

Development of Sustainable Gross National Income from Potato Export in Bangladesh- A Perspective Review

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Abstract Potato (*Solanum tuberosum* L.) in Bangladesh has arisen fast due to economic liberalization coupled with growing urbanization, expanding market options. The potato is considered to be a potential crop to face the challenge of 21st century. It can serve the food security of the ever growing population, creation of job opportunities and developing agro-based and agro-processing industries in the country for sustainable economic growth. Bangladesh achieved a remarkable success in potato production to take it to 7th rank in the world map. Potato production is increasing day by day both vertically and horizontally. In 2014, total production was 8.6 million tons and the consumption capacity was 6.5 million tons, rest 2.1 million tons was surplus. So need to export potato to foreign countries. But the major constraints for this is non-availability of sufficient suitable varieties with high dry matter (>21%) and low reducing sugar content (<0.01%). Identification of cropping zones, technology packages for production of export quality varieties, non-availability of resistant varieties for bacterial wilt and technologies for long period storage are other limitations in developing export sectors in the country. To meet the instant need of the processing varieties, the variety introduction procedure may be liberalized under a crush programme to ensure quick inflow of processing varieties in the country. Export of potatoes is an important avenue to expand utilization of potatoes grown in the country.

Keywords Consumption, Export, Glut, National Income, Quality, Production, Potato

non-cereal crop with a vital role in the global food system. It can be compared only with rice, wheat and maize for its contribution towards securing the food and nutrition and eradicating malnutrition and hunger, especially in developing countries [2, 3]. Potato crop has the capacity to produce more food per unit time and area and has high nutritional value to sustain burgeoning population. It produces 47.6 kg of food/ha/day whereas wheat, rice and maize produce 18.1, 12.4 and 9.1 kg food/ha/day, respectively [4]. Potato is a wholesome food containing carbohydrates (16%), protein (2%), minerals (1%), dietary fibres (0.6%) and a good source of vitamin C and antioxidants. It is a versatile food as it can be cooked in many ways, can be processed into a number of products each having its characteristics tastes and can fit into any meal. There has been a sustained change in potato consumption pattern in most of the developing countries. This is due to increasing population pressure, growing urbanization and fast changing consumers and market preferences [5]. Till date, The Tuber Crops Research Centre, Bangladesh Agricultural Research Institute has released 66 high yielding potato varieties including ‘Lady Rosetta’, ‘Courage’ ‘Asterix’ which have been specifically based for catering to the needs of processing industries. Bangladesh just started to export potato on “Granula” due to its quality standard for export but several potato varieties (Lady Rosetta, Courage and Asterix) are screened as per exportable standard as Granula. With maintaining the national demand of potato consumption now a resilient door is opened for export in abroad. From these perspectives, the present study was aimed to know the status of potato production and consumption for export by meeting the national demands for quality consumption throughout the major potato eating countries.

1. Introduction

Potato popularly known as ‘The king of vegetables’, it is the 4th most important food crop in the world after rice, wheat and maize [1]. Potato is the world’s single most important

2. Materials and Methods

To make a good format for the present study, the information’s were collected from the secondary data

sources and personal contact with DAE personnel's. After collecting the data, different graph was made by using MS excel spread sheet and different tables were made from literature. No logical framework has been used under present study and no variables were used to analyze importance of different status of production, consumption, surplus and export. Only different secondary data was used to make this article to highlight the importance of potato export through processing industry.

3. Discussion

3.1. Present Status of Potato in Bangladesh

After rice and wheat, potato is the third largest food crop in Bangladesh. Potato (*Solanum tuberosum* L.) is one of the major food crops of the world. In Bangladesh, it ranks second after rice in production [1]. The total area under potato crop, per hectare yield and total production in Bangladesh are 0.44 million hectare, 19.37 ton/ha and 8.6 million tons, respectively [6]. The total production is increasing day by day as such consumption also rapidly increasing in Bangladesh [6]. Over the past six decades, a remarkable growth in area, production, and yield of potatoes have taken place in Bangladesh. Potato is one of the most important vegetable crops and having a balanced food containing about 75 to 80% water, 16 to 20% carbohydrates, 2.5 to 3.2% crude protein, 1.2 to 2.2% true protein, 0.8 to 1.2% mineral matter, 0.1 to 0.2% crude fats, 0.6% crude fiber and some vitamins [7]. It is a staple diet in European countries and its utilization both in processed & fresh food form is increasing considerably in Asian countries [8]. Moreover, number of processing industries and potato products are increasing with the demand of specific varieties. Besides culinary consumption, the use of potato has progressively increased as a raw material by the processing industry [9]. Now a day, the most important features of potato production is tuber quality [8]. So quality attributes should take into account to fulfill the customers and industry demand. Potato must meet a number of requirements including high dry matter content and good color to fulfill the requirement of processing. Presently there are very few varieties for processing purpose, developed locally, despite the increasing demand of acceptable yield and processing quality. The yield and processing characteristics of available potato genotypes are largely unidentified. Keeping in view the consumers requirement, it is important to identify varieties that possess traits to meet the domestic demand and provide growers the opportunity to meet the challenges of frequently changing market, production circumstances and improving their economic condition by selling their export quality potato at good price to the processing industry both in Bangladesh and abroad [10].

3.2. Ranking of Bangladesh in the World

The cumulative success in production of potatoes over the years took Bangladesh to the seventh position in the world as may appear in Fig. 1-4 below.

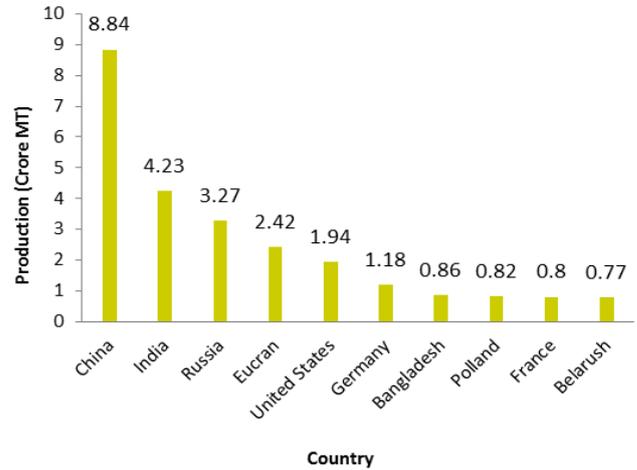


Figure 1. Global ranking of top 10 countries in production of potatoes (FAOSTAT, 2014)

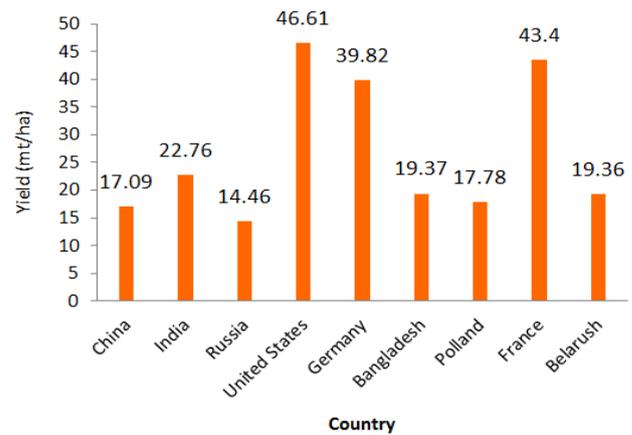


Figure 2. Global ranking of top 10 countries in yield of potatoes (FAOSTAT, 2014)

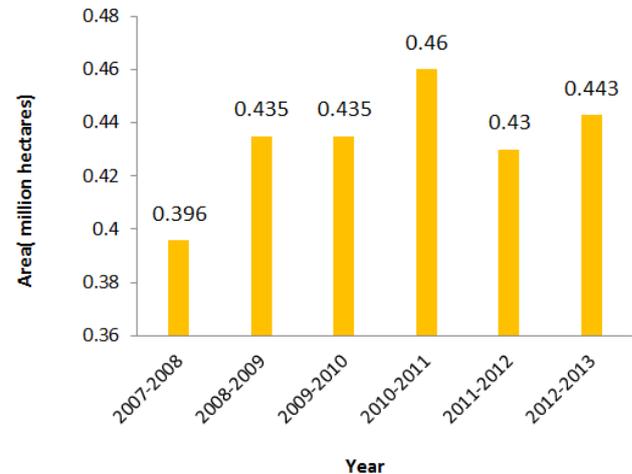


Figure 3. Area harvested for potato in Bangladesh (FAOSTAT, 2014)

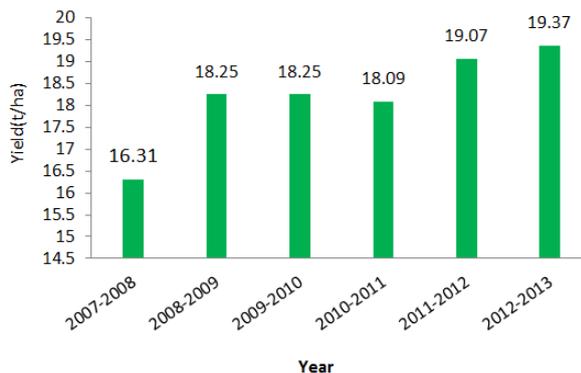


Figure 4. Yield status of potato in Bangladesh (FAOSTAT, 2014)

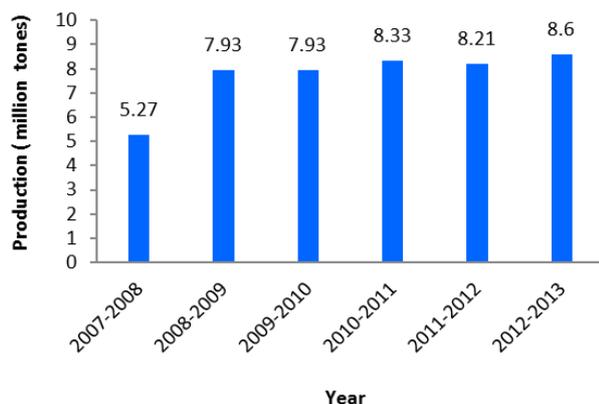


Figure 5. Production status of potato in Bangladesh (FAOSTAT, 2014)

Nevertheless, Bangladesh not only surpassed many of the developed countries, but also crossed most of the developing countries in production of potatoes. Upon analysis of the above Figs 1-5, it is evident that overall growth of potatoes in Bangladesh are positive in terms of area, production and yield except slight periodically fluctuation with yield and production. In the terminal year 2012-13, the combined effects of these three factors contributed to attain highest production of potatoes in Bangladesh which led to give so called “Potato Glut” in the country.

3.3. The Potato Glut and Its Management

When cereal production is plenty, it is called as the outcome of “Green Revolution”. But the bumper production of potatoes in the country due to success in development of

seed and seed based agronomic technologies, is called “Glut” undermining the success. This is actually a “Problem Plenty”. When the country is struggling for food self-sufficiency and we get the surplus production with potatoes, also a food but non cereal one, we are not very happy and call it a “Glut” to designate as an unwanted problem. Nevertheless, the development of potato industry in the country must have to go via Glut. So, the Glut will be not a curse but a blessing for the country. It should be managed and used for the economic development of the country in the light of instances available globally.

3.4. Potato Production by Divisions and Districts

Actual growth in area, production and yield over the last ten years is presented in Fig 6 and Table 1. During the last eleven years, the area under potato expanded by 85% while production increased by 160%. Evidently, the higher rate of growth in yield over the base year compensated the lower rate of growth in area to attain the ever biggest yield in the terminal year.

Potatoes are grown in all division and 64 districts of Bangladesh. But there exists significant yield variations amongst the districts which may appear from the Fig 6 and table-3, derived after [12]. It is evident that, the yields of potatoes in the north-western districts were less than that of mid Bangladesh districts despite having cooler agro-climate of the former agro-ecological belt which are considered more suitable for yield development. It may be concluded that the socio- economic and management factors contributed for higher yields of the latter districts. In this regard, achievement of Munshiganj district may particularly be mentioned. Nevertheless, the yield of Munshiganj has far surpassed the yields of all districts of the country. This achievement may be assigned to the skill and expertise in production of potatoes of the Munshiganj farmers. Higher yield is a pre-requisite for commercial agriculture and availability of low cost raw materials of potatoes for processing industries. So, production of potatoes may be considered suitable in most districts irrespective of climatic variations. There remain also scopes of yield equalization to some extent amongst the districts for furtherance of national production.

Table 1. Ranking of ten leading districts of Bangladesh in production of potatoes (Average of 2007-08 and 2008-09)

SL No	District	Area (Ha)	Production (MT)	Yield (MT)	Rank
01	Munshigonj	34379	1031385	30.0	01
02	Rangpur	53230	990197	18.63	02
03	Chandpur	14653	272468	18.61	03
04	Comilla	15942	294572	18.25	04
05	Rajshahi	33275	591910	17.69	05
06	Thakurgaon	23337	374802	15.94	06
07	Joypurhat	37472	549352	14.59	07
08	Nilphamari	23475	334804	14.23	08
09	Dinajpur	39994	574706	14.23	08
10	Bogra	63483	808583	12.71	09

Source: [11].

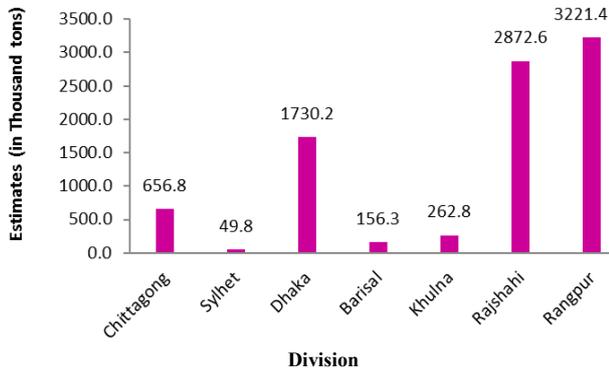


Figure 6. Estimation of potato per division in Bangladesh (BBS, 2012-2013)

3.5. Scenarios of Global Per Capita Production and Consumption

The production and consumption trend are going to raise day by day (Fig. 7 & 8). The food habit may changing in Bangladesh.

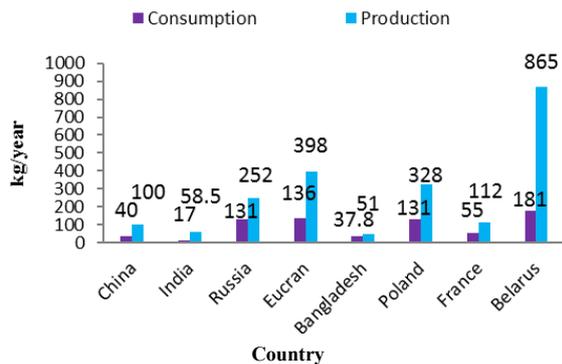


Figure 7. Production and consumption scenarios of major potato producing countries (PotatoPRO.com, 2008)

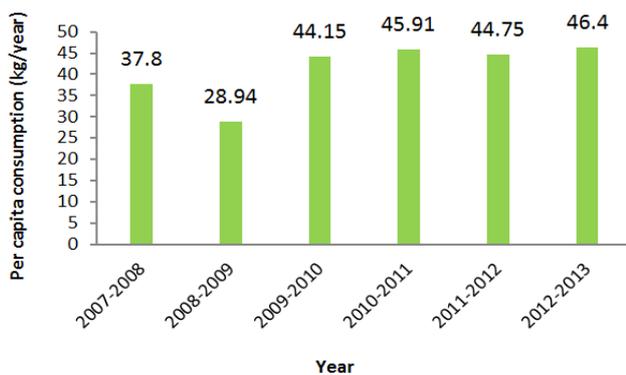


Figure 8. Consumption scenarios of potato in Bangladesh (PotatoPRO.com, 2008)

3.6. Need for Export

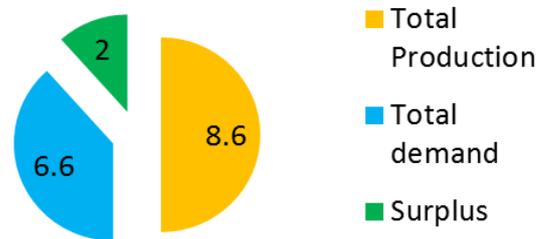


Figure 9. Current status of potato in Bangladesh during 2014-15 (in million ton)

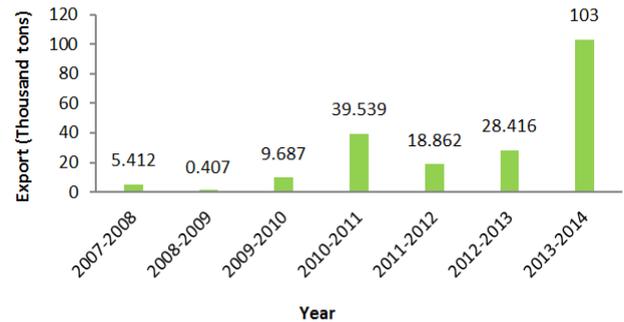


Figure 10. Export status of potato from Bangladesh (FAOSTAT, 2014)

Bangladesh produced 8.6million MT of potato during 2012-13 that made it the seventh largest producer in the [13]. The average productivity of potato in India is 19.37 t/ha which is more than the world average (17.2 t/ha). The per capita availability of potato has gone up to 37.8 kg/year from 5 kg/year in 1952; however, it is still far behind Ukraine (136 kg/year) Russian Federation (131kg/year) and Belarus (181 kg/year) [14]. According to Directorate General of Food (DGoF), annual demand for potato in the country is 6.5-7.0 million tons against its production of 8.95 million tons (FY 2014). Potato is a perishable commodity and its harvest time (Feb/March) coincides with steep rise in temperature. From April onwards, temperatures start shooting up and the produce has either to be consumed within a short period or is required to be shifted to the cold stores. Due to inadequate, expensive and unevenly distributed refrigerated storage facilities, there are frequent gluts in the market causing substantial economic loss to the farmers and wastage of precious food. Such gluts have occurred every 2 to 3 years, whenever there had been an increase in potato production by 4–5% [5]. The glut years are followed by a reduction in potato area in the following year and the boom and bust cycle continues. Therefore, it is essential that potato consumption is increased to sustain this increase in production and to ensure remunerative prices to the farmers. Under the above existing circumstances, exporting of the bulky perishable potato into different foreign countries has increased. The demand for quality potato is increasing continuously for exporting foreign countries.

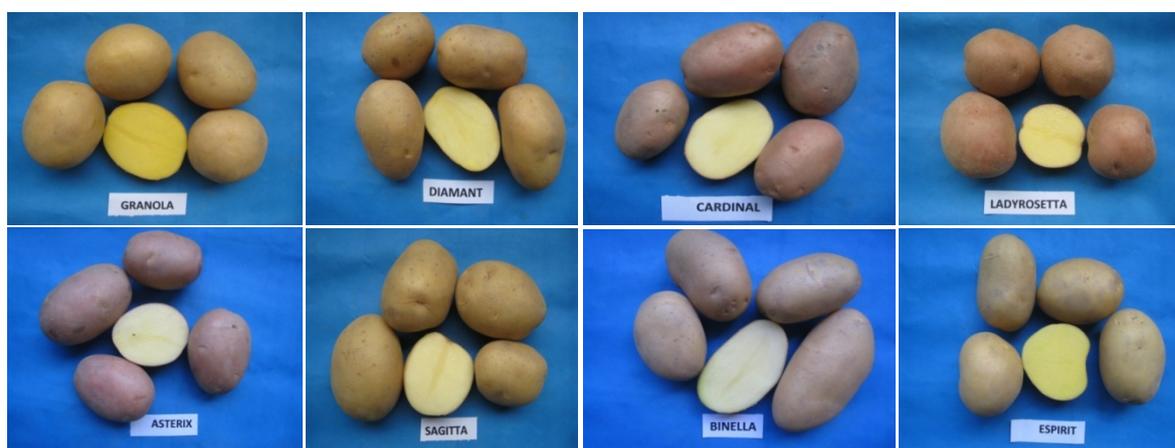


Plate 1. Some promising potato varieties in Bangladesh for export and processing industry

Table 2. Country wise Potato export from Bangladesh from 2008-09 to 2013-14 (Value US\$)

Country	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
United arab emirates	-	93534	466124	265545	429706	1964069
Belgium	-	-	-	-	-	5156
Brunei darussai-am	-	-	39416	4503r	786t6	77742
Bahrain	-	16578	18132	-	14992	233819
Canada	-	75	-	-	-	3025
Saint barthelemy	-	-	-	-	-	6821
China	-	-	6160	-	-	-
Cote d'ivoire						15495
Georgia						3025
France				2008		
United kingdom			3258	14733		
Greece		9128				
Hong kong			s025		709a	
Indonesia			1565409	572210	40082	150608
Japan						64551
Italy	t946	1 195	60903			
Combdia			49		79409	
Kuwat		80479	200686	7772		576269
Srilanka		94645	2187826	1085986	1375739	5067490
Myanmar		1811	95434	4t304	51 16	4760
Maldives			49315	25458		
Malaysia	64588	1909369	7242054	3495135	4736644	12355
Netherlands						11918246
Nepal			2313			
Oman			895	6784	19750	12354
Pakistan		1698			t286	42839
Poland			9529			
Qutar					34680	286534
Russian federation		8109	tloo692	294678	67979t	8837811
Saudi araeiia	255812	203623	258474	188623	440654	100954
Singapore	364547	tot2957	2667929	2401951	2627882	2761693
Senegal					87245	
Thailand						17126
Suriname					74t47	
Turki						6424
Togo			64731			
United states		1301				
Vietnam		29277	677313	50392	197229	236799
Total	686892	3454651	16730794	8497610	10930066	32531912

Source: Export Promotion Bureau, 2014.

4. Concluding Remarks

Bangladesh is blessed with favorable agro-climate for production of potatoes all over the country but most favorably in the northern areas of this country. Its production can be increased with least efforts as against cereal food crops having almost touched the yield plateau. Apart from producing higher dry matter per unit area and per unit time, potato is a labor intensive crop. From our study, we found that in the context of production and export potato has a great prospect in Bangladesh. Considering all these advantages, potatoes can help attaining short and long term economic targets of the country and to face 21st century challenges for “Digital Bangladesh” and to take part in world economy by attaining the developed country from low income situation for hunger free planets.

Conflicts of Interest

The author declares no potential conflict of interest about the present manuscript and author declares no part of this manuscript has been published elsewhere.

Author’s Contribution

Tuhin Suvra Roy, helped by reviewing the manuscripts to become at present form and Rajesh Chakraborty, collected the data and literature from secondary sources for writing. Both authors were involved in manuscripts writing.

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