



HOW GLOBALIZATION AND THE NEED FOR INCREASE IN WORLD EFFICIENCY REQUIRE BOTH KNOWLEDGE AND AGRARIAN ECONOMIES

Vedant R Iyer

Pinnacle High International School

Abstract

With the growth of knowledge economies and the importance of information being palpable, the production, distribution and use of this knowledge in all aspects of society is increasingly significant. When global ‘foodbaskets’ like Ukraine and Russia have threatened food security around the world, when demand for food and agriculture from China, India and Sub-Saharan Africa particularly is expected to grow considerably over the next decade and when the need for improvements in the agricultural sector to prevent any environmental ramifications is at its highest, the aim of this study is to show the significance of moving from resource-based agriculture to knowledge-based, scientific and sustainable agriculture.

Keywords: Knowledge-based; sustainable agriculture; food security; intellectual capital; Knowledge Economy Index

INTRODUCTION

The advancements in technology and enhancements in knowledge indeed hint at a potential shift from traditional agrarian economies to knowledge economies. Knowledge is essentially information, and can be instilled in every economic structure. The World Bank says that to participate in the knowledge economy, a country needs four “pillars”:

1. an educated and skilled population
2. technology infrastructure
3. a *regime* that encourages technology and entrepreneurship
4. a tightly knit network of public and private research organizations

The future of economies, however, must not be seen as Knowledge “or” Agrarian, but Knowledge “and” Agrarian. With PwC estimating that roughly 1.5 million new people become part of the global metropolitan population every week, there’s no getting away from the fact that agrarian activities will always be necessary. [1]

Theory

Theoretically, the growth of knowledge and intellectual capital in an economy broadens the scope of the resources in an economy, whether that is the flexibility of labor or the innovations in technology. Revamping an economy’s resources channels from the idea of resource-based production to knowledge-based production, which develops the resources in itself. To enhance distribution of knowledge and human capital, education must undeniably be improved. These intellectual gains can then be implemented in crucial sectors like agriculture to combat the



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challenges posed in the form of climate change and food insecurity. Agricultural modernization must be in place for developing nations to achieve high-income status. Modernization also helps achieve humanitarian goals by raising incomes and productivity of poor farmers, lowering food prices, and augmenting soil fertility and in turn, nutrition. A nutrition intervention in Guatemala led to a 46 percent increase in wages for these children as adults above those who did not receive the intervention. [2]

Experimental

Moving from theory, the effectiveness of knowledge in boosting productivity must be assessed. Attributed to the World Bank’s Knowledge Economy Index (KEI), the experiment uses the institution’s 4 pillars of the knowledge economy, as shown in Fig 1, and 12 knowledge indicators, where each one accords to one of the 4 pillars, as demonstrated in Table 1.

PILLAR 1 Economic and institutional regime	PILLAR 2 Education and skills	PILLAR 3 Information and communication infrastructure	PILLAR 4 Innovation system
The country's economic and institutional regime must provide incentives for the efficient use of existing and new knowledge and the flourishing of entrepreneurship.	The country's people need education and skills that enable them to create and share, and to use it well.	A dynamic information infrastructure is needed to facilitate the effective communication, dissemination, and processing of information..	The country's innovation system—firms, research centers, universities, think tanks, consultants, and other organizations—must be capable of tapping the growing stock of global knowledge, assimilating and adapting it to local needs, and creating new technology.

Fig. 1 The four pillars of the knowledge economy [3]

Pillar	Indicator
Economic and institutional regime	<ul style="list-style-type: none"> • Tariff and non-tariff barriers • Regulatory quality • Rule of law
Education and skill of population	<ul style="list-style-type: none"> • Adult literacy rate • Gross secondary enrollment rate • Gross tertiary enrollment rate
Information infrastructure	<ul style="list-style-type: none"> • Telephones per 1,000 people • Computers per 1,000 people • Internet users per 1,000 people
Innovation system	<ul style="list-style-type: none"> • Royalty payments and receipts, US\$ per person • Technical journal articles per million people • Patents granted to nationals by the U.S. Patent and Trademark Office per million people

Table 1 Mapping the knowledge indicators to the four pillars of the knowledge economy [3]



Each country is scored from 0 to 10 on each of these indicators, and the KEI is then constructed by eliciting a simple average of the 12 scores. A KEI score that is close to 10 implies relatively good development of the four knowledge economy pillars as compared to other countries, while a score close to 0 indicates relatively poor development.

RESULT

Taking the case of Iran during 2008-2009 in this study, the average of KEI increased from 4.07 to 5, inferring a relatively “poor performance” of Iran in this index. Moreover, the results also showed the positive implications that capital stock, employment and the Knowledge Economy Index have on agricultural growth. Out of the elasticities of capital stock (0.26), employment (0.075) and that of the Knowledge Economy Index (0.90), the most significant one is of the KEI, deducing the importance of knowledge in agriculture. [4]

DISCUSSION

While the results depict how imperative knowledge in economies is, and how it can significantly increase agricultural growth, over-reliance on the same may not always be beneficial. The knowledge economy may have elongated the income inequality between high-skilled and low-skilled workers, which may worsen the income distribution considerably in developing countries driven by agriculture. The knowledge economy may also be a factor behind the rise of the ‘Gig economy.’ This creates more opportunities for those with high intellectual capacity, but those with lower skills may find work increasingly temporary and low-paid, increasing job-insecurity. Knowledge must not be restricted to these two sectors, but in fact, must be pervaded around the world, even in diplomacy! The war in Ukraine has increased the importance of agriculture extensively, with Russia and Ukraine accounting for about 29 % of the global wheat export market.

Substantively, Ukraine’s contribution to the world food market in 2021 is equivalent to the food of about 400 million people, not counting the population of Ukraine. By 2030, it is planned to provide food for 1 billion people worldwide. [5]

With respect to climate change, the agriculture sector, together with forestry and other landuses, contributes nearly a quarter of all anthropogenic greenhouse gas emissions (GHGs). Half of this share comes from direct agricultural emissions, mainly from livestock, with most of the rest from deforestation of which agriculture is the main driver. These, once again, do not point at a need to shift from agrarian economies, but need for innovations in such economies.

CONCLUSION

Actions are urgently needed. Urgently, to tackle food insecurity and the climate crisis. According to estimates by the UN Food and Agriculture Organization, COVID-19 has led to a sharp increase in undernourishment with between 720 and 811 million people in the world facing hunger in 2020, 118 million more people in 2020 than in 2019. [6] These improvements require intellectual capacity. Farmers in many OECD countries have made improvements in the use and management of nutrients, pesticides, energy and water, using less of these inputs per unit of land. Farmers have also made good progress in adopting more environmentally beneficial practices, such as conservation tillage, improved manure storage, or soil nutrient testing. [7]



At the forefront of these issues, policy makers must take radical measures. Keeping in mind the results of the World Bank mentioned above, governments need to innovate and foster innovation. In India, the National Innovations in Climate Resilient Agriculture (NICRA) project launched by the Indian Council of Agricultural Research analyses certain villages, and forecasts the level of risk of climate change events through the aid of research and technology. This information then enables them to help build farmers' resilience to climate fluctuations and extreme weather conditions.

Digital opportunities are vast. Tools and technologies can assist governments to improve consumer health and the sustainability of food systems. These tools can be used to encourage consumers to buy healthy and nutritious foods and foods produced through sustainable farming practices, as well as to reduce asymmetries of food labelling schemes. They also contribute to more effective food data collection systems that can inform policy decisions, including by combining commercial sales information with national dietary intake survey data.[8] Lastly, the benefits of globalization must be exploited, by expanding the distribution of global knowledge. First, globalization allows countries to gain easier access to foreign knowledge. Second, it enhances international competition—including as a result of the rise of emerging markets—and this strengthens firms' incentives to innovate and adopt foreign technologies.

REFERENCES

- G.F. Hounbo “The importance of agrarian development in India Agriculture – the lifeblood of humanity” IFAD.org
<https://www.ifad.org/en/web/latest/-/blog/the-importance-of-agrarian-development-in-india>
- J.Lin “Agriculture is key for economic transformation, food security, and nutrition” IFPRI.org
<https://www.ifpri.org/blog/agriculture-key-economic-transformation-food-security-and-nutrition>
- Knowledge for Development (K4D) Program, Knowledge Assessment Methodology and Knowledge Economy Index, The World Bank Institute, Washington, DC
https://web.worldbank.org/archive/website01030/WEB/IMAGES/KAM_V4.PDF
- S.Naghavi, The role of knowledge-based economics in the agriculture growth of selected countries, with an emphasis on Iran.
http://www.iranianjae.ir/article_36553.html?lang=en
- [5]The Odessa Journal, “Ukraine feeds 400 million people in the world and will feed a billion by 2030”
[Ukraine feeds 400 million people in the world and will feed a billion by 2030 | odessa-journal.com](http://odessa-journal.com)
- [6]OECD, “Better agro-food policies are crucial to improving global food security”
<https://www.oecd.org/agriculture/topics/food-security/>
- [7] OECD, “Agriculture and the environment”
<https://www.oecd.org/agriculture/topics/agriculture-and-the-environment/>
- [8]OECD Library, “Digital opportunities for demand-side policies to improve consumer health and the sustainability of food systems”
https://www.oecd-ilibrary.org/agriculture-and-food/digital-opportunities-for-demand-side-policies-to-improve-consumer-health-and-the-sustainability-of-food-systems_bec87135-en