REPORT

2024

AGRICULTURE IN BRICS COUNTRIES:

expansion and deepening



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BRICS



PREFACE

The Action Plan 2021-2024 for Agricultural Cooperation of BRICS Members aimed to promote the exchange of knowledge and practices in the field of agricultural research and development was adopted in August 2021, on the eve of the 13th BRICS summit in New Delhi.

Egypt, Iran, the UAE, Saudi Arabia and Ethiopia entered into BRICS in January 2024. In addition, the applicant status has been assigned to another eighteen countries, and 14 states are in the application stage.

BRICS is not only a more diversified international platform for the elaboration and joint promotion of priorities on the global agriculture and food agenda. The group objectively increases its weight and potential in the global food security system. At the same time, additional incentives arise for rapprochement with and participation of a large group of countries of the Global South. Moreover, BRICS already accounts for 42% of forest resources, 29% of fish catch, 31% of agricultural land, 36% of arable land and 35% of fresh water reserves in the world. The share of BRICS in the global production of wheat is 48%, alongside 39% of corn and 55% of rice.

In this context, there is an urgent need for a drastic revision of the long-term BRICS strategy in the field of food security and agricultural policy, including the four-year BRICS Action Plan for Agriculture, which expires in 2024. The BRICS strategy on food and agricultural policy can become truly effective and successful if more integrative, comprehensive goals and priorities are formulated beyond bilateral agricultural trade, and an open and constructive dialogue on possible challenges is conducted with experts from agribusiness, research, innovation and technology institutes and associations.

New member states with different agriculture and food models may create synergies for mutually beneficial cooperation within the group, especially broader trade in agricultural products and raw materials (including fertilizers and feed), as well as vaccines for livestock. In this report, experts from the Russian Academy of Science's Institute of China and Contemporary Asia (RAS ICCA) and the National Coordinating Center (NCC) present an analysis of the agriculture and food potential of BRICS members and review key challenges, differences, possible synergy and potential cooperation areas.

> Kirill Babayev, NCC President, RAS ICCA Director







BRICS EXPANSION

FIVE NEW MEMBERS:

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Egypt, Iran, the UAE, Ethiopia and Saudi Arabia – have joined BRICS since January 2024. The expanded configuration makes BRICS a more diversified international platform unlocking new opportunities for the elaboration and promotion of joint priorities at international venues with the global agriculture and food agenda. Simultaneously, additional incentives arise for harmonizing interests of business, academic and research communities, including agribusiness and agricultural technology, in a new format of group interaction, including due to the growing interest of a large group of countries of the Global South in being involved in it.

With the BRICS expansion launched in 2024, its weight and potential in the global food security system is objectively growing, and new factors for synergy and complementarity of national agriculture and food systems are emerging. These factors should be analyzed through the lens of the entire spectrum of cooperation, from the potential of agricultural trade and agricultural markets, and the emergence of new global and regional food value chains, to the investment and financial potential of the agro-industrial complex (including the transition to settlements in national currencies), as well as growing collaboration in the field of science and research, technology and innovation, and finally, such crucial issues for all BRICS states as harmonizing food and veterinary standards and customs legislation, and ensuring high-quality and healthy nutrition.

The added value of the new, expanded BRICS also lies in the possibilities of influence and positioning on specialized international platforms, where the group can present more significant common positions on topical issues of food security and agricultural policy. At the same time, it should be recognized that the BRICS expansion poses additional challenges. New members make it more difficult to coordinate the intertwined or even opposite national interests and positions in the sensitive food sector.

Given rather different structures and potential of the national agriculture and food systems of the new members, it is much more difficult to reach a consensus on pressing issues of current agricultural policy, including export restrictions, principles of agricultural subsidies, food standards, pricing policy, etc.

In this context, there is an urgent need for a drastic revision of the long-term BRICS strategy for food security and agricultural policy, including the four-year BRICS Action Plan for Agriculture Cooperation, which expires in 2024. The BRICS strategy on food and agricultural policy can become truly effective and successful if more integrative, comprehensive goals and priorities are formulated beyond bilateral agricultural trade, an open and constructive dialogue on possible challenges is conducted with experts from agribusiness, research, innovation and technology institutes and associations.





ADDED VALUE OF EXPANDED BRICS

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Given the BRICS expansion, it is important to analyze the updated group potential by the widest range of key indicators in the field of food production and agriculture and food raw material markets, key agricultural resources (including fish, forest, soil and water resources), as well as consumer markets, investment flows and research capital in the agricultural sector in order to fully assess the new configuration and its role in the global agriculture and food system.

An initial comparative analysis of the share of the agricultural sector (including agriculture, fisheries and forestry) in national GDP among initial and new BRICS members indicates a significant strengthening of the agricultural component in the BRICS national economies after the expansion. Among the new BRICS members, Ethiopia (36%), Iran (13%) and Egypt (11%) are way ahead of many original members by the share of the agricultural sector in national GDP. For example, the average share of the agricultural sector in GDP of five main BRICS members stood at 7% before the expansion. It grew to 13% after the expansion.

FIG. 1.

SHARE OF THE AGRICULTURE AND FOOD SECTOR, INCLUDING AGRICULTURE, FISHERIES AND FORESTRY, IN NATIONAL GDP (2022)



Although a higher share of the agrarian sector in the national GDP of BRICS members is an important indicator, it is still insufficient for understanding a full and objective effect of the group expansion from the angle of BRICS added value and potential in the agriculture and food sector.



MANUFACTURING SECTOR

An analysis of the BRICS manufacturing sector after the expansion reveals two noticeable trends. On the one hand, the BRICS potential has markedly grown in terms of total value of agricultural production¹, mostly due to Iran. Tehran ranks the world's fifth by value of agricultural production, after China (\$1.6 billion), India (\$500 million), the United States (\$474 million), and Brazil (\$220 million). Its value of agricultural production grew more than ten-fold in 1991-2022, from \$17 million to \$188 million. Other members of the respective top ten are Egypt (\$37 million) and Saudi Arabia (\$24 million).

On the other hand, no fundamental shifts occurred in the production of key foods. After five new members joined BRICS, the production potential experienced a slight change within 1%-3%. The most significant is wheat production. New members increased the total share of BRICS in world wheat production from 45% to 48%, mainly due to the potential of Iran and Egypt. The growth of the BRICS share in world corn and rice production was insignificant, within 1%. In the corn market, the BRICS share increased from 38% to 39% of world production, mainly due to the potential of Ethiopia and Egypt, and a growth from 54% to 55% of world production was seen in the rice market, mainly due to Egypt.

¹ Value of agricultural production is calculated by methodology of the FAO Statistics Division based on primary production data from the manufacturing sector and consumer price data. The cost (value) of livestock products is calculated by the production and sale of raw (unprocessed) meat.

Source: FAO Stat

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In the livestock market, the real share of BRICS in the total of the main types of meat and dairy production increased by 2% - from 42% to 44% of the world market, mainly due to Egypt, Iran and, partly, Saudi Arabia. At the same time, the new BRICS members added 5% in the production of chicken, increasing its share from 67% to 72% of world production. The share of BRICS in the world raw milk production grew 3%, from 35% to 38%, mainly due to the contribution of Iran and Egypt.

TABLE 1.

COMPARATIVE ANALYSIS OF THE BRICS POTENTIAL FOR PRODUCTION OF KEY TYPES OF FOOD IN 2022 (MLN TN)

STATES	WHEAT	CORN	RICE	LIVESTOCK FARMING	POULTRY	RAW MILK
World production	808	1200	776	352	123	929
China	138	277	210	92	56	41
India	107	34	196	10	4,9	213
Russia	104	15	1	11,6	5,3	33
Brazil	10	109	10	29	14	36
South Africa	2	16	0,1	3,5	1,9	4
Initial BRICS members (total)	361	451	417	146	82,1	327
Iran	10	0,3	1,5	2,3	2,1	8,3
Egypt	9,7	7,5	5,8	3,2	2,5	5,4
Ethiopia	7	10	0,2	0,7	0,4	4,4
Saudi Arabia	0,8	0,5	0	1,3	1,1	2,7
UAE	0	2,3	0	O,1	0	0
New BRICS members (total)	30	20,6	7,5	7,6	6,1	20,8
BRICS (total)	391	472	425	154	88,2	349
BRICS (total) in %	48%	39%	55%	44%	72%	38%



Notably, the bulk of food produced in Egypt and Iran, the new BRICS members with the largest real share of agricultural production, is intended to meet growing domestic demand and accordingly accommodates domestic needs. This means that the export potential of the BRICS agricultural sector has grown on the average after expansion, but the increase was less significant than production. However, in certain categories of food exports, the real share of BRICS has grown significantly. In particular, Iran is a major global supplier of dried fruit and walnuts, controlling 5% of the world export market in both segments.

TABLE 2.

COMPARATIVE ANALYSIS OF THE BRICS POTENTIAL FOR FOREST, FISH, LAND AND WATER RESOURCES IN 2022

STATES	Forest resources (min hectares)	Fishing resources - catch (mIn tn per year)	Agricultural land (mIn hectares)	Arable land (min hectares)	Fresh water resources (bln cubic meters)	
World reserves	4000	92	4800	1383	42	
Russia	815	4,9	215	121	4,3	
Brazil	496	0,9	223	55	5,7	
China	220	13	521	108	2,8	
India	72	5,5	179	155	1,5	
South Africa	17	0,5	96	12	0,05	
Initial BRICS members (total)	1600	24,8	1234	456	14,35	
Iran	10	0,8	47	16	O,1	
Egypt	45	0,5	4	3	Ο	
Ethiopia	17	O,1	39	16	O,1	ler
Saudi Arabia	1	O,1	174	3	0	bal Wat d Bank
UAE	0,3	O,1	0,3	1	0	e of Glo 22, Worl
New BRICS members (total)	73	1,6	264	39	0,2	tat, Stat
BRICS (total)	1673	26,4	1500	495	14,55	: FAO S ces Rep
BRICS (total) in %	42%	29%	31%	36%	35%	Source Resour

Finally, with the expansion of BRICS, it is important to note the significant growth in the potential of human resources employed in the agro-industrial complex. In particular, if the average share of employment in agriculture was 20% in the initial BRICS format with the highest share in India (43%), then the average reaches 22% among the five new BRICS members, or even 63% in Ethiopia.

Obviously, it would be wrong to compare these figures in absolute values, taking into account demographic differences, as well as different levels of productivity and efficiency in the agricultural sector. But this indicator is extremely important from the point of view of the social dimension, since agriculture provides employment and livelihoods for households in these countries.



AGRICULTURAL RAW MATERIALS

Building the BRICS capacity to produce primary raw materials for the agricultural sector, including fertilizers, seeds and feed grains, is of paramount importance for the group positioning in the agricultural sector, including agricultural production and markets. An analysis of the consequences of BRICS expansion for building the group capacity in the global fertilizer production demonstrates mixed trends.

For example, the share of BRICS in the global production of potash fertilizers is ensured primarily by the production capacities of Russia and China and amounts to 26%, and the share has hardly increased with the accession of new members. At the same time, the share of the expanded BRICS in the production of nitrogen and phosphate fertilizers increased by 8% and 5%, respectively, reaching 51% and 59% of global production, respectively.

A rise in the production of nitrogen fertilizers was owing to the capacities of Egypt, Iran and Saudi Arabia, which are among the top ten producers of nitrogen fertilizers, while Saudi Arabia and partly Egypt contributed to an increase in the phosphate fertilizers output. In terms of feed grain production, China, Brazil, India and Russia together account for 33% of the global market and are among the top ten, and with the addition of new BRICS members, the potential has increased by 2%, owing to Iran and Egypt.

TABLE 3.

COMPARATIVE ANALYSIS OF BRICS POTENTIAL FOR FERTILIZER AND FEED PRODUCTION, 2022

STATES	Nitrogen fertilizers (mIn tn per year)	Potash fertilizers (mIn tn per year)	Phosphate fertilizers (min tn per year)	Feed grain (million tn per year)	
World total	117	43	46	1300	
Russia	9,4	5	4	36	
Brazil	0	0,2	2	83	
China	28	6	14	263	
India	13	0	4,7	53	
South Africa	0	0	0,2	0	
Initial BRICS members (total)	50,4	11,2	24,9	435	
Iran	2,8	0	0	13	
Egypt	3,4	0	0,4	7	
Ethiopia	0,4	0	0,2	0	
Saudi Arabia	2,8	0	1,7	0	
UAE	Ο	0	0	0	
New BRICS members (total)	9,4	0	2,3	20	
BRICS (total)	59,8	11,2	27,2	455	FAO Stat
BRICS (total). %	51%	26%	59%	35%	Source:

In terms of seed production and export, BRICS does not have a significant advantage, given the traditional dominance of U.S. and European companies in this area. However, in terms of prospects for domestic trade within BRICS, new initiatives may be implemented to establish international cooperation between leading seed exporters within BRICS (Russia, India and China) and major importers from among new members (Egypt, Saudi Arabia, UAE).

TABLE 4.

COMPARATIVE ANALYSIS OF LEADING SEED EXPORTERS AND IMPORTERS WITHIN BRICS (2020)

	Leading BRICS exporters	Annual exports (metric ton)	Leading BRICS importers (new members only)	Annual imports (metric ton)
	Russia	220 000	Egypt	114 000
	India	85 000	Saudi Arabia	47 000
	China	38 000	UAE	24 000
	Leading world exporters		Leading world importers	
	The Netherlands	1 137 000	Belgium	1 427 000
eed Lorporat	France	820 000	Italy	829 000
ernational S(The U.S.	530 000	The Netherlands	726 000
source: Int	World total	7 264 000	World total	7 502 000



INVESTMENT AND FINANCIAL POTENTIAL

In a global context, there has been a significant reduction in the volume and geography of foreign direct investment in the agricultural sector (including agriculture, fisheries and forestry) over the past decade (2013-2023) due to various factors, which coincides with the general trend of reducing foreign direct investment. At the same time, the agricultural sector is traditionally underestimated by investors, and attracts much less investment than such sectors as energy, finance, technology, construction, etc.

In the global ranking, the BRICS members do not demonstrate impressive results, since the bulk of foreign direct investment in the agricultural industry - in addition to large industrial countries - is now directed to dynamically developing countries in the Asia-Pacific region (Indonesia, Vietnam). Among the BRICS members, the leader in attracting foreign direct investment in the agricultural sector is Brazil (\$600 million to 700 million per year), followed by Egypt (\$20 million per year), which is in the third ten countries in the world by this indicator. At the same time, China is the leading foreign investor in the agricultural sector in BRICS (\$800 million to 900 million per year), followed by India (\$200 million to 300 million per year).

At the same time, the UAE and Saudi Arabia, as new active players in the FDI market, especially on the African continent, are not yet actively investing in the

agricultural sector of developing countries, and there is certainly great untapped potential for growth here. Both of these new BRICS members currently allocate around \$18 million to 24 million annually for all purposes as foreign investment in the economies of other countries, which is still significantly lower than the financial resources allocated by leading Western countries, which average \$50 million to 100 million per year.

Another potential point of growth, after the expansion of BRICS, is the role of the UAE and Saudi Arabia as new powerful forces of attraction for foreign investment, some of which can be directed to financing projects in the agricultural sector, thus creating new drivers for joint innovative, environmentally sustainable and high-tech projects in the BRICS format.

Given the limited natural and human resources to ensure food sovereignty, both are solving the problem by introducing modern technologies for sustainable use of land and water resources, as well as robotics in agriculture. It is no coincidence that, in 2023, the UAE ranked the world's second after the United States in terms of attracting foreign direct investment to finance projects in the green economy. The total volume of such investments exceeded \$15 billion (a 36% yearon-year growth). Notably, Dubai retained its position as the leading city in the world by attracting green investments, ahead of Singapore and London.

At the same time, BRICS partners such as India, China and Saudi Arabia ranked second, fifth and sixth, respectively, among chief investors in green economy projects in the UAE, totaling \$5.3 billion, or over 30% of all investments. However, sectoral analysis of investments shows that despite all these achievements, only a very small part of foreign direct investment in the UAE's green economy is directed specifically to the agricultural sector. They mostly accumulate in the oil and gas sector (\$2.6 billion), business services (\$1.8 billion), renewable energy (\$1.5 billion), electric vehicle manufacturing (\$1.5 billion), as well as in the IT, telecommunications, aerospace, and logistics sectors. Even a minor redirection of these investment flows from India, China, and Saudi Arabia to the agriculture and food sector could lead to significant structural shifts within the framework of cooperation within BRICS.

Besides foreign direct investment, which many BRICS members increasingly assess negatively from the angle of Western transnational corporations' ability to establish their influence and rules of the game in national markets, especially in the sensitive agricultural sector, an important indicator is the scale of development financing. Unlike profit-oriented and commercially beneficial targeted investments of international or regional corporations, finance for development (FDA) includes various models of loans and credits for farms, among them microloans, which are poured into the agricultural sector through international financial institutions, global and regional development banks, UN special agencies and other partners.

In these terms, the new BRICS members are the undisputed leaders - Egypt attracts \$2 billion per year on average in development financing of the agricultural sector, alongside \$400 million attracted by Ethiopia. Iran stands out

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among the new BRICS members by investment in the agricultural sector. Amid the current international sanctions, it is still isolated from global and regional financial and investment resources for development purposes, but it certainly has a significant internal potential due to its agricultural resources and especially its production capacity (the fifth country in the world in terms of value of agricultural production).



RESEARCH AND DEVELOPMENT POTENTIAL

The most important indicator of the agriculture research potential is the amount of national spending on respective research and development (R&D). According to the UN, this type of investment brings the most effective and profitable return among all types of investment activities in agriculture.

In terms of spending on research and development (R&D) in the agricultural sector, the initial members – China, India and Brazil – lead among BRICS members. Over the past decade, China has been able to increase its spending on agricultural R&D manifold, from \$1.3 billion to \$ 6.6 billion. By the end of 2022, China ranked the world's first by this parameter, overtaking the United States, India and Brazil, whose spending totaled \$5.6 billion. At the same time, Brazil and India hold the third and fourth positions in the global R&D spending in the agricultural sector.

In total, China, Brazil and India account for 15% of global agricultural R&D expenditures, which amount to about \$70 billion per year. At the same time, developing states' expenditures in this investment package do not exceed 2%. Of the initial BRICS members, Russia and South Africa are still the outsiders by this indicator. For example, Russia allocates about \$30 million to 40 million annually for agricultural R&D, while South Africa allocates \$130 million.

New BRICS members, even such dynamic economies as the UAE and Saudi Arabia, are far behind the world leaders by this parameter. The lag of the new BRICS members is significant, even though the states with an average level of development have significantly increased the share of their allocations to support research and development in the agricultural sector in recent years, especially such Asian countries as Vietnam and Indonesia.

Nevertheless, it is Saudi Arabia and the UAE that can potentially act as new BRICS investment hubs in the field of scientific research and development in agriculture. In particular, Saudi Arabia has been increasing investments in environmentally sustainable and green technologies in agriculture year after year. To this end, the Kingdom has established the National Research and Development Center for Sustainable Agriculture, which is implementing ambitious and large-scale research projects on greenhouse gases and vertical farming.

The private sector in Saudi Arabia is implementing innovative farming projects aimed at sustainable food production, including Neom Food, AeroFarms, and Red Sea Farms. Finally, the Saudi Agricultural Development Fund has approved a \$1 billion investment plan for 2024-2025, and intends to use part of this to finance experimental research.



CONSUMER MARKET

In the area of food consumption, the accession of new members has naturally complicated harmonization and coordination of BRICS policies and approaches in the area of food and veterinary standards, in particular due to differences in national certification systems and various financial models for ensuring nutrition at the national level. A chief indicator in this field is the cost of healthy food by purchasing power parity (PPP), which is formed under the influence of various production, trade and investment factors, as well as climate change, and directly affects the economic access of the population of BRICS members to quality healthy food.

Among the new BRICS members, healthy food is the most expensive in Iran and Egypt – it costs \$5.13 and \$4.55 per person per day, respectively, which is higher than the world average (\$3.96 per day). The high cost of food production in these states is due, in addition to economic factors (both are net importers of a number of key types of agricultural products), to the increasing negative impact of climate cataclysms and low resilience of national agriculture and food systems to these new challenges. Taking into account the size of national GDP and the level of economic development, the population of these states has a rather limited access to healthy food. At the same time, Russia leads by this indicator (\$2.9 per person per day), followed by the UAE and China.

FIG. 2.

COST OF HEALTHY FOOD PER PERSON IN U.S. DOLLARS PER DAY BY PPP IN BRICS MEMBERS



Source: FAO Stat





ANALYSIS OF SYNERGY FACTORS

The expansion of BRICS and the creation of a more diversified food production, trade and consumption structure has objectively created new factors that may, in the medium and long term, stimulate synergy between the initial and new BRICS members and lay a foundation for a stronger and more strategic partnership in the agriculture and food sector.

FACTOR 1

More Organic and Complementary Models of Agriculture and Food Systems

A more balanced, diversified coalition of states with complementary interests and points of contact is being formed within the expanding BRICS space. In terms of agricultural potential, the initial BRICS format represented, first of all, a powerful raw materials and production group of states with a high level of national food sovereignty and significant influence in global agricultural markets.

The emergence of new members with different agriculture and food models may encourage synergy for mutually beneficial cooperation, especially larger trade in agricultural products, agricultural raw materials (including fertilizers and feed), and vaccines for livestock. Such synergy can eventually lead to the appearance of stable, sustainable supply chains within BRICS.

For example, Egypt, the UAE and Saudi Arabia are large net importers of foods, including wheat and meat and dairy products, which leading exporters such as Russia, Brazil and China can supply. At the same time, there is an impressive potential for expanding bilateral and multilateral agriculture and food trade.

In turn, China exports most of its food to the United States, Japan and neighboring countries in the Asia-Pacific region, while food trade with the UAE and South Africa does not exceed \$200 million to 250 million per year, and with Saudi Arabia and India varies within \$100 million to150 million per year. Establishing cooperation in the veterinary and phyto-sanitary track may also be promising, where states such as Ethiopia, South Africa, Egypt and Iran need to receive modern quality vaccines for the livestock industry, which Russia and China can provide.

FACTOR 2

New Financing and Investment Models (example)

Another promising area for synergy within the expanded BRICS could be mutual financing of agricultural projects and research and development,

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in addition to technology and innovation exchange.

Using its own or affiliated financial mechanisms (New Development Bank, Asian Infrastructure Investment Bank), BRICS can offer new, innovative forms of investment in the agriculture and food sector of poor states as opposed to the outlived traditional donor aid through Official Development Assistance (ODA) channels.

On the one hand, the accession of the UAE as a new major financial player increases financial support for projects through BRICS development institutions, including in the agriculture and food sector (balancing the dominance of Chinese capital). Opportunities also open up for attracting Arab financial mechanisms to support BRICS objectives, including the Islamic Development Bank, and the UAE Sovereign Wealth Fund.

On the other hand, the accession of countries such as Egypt and Ethiopia creates conditions for pilot financing of agriculture and food development projects under the auspices of BRICS in Africa on an equal basis, with a focus on national priorities, including the creation of local production, scientific potential and infrastructure, as well as local full-cycle agriculture and food chains, as opposed to ineffective donor assistance through Official Development Assistance (ODA) mechanisms. This type of investment, in case of sufficient profitability, will help build and formalize new international mechanisms for financing agriculture and food systems under the auspices of BRICS.

FACTOR 3

New Strategic Food Trade Hubs

The new BRICS configuration opens up opportunities for strategic positioning and creation of an integrated network of regional hubs for better coordinated and harmonized trade in food, as well as agricultural raw materials, including fertilizers, seeds and vaccines. Such a network could potentially play an important stabilizing role in stable, sustainable food supplies, protected by the BRICS umbrella from the threat of unilateral restrictions and sanctions on the food track, practiced by Western nations. There are several prerequisites for such synergy.

Firstly, Iran, the UAE, Saudi Arabia and Egypt, given their geo-economic location, are potentially key hubs for agriculture and food trade in the Middle East and North Africa, as well as for the trade transit from Asia to Europe and Africa. At the same time, Iran and the UAE play a critical transit role in the North-South corridor context. Landlocked Ethiopia stands out among the new BRICS members.

Secondly, as global agricultural trade decentralized in 1995-2023, accelerated by the coronavirus pandemic, and the role of the United States



and Western Europe as dominant transport hubs weakened (possibly irreversibly) due to the strengthening of China, Russia, and South Africa, the entire trade system is being regionalized. This process has a significant impact on the emergence of new transport and logistics infrastructure and transport flows.

Following a drastic transformation of global trading systems in the last few decades, all five new BRICS members – Iran, Egypt, Ethiopia, the UAE and Saudi Arabia – are now part of a single regional trade cluster with Russia, India and South Africa, which unites Eurasia, the Middle East, South Asia and a significant part of Africa. China plays a systemically important role in another trade cluster, which includes its neighbors in the Asia-Pacific region.

Notably, back in 2013, an entire group of future BRICS members, including South Africa, Iran, Saudi Arabia and the UAE, belonged to regional trade clusters associated with China and India, while Russia was integrated into another trade cluster associated with the post-Soviet space and Eastern European countries.

FIG 3.

EVOLUTION OF REGIONAL AGRICULTURE AND FOOD TRADE CLUSTERS (1995-2019)



FACTOR 4

Technology and Innovation Prospects

The expansion of BRICS creates a broader platform for dialogue and cooperation in agricultural technology and innovation in a number of promising areas.

Firstly, this is about exchanging advanced technologies designed to increase agricultural productivity. Here, the main initiator is the UAE, which - given the national challenges facing the country - leads in the development of the most

advanced, sustainable technologies for vertical farms, hydroponic farming, aquaculture production and fish farms. Iran specializes in the introduction of robotic systems and drones for greenhouses and arable land, and also has an extensive network of satellite weather and climate monitoring. Ethiopia specializes in the creation of large agro-industrial technology parks to increase productivity and modernize agriculture.

Secondly, new promising markets are opening up for financing agro-tech startups. Egypt is the second largest startup market on the African continent after Nigeria, but does not invest enough in the agricultural sector. For example, in 2021, Cairo raised \$446 million in venture capital to fund startups, but only 2% was allocated to agricultural development.

Thirdly, an important task that could unite BRICS members on the technological track could be a unified digital system of early climate warning for small and medium-sized farms based on cooperation between national hydro-meteorological services. Such a system could be in high demand for the new BRICS members, as it would allow them to gain access to advanced satellite data and remote sensing technologies for monitoring and preventing adverse climatic and environmental disasters, including droughts and floods, as well as the reproduction of insects and pests.

Fourthly, the expansion of BRICS opens new windows of opportunity for cooperation in plant and animal genetic resources. The national genetic resource banks play an important role in the selection of seeds and feed and, accordingly, in the growth of agricultural productivity, since they ensure the ability of crop and livestock production to withstand climatic and environmental changes, as well as various infectious diseases. In particular, in the field of plant growing, Ethiopia is ranks the world's fifth by the size of germplasm collections (plant seed samples), behind China, Mexico, India and Brazil, and has the world's largest national collection of teff seeds (a cereal crop, a type of millet) and one of the largest national collections of coffee seeds.

Fifthly, there are a number of promising tracks in the field of agricultural biotechnology, that could serve as an additional unifying factor of the expanded BRICS. For example, Iran is one of the world's leading biopharmaceutical hubs, producing vaccines important for livestock farming. The Iranian Biotechnology Society has been operating since 1997, and two national institutes (the Razi Vaccine and Serum Research Institute and the Pasteur Institute) are the leading regional vaccine manufacturers for Ethiopia and Egypt.



ANALYSIS OF POST-BRICS-EX-PANSION CHALLENGES

CHALLENGE 1

Models of National Agro-Industrial Systems are at Various Development Stages

The national agro-industrial complex systems of BRICS members are at different stages of evolution. Therefore, many BRICS members are catching up with other partners. The imbalance has been increasing with the accession of new members.

TABLE 5.

MODELS OF NATIONAL AGRO-INDUSTRIAL SYSTEMS OF BRICS MEMBERS (FAO METHOD-OLOGY)

Agricultural and food model (in order of evolution)	States
Crisis	Ethiopia
Traditional	India
Expanding	Egypt
Diversifying	China, Iran, South Africa
Emerging	Russia, Brazil, UAE, Saudi Arabia
Industrial	-

It seems difficult to implement a common, coordinated policy on global platforms under the new conditions, given different national priorities. BRICS members objectively have different, inconsistent focuses on financing, subsidies and other forms of state support for the agro-industrial complex. There are also significant differences in the structure of the agro-industrial complex. Small and medium-sized farms constitute the foundation of China's agricultural sector, whereas large agribusinesses control production in Russia and Brazil.

In addition, the hidden costs of food², influencing the domestic pricing policy, also vary significantly. Most of the hidden costs are accounted for by social support in states with a less developed model, such as Egypt, Iran, Ethiopia, and India. For example, their governments have to disburse

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large subsidies for the production of bread, as well as fuel for food transportation, in order to provide basic foods for the majority of the poor, socially disadvantaged population.

² The term of hidden cost of food is hereafter used in this report in accordance with the FAO methodology, which estimates the economic cost of marginal damage to the environment (greenhouse gas emissions), resources (water, soil) and human health as a result of food production and consumption at the global and national levels.

The same states bear high environmental costs of climate disasters, since their agricultural systems are more vulnerable and have low resilience to droughts, floods, infectious diseases, insect pests, etc. In particular, India, given the size of its economy, bears the highest costs in the world by combating malnutrition and supporting poor farmers in rural areas, which are the main element of the hidden cost of food in this country.

For countries with a more advanced model, such as Russia, the UAE, Saudi Arabia and China, the main share of hidden costs in agricultural and food prices is associated with improving the quality of nutrition, raising food standards, and ensuring a healthy diet, including overcoming the obesity problem.

Due to its size, China is the world leader by hidden costs of maintaining food quality and a healthy diet, and India, Brazil, Russia and Saudi Arabia also lead by this parameter. At the same time, two new BRICS members, Saudi Arabia and the UAE, have the biggest share of obese residents, 41% and 33%, respectively.

TABLE 6.

HIDDEN COSTS OF AGRICULTURAL PRODUCTS DEPENDING ON THE MODEL

AGRICULTURAL AND FOOD SYSTEM MODEL	ENVIRONMENTAL COSTS (GDP SHARE BBIT, %)	HEALTH, HEALTHY FOOD COSTS (GDP SHARE, %)	SOCIAL SUPPORT COSTS (GDP SHARE, %)
Crisis	18	8	17
Traditional	6	8	8
Expanding	5	8	1
Diversifying	4	9	0
Emerging	3	7	0
Industrial	2	4	0

CHALLENGE 2

Different Levels of Food Security and Nutrition

The differences of this level, especially between initial and new BRICS members, exacerbate the imbalance in the national food security and nutrition priorities. For example, the undernourished population amounts to practically a quarter in Ethiopia, while it does not exceed 6% among the initial BRICS members. This does not mean that the approaches of BRICS members to global food security issues addressed on international platforms differ a priori, while they directly affect the setting of priorities, including financing, social policy, agricultural trade and markets, etc.

Due to these differences, BRICS members have set different priorities for national agricultural and food policies, food security strategies and positioning on international platforms. While for most of the initial BRICS members (except India) the problem of food security has been largely resolved at the national level, fighting poverty, hunger and malnutrition and strengthening food security, remains a real pressing problem and a high priority for agricultural policy of some new BRICS members.



TABLE 7.

COMPARATIVE ANALYSIS OF BRICS STATES BY THE SHARE OF UNDERNOURISHED POPULATION

State	2006 (%)	2023 (%)
Ethiopia	37%	22%
Iran	5,4%	6,5%
Egypt	5,9%	8,5%
Saudi Arabia	4,5%	3%
UAE	7,8%	2,7%
India	21,4%	13,7%
China	7,1%	Less than 2.5%
Brazil	6,2%	3,9%
Russia	Less than 2.5%	Less than 2.5%
South Africa	3,4%	8,1%
Initial members (average)	8,1%	6%
World	12%	9%



CHALLENGE 3

Different National Food Standards

This factor objectively complicates the efforts towards harmonizing customs, veterinary and phyto-sanitary legislation and standardization within the new BRICS configuration. In particular, BRICS members are at polar levels in the issues of economic and physical accessibility of healthy food (healthy diet) for the population, and the admission of new members adds to this disunity, especially considering Ethiopia and Egypt, where the share of the population that does not have access to healthy food is very high. Thus, BRICS members formulate food security standards depending on the different access to quality healthy food.

FIG. 4.

BRICS STATES BY SHARE OF POPULATION WITH NO ACCESS TO HEALTHY FOOD, 2022



Source: 2024 State of Food Insecurity in the World (SOFI) report by FAO, WFP, UNICEF, WHO and IFAD.

CONCLUSIONS AND RECOMMENDATIONS

The large-scale expansion of BRICS, which started in 2024 and doubled its size (from five to ten members), brings new opportunities, prospects and challenges for cooperation and the group's positioning in food security, agriculture and food policy, and agricultural development.

A comparative analysis of the BRICS potential "before" and "after" for various elements of the agriculture and food system (raw materials-production-processing-consumption), including investment, technology and science, human and economic potential, revealed a whole range of synergy factors between initial and new BRICS members, which make the group more balanced and complementary in terms of the interests of the agricultural sector and agribusiness.

Building a comprehensive multidimensional strategy to replace the BRICS Agriculture Action Plan 2021-2024, which expires in 2024, in the context of new realities, potentials and opportunities, will become the cornerstone of the new BRICS partnership in this sector. It is important to identify potential growth drivers for fully unlocking the potential, and to create strong horizontal ties between agribusiness, academic and research communities of ten BRICS members for the sake of deeper integration.

In addition, it is advisable to outline the contours of a new global mechanism for the joint promotion of BRICS interests in global food security and agriculture and food policy at international venues, including UN agencies. This strategy could eventually become an important center of attraction for other countries of the Global South potentially interested in deeper cooperation in the BRICS format with the prospect of accession.

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