SECTION II

INPUTS USE ASSESSMENT

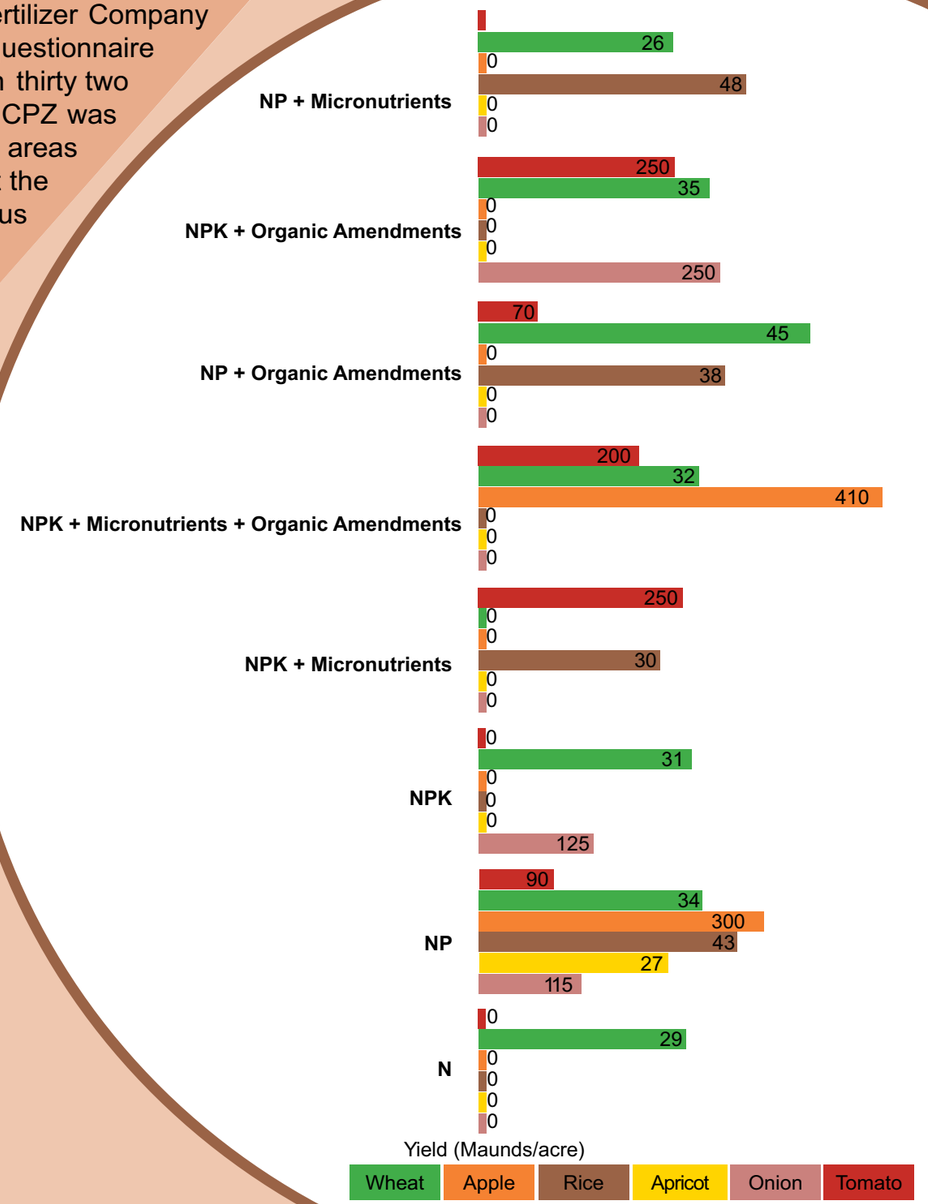
FERTILIZER USE AND CROP YIELD

To assess inputs/fertilizer use at farm level, an Inputs Use Assessment was carried out during 2018 with the involvement of the Balochistan Agriculture Research and Extension Departments. All national fertilizer companies including Fauji Fertilizer Company Limited, Fatima Fertilizers/Pak Arab Group, and Engro Fertilizers played a vital role in conducting this assessment. A questionnaire was developed in consultation with different stakeholders; and thereafter, farmers' interviews were conducted in thirty two districts across seven Crop Production Zones (CPZs) in Balochistan. The number of farmers selected from each CPZ was based on the trends of fertilizers offtake in the last ten years. More farmers were selected for the assessment from areas of proportionately higher fertilizers offtake. Overall, this sample size was found representative when aggregated at the CPZ and provincial scales (>2500 farmers). The information through this assessment pertains to the use of various fertilizers, yield of major crops, major soil constraints hampering productivity, and numbers of farmers availing soil and water testing facility in each district of Balochistan. The validation of such trends in each district was based on field surveys, follow up interviews, and interaction with the farmers during commodity based workshops and discussions with public and private sector experts/individuals. The data collected through this Inputs Use Assessment is used to prepare fertilizer use maps and/or infographs for major crops across CPZs. The trends of average crop(s) yield under different fertilizer use scenarios obtained by the interviewed farmers are described. The use of potassium (K) and/or micronutrients and organic sources of nutrients in appropriate combination(s) along with N and P is recommended for achieving optimal crop productivity under the prevailing agro climatic conditions in Balochistan.

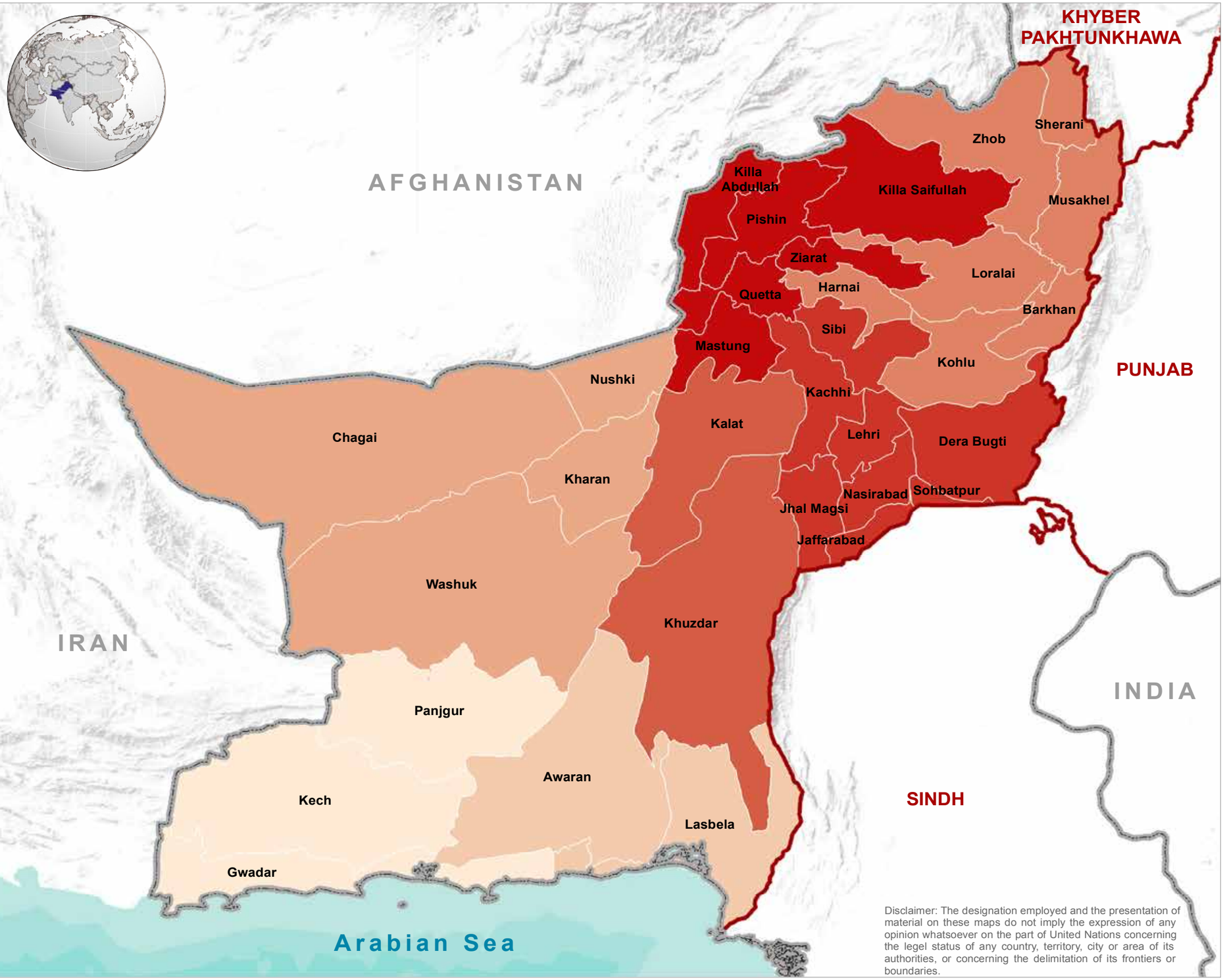
KEY INDICATORS

- Major crops grown by farmers
- Yield of major crops
- Farm size
- Crop wise use of inputs (inorganic/chemical fertilizers, and organic sources of nutrients)
  - Crop wise use of Urea
  - Crop wise use of Di-Ammonium Phosphate (DAP)
  - Crop wise use of Sulphate of Potash (SOP) and Muriate of Potash (MOP)
- Crop wise use of organic sources of nutrients/FYM
- Farmers availing soil and water test facilities

Laboratory Analysis	**Percent Farmers**
▪ Soil Test	20%
▪ Water Test	8%
Major Problems	
Soil Water Constraints	>70%
▪ Water Scarcity	60%
▪ Salinity	7%
▪ Sodicity	8%
Non Soil Water Constraints	
▪ Pest/Diseases	>70%
▪ Seed Quality	60%
▪ Agri Loan	>60%
Others	>30%
▪ Satisfied with Fertilizer Prices	7%
▪ Satisfied with Commodity Prices	10%
Use of Organic Sources	
▪ Wheat	11%
▪ Rice	10%
▪ Tomato	09%
▪ Cauliflower	22%
▪ Cucumber	33%
▪ Apple	16%
▪ Apricot	28%
▪ Grape	17%
▪ Peach	21%
▪ Pomegranate	18%



MAJOR CROP PRODUCTION ZONES IN BALOCHISTAN



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Map Legend

Administrative limits

- International boundary
- Provincial boundary
- District boundary

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6
- Zone 7

About Map

The map shows 7 cropping zones in the province. This zoning was done on the basis of relevant NFDC fertilizer offtake assuming a corresponding intensity of cropping. Such zoning is also endorsed by the IUCN. For a simpler presentation of a zone, adjacent districts were clubed with the districts showing higher fertilizer offtake.

Date: 01 Nov, 2018
Created by: IM UNIT, FAO Pakistan
Map Number: PAK_Soil_Fertility_Atlas_Bal_Cropping_Zones_Map_20181101_0200

Data Sources

GAUL, FAO and Government of Balochistan

Map Scale and Datum

Nominal scale: 1:3,804,672 at A3

Datum: WGS 84

N

0 50 100 150 200

Kilometers

AREA WISE MAJOR CROPS IN EACH CROPPING ZONE

KHYBER PAKHTUNKHAWA

AFGHANISTAN

PUNJAB

SINDH

IRAN

INDIA

Arabian Sea

Zhob
Sherani
Killa Saifullah
Killa Abdullah
Pishin
Musakhel
Ziarat
Loralai
Harnai
Quetta
Barkhan
Sibi
Mastung
Kohlu
Nushki
Kachhi
Chagai
Kalat
Lehri
Dera Bugti
Kharan
Nasirabad
Sohbatpur
Jhal Magsi
Jaffarabad
Washuk
Khuzdar
Panjgur
Awaran
Kech
Lasbela
Gwadar

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Map Legend

Administrative limits

- International boundary
- Provincial boundary
- District boundary
- Wheat, Dates, Onion
- Wheat, Cotton, Onion
- Wheat, Dates, Onion
- Wheat, Almond, Apricot
- Wheat, Apple, Onion
- Wheat, Rice, Cotton
- Wheat, Apple, Onion

- Wheat
- Rice
- Cotton
- Dates
- Apple
- Almond
- Apricot
- Onion

About Map

The map shows three major crops, based on cultivated area of each, in different cropping zones of Balochistan. Wheat is the most common crop grown in all seven cropping zones followed by onion in five zones. Dates, apple and apricot, each in two crop zones, are commonly grown while rice and cotton are confined to the irrigated zone adjoining Sindh province.

Date: 01 Nov, 2018
Created by: IM UNIT, FAO Pakistan
Map Number: PAK_Soil_Fertility_Atlas_Bal_Major_Crops_Map_20181101_0900

Data Sources

GAUL, FAO and Government of Balochistan

Map Scale and Datum

Nominal scale: 1:3,804,672 at A3

Datum: WGS 84

N

0 50 100 150 200

Kilometers

MAJOR CROPS BASED ON ECONOMIC IMPORTANCE

KHYBER PAKHTUNKHAWA

AFGHANISTAN

PUNJAB

IRAN

INDIA

SINDH

Arabian Sea

Zhob
Sherani
Killa Saifullah
Killa Abdullah
Pishin
Musakhel
Ziarat
Loralai
Quetta
Harnai
Barkhan
Sibi
Mastung
Kohlu
Nushki
Kachhi
Kalat
Chagai
Lehri
Dera Bugti
Kharan
Nasirabad
Sohbatpur
Jhal Magsi
Jaffarabad
Washuk
Khuzdar
Panjgur
Awaran
Kech
Lasbela
Gwadar

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Map Legend

Administrative limits

- International boundary
- Provincial boundary
- District boundary

- Dates, Onion, Wheat
- Onion, Cotton, Wheat
- Onion, Dates, Wheat
- Tomato, C.flower, Almond
- Apple, Onion, Wheat
- Rice, Wheat, Cotton
- Apple, Grapes, Onion

- Wheat
- Rice
- Cotton
- Dates
- Apple
- Almond
- Appricot
- Cauliflower
- Tomato
- Grapes
- Onion

About Map

The map shows major crops based on economic importance in each cropping zone of Balochistan. Onion is the most common crop of economic importance in five cropping zones. Apple is economically important in upper cropping zones while the dates in south zone. Rice is the crop of economic importance in the area closer to Sindh, whereas vegetables like tomato, couliflower are important cash crops in the central irrigated zone.

Date: 17 Nov, 2018
Created by: IM UNIT, FAO Pakistan
Map Number: PAK_Soil_Fertility_Atlas_Bal_Major_Crops_Economic_Map_20181117_0900

Data Sources

GAUL, FAO and Government of Balochistan

Map Scale and Datum

Nominal scale: 1:3,804,672 at A3
Datum: WGS 84

0 50 100 150 200
Kilometers

N

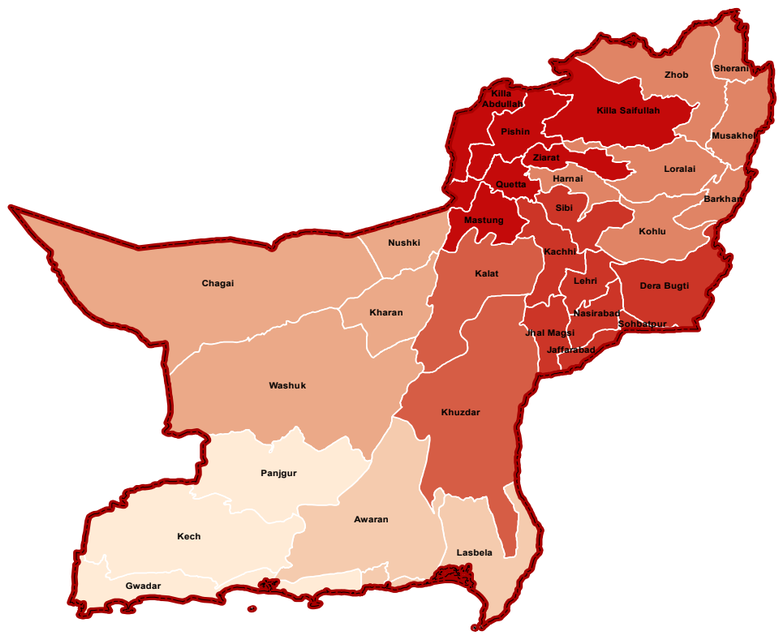
ZONE WISE CROPS YIELD UNDER NUTRIENT USE PRACTICES

Zone 7

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Rice	20 - 45	N + P + MN	80
Cotton	11 - 35	N + P + OA	75
Wheat	15 - 50	N + P	70

Zone 1

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Dates	----------	----------	--------
Onion	----------	----------	--------
Wheat	20	N + P + OA	100



Zone 6

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Tomato	220 - 300	N + P + OA	66
Cauliflower	----------	----------	--------
Wheat	20 - 60	N + P	60

Zone 2

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Onion	----------	----------	--------
Dates	----------	----------	--------
Wheat	40 - 54	N + P	50

Zone 5

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Apple	180 - 750	N + P + OA	50
Grapes	110 - 410	P + K + MN + OA	40
Onion	375	N + P + K + OA	100

Zone 4

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Apple	40	N + P + OA	100
Onion	----------	----------	--------
Wheat	15 - 40	N + P	50

Zone 3

Crop	Yield (Maunds/acre)	Nutrient Use	% Farmers
Onion	110 - 280	N + P	80
Cotton	14 - 32	N + P	80
Wheat	18 - 45	N + P	70

About Map

The map shows yield of economic crops under the most common nutrient use practices in different crop production zones of Balochistan. Use of N+P is the most common practice for wheat crop. Relatively fewer farmers apply N+P+K along with organic manure and micronutrients particularly on vegetable crops. However, variable responses of a crop to a given nutrient use practice in different crop zones indicate significant influence of factors other than nutrition on crop productivity.

N = Nitrogen
P = Phosphorus
K = Potassium
MN = Micronutrients
OA = Organic amendments

Date: 17 Nov, 2018
Created by: IM UNIT, FAO Pakistan
Map Number:PAK_Soil_Fertility_Atlas_Bal_Crops_Yield_Nutrient_Map_20181117_0900

Data Sources

GAUL, Inputs Use Assesment FAO, 2018

Map Scale and Datum

Nominal scale: 1:3,804,672 at A3
Datum: WGS 84

N

0 50 100 150 200
Kilometers

AN OVERVIEW OF NUTRIENT USE PRACTICES AND CROP YIELDS

Percentage of farmers practicing the scenario and crop yield (Maunds/acre)

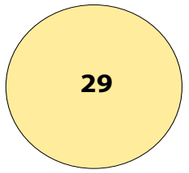
N

248

97% Agro-Crops

2% Fruits

1% Vegetables



Crop Yield

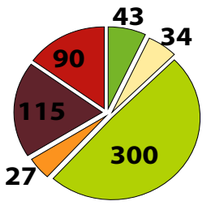
N + P

394

37% Agro-Crops

33% Fruits

30% Vegetables



Crop Yield

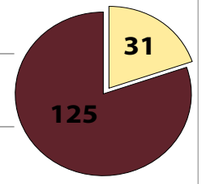
N + P + K

1023

91% Agro-Crops

9% Fruits

0% Vegetables



Crop Yield

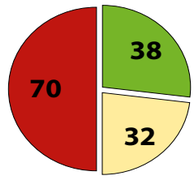
N + P + OA

131

16% Agro-Crops

52% Fruits

32% Vegetables



Crop Yield

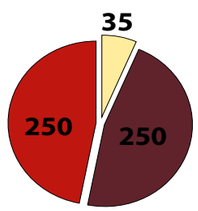
N + P + K + OA

72

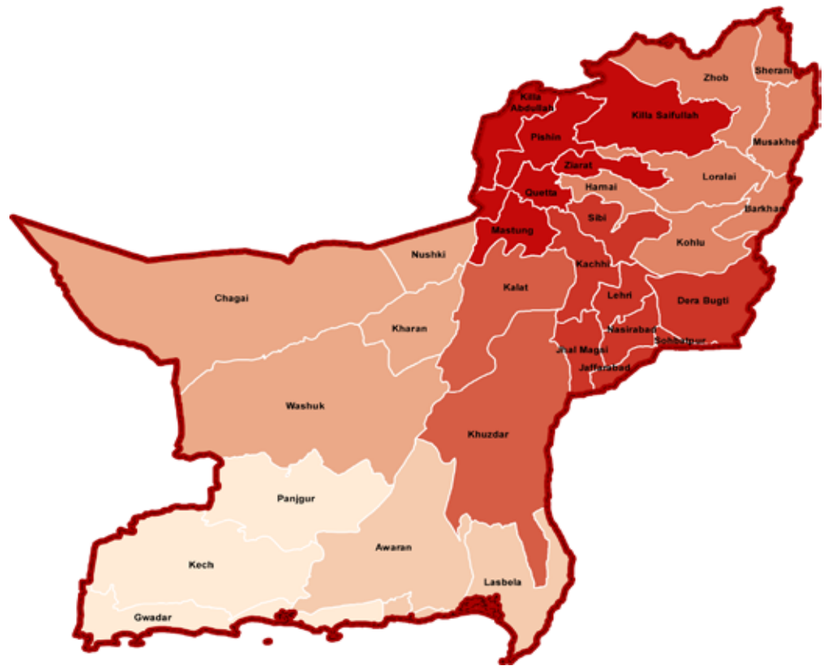
20% Agro-Crops

80% Fruits

0% Vegetables



Crop Yield



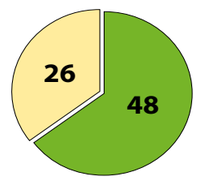
N + P + Micronutrients

200

87% Agro-Crops

3% Fruits

10% Vegetables



Crop Yield

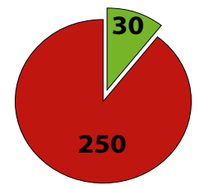
N + P + K + Micronutrients

141

80% Agro-Crops

20% Fruits

0% Vegetables



Crop Yield

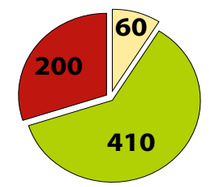
N + P + K + Micronutrients+ OA

299

80% Agro-Crops

20% Fruits

0% Vegetables



Crop Yield

Map Legend

Zone 1 Zone 4 Zone 7

Zone 2 Zone 5

Zone 3 Zone 6

Crops

Tomato Apple

Onion Wheat

Apricot Rice

No. of farmers

About Map

Out of 2,500 farmers, majority of them apply N + P + K irrespective of the crop or cropping zone in the province. Additional use of micronutrients, in particular, and organic amendments enhanced yield of wheat and vegetable crops. Overall trend of the farmers using only N + P was similar for grain, vegetable and fruit crops. However, additional use of either K or micronutrients was much skewed towards grain crops. On the other hand, use of organic amendments was more on fruit orchards.

N = Nitrogen
P = Phosphorus
K = Potassium
OA = Organic amendments

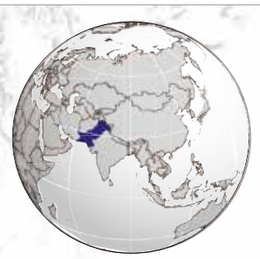
Data Sources

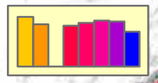
GAUL, Inputs Use Assessment FAO, 2018

MAJOR CONSTRAINTS HAMPERING PRODUCTIVITY IN DIFFERENT CROP PRODUCTION ZONES OF BALOCHISTAN

USAID FROM THE AMERICAN PEOPLE

USDA





KHYBER PAKHTUNKHAWA

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SINDH

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Killa Abdullah

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Musakhel

Ziarat

Loralai

Quetta

Harnai

Barkhan

Sibi

Mastung

Kohlu

Nushki

Kachhi

Chagai

Kalat

Lehri

Dera Bugti

Kharan

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Map Legend

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Zones	Constraints
Zone 1	Consultation AES
Zone 3	Accessibility AES
Zone 2	Water Scarcity
Zone 6	Salinity Problem
Zone 4	Sodicity Problem
Zone 7	Pests/Diseases
Zone 5	Seed Quality
	Agriculture Loans

About Map

Soil salinity/sodicity and water scarcity are the main constraints with respect to physical resources. Coupled with the natural threats of insect pests/ diseases, the management issues such as seed quality, poor services of agriculture loans and extension result in low productivity.

Date: 01 Nov, 2018
Created by: IM UNIT, FAO Pakistan
Map Number: PAK_Soil_Fertility_Atlas_Bal_ Cropping_Zones_Map_20181101_0200

Data Sources

GAUL, Input Use Assessment FAO, 2018

Map Scale and Datum

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Datum: WGS 84

0 50 100 150 200
Kilometers

N

NFDC