Cambodia’s Agriculture Productivity: Challenges and Policy Direction

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December 16th, 2019
Outline

1. Introduction
2. Research Objectives, Analytical Framework and Literature Review
3. Discussion of Research Findings
4. Conclusion and Policy Recommendations
1. Introduction:
Development of Agriculture Sector and Motivation of Study
Agriculture enjoyed strong growth during 2004-2013, mainly attributed to land expansion, introduction of new farming technique, and strong commodity prices....
The remarkable growth of agriculture significantly contributed to poverty reduction....

Source: World Bank and Author's Calculation based on CSES
....and provided employment and addressed food security

![Graph showing Employment in Agriculture Sector from 2008 to 2017]

![Bar chart showing Annual Surplus of Paddy Rice (2011-2017)]

![Bar chart showing Share of Undernourished, % of Population for 1991, 2000, and 2016]

Source: CSES, MAFF, and FAO
However…..

“Strong growth of agriculture in the past becomes the history over the last five years: 2014-2018”

“Boosting Agriculture Productivity is the Key to accelerate agriculture growth”
Key Focuses of Agriculture Development in RS4
(i) Enhancing productivity, quality, and diversification;
(ii) Upgrading processing industry and commercialization,
(iii) Promoting livestock and aquaculture,
(iv) Promoting vegetable production aimed at import substitution,
(v) Strengthening the management of economic land concessions;
(vi) Prioritization of investment in irrigation systems.
2. Objectives, Analytical Framework of Study, and Literature Review
Research Objectives

(1) To assess the current status of agriculture productivity growth including the growth of total factor productivity, land productivity and labor productivity in agriculture;

(2) To identify the critical challenges affecting the weak performance of agriculture productivity growth;

(3) To provide policy recommendations aimed at accelerating the growth of agriculture productivity—land productivity, labor productivity and total factor productivity in Cambodia’s agriculture.
Analytical Framework

Agriculture Productivity

- Land Productivity
  - Performance Critical Issues
- Labor Productivity
  - Performance Critical Issues
- Total Factor Productivity (TFP)
  - Performance Critical Issues

**Macro Level:** Law, Regulation, Policy, Public Investment etc.

**Micro Level:** R&D, Extension, Human Capital, Technology etc.
Concept of Agriculture Productivity

• **Agriculture Productivity** is measured as the Ratio of Agriculture Outputs to Agriculture Inputs.

• **Land Productivity**: Measures of land productivity—partial factor productivity (PFP) measures—are calculated as the *ratio of total output to total agricultural area.*
Labour Productivity: Measures of labour productivity—partial factor productivity (PFP) measures—are calculated as the ratio of total output to the number of economically active persons in agriculture.

TFP is an indicator of how efficiently agricultural land, labor, capital, and materials (agricultural inputs) are used to produce a country’s crops and livestock (agricultural output).
Global experience clearly demonstrated that enhancement of agriculture productivity was very important to boost agriculture growth....

Source: USDA
Macro Factors Affecting Agriculture Productivity

- Public Investment and Policy
- Human Capital
- Research and Technology Transfer
- Political Stability and Conflict

Source: FAO
Growth, Productivity, Commercialization and Diversification

- Commercialization and Agro Processing
- Growth of Agriculture
- Agriculture Productivity (Quantity or Quality)
- Factor of Production (Land Expansion, Other Inputs)
- Agriculture Commodity Price (Uncontrollable Factor)
- Diversification
3. Discussion of Preliminary Findings
Agriculture sector demonstrated remarkable structural transformation over the last five years.

Source: CSES and NIS
However, during 2014-2018, agriculture experienced much declining growth while its share to economy gets smaller....

Source: NIS
Much slower sectorial growth pushed its contribution to GDP growth to near zero...

**Contribution to Growth of Agriculture and Other Sectors**

- **2004-2008:** 8.5% (1.8%), 4.6% (1.0%), 6.9% (0.2%)

**Share of Contribution to Growth of Agriculture vs. Other Sectors**

- **2004-2008:** 83% (17%), 82% (18%), 97% (3%)

Source: NIS
And this weak growth performance has caused the agriculture value add per worker to extremely decelerate…….

Growth of Agriculture Value Add Per Worker by Country

Cambodia 19.3% 2.0% 3.7%
Thailand 4.8% 2.9% 1.4%
Vietnam 5.7% 2.0% 4.9%
Laos 2.5% 2.8% 2.9%
India 6.2% 3.8% 2.9%
Indonesia 4.6% 5.1% 5.6%
China 10.4% 10.3% 9.8%

Source: WDI
Factors Affecting Decelerating Growth of Cambodia’s Agriculture

- Slower Growth of Agriculture Sector
  - 1. Drop of Agriculture Commodity Price
  - 2. Extreme Weather Event
  - 3. Decelerating Growth of Agriculture Productivity (Land, Labor and TFP)
The combined effect of agriculture commodity price drop and extreme weather on agriculture growth was significant....

Agriculture Price Index (2010=100)

Economic Loss and Damage Caused by Flood and Drought, USD Million

Source: WB

Source: ADB and NCDM

2011 Flood 624
2013 Flood 356
2015 Elnino 1,500

Source: WB

Source: ADB and NCDM
Agriculture’s land productivity growth keeps decelerating....

Growth of Land Productivity by Country

Source: GFPR 2018
Softer growth of land productivity was reflected by declining growth of production yield.

Cereal Yield Comparison by Countries, Kilogram/ha

Annual Growth of Production Yield (Paddy Rice and Rubber)

Source: WDI

Source: MAFF
Factors Affecting Land Productivity

1. Degradation of Land Quality, Improper Use of Land, and Small Scale Farm Land

2. Limited access to water despite remarkable investment in irrigation scheme

3. Inefficiency of Labor—sowing seeds, spraying pesticide and cutting crops etc.

4. Low quality of agriculture inputs utilized (seeds, fertilizer, pesticide etc.)

Slower growth of land productivity was caused by four main factors.....
Limited spending on R&D could be the major constraint to boost land productivity.....

Source: MEF, CDC
The growth of labor productivity was much decelerating if compared to other peer countries’…..

Growth of Labor Productivity by Time Period

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</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>10.4%</td>
<td>55.8%</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>31.7%</td>
<td>20.7%</td>
<td></td>
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<tr>
<td>Vietnam</td>
<td>36.3%</td>
<td>10.3%</td>
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<tr>
<td>Laos</td>
<td>22.2%</td>
<td>30.8%</td>
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<tr>
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<td>12.6%</td>
</tr>
<tr>
<td>China</td>
<td>82.5%</td>
<td>34.9%</td>
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</tbody>
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Source: GFPR 2018
The annual public spending on extension services was estimated around 5.8% of total public spending in agriculture.

However, large percentage of farmers still do not have proper farming technique.

Messages of agriculture extension delivered to farmers by key actors are not consistent and the same.
Building the human capital of smallholder farmers can raise productivity, increase livelihoods and improve food security.

It plays a critical role in agricultural growth and development.

Human capital determines the quality of the labour force that can be employed in innovative activities.

Human capital plays important roles to promote labor productivity; however human capital in Cambodia remains low.

Source: World Bank
Cambodia experienced negative growth of total factor of productivity while other countries enjoyed the strong growth....
Study showed that **LOSS** during harvest of paddy rice is very significant—around **150-200kg** per hectare—equivalent to around **USD 300 million/annum**.

Despite no concrete number, past field consultation showed that farmers don’t appropriately use agriculture inputs (fertilizer, pesticide and amount of seeds).
The inefficiency of agriculture input use and mechanization could be explained by diverging trend of household’s income and spending…

Trend Analysis of Household Spending and Household's Income

Source: CSES
Slower growth of diversification has explained the reasons of declining growth of TFP Cambodia’s Agriculture....
Overall, decelerating growth of agriculture over the last five years would be reflected by the stagnant growth of both Agriculture Inputs and Agriculture TFP.

**Agriculture Inputs:**
- Land
- Labor
- Livestock Capital
- Machinery Capital
- Fertilizer
- Feed

**Agriculture Total Factor Productivity:**
Degree of Efficiency of Utilizing Agriculture Inputs

Source: USDA, Economic Research Services Office
The growth pattern would be on the upward trend with the increase of both Agriculture Inputs and Agriculture TFP.

Simulated Annual Growth of Agriculture Sector with Different Scenarios

- **Annual Agriculture Inputs Growth (2019-2030)**
- **Annual Agriculture TFP Growth (2019-2030)**
- **Annual Agriculture Growth (2019-2030)**

**Source:** Simulated by Researcher by Utilizing Data from USDA, Economic Research Services Office
4. Policy Recommendations
Constraint and Opportunity of Boosting Agriculture Productivity

**Constraints**

- Limited Land Expansion
- Concern about Environmental Sustainability
- Shortage of Labor and Increase of Labor Cost

**Opportunities**

- Rising Demand of Safe and Quality Food
- Expected natural land consolidation
- Rapid Development of Technology

Agriculture Productivity (Quantity or Quality)
<table>
<thead>
<tr>
<th>Increase Land Productivity</th>
<th>Enhance Labor Productivity</th>
<th>Accelerate TFP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rationalize and harmonize irrigation scheme.</td>
<td>1. Provide demand driven extension services through PPP approach.</td>
<td>1. Optimize the use of agriculture inputs</td>
</tr>
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<td>2. Improve land quality, enforce land zoning and natural consolidation.</td>
<td>2. Strategically focus on relatively niche product with higher value add rather than mass product.</td>
<td>2. Increase efficiency of mechanization through training to machinery (tractors) drivers.</td>
</tr>
<tr>
<td>3. Further invest in R&amp;D in good quality seeds and supply in the affordable manner.</td>
<td>3. Promote basic education and agro-entrepreneurship of farmers.</td>
<td>3. Promote diversification of agriculture commodities.</td>
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<td>4. Enforce the agriculture input quality control.</td>
<td>4. Unlock the potential of technology and educate farmers to utilize it.</td>
<td>4. Improve the infrastructure linkage and harmonization of planning and implementation</td>
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Thanks for Your Attention!!!!