

Strategic Analysis Paper

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Food and Water Shortages Looming in Sub-Continent

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Summary

The Indian sub-continent region faces some significant challenges in the next century. A combination of population growth, a reduction of arable land and the increasing living standards, will place pressure on food and water security in the region.

This paper takes a close look into three countries in the region: India, Pakistan and Bangladesh. It investigates what each country is facing in the foreseeable future and how they are dealing with the challenges.

Analysis

India

India is one of the fastest growing economies in the developing world. In recent times, India has experienced economic growth rates as high as 10 per cent, as in 2006. As a result of the 2008 global recession, India has suffered in the same way as most economies, experiencing a decline in economic growth particularly due to a fall in exports, their first decline in five years. However, the economy has begun to show signs of a recovery with growth in its annual gross domestic product (GDP) reaching 8.8 per cent in the second quarter of 2010. India is set to continue its strong economic rise in Asia, along with China, into the foreseeable future with its recently announced plans to create a workforce of 150 million skilled people by 2022. India plans to achieve this through the introduction of ten skill development centres and four sector skill centres this year. These are only a couple of the strategies the Indian Government plans to undertake to sustain its high levels of economic growth over the long term.

India has the second largest population in the world, behind only China, with a population estimated at more than 1,150 million people. This is three times the number of people living in the United States. However, India's population has not exploded in recent times. In fact, India has been experiencing a slowdown in population growth since the 1970s, with a slight climb in 1985. India currently has an estimated population growth rate of 1.41 per cent. It could be said that India's population growth has been slow and sustained, which is not

usually the case for developing countries where population growth is expected to be rapid. If current trends continue, some estimates indicate that India is set to overtake China as the most populous country by at least 2050, with a population expected to reach 1.6 billion people¹.

India has a vast amount of arable land totalling about 1.45 million square kilometres, or just fewer than 50 per cent of the total arable land area. The agricultural sector contributed 17 per cent to the country's GDP in 2009. Furthermore, the sector provides the country with a solid employment base, where 52 per cent of the labour force is associated with agriculture². However, India needs to take into account both its population growth projections and the high rate of urbanisation, which have had an impact on the agricultural sector. There has been a rapid conversion of arable land to non-agricultural uses, such as the increasing development of residential areas and industrial facilities to cope with the country's growth rate.

The increasing growth of India's economy has trickled down to its occupants in the form of increased wealth. However, this wealth is not shared by all; India still has a large gap between the rich and poor. Poverty is still a major issue because 37 per cent of India's population is considered to be living under the poverty line; that is, 400 million Indians live on less than \$US1 per day. Poverty rates are also different between urban and rural populations. The urban population has benefited more from India's growing economy than the rural population. However, the improved overall living standards of urban areas have produced a positive impact upon the rural poor who rely upon the sale of agricultural produce. Growth in the rural economy is one of the main driving forces in the reduction of overall poverty in India; this emphasises the importance of the agricultural sector, particularly for the rural population.

Feeding India's entire population has become an important issue that needs to be addressed. Statistics from the Food and Agriculture Organization of the United Nations (FAO) indicates that the Indian population is undernourished by an average of 260 kilocalories per day (2004-2006 statistics), which puts a large part of the population at risk of health problems associated with undernourishment. The number of undernourished people in India has continued to increase over time. The 2005-2007 statistics from the FAO indicate approximately 237.7 million people were affected; an increase from 172.4 million in 1990-1992.

Further complicating this issue of inadequate nutrition and food, India's forecast population growth and increasing personal incomes are expected to put pressure on the nation's food security, particularly the production of, and demand for, food commodities such as wheat and rice. Population growth is expected to increase the demand for food, while an increase in personal income is likely to lead to a change in dietary patterns. The increase in demand for basic food commodities will place upward pressure on prices, which will have substantial consequences for the Indian population; particularly the poor, as 80 per cent of their income

¹ http://www.futuredirections.org.au/admin/uploaded_pdf/1284537436-FDI%20Strategic%20Analysis%20Paper%20-%2015%20September%202010.pdf

² <https://www.cia.gov/library/publications/the-world-factbook/geos/in.html>

is spent on food. Even though food is available, price increases will reduce peoples' purchasing power and deprive them of their recommended daily intake.

As a result, food security is an issue India needs to address, in both the short-term and long-term, to keep food commodity prices down and affordable. However, India needs to find a balance between short-term and long-term food security policies. Reports have indicated that over 30 tonnes of wheat and rice have been stored in government warehouses, yet a large portion of the population is undernourished and going hungry³. Furthermore, over the years, India's food grain supplies per capita have dropped between 10 to 15 per cent, even though output has been relatively stable. One of the reasons for this is India's emphasis on exporting large volumes of food grains since the mid 1990s, resulting in smaller volumes being available to the domestic market.

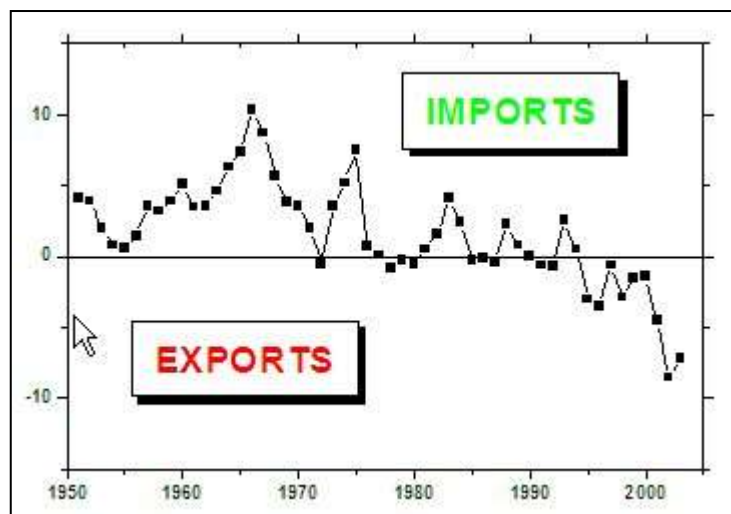


Figure 1. Imports and Exports of Food Grains (in Millions of Tonnes)
 Source: <http://www.indiatogether.org/photo/2005/agr-output.htm>

The domestic consumption of wheat and rice was estimated at 132 million tonnes in 2000. In the current year, estimates indicate that the consumption of wheat and rice will grow to 170 million tonnes, and reach 211 million tonnes by 2020. However, production this year of wheat and rice combined is estimated at 166 million tonnes, which means that there is a production-consumption deficit of four million tonnes. This deficit is expected to continue into 2020, when the combined production of wheat and rice is estimated to reach 198 million tonnes, resulting in a 13 million tonne deficit. If these estimates prove to be accurate, it is likely that India will become a net importer of wheat and rice as well as other cereals and grains.

Water availability is also going to become a concern for India in the coming decades. Currently, India is in an insecure position on water availability. In a paper called "The Himalayan Challenge: Water Security in Emerging Asia" (2010), published by Strategic Foresight Group (which is further discussed in an article published by Future Directions International "Water Security in India: The Coming Challenge" (2010)), statistics indicated that India's water availability per capita was at risk of being declared "water stressed" by the World Bank in 2006, when it had 1,730 cubic metres of water available per person. The World Bank considers volumes lower than 1,700 cubic metres of water per person a "water

³ http://epress.anu.edu.au/narayanan/mobile_devices/ch09s02.html

stressed” country. The paper also indicates that by 2030, the availability of water in India is expected to drop to 1,240 cubic metres per person, which means that the country will be close to being considered “water scarce”. However, India’s large and growing population is not the main cause of increasing water usage. Instead, it comes down to inefficient water usage and lack of water storage facilities. The continuous reduction in available water will have a negative impact on Indian life, especially agriculture and food security but also the economy in general. Thus, India needs to work on improving its water usage and water storage facilities. However, there is evidence that India has begun addressing these problems, with possible solutions discussed and tested. One possible solution relates to “interlinking” river basins by the construction of canals, so that electrical power can be utilised to transport water from wet regions to dry regions⁴.

Water scarcity is not the only water problem India faces. Water quality is also of concern. It is estimated that over 200 million people in India do not have clean water to drink, while a 2001 census of Indian households reported that 30 per cent had no access to safe drinking water. Unclean water in India usually contains chemical contaminants such as fluorides, arsenic and selenium. Those who get their drinking water from groundwater systems are further exposed to an increase in the concentration of chlorides, total dissolved solids, nitrates and iron compounds. As a result of the low water quality, there is a heavy burden on the health of the Indian people. It has been estimated that over 37 million people are affected by waterborne diseases each year, with 73 million working days lost as a result, and about 1.5 million children dying from diarrhoea alone. A background paper by Water Aid called “Drinking water quality in rural India: Issues and approaches” (2008) has estimated the economic burden of poor water quality at \$600 million a year.

Over the next 25 years, India’s total population is expected to grow by about one percent per year. About five-sixths of this growth will be in the working-age population. Society, therefore, will remain fairly youthful.

But India has significant regional disparities in its population profile. This is the result of the “great north-south fertility divide.” The north, for instance, which includes parts of the Ganges river basin and some western districts, has high fertility levels with women having four or more children. In the south, however, fertility levels are below population replacement levels.

The result of this dichotomy is that two very different types of India are emerging. The north is characterised by a rapidly growing, youthful, population akin to that of a traditional third-world society. In the south, on the other hand, population growth has come to an end and a pronounced aging process is taking place.

This demographic divergence could hamper economic growth. Future workers increasingly will have to come from the north. Yet India’s continued economic growth requires relatively well-educated workers and the north is known for its low-levels of schooling.

This disparity, of course, reflects the education situation in India today. Certainly India can boast of millions of university graduates. But they represent a small portion of the

⁴ <http://www.ecoworld.com/waters/indias-water-future.html>

population whose general education levels are low. Several generations will be needed to change this situation.

Pakistan

Pakistan has the sixth largest population in the world, with a population estimated to be close to 175 million people. Pakistan's population growth rate has been relatively stable but slowly declining over the years. The growth rate hit its peak in the 1970s at 3.19 per cent per annum, but has since slowed to an estimated 1.56 per cent in 2010. The government plans to further reduce this rate to 1.3 per cent per annum by 2020. A possible reason for this could be a lack of sufficient water, resulting from population growth and rapid urbanisation, inadequate housing stock and a relatively young population (39 per cent of the population is under 14 years of age). Even with its targets to slow down population growth, Pakistan is expected to become the fourth most populous country by 2050, with a population closing in on 335 million people⁵.

The Pakistani economy has experienced instability over the past decade. After dropping to a GDP growth rate of 2 per cent in 2002, its lowest point, the economy surged upwards to its most recent peak of 9 per cent in 2006, a considerable turnaround. However, since then, apart from a 1 per cent rise in 2008, the economy has not looked promising and has dropped back down to 2 per cent in 2010⁶. It could be argued that the economy is unlikely to recover the growth it experienced between 2002 and 2006, as it is now dealing with the effects of possibly the worst floods in its history, which have left at least four million people homeless and eight million in urgent need of humanitarian aid.

Pakistan has a land area of just over 770 thousand square kilometres, of which nearly 25 per cent is considered arable land. Like India, the agricultural sector is relatively important to Pakistan. It contributed 20 per cent to the annual GDP and employed up to 43 per cent of the labour force in 2009. However, with a significant portion of land suitable for agricultural purposes and a great reliance on the agricultural sector, Pakistan is susceptible to natural disasters such as earthquakes and severe flooding, which significantly reduce agricultural production.

Pakistan has a significant growing middle class, estimated to be 30 million people. The upper class is also expected to continue growing. That said, the strong economic growth between 2002 and 2006 seems to have had a positive economic impact on the less privileged. For example, the World Bank has revealed that the poverty rate was reduced 50 per cent, down to 17.2 per cent, under the former President, Pervez Musharraf, between 2001 and 2008. The reduction in poverty was the result of the economic growth and President Musharraf's emphasis on reducing poverty. With the impact of the 2005 earthquake still being felt and the recent floods, it is likely that the number of poor people will continue to increase into the foreseeable future.

Pakistan has a relatively high rate of undernourishment among its population. Statistics from the FAO for the period 2004-2006 indicate that Pakistan's population is undernourished, on

⁵ http://www.futuredirections.org.au/admin/uploaded_pdf/1284537436-FDI%20Strategic%20Analysis%20Paper%20-%2015%20September%202010.pdf

⁶ <http://www.tradingeconomics.com/Economics/GDP-Growth.aspx?Symbol=PKR>

average, by 280 kilocalories per day. This shortfall in kilocalories has risen from 260 in 1995-1997, perhaps indicating signs of food scarcity pressured by an increasing population. The number of undernourished people has also grown significantly since 1995-1997, from 26.9 million people to 43.4 million people in 2005-2007. This is equivalent to nearly one-quarter of the country's population.

Pakistan's high rates of undernourishment and food scarcity highlight the key issue of food security. The poor have restricted access to food supplies and the prices of staple commodities play a critical role in this situation. The poor in Pakistan are automatically put at a disadvantage when the prices of such commodities rise; the problem is particularly acute when they reach a level in which they cannot afford to purchase enough to meet their daily needs.

Like most developing Asian countries, wheat and rice are staple foods of the Pakistani diet. Wheat production for 2010 is estimated at 25 million tonnes, one million more than the previous year, while rice production is estimated at 6.3 million tonnes, a slight fall from the 6.5 million tonnes of the previous year. However, consumption of wheat for 2010 is expected to stand at 18 million tonnes. This represents a drop from the usual level, which exceeds 20 million tonnes. The drop in wheat consumption has been caused by the declining purchasing power of individuals, higher inflation rates, and possibly an over reliance on the consumption of wheat. The outcome is likely to be a surplus in the production of wheat for 2010. However, this surplus does not mean that wheat is a secure source of food for Pakistan, because there have been years when natural disasters, such as droughts and extensive flooding, have turned an expected surplus into a deficit. For rice, consumption is estimated at 2.2 million tonnes annually. However, a significant proportion of rice production is exported to other nations⁷, making it one of the main exports of Pakistan. As a result of the surplus in production, rice may become an important food commodity to ensure future food security in the event that the production-consumption ratios of other food commodities begin to move into deficits.

Water scarcity is becoming an important issue for Pakistan as its population continues to grow. Water availability has dropped significantly since the 1950s when it had 5,000 cubic metres of water available per capita. Today's estimate is less than 1,500 cubic metres per capita. It is expected that this figure will drop below 1,000 cubic metres per capita by as early as 2020, making Pakistan "water-scarce". Such a low amount of water available per person is believed to impede the development of the country and harm human health. Besides its growing population, other reasons that have contributed to Pakistan's decline in water capacity include: inefficient irrigation, which is where 90 per cent of its water resources go, environmental degradation and insufficient regulation of water supply usage. Thus, possible solutions to Pakistan's water scarcity issue lie in investing in water saving technology and innovations, upgrading existing infrastructure, researching and developing crops that are less water intensive, and looking at water allocation strategies.

Bangladesh

⁷ http://www.dailytimes.com.pk/default.asp?page=2010\09\19\story_19-9-2010_pg5_12

Bangladesh is estimated to have a population of just over 156 million people, the seventh largest population in the world. Bangladesh's population growth rate has been declining since 1975, when it had a peak rate close to 3.4 per cent. The population growth rate is expected to fall to 1.29 per cent in 2010. This growth trend is expected to continue into the foreseeable future. The Government has placed a major and growing emphasis on controlling population growth. According to the UN, its population is expected to climb over 181 million people in 2015 and past 200 million by 2050, based on the current population growth rates. The growing population is likely to continue to challenge the country's government and its economic resources.

Bangladesh's economy has been moving along steadily since its independence in 1971. Over the past decade it has experienced some of its highest growth rates, with a peak in 2006 when GDP rose 6.5 per cent. The GDP rate for 2010 is estimated at 5.7 per cent, making it one of the top performing countries in the region, although slightly lower than that of India. Bangladesh's economic growth rate has been significantly aided by foreign investment and its large garment and agriculture sectors. One of the benefits accrued from Bangladesh's consistently high economic performance over the past decade has been a reduction in poverty and improvements in health and education.

As previously mentioned, the agricultural sector has played a significant role in Bangladesh's economic success. The sector employs nearly half of the labour force and contributes nearly 20 per cent of the country's GDP. The agricultural sector has been helped by the availability of large areas of arable land, an ample water supply and fertile soil. Bangladesh has a total land mass of 144,000 square kilometres, of which roughly 55 per cent is considered arable land⁸. However, the country is susceptible to natural disasters such as floods, droughts and cyclonic storms, which reduce both harvesting quantities and farmers' incomes.

The depletion of arable land for farming has become a concern for Bangladesh as it tries to cope with housing an increasing population in a relatively densely populated country. It is estimated that Bangladesh is losing 212 hectares of land every day, as a result of industrial expansion and demand for human accommodation. If this continues, 1.4 million hectares of arable land is expected to be lost by the agricultural sector by 2021; by the end of the century, almost all of it will be gone. One suggested solution to deal with the increasing demand for human accommodation is the introduction of multi-storey flats.

Bangladesh's recent economic prosperity has resulted in an increase in wealth in some sectors. The middle class has benefitted the most, with over 10 per cent of the population falling into this group. It is expected that if economic growth remains the same, the proportion of Bangladesh's population in the middle class will close in on India's (30 per cent) and Pakistan's (18 per cent). However there are still significant disparities between upper-class and lower-class citizens.

On food security, Bangladesh is in a similar position to India and Pakistan. Bangladesh's population in 2004-2006 had a food deficit per person of 290 kilocalories, though decreasing from 320 in 1995-1997. Such a large deficit in the recommended daily intake leaves the population prone to health risks from undernourishment. However, the number of

⁸ <https://www.cia.gov/library/publications/the-world-factbook/geos/bg.html>

undernourished people in the Bangladesh has fallen by 12.5 million people since 1995-1997 to 41.7 million people in 2005-2007.

In Bangladesh, rice is one of the main commodities. Rice production in 2010 is expected to remain unchanged at 32 million tonnes, while wheat production is expected to drop to 850 thousand tonnes as a result of poor weather conditions.

Unlike India and Pakistan, Bangladesh has an ample volume of water available, with an estimated 7,320 cubic metres per capita. However, like the two other countries, the volume of available water is expected to decline. The paper, “The Himalayan Challenge: Water Security in Emerging Asia” (2010), estimates Bangladesh’s water volume will decline to 5,700 cubic metres per capita by 2030. A major concern with Bangladesh’s water supply is the quality, particularly the water from tube-wells. A 2008 United Nations International Children’s Emergency Fund (UNICEF) report has revealed as many as 1.4 million of these tube-wells had traces of arsenic. This directly affects thousands of villages and puts 30 million people at risk of developing fatal cancers. Reports have indicated that as many as half of Bangladesh’s population, 77 million people, have been exposed to toxic levels of arsenic since the 1970s. In Bangladesh’s capital, Dhaka, 20 per cent of all deaths can be directly related to drinking well water with high levels of arsenic⁹.

Conclusion

A look at three South Asian countries, India, Pakistan and Bangladesh, has revealed economic success measured by economic growth, which has improved the lives of many of their citizens by providing jobs and higher wages. However, not all is good. These countries are still experiencing food security and water scarcity problems, which will be further strained by growing populations in the near future. Thus, the challenge for these three countries is to develop sustainable strategies to immediately tackle these challenges, with the long term future in mind.

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⁹ <http://www.earthweek.com/2010/ew100625/ew100625c.html>