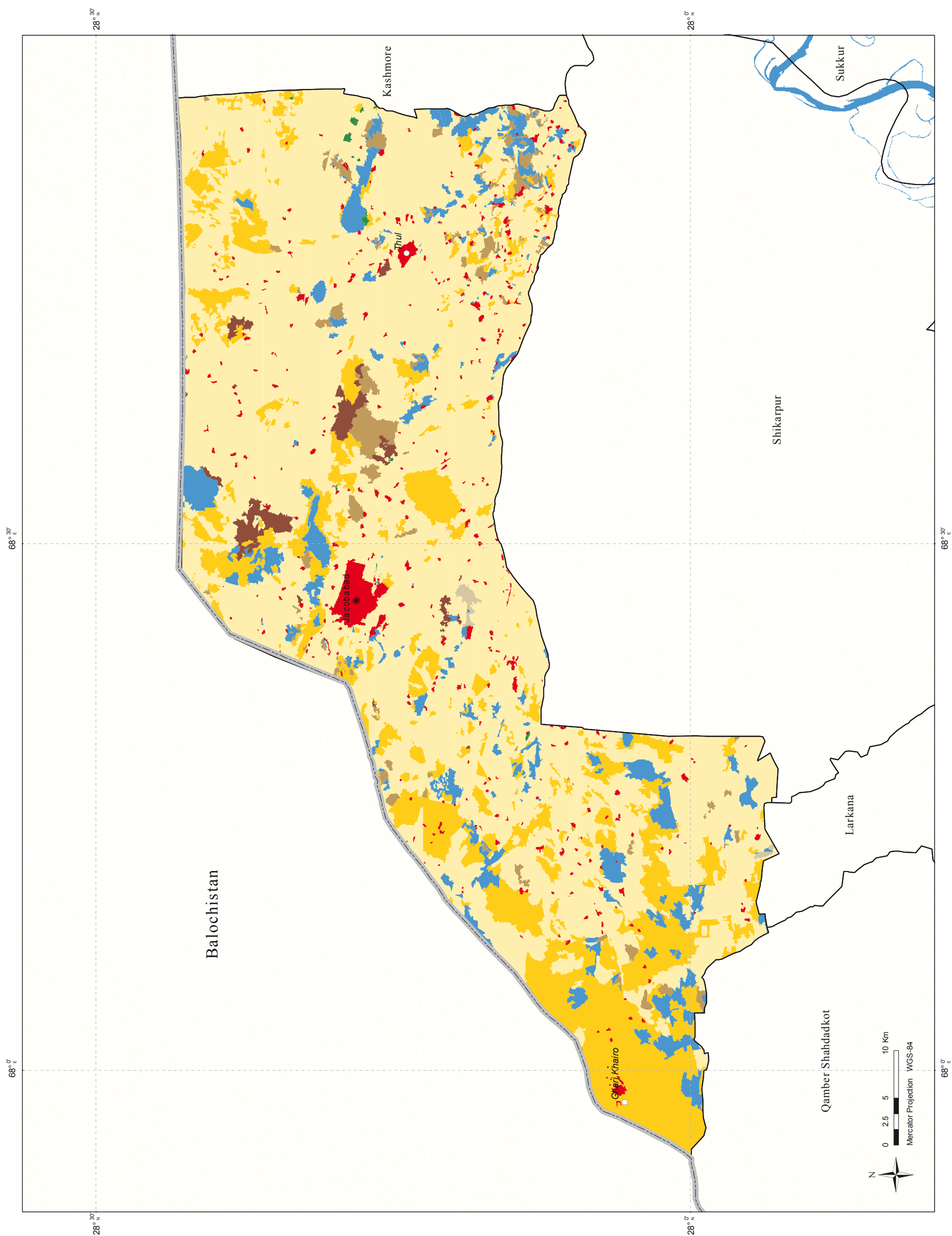
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	0.31	0.0
Crop Irrigated	1,822.08	68.0
Crop Marginal and Irrigated Saline	531.09	19.8
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	2.54	0.1
Natural Vegetation in Wet Areas	0.00	0.0
Range Lands - Natural Shrubs and Herbs	64.99	2.4
Built-up	52.15	1.9
Bare Areas	31.48	1.2
Bare Areas with Sparse Natural Vegetation	4.70	0.2
Wet Areas	172.13	6.4
Snow and Glaciers	0.00	0.0
Grand Total	2,681.46	



JAMSHORO

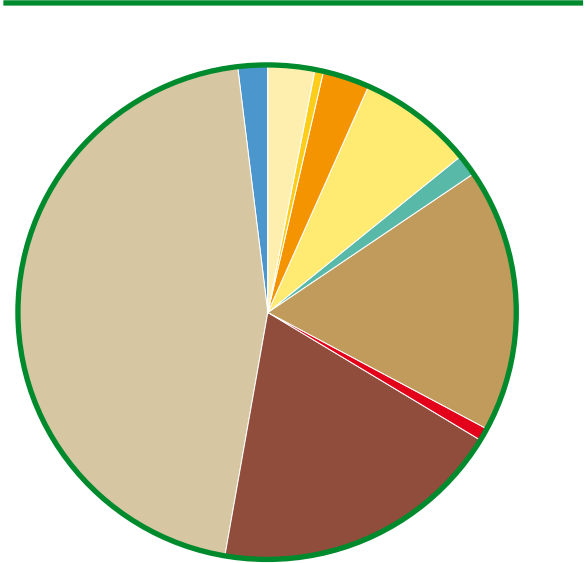
Jamshoro district is famous for its Sufi patron saint, Lal Shahbaz Qalandar. Manchar lake,one of the largest lakes in Asia, and Kirther National Park are situated in Jamshoro . The district lies at right bank of Indus River and is famous for its educational institutes. Mehran University of Engineering and Technology, Liaquat University of Medical and Health Sciences and University of Sindh are the major academic institutes of Sindh. The district is also famous for its onion production and market. The major towns of the district are Sehwan, Manjhand, Kotri and Thano Bola Khan.

INDEX MAP



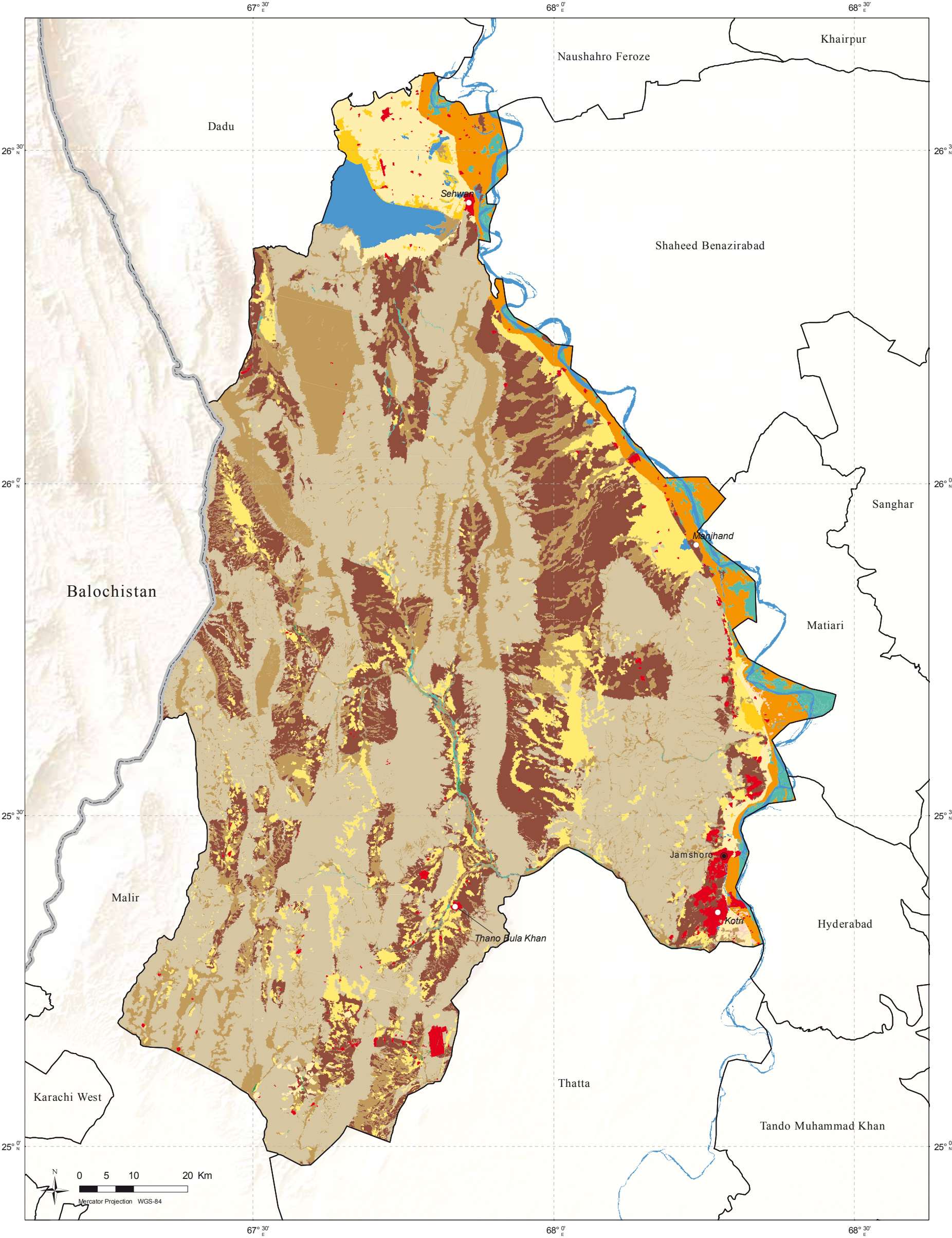
Source: www.socialmediaofyouth.wordpress.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

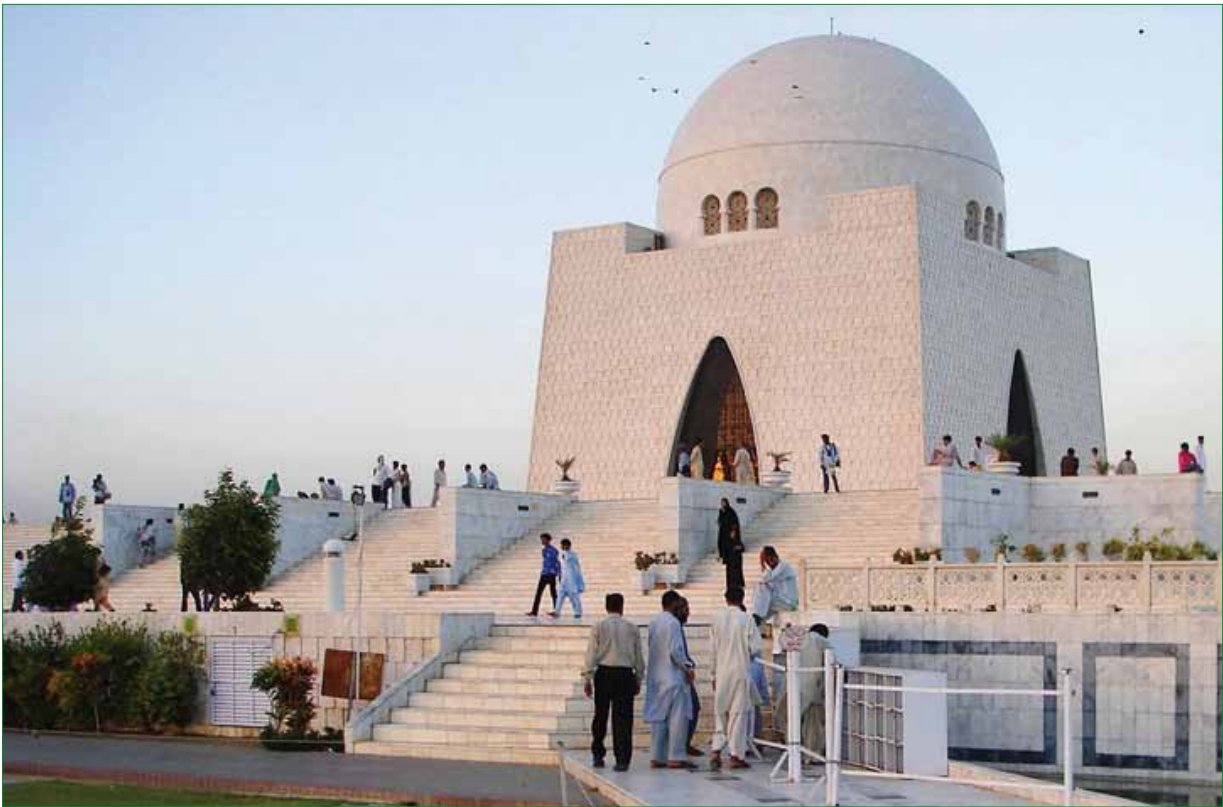
Legend	km²	%
Orchards	8.96	0.1
Crop Irrigated	354.08	3.1
Crop Marginal and Irrigated Saline	61.26	0.5
Crop in Flood Plain	365.09	3.2
Crop Rainfed	830.96	7.4
Forest - Natural Trees and Mangroves	3.69	0.0
Natural Vegetation in Wet Areas	168.31	1.5
Range Lands - Natural Shrubs and Herbs	1,915.61	17.0
Built-up	105.44	0.9
Bare Areas	2,159.68	19.1
Bare Areas with Sparse Natural Vegetation	5,100.53	45.2
Wet Areas	210.45	1.9
Snow and Glaciers	0.00	0.0
Grand Total	11,284.08	



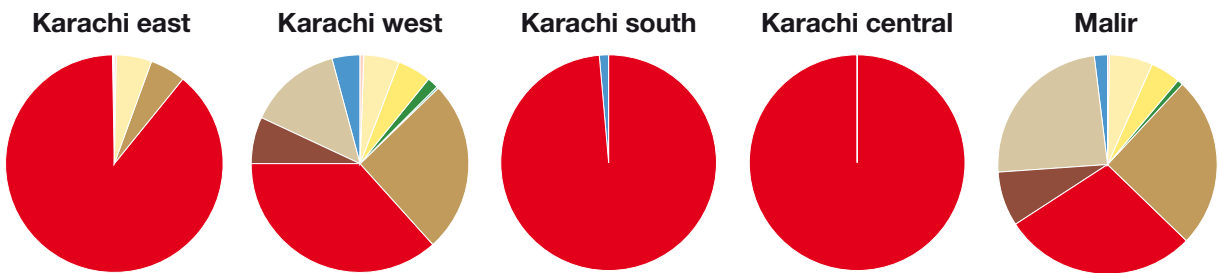
KARACHI

Karachi is the administrative capital of Sindh province and the largest and most populous metropolitan city of Pakistan. It is Pakistan’s main seaport and also the main financial centre. Karachi is the 3rd largest city in the world by population (within city limits) and the 11th largest urban agglomeration. It is Pakistan’s centre of banking, industry, economic activity and trade and the home to Pakistan’s largest corporations. Tomb of Quaid-e-Azam Muhammad Ali Jinnah, the founder of Pakistan, is also situated in Karachi. Vegetables are the major crop of Karachi. Karachi city comprises of five districts namely Karachi east, Karachi west, Karachi south, Karachi central and Malir.

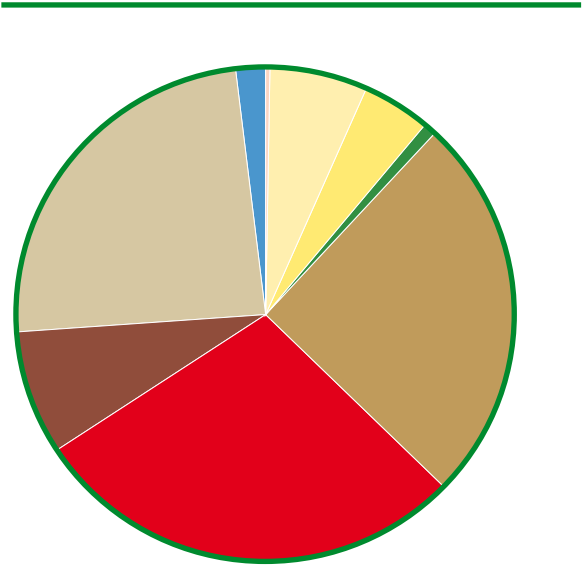
INDEX MAP



Source: www.panoramio.com

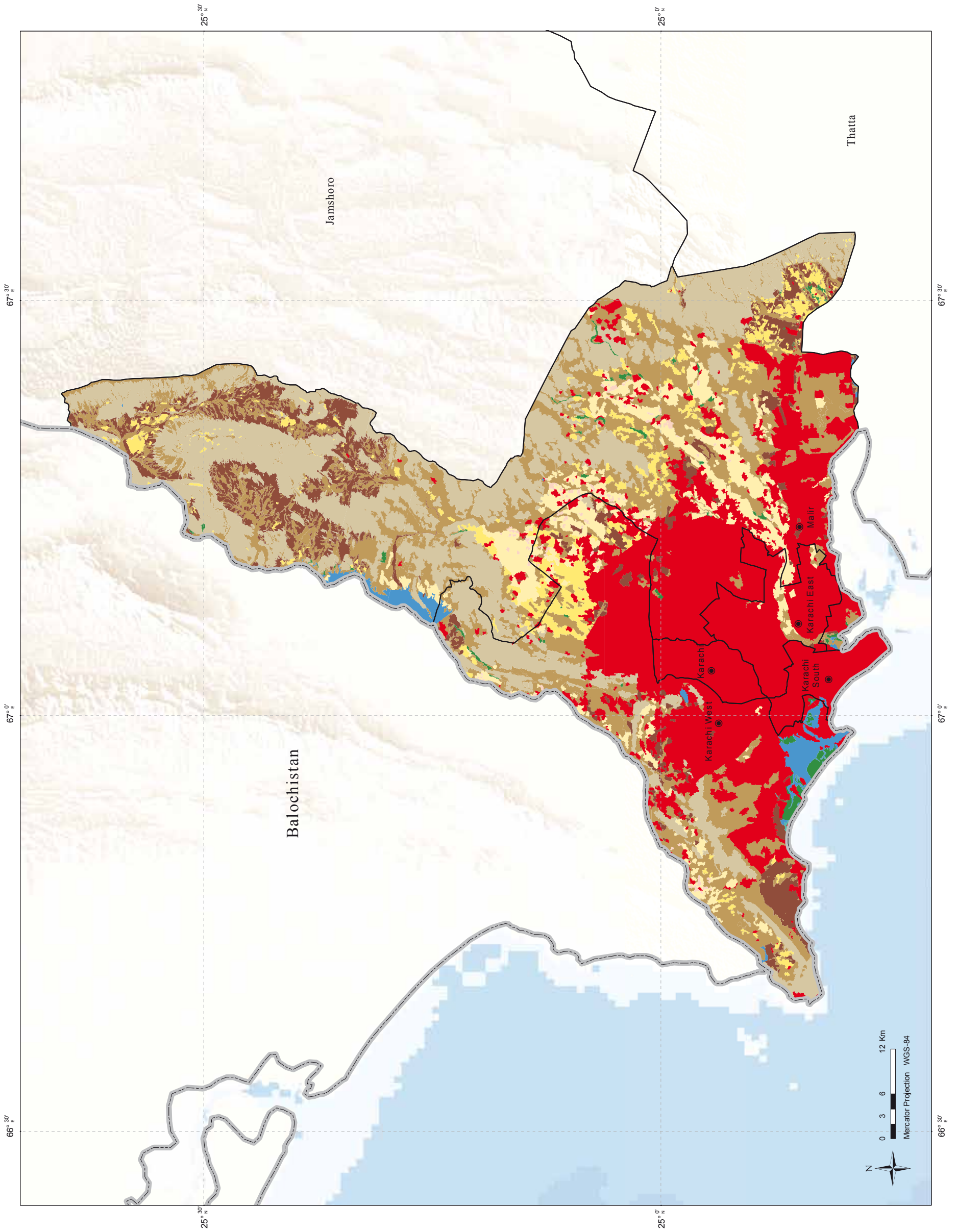


LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

LEG	Karachi east	Karachi west	Karachi south	Karachi central	Malir	TOTAL	%
Orc	0.45	5.88	0.00	0.00	9.82	16.15	0.4
Clr	8.72	56.12	0.00	0.00	169.56	234.40	6.5
ClS	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Cfp	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CRa	0.00	50.70	0.00	0.00	106.87	157.57	4.4
NtM	0.00	16.24	0.00	0.00	12.40	28.64	0.8
NvW	0.00	0.57	0.00	0.00	0.05	0.62	0.0
Rsh	8.72	259.70	0.06	0.00	642.58	911.06	25.2
Bui	144.55	372.57	79.03	66.63	377.77	1,040.55	28.8
Bar	0.36	68.97	0.03	0.00	220.88	290.24	8.0
Bav	0.00	143.34	0.00	0.00	730.76	874.10	24.2
Wet	0.00	39.36	0.93	0.00	25.41	65.70	1.8
Snw	0.00	0.00	0.00	0.00	0.00	0.00	0.0
	162.79	1,013.43	80.04	66.63	2,296.09	3,618.98	



KASHMORE

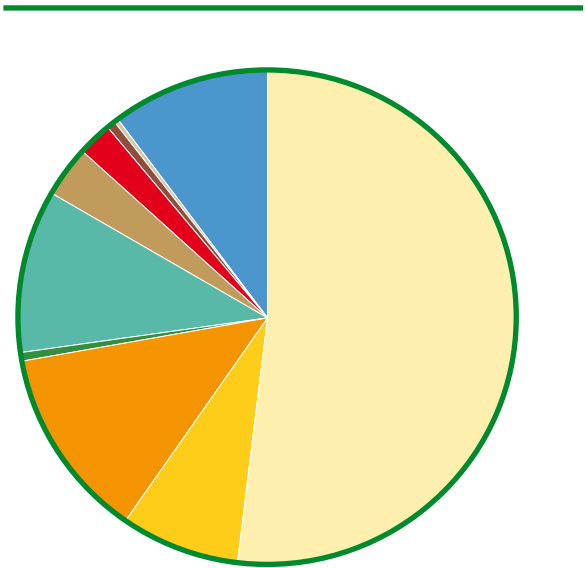
Kashmore district is situated in northern part of Sindh, bordering Ghotki Jacobabad, Shikarpur and Sukkur districts. It also borders Balochistan on one side and Punjab on the other. The district headquarter is located at Kashmore. The southeastern side of Kashmore district is covered with forest of Kacho area that supports wildlife. The Thar desert falls on the eastern side and is home to desert wildlife. The major towns of the district are Kashmore, Kandhkot and Tamgwani.

INDEX MAP



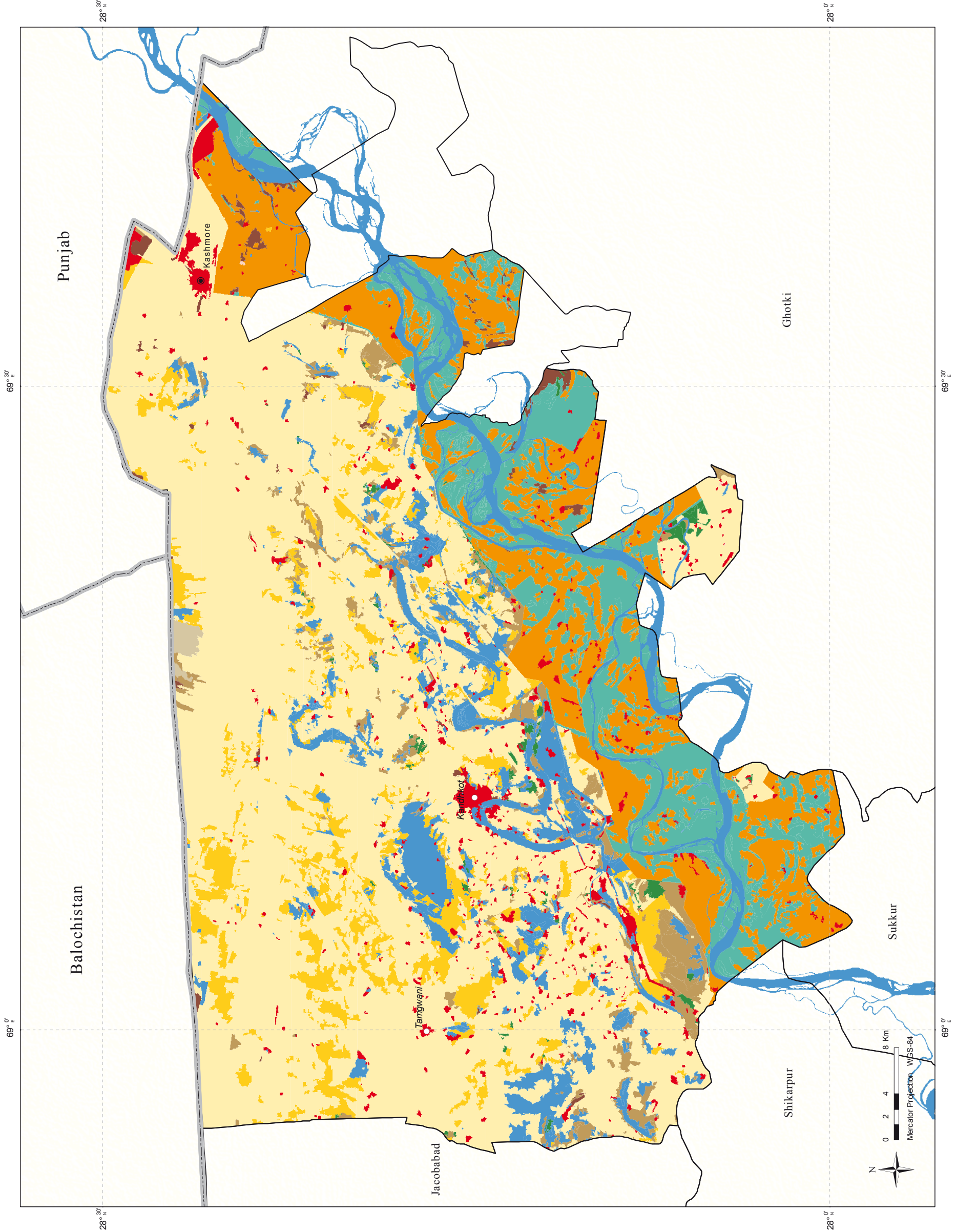
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km ²	%
Orchards	0.42	0.0
Crop Irrigated	1,392.80	52.1
Crop Marginal and Irrigated Saline	204.84	7.7
Crop in Flood Plain	333.63	12.5
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	14.80	0.6
Natural Vegetation in Wet Areas	284.09	10.6
Range Lands - Natural Shrubs and Herbs	93.18	3.5
Built-up	55.91	2.1
Bare Areas	18.33	0.7
Bare Areas with Sparse Natural Vegetation	6.12	0.2
Wet Areas	268.70	10.1
Snow and Glaciers	0.00	0.0
Grand Total	2,672.82	



KHAIRPUR

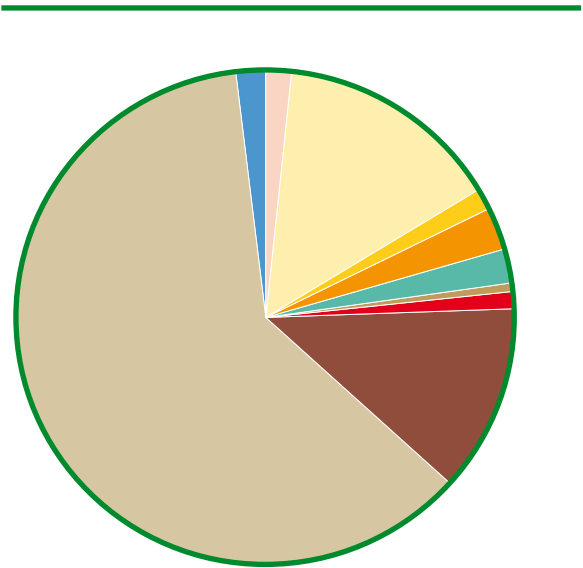
Khairpur district is located in northern Sindh with Kairpur as the district headquarter. The district is famous for f Kot Diji fort. The north western part of Thar desert lies in Khairpur district. Khairpur is famous for its bountiful production of dates, cotton, sugarcane, oil seeds and vegetables. The major towns of district are Faiz Ganj, Gambat, Khairpur, Kingri, Kot Diji, Mirwah, Nara and Sobho Dero.

INDEX MAP



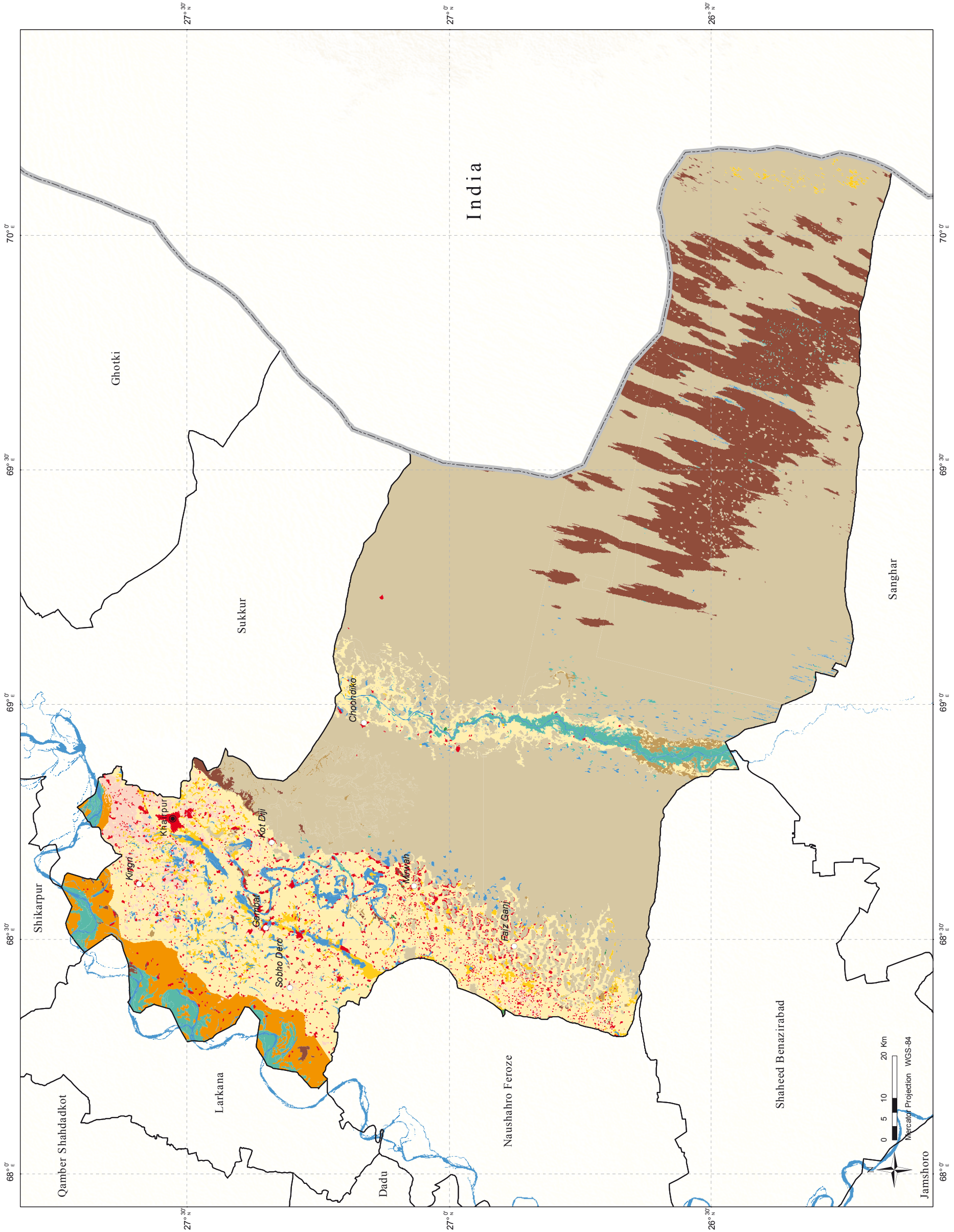
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	283.51	1.8
Crop Irrigated	2,317.36	14.8
Crop Marginal and Irrigated Saline	226.35	1.4
Crop in Flood Plain	411.95	2.6
Crop Rainfed	0.04	0.0
Forest - Natural Trees and Mangroves	6.19	0.0
Natural Vegetation in Wet Areas	343.65	2.2
Range Lands - Natural Shrubs and Herbs	118.63	0.8
Built-up	166.05	1.1
Bare Areas	1,890.50	12.0
Bare Areas with Sparse Natural Vegetation	9,637.07	61.4
Wet Areas	295.08	1.9
Snow and Glaciers	0.00	0.0
Grand Total	15,696.37	



LARKANA

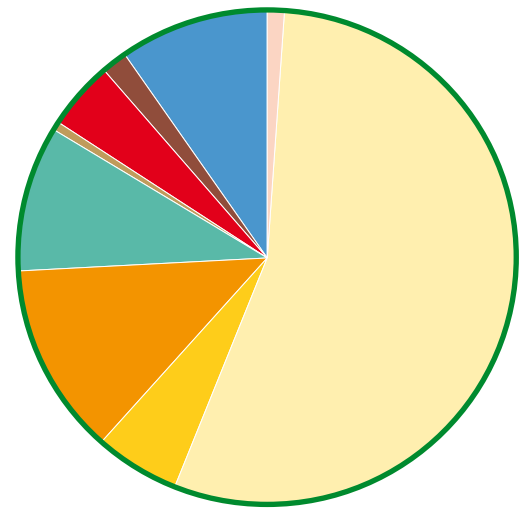
Larkana district is located in the north western part of Sindh province. The district’s headquarter is located at Larkana. Larkana is surrounded by fertile land where many varieties of fruits and vegetables are cultivated, including potatoes, melons, olives, oranges, peas, carrots, cucumber, mangoes and guava. Rice and oil seeds are also major crops of the district. Ruins of the ancient Indus Valley Civilization are located at Moen-jo-Daro, District Larkana.. Major towns of district are Dokri, Bakrani, Larkana and Ratodero.

INDEX MAP



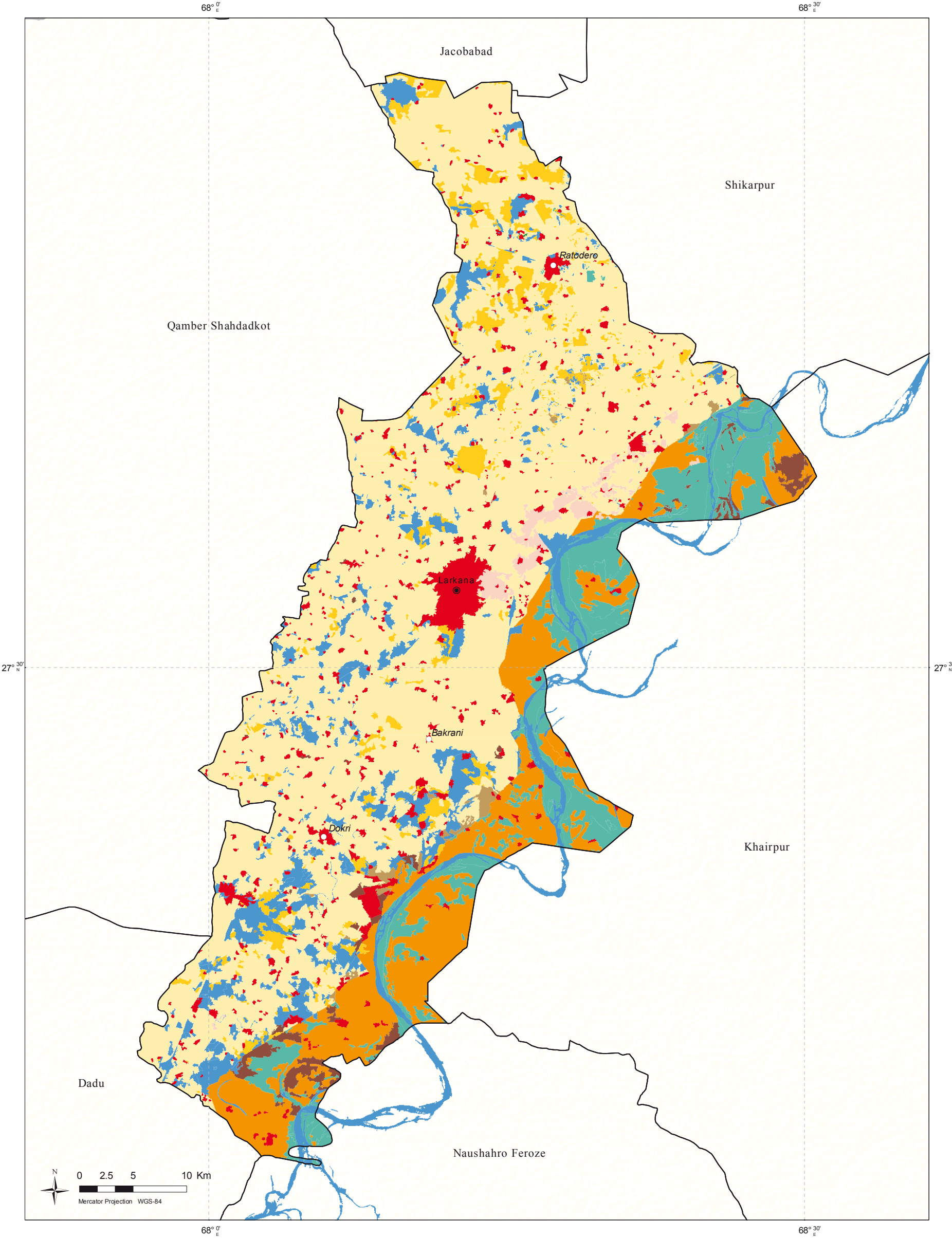
Source: Wikipedia

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	25.40	1.3
Crop Irrigated	1,072.56	55.1
Crop Marginal and Irrigated Saline	108.73	5.6
Crop in Flood Plain	240.02	12.3
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	0.12	0.0
Natural Vegetation in Wet Areas	186.13	9.6
Range Lands - Natural Shrubs and Herbs	10.65	0.5
Built-up	85.27	4.4
Bare Areas	30.20	1.6
Bare Areas with Sparse Natural Vegetation	0.00	0.0
Wet Areas	188.76	9.7
Snow and Glaciers	0.00	0.0
Grand Total	1,947.85	



MATIARI

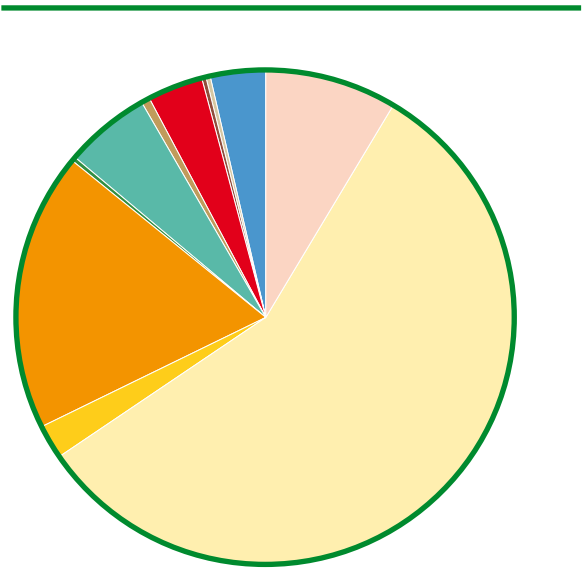
Matiari district was formed in the year 2005. Main crops of the district are cotton, wheat and sugarcane. The district headquarter is situated at Matiari City. Major towns of the district are Hala, Matiari and Saeedabad.

INDEX MAP



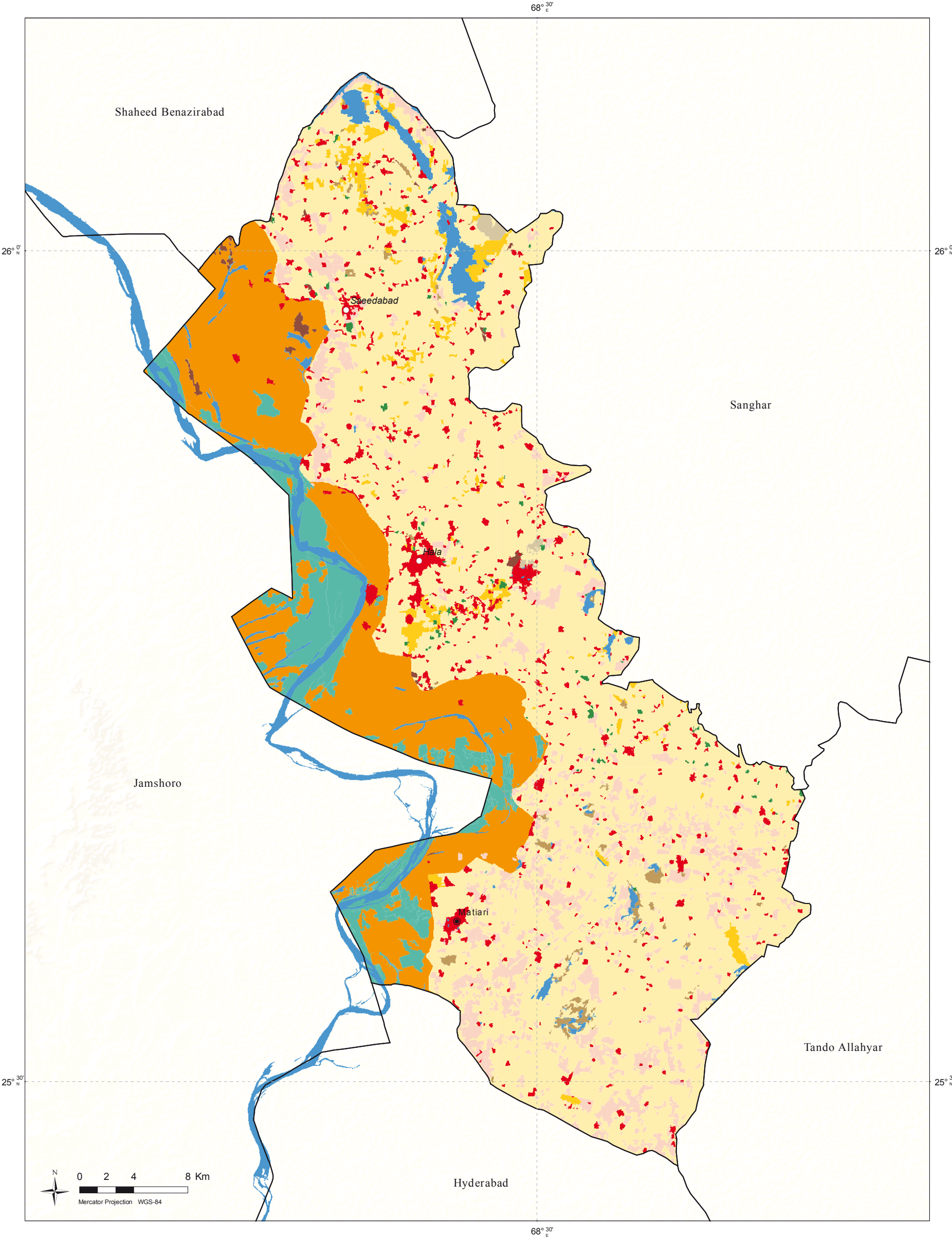
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	124.40	8.8
Crop Irrigated	805.07	56.9
Crop Marginal and Irrigated Saline	33.00	2.3
Crop in Flood Plain	253.11	17.9
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	4.26	0.3
Natural Vegetation in Wet Areas	78.23	5.5
Range Lands - Natural Shrubs and Herbs	9.43	0.7
Built-up	50.81	3.6
Bare Areas	4.00	0.3
Bare Areas with Sparse Natural Vegetation	3.32	0.2
Wet Areas	49.52	3.5
Snow and Glaciers	0.00	0.0
Grand Total	1,415.14	



MIRPURKHAS

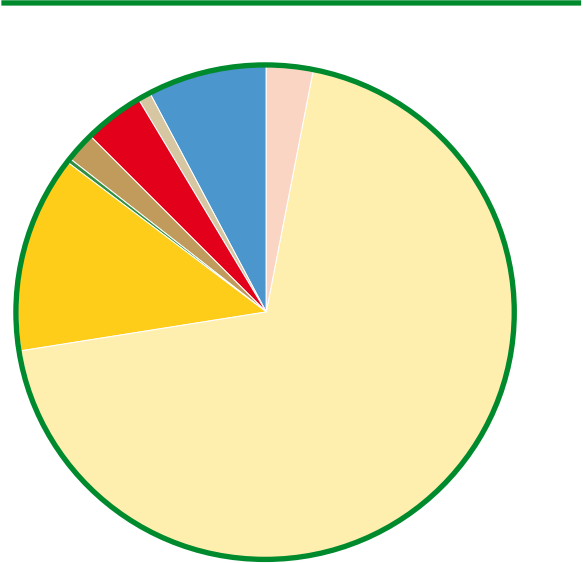
Mirpur Khas district’s main crops include cotton, sugarcane, oil seeds and vegetables. The district is also famous for its mango orchards. District headquarter is located at Mirpur Khas. The major towns of the district are Digri, Kot Ghulam Muhammad, Mirpur Khas and Jhudo.

INDEX MAP



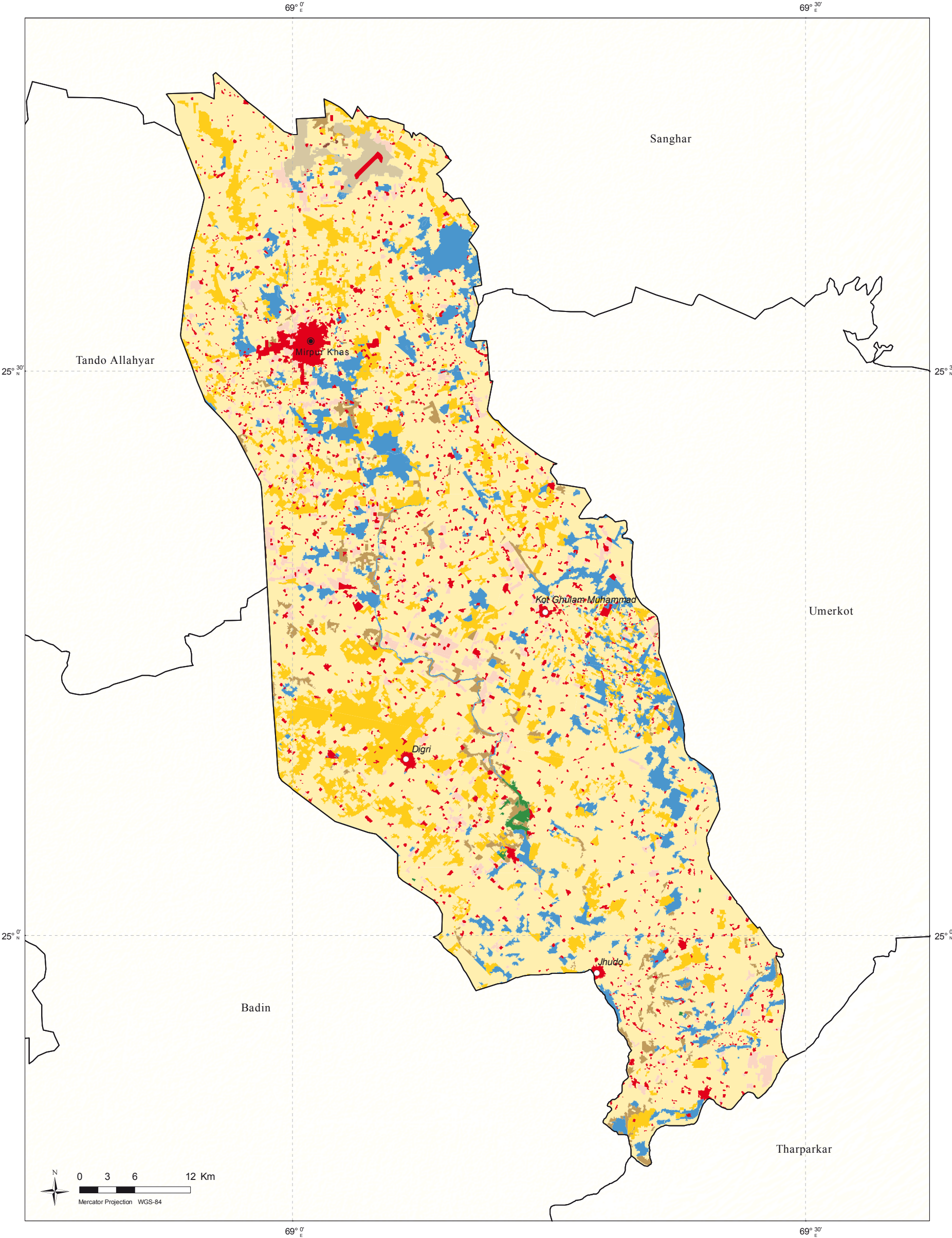
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	97.02	3.3
Crop Irrigated	2,047.15	69.2
Crop Marginal and Irrigated Saline	379.55	12.8
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	5.44	0.2
Natural Vegetation in Wet Areas	0.00	0.0
Range Lands - Natural Shrubs and Herbs	60.29	2.0
Built-up	111.51	3.8
Bare Areas	0.48	0.0
Bare Areas with Sparse Natural Vegetation	27.27	0.9
Wet Areas	228.94	7.7
Snow and Glaciers	0.00	0.0
Grand Total	2,957.66	



NAUSHAHRO FEROZE

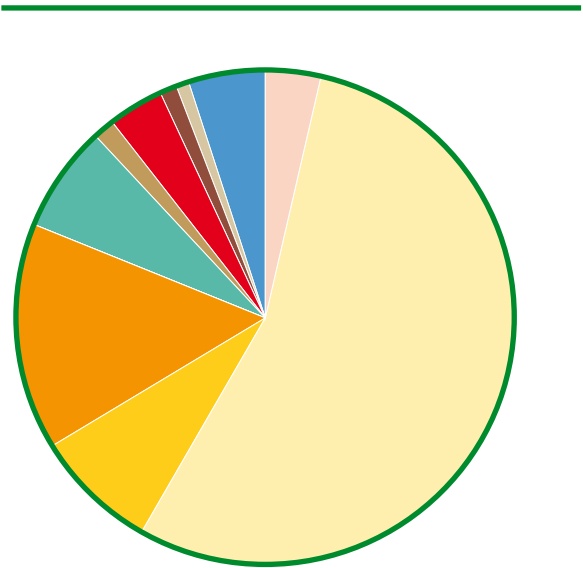
Naushahro Feroze’s main crops include cotton, sugarcane, oil seeds and vegetables. Major towns of Naushahro Feroze are Moro, Naushahro Firoz, Bhiria, Kandiaro and Mehrabpur. District headquarter is situated at Naushahro Feroze.

INDEX MAP



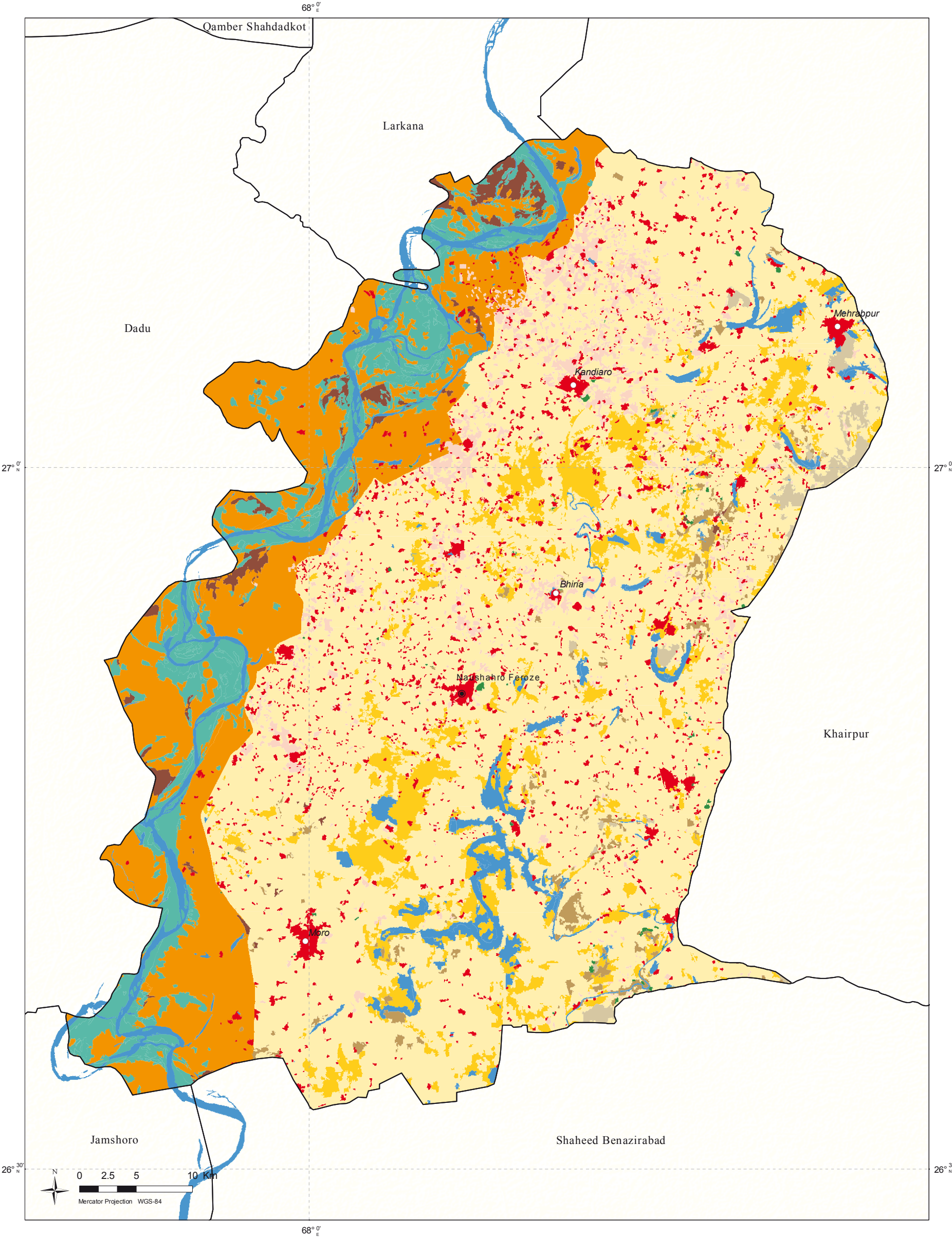
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	118.70	3.8
Crop Irrigated	1,692.13	54.6
Crop Marginal and Irrigated Saline	256.11	8.3
Crop in Flood Plain	449.08	14.5
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	4.03	0.1
Natural Vegetation in Wet Areas	219.82	7.1
Range Lands - Natural Shrubs and Herbs	39.29	1.3
Built-up	112.43	3.6
Bare Areas	35.94	1.2
Bare Areas with Sparse Natural Vegetation	25.32	0.8
Wet Areas	147.91	4.8
Snow and Glaciers	0.00	0.0
Grand Total	3,100.78	



QAMBER SHAHDADKOT

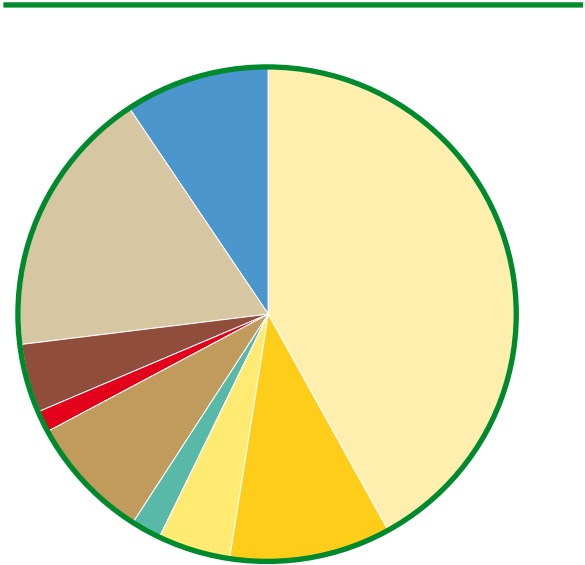
Qamber Shahdadt district lies at the western side near Hamal lake. Headquarter of the district is located at Qamber. Major towns of the district are Qamber, Warah, Mirokhan, Nasirabad, Qubo Seed Khan and Shahdadt.

INDEX MAP



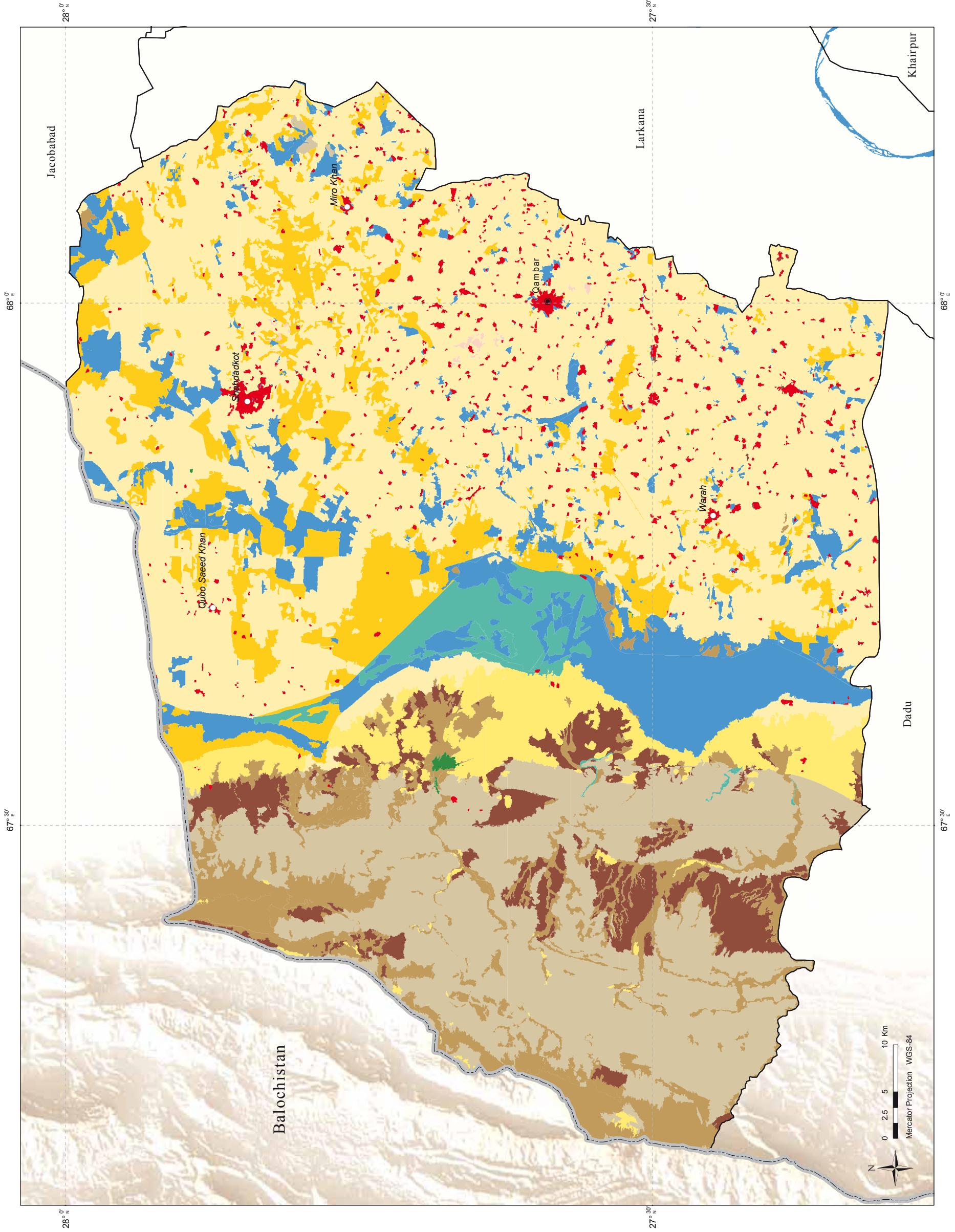
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	4.81	0.1
Crop Irrigated	2,310.16	42.1
Crop Marginal and Irrigated Saline	570.71	10.4
Crop in Flood Plain	0.00	0.0
Crop Rainfed	257.90	4.7
Forest - Natural Trees and Mangroves	3.50	0.1
Natural Vegetation in Wet Areas	117.12	2.1
Range Lands - Natural Shrubs and Herbs	425.06	7.8
Built-up	86.94	1.6
Bare Areas	241.16	4.4
Bare Areas with Sparse Natural Vegetation	951.93	17.4
Wet Areas	514.13	9.4
Snow and Glaciers	0.00	0.0
Grand Total	5,483.42	



SANGHAR

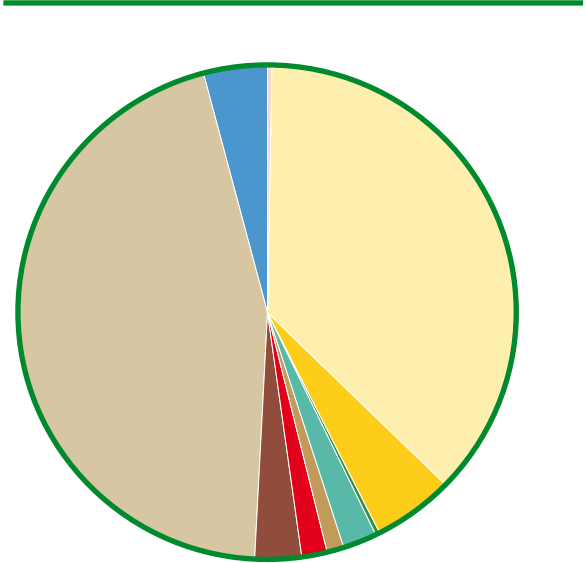
Sanghar district is located at the centre of Sindh province and bordered to the east by India. District headquarter is at Sanghar and the district’s main crops include cotton, sugarcane, oil seeds and vegetables. Major towns of the district are Jam Nawaz Ali, Khipro, Sanghar, Shahdadpur, Sinjhoru and Tando Adam Khan.

INDEX MAP



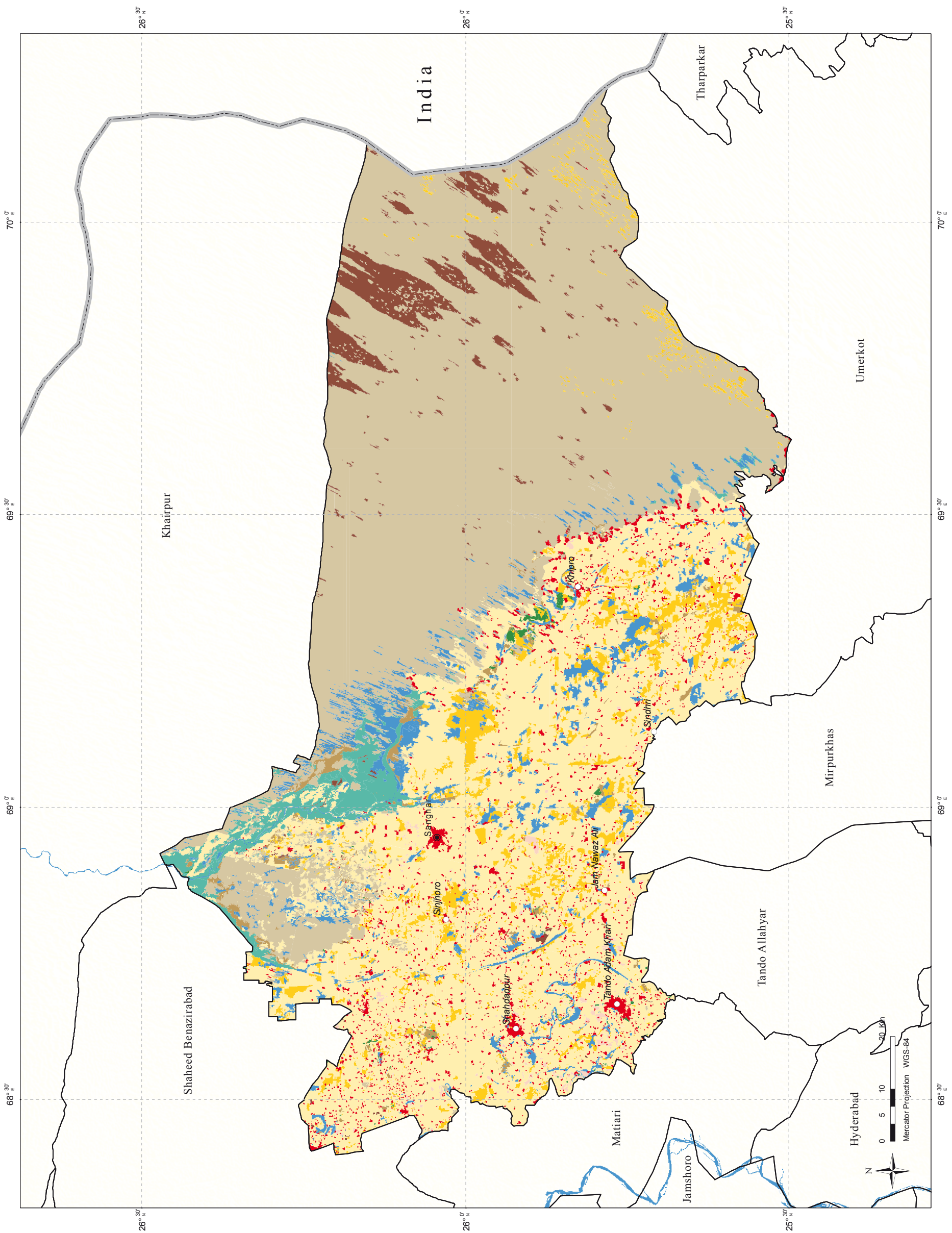
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

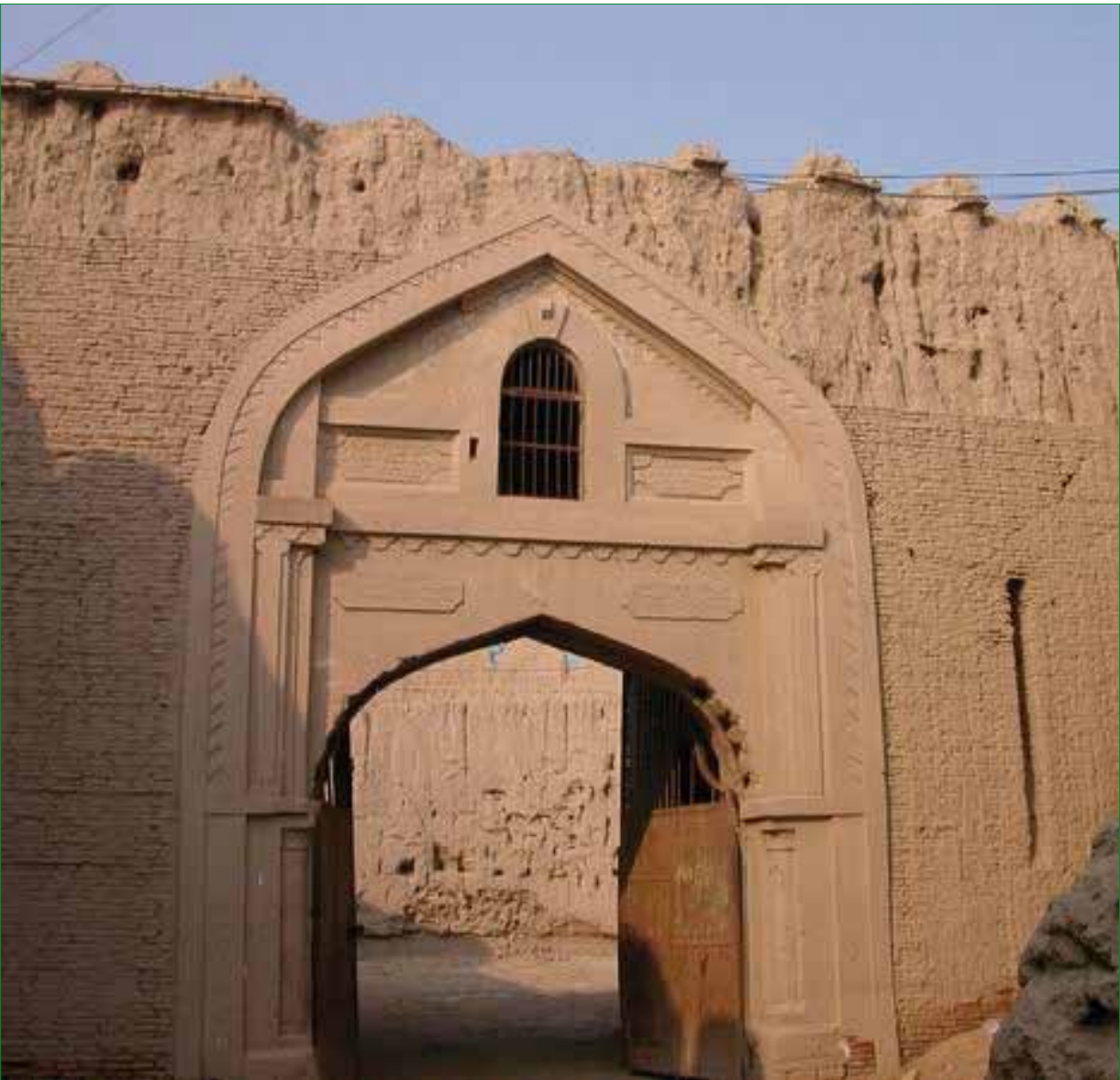
Legend	km²	%
Orchards	49.42	0.5
Crop Irrigated	3,956.99	36.8
Crop Marginal and Irrigated Saline	574.67	5.3
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	23.10	0.2
Natural Vegetation in Wet Areas	258.09	2.4
Range Lands - Natural Shrubs and Herbs	118.51	1.1
Built-up	187.64	1.7
Bare Areas	326.77	3.0
Bare Areas with Sparse Natural Vegetation	4,850.30	45.0
Wet Areas	421.83	3.9
Snow and Glaciers	0.00	0.0
Grand Total	10,767.32	



SHAHEED BENAZIRABAD

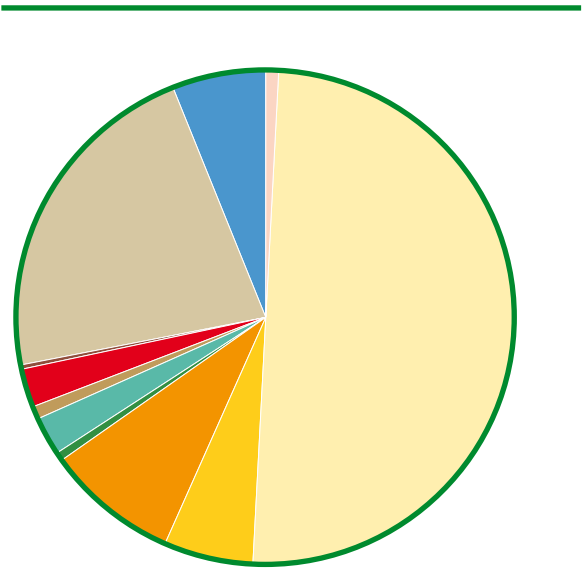
Shaheed Benazirabad district’s major crops include cotton, sugarcane, oil seeds and vegetables. The district headquarter is located at Nawabshah and the major towns include Daulatpur, Daur, Nawabshah, Qazi Ahmed and Sakrand.

INDEX MAP



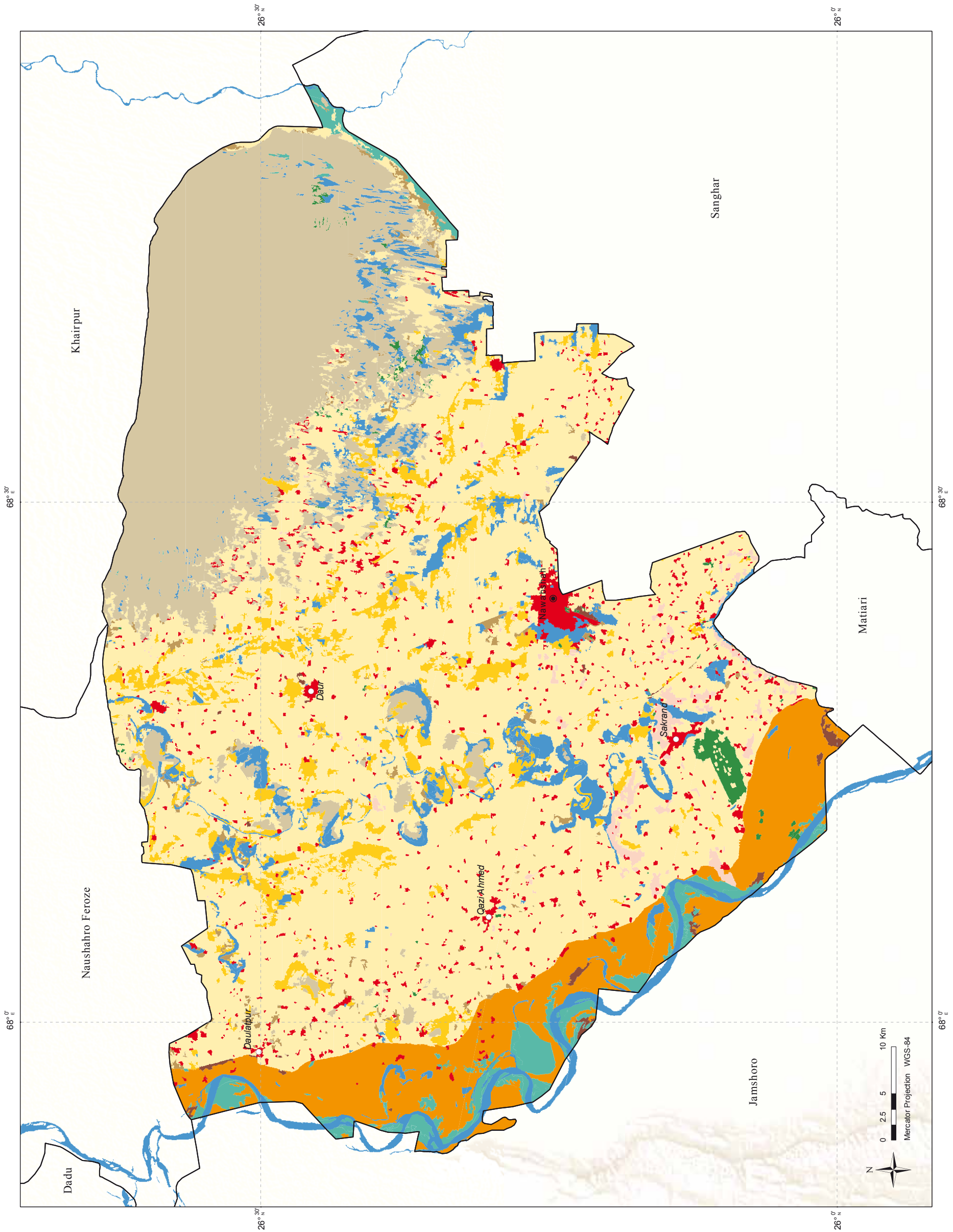
Source: www.wikipedia.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	47.63	1.1
Crop Irrigated	2,189.85	49.9
Crop Marginal and Irrigated Saline	265.23	6.0
Crop in Flood Plain	370.74	8.5
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	25.64	0.6
Natural Vegetation in Wet Areas	104.33	2.4
Range Lands - Natural Shrubs and Herbs	39.21	0.9
Built-up	104.08	2.4
Bare Areas	12.95	0.3
Bare Areas with Sparse Natural Vegetation	959.50	21.9
Wet Areas	267.37	6.1
Snow and Glaciers	0.00	0.0
Grand Total	4,386.52	



SHIKARPUR

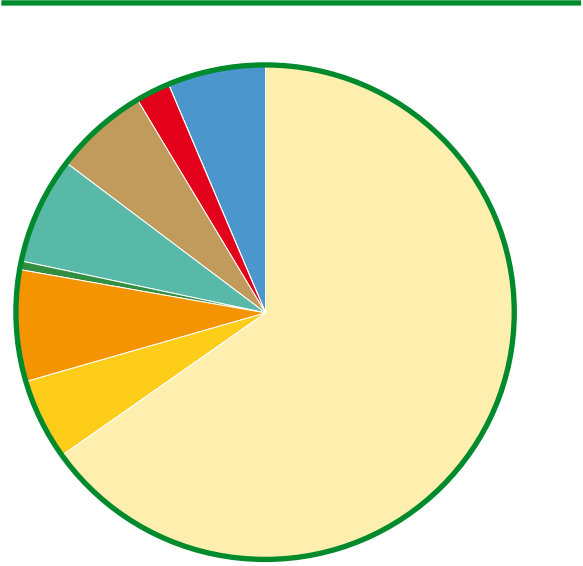
Shikarpur district borders Larkana, Jacobabad, Khairpur and Sukkur. Shikarpur was a fortified city with seven gates,Hathi Gate, Lakhi Gate, Hazari gate, Khanpuri gate, Suwi gate, Wahgan gate and Kiran gate. Rice, oil seeds and vegetables are major crops of the district. It is also famous for a variety of pickle production. The district headquarter is situated at Shikarpur and major towns of the district are Garhi Yasin, Khanpur, Lakhi and Shikarpur.

INDEX MAP



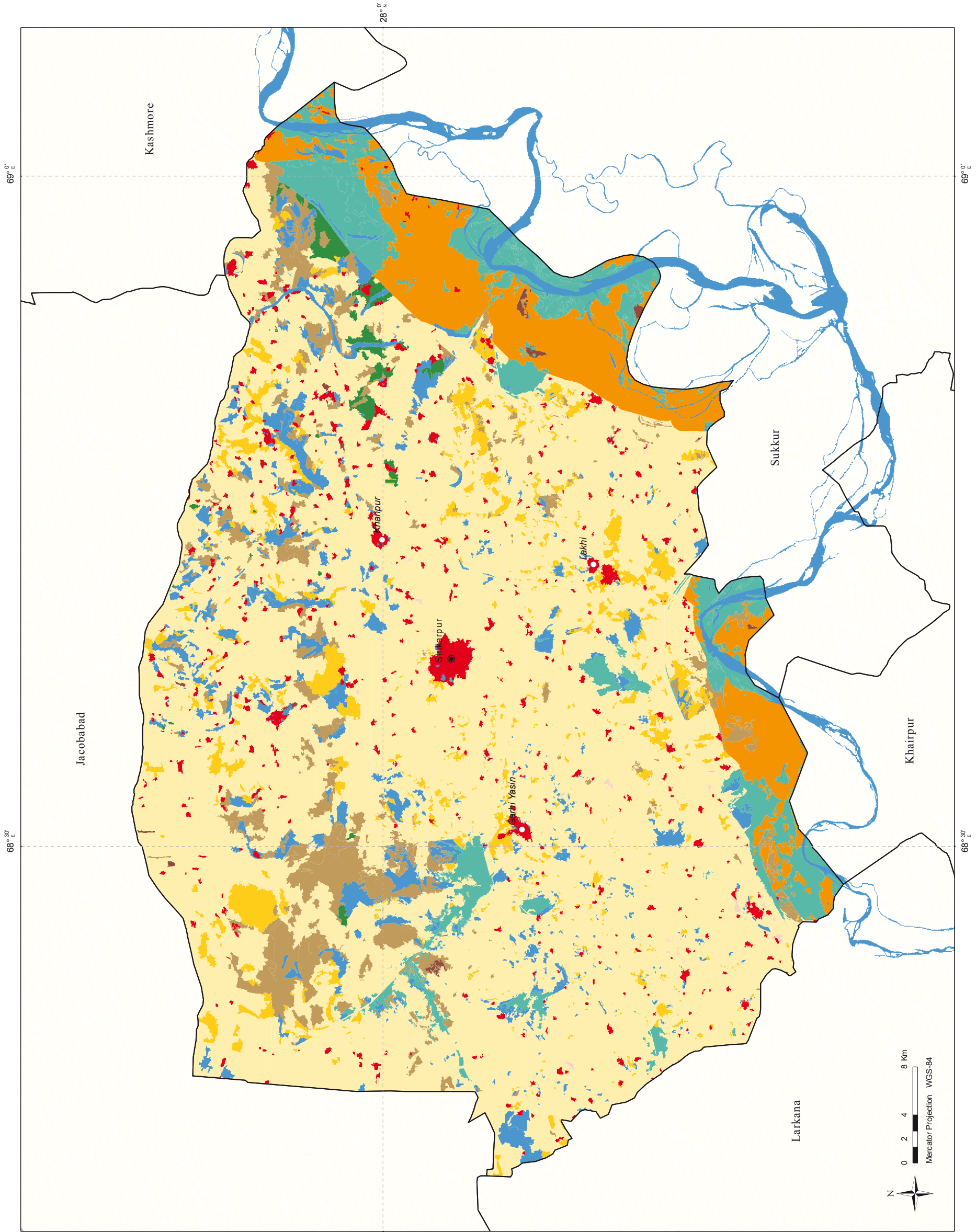
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	2.31	0.1
Crop Irrigated	1,743.84	65.3
Crop Marginal and Irrigated Saline	136.27	5.1
Crop in Flood Plain	192.20	7.2
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	19.47	0.7
Natural Vegetation in Wet Areas	184.11	6.9
Range Lands - Natural Shrubs and Herbs	164.93	6.2
Built-up	56.13	2.1
Bare Areas	3.94	0.1
Bare Areas with Sparse Natural Vegetation	0.01	0.0
Wet Areas	166.01	6.2
Snow and Glaciers	0.00	0.0
Grand Total	2,669.22	



SUKKUR

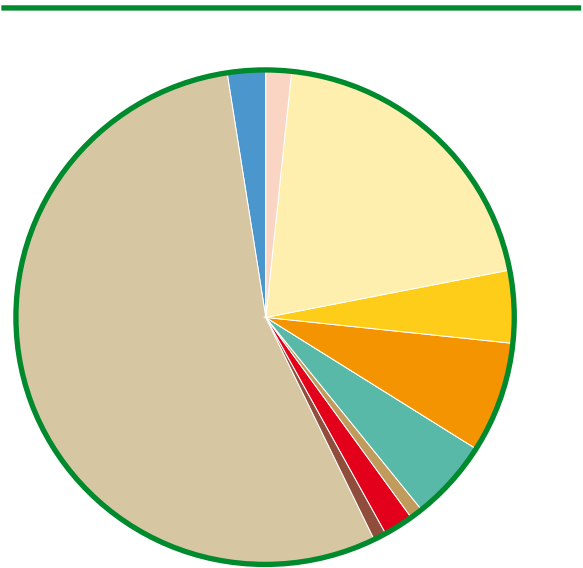
Sukkur district’s major crops include cotton, sugarcane, oil seeds and vegetables. Sukkur is famous for its date orchards. Rohri, the smallest tehsil of the Sukkur district in both area and population, has one of the ancient and important railway junctions, the Rohri Junction. Sukkur barrage and Lansdowne Bridge Rohri are the most famous historical landscapes in Sukkur. District headquarter is situated at Sukkur and major towns include Sukkur, Rohri, Saleh Pat and Pano Aqil.

INDEX MAP



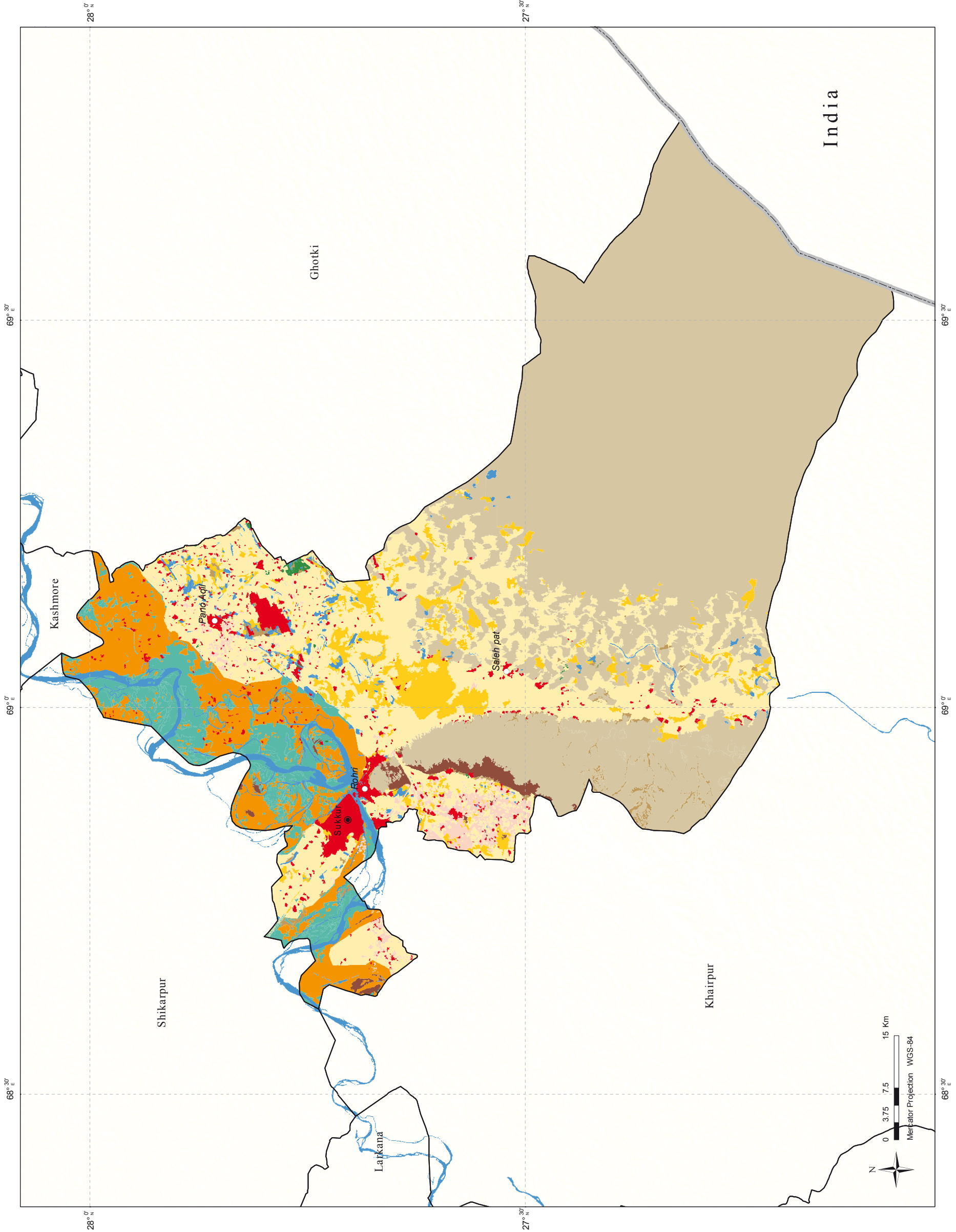
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	81.21	1.7
Crop Irrigated	994.19	20.5
Crop Marginal and Irrigated Saline	217.78	4.5
Crop in Flood Plain	359.32	7.4
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	5.45	0.1
Natural Vegetation in Wet Areas	245.80	5.1
Range Lands - Natural Shrubs and Herbs	37.47	0.8
Built-up	96.31	2.0
Bare Areas	40.41	0.8
Bare Areas with Sparse Natural Vegetation	2,666.27	54.9
Wet Areas	112.72	2.3
Snow and Glaciers	0.00	0.0
Grand Total	4,856.93	



TANDO ALLAHYAR

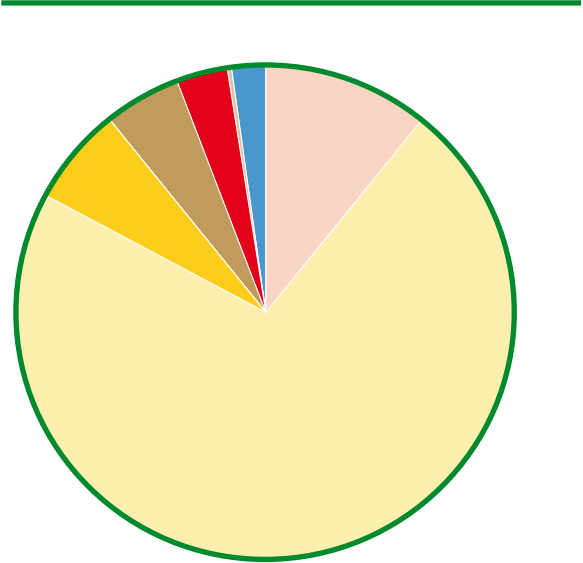
Tando Allahyar district is famous for mangoes plantation. A wide variety of mangoes are planted. Cash crops like sugarcane, wheat, onions and cotton are cultivated in a vast area.. Tando Allahyar produces the highest quantity of sugarcane. The district headquarter is located at Tando Allahyar and major towns include Chamber, Jhando Mari and Tando Allahyar.

INDEX MAP



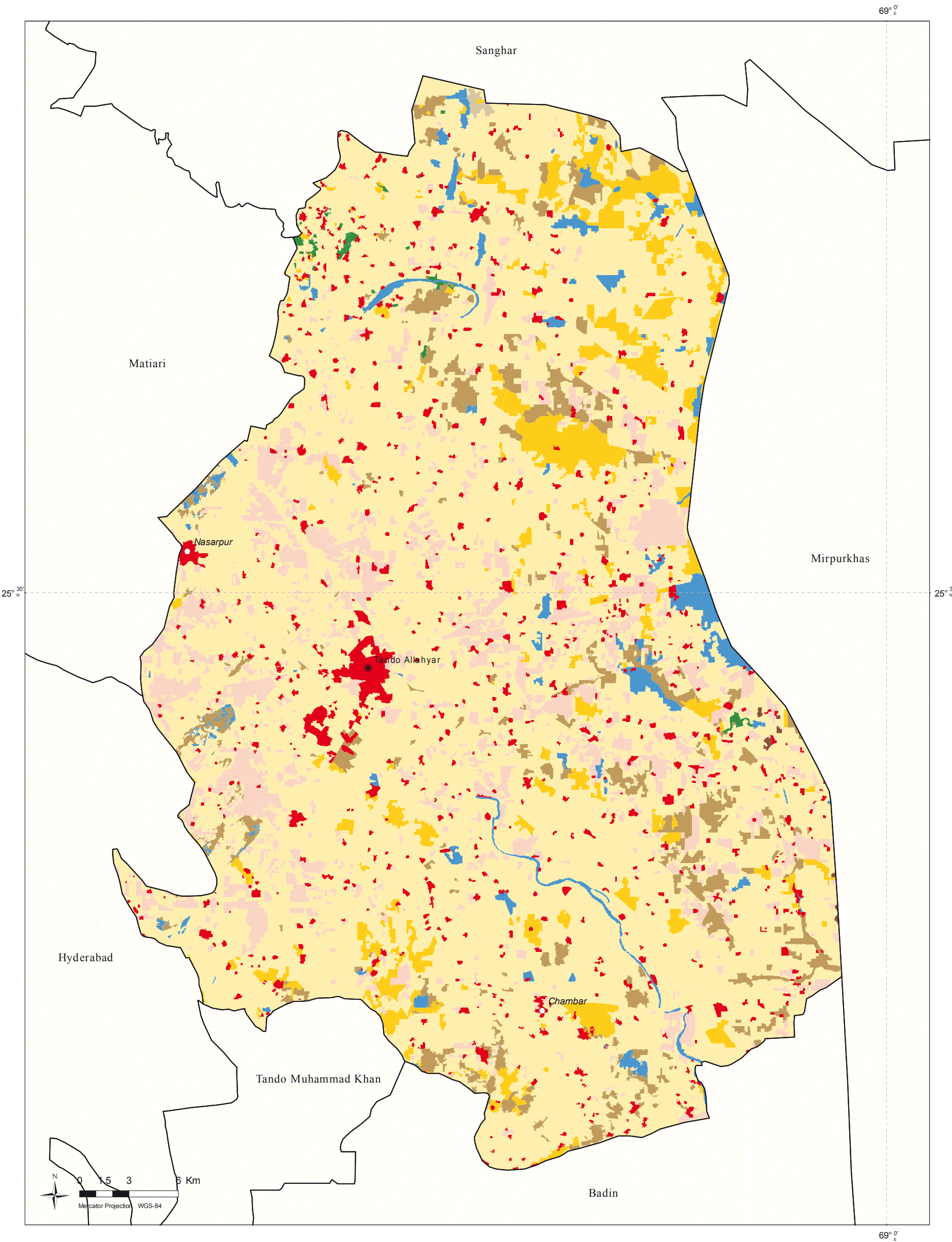
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	167.98	10.9
Crop Irrigated	1,111.59	72.2
Crop Marginal and Irrigated Saline	94.81	6.2
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	2.68	0.2
Natural Vegetation in Wet Areas	0.00	0.0
Range Lands - Natural Shrubs and Herbs	75.04	4.9
Built-up	52.16	3.4
Bare Areas	0.72	0.0
Bare Areas with Sparse Natural Vegetation	1.16	0.1
Wet Areas	33.46	2.2
Snow and Glaciers	0.00	0.0
Grand Total	1,539.60	



TANDO MUHAMMAD KHAN

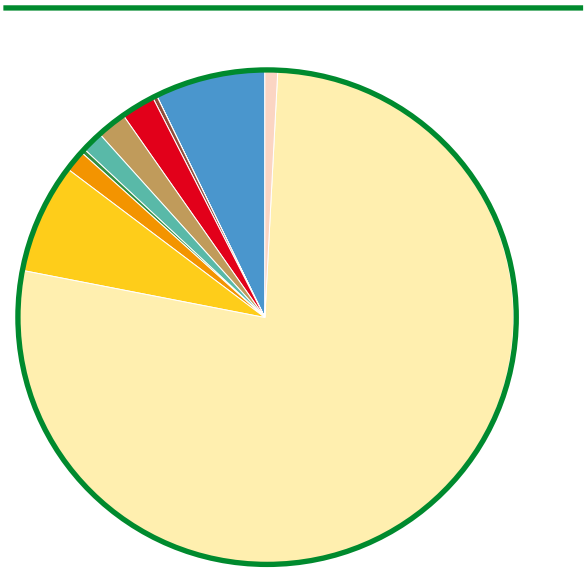
Main crops grown in Tando Muhammad Khan district are sugarcane, rice, wheat and cotton. The major towns of the district are Tando Muhammad Khan, Bulri Shah Karim and Tando Ghulam Hyder. District headquarter is situated at Tando Muhammad Khan.

INDEX MAP



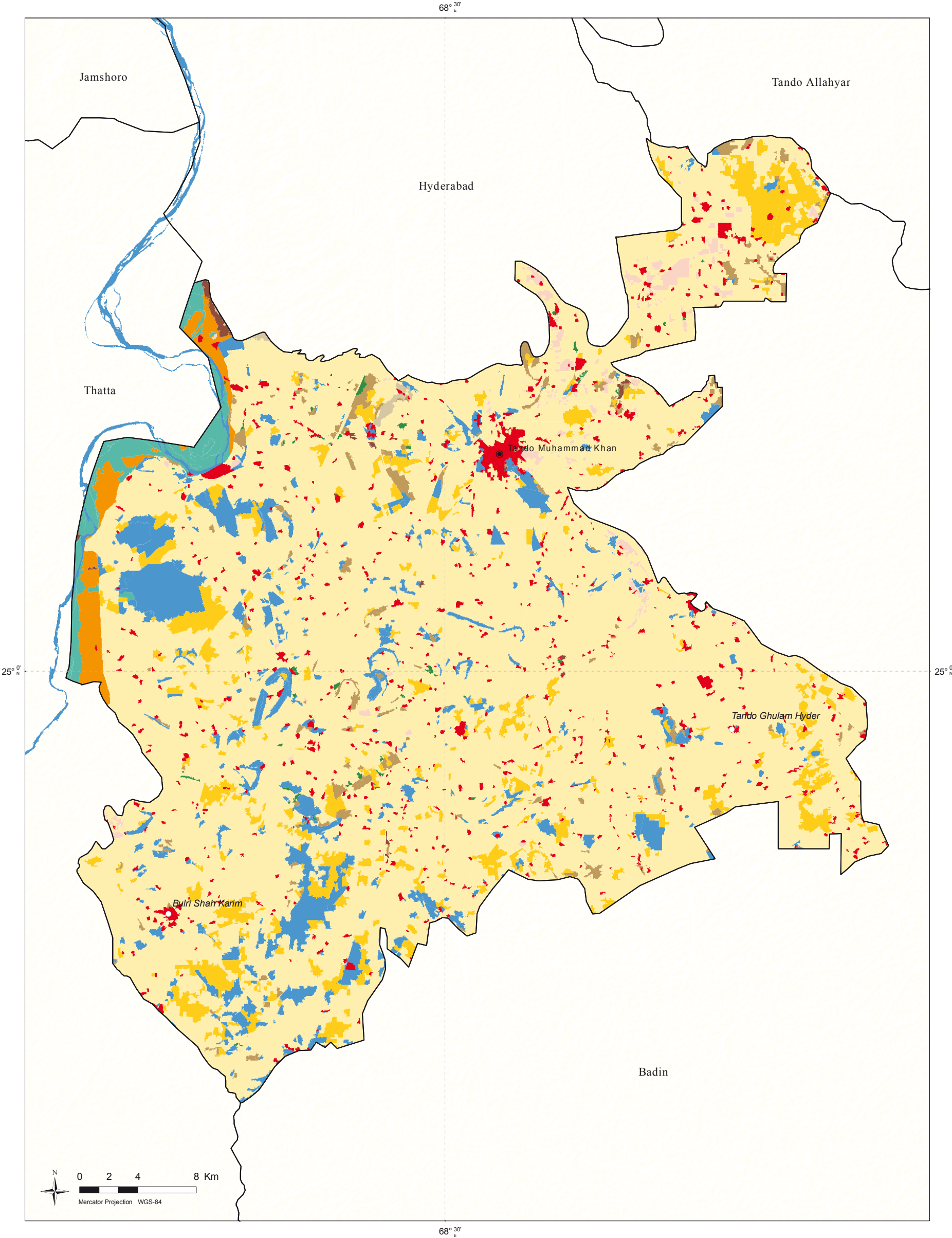
Source: www.panoramio.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	16.48	1.1
Crop Irrigated	1,202.72	76.9
Crop Marginal and Irrigated Saline	116.01	7.4
Crop in Flood Plain	21.13	1.4
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	2.75	0.2
Natural Vegetation in Wet Areas	24.17	1.5
Range Lands - Natural Shrubs and Herbs	26.87	1.7
Built-up	38.29	2.4
Bare Areas	2.81	0.2
Bare Areas with Sparse Natural Vegetation	2.30	0.1
Wet Areas	110.22	7.0
Snow and Glaciers	0.00	0.0
Grand Total	1,563.77	



THARPARKAR

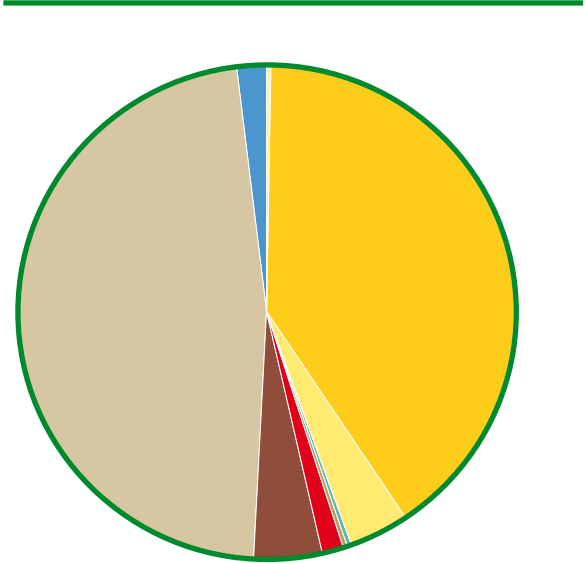
Tharparkar district’s major portion comprises of Thar Desert with very few portions of agricultural land. Handicrafts and livestock are key business activities in Mithi which is the district headquarter. The beauty of Tharparkar is due to its pink granite, Karronjhar hills located in Nagarparkar tehsil and the rich flora and fauna. Various environmentalists have been demanding the national park status for the Nagarparkar. Oil seeds are the major crop of the district. The major towns of the district are Chachro, Diplo, Islamkot, Mithi and Nagarparkar.

INDEX MAP



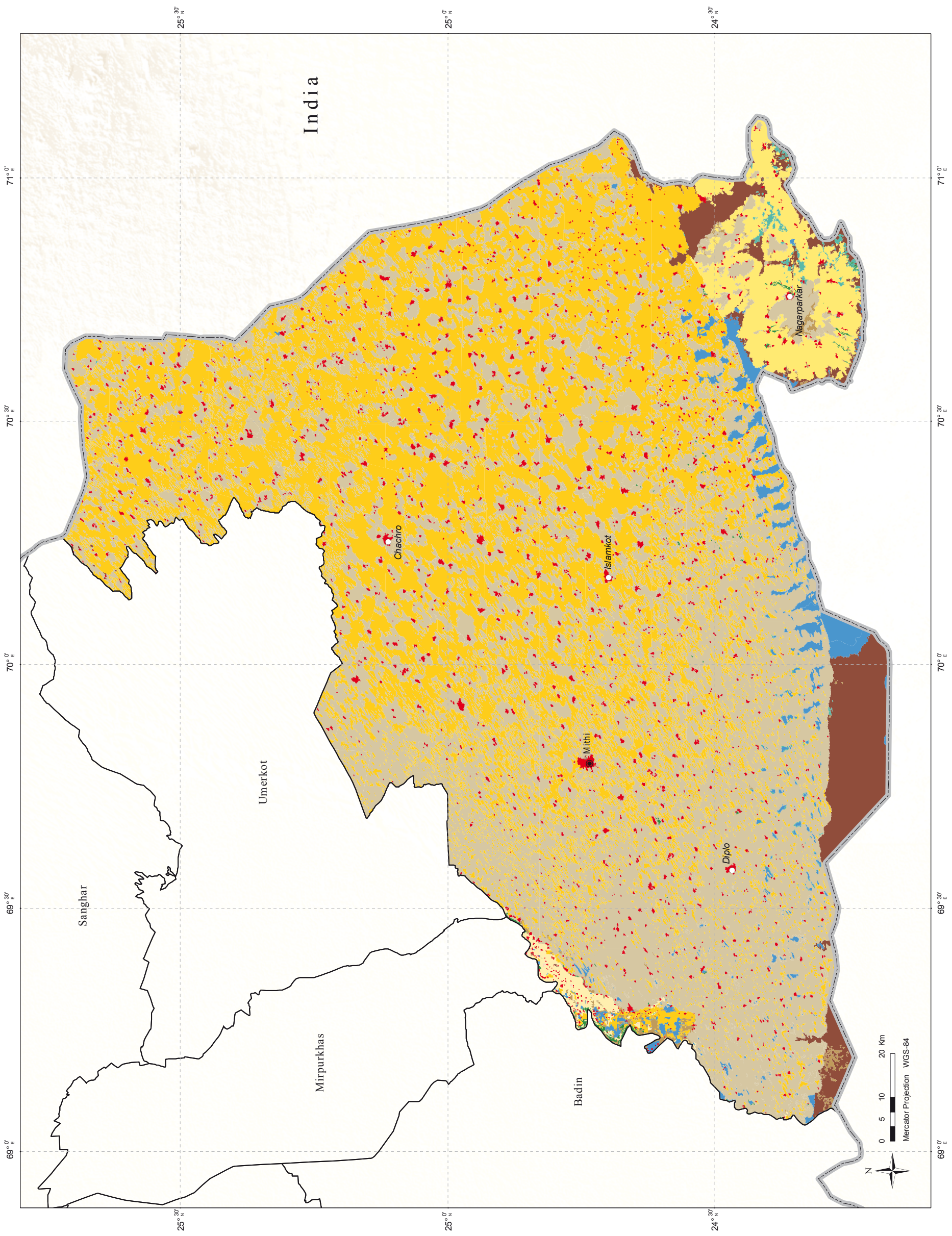
Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	1.12	0.0
Crop Irrigated	102.84	0.5
Crop Marginal and Irrigated Saline	7,844.27	40.1
Crop in Flood Plain	0.00	0.0
Crop Rainfed	747.93	3.8
Forest - Natural Trees and Mangroves	23.69	0.1
Natural Vegetation in Wet Areas	43.37	0.2
Range Lands - Natural Shrubs and Herbs	76.06	0.4
Built-up	286.75	1.5
Bare Areas	823.09	4.2
Bare Areas with Sparse Natural Vegetation	9,233.71	47.3
Wet Areas	358.48	1.8
Snow and Glaciers	0.00	0.0
Grand Total	19,541.33	



THATTA

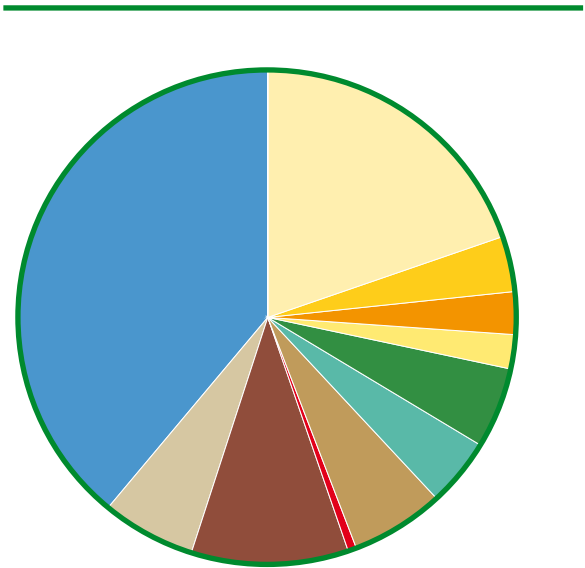
Thatta district is known for hand-printed fabrics, glass bangles and Sindhi embroidery work in laid with tiny mirrors; one of the famous handicrafts of Pakistan. Rice, wheat, sugarcane, oil seeds and vegetables are the major crops of Thatta district. Thatta served as capital of Sindh and center for Islamic arts in the ancient period. Famous Shah Jehan Mosque is also situated in Thatta which was built be Mughal Emperor Shah Jahan. The major towns of the district are Mirpur Sakro, Thatta and Ketī Bander. District headquarter is at Thatta.

INDEX MAP



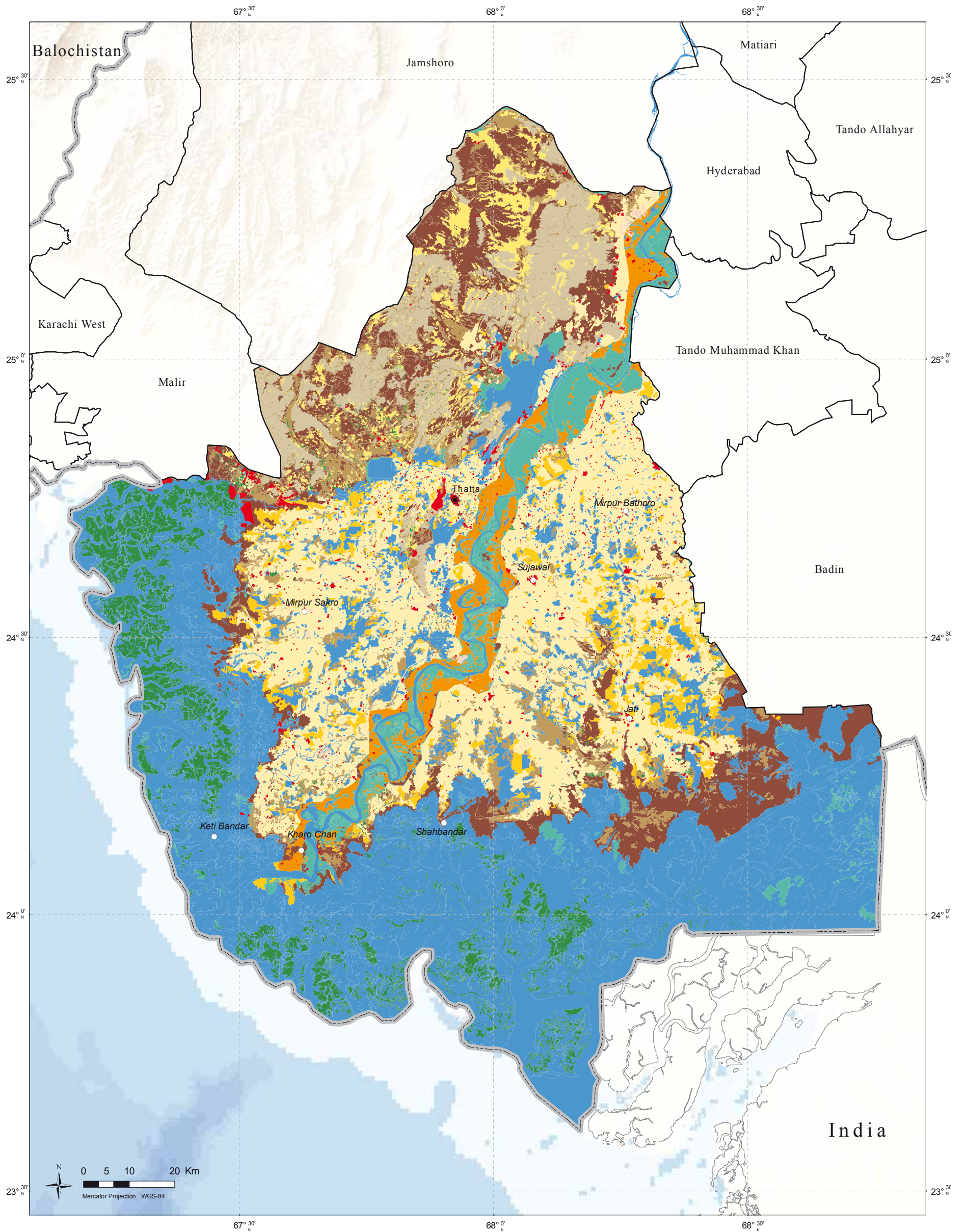
Source: www.staticflickr.com

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	30.69	0.2
Crop Irrigated	3,377.83	19.6
Crop Marginal and Irrigated Saline	634.88	3.7
Crop in Flood Plain	474.45	2.7
Crop Rainfed	375.60	2.2
Forest - Natural Trees and Mangroves	934.51	5.4
Natural Vegetation in Wet Areas	752.87	4.4
Range Lands - Natural Shrubs and Herbs	1,052.20	6.1
Built-up	120.76	0.7
Bare Areas	1,779.38	10.3
Bare Areas with Sparse Natural Vegetation	1,018.55	5.9
Wet Areas	6,720.96	38.9
Snow and Glaciers	0.00	0.0
Grand Total	17,272.68	



UMERKOT

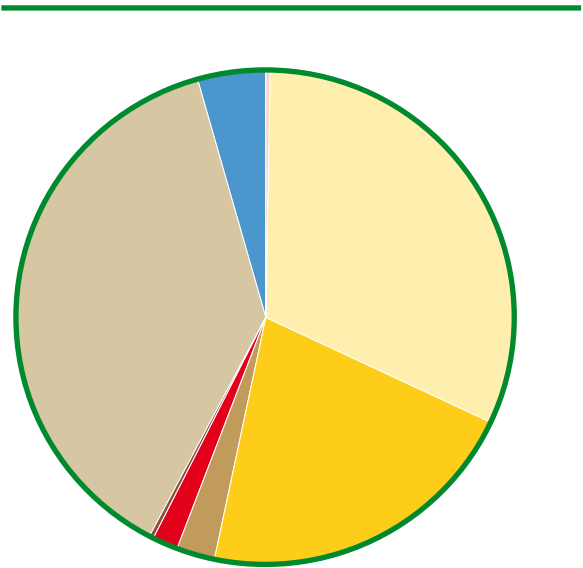
Umerkot district was formerly known as Amarkot, which was the capital of Greater Sindh Province, including some parts of present Rajasthan state of India. The Mughal king Akbar was born in Umerkot when his father Humayun fled from military defeat at the hands of Sher Shah Suri. Rana Prasad, a Hindu Sodha Rajput ruler of Amarkot, gave refuge to Humayun. The major towns of the district are Umerkot, Samaro, Pithoro and Kunri. The headquarter is at Umerkot, which is famous for a beautiful historical fort and museum.

INDEX MAP



Source: SUPARCO

LAND COVER IN PERCENTAGE



DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	26.24	0.5
Crop Irrigated	1,757.03	31.5
Crop Marginal and Irrigated Saline	1,194.71	21.4
Crop in Flood Plain	0.00	0.0
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	2.39	0.0
Natural Vegetation in Wet Areas	0.08	0.0
Range Lands - Natural Shrubs and Herbs	140.19	2.5
Built-up	100.58	1.8
Bare Areas	9.60	0.2
Bare Areas with Sparse Natural Vegetation	2,115.35	37.9
Wet Areas	240.21	4.3
Snow and Glaciers	0.00	0.0
Grand Total	5,586.38	

