## Introduction:

Unfortunately, in the world of today the gap between rich and poor is widening. Developed countries are simply more productive. For instance measured in GDP per capita for 2007, very basically assessed, a German on average had in gross terms 47 times "more to live from" than a Pakistani (WORLD BANK, 2008).

The importance of the concept of (Total Factor-) Productivity, the social infrastructure and human capital accumulation in relation with TFP for explaining economic growth and vice versa disparities worldwide shall be emphasized.

### Methodological Approach:

On the basis of the geometric index number theory the level and growth rate of agricultural Total Factor Productivity for Pakistan for the entire period from 1960–2004 is estimated. In order to test the contribution of Total Factor Productivity growth to economic improvement, inputs are not entirely treated as exogenous.

### TFP Estimation for Pakistan—The Importance of the Collective Infrastructure to Feed the Poor

Tropentag, September 14-16, 2010, Zurich

“World Food System — A Contribution from Europe”

### Productivity in Pakistan 1960–2004 — Results and Interpretation

<table>
<thead>
<tr>
<th>Province</th>
<th>Total Food Crop Area (in '000 ha)</th>
<th>Share in Total Food Cropped Area (%)</th>
<th>Yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>7694</td>
<td>18,10%</td>
<td>2189,609</td>
</tr>
<tr>
<td>Sindh</td>
<td>1664</td>
<td>37,74%</td>
<td>2316,732</td>
</tr>
<tr>
<td>N.W.F.P.</td>
<td>1398</td>
<td>4,53%</td>
<td>1330,483</td>
</tr>
<tr>
<td>Balochistan</td>
<td>462</td>
<td>28,40%</td>
<td>2189,609</td>
</tr>
</tbody>
</table>

**The geometric index of TFP**

\[ H = I + D + P \times \exp (\psi + S) \]

**The growth rate of TFP**

\[ \gamma = \frac{\ln Y - \ln K}{\phi + S} \]

The Concept of TFP:

since A (TFP) is a pure number, it carries no interesting information in itself. But changes in the number indicate shifts in the relation between measured aggregate inputs and Outputs and changes are assumed to be caused by changes in technology and changes in efficiency and/or in the scale of operations of countries.

### Conclusion:

Despite rising per capita income, food demand is likely to grow rapidly given the low level of current per capita income. Recent projections for future food supply and demand, call for sustained efforts for increasing production of essential items (wheat, edible oils, etc.). Faced with limits to further expansion of cultivated land and slowing returns to further input intensification, productivity growth assumes a central role in meeting the challenges of the future. In agriculture TFP explains a substantial part of growth. The periods of high/low agricultural growth have generally coincided with periods of robust/poor performance of the national economy. Over the entire period Pakistan’s agricultural TFP has grown with an annual average of 1.8%, however investments in agriculture as compared to other sectors remain very low. The analysis of the country’s collective infrastructure reveals the main determinants of failure being hidden in the political instability, the elitist political structure since independence in 1947 and corruption. Further research into the determinants of the productivity increases and decreases will be substantial.

Mirza Noman Ahmed, Justus-Liebig-University of Giessen, Agricultural and Development Policy, Germany