

Agriculture in high-growth markets

Securing global food supplies

A research report for Passion Céréales

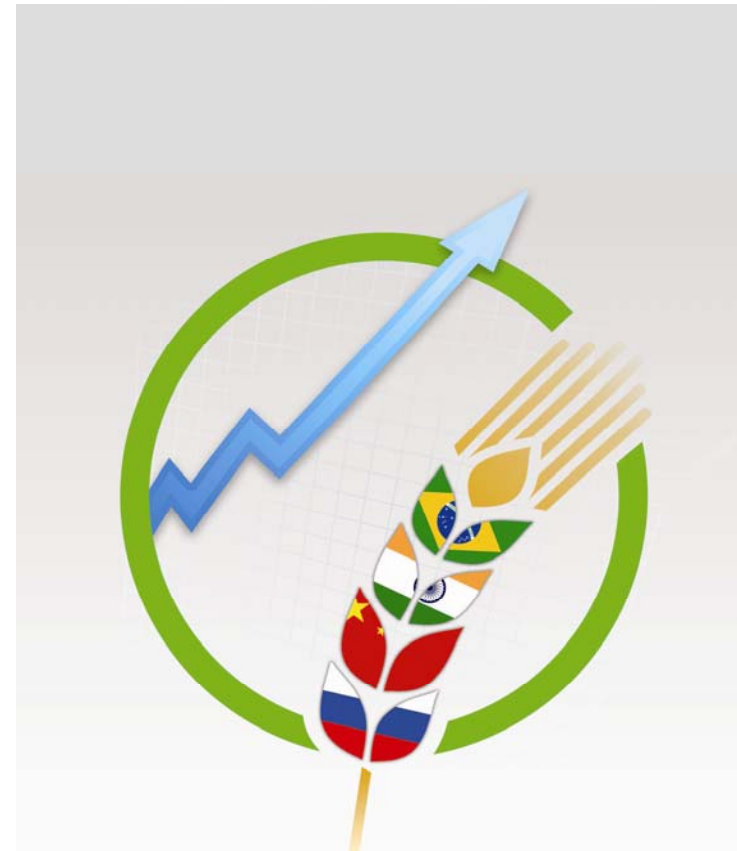
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**Passion
Céréales**
une culture à partager

Objectives of the research

Background

- The world is at the start of a new agricultural era.
- Brazil, Russia, India and China have been some of the world's most successful food producers over the last two decades.



White paper

- This study discusses the food supply challenges that the world faces in the coming decades; and investigates how the BRIC countries are addressing these.
- It examines the successful measures being taken to expand food production in high-growth markets.
- It suggests ways in which others can learn from these countries' successes...
- ... but also how the BRICs can further improve their own agricultural practices.
- The report suggests how best to cooperate to secure food supplies in the coming years.

About the research

Desk research and data analysis

- Sourced from a number of international organisations including:
 - **Food and Agriculture Organisation of the United Nations**
 - **International Food Policy Research Institute**
 - **World Economic Forum**
 - **The World Bank**



In-depth interviews with:

- **Dr Mauricio Lopes**, executive director of research and development, **Embrapa (Brazil)**
- **Dr Alysson Paolinelli**, president, **Abramilho (Brazil)**
- **Professor Jikun Huang**, director, **Centre for Chinese Agricultural Policy (China)**
- **Dr Dmitri Rylko**, general director, **Institute for Agricultural Market Studies (Russia)**
- **Dr Shenggen Fan**, director general, **International Food Policy Research Institute (US)**
- **Dr Mendes Ribeiro Filho**, minister of agriculture, livestock and food supply **(Brazil)**
- **Professor Ramesh Chand**, director, **National Centre for Agricultural Economics (India)**
- **Rustem Mirgalimov**, chief executive officer, **Razgulay Group (Russia)**
- **Dr Thaís Affonso**, head of business intelligence, **Syngenta (Switzerland)**

Key findings

1. Global food production must expand as much as 3% annually to meet demand.
2. Agriculture will increasingly be ecologically sustainable, technologically driven, and inclusive of small suppliers.
3. High-growth economies are acting decisively to boost agricultural productivity.
4. There is still scope for improvement in food productivity.
5. Lessons can be drawn from the experiences of the high-growth economies.
6. Closer global co-operation can drive food production.



Key finding 1: Expanding agricultural output

The rise and rise of food demand...

- Key drivers of this accelerating consumption:
 - growth in world **population**
 - increasing **prosperity**
 - the spread of **urbanisation**
- Prof Chand, director of the National Centre for Agricultural Economics and Policy Research (India):
 - 1990-2007: global annual growth in agricultural output at just over 2%
 - **2012-2030: this growth rate must rise to 3%**



... yet productivity is falling

- In the developed world, the speed of yield improvement has slowed: currently **only 1%** annually.

“The developed markets, like the US and Europe, have really under-invested in their agriculture.”

Shenggen Fan
director general of IFPRI, US

Key finding 2: The new face of agriculture 'Doing more with less'

Current challenges...

- Physical limitation of resources (degradation through salinisation and water-logging)
- Biofuel demands (Europe: 10% target for 2020, China: 15% for 2020)
- Environmental concerns – e.g. expansion into tropical areas
- Food-price volatility – domino effect between markets

“Agriculture in the next decades will be very much different to the agriculture we see today.”

Mauricio Lopes
executive director of R&D, Embrapa, Brazil

... call for new approaches

- Agriculture will become more **sustainable** – more efficient use of land, water and agrochemicals
- Agriculture will use **research** into plant breeding technologies – hybrids to drive crop yields and shorten crop cycles
- Improving **access** to advances in agricultural practices – so that productivity gains reach smallholders

Key finding 3: BRICs lead in boosting productivity

The figures...

- Stepping up public investment in support of agriculture:
 - China: 8% in 2005, up to **10% in 2011**
- Private investments by farmers have grown too:
 - India: from 12% to **17%** of GDP over past six years
- Agricultural research investments:
 - China: 2010-11, average growth of **20%** annually—versus **1.5%** growth globally

“A lot of our technology was not reaching farmers previously. It was not converted into innovation.”

Ramesh Chand

Director, National Centre for Agricultural Economics and Policy Research, India

... and the examples

- India
 - *Krishi Vigyan Kendra* – investing in rural structures to ensure that innovations reach farmers
- Russia
 - Grain Intervention Fund – stabilising prices in grain markets
- Brazil
 - Work on genetic resources – adapting crops to harsher climates
 - Weather-related rural insurance programmes – helping farmers to manage volatility

Key finding 4: Scope for improvement

Current obstacles

- Despite clear successes, food productivity in the BRICs can be increased yet further through:
 - **Access** – good agricultural practices and technologies are not being transferred to farmers
 - **Mechanisation** – **China**: 30% of the labour force works in farming
 - **Precision agriculture** – overuse of water and fertiliser is counterproductive
 - **Crop cultivation** – **India**: only one-third of the land provides two crops a year
 - **Infrastructure** – **Russia**: cost of food production is growing due to lack of adequate infrastructure

Focus: India

Soil health cards for farmers

- Since 2009, farmers are provided with fertiliser recommendations based on the specific requirements of their crops.
- The government plans to issue soil health cards to every farmer in the country by 2013.

“We need better agricultural protocols: that means the right product applied at the right time in the right quantity.”

Thaís Affonso
head of business intelligence, Syngenta
Switzerland

Key finding 5: Lessons from the BRICs

Success factors

- **Fostering an entrepreneurial environment**
 - Open to innovation and willing to test new technologies
- **A low level of state subsidies**
 - Subsidies can cause market distortion and may lead to efficiency loss – instead, the BRICs appear committed to productive investments in support of agriculture
- **Widespread adoption of modern plant breeding technologies**
 - Climate change will force regions to adapt their crops to new climates



“Elements of the BRIC countries’ success really are replicable. And at the same time, they present some kind of challenge to the rest of the world.”

Dmitri Rylko
general director, Institute for Agricultural
Market Studies, Russia

Key finding 5: Plant research and development

Why technology matters

- **Constraints to taking in new land, using more irrigation or using more fertiliser**
 - Main gains will come from agricultural research into new plant technologies
- **Improved cereal varieties account for 50% of yield increase over the past decades**
 - Bring new areas under cultivation
 - Create salt-tolerant, drought-tolerant plants
 - Create nutrient-efficient plants
- **Farmers need a genetically diverse portfolio of improved crop varieties...**
 - e.g. unlock central Ghana's agricultural potential
- **... but technology alone is not a solution**
 - Farmers also need fertiliser, management, infrastructure...
- **GM is not a panacea**
 - marker-assisted breeding could generate 1.5-2% yield growth p.a.

“Many countries in Europe are still against genetically modified organisms and biotechnology. That really limits [their] future agriculture or food production.”

Shenggen Fan
director general of IFPRI, US

Key finding 6: Opportunities for global cooperation

Sharing know-how

- Countries need to **share research capabilities**, technology and knowledge
 - BRIC agricultural cooperation agreement (2010)
 - Embrapa to open new laboratory in China in 2012
- **Cross-sector effort** needed:
 - Food-water-energy nexus
 - Linking farmers to PPPs
- **Geographic specialisation**: food must travel
 - Growing food where it is most cost-effective to do so
 - Connecting areas of surplus to those who need it

Focus: Brazil, Mozambique and Japan

Transforming the African savannah

- ‘The Project for Improving Research and Technology Transfer Capacity for Nacala Corridor Agriculture Development’ – one of the largest trilateral co-operation projects in the world
- Mozambique: 55 m ha of tropical savannah, but only 2 m ha are cultivated
- Area similar to Brazil’s *cerrado*: help African countries to leapfrog

Conclusions

- ❖ Demand for food will continue to accelerate, particularly in high-growth economies
- ❖ Limitations on resources will put pressure on food production
- This has already forced a rethink in the BRICs:
 - investments in agricultural research
 - new agricultural techniques (minimum-tillage farming, precision agriculture)
 - financial support for smallholder farmers (micro-insurance)
- **Best-practice actions** aimed at boosting agricultural productivity:
 - Fostering an entrepreneurial environment in agriculture
 - Maximising the potential of plant breeding technologies
 - Promoting closer international cooperation



An often polarised debate

- **Food for thought** and current myths around agricultural production and productivity:
 - Hi-tech and small farmers *do* go together...
 - ... yet technology alone is not the solution.
 - We cannot increase productivity by using more agrochemicals; but we cannot completely condemn them either.
 - Sustainability is not the enemy of productivity.
 - All farmers want better productivity for their acre. We need to help them to invest in their business.

Thank you

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