Pakistan Food Security Challenges and Opportunities

Pakistan Agricultural Research Council,

Ministry of National Food Security & Research

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Vision & Mission

Vision

A Food Secure Pakistan

Mission

To ensure modern and efficient food production and distribution system that can best contribute towards food security and nutrition, in terms of availability, access, utilization and stability

Overview of Pakistan Agriculture

Contribution to GDP
18.5%

Labour force Employed
38.5%

Livelihood to rural Population
59.5%

Average growth rate in 2010s
2.4%

Share of Agriculture in total exports
58%

Source: Govt. of Pakistan - Pakistan Economic Survey 2018-19

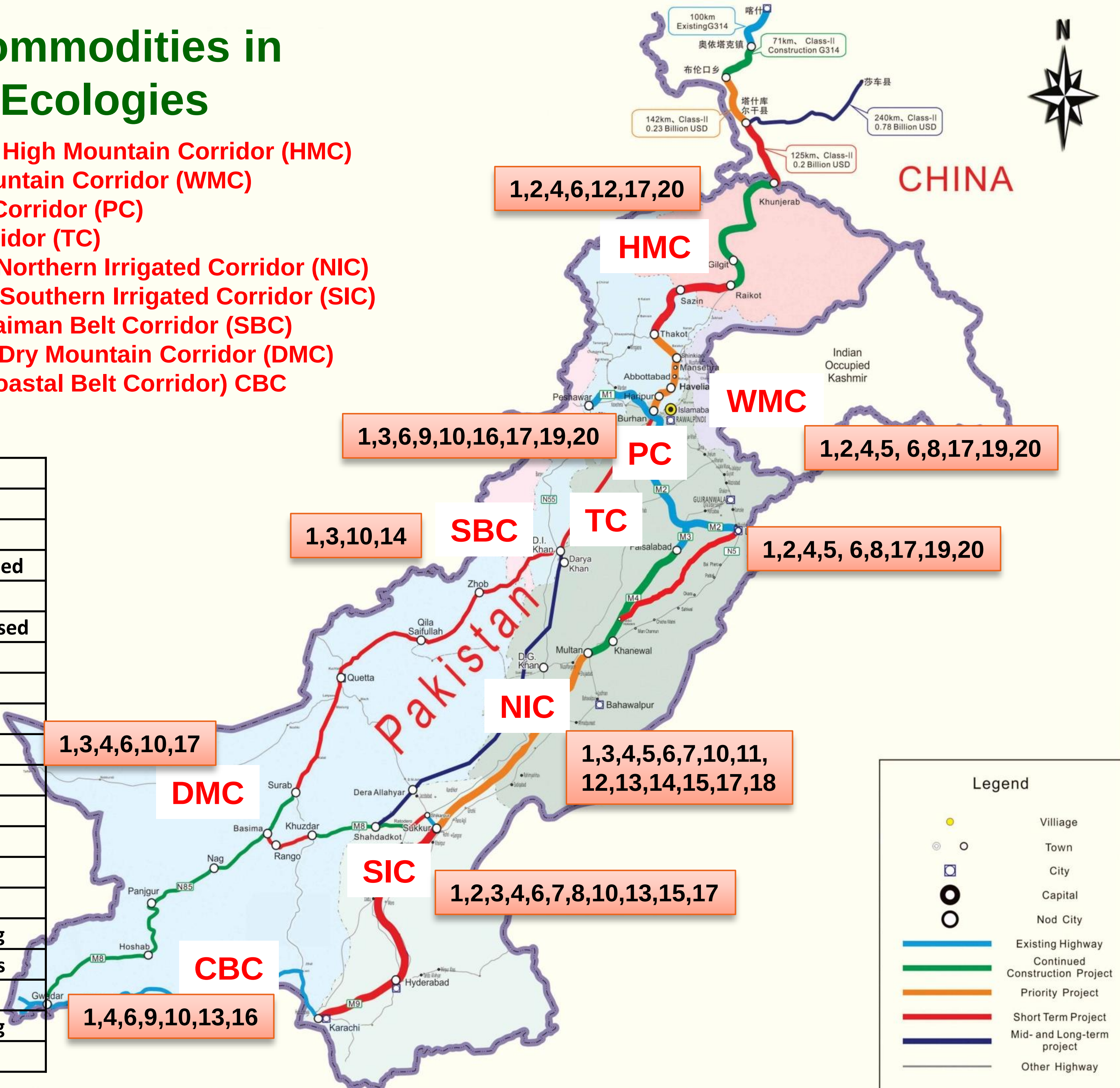
Resource Base

- **Total Cropped Area** --- **22.63 Million ha**
- **Rangelands and cultivated area** --- **50.8 Million ha & 22.16 Million ha**
- **Irrigated areas --- 19.32 Million ha (87.3% of total cultivated area)**
- **Culturable waste** --- **8.37 Million ha,**
- **Irrigated agriculture produces 90% of Pakistan's food/fiber requirements**
- **Water harvesting potential ----12 MAF runoff water can be harvested to command 7 mha uncultivated area**
- **Entirely irrigation based crops** --- **Rice, Sugarcane, Cotton, Vegetables**
- **Diversity of Agriculture** 11 crops, 30 fruits, 32 vegetables, 5 pulses, 31 sheep, 34 goat, 05 buffalo, 15 cow

Agricultural Commodities in Different Agro-Ecologies

1. Northern Dry Mountains **High Mountain Corridor (HMC)**
2. Wet Mountains **Wet Mountain Corridor (WMC)**
3. Barani Lands **Potowar Corridor (PC)**
4. Sandy Desert **Thal Corridor (TC)**
5. Northern Irrigated Plain. **Northern Irrigated Corridor (NIC)**
6. Southern Irrigated Plain **Southern Irrigated Corridor (SIC)**
7. Sulaiman Piedmont **Sulaiman Belt Corridor (SBC)**
8. Western Dry Mountains **Dry Mountain Corridor (DMC)**
9. Dry Western Plateau **(Coastal Belt Corridor) CBC**
10. Indus Delta

1	Livestock, Dairy products
2	Fish Farming/Feed
3	Cereals & Products
4	Vegetables, Fresh & Processed
5	Poultry/Feed
6	Fruits Fresh, Dried & Processed
7	Sugar, Gur & Molasses
8	Cut Flower Production
9	Spices
10	Animal Feed & Fodder
11	Tobacco Industry
12	Animal Skin Processing
13	Seeds Production
14	Pulses
15	Cotton Processing
16	Wool Cleaning & Processing
17	Plants, Nurseries,& Products
18	Veg.oil, Essential oils etc
19	Olive Production/Processing
20	Honey



Pakistan's Ranking in the World

Sr.#	Crop/ Item	World Ranking
1	Population	6
2	Cotton	4
3	Sugarcane	5
4	Wheat	9
5	Rice	12
6	Maize	14
7	Buffalo	2
8	Goat	3
9	Sheep	9
10	Cattle	13
11	Milk	5
12	Fruits – Comparative advantage in mango, citrus & dates	

Source: FAO STATS, PBS, EW & Economic Survey 2017-18

Pakistan Crops Productivity
(Yield- Tons/Hec)

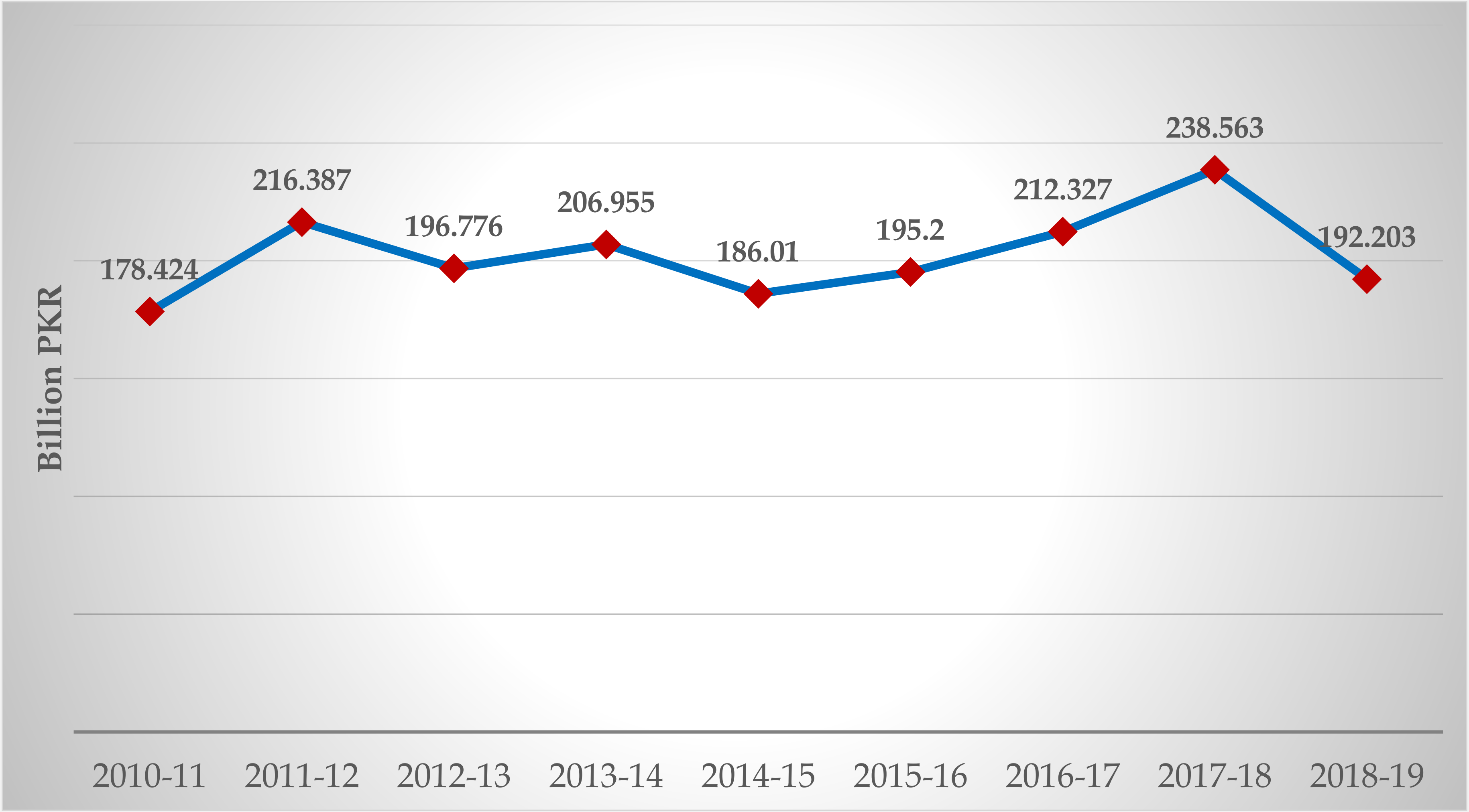
Crops	Pakistan	China	World # 1	World Avg
Wheat	2.7	5	New Zealand 9	3.2
Rice	2.4	6.7	Australia 10	4.4
Cotton	0.75	1.6	Australia 1.8	0.81
Sugarcane	57	66	Peru 134	70.77
Maize	4.15	6.02	New Zealand 12	5.46
Milk (liter/animal/lact	2100	3700	Israel & USA 15000	5500

Fodder Export Potential

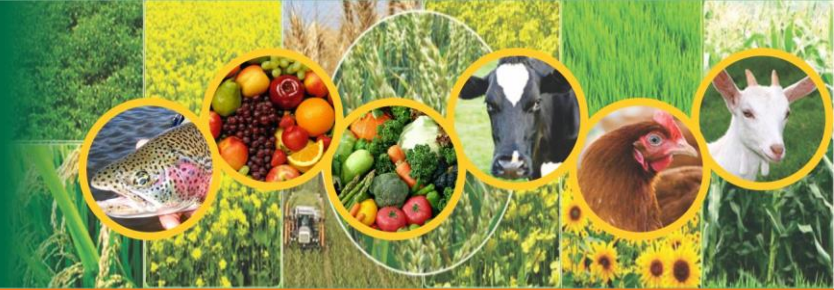
Fodder crops area:	2.31 million ha
Production:	56 million tons
Average:	22.4 t/ha
Potential:	**50 ton/ha (116 million tons)**
Quantity of Fodder:	**8,345 tons Exporting**
Value:	**USD 1.1 Million**
Major buyers:	**Afghanistan, UAE, Kuwait & Qatar**

Low yield and lack of silage/hay machinery limit the export

Import Bill of Edible Oils

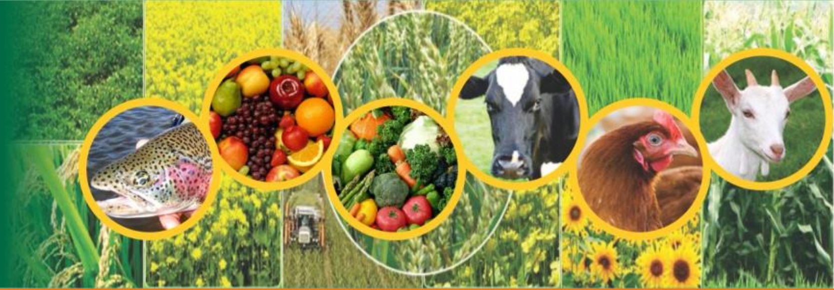


Seed Availability



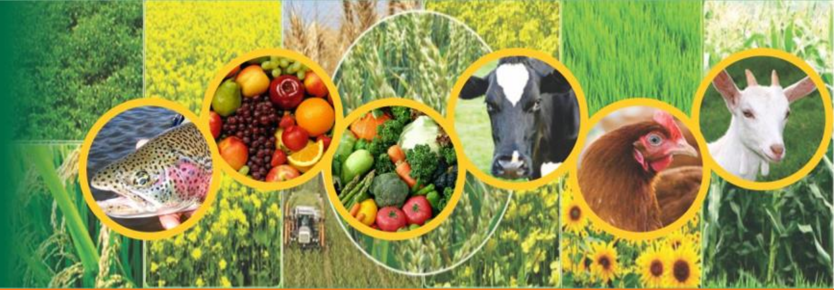
Crop	Area 000 Ha	Total seed Requirement (MT)	Seed Availability (M.T)			
			Public	Private	Imported	Total (L+I)
Wheat	883	1,090,925	55,871	359,452	0	415,322
Cotton	2895	57,205	1,569	64,323	0	65,893
Paddy	2879	42,393	5,211	67,383	9,947	82,541
Maize	1328	32,794	734	2,560	18,901	22,195
Pulses	1185	42,674	672	1,652	0	2,323
Oilseeds	830	10,790	100	378	399	876
Vegetables	280	8,400	109	5,296	5,681	11,085
Fodders	2038	61,140	43	27,714	50,506	78,263
Potato	166	415,000	0	0	4,735	4,735
Total	**20,435**	**1,761,321**	**64,309**	**528,756**	**90,169**	**683,234**
			4%	**30%**	**5%**	**39%**

Import of Seed



Crop	Quantity (MT)	Value	
		Rs. Million	Million USD
Cereals	4,735	2,106	86
Fodder	50,505	5,185	32
Oilseeds	189	165	1
Potato	4,735	2,106	13
Vegetables	5,681	5,979	37
Total	**90,067**	**27,375**	**171**

Post-Harvest Losses

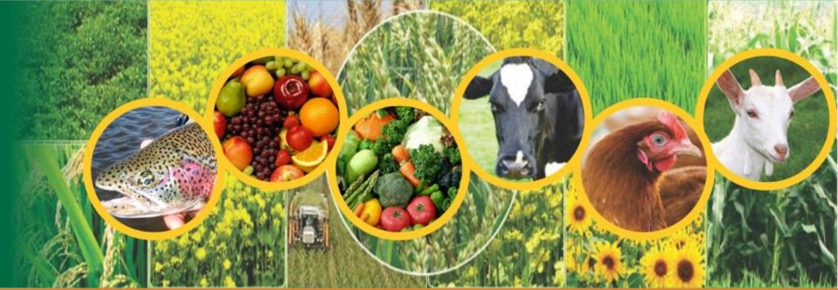


Item	Post-Harvest Loss
Fruits & Vegetables *	53 %
Cereals *	24 %
Major Fruits All fruits	15-35 % 24.5 %
Rice	16 %
Food Grains	10 %

Challenges

- Worsening terms of trade (i.e. TOT – 71 with base year 2010)
- Yields drastically lower than world leaders (Milk 7 times, wheat 2 times, rice 3 times, cotton/sugarcane 1.5 times
- Low value addition and processing (2-5% only)
- Low food exports (deficit USD 1.8 Bn)
- Poor infrastructure (marketing, e-commerce, road-network, cold chain)
- Scattered efforts - weak linkages with development partners
- Uneven policy support (huge import bill on edibles)
- Malnutrition (45% stunting)
- Climate Change (Pakistan is ranked 8th on climate change vulnerability)
- Inappropriate market infrastructure (marketing margins 8%-39% in major crops and 15%-37% for vegetables)

Consumption of Main Food Commodities
(Kg per capita per annum)



Food Commodities	Pakistan	South Asia	Gaps (Number of Times)	USA	Gaps (Number of Times)
Poultry Meat	3.84	3.20	0.8	37.48*	9.8
Beef	2.76	2.40	0.9	24.67	8.9
Fish	0.84	6.90	8.2	6.39	7.6
Mutton	0.84	1.20	1.4	0.45	0.5
Milk (Fresh, Boiled & Packed)	83.04	82.90	1.0	74.84	0.9
Wheat and Wheat Flour	86.40	66.20	0.8	59.63**	0.7
Rice	12.48	72.40	5.8	9.54	0.8
Sugar	7.08	21.10	3.0	31.0***	4.4
Vegetable Ghee, Cooking Oil & Butter	11.28	11.40	1.0	36.15	3.2
Fruits (Fresh & Dry)	14.18	50.20	3.5	66.15	4.7
Vegetables	50.64	77.00	1.5	161.8****	3.2

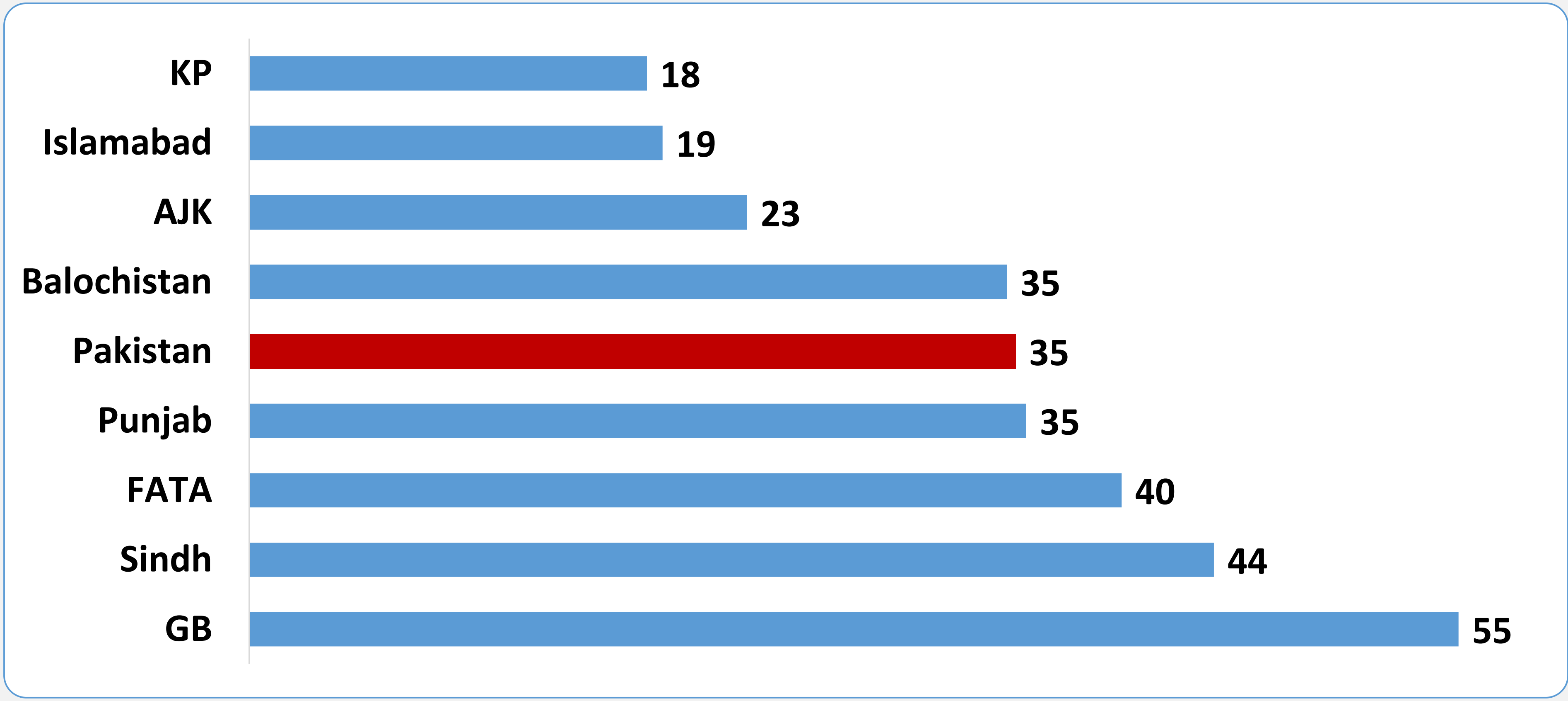
**Excluding Turkey's consumption of 7.11 kg/capita/annum*

*** Wheat Flour (excluding wheat bran, wheat germ, wheat berries)* **** Cane and beat sugar, only*

*****Fresh/Canned/Frozen & Dehydrated*

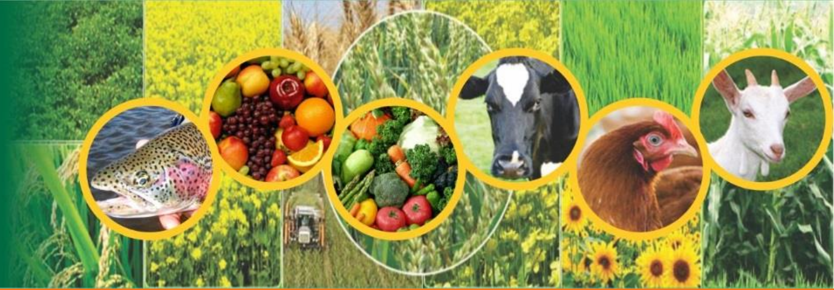
Sources : HIES (2012-13) , FAO & USDA (2016)

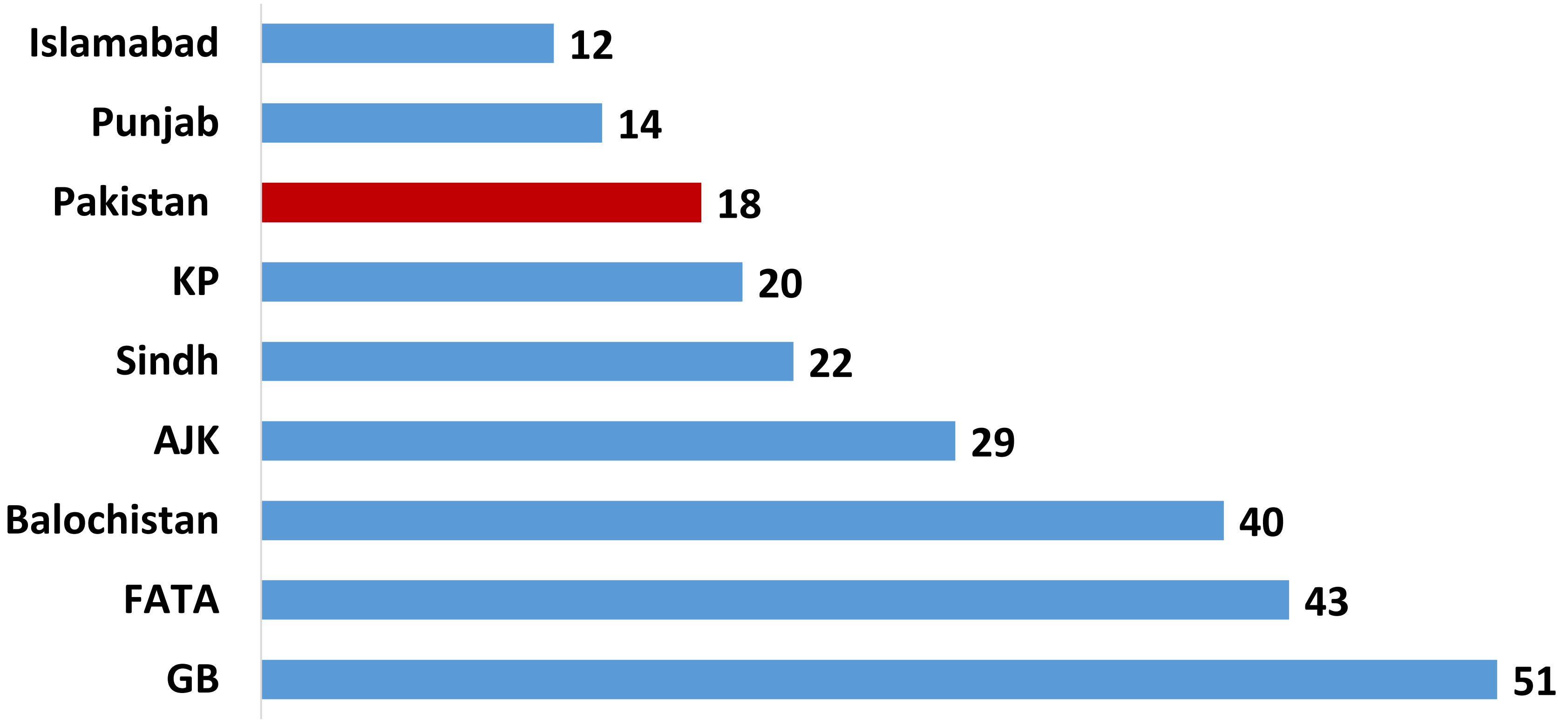
Households with low dietary diversity
(five or fewer food groups)



Source: Food Security Assessment Survey 2017

Prevalence of Undernourishment (PoU,%)





Source: Food Security Assessment Survey 2017

Rural Poverty

Size of Farms (Acres)	Distribution of rural households (%)	Incidence of Poverty (%)	Distribution of poverty (%)	Share of Food Expenditure over Total Expenditures (Rural Punjab)
Landless	63	**49**	**72**	53%
More than zero but less than 3	15	**45**	16	55%
3 to less than 5	8	28	5	55%
5 to under 12.5	10	27	6	53%
12.5 to under 25	2	16	1	53%
25 to under 50	1	8	0	48%
50 to under 75	0.5	0	0	23%
75 and above	0.2	0	0	35%
Total	100	44	100	53%

Opportunities

- Middle class expanding overtime in Pakistan, thus demand for fresh / processed fruits / vegetables is on the increase
- 8th largest world market, retail sale of processed food expanding @ 10% per annum, 50% income spent on food consumption
- Vast potential for expanding exports of fresh / processed fruits, vegetables and HALAL meet exist in Middle Eastern and other markets
- CPEC would expand opportunities further for food exports to China (Food market of over one trillion USD) and Central Asian Economies

Pakistan China Trade

- China the second largest economy with $12.24Tn nominal GDP, $2.4Tn exports and $1.8Tn imports
- Unilateral market access and priority quota allocation

China's Overall Trade (2017)	US $ Billion
Exports (USD)	2300
Imports (USD)	1800
Total Trade (USD)	**4100**

Source: *UNCOMTRADE*

Total export to Pakistan $15.38 Billion
Total Import from Pakistan $1.5 Billion

Accelerate Agriculture Growth Rate to Achieve Overall Economic Growth Rate of 6%

Actions

i. Strengthening knowledge and innovation systems (R&D)
ii. Improve resource use efficiency (Land and water)
iii. Reduce cost of production and increase productivity
iv. Targeted subsidies for smallholders
v. Efficient agri. marketing
vi. Price support and price de-capping
vii. Diversification, import substitution and certification for trade

Targets

Achieve an average growth rate from 2.1% to 3.6%

Improvement in Agricultural Terms of Trade by 30%

Increase food export & reduce food trade deficit

Prime Minister’s Agriculture Emergency Program

- Prime Minister’s Agriculture Emergency Program worth Rs. 309.7 Billion initiated with focused on:
  - Productivity Enhancement of Wheat, Rice & Sugarcane
  - Oilseeds Enhancement Program
  - Conserving Water Through Lining of Watercourses
  - Enhancing Command Area of Small and Mini Dams in Barani Areas
  - Water Conservation in Barani areas of Khyber Pakhtunkhwa
  - Shrimp Farming
  - Cage Fish Culture
  - Trout Farming in Northern Areas of Pakistan
  - Save & Fattening of Calf Program
  - Backyard Poultry Program

Improving Food Security and Reducing Malnutrition

Actions

i. Sustainable local production and supply of diversified food

ii. Reorientation of social safety nets program

iii. Enhancing economic access for nutritious food

iv. Awareness for behavioral change

v. Food fortification and bio-fortification

vi. Improving food quality and safety

vii. Establish food and nutrition security information system

Targets

Reduce Prevalence of Undernourishment (PoU) from 18% to 12%

Reduce malnutrition by 25-75%

Children under five

- Stunting from 38% to 28%
- Wasting from 9% to 5.5%
- Underweight from 23% to 13%

Women

- Anaemia from 51% to 40%

Rural Transformation for Inclusive Growth

Actions

i. Rural enterprise policy to support fast rural transformation

ii. Skill development program to support rural enterprises

iii. Access to funds for rural enterprises

iv. Cluster Development based agriculture Transformation (CDBAT)

v. Integration with CPEC long term agriculture development plan

vi. E-Commerce in commodity clusters

vii. Six stages of rural transformation model

Targets

Enhance contributions of non-farm sector from 61 to 70% in rural income for rapid rural transformation

Basic Facts of Cluster Based Development

- **Name**: **CDBAT- 2025**
- **Period**: **June 2018-May 2019, being extended to Mach 2020**
- **Process: Selection of a firm on competitive basis**
- **Mechanism in the Planning Commission: i) Project Unit in the PCP to address day to day issues, ii) Advisory Committee, iii) Steering Committee**
- **Coverage: 33 agriculture commodities selected by the SC based on the initial analysis of potential in PCP**

Key Product/Technology Interventions

Name of the commodity	Key product interventions
Dates	Dates pack house, Dates drier Conversion of Doka into Table dates
Almond	Almond Oil Processing Plant Shelling machine
Plums	Prunes Collection Center
Apple	Apple Processing for Juice Making as Cottage Industry
Banana	Banana Chips Manufacturing Unit
Tomato	Tomato Puree Production Unit
Chilies	Chilies Processing Unit
Onion	Onion Drying Unit
Carrots and Turnip	Carrot and Turnip pack house
Peas	Green Pea's Pack House
Basmati Rice	Rice Bran Oil Processing Plant
Grapes	Raisin Production Unit

Key Product/Technology Interventions

Name of the commodity	Key product interventions
Cucumber	Cucumber pack house
Barely	Barley Porridge Production Unit
Egg Plant	Brinjal pack house
Tobacco	-
Milk	Milk Pasteurization Process
Beef	Small scale mechanical abatoir at village level
Garlic	Garlic Planters
Sugarcane	Small scale sugarcane Juice-making plant
Potato	Potato Chips Production Process
Rapeseed and Mustard	Small scale mechanical oil expeller
Spices	Turmeric Processing Plant

Key Product/Technology Interventions

Name of the commodity	Key product interventions
Medicinal Herbs	Ispaghol (Psyllium) De-husking Processing Plant
Cherries	Solar drying unit
Apricot	Solar drying unit
Walnut	Deshelling of walnut Walnut oil extraction
Citrus	
Mango	Hot water treatment plant, farm-level cold storage, Collection Center
Pattoki Nursery	-
Flower	Tissue culture labs

Proposed Interventions for Rural Transformation

- Renovation of Existing Orchards → Certified nurseries, capacity building
- Introduction of New Varieties → Strengthen research system, import of germplasm
- Introduction of Improved Management Practices → Capacity building of farmers
- Reduce Post-Production Losses → Training on harvesting, introduce value chain, cold chain, better packaging material, etc.
- Improve value chain → Value chain infrastructure, cool chain, capacity building, loans.
- Introduce Processing → Small scale processing units, capacity building
- Linking stakeholders with markets → Organizing farmers into groups, Improve international links, establish e-commerce, information plat form, etc.

Investment Required

Item	Government (Million US$)	Private (Million US$)	Total (Million US$)
Research	33.6 (8.2 %)	0.0 (0%)	33.6 (3.2%)
Capacity building of farmers	26.5 (6.4%)	0.0 (0%)	24.8 (2.3%)
Capacity building of VC stakeholders	55.9 (13.6%)	0.0 (0%)	55.9 (5.3%)
Planting material, Nurseries and renovation	34.0 (8.3%)	110.3 (17.1%)	144.3 (13.7%)
Value chain infrastructure/processing	124.5 (30.2%)	524.6 (81.4%)	649.0 (61.4%)
International marketing and linkages	3.0 (0.7%)	9.7 (1.5%)	12.8 (1.2%)
PMU	5.2 (1.3%)	0.0 (0%)	5.2 (0.5%)
Loan	66.4 (16.1%)	0.0 (0%)	66.4 (6.3%)
Total	411.9 (39.0)	644.6 (61.0)	1056.5

Way Forward

- **Bring average yield of a commodity closer to the world average level**
- **Reduce post-harvest losses from 50-30% to 25-10%**
- **Bring export-production ratio near to the world average ratio**
- **Bringing the Pakistan’s export price near to the world average,**
- **Bringing prices of 10% of the commodity sold within the country equal to the imported/exported price of the commodity**
- **Increase processing and value addition**
- **Reduce cost by adopting mechanized operation on certain area**

Opportunities in Agriculture Sector

- 8 mha cultureable waste for high value agriculture
- Plantation of palm oil and cotton along costal bet
- Marine cage culture for high value fish for exports
- Value added trade of branded products through cost effective high-tech processing
- Demonstration models for fully mechanized agriculture
- Cluster based rural transformation Chinese model
- Local seed production system with special focus on hybrids
- Human recourse development in high tech areas

THANK YOU