United Nations Conference on Trade and Development

13th Multi-Year Expert Meeting on Commodities and Development

10-12 October 2022, Geneva

Facts and figures about the phosphate fertilizer market

By

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The views expressed are those of the author and do not necessarily reflect the views of UNCTAD.
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Why phosphate matters?

Phosphorus is an essential nutrient found in soil and water. Its economic and agricultural functions are essential:

• For agriculture.
• For industries. Industrial phosphates are used in a broad range of end uses including food, detergents, personal hygiene, high technologies (lithium iron phosphate battery Li-IP) and construction and account for only around 6–8% of global phosphate consumption.
• For medical sector. Phosphorus-containing drugs belong to an important class of therapeutic agents and are widely applied.
A key determinant of agricultural productivity (1)

- There are three critical nutrients for life: nitrogen, phosphorus and potassium.
- Added with irrigation and pesticide utilization, they can boost food productivity, stabilize food production and strengthen food security.
A key determinant of agricultural productivity (2)

- Crop yields grow with phosphorus concentration up to a plateau.
- Profitability increased and then decreased once the critical level of reached.
- Welfare change of phosphorus fertilizer is positive if agricultural profitability gains outweigh social gains (environmental costs of fertilizer use).

Source: NC State Extension Publications
Phosphate fertilizers market
Phosphate markets

• **Monoammonium and diammonium phosphate** (HS Code 310530 & 310540)
  Ammonia is added to phosphoric acid to produce MAP and DAP

• **Superphosphates** (HS Code 310310, 310311 & 310319)
  Superphosphates form a type of very efficient fertilizer due to a high phosphorus content and a higher rate of assimilation than simple phosphates.

• **NPKs, also called compound fertilizers** (HS Code 310520, 310551, 310559 & 310560)
  Fertilizers that contain the three basic nutrients, nitrogen, phosphorus and potassium in different proportions. There are many kinds of NPK products in the world.
International trade of phosphate products

Source: FAOstat (Share of trade in value for 2019-2020)
Phosphate markets

- Phosphate fertilizer production is closely related to phosphate rock extraction. It is an oligopoly market, with few major players.

- This is due to the nature of phosphate rocks (raw material) and deposits, as well as the strategy of countries with important phosphate deposits.

- 5 top phosphate fertilizer producers originate from countries with important reserves:
  - China (GPCG and YTH)
  - OCP Group (Morocco)
  - USA (Mosaic)
  - Russia (PhosAgro)
# Phosphate rock market

<table>
<thead>
<tr>
<th>Country</th>
<th>Production</th>
<th>Share</th>
<th>Reserves</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>85.000</td>
<td>38.6%</td>
<td>3.200.000</td>
<td>4.5%</td>
</tr>
<tr>
<td>Morocco</td>
<td>38.000</td>
<td>17.3%</td>
<td>50.000.000</td>
<td>70.4%</td>
</tr>
<tr>
<td>United States</td>
<td>22.000</td>
<td>10.0%</td>
<td>1.000.000</td>
<td>1.4%</td>
</tr>
<tr>
<td>Russia</td>
<td>14.000</td>
<td>6.4%</td>
<td>600.000</td>
<td>0.8%</td>
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<tr>
<td>Jordan</td>
<td>9.200</td>
<td>4.2%</td>
<td>1.000.000</td>
<td>1.4%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>8.500</td>
<td>3.9%</td>
<td>1.400.000</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

*Source: USGS. FY2021. Volume in thousand tons*
Phosphate product exporters

Agricultural Phosphate consumption

Source: FAOstat. In tons
Phosphate prices

Source: World Bank. "Pink Sheet" Data
Phosphate prices (2)

Source: World Bank. "Pink Sheet" Data
Phosphate fertilizer consumption per hectare of arable land

Source: Author’s calculations based on FAOstat data FY2019
Conclusion
The paradox(es) of phosphate (1)

• 1\textsuperscript{st} paradox: we need more phosphate as human population grows, but we consume less. How can we explain this situation?

• 2\textsuperscript{nd} paradox: prices are going up while average consumption is stagnant.

• 3\textsuperscript{rd} paradox: Africa has become a major player in P fertilizer production. How come its farmers still have a limited access to it?
The paradox(es) of phosphate (2)

- **Mr. Michael Wurmsen**, Norge Mining. Phosphates in Norway: Analysis of recent new deposit findings
- **Ms. Laura Cross**, International Fertilizer Association. Outlook of the fertilizer market
- **Mr. Kaushik Majumdar**, African Plant Nutrition Institute. The role of phosphorus in smallholder production systems and its sustainable management to improve crop yields
- **Ms. Jihane Ajjiti**, Office Chérifien des Phosphates, Morocco. Review of the industrial development of the OCP group and of its development projects in Africa
Thank you!