

Rice trade trend and policy implication in Nepal

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Abstract

This paper examines how rice external trade behaves over the recent six decades including major trading partners in the context of Nepal. Bringing the time series trade data from reliable sources, this study also attempts to highlight import dependency ratio, correlation of population and GDP per capita growth with total import and pin down plausible reasons behind these pictures. The correlation study between import data to population growth and GDP per capita showed a positive correlation with r values 0.71 ($p < 0.05$) and 0.99 ($p < 0.05$), respectively. National supply sides when combine with domestic production mimics aggregate rice demands and these figures show increasing patterns accompanied by growing imports together with import dependency ratio. India alone dominates the rice trade which accounts for more than 90 percent of Nepal's import in recent years. These noticeable surges in rice imports can be attributed to liberal trade policies of the respective trade partner countries, improvement in incomes, closer proximity, similar languages, and consumer preferences among others. Opening a domestic market for rice cannot be denied theoretically in favor of welfare-improving policy tools, however, it should be carefully considered to protect local farmer's concerns. Though growth in rice productivity is encouraging over the recent previous years, there is ample potential to increase further by integrated programs combining expansion of spring paddy, inputs, irrigation, and technology. Moreover, attention should be paid toward consumer's fine rice preferences aligning farmer's motivations. The introduction of fiscal policy with application of tariff or non-tariff measures at least for a few years can encourage the domestic rice industry. Above policy adjustment can drive Nepal toward its rice self-reliant footing.

Keywords: Export, import, new trade theory, rice, trade

Introduction

Paddy is a widely grown and consumed cereal crop in the world. Around 3.5 billion consume paddy globally as a staple food. Importantly, it has been a major dietary contributor across the 17 Asian, 9 American, and 8 African countries (Hedge and Hedge, 2013). Alike in other Asian countries, rice has remained a key food item for almost every family member in Nepal (Pokhrel *et al.*, 2021) and consumption figures show a clear rising trend over the recent couple of years (Pudasaini *et al.*, 2018). Taken as a major staple and widely consumed food both in terms of frequency of intake in a single day and proportion of households, it dominates over the food basket for human consumption, and importantly people across each groups castes/ethnicity as well each agro-ecological belt take it as the most preferable food item (Dhungel and Acharya, 2017; Ghale, 2017).

Rising rice import figures in a predominantly agricultural country Nepal has sparked public policy debates which is also reflected in national agricultural plan documents such as Agriculture Development Strategy (ADS) and Fifteenth Plan. Agriculture Development Strategy and National Planning Commission plan documents primarily set import substitution strategy for many agricultural commodities including paddy (ADS, 2015; NPC, 2018). Critics opine surging importation of rice is a blow to the agricultural performance blaming that there is series of caveats in policy design or implementation weaknesses or both. Though the productivity and production figures are encouraging, the rising import is not self-explanatory. In addition, bilateral trade between the countries is regarded as an accelerating factor for the economic growth of both the partner countries and often regarding welfare increasing (Bhagavati and Srinivasan, 2002). Accordingly, countries are encouraged to open their border for foreign goods and services, popularly known as open trade policy. While others argue it is not always good to fully open the domestic markets since it may hurt infant industry and adversely affect job markets. Overwhelmingly,

many trade economists are in favor of open trade and finance and lead function of the World Trade Organization (WTO) is guided accordingly. In South Asia, Nepal became second in opening its domestic market employing open general licensing (OGL) procedure with the introduction of trade policy in 1981 after Sri Lanka while India follows the same suite a bit later. Additionally, as in other parts of the globe, India, the key trading partner country of Nepal and Nepal itself forged trade treaty along with a wider regional bloc first in 1995 as the South Asian Preferential Trade Agreement (SAPTA) which expanded as more liberal pluralistic one in 2006, South Asian Free Trade Agreement (SAFTA). These outward-looking trading policies together with the improving incomes supported by macroeconomic growths might have contributing factors for the expansion of regional trade that can be attributed to the surge of rice import in Nepal (Regmi *et al.*, 2017). Bringing together time series import data from reliable sources, this study attempts to highlight the trend over the decades, pin down plausible reasons behind these pictures. At the end policies and implementation strategies and associated activities get revisit opportunity for possible improvements in the future. Further, the paper briefly highlights salient features of external rice trade picking major trading partners of Nepal and attempt to concatenate related domestic trade and agricultural policies so that we can find few tangible and actionable solutions in favor of growing trade imbalances in agriculture commodities in general, and particularly in rice. This paper is developed discussing the first method, followed by data analysis while the conclusion section closes.

Materials and Methods

The study employed secondary data sources for the analyses. The secondary data was collected from relevant government publications and sources. Time-series data on rice trade for the period (1961-2019) was collected from the Department of Custom, Trade and Export Promotion Centre and Faostat web browser (<http://www.fao.org/faostat/en/#data>). Rice production time-series data was collected from the Ministry of Agriculture and Livestock Development, Economic Survey of Nepal. Population time series data was collected from Centre Bureau of Statistics. Gross domestic product (GDP) per capita in purchasing power parity (PPP) was collected from the World Bank (<http://datatopics.worldbank.org/world-development-indicators/>). Other relevant informations were collected from different journal articles, proceeding articles, books, annual reports and internet. The collected data was analyzed with the help of basic statistical techniques like trend, ratios, percentages and growths. The correlation study between import with population and GDP per capita in PPP (in constant 2011 international dollar) was also assessed in the study.

The import dependency ratio (IDR) expresses the share of available domestic supplies that come from import (<http://www.fao.org/3/i2493e/i2493e06.pdf>) and was calculated using the formula,

$$\text{IDR} = \text{Imports} \times 100 / (\text{Production} + \text{Imports} - \text{Exports})$$

Results and Discussions

Trade flows and balance: 1961-2019

Compiling official data since 1961, we have an opportunity to visualize: export, import, balance of rice to see how these moved throughout study periods. The amount of rice exports and imports varies considerably over years. It is now surprising to know that Nepal was a net rice exporter till the year 1980, however, figures picked other way round right after and seems it could not return as a net exporter again. Grain trade was encouraged by then state, by establishing *dahan/chamal* Export Company in 1974/75 to enable rice export in the country as a government undertaking is an indication of national trade priority (Mallick, 1981). Rice trade flows started to follow reverse order around 1980s; consequently, Nepal became a net rice importer afterward though the amount varies considerably over the study period (Figure 1). When we look at the bilateral flows, figures follow oscillating patterns. Aggregate rice export including paddy husk, milled and brown rice, and broken rice stand 28.66 *lakhs* MT for the period 1961-70, which dropped as little as to 10.88 *lakhs* MT in 1971-80 (Faostat, 2020).

When we look five-year average, rice exports in terms of quantity follow a smooth trend till the 1970s and started to drop slowly first which came down further and reached to its lowest making it almost nil around the year 1985. Most importantly, it could not rebound afterward posing challenges to national agriculture or trade policy. On the other hand, possibly to meet the growing consumers' demand in Nepal, rice import started to grow since the year 1980s. Import growth remains almost stagnant till the year 2005 which surges afterward till now. Striking point is that import demand is noticeable in the immediate past five years.

Correlation of population and GDP per capita growth with total import

Movements of trade flows may depend on various socio-economic factors such as population growth, trade policies, physical infrastructures, level of production, change in consumer preferences and this applies in our case too. Productivity and production of rice and market connectivity play crucial roles as well. Increasing national production and productivity of rice could not able to meet the national demand. The correlation study between import data and population growth and GDP per capita in PPP showed a positive correlation with r values 0.71 ($p < 0.05$) and 0.99 ($p < 0.05$), respectively. The classical simple scatter plot between import data versus population growth (Figure 1A) and import data versus GDP per capita in PPP (Purchasing power parity) (Figure 1B) was plotted using locally estimated scatterplot smoothing techniques. Import was found to be robust after the country has crossed the 26 million populations. Further, the import data has also increased sharply when the GDP per capita in PPP crossed \$2000 (Figure 2). The data coincides with the last decade data on import, population and GDP per capita in PPP (Figure 1, Figure 2). This kind of inference provides as partial information as the country lacks data on many variables, for example, change in consumer preferences, use of in-country production in sectors other than staple food, illegal import and export to border countries etc.

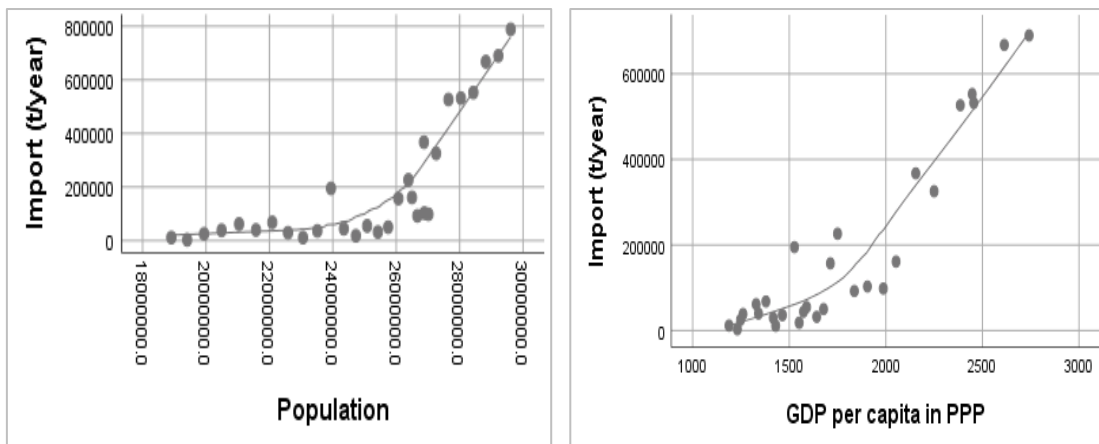


Fig. 1: Scatter plot showing relationship between import quantity and population and GDP per capita in PPP.

Country-wise rice imports to Nepal (milled equivalent) 2008/09-2018/19

Next, we take into account import of rice by country of origin to infer whether a particular country or group of countries has any visible concentration. Picking recent 11-year trade data from Nepal customs, we see that bordering country India remains a major country of origin for rice whether it is milled, or husk, or beaten types (Figure 2). Based on annual changes in total rice imports often exhibits positive growth, remarkably highest in the year 2011 climbing about 3 folds than 2010, while the years 2010 and 2015 witnessed declined imports (Figure 3). Both the volume and values of rice are tabulated to triangulate the import data. Total import increased by six folds in terms of quantity whereas the values of

imports reached about 16 folds susceptible to the reporting figures in customs declaration. This type of reliability in trade data is common in many developing countries, based on duty levied against values, we prefer to confine on values when such doubts come in. Besides India, Nepal has imported rice from Japan, Italy, United States, Malaysia, Philippines, and Thailand albeit in a lower amount.

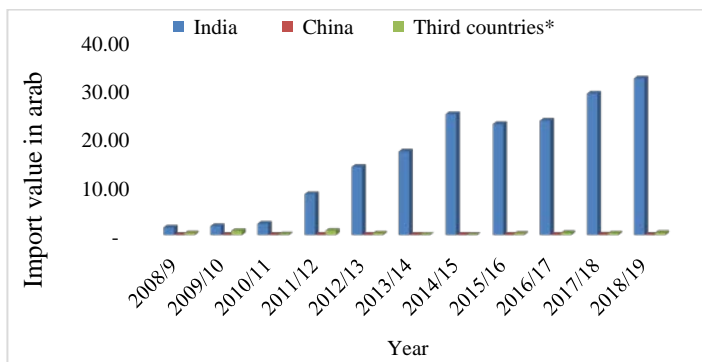


Fig. 2: Country-wise rice import to Nepal.

Note: *Bangladesh, Japan, Italy, United States, Malaysia, Thailand, Vietnam etc.

We used milling percentages 66.2 following Panta and Aryal, (2014) for calculating rice milled equivalent. Core dataset is presented in Annex 1. Source: Department of custom, 2020

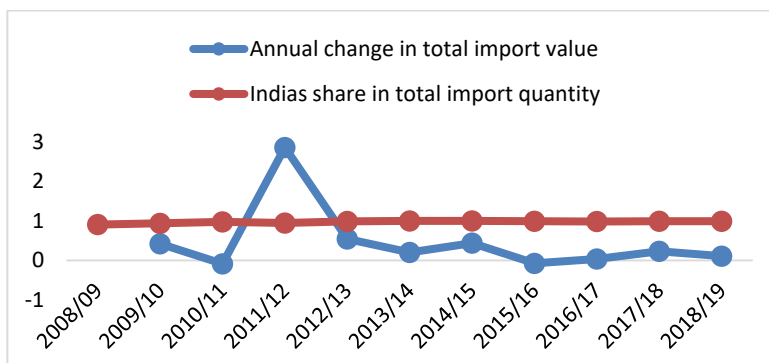


Fig. 3: Annual flow trend and India's share in rice import

Core dataset is presented in Annex 1. Source: Department of custom, 2020

Average exports over the study period are merely about 44 Lakhs NPR (0.01%) against 32 arab (99.99%) in imports which show pronounced imbalances in cereal (Table 1). Rice imports keep increasing trend in the study period. Among the cereal grains, rice imports dominate covering about 65 percent on average. Table 1 shows aggregate grain trade and corresponding rice flows over the most recent eight years.

Table 1. Share of rice import to total cereal import: 2011-2018

Year	Rice Imports in value (000NPR)	Rice export value (000NPR)	Total cereal imports value (000NPR)	Total cereal exports value (000NPR)	Share of rice imports in total cereal imports (%)
2011/12	9,288,122	47	11,972,435	8,422	77.58
2012/13	14,337,581	24,728	20,047,598	39,446	71.52
2013/14	17,254,764	8,297	28,161,992	18,373	61.27
2014/15	24,834,719	-	35,670,123	16,804	69.62

Year	Rice Imports in value (000NPR)	Rice export value (000NPR)	Total cereal imports value (000NPR)	Total cereal exports value (000NPR)	Share of rice imports in total cereal imports (%)
2015/16	23,005,541	199	39,025,913	16,303	58.95
2016/17	23,867,195	651	40,148,372	30,072	59.45
2017/18	29,409,407	309	45,414,446	16,517	64.76
2018/19	32,595,052	4,476	51,802,396	25,396	62.92

Source: Department of Custom, 2020

Import dependency ratio

One of the indicators of food security is import dependency ratio which reflects how the national supply of the commodity in question. It gives fair ideas on how a country fulfills its consumer demand both from production or imports. High dependency on a particular food item is often considered as supply vulnerable in case of any export friction of the exporting country. Exports restriction of edible food often generates price spikes in the highly import-dependent country or creates short supply pushing many people into a state of chronic food insecurity. For instance, worlds' staple food-importing countries faced big challenges of food price hikes in the year 2008-09 because of the export rigidity imposed by major exporting countries including India. This hast decision was announced to ensure its population's food requirement at affordable prices. Table 2 highlights the time series data on rice import dependency ratio over the recent decade. Rice dependency ratios over the year show visible growth over the study period indicating that rice demand is not met by national production. Shifting of people's consumption from other meals like millets and maize toward rice partly be explained by such ratios. Similarly, a change in varietal choice of Nepali consumers toward fine and aromatic rice which has little production in the country may be another reason. India, as a major rice exporter to Nepal, has leapfrogged in agriculture development popularly known as the "green revolution" that begins around 1960s. With the observed bumper harvest, it was successful in exporting paddy to many countries including Nepal. Additionally, export enabling trade policies together with reduction in non-tariff barriers in the exporting countries may have encouraged such import growth (Hussain and Sinha, 2019). Likewise, the proximity of land border and similar languages can be regarded as a further import catalyzing factor.

Table 2. Import dependency ratio: 2009- 2018

Year	Production (Milled equivalent), mt	Import (Milled equivalent), mt	Export (Milled equivalent), mt	Import dependency ratio (%)
2009/10	2,663,771	98,377	0	4
2010/11	2,952,704	127,307	0	4
2011/12	3,357,828	325,918	338	9
2012/13	2,981,981	443,904	597,325	16
2013/14	3,341,145	445,753	123,152	12
2014/15	3,170,061	608,824	-	16
2015/16	2,845,990	511,938	650	15
2016/17	3,462,476	534,772	1,787	13
2017/18	3,410,574	667,810	1,599	16
2018/19	3,713,827	690,081	11,898	16

Note: *we used milling percentages 66.2 following Panta and Aryal, 2014 for calculating rice milled equivalent. Since the country is lacking nationally representative post-harvest loss data for rice, and therefore not postharvest loss accounted for milled rice calculation. Source: Department of Custom, 2020

Productivity of selected countries

Rice productivity in Nepal at present and potential to grow bears special meaning for agriculture as well as trade policies. Since land under crops cannot go above some caps to maintain environmental health and sustainable agriculture and food system, the alternative is to gain on rice productivity through continuous research and extensions. Figure 5 sheds light on the most recent five-year average productivity that of Nepal and other high-yielding countries. China stands at the top rank in rice productivity with an average of 6.9 t/ha, followed by Japan and Vietnam. Nepal's five-year average productivity still lags behind most of the major producing and globally exporting countries. However, based on these FAO sources, major rice exporting country, Thailand's productivity is a bit lower than Nepal's reveals interesting curiosity. This is because Thailand produces mainly fine rice varieties for export purposes as it fetches a higher price. The productivity of fine rice varieties (traditional Thai origin) are lower yielding than hybrids and coarse high yielding varieties (HYVs). Both Asian and global productivity trend has fluctuated over recent years. Again, among Asian countries, China and India are big rice producing country in the world. They are consuming the majority of paddy produced domestically (Hedge and Hedge, 2013). However, productivity is high in Japan, Indonesia, China have higher productivity than the world average (Figure45)

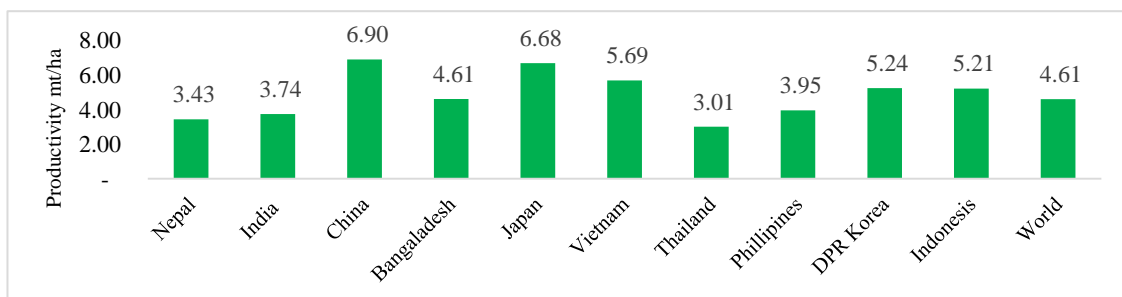


Fig. 4: Paddy average productivity comparison: Major Asian countries recent five year (2014-2018)

Source: Faostat, 2020

Given the wider rice productivity potential to achieve, there is ample opportunity for increased production by employing various policy measures. This may include but not limited to enhanced research customized to locality targeted, improvement in input supplies both in timely availability and at the recommended level, development in physical structures including agricultural roads, and quality extension services. Introducing modern post-harvest technology, strengthening market capacity at local levels, and management of year-round irrigation services are other areas on the list.

Conclusion

In spite of being an agrarian country, the continuously rising imports and sluggish or no exports affected the country's rice trade balance badly in recent years. The country was turning to importing country by following the route exporting-subsistence-importing country in rice. It is evident that Nepal exported a considerable amount of rice in 1970's and mid 1980's however, afterward, the country was importing rice and it is soaring up in recent years. The local production of rice is not enough to meet the increased requirement of the country leading dependency to India and China both for rice imports in terms of seed and grain (the negative trade balance), even though the country's edible cereal availability is sufficient. In order to ascertain food and nutrition security to its people, improved ongoing food trade deficit and increased rice production is an immediate national priority. Increased investment in agriculture, easy access of major inputs and blending of research finding with extension are some of the crucial policy areas of potential improvement.

Acknowledgments

We acknowledge Mr. Krishna Bajgain, Senior Officer working on Trade and Export Promotion Centre for providing trade data.

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