Food security, consumption, poverty and nutrition in Pakistan: What do we know and what can we do about it?

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بسم الله الرحمن الرحيم
Food Security, Consumption, and Nutrition

Food Security

Availability
- Production + Stocks
- Imports-exports

Accessibility
- Prices
- Income

Utilization
- Consumption
- Water, sanitation and Hygiene (WASH)
- Nutritional status

Sustainability
- Nutritional status
- Variability in availability, accessibility, utilization

Income

Poverty

Nutritional status

Resilience
World Hunger Facts – What do we know?

• About **842 million people** in the world do not eat enough to be healthy (FAO, 2013)

• Most of the world’s undernourished people are still to be found in **Southern Asia**, closely followed by sub-Saharan Africa and Eastern Asia. (FAO, 2013)

• A **third of all deaths** in children under the age of five in developing countries are linked to under-nutrition. (IGME, 2011)

• In the developing world, **one child in four** is stunted, meaning that their physical and mental growth is impaired because of inadequate nutrition. (The Lancet, 2013)
The Global Hunger Index

GHI = \frac{(PUN + CUW + CM)}{3}

- PUN = Undernutrition
- CUW = Child underweight
- CM = Child mortality
Global Hunger Index – Pakistan Borderline Alarming in 2014

<table>
<thead>
<tr>
<th>Country</th>
<th>GHI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>19.1</td>
</tr>
<tr>
<td>India</td>
<td>17.8</td>
</tr>
<tr>
<td>Nepal</td>
<td>16.4</td>
</tr>
<tr>
<td>Pakistan</td>
<td>19.1</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>15.1</td>
</tr>
</tbody>
</table>
Food Security in Pakistan - Availability
Percentage share of agriculture in GDP is declining overtime

Source: Economic Survey (various issues)
Growth rates in Agriculture are Declining and Low

Source: Economic Survey (various issues)
Shares of important crops are constant

Source: Economic Survey (various issues)
Yield per hectare of Major Crops are low and stagnant - except Maize

Source: Economic Survey (various issues)
Share of Labor in Agriculture is high and not declining as share of Agriculture in GDP declines (%)
The Total Number of Under 5 Acres Farms has More than Tripled since 1960
Limited Diversification in Crop Agriculture across all farm sizes

Source: Agriculture Census of Pakistan (1990; 2010)
Large variability of Crop Yields across Agro-climatic Zones in Pakistan 2010-11

<table>
<thead>
<tr>
<th>Zone</th>
<th>Wheat</th>
<th>Rice</th>
<th>Maize</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of Variation (%)</td>
<td>31.39</td>
<td>38.16</td>
<td>77.35</td>
</tr>
<tr>
<td>Mean</td>
<td>2,584 (811)</td>
<td>2,088 (797)</td>
<td>2,721 (2105)</td>
</tr>
</tbody>
</table>

Source: Computed from HIES (2010-11)
Pure Farm Households are a small proportion of Rural Households in 2014 (%)

- Farm house holds: 2.6%
- Nonfarm house holds: 64.1%
- Mixed house households: 33.3%
Food Availability in Pakistan
Food Prices are Rising in Pakistan

The chart illustrates the rise in food prices in Pakistan from 2000-01 to 2013-14 for various items:

- Wheat flour
- Basmati rice
- Moong
- Sugar
- Milk

Each item is represented with bars for different years:
- Orange: 2000-01
- Yellow: 2004-05
- Green: 2009-10
- Brown: 2013-14

The vertical axis represents the price in Rs/kg.
Average Supply of Calories per capita per day is only marginally higher than minimum subsistence requirement.
Food Accessibility in Pakistan
Share of Food expenditure of Poor Households is Very High

Source: HIES (various issues)
Share of food expenditure increased by 5 percentage points during 2007/08 – 2010/11

Differences in the Consumption Patterns of Poor and Non-poor (Pakistan 2010-11)

Source: HIES 2010-11
On Average more than 70% of food expenditure is spent on energy dense food (2010-11)

Source: HIES 2010-11
Poor Spend more on wheat and non-poor on Dairy (2010-11)

Source: HIES 2010-11
Calorie Consumption Differs very little across Poverty Status in Rural Areas (based on Official Data)

Source: HIES 2010-11
Dietary Diversity in Rural Pakistan 2014:
(% households reporting type of food items consumed in last 24 hours - PSSP)

Source: RHPS (2014)
Food Frequency Reported in last seven days 2014 (% of hholds - PSSP)

Source: RHPS (2014)
Wheat is the major source of energy

Source: HIES 2010-11
Trends in the Prices of Food Items

- Wheat flour
- Basmati rice
- Moong
- Sugar
- Milk

Rs/kg

Sharp Increase in the Price of Wheat since 2007-08

Decreasing ability to access: Kilograms of Wheat Flour that one Day’s Wages can Buy declining
Calories consumed and the cost of calories – (PSSP Study)

<table>
<thead>
<tr>
<th>Region or Population Group</th>
<th>Total Calories (per AE/day)</th>
<th>Food Expenditure (per AE/day) (Rs)</th>
<th>100 Calories cost Overall Food (Rs)</th>
<th>Calories from wheat (per AE/day)</th>
<th>Expenditure on Wheat (per AE/day) (Rs)</th>
<th>100 Calories cost from Wheat (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Poor</td>
<td>1,882</td>
<td>36.8</td>
<td>1.95</td>
<td>1,007</td>
<td>8.2</td>
<td>0.81</td>
</tr>
<tr>
<td>Rural Non-Poor</td>
<td>2,664</td>
<td>67.0</td>
<td>2.52</td>
<td>1,208</td>
<td>7.7</td>
<td>0.64</td>
</tr>
<tr>
<td>Urban Poor</td>
<td>1,782</td>
<td>40.1</td>
<td>2.25</td>
<td>881</td>
<td>9.2</td>
<td>1.04</td>
</tr>
<tr>
<td>Urban Non-Poor</td>
<td>2,289</td>
<td>74.8</td>
<td>3.27</td>
<td>872</td>
<td>7.3</td>
<td>0.83</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2,260</td>
<td>57.0</td>
<td>2.52</td>
<td>1,041</td>
<td>7.3</td>
<td>0.70</td>
</tr>
</tbody>
</table>

## Change in Prices and Income and Demand for Wheat 2010-11: (PSSP Study)

<table>
<thead>
<tr>
<th></th>
<th>Budget share on wheat</th>
<th>Expenditure elasticity</th>
<th>Own price uncompensated elasticity</th>
<th>Own price Compensated elasticity</th>
<th>Wheat-rice elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rural areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>22.9</td>
<td>0.84</td>
<td>-0.35</td>
<td>-0.165</td>
<td>-0.005</td>
</tr>
<tr>
<td>Non-poor</td>
<td>15.8</td>
<td>0.75</td>
<td>-0.35</td>
<td>-0.227</td>
<td>0.023</td>
</tr>
<tr>
<td><strong>Urban areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>20.0</td>
<td>0.92</td>
<td>-0.36</td>
<td>-0.155</td>
<td>-0.001</td>
</tr>
<tr>
<td>Non-poor</td>
<td>11.8</td>
<td>0.67</td>
<td>-0.20</td>
<td>-0.107</td>
<td>-0.002</td>
</tr>
<tr>
<td><strong>Pakistan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>22.0</td>
<td>0.81</td>
<td>-0.21</td>
<td>-0.163</td>
<td>-0.012</td>
</tr>
<tr>
<td>Non-poor</td>
<td>14.5</td>
<td>0.76</td>
<td>-0.39</td>
<td>-0.173</td>
<td>0.021</td>
</tr>
</tbody>
</table>

Estimates indicate that Increase in Wheat Price has possible adverse implications for other essential Human Development Indicators

- An increase in the price of wheat **may not result in substitution with other food items**
- However, **substitution with non-food items is possible**
- A substitution with health and education may worsen the already low human development indicators and may have adverse effect on already high levels of poverty in the country
- Serious implications especially for current **nutritional status** and productivity of future generation
- A reduction in the purchasing power of the wage earners can aggravate this situation further.
Food Utilization: Dietary patterns impact on nutritional status
Malnutrition among Women – Only 53 % are normal (BMI -official data)

Source: NNS 2010-11
Micronutrient Deficiency among Women (2001-2011 - official data)

Source: NNS 2010-11
Nutritional Intake among Women (24 hours food recall - official data)

Source: NNS 2010-11
Undernourished Females – Implications for Future Generation (World Bank Study, 2006)

• A malnourished woman is at higher risk of giving birth to an anemic or an underweight child (less than 2.5 kg)
• Such children have five times the risk of death in the first year and a high risk of growth failure during childhood
• Low birth weight may result in greater chronic diseases as an adult
• Severe iron deficiency anemia causes deaths during pregnancy and childbirth
• Iodine deficiency in pregnancy causes the birth of mentally impaired children
• Human and economic potential can be at risk by malnutrition
For Pakistan Malnutrition Results in:

• Child mortality
  • Low birth-weight babies (31.6% of live births in 2007) rank 3rd in 183 countries
  • Under five mortality rate (89 per 1000 live births, 2008-2012)
  • Infant mortality rate (74 per 1000 live births, 2008-2012)
  • Neonatal mortality rate (55 per 1000 live births, 2008-2012)

• Disability
  • About 2.65 % population was disabled in 2012 (based on the projections on 1998 Census), 2.54% was in 1998
  • Of these, 43% are children (1-15 years)
  • Of total disabled, 8.2% are blind, 7.5% deaf, 14% mentally retarded, 8.3% have multiple disabilities

• Probability of falling sick, loss in work days and income

Source: PDHS 2012-13
Source: UNICEF, State of the World's Children, Childinfo, and Demographic and Health Surveys by ICF International
Protein-Energy Malnutrition among Children official data (< 5 years of age - official data)

Source: NNS 2010-11
Micronutrient Deficiency among Children (2001-2011 - official data)

Source: NNS 2010-11
Nutritional Intake among Children 0-23 months
(24 hours food recall - official data)

Source: NNS 2010-11
Low Levels of Mothers’ Knowledge about Child Nutrition (PSSP data)

- Iron deficiency: 23.59%
- Iodine Rich Food: 25.59%
- Drinking Water Treatment: 14.06%

Source: RHPS (2012)
High and Variable Prevalence of Malnutrition (˂–2SD) by Province and Rural Pakistan (2013 - PSSP Study)

Source: Shahzad et al. (2013)
Comparison of malnourished children in NNS 2011 and RHPS 2013 (PSSP Study)

Source: Shahzad et al. (2013)
Logistic Regression Analysis (PSSP Study)

- **Dependent variables**: HAZ, WAZ, WHZ
  - $=1$ if malnourished (z-score $<-2$), 0 otherwise
- **Child characteristics**: age and gender
- **Mother Characteristics**: age at child birth, literacy
- **Household characteristics**: number of siblings, nuclear family, farm household, flush toilet, and poverty status
- **Community characteristics**: distance from BHU, LHV/LHW
- **Location characteristics**: Sindh and KPK
Results of Logistic Regression (PSSP Study)

• Incidence of malnutrition among children under five is highest in Sindh
• Improving hygienic conditions appear important to reduce long term malnutrition (toilet facility and safe drinking water)
• Access to health care services plays a significant role in reducing the short-term nutrition (LHW)
• Mother’s education improves the general state of nutrition among children under five
And child malnutrition is high across all expenditure quintiles (PSSP Study)

Source: Shahzad et al. (2013)
Results Indicate the Need for:

• Identification of malnourished population based on scientific method (mapping exercise)
  • Strong and accessible database for analysis; consistency in measuring indicators

• Moving towards nutrition-sensitive agriculture
  • Agricultural value chain
  • Kitchen gardening
  • Better storage facilities/techniques for agricultural products
  • Improved infrastructure and well functioning institutions (credit, marketing, etc)
  • Fortification and bio-fortification

• Creating awareness about nutritious diet (in schools and homes through media)

• Role of local institutions (e.g., LHW)

• Strengthen PINS and SUN through appropriate monitoring and evaluation
Malnutrition better indicator of Poverty

• Overall levels of poverty are high and calorie consumption is low across the board
• Children in all expenditure categories are equally affected
• Average calories intake of 80 percent households (bottom 4 quintiles) is 2211 when recommended allowance is 2350 calories
• Poverty and malnutrition are determined by the same variables
• Malnutrition indicators are often used as a proxy for poverty in international studies (Reinhard and Wijayaratne, 2002; Setboonsarng, 2005; Heltberg, 2009; Klaver. 2010)
• United Nation’s Millennium Development Goals first goal “eradicate extreme poverty and hunger.” Undernourishment and malnutrition are amongst the indicators for this goal
Malnutrition better indicator of Poverty (contd.)

• Nutritional Status is a more direct measure of the welfare of a people
  • It can be measured directly and in physical terms
  • not indirectly and through assumption based analysis such as those for money-metric measures of poverty which have proved very controversial in Pakistan
Summing up

• High prevalence of malnutrition in the country:
  • **Poverty** - Lack of resources at the household level to maintain the minimum daily allowance of essential nutrients; and
  • **Lack of awareness** about balanced diet and maintaining good health

• Focus of previous research on estimating numbers only

• **Food Security not fully understood or integrated into policies**
  • Little work on understanding the linkages between food security, consumption behavior and nutritional outcomes and variations across socio-economic groups and regions

• Need re-prioritization and evaluation of any previous policies and programs
Summing up

- **Limited Dietary Diversity**: Cereals, fats, sugars, and dairy products are the main sources of calories and macro-nutrients.

- The consumption of micronutrient rich foods is very low (vegetables and fruits).

- Average calorie consumption is lower than the recommended level of 2350 and unbalanced in terms of micro-nutrients.

- Wheat is the main source of calories, carbohydrate, and fiber.

- Current policy focused on availability of wheat tonnage through production and import. Little diversification away from four major crops.

- Lesser focus on accessibility, sustainability, and safety.

- Wheat consumption is price inelastic (implications for dietary diversity and household expenditures on education, health care, etc.?)
Implications for Poverty Reduction

• Addressing this alarming situation requires:

1. Urgent development and implementation of appropriate **multi-dimensional policies** for poverty reduction emphasising Food Security (with greater emphasis on access and utilization aspects), education (especially female), health and nutrition

2. More urgent **awareness building** about the gravity of the situation.
Some Comments on the Multidimensional Poverty Index
Pakistan is in the process of adopting a Multidimensional Poverty Index – this is an adapted and expanded version of the UNDPs Human Development Index

The MPI is the product of two components:

- **Incidence**: the percentage of people who are poor (or the headcount ratio, $H$);
- **Intensity**: the average share of indicators in which poor people are deprived ($A$).

$$\text{MPI} = H \times A$$
### Indicators of Multidimensional Poverty Index and Weights assigned to them

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Indicator</th>
<th>Deprived if....</th>
<th>Relative Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td>Years of Schooling</td>
<td>No household member has completed five years of schooling.</td>
<td>1/6</td>
</tr>
<tr>
<td></td>
<td>Child School Attendance</td>
<td>Any school-aged child is not attending school up to the age at which they would complete class 8.</td>
<td>1/6</td>
</tr>
<tr>
<td><strong>Health</strong></td>
<td>Child Mortality</td>
<td>Any child has died in the household.</td>
<td>1/6</td>
</tr>
<tr>
<td></td>
<td>Nutrition</td>
<td>Any adult or child for whom there is nutritional information is malnourished.</td>
<td>1/6</td>
</tr>
<tr>
<td><strong>Living Standard</strong></td>
<td>Electricity</td>
<td>The household has no electricity.</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>Improved Sanitation</td>
<td>The household’s sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households.</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>Safe Drinking Water</td>
<td>Water The household does not have access to safe drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minute walk from home, roundtrip.</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>Flooring</td>
<td>The household has a dirt, sand or dung floor</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>Cooking Fuel</td>
<td>The household cooks with dung, wood or charcoal.</td>
<td>1/18</td>
</tr>
<tr>
<td></td>
<td>Assets</td>
<td>The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.</td>
<td>1/18</td>
</tr>
</tbody>
</table>
Multiplicity of available data sources with very variable quality

- Demographic and Health Surveys
- Multiple Indicator Cluster Survey
- Household Income and Economic Surveys
- WHO Health Surveys

PLEASE FOCUS ON THE HUGE VARIABILITY IN NUTRITION ESTIMATES FROM THREE DIFFERENT SURVEYS IN 2001 IN THE NEXT SLIDE
Pakistan’s available data leave much to be desired

Levels of Malnutrition in Pakistan (1976 to 2013)

<table>
<thead>
<tr>
<th>Data source</th>
<th>Percent Underweight</th>
<th>Percent Stunted</th>
<th>Percent Wasted</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNS 1976</td>
<td>-</td>
<td>42.9</td>
<td>8.6</td>
</tr>
<tr>
<td>MNS 1985</td>
<td>51.5</td>
<td>41.8</td>
<td>10.8</td>
</tr>
<tr>
<td>PDHS 1990</td>
<td>40.4</td>
<td>50.2</td>
<td>9.2</td>
</tr>
<tr>
<td>NNS 1998</td>
<td>38.8</td>
<td>60.1</td>
<td>9.5</td>
</tr>
<tr>
<td>NNS 2001</td>
<td>42.3</td>
<td>32.5</td>
<td>11.2</td>
</tr>
<tr>
<td>PSES 2001</td>
<td>51.4</td>
<td>52.7</td>
<td>-</td>
</tr>
<tr>
<td>PRHS 2001</td>
<td>56.6</td>
<td>64.4</td>
<td>18.4</td>
</tr>
<tr>
<td>PPHS 2010</td>
<td>39.8</td>
<td>64.5</td>
<td>17.2</td>
</tr>
<tr>
<td>NNS 2011</td>
<td>33.3</td>
<td>46.3</td>
<td>16.1</td>
</tr>
</tbody>
</table>
Why Not a Happiness Index for Pakistan?

• Economic Wellness:
• Environmental Wellness:
• Physical Wellness
• Mental Wellness:
• Workplace Wellness:
• Social Wellness
• Political Wellness
Why is Pakistan not using the available BISP Poverty Scorecard Indicators Data – it has all the multidimensional information needed

- **Demographics**
  - Number of dependents – (age Less than 18 or greater than 65 and above)

- **Education**
  - Head education
  - The number of children from 5 to 16 years old currently attending to the school

- **Household Characteristics**
  - Room ratio
  - Kind of toilet

- **Assets**
  - At least one refrigerator, freezer or washing machine
  - At least one air conditioner, air cooler, geyser or heater
  - At least one cooking stove, cooking range or microwave oven
  - At least one TV
  - One car or one car with one moto
  - One moto (but no car)
  - One buffalo or bullock and at least one cow or goat or sheep
  - Neither buffalo, bullock nor cow, goat or sheep
  - Some agricultural land but less or equal than 12.5 acres
  - More than 12.5 acres of agricultural land
Pakistan Needs

• Simple Robust Real Time Measures
• Comparable over time and Space to capture changes over time and vast disparities across space.
• Minimal Data Requirements
• Easily Understood and applicable Methodology
• Confidence in the Measures
Thank you so much