

**SECTION IV  
DISTRICT PROFILES  
AND  
SOIL FERTILITY STATUS**

# ABBOTTABAD

Abbottabad is known for its pleasant weather and, thus, as a popular hill station; several high standard educational institutions are located there. The climate is humid subtropical with mild to hot summers and cold to freezing winters. Snowfall occurs occasionally in December and January, while heavy rainfall occurs during the monsoon season from July to September. Main crops include wheat, onion, barley, pulses, vegetables and fruits. The district headquarter is located at Abbottabad.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvium, piedmont, sub recent mountains outwashes
<b>Dominant soil series</b>	Ayubia, Bagnoter, Baragali, Kohala, Makhnial
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	6.84 – 8.8 (Alkaline)*
<b>Electrical conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.1 – 2.63 (Saline)*
<b>Organic matter (%)</b>	0.3 – 3.23 (Medium)*
<b>Available phosphorus (ppm)</b>	1 – 15 (Low)*
<b>Extractable potassium (ppm)</b>	42 – 400 (Adequate)*
<b>Farmers availing soil test facility (%)</b>	21 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

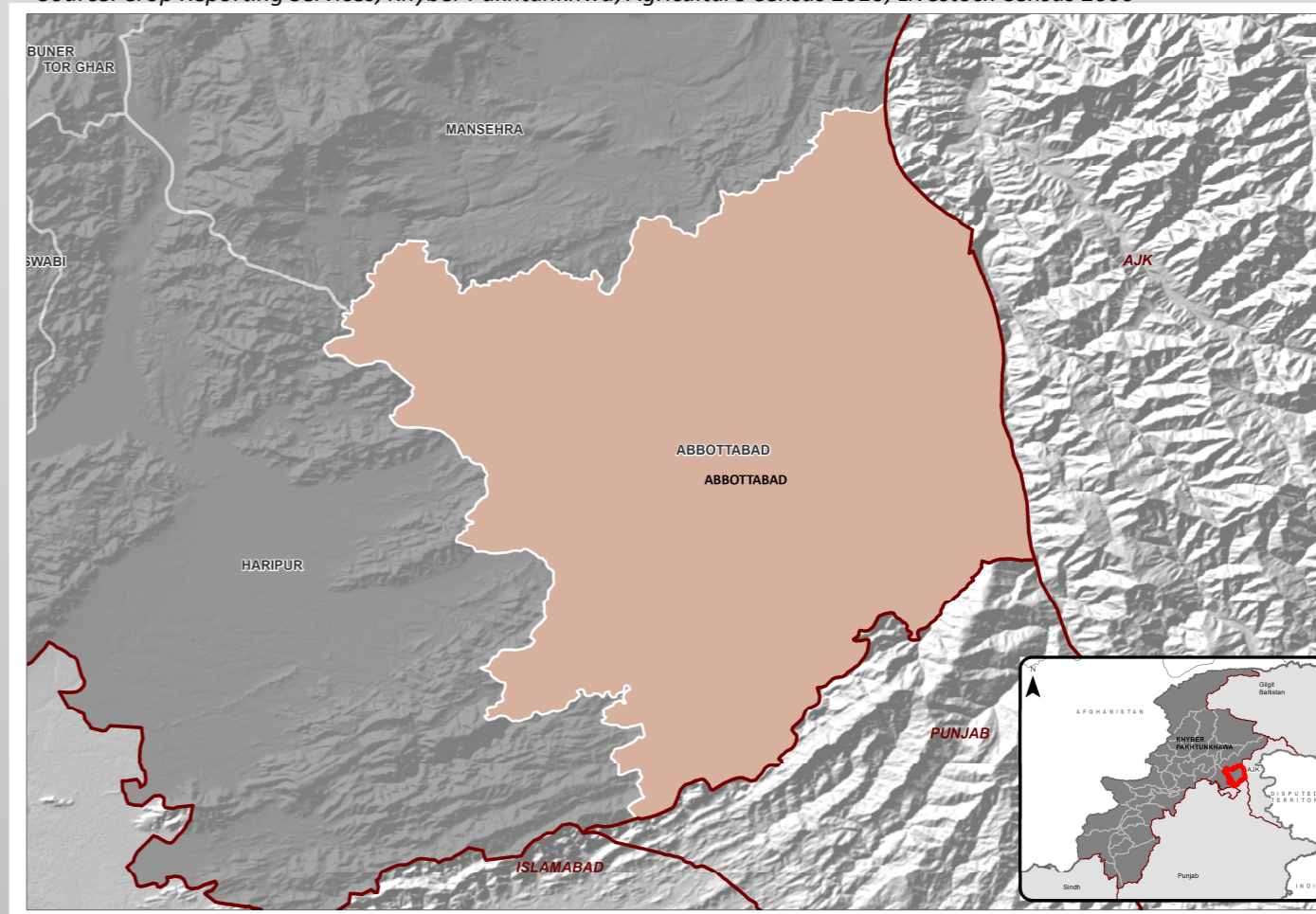
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	47,288
<b>Total non-cultivated area (hectares)</b>	131,113
<b>Total area under irrigation (hectares)</b>	5,500
<b>Major rabi crop(s)</b>	Wheat
<b>Major kharif crop(s)</b>	Maize
<b>Total livestock population</b>	1,259,917

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Bannu was recorded as a district in 1861 during the British Raj. The district borders Karak district to the northeast, Lakki Marwat to the southeast, and South Waziristan to the southwest. The climate is arid to semi-arid division of sub-tropical continental with extreme hot summers and moderately cold winters. Main crops grown here are wheat, rice, sugarcane, pulses, vegetables and fruits. The district headquarter is located at Bannu.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Sub recent gently sloping piedmont plains
<b>Dominant Soil Series</b>	Matli, Thatti, Shahpur, Janikhel, Malikshahi
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	8.0 – 8.4 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.41 – 3.91 (Saline)*
<b>Organic matter (%)</b>	0.5 – 1.29 (Low)*
<b>Available phosphorus (ppm)</b>	6 – 10 (Low)*
<b>Extractable potassium (ppm)</b>	180 – 730 (Medium)*
<b>Farmers availing soil test facility (%)</b>	32 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	21 (Based on crop production zone wise data)

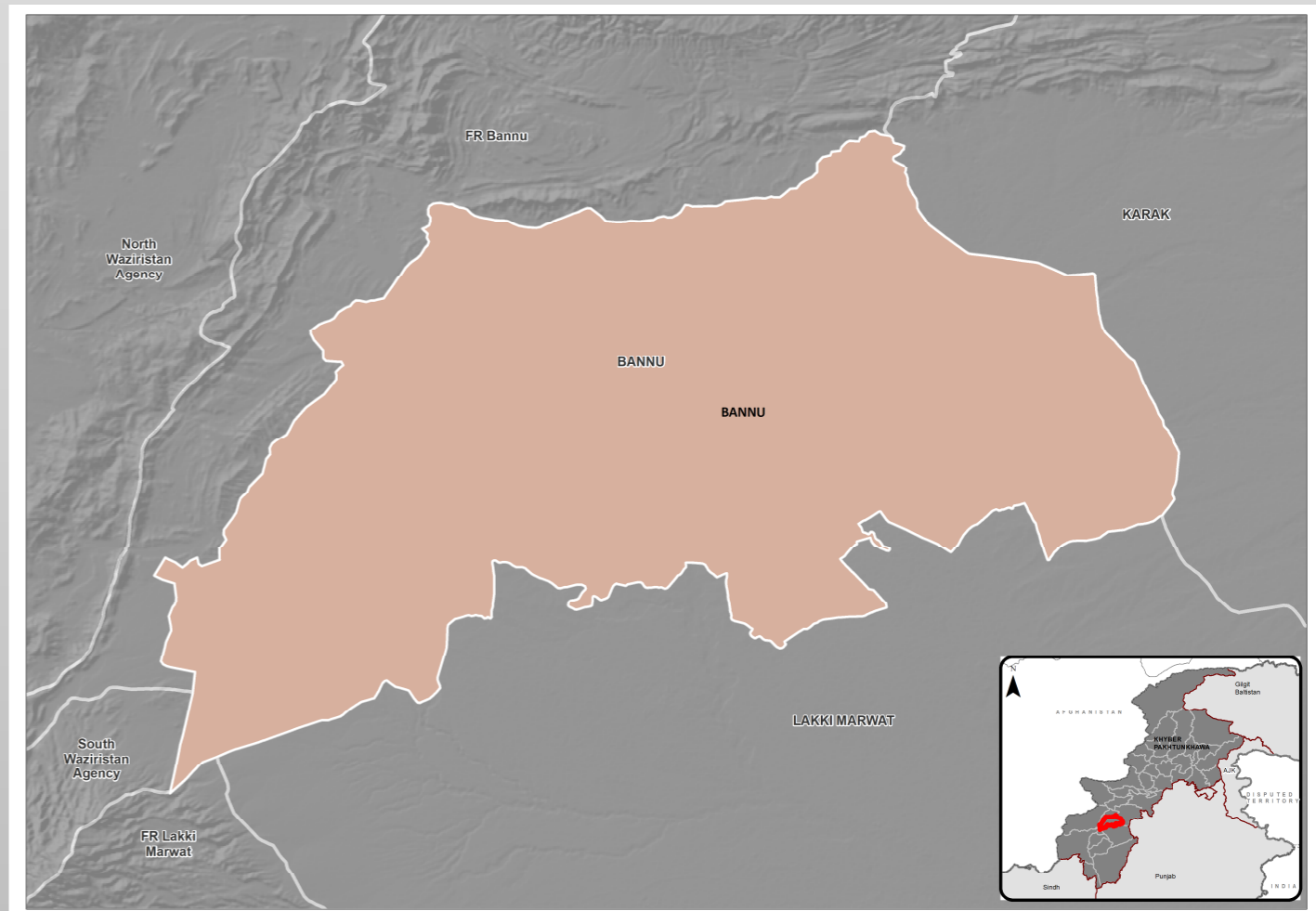
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	83,043
<b>Total non-cultivated area (hectares)</b>	35,780
<b>Total area under irrigation (hectares)</b>	56,780
<b>Major rabi crop(s)</b>	Wheat, vegetable and fruit crops
<b>Major kharif crop(s)</b>	Maize, rice, sugarcane, fruit crops
<b>Total livestock population</b>	1,999,290

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# BATTAGRAM

Battagram district borders Shangla district to the west, Kohistan to the north, Mansehra to the southeast, and Torghar district to the southwest. The climate varies from sub-tropical at the base of the hills to “alpine” conditions on the higher reaches. Temperature is mild in summers and extreme cold in winters. The major crops include maize, wheat, rice, vegetable and fruit crops. There are two tehsils in the district: Allai and Battagram. The district headquarter is located at Battagram.

## SOIL ATTRIBUTES

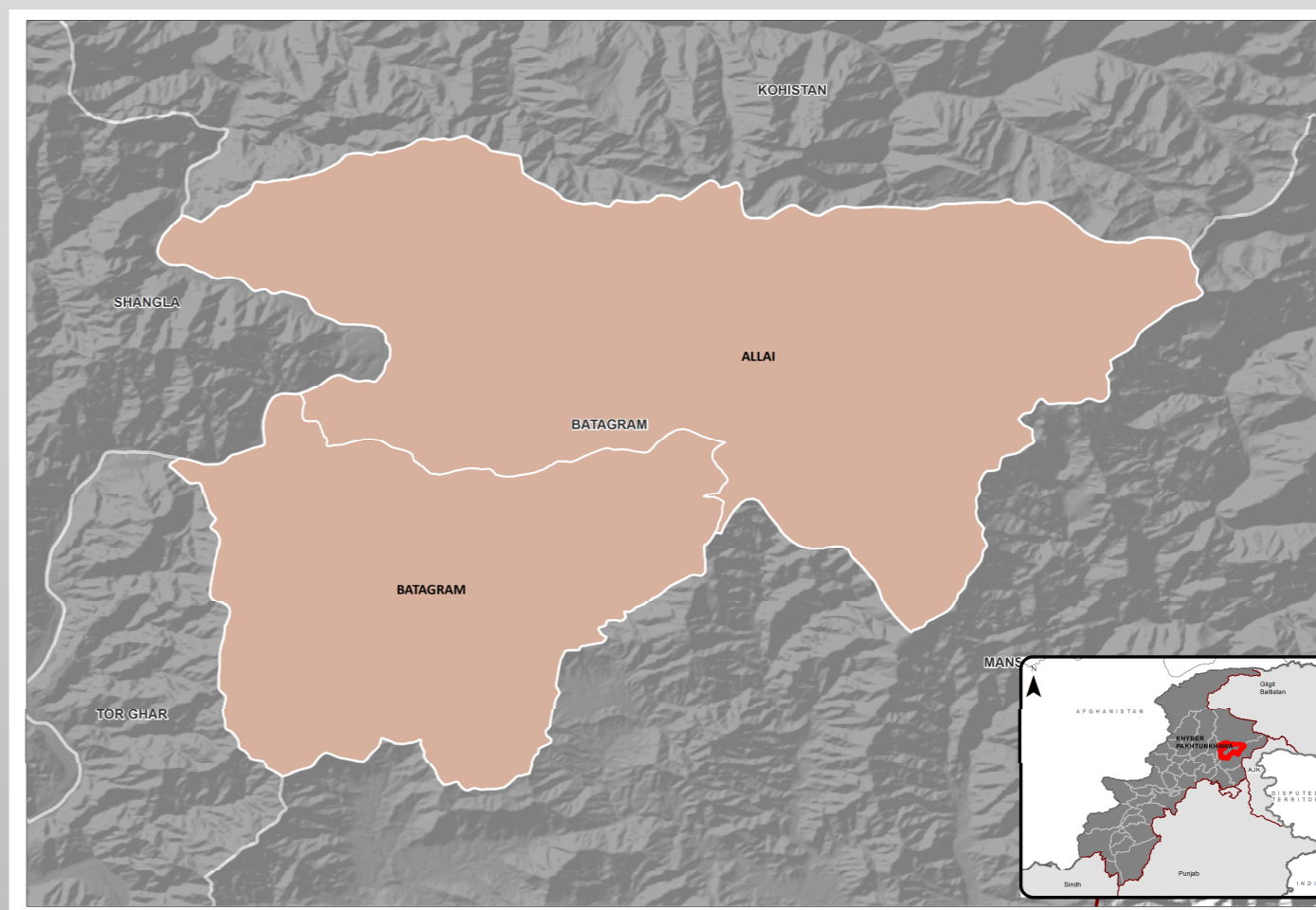
<b>Soil Type/Parent Material</b>	Residual and colluvial deposits
<b>Dominant Soil Series</b>	Shaddar, Kedam
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	No data available
<b>Electrical conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	No data available
<b>Organic matter (%)</b>	No data available
<b>Available phosphorus (ppm)</b>	No data available
<b>Extractable potassium (ppm)</b>	No data available
<b>Farmers availing soil test facility (%)</b>	– –
<b>Farmers availing water test facility (%)</b>	– –

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFL)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area(hectares)</b>	24,173
<b>Total non-cultivated area(hectares)</b>	68,827
<b>Total area under irrigation (hectares)</b>	4,314
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Maize, rice
<b>Total Livestock Population</b>	1,025,753

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Buner district borders Swat district to the northwest, Shangla to the northeast, Swabi to the south, and Mardan to the southwest. The Mazar (shrine) of Pir Baba is famous place of the district. The climate of Buner can be classified as dry sub-tropical. Most part of the year remains pleasant. The main crops grown here are wheat, maize, rice, sugarcane, vegetables and fruits. There are four tehsils in the district: Dagger, Gagra, Mandanr and Khadukhail. The district headquarter is located at Buner.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Mixed alluvial deposits, loess, re-deposited loess
<b>Dominant Soil Series</b>	--
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	7.33 – 8.22 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.08 – 0.17 (Saline)*
<b>Organic matter (%)</b>	0.73 – 1.36 (Medium)*
<b>Available phosphorus (ppm)</b>	3 – 10 (Low)*
<b>Extractable potassium (ppm)</b>	46 – 178 (Adequate)*
<b>Farmers availing soil test facility (%)</b>	--
<b>Farmers availing water test facility (%)</b>	--

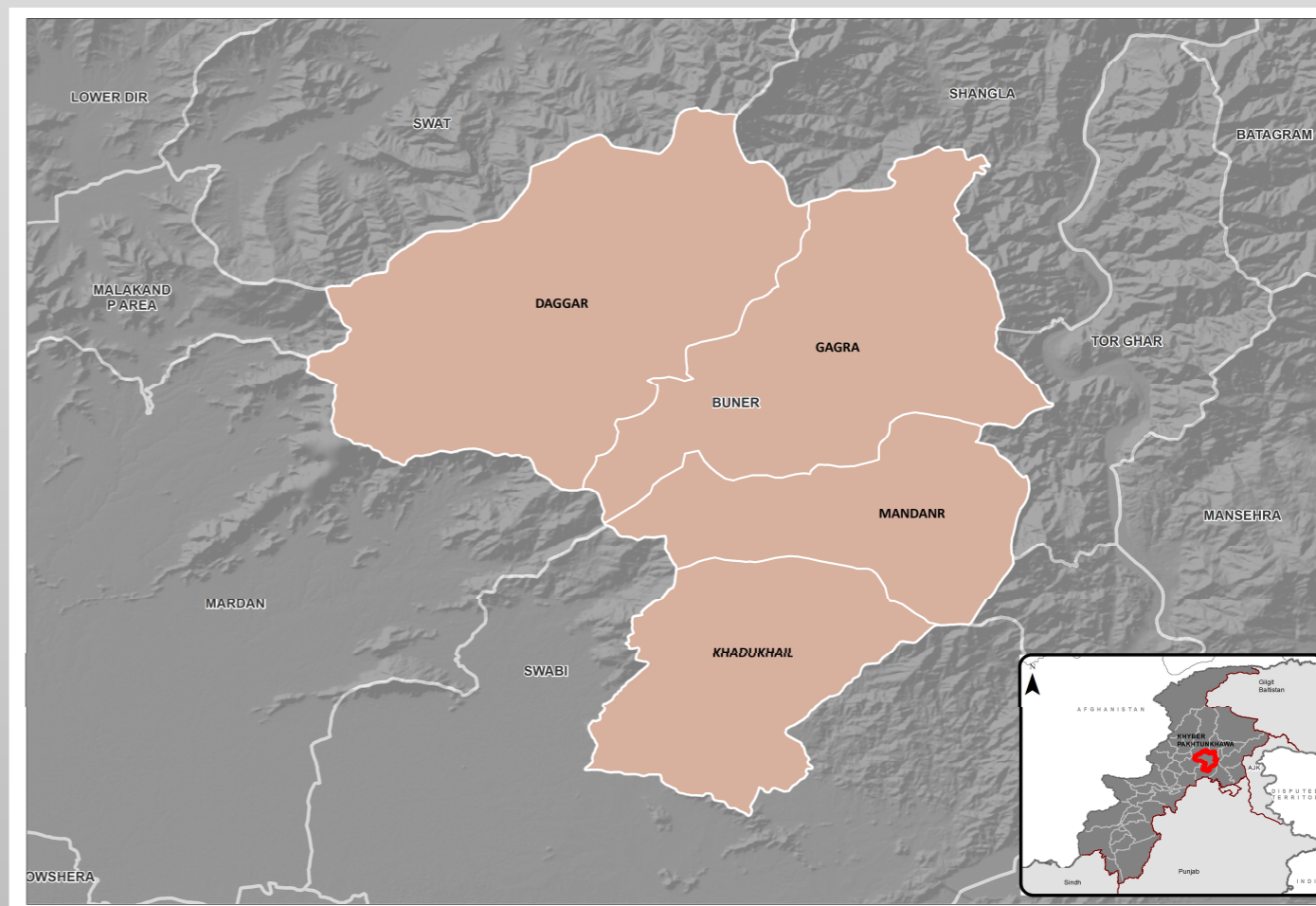
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	55,970
<b>Total non-cultivated area (hectares)</b>	116,461
<b>Total area under irrigation (hectares)</b>	13,009
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Maize, rice, vegetable crops
<b>Total livestock population</b>	1,130,620

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# CHARSADDA

Charsadda is known to be the most fertile land of the Khyber Pakhtunkhwa province. Three rivers flow in the district: the Jindi River, the Kabul River, and the Swat River. The climate varies from semi-arid to sub humid continental sub-tropical with hot summers and mild winters. Main crops include wheat, maize, rice, potato, sugarcane and vegetables. There are three tehsils in the district: Charsadda, Tangi and Shabqadar. The district headquarter is located at Charsadda

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvial, piedmont , loess
<b>Dominant Soil Series</b>	Parang, Charsadda, China, Rajar, Missa
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	6.2 – 10.4 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.04 – 5.88 (Slightly Saline)*
<b>Organic matter (%)</b>	0.1 – 2.72 (Low)*
<b>Available phosphorus (ppm)</b>	1 – 45 (Low)*
<b>Extractable potassium (ppm)</b>	50 – 830 (Low)*
<b>Farmers availing soil test facility (%)</b>	2 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	2 (Based on crop production zone wise data)

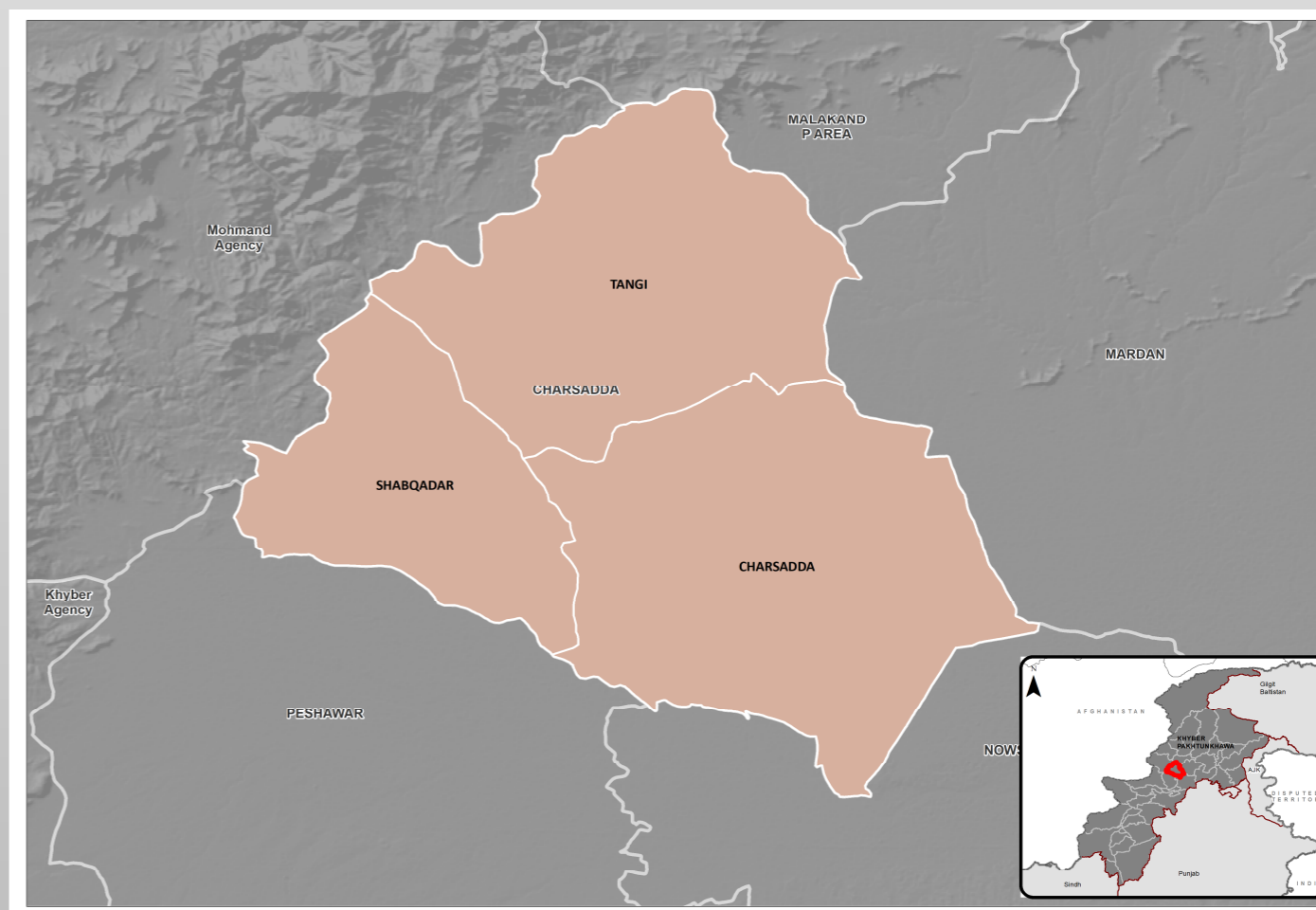
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area( hectares)</b>	73,319
<b>Total non-cultivated area (hectares)</b>	25,322
<b>Total area under irrigation (hectares)</b>	66,539
<b>Major rabi crop(s)</b>	Wheat, vegetable and fruit crops
<b>Major kharif crop(s)</b>	Maize, rice, sugarcane, fruit crops
<b>Total livestock population</b>	1,750,692

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Chitral is the largest district in the Khyber Pakhtunkhwa province. The district is situated on the main crossroad to Central Asia and has a long fascinating history. There are certain famous places and valleys in Chitral including 7,788 m Trichmir, the highest peak of the Hindu Kush mountain. The climate is continental with hot summers and extremely cold winters. The main crops are wheat, maize, rice, barley, sorghum, vegetable and fruit crops. There are two tehsils in the district: Chitral and Mastuj. The district headquarter is located at Chitral.

## SOIL ATTRIBUTES

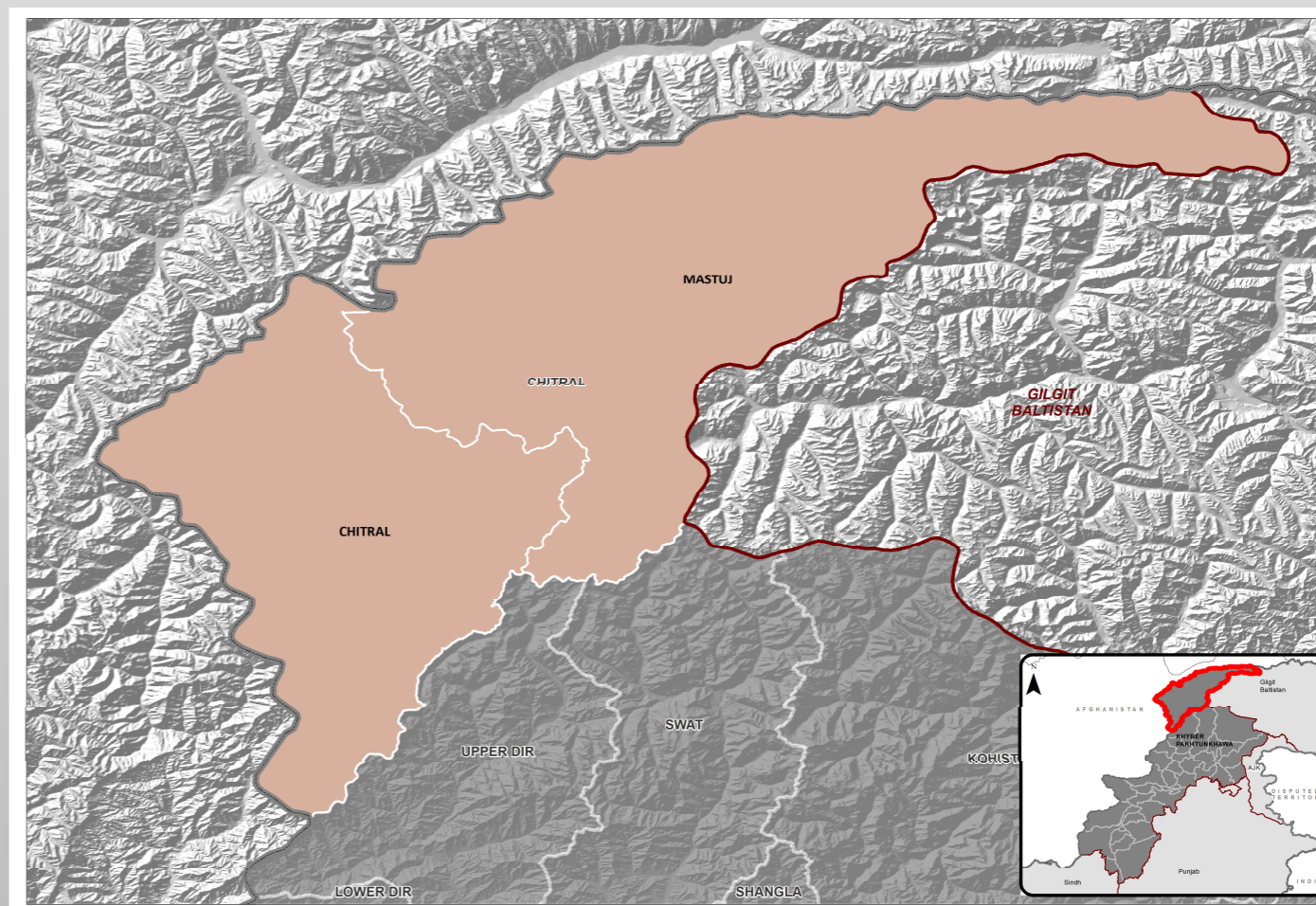
<b>Soil Type/Parent Material</b>	Mixed alluvial and colluvial deposits
<b>Dominant Soil Series</b>	Sin, Koghozi, Drosh, Shali, Shishi
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	Data not available
<b>Electrical conductivity<sub>(1:2.5)</sub> (dS m<sup>-1</sup>)</b>	Data not available
<b>Organic matter (%)</b>	Data not available
<b>Available phosphorus (ppm)</b>	Data not available
<b>Extractable potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	21,500
<b>Total non-cultivated area (hectares)</b>	76,119
<b>Total area under irrigation (hectares)</b>	20,934
<b>Major rabi crop(s)</b>	Wheat, barley, fruit crops
<b>Major kharif crop(s)</b>	Maize, rice, vegetable crops
<b>Total livestock population</b>	1,131,624

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# DERE ISMAIL KHAN

Dera Ismail Khan lies along the western bank of Indus River in the southeast of Khyber Pakhtunkhwa province. The climate is arid to semi-arid with hot summers and cold winters. Main crops include wheat, maize, cotton, sugarcane, chickpea, fodders, vegetables and fruits. Agriculture is the major economic activity and the main source of income. The district is famous for producing a local cultivar of dates known as 'Dhakki'. There are five tehsils in the district and the district headquarter is located at Dera Ismail Khan.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvium, colluvium, piedmont deposits
<b>Dominant Soil Series</b>	Tikken, Sultanpur, Buzdar, Notak, Shahdara
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	7.29 – 9.6 (Alkaline)*
<b>Electrical conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.07 – 12.8 (Saline)*
<b>Organic matter (%)</b>	0.1 – 1.66 (Low)*
<b>Available phosphorus (ppm)</b>	1 – 20 (Low)*
<b>Extractable potassium (ppm)</b>	60 – 1240 (Medium)*
<b>Farmers availing soil test facility (%)</b>	0 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

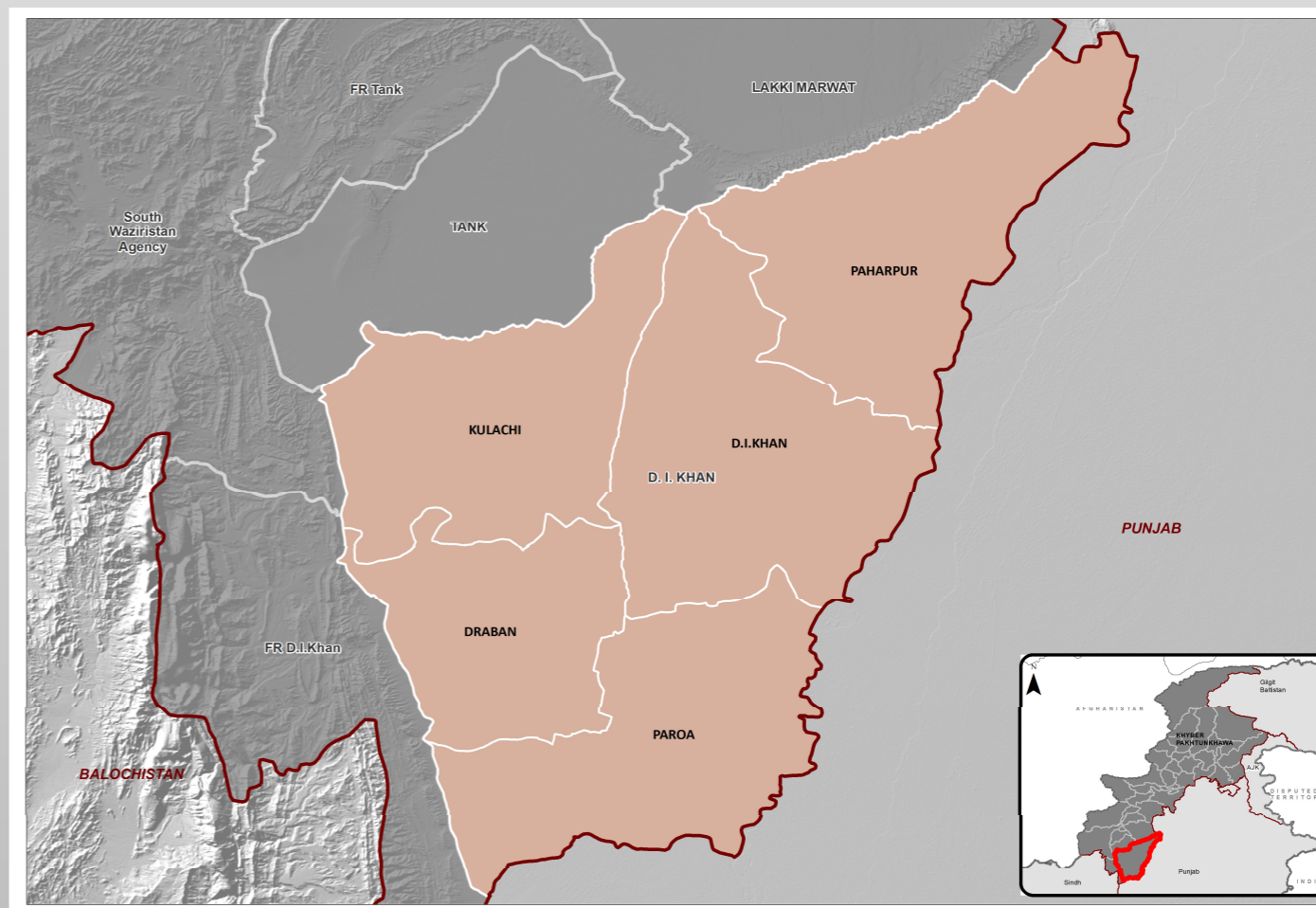
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFL)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	246,711
<b>Total non-cultivated area (hectares)</b>	483,864
<b>Total area under irrigation (hectares)</b>	165,994
<b>Major rabi crop(s)</b>	Wheat, vegetables and fodders
<b>Major kharif crop(s)</b>	Maize, sugarcane and fruit crops
<b>Total livestock population</b>	2,791,260

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan



Hangu district borders Kurram district to the northwest, Kohat to the northeast, Karak to the southeast, and North Waziristan to the southwest. The district was created from part of Kohat during 1996. The climate of the Hangu district is hot in summers and cold in winters. Main crops grown include wheat, maize, barley, mustard, fodder and vegetables. Meezary is an important crop of the district used to make ropes for wooden cots. There are two tehsils in the district: Hangu and Thall. The district headquarter is located at Hangu.

## SOIL ATTRIBUTES

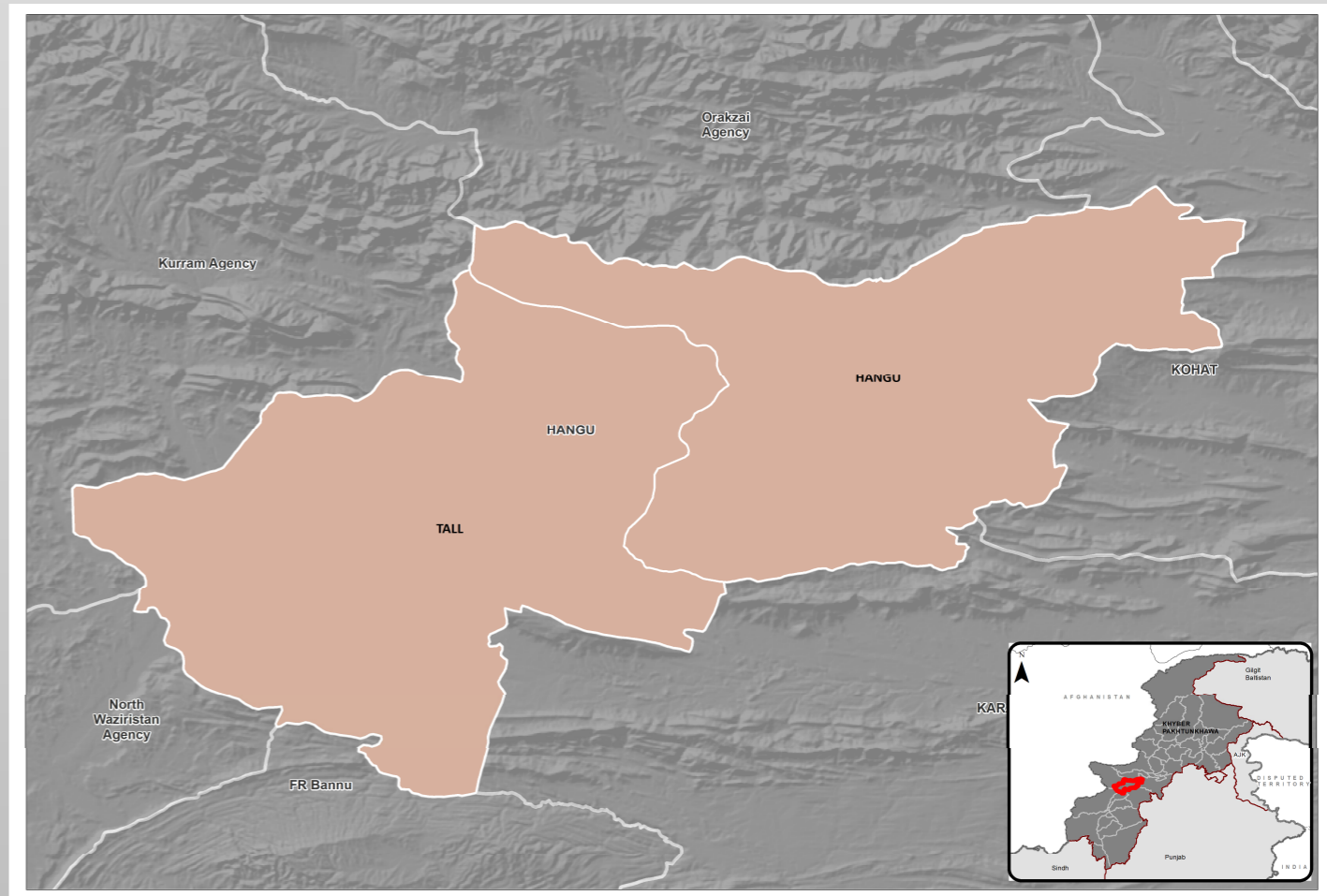
<b>Soil Type/Parent Material</b>	Loess, re-deposited loess plains
<b>Dominant Soil Series</b>	Kohat, Hangu, Tarkhoba, Zeran, Pacca
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	No data available
<b>Electrical conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	No data available
<b>Organic matter (%)</b>	No data available
<b>Available phosphorus (ppm)</b>	No data available
<b>Extractable potassium (ppm)</b>	No data available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	27,253
<b>Total non-cultivated area (hectares)</b>	105,012
<b>Total area under irrigation (hectares)</b>	5,474
<b>Major rabi crop(s)</b>	Wheat, barley, mustard
<b>Major kharif crop(s)</b>	Maize, fodder crops
<b>Total Livestock Population</b>	604,620

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# HARIPUR

Haripur district borders Swabi to the northwest, Mansehra and Abbottabad districts to the northeast, Islamabad Capital Territory to the southeast, and Punjab province to the southwest. The district is rich in natural resources and has two important reservoirs: Tarbela Dam and Khanpur Dam. The climate is humid subtropical with hot summers and cold winters. The precipitation is evenly distributed throughout an year. The major crops include wheat, maize, fodders, vegetables and fruits like citrus and guava. The district headquarter is located at Haripur.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Residual and colluvial deposits
<b>Dominant Soil Series</b>	Haripur, Pirsabak, Barian, Chamba, Baragali
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	6.02 – 9.9 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.05 – 3.59 (Saline)*
<b>Organic Matter (%)</b>	0.1 – 2.24 (Low)*
<b>Available Phosphorus (ppm)</b>	1 – 36 (Low)*
<b>Extractable Potassium (ppm)</b>	14 – 700 (Medium)*
<b>Farmers availing soil test facility (%)</b>	33 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

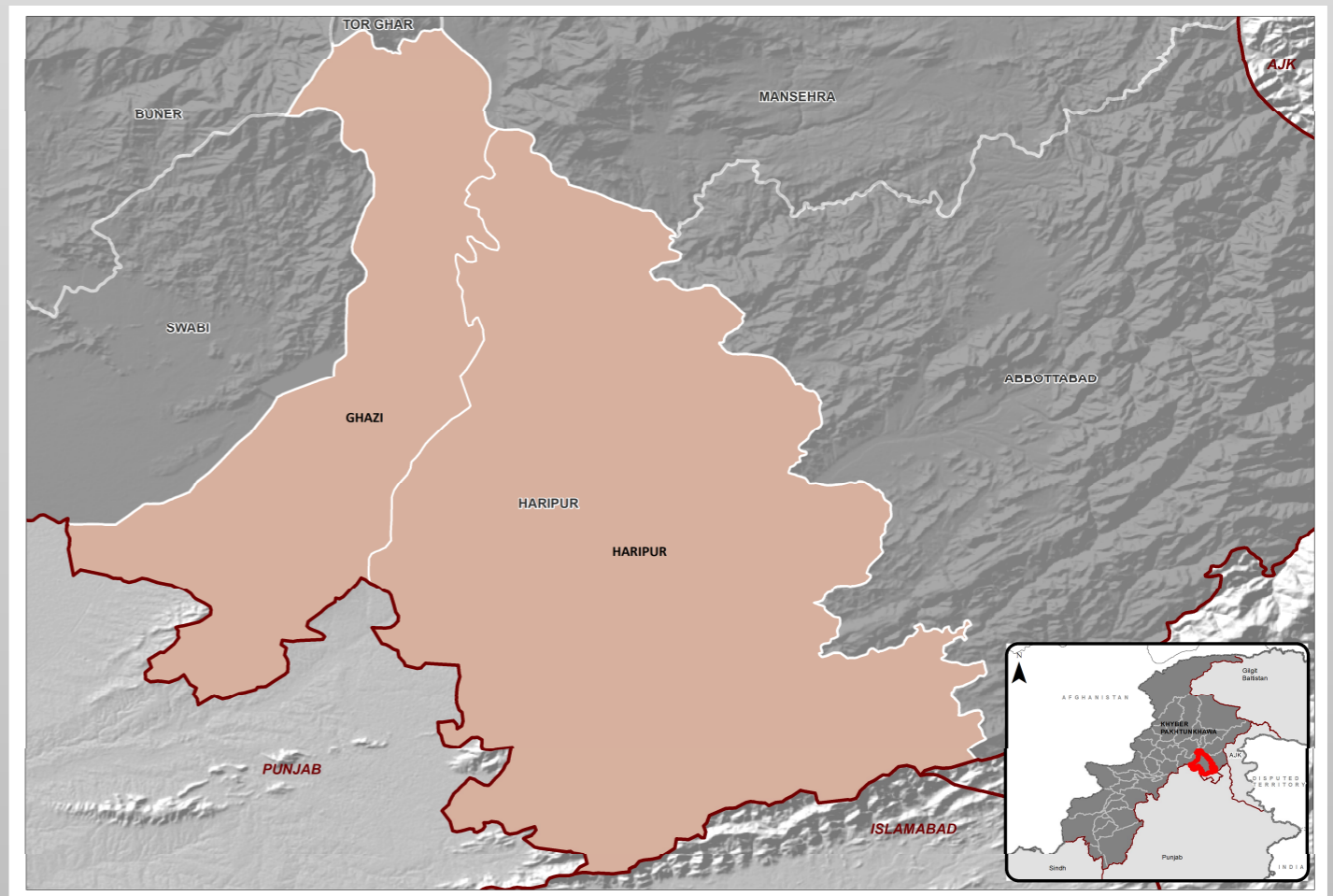
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\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	68,405
<b>Total non-cultivated area (hectares)</b>	117,780
<b>Total area under irrigation (hectares)</b>	24,862
<b>Major rabi crop(s)</b>	Wheat, fruit crops
<b>Major kharif crop(s)</b>	Maize, vegetable crops
<b>Total livestock population</b>	1,165,838

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Karak is situated to the south of Kohat district, on the northeast of Bannu and Lakki Marwat, and on the northwest of Punjab province. The main Indus Highway between Peshawar and Karachi passes through this district. The climate is semi-arid, sub-tropical and continental with hot summers and moderate winters. Main crops grown include wheat, barley, maize, chickpeas, groundnut, mustard, fodder and vegetable crops. There are three tehsils in the district, and the district headquarter is located at Karak.

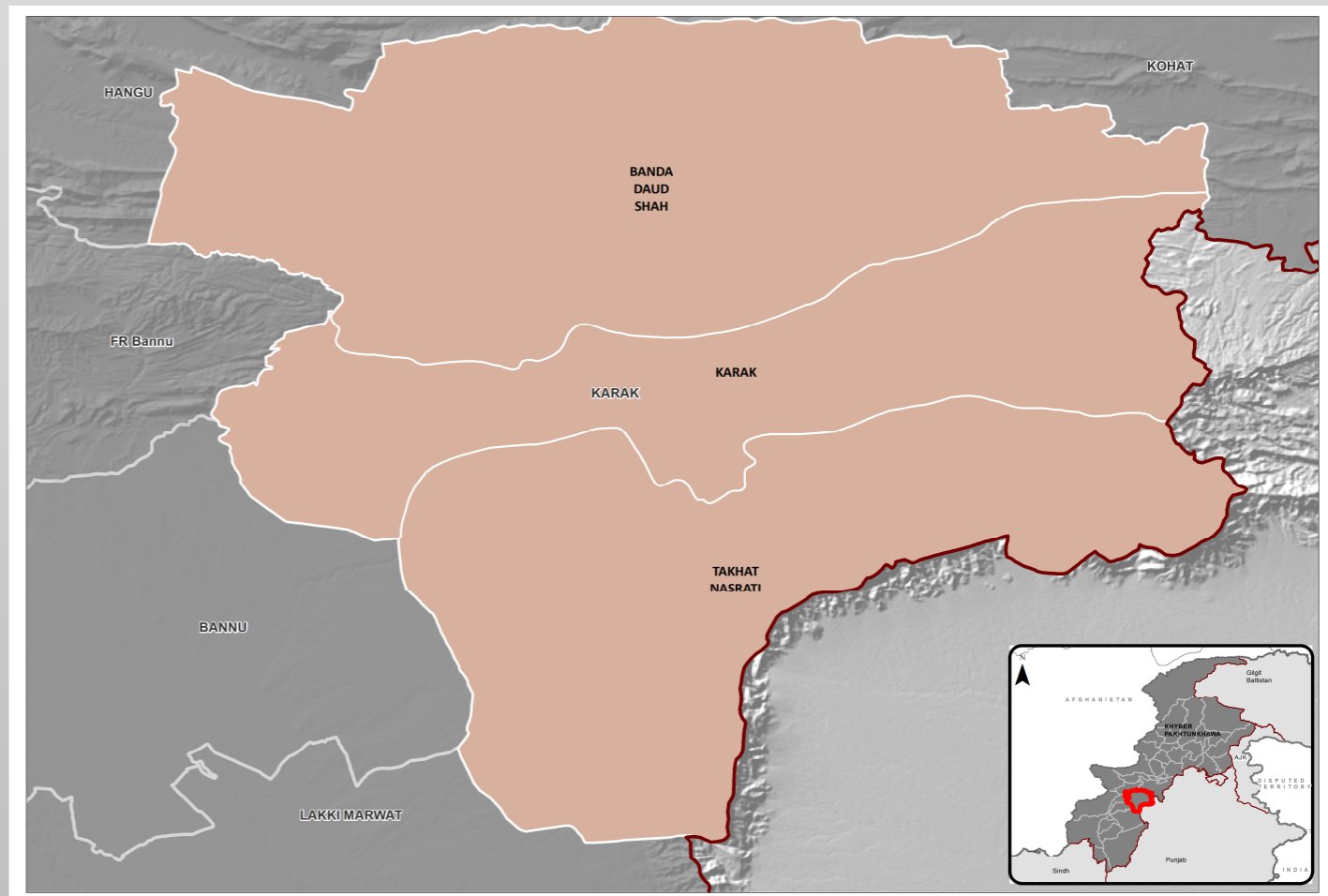
**SOIL ATTRIBUTES**

<b>Soil Type/Parent Material</b>	<b>Sub recent to old piedmont plains</b>
<b>Dominant Soil Series</b>	Changhoz, Thatti, Lachi, Kohat
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	Data not available
<b>Electrical conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	Data not available
<b>Organic matter (%)</b>	Data not available
<b>Available phosphorus (ppm)</b>	Data not available
<b>Extractable potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

**AGRICULTURAL INFORMATION**

<b>Total cultivated area (hectares)</b>	75,641
<b>Total non-cultivated area (hectares)</b>	189,560
<b>Total Area under irrigation (hectares)</b>	1,996
<b>Major rabi crop(s)</b>	Wheat, barley, chickpea
<b>Major kharif crop(s)</b>	Maize, vegetables and fodder crops
<b>Total Livestock Population</b>	1,213,624

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Source:  
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 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
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 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

# KOHAT

Kohat district borders Orakzai to the northwest, Nowshera to the northeast, Punjab province to the southeast, and Karak district to the southwest. The climate is sub-tropical continental and varies from semi-arid to sub-humid. The rainfall ranges within 300-950 mm. Main crops grown here are wheat, barley, onion, garlic, maize, oilseeds, fodder and fruit crops. There are two tehsils in the district: Kohat and Lachi. The district headquarter is located at Kohat

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Sub recent to old piedmont plains
<b>Dominant Soil Series</b>	Kohat, Hangu, Tarkhoba, Zerani, Lachi
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	7.48 – 8.9 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.1 – 13.2 (Saline)*
<b>Organic Matter (%)</b>	0.17 – 1.75 (Low)*
<b>Available Phosphorus (ppm)</b>	2 – 18 (Low)*
<b>Extractable Potassium (ppm)</b>	52 – 640 (Medium)*
<b>Farmers availing soil test facility (%)</b>	100 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	50 (Based on crop production zone wise data)

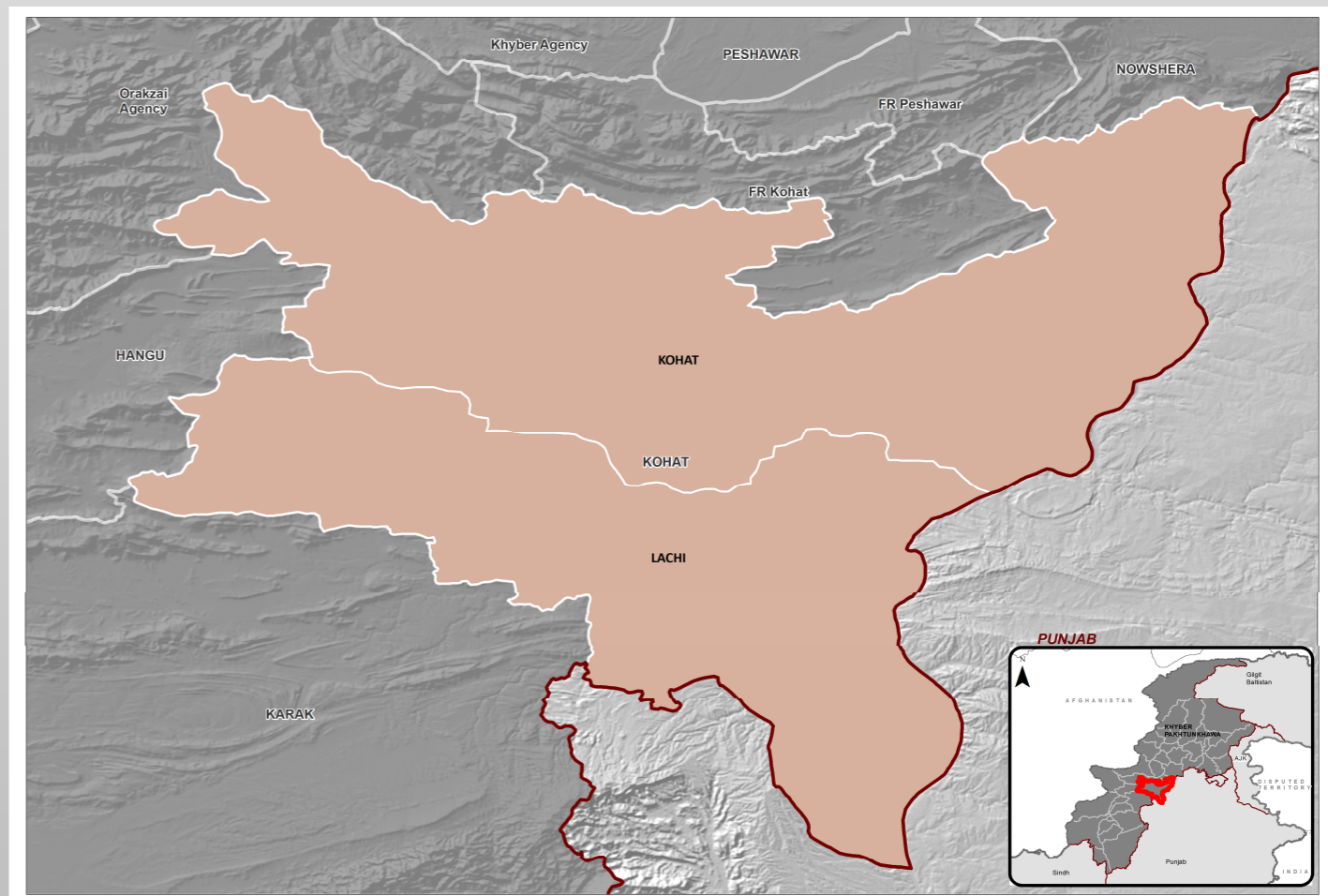
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\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	72,786
<b>Total non-cultivated area (hectares)</b>	222,345
<b>Total area under irrigation (hectares)</b>	18,275
<b>Major rabi crop(s)</b>	Wheat, barley, oilseeds
<b>Major kharif crop(s)</b>	Maize, fodder crops
<b>Total livestock population</b>	1,341,511

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Censuses 2006



Source: Information Management Unit, FAO Pakistan

Kohistan (in Persian, meaning 'Land of mountains') has a rich local history as a crossroads between Central, South and South-western Asia. The climate is warm in summers except some areas of high altitude and very cold in winters. Due to long distance from the plains, the monsoon rains fail to reach this area. The major crops grown here are maize, wheat, pulses and potatoes. The district headquarter is located at Dassu.

## SOIL ATTRIBUTES

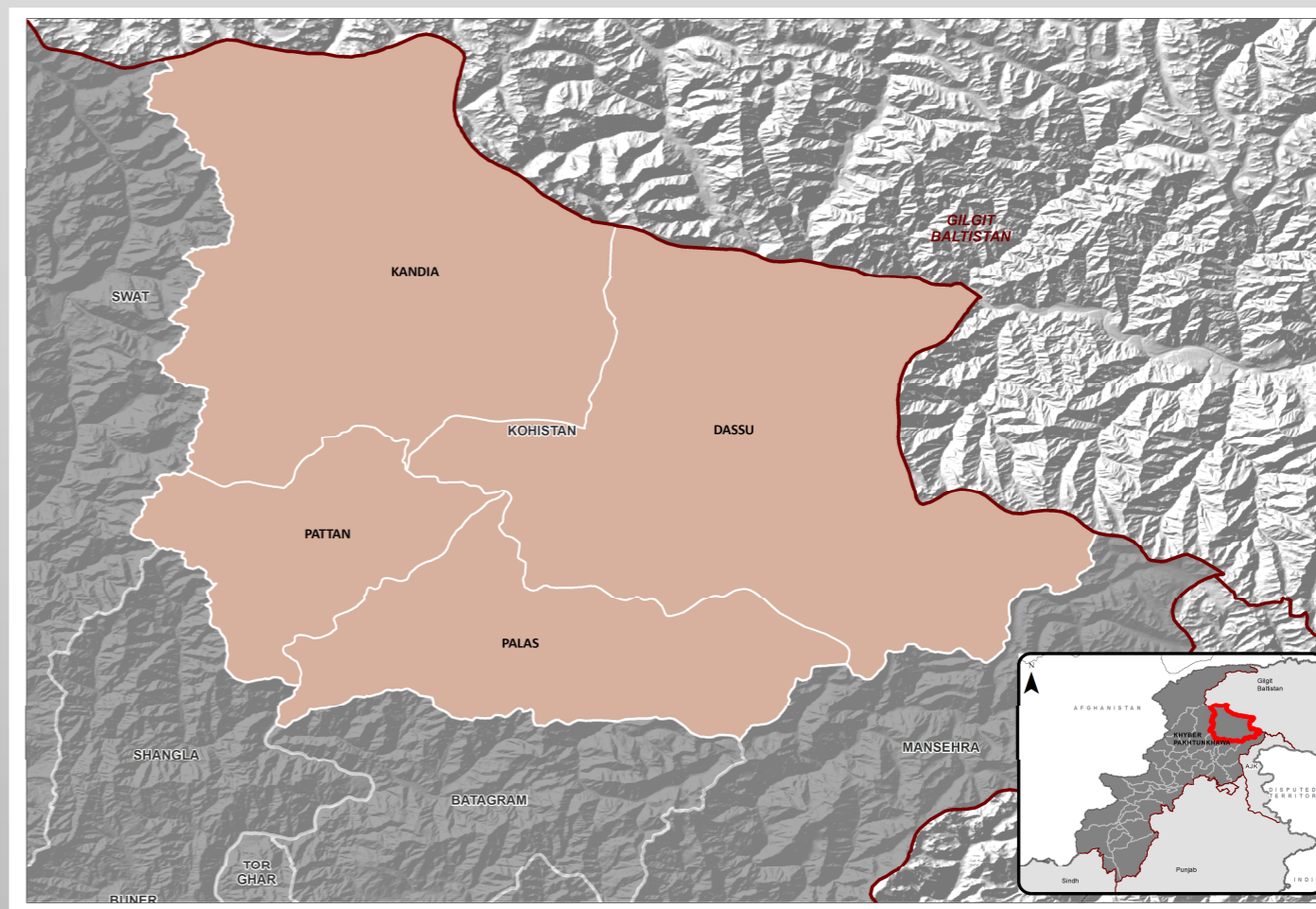
<b>Soil Type/Parent Material</b>	Residual, alluvial and colluvial deposits
<b>Dominant Soil Series</b>	Data not available
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	Data not available
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	Data not available
<b>Organic Matter (%)</b>	Data not available
<b>Available Phosphorus (ppm)</b>	Data not available
<b>Extractable Potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	36,749
<b>Total non-cultivated areaa(hectares)</b>	721,367
<b>Total area under irrigation (hectares)</b>	25,785
<b>Major rabi crop(s)</b>	Wheat
<b>Major kharif crop(s)</b>	Maize
<b>Total livestock population</b>	1,740,666

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# LAKKI MARWAT

Lakki Marwat was declared a district of Khyber Pakhtunkhwa province during 1992, prior to which it was a part of Bannu district. The climate is that of a desert: hot and dry in summers and moderately cool in winters. Periodic sand storms rage through the area during May and June due to the prevalent low humidity. The major crops grown here are wheat, chickpea, sugarcane, potatoes, fodders and fruit crops. There are two tehsils in the district, and the district headquarter is located at Lakki Marwat.

## SOIL ATTRIBUTES

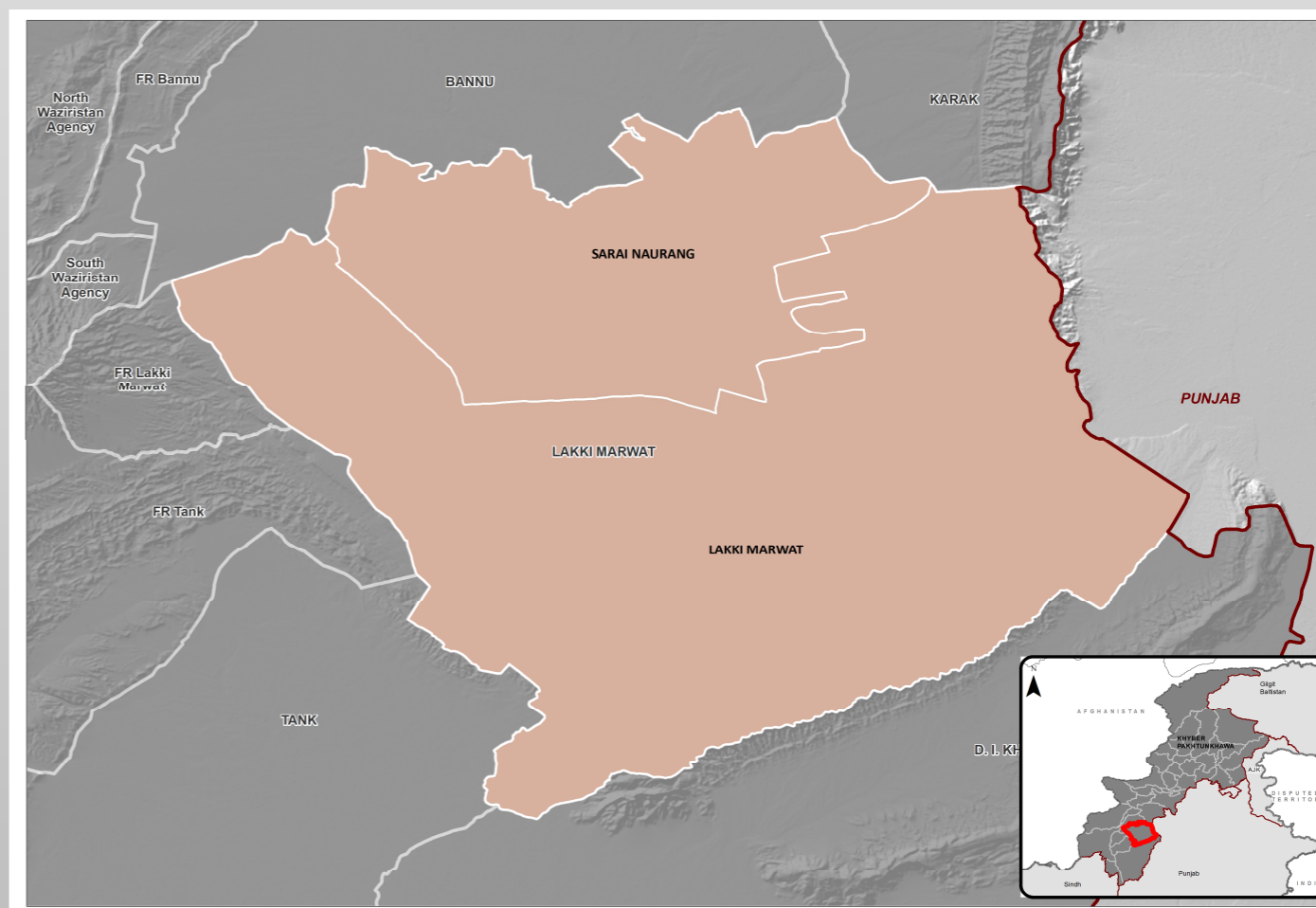
<b>Soil Type/Parent Material</b>	Sub-recent to old gently undulating piedmont plains
<b>Dominant Soil Series</b>	Lakki, Tejazai, Ghaznikheil, Malikshahi
<b>pH (1:2.5 H<sub>2</sub>O)</b>	Data not available
<b>Electrical conductivity (1:2.5) (dSm<sup>-1</sup>)</b>	Data not available
<b>Organic matter (%)</b>	Data not available
<b>Available phosphorus (ppm)</b>	Data not available
<b>Extractable potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	116,900
<b>Total non-cultivated area (hectares)</b>	198,073
<b>Total area under irrigation (hectares)</b>	36,296
<b>Major rabi crop(s)</b>	Wheat, fodder crops
<b>Major kharif crop(s)</b>	Chickpea, fruit crops
<b>Total livestock population</b>	1,154,154

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Lower Dir was declared a district of Khyber Pakhtunkhwa province in 1996, prior to which it was a part of combined Dir district. It borders Upper Dir district to the north, Swat to the east, Malakand to the south, and Bajaur to the southwest. The climate is humid sub-tropical with mild to hot summers and extreme cold winters. Main crops grown here include wheat, maize, rice, vegetables and fruits. The district headquarter is located at Temergara.

## SOIL ATTRIBUTES

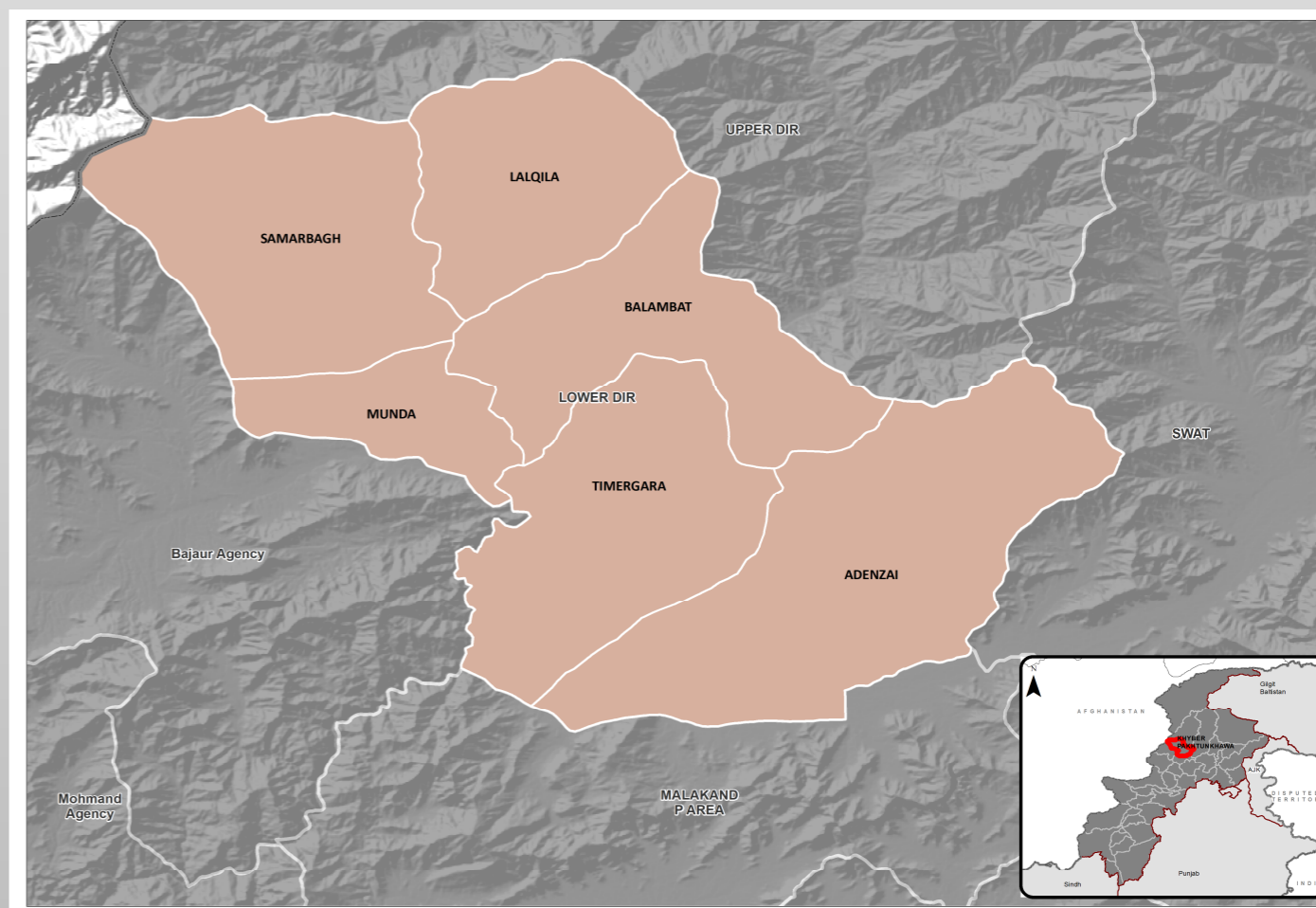
<b>Soil Type/Parent Material</b>	Residual, alluvial, colluvial deposits
<b>Dominant Soil Series</b>	Kedam, Dir, Sheldar, Gulibagh
<b>pH</b> (1:2.5 H <sub>2</sub> O)	Data not available
<b>Electrical Conductivity</b> (1:2.5) (dSm <sup>-1</sup> )	Data not available
<b>Organic Matter (%)</b>	Data not available
<b>Available Phosphorus (ppm)</b>	Data not available
<b>Extractable Potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	41,004
<b>Total non-cultivated area (hectares)</b>	101,634
<b>Total area under irrigation (hectares)</b>	41,757
<b>Major rabi crop(s)</b>	Wheat, fruit crops
<b>Major kharif crop(s)</b>	Maize, rice, vegetable crops
<b>Total livestock population</b>	1,659,203

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Censuses 2006



Source: Information Management Unit, FAO Pakistan

# MALAKAND

Malakand district borders Bajaur to the northwest, Swat to the north, Mardan to the southeast, and Mohmand and Charsadda districts to the southwest. The climate in Malakand is warm and temperate. The average annual rainfall is 743 mm which occurs mostly in the winter. Main crops grown here are wheat, maize, rice, sugarcane, onion and fruit crops. There are two tehsils in the district and the district headquarter is located at Malakand.

## SOIL ATTRIBUTES

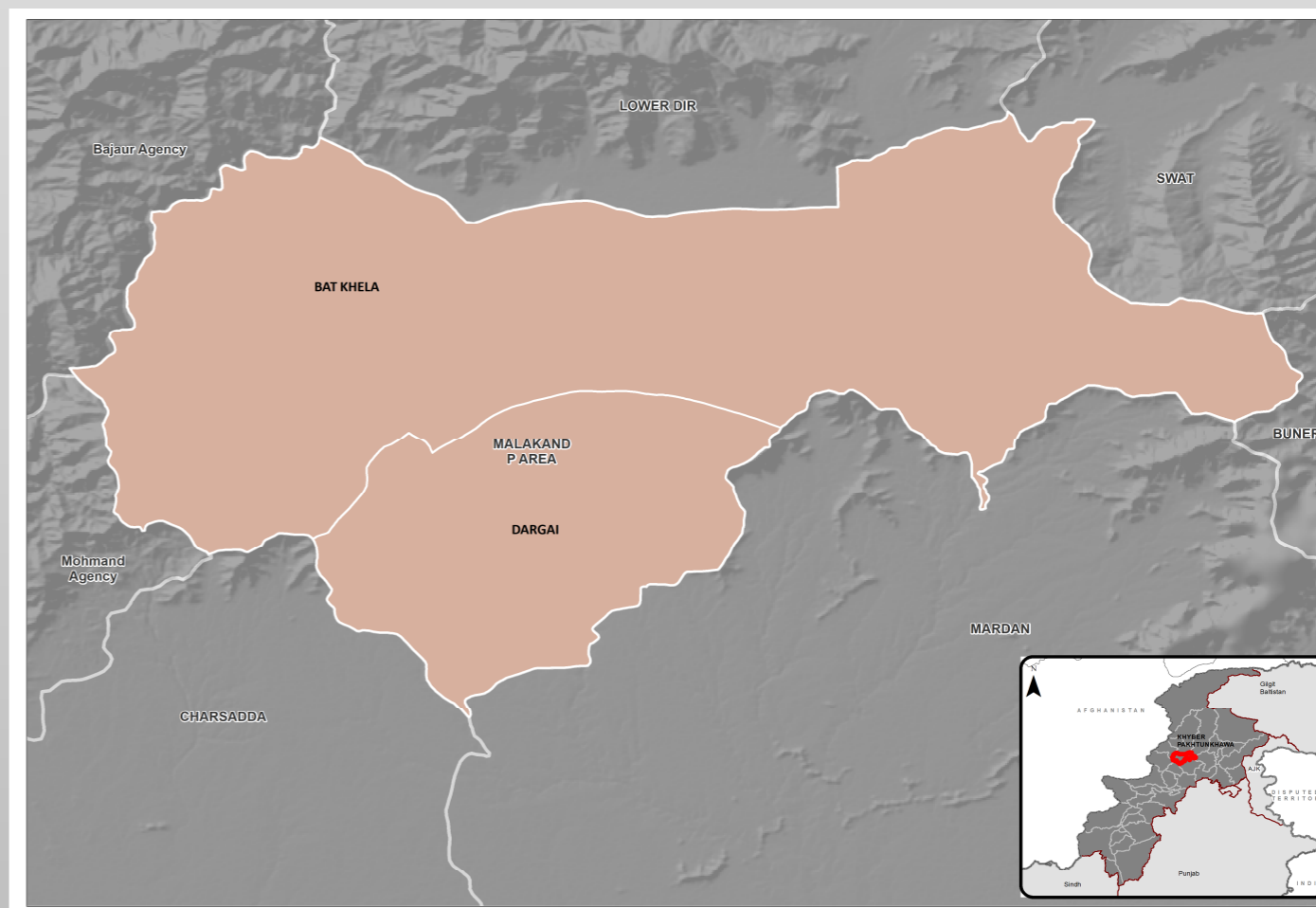
<b>Soil Type/Parent Material</b>	Alluvial and colluvial deposits, loess, re-deposited loess
<b>Dominant Soil Series</b>	Data not available
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	Data not available
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	Data not available
<b>Organic Matter (%)</b>	Data not available
<b>Available Phosphorus (ppm)</b>	Data not available
<b>Extractable Potassium (ppm)</b>	Data not available
<b>Farmers availing soil testing facility (%)</b>	100 (Based on crop production zone wise data)
<b>Farmers availing water testing facility (%)</b>	50 (Based on crop production zone wise data)

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	45,681
<b>Total non-cultivated area (hectares)</b>	6,453
<b>Total area under irrigation (hectares)</b>	35,578
<b>Major rabi crop(s)</b>	Wheat, onion, fruit crops
<b>Major kharif crop(s)</b>	Rice, Sugarcane
<b>Total livestock population</b>	419,905

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan



Mansehra district is an important tourist location in the eastern Khyber Pakhtunkhwa province. The district is famous for 150 km long Kaghan valley containing scenic Makra Top (3,586 m), Babusarpass (4173 m), Saif-ul-Maluk Lake and roaring Kunhar River renowned for trout fish. The climate is humid with pleasantly warm summers and freezing cold winters. Annual rainfall is above 1200 mm and heavy snowfall occurs during the winter season. The main crops include maize, wheat, rice, potatoes, vegetables, and fruits. The district headquarter is located at Mansehra.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvial and colluvial deposits
<b>Dominant Soil Series</b>	Mansehara, Jaba, Dosera, Girari, Nakholi
<b>pH (1:2.5 H<sub>2</sub>O)</b>	3.4 – 8.22 (Alkaline)*
<b>Electrical conductivity (1:2.5) (dSm<sup>-1</sup>)</b>	0.05 – 0.95 (Normal)*
<b>Organic matter (%)</b>	0.18 – 2.6 (Medium)*
<b>Available phosphorus (ppm)</b>	1 – 40 (Low)*
<b>Extractable potassium (ppm)</b>	34 – 690 (Medium)*
<b>Farmers availing soil test facility (%)</b>	28 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	17 (Based on crop production zone wise data)

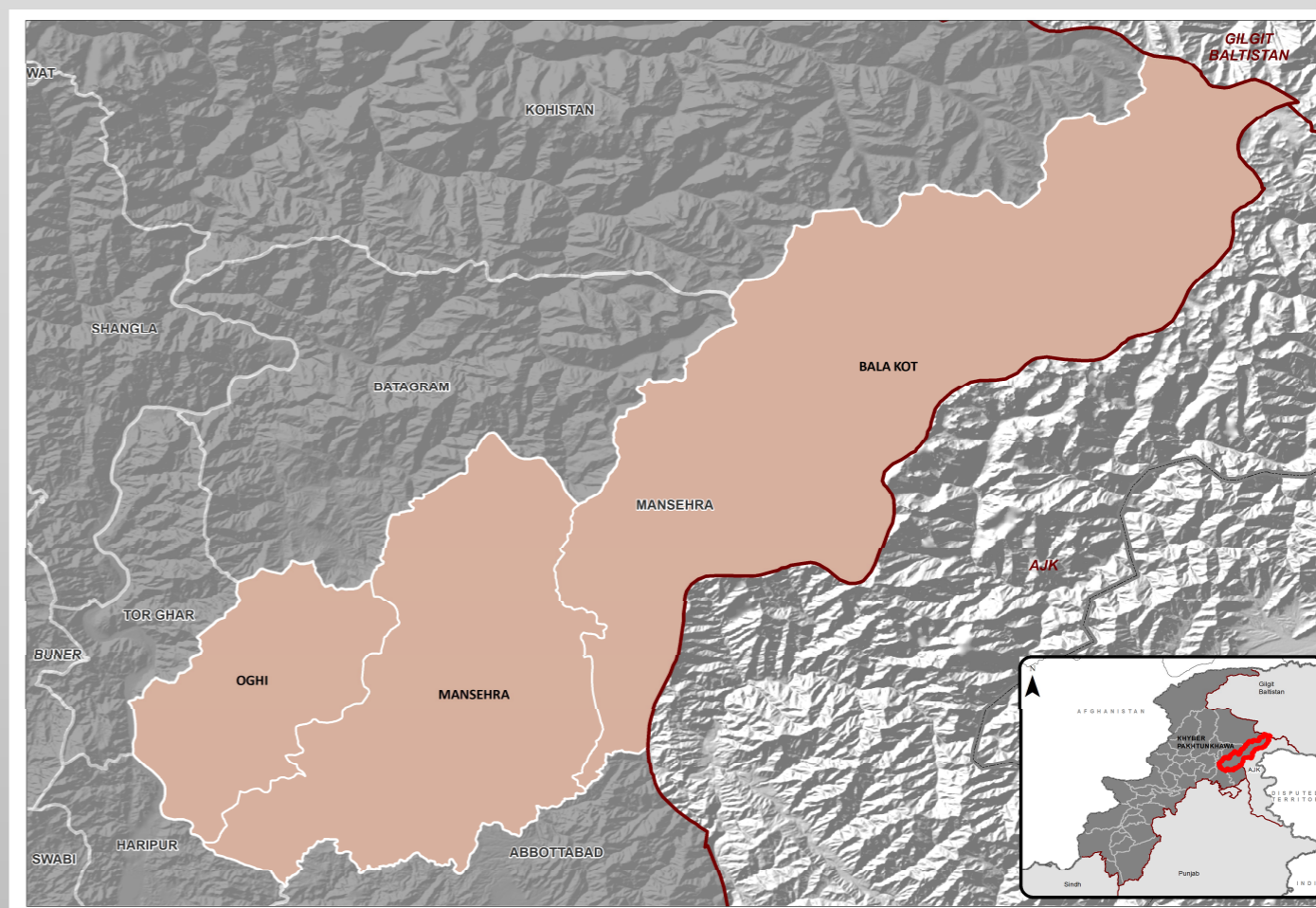
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	80,747
<b>Total non-cultivated area (hectares)</b>	358,676
<b>Total area under irrigation (hectares)</b>	16,878
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Maize, fruit crops
<b>Total livestock population</b>	1,840,148

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# MARDAN

Mardan is known as one of the best agriculture lands in the Khyber Pakhtunkhwa province. The district borders Malakand to the northwest, Buner to the northeast, Swabi to the southeast, and Charsadda district to the southwest. The climate is semi-arid to humid with hot summers and cold winters. The major crops include wheat, maize, rice, sugarcane, fodder, vegetable and fruit crops. There are three tehsils in the district: Katlang, Mardan and Takht Bhai. The district headquarter is located at Mardan, which is the second largest city of the province.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Loess, re-deposited loess
<b>Dominant Soil Series</b>	Guliana, Missa, Rajar, Mardan-Dosehra
<b>pH</b> (1:2.5 H <sub>2</sub> O)	6.96 – 9.9 (Alkaline)*
<b>Electrical Conductivity</b> (1:2.5) (dSm <sup>-1</sup> )	0.05 – 3.32 (Saline)*
<b>Organic matter (%)</b>	0.3 – 3.2 (Medium)*
<b>Available phosphorus (ppm)</b>	1 – 49 (Low)*
<b>Extractable potassium (ppm)</b>	30 – 840 (Medium)*
<b>Farmers availing soil test facility (%)</b>	4 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

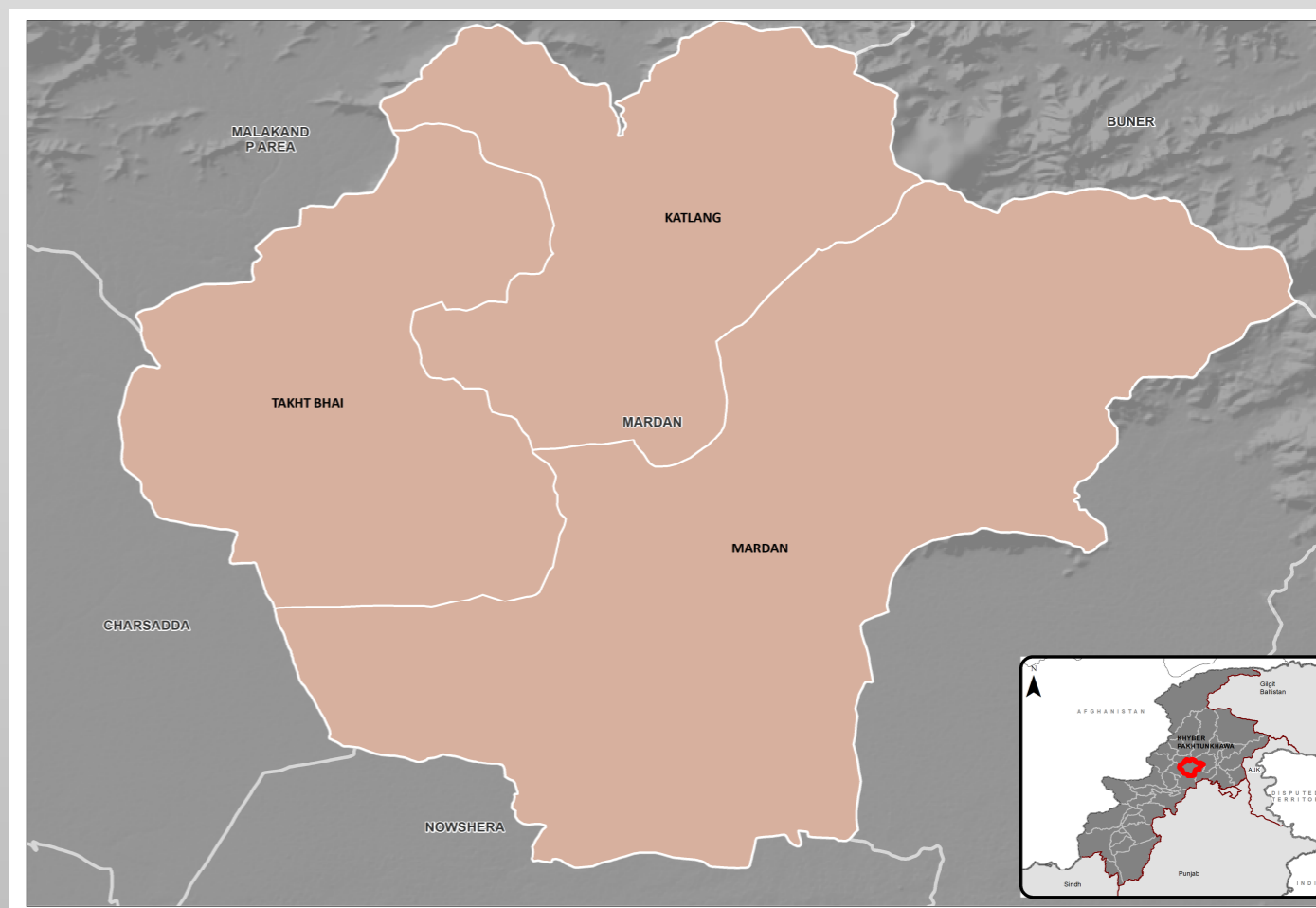
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	99,926
<b>Total non-cultivated area (hectares)</b>	62,174
<b>Total area under irrigation (hectares)</b>	74,270
<b>Major rabi crop(s)</b>	Wheat, oilseeds, vegetable crops
<b>Major kharif crop(s)</b>	Maize, sugarcane, fruit crops
<b>Total livestock population</b>	2,206,644

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Nowshera is one of the most fertile districts of the Khyber-Pakhtunkhwa Province. The district borders Charsadda to the northwest, Swabi to the northeast, Punjab province to the southeast, and Peshawar to the southwest. The climate varies from semi-arid to sub-humid continental with extreme hot summers and moderately cold winters. Major crops include wheat, maize, sugarcane, fodder, vegetable and fruit crops. The district headquarter is located at Nowshera.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvial, loess deposits
<b>Dominant Soil Series</b>	Nowshera, Kund
<b>pH (1:2.5 H<sub>2</sub>O)</b>	7.0 – 10.1 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.6 – 7.8 (Saline)*
<b>Organic matter (%)</b>	0.1 – 1.98 (Medium)*
<b>Available phosphorus (ppm)</b>	1 – 26 (Low)*
<b>Extractable potassium (ppm)</b>	16 – 710 (Medium)*
<b>Farmers availing soil test facility (%)</b>	0 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFL)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	52,528
<b>Total non-cultivated area (hectares)</b>	125,542
<b>Total area under irrigation (hectares)</b>	24,893
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Maize, sugarcane, fruit crops
<b>Total livestock population</b>	1,483,696

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# PESHAWAR

Peshawar is the provincial capital of Khyber Pakhtunkhwa province and is known for the Afghanistan-Pakistan trade route via Khyber Pass. The climate varies from semi-arid to sub-humid continental, sub-tropical with extreme hot summers and moderately cold winters. Major crops grown in the district are wheat, barley, millet, maize, sugarcane, vegetables and fruits. The valley of Peshawar is famous for orchards such as of pears, peaches, apricot, citrus and guava. The district head quarter is located at Peshawar.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Piedmont, alluvium, loess
<b>Dominant Soil Series</b>	Missa, Rajar, Sultanpour, Guliana, Peshawar
<b>pH (1:2.5 H<sub>2</sub>O)</b>	7.4 – 10.4 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.5 – 22.3 (Saline)*
<b>Organic matter (%)</b>	0.1 – 2.72 (Medium)*
<b>Available phosphorus (ppm)</b>	1 – 62 (Low)*
<b>Extractable potassium (ppm)</b>	10 – 780 (Medium)*
<b>Farmers availing soil test facility (%)</b>	33 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

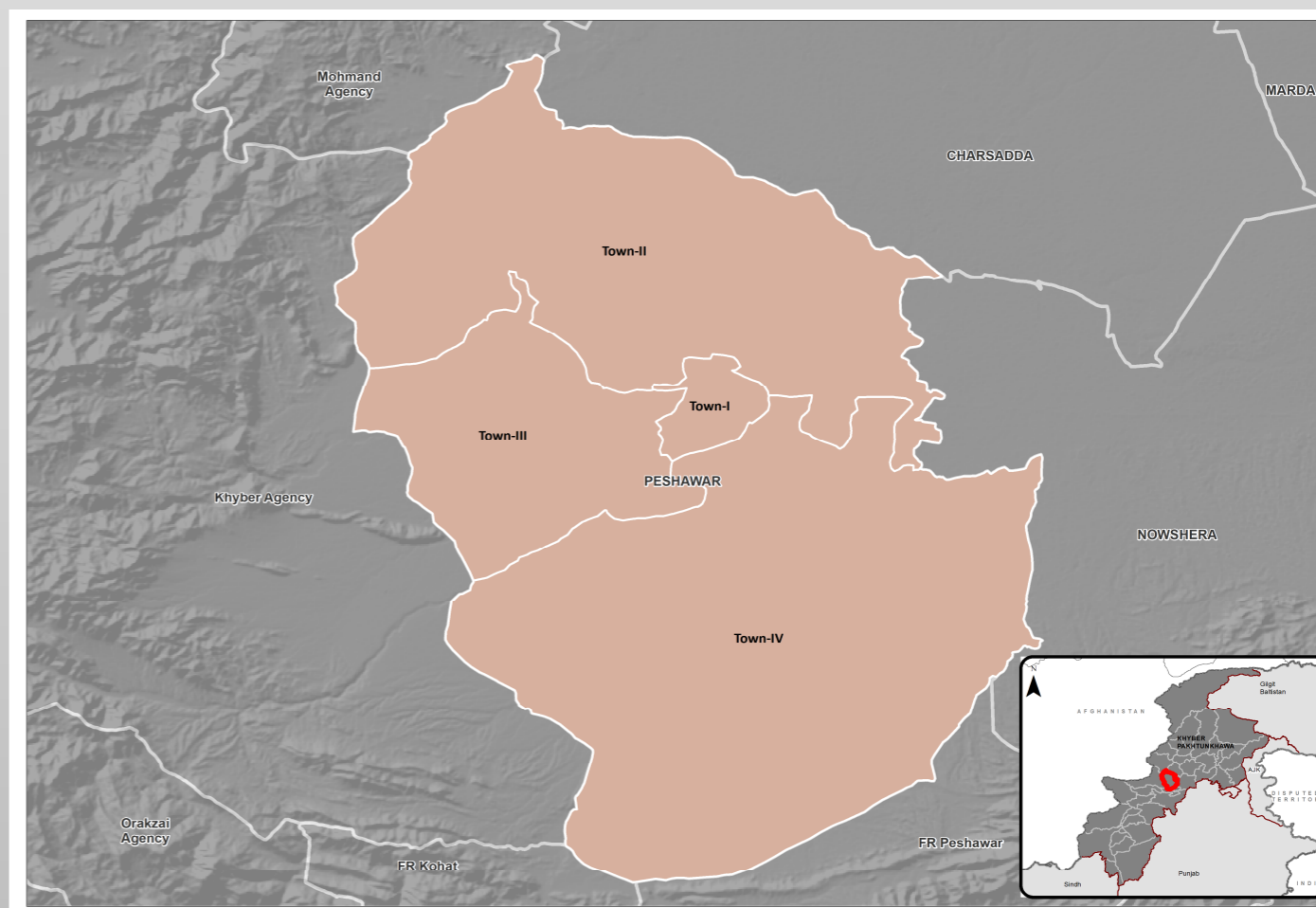
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	78,854
<b>Total non-cultivated area (hectares)</b>	47,807
<b>Total area under irrigation (hectares)</b>	74,840
<b>Major rabi crop(s)</b>	Wheat, barley, fruit crops
<b>Major kharif crop(s)</b>	Maize, sugarcane, vegetable crops
<b>Total livestock population</b>	2,678,312

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Swat is a historic and worth seeing district of the Khyber Pukhtunkhwa province. The district is famous for its tourist spots as containing majestic snow-covered peaks, lush green forests, fascinating lakes and roaring rivers. The climate is sub-humid, sub-tropical continental highlands. The summers are moderate and refreshing, while the winters are cold and below freezing. Main crops include wheat, maize, sugarcane, rice, vegetables and fruit crops like apple, peach, pears, plum and persimmon. The district headquarter is located at Mingora.

**SOIL ATTRIBUTES**

<b>Soil Type/Parent Material</b>	Mixed alluvial deposits, ioess, re-deposited loess
<b>Dominant Soil Series</b>	Mingora, Kotak, Chakdara, Marghuzar, Madyan,
<b>pH<sub>(1:2.5 H<sub>2</sub>O)</sub></b>	6.1 – 8.2 (Alkaline)*
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	0.1 – 0.29 (saline)*
<b>Organic matter (%)</b>	0.16 – 2.13 (Low)*
<b>Available phosphorus (ppm)</b>	2 – 15 (Low)*
<b>Extractable potassium (ppm)</b>	60 – 380 (Medium)*
<b>Farmers availing soil test facility (%)</b>	29 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	10 (Based on crop production zone wise data)

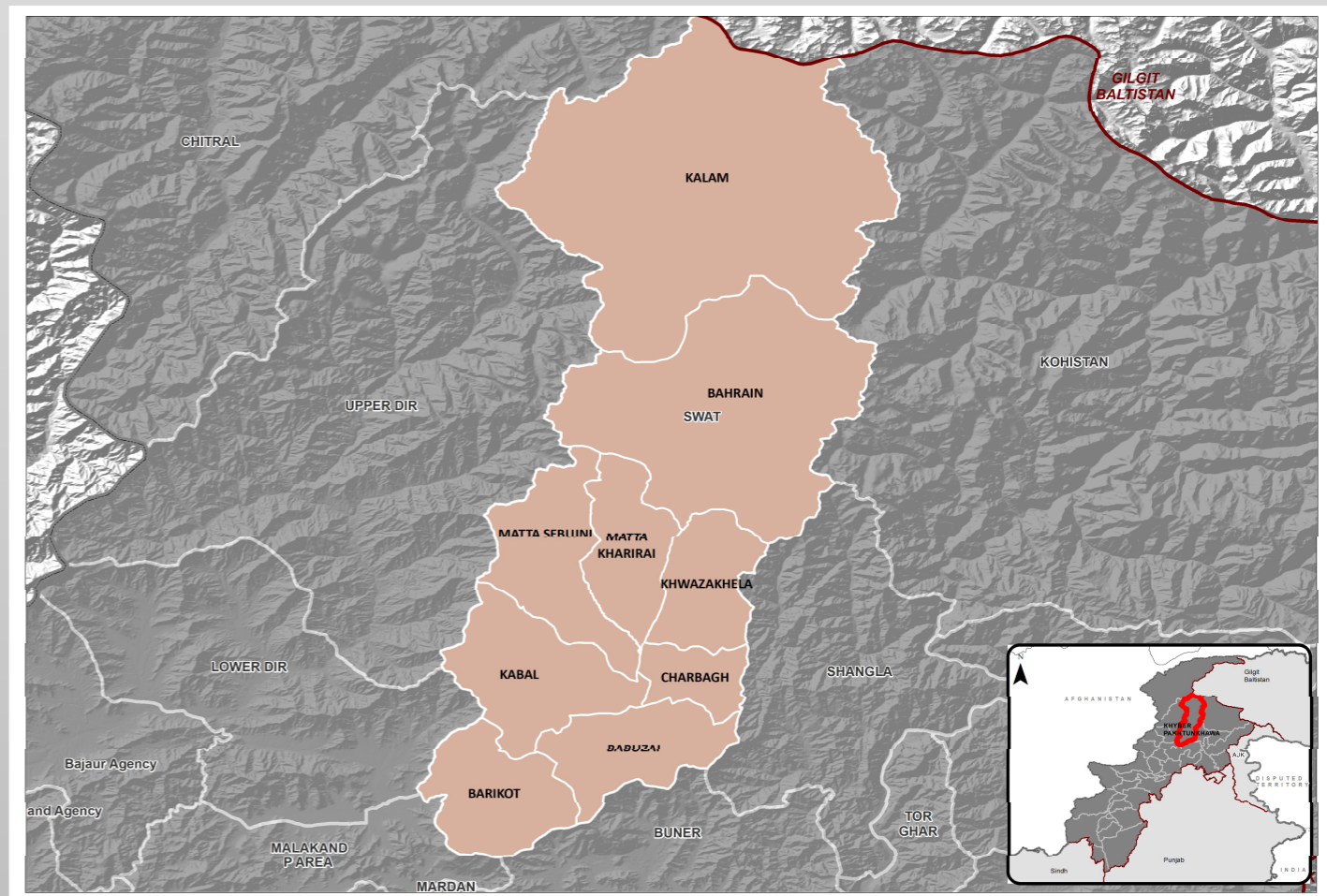
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

**AGRICULTURAL INFORMATION**

<b>Total cultivated area (hectares)</b>	97,281
<b>Total non-cultivated area (hectares)</b>	409,219
<b>Total area under irrigation (hectares)</b>	84,780
<b>Major rabi crop(s)</b>	Wheat, vegetable, fruit crops
<b>Major kharif crop(s)</b>	Rice, sugarcane, fruit crops
<b>Total livestock population</b>	1,854,532

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census



Source: Information Management Unit, FAO Pakistan

# SWABI

Swabi is the fourth most populous district of the Khyber Pakhtunkhwa province. The district borders Mardan to the northwest, Buner to the north, Haripur to the east, and the Punjab province to the south. The climate is humid subtropical with hot summers and moderately cold winters. Main crops grown here include maize, sugarcane, groundnut, wheat, barley, fodders, oilseeds and vegetable crops. The district headquarter is located at Swabi.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Alluvial, piedmont, loess deposits
<b>Dominant Soil Series</b>	Sultanpur, Wazirabad, Mansooka, Ambela
<b>pH</b> (1:2.5 H <sub>2</sub> O)	5.96 – 9.85 (Alkaline)*
<b>Electrical Conductivity</b> (1:2.5) (dSm <sup>-1</sup> )	0.4 – 2.56 (Saline)*
<b>Organic matter (%)</b>	0.1 – 2.0 (Low)*
<b>Available phosphorus (ppm)</b>	1 – 19 (Low)*
<b>Extractable potassium (ppm)</b>	40 – 660 (Adequate)*
<b>Farmers availing soil test facility (%)</b>	0 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

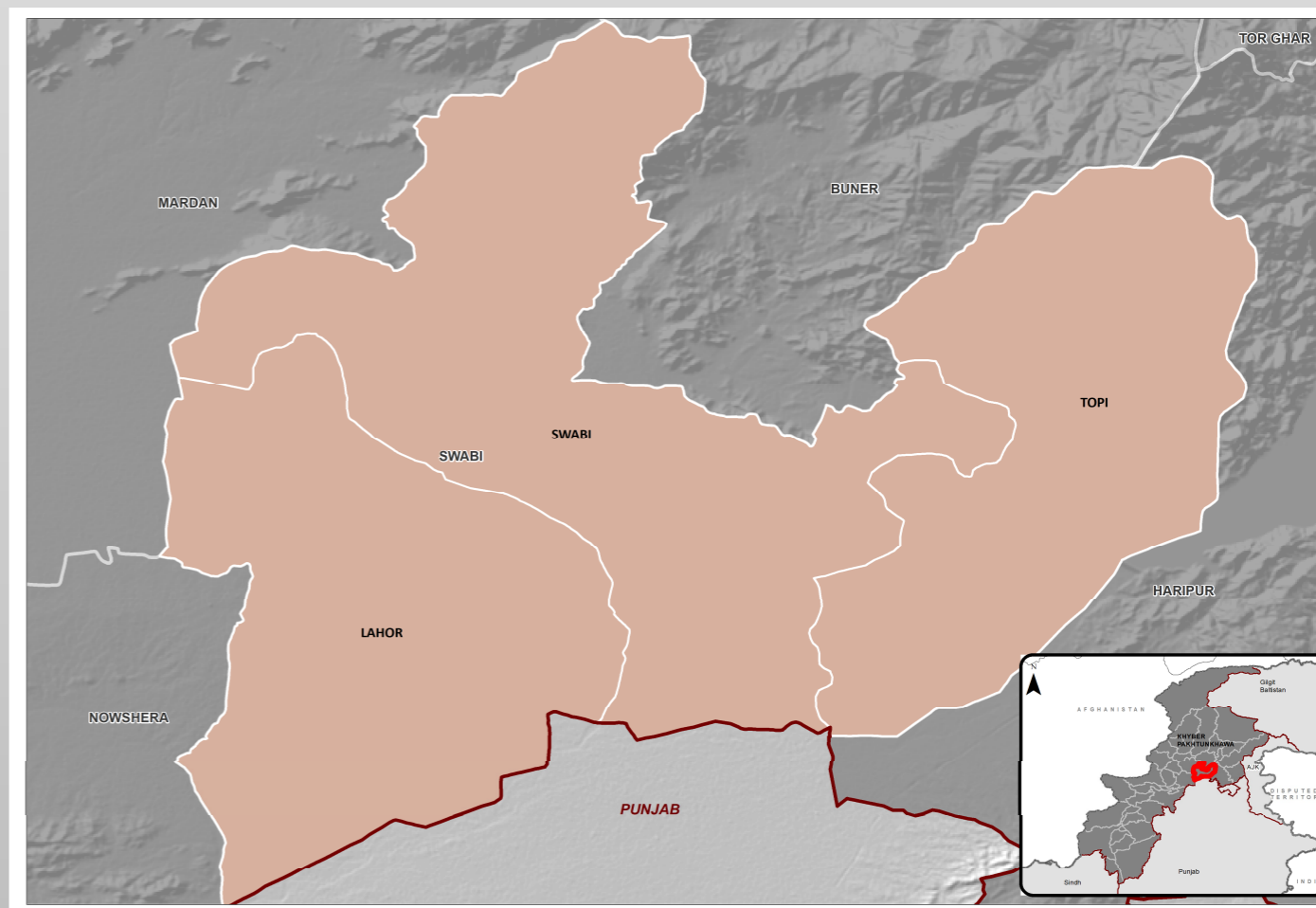
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	87,046
<b>Total non-cultivated area (hectares)</b>	61,643
<b>Total area under irrigation (hectares)</b>	37,307
<b>Major rabi crop(s)</b>	Wheat, barley, oilseeds
<b>Major kharif crop(s)</b>	Maize, sugarcane
<b>Total livestock population</b>	1,674,393

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

Upper Dir borders Chitral district to the northwest, Swat to the east, Lower Dir to the south, and Afghanistan to the west. Dir was declared as a district in 1970 and then bifurcated into Upper and Lower Dir districts in 1996. The climate varies from semi-arid and sub-tropical continental highlands. In winter whole area remains snow-covered. Major crops include maize, wheat, rice, sugarcane, vegetables and fruits like plum, apricot and apple. The district headquarter is located at Dir city.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Residual, alluvial and colluvial deposits
<b>Dominant Soil Series</b>	Shaga, Maiar, Barwa, Jandol
<b>pH</b> (1:2.5 H <sub>2</sub> O)	7.0 – 8.3 (Alkaline)*
<b>Electrical Conductivity</b> (1:2.5) (dSm <sup>-1</sup> )	0.05 – 0.32 (Saline)*
<b>Organic Matter (%)</b>	0.17 – 1.17 (Medium)*
<b>Available Phosphorus (ppm)</b>	2– 20 (Low)*
<b>Extractable Potassium (ppm)</b>	50 – 310 (Low)*
<b>Farmers availing soil test facility (%)</b>	0 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	0 (Based on crop production zone wise data)

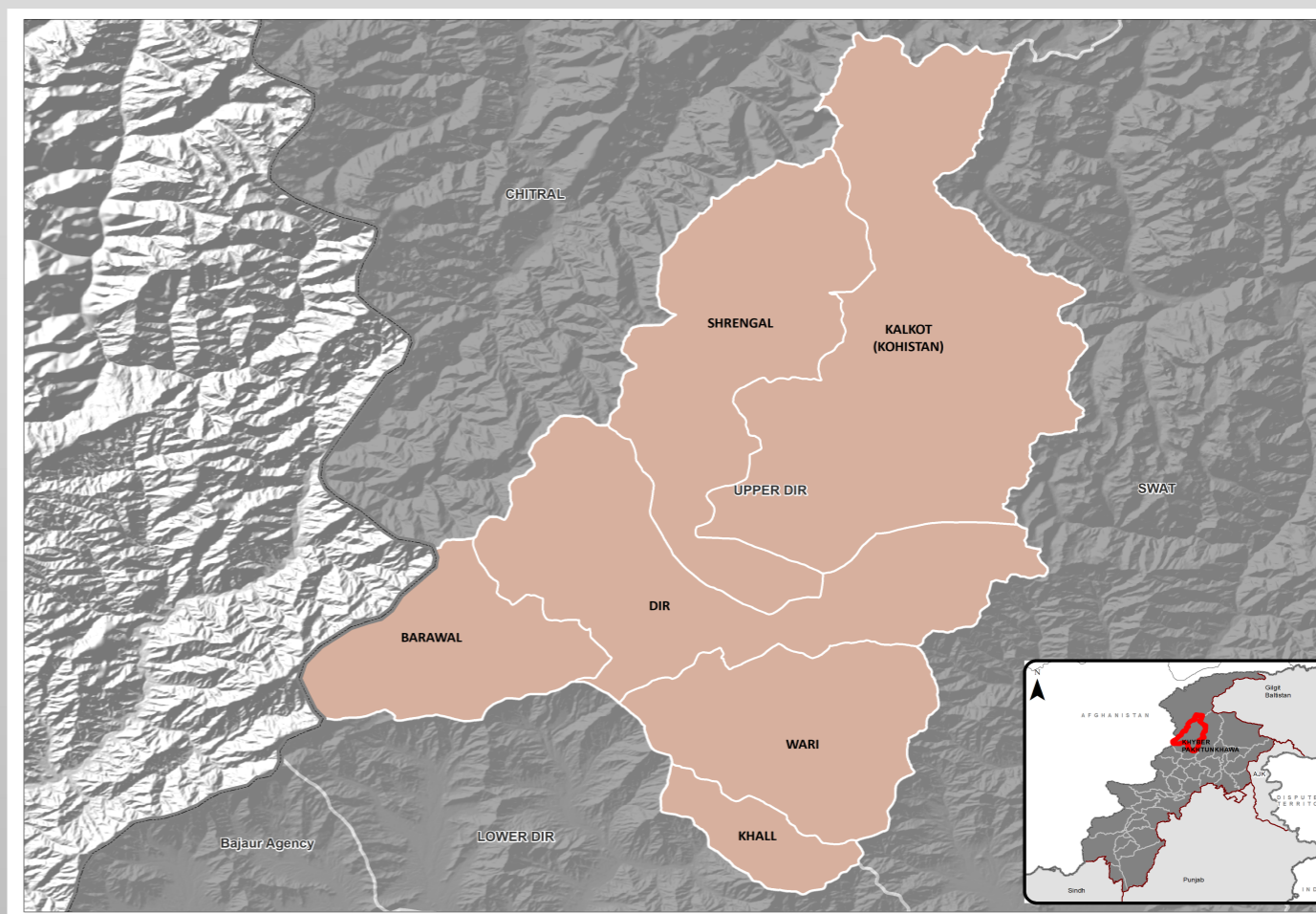
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	31,572
<b>Total non-cultivated area (hectares)</b>	94,928
<b>Total area under irrigation (hectares)</b>	22,388
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Maize, rice, fruit crops
<b>Total livestock population</b>	1,402,301

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# TANK

Tank district of Khyber Pakhtunkhwa was formerly a part of Dera Ismail Khan district. The district borders South Waziristan to the west, Lakki Marwat to the northeast, and Dera Ismail Khan to the southeast. The climate is arid to semi-arid with extreme hot summers and moderately cold winters. Main crops grown here include wheat, maize oilseeds, fodders, vegetable and fruit crops. The district has one tehsil with district headquarter at Tank city.

## SOIL ATTRIBUTES

<b>Soil Type/Parent Material</b>	Recent and sub recent piedmont plains
<b>Dominant Soil Series</b>	Buzdar, Ramak, Tikken, Wajan, Zindani
<b>pH</b> (1:2.5 H <sub>2</sub> O)	7.8 – 8.6 (Alkaline)*
<b>Electrical Conductivity</b> (1:2.5) (dSm <sup>-1</sup> )	0.13 – 3.45 (Slight saline)*
<b>Organic Matter (%)</b>	0.37 – 1.12 (Medium)*
<b>Available phosphorus (ppm)</b>	2–5 (Low)*
<b>Extractable potassium (ppm)</b>	100 – 640 (Medium)*
<b>Farmers availing soil test facility (%)</b>	32 (Based on crop production zone wise data)
<b>Farmers availing water test facility (%)</b>	21 (Based on crop production zone wise data)

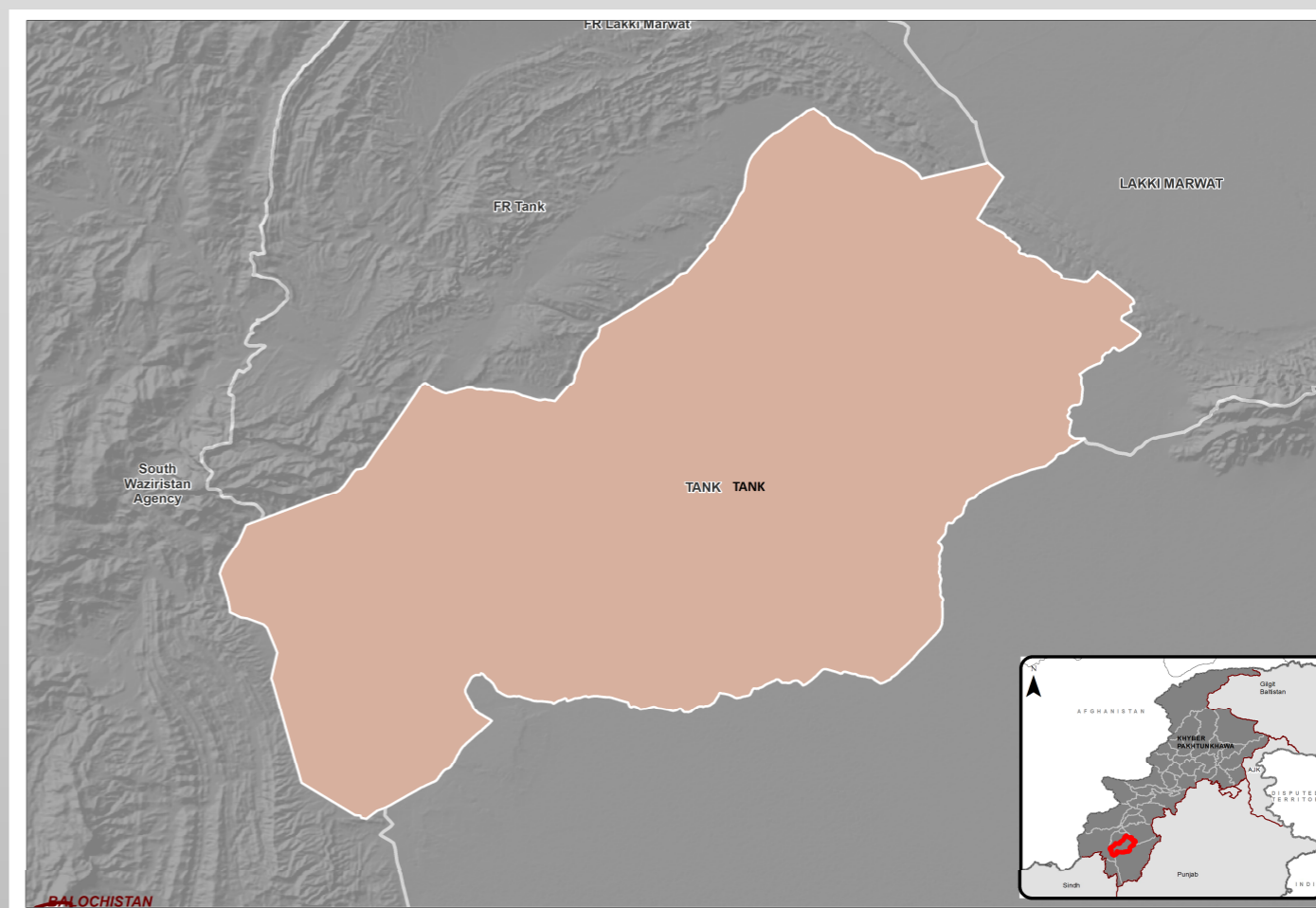
Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

\*The fertility class was assessed based on results of the soil samples (≥70%) analyzed.

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	28,548
<b>Total non-cultivated area (hectares)</b>	137,051
<b>Total area under irrigation (hectares)</b>	7,630
<b>Major rabi crop(s)</b>	Wheat, fodders and vegetable crops
<b>Major kharif crop(s)</b>	Maize, fodders and vegetable crops
<b>Total Livestock Population</b>	508,731

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan



Torghar (means 'Black mountain') formerly a tribal area, was declared district of Khyber Pakhtunkhwa province in 2011. It borders Shangla district to the northwest, Battagram to the northeast, Mansehra to the southeast, and Buner district to the southwest. The climate is sub-tropical with mild to hot summers and cold winters. Major crops include wheat, maize, rice, sugarcane, vegetable and fruit crops. The district headquarter is located at Judba.

## SOIL ATTRIBUTES

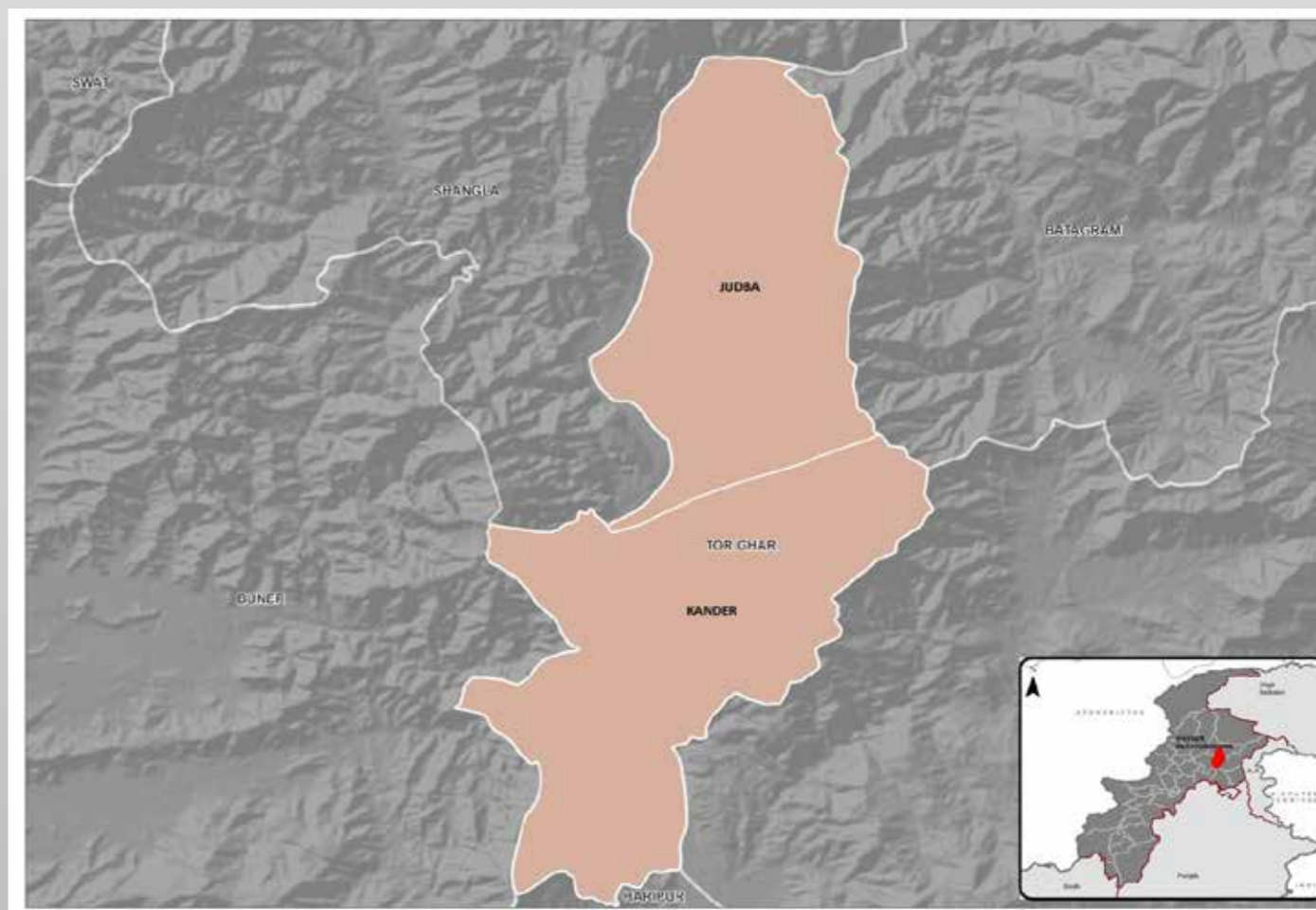
<b>Soil Type/Parent Material</b>	Residual and colluvial deposits
<b>Dominant Soil Series</b>	Besham, Sheldar, Phegora
<b>pH (1:2.5 H<sub>2</sub>O)</b>	Data not available
<b>Electrical Conductivity<sub>(1:2.5)</sub> (dSm<sup>-1</sup>)</b>	Data not available
<b>Organic matter (%)</b>	Data not available
<b>Available phosphorus (ppm)</b>	Data not available
<b>Extractable potassium (ppm)</b>	Data not available
<b>Farmers availing soil test facility (%)</b>	- -
<b>Farmers availing water test facility (%)</b>	- -

Source:  
 District Soil Survey Reports, Soil Survey of Pakistan  
 Farm Advisory Centers, Fauji Fertilizer Company Limited (FFC)  
 Inputs Use Assessment, FAO (2018)  
 Land Cover Atlas of Khyber Pakhtunkhwa (FAO, SUPARCO and Government of Khyber Pakhtunkhwa)

## AGRICULTURAL INFORMATION

<b>Total cultivated area (hectares)</b>	58,969
<b>Total non-cultivated area (hectares)</b>	13,021
<b>Total area under irrigation (hectares)</b>	55,023
<b>Major rabi crop(s)</b>	Wheat, vegetable crops
<b>Major kharif crop(s)</b>	Rice, sugarcane
<b>Total livestock population</b>	-

Source: Crop Reporting Services, Khyber Pakhtunkhwa; Agriculture Census 2010; Livestock Census 2006



Source: Information Management Unit, FAO Pakistan

# KEY MESSAGES

## SOIL HEALTH MANAGEMENT AND CROP PRODUCTIVITY

01

Most of the agricultural soils in Khyber Pakhtunkhwa (KP) province have become deficient in various macro and micro-nutrient elements, mostly due to mining of the nutrients without adequate replenishment. Consequently, adoption of Fertilizer Best Management Practices (FBMPs) according to the specific farming system(s) is essential for sustainable crop production and maintenance of soil health. Hence, the following recommendations have been formulated for the benefit of farming communities.

02

As the Management Practices differ according to different cropping systems, the fertilizers (plant nutrients) should be applied following the guiding principles of **4R Nutrient Stewardship**, as described below:

- Right source (Suitable source of fertilizer and nutrients)
- Right rate (Optimum fertilizer dose according to crop requirement and soil test)
- Right time (Fertilizer applied at the time when crop can best utilize it)
- Right placement (Suitable method of application)

03

**Always Use Quality Fertilizers:** Quality of fertilizer (without adulteration) products is a serious issue and can lead to reduced crop productivity. Unless fertilizers are of good quality, the money and effort to correct nutrient deficiencies in soil-plant system(s) cannot be remunerative. Farmers are, therefore, advised to buy quality fertilizers from trusted/authorized dealers and reputed companies providing/assuring quality control. Presumably, when fertilizer bag is getting out of a factory, the quality is no issue. The adulteration issue mostly occurs at a later stage, especially at dealer levels in the case of phosphatic fertilizer, mixing of nitrophos in diammonium phosphate (DAP) or gypsum is colored like DAP fertilizer. To avoid adulteration, fertilizer act needs to be implemented in its true spirit in the province.

04

**Soil and Water Testing Facilities:** These facilities are available at the district level both in government and private sectors (especially the fertilizer companies) free of cost or at nominal charges. Farmers should get soil and water samples analyzed before seeding, and use balanced fertilizers based on the soil test values for achieving maximum profitability. Farmers can contact officers of the respective companies to get soil and water samples analyzed before planting their crops. The use of optimum and balanced fertilizer inputs based on soil testing results for achieving maximum profitability is recommended. In case, there is any response issue; farmers may feel free to contact at the company's helpline and/or the FAO Pakistan.

# KEY MESSAGES

## SOIL HEALTH MANAGEMENT AND CROP PRODUCTIVITY

05

**Integrated Use of Nutrients:** Balanced and integrated nutrient/ fertility management is the key to soil health, high productivity, profitability and environmental protection. Organic sources of nutrients (e.g. organic fertilizers: green manure, farm yard manure, compost, poultry waste, sewage sludge) including bio-fertilizers should be integrated with inorganic fertilizers to enhance nutrient use efficiency and improve soil health.

06

**Crop Residue Management:** Crop residues are a source of nutrients as well as soil conditioner, which may supplement other nutrient inputs and improve soil physical conditions and burning agricultural residues can lead to an array of environmental problems and decline in soil health. Burning of crop residues should be discouraged; rather these should be incorporated in the soil, or residues should be charred or pyrolyzed properly and then applied to the soil to enhance organic matter content – a key factor in managing soil fertility and health management, and other beneficial effects.

07

**Proper Timing of Fertilizer Application:** Soil moisture is extremely important for the uptake of nutrients and plant growth. In rainfed cropping system, hardly any fertilizer is applied by subsistence farmers due to the uncertainty of seed germination and crop establishment, hence crop yields are extremely low. Under such conditions, i) apply fertilizer when the soil is at field moisture capacity at sowing time, ii) immediately irrigate the field after fertilizer in case the fertilizer is applied/broadcasted in standing crop, iii) apply fertilizer before expected rainfall in the rainfed areas, and iv) use half of the N, P and K fertilizers at the time of sowing in such areas. The remaining half of the N may be applied if soil moisture is available at critical stages of crop growth.

08

**Improving Produce Quality:** Potassium (K) is a quality nutrient element. The application of K-based fertilizers where soils are K deficient enhances crop productivity and product quality, especially for high value crops, such as apple, tomatoes, potatoes and vegetable crops.

# KEY MESSAGES

## SOIL HEALTH MANAGEMENT AND CROP PRODUCTIVITY

09

**Urea Losses:** In sandy soils, apply urea in two or more splits, but do not use more than the recommended dose. The excessive application of urea causes succulence (succulence means more tissue water content as a result of excessive N uptake along with excessive water uptake) at vegetative stage. It may damage the crop through insect/pest attack, crop lodging and depress fruiting due to excessive vegetative growth. Apply urea in the late afternoon when temperature is low to avoid volatilization losses.

10

**In Salt-affected Areas:** The dose of NPK fertilizers in salt-affected lands is 25% greater than the regular or standard recommended application rate, which leads to good results since nutrient uptake is lower due to the presence of salts at the soil solution-root interface. Bed-and-furrow sowing and more split applications of fertilizers will further enhance the nutrient use efficiency of salt tolerant crops.

11

**Band Placement and Fertigation:** Band placement of urea and phosphatic fertilizers 2–3 cm below the soil surface may help reduce N losses and improve fertilizer use efficiency. Split application of N fertilizer may also reduce N losses. Fertigation saves mobile nutrients (nitrate-N) by lowering their losses and enhancing fertilizer use efficiency. Normally, phosphatic fertilizers are band placed so that fertilizer remains close to plant root for its efficient uptake.

12

**Brackish Water Management:** Management of brackish water is a very important factor for optimal crop production, particularly under salinity stress conditions. Brackish water includes high soluble salts containing water and high residual sodium carbonate (RSC) containing water. Saline water may be used for irrigation in a cyclic manner, i.e., one or two irrigations using a brackish water followed by using a canal water or blending of the canal water (if available) with brackish water. High RSC water could be used after mixing with canal water to lower down RSC. Brackish water may be used to irrigate salt tolerant crops. If brackish water is the only available source, then high leaching fraction should be maintained to avoid salt build up in the soil.

# KEY MESSAGES

## SOIL HEALTH MANAGEMENT AND CROP PRODUCTIVITY

13

**Use of Poultry Waste:** Application of poultry waste is a common practice in the province, particularly in vegetable crops in the north zone (Abbottabad, Mansehra), but unfortunately without any research-based backing. A scientific evaluation of the nutrient status of poultry waste(s) and its use as alternate source of plant nutrients, especially phosphorus, is deemed essential. Accordingly, specific recommendations regarding the use of poultry waste as supplement or replacement of inorganic sources of P may be devised.

14

**Amendments/Manures** should be applied to maintain soil health under irrigation with poor quality water. When water is sodic, gypsum is required at the rate according to gypsum requirement should be applied before growing crop. Farm yard manure/ green manure may be included/added to enhance soil infiltration, gypsum solubility and soil health in case there is sodicity problem or water of sodic hazard is applied.

15

• **Use of Agricultural Helplines:** Advisory services are available to help farmers and resolve their problems on a priority basis. Farmers are encouraged to use the toll-free Helplines listed below for farm advisory services and agriculture associated issues:

**Tel-Farming/e-Farming System: Agriculture**  
**Fauji Fertilizer Company Limited:**  
**Fatima Fertilizers Company Limited/Pak Arab Fertilizers:**  
**Engro Fertilizers Limited:**

<b>Call Center</b>	<b>0348-1117070</b>
<b>Toll-free Helpline</b>	<b>0800-00332</b>
<b>Toll-free Helpline</b>	<b>0800-91919</b>
<b>Toll-free Helpline</b>	<b>0800-00110</b>

# KEY MESSAGES

## SOIL HEALTH MANAGEMENT AND CROP PRODUCTIVITY

16

**Use of Micronutrients:** The deficiencies of micronutrients, like zinc (Zn) and iron (Fe), are most common in alkaline calcareous soils. In Pakistan, micronutrients deficiencies especially Zn deficiency is common in rice, boron (B) deficiency in cotton, and Fe deficiency in the form of chlorosis in deciduous fruits and citrus. Deficiency of micronutrients may be corrected through soil nutrient application or the use of a foliar spray of the required nutrient.

Wheat grains in Pakistan contain around  $25 \text{ mg kg}^{-1}$  Zn, as compared to  $40\text{--}60 \text{ mg kg}^{-1}$  Zn required for good human health. Zinc concentration in wheat grains can be increased effectively through a soil application of zinc sulfate or two foliar sprays of Zn – the first, one week prior to heading and the second, one week after heading or Zn fortification through Zn priming.

Boron deficiency in cotton crop increases premature flower abortion and in rice crop results in empty panicles on lower end of the ears. Application of B fertilizer in cotton may stop the dropping of bolls/flowers and reduce sterility in rice - the condition when spikelet remains unfilled. It is believed that B is an enzyme carrier to the spikelet. When the enzyme does not get there due to B deficiency, the spikelet remains unfilled.

Micronutrient deficiencies in orchards: Most fruit orchards (apple, peach, plum, citrus, grape) experience Zn and Fe deficiencies, which can be corrected by applying 2 to 3 foliar sprays of soluble Zn and Fe source as well as by soil application of micronutrient fertilizers. Further, application of macro- and micronutrients in orchards is necessary for quality and optimum yield.

**Soil-applied Micronutrient Fertilizers:** These have beneficial residual effects on soil that can be taken up by the succeeding crops. Therefore, it is not necessary to apply micronutrient fertilizer for each crop. However, periodic soil testing is recommended to ascertain the adequate supply of nutrients for a given crop.

**Micronutrient Fertilizers Mixed with Foliar Solutions of Pesticides:** Such sprays are equally effective in correcting micronutrient deficiencies. For example, zinc sulfate mixed with Confidor insecticide is effective in ameliorating deficiency of Zn in fruit and vegetable crops. Boron fertilizer can be mixed safely with foliar sprays of pesticides.

**Horticultural crops (fruits and vegetables):** These crops have great potential with regard to the export processing zones planned in China-Pakistan Economic Corridor (CPEC). Special focus is required on the production of quality fruits and vegetables for direct export and/or value added products visualizing the future opportunities. Tunnel, as well as greenhouse farming, may be promoted for off-season vegetables to ensure uninterrupted supply to the consumers/markets.