© Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.19-28, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

business REVIEW
a journal of business administration discipline

The Construction of *Khan Jahan Ali* Bridge: Its Effects on Income and Household Ownership Patterns During Different Time Periods

* Md. Nasif Ahsan

Abstract:

The issue of construction of a bridge over the river Rupsha to connect Khulna city with hinterland[1] of Mongla Sea-port and other parts of the Southern region was a long-standing demand of the people of the area. Now that dream comes to reality. After the construction of Khan Jahan Ali Bridge and the bypass road, the city is being expanded and as a consequence the living standard of the people of the surrounding areas is being changed. Since this bridge generates both tangible and intangible benefits, this study analyzes the change in income of the households in the bridge and its adjacent areas. This paper investigates how the income-change has influenced the household-ownership pattern in the concerned areas. A comparison between past and present situation of peoples' income influencing household-ownership pattern is presented in this paper though an econometric model.

Key Words: Khan Jahan Ali bridge, pre and post construction period, income, household, ownership.

Introduction

Development is a continuous process but it is always trailed by various parameters. It refers mainly to the development of peoples' living standard which relates with a number of determinants such as development of cultural, economical, infrastructural and environmental aspects and all these aggregately show the magnitude of the socio-economic development of a particular region (Perkins, 2001).

Bangladesh being an LDC, is trying to attain higher economic growth. A better transportation network is one of the major determining factors for economic development of the country. Economic as well as infrastructural developments depend on each other or sometimes one cause for the other. For instance the appropriate role of a bridge, predominantly the bridge which is connected with the hinterland of any sea port is undeniable for the development of any country, especially for that particular region. Khulna, the Divisional Headquarter of the administrative division, is alienated from *Mongla* sea-port along with the southeastern part of the country by the river *Rupsha*. This river is a natural physical barrier between the eastern and western parts of Khulna region.

After the construction of *Khan Jahan Ali* Bridge, now there is no river interruption between Khulna and other parts of the southeastern region. This bridge has been acting as an efficient linkage between north-west region and south-west region of the country, including *Mongla* sea-port (Murtaza and Sattar, 2004). This Bridge carries a vital socio-economic importance since land

* Corresponding Author
Md. Nasif Ahsan, Lecturer, Economics Discipline, Khulna University-9208, Bangladesh.

[1] Area just behind of any establishment

value has increased drastically after the construction of the bridge and its bypass, which creates the opportunity of unearned income and quasi-rent for the local community. Besides, lots of people became able to run their own enterprises in the subsequent area of the bridge and the bypass. Thus, it is now bearing great economic importance. This bridge is an architectural beauty, for this reason huge numbers of viewers from numerous areas come to see it and this intention creates innovative prospects to develop a new group of entrepreneurs. Due to good transport and communication facilities it is very much possible to develop an industrial precinct in the adjacent areas to bridge and bypass. Socially, this area is now better enough than that of previous time (Debnath, 2004). For this reason, various private land developers have invested here. Apart from this, people of this area are now having a great opportunity in business and commerce and other effective economic activities because this area possesses lot of vacant land with good transport facilities. On the other hand, the *Rupsha* ferry *ghat* is loosing its old shine because the growth center which was created here over the long time is now being shifted towards the bridge (JICA-GOB, 1998). Most of the inhabitants in surroundings of the Bridge along with by-pass road areas possess own houses for their living since the majority of the population here are either local people or migrated from somewhere else long time ago. Besides, the reasonable land value of these places and expansion of the city, people become interested to build their houses and stay there. 79% of the local population have their own house and 21% live as tenants (Islam and Jahan, 2006). The house rent of the study areas is very low as compared with that of city center. Due to smooth communication facilities people can reach early to their working from their residents. Hence, people now prefer these locations especially by the low income group for their living. This paper reveals the impacts on household-ownership pattern related with income change in selected study areas between pre and post construction periods of *Khan Jahan Ali* Bridge.

Objective of the study

The objectives of this study are to - (i) figure out features of various household characteristics in pre and post construction periods of the Bridge; and (ii) show the impact of Bridge construction on household ownership pattern related with income change.

Materials and Methods

The study is an out and out primary data-based work. The data were collected through questionnaire survey and observation method. Collection of data was conducted in various units under the study area and after compilation of data, various outcomes on household factors are presented accordingly.

Study Area: In this study the main target area had been *Khan Jahan Ali* Bridge and its hinterland, which has a long bypass road and link road. Hence, areas adjacent to the Bridge along with the bypass and link road were taken as study area. Moreover, *Rupsha* ferry *ghat* and its adjacent areas were also considered under study area. Therefore, to get a perfect scenario of impacts of *Khan Jahan Ali* Bridge, its adjacent areas such as *Krisnanagar*, *Sachibunia,* and *Jabusha* villages; *Lobonchara* (KCC[2] Ward No. 31); and *Rupsha* ferry *ghat (Char Rupsha)* were also considered as study area. In this study both eastern and western parts of the Bridge were included but more emphasis was given on western part because it occupies 13.71 km. long bypass road. To select the location of the study area, emphasis is given mainly on the hinterlands of the *Khan Jahan Ali* Bridge and the bypass road. It comprises of the six different locations as stated above for the betterment of the study. The locations and their distances from the *Khan Jahan Ali* Bridge are shown in appendix-I in table 01.

[2] Khulna City Corporation

© Business Review : Volume 06, Number 01 & 02, January to December, 2008. pp.19-28, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

Sampling Unit and Sample Size Determination: The sample consists of those units from the total population, which has been selected for data collection. Quota sampling method was applied for this study. In this study, Household (HH) had been considered as the only unit. Side by side, sample size determination was also an important factor of this study. To avoid error it is essential to consider a very good proportion as sample size and hence 100 households were taken as samples. Table 02 in appendix-I shows the sampling distribution of households in the study areas.

Household Data Analysis and Discussion

Household data have been analyzed on the basis of field survey, which was conducted through questionnaire survey method and personal interview method. By analyzing the collected data, it is possible to get the impact on household ownership pattern related with income change of the respondents of the study area. Though all sample units under the study area are closely situated and well linked with the *Khan Jahan Ali* Bridge, the standard living of the concerned study area as a whole differs a bit from one another (Murtaza and Sattar, 2004). In this study comparative scenario between situation after bridge construction and situation before bridge construction of these areas has been presented.

Housing Pattern: The housing condition of the respondents is described by categorizing them into bamboo walled, mud walled, thatch/straw walled, timber, timber and brick, semi-pucca, pucca and other patterns of houses. If the housing condition of the respondents is considered before the construction of *Khan Jahan Ali* Bridge, then it is seen that 32% house are of bamboo walled, 3% are mud walled, 19% are thatch/ straw walled, 5% are made of timber, 9% are made of timber and brick, 19% houses are semi-pucca, 5% are pucca and other type of houses are 8%. From the above information, it is seen that a large portion (32%) of houses are bamboo walled. On the other hand, percentage of pucca house does not occupy a significant portion.

Now, after the construction of *Khan Jahan Ali* Bridge the housing conditions of the respondents have been changed. The changes are shown by the Figure 01. Here it is to be noted that the percentages of semi-pucca house and pucca house are handsomely improved from 19% to 29% and 5% to 14% respectively from pre-bridge to post-bridge situation. On the other hand, percentage of bamboo walled has declined from 32% to 17%. So by the above analysis it can be said that the housing conditions have changed a lot from before bridge construction situation.

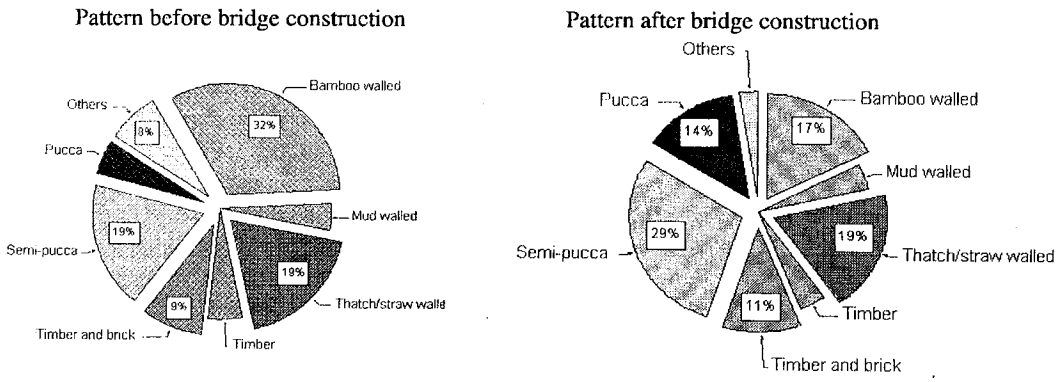


Figure 01 Housing pattern of the respondents before and after construction of the Bridge
Source: Field Survey, October 2006

Household Size: The household sizes of the respondents of in the study areas are like that 57% of the respondents have 1-5 members in their family, 36% have 6-10 members and only 7% have 11-15 members in their family. Here one thing is to be noted that in this survey any massive family

© Business Review : Volume 06, Number 01 & 02, January to December, 2008. pp.19-28. Business Administration Discipline. Khulna University, Khulna-9208 (ISSN 1811-3788)

like 15+ members was not found. On the basis of the above-mentioned information it can be concluded that most of the respondents of the study areas possess small and nuclear family. With the help of Table 03 in appendix-I, the distribution of respondents by number of family members is shown.

Occupational Pattern: In case of occupational pattern, it is found that out of hundred respondents 51% are occupied with small business. Due to the establishment of *Khan Jahan Ali* Bridge most of the respondents who were previously engaged in agriculture and were jobless become interested to start small business like grocery shop. Many of the respondents have supporting (additional) job; according to the survey 29% people in study area have the supporting jobs. Besides, 18% people are service holders; most of them live in *Lobanchara* area. It is found that 23% respondents are farmers and 8% are day labourers. The overall situation of the survey is exemplified with the following Figure 02 and table 04 in the appendix-I.

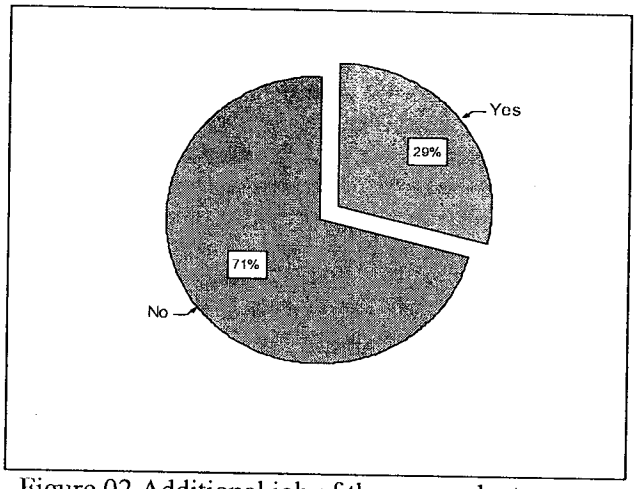


Figure 02 Additional job of the respondents
Source: Field Survey, October 2006

House and Land Ownership Pattern: Most of the respondents possess own houses. It is due to the fact that the large portion of the respondents are either local people or migrated here long time ago. Another reason is, the land value of these areas was low and for the expansion of the city, people become interested to settle down permanently in these areas. On the whole, 79% of respondents have been found to have their own houses. In *Lobonnchara*, out of 40 respondents surveyed 32 live in their own house. In case of *Jabusha* it is 100% that is 20 out of 20. Among total respondents, 21% of the respondents live as tenants. The average house rent of the study areas is lower than that of at city center. The transportation and communication facilities of these areas are very much developed at present and for this people can reach early to their working station from their residences. Hence, people now prefer these places, especially by the low income group.

In case of land ownership pattern of the respondents, it is found that 46% respondents have their own land, 35% are landless and 19% are tenants. It is found that many of respondents have their own land only for living, not for cultivation. The landless respondents are engaged in some small business or service and live in house as tenants. Some respondents do not have their own land but

they are using other peoples' land for cultivation as a tenant. Collected data is shown by table 05 in appendix-I.

Income Pattern: Income pattern of respondents is the most important indicator of their living standard. Here, on basis of collected data a comparison is made between the income pattern of a respondent pre and post construction of *Khan Jahan Ali* Bridge.

Thus, table 06 in appendix-I shows the information about the income pattern of the respondents during pre-bridge the construction situation. The same table indicates that most of the respondents earn at a range of Tk. 1000-2000 /month, which is too small amount to maintain a family. Thirty four percent of the respondents fall under the monthly income range of Tk. 1000-2000. Besides, 23% respondents have income within Tk. 2000-3000/month, 17% are in Tk. 3000-4000/month group, 7% are in Tk. 4000-5000/month group, 6% earn Tk. 5000-6000 /month, 2% earn Tk. 6000-7000/month and 2% are in Tk. 7000-8000/month range. But there is no respondent found in above 8000 Tk./month income group. Analyzing the income pattern, it is found that comparatively high-income groups mostly live in *Lobonchara* area.

The income pattern of the respondents during the post construction of the bridge can be found from the table 07 in appendix-I. This table reveals that most of the respondents (35%) are within income group of Tk. 2000-3000/month. 15% respondents are in Tk. 1000-2000/month group, 19% under group of Tk. 3000-4000/month, 16% under Tk. 4000-5000/month group., 5% belongs to both Tk. 5000-6000 and Tk. 6000-7000/month group, finally Tk.7000-8000 and more than Tk. 8000/month income group takes 2%. Here it is also found the same trend which is seen during pre construction situation, *Lobonchara* is in the high income group area.

The above analysis has been conducted on the same respondents and their respective incomes during two different periods. From the above information, it is seen that there are lot of changes in total income generation. Except *Lobonchara*, other study areas comprise the low income groups. But it is found that some notable changes in income during pre and post construction period of the Bridge has happened. Focusing on Tk. 1000-2000/month and Tk. 2000-3000 /month income groups, it is found that total number of people in the former income group during post-construction period is less than that of in pre-construction period; yet in case of latter income group the above-mentioned phenomenon is reverse. Again, 2% respondents who earn above Tk. 8000/month is figured out only in post-construction period of the Bridge. From the survey, it is found that the reason behind such rise in income is due to the involvement of respondents into various small businesses because of creation of new business opportunities in the area. All these indicate the improvement of income level of the respondents as well as the betterment of their standard of living.

Econometric Model: For economic interpretation it is necessary to follow a number of determinants which are closely related with economic behavior. From this perspective, in this study the household ownership pattern related with income change is presented with the help of an econometric model. It is quite obvious that the research activities have some significant objectives or certain goal. So, the current study also has some objectives as mentioned earlier. In order to realize the objectives it is necessary to testify a hypothesis. The Hypothesis is testified by the LPM or Linear Probability Model. This model is also considered as the binary response regression model (Gujarati, 2003).

Here,

$$Y_i = \alpha + \beta X_i + u_i \quad \text{-- -- -- -- --- ---} \quad \text{(i)}$$

Where, Y_i = Dependent variable / Dummy variable[3]

X_i = Independent variable / Income of the respondent

u_i = Error of the estimate

α = Intercept

β = Coefficient of the independent variable

Consider the above regression model (i) which looks like a typical linear regression model but because the regressand (dependent variable) is binary, or dichotomous, it is called Linear Probability Model (Gujarati, 2003).

"Khan Jahan Ali Bridge boosts up household ownership in the southwestern region in Bangladesh"- this assumption is the research hypothesis. 'Income' is considered as indicator or variable which is used as an independent variable in this model. With the help of the LPM model the marginal change in income of the respondents can be shown in 'pre' and 'post' construction-period of bridge situation which admires that the considered hypothesis is true. The household data collected through field survey have been taken into consideration for analysis. These data are tested with the above-mentioned model. The data has been compiled with the help of SPSS (Statistical Package for Social Science) software.

Change in Marginal Income on Household: To clarify marginal change in income of household, the components of regression model is interpreted where one is obtained for **Pre Construction of Bridge** situation data and the other is obtained for **Post Construction of Bridge** situation data. Firstly, interpretation of the first one is done where the value of intercept is (α) – 0.627398 (From Table 08 in appendix-I) which gives the probability that a family with zero income will own a house. Since the value is negative, and since probability cannot be negative, this value is treated as zero. On the contrary, the other intercept (α) - 0.877596 (From Table 08 in appendix-I) gives the same interpretation for that particular equations. That is sensible in the present instance[4].

The results of the equations of the table 08 in appendix I are calculated and given in details in the appendix II. In case of Pre Construction situation of the Bridge, the coefficient value of independent variable (β) is 0.357469 which means, for a unit change in income (here Tk. 1000), on the average the probability of owning a house increases by 0.357469 or 35 percent. But in case of the Post Bridge construction situation it can be counted that the coefficient value of independent variable (β) is 0.419310 means that for a unit change in income (here Tk. 1000), on the average the probability of owning a house increases 0.419310 or 42 percent. By those probabilities it can be concluded that Post Bridge Construction situation is better than the Pre Construction situation, and which shows the obvious possibility of the socio-economic prosperity in the study areas.

Conclusion

Income situation of the respondents is one of the most important findings of the study. In this study, the comparative analysis of their two period income situation (pre and post construction

[3] It represents the nominal scale variables. We could quantify such attributes by constructing artificial variables that take on values of 1 or 0, 1 indicating the presence (or possession) of that attribute and 0 indicating absence of that attribute.

[4] One can loosely interpret the highly negative value as near improbability of owning a house when income is zero.

period of bridge) is given. It is shown with the help of interrelated factors that how the *Khan Jahan Ali* Bridge and its bypass help the people to increase their earnings. In post construction period of the bridge, some supporting or additional job opportunities have been created. Side by side, increase in land-use pushes to increase the land value; and from the view point of household respondents, about 79% have their own dwelling land and 46% have the agricultural land which generates the provision of unearned income and quasi-rent also. All these are figured out from the study findings where it is seen that about 35% respondents have the income of 2000-3000 Tk./month which was 23% in pre-construction period of the Bridge. The same result is obtained for the 4000-5000 Tk./month income group where it is 16% in present situation which was 7% at previous situation. Besides, it was also counted 1% of 0-1000 Tk./month income group in present time which was 9% at past time. Hence the impact of construction of *Khan Jahan Ali* Bridge induces household income to be increased.

Acknowledgment

The author is indebted to Sk. Mainul Islam and Afrin Jahan, a group of former undergraduate students of Economics Discipline, Khulna University for their valuable contribution in primary data collection stage.

References

Debnath, R (2004). "Socio-economic impact of establishment of Khulna University – A case study on Krishnanagar Mauza of Khulna". *An undergraduate thesis of Economics Discipline of Khulna University.* January, pp. 17-29.

GOB, (2002). Bangladesh Population Census, 2001, Zila: Khulna Zila Series. Bangladesh Bureau of Statistics, Dhaka: Statistics Division, Planning Commission.

Gujrati, D N (2003). *Basic Econometrics.* 4th Edition. New York: The McGraw-Hill Companies Limited, pp. 297, 580-594.

Islam, M and Jahan, A (2007). "Impact of *Khan Jahan Ali* Bridge on the Socio-economic Development of Khulna Region". *An undergraduate thesis of Economics Discipline of Khulna University.* March, pp. 39-63.

JICA-GOB, (1998). "The Study on Construction of the Bridge over the River Rupsha in Khulna (Phase I)", *Interim Report*, Summary volume.

Murtaza, M G and Sattar, M G (2004). "Initial Social Impact of The Rupsha Bridge Project in Khulna", *BRAC Journal*, BRAC Center Mohakhali, Dhaka-1212, Bangladesh.

Perkins, D H (2001). *Economics of Development.* 5th Edition. New York: Norton, pp. 6-15.

© Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.19-28, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

Appendices

Appendix 1

Table 01 Distance of study area from *Khan Jahan Ali* Bridge

Study Areas	Distance from *Khan Jahan Ali* Bridge (km.) →				
Lobonchara	0.0				
Jabusha		2.0			
Rupsha ferry *ghat*			5.0		
Sachibunia				12.0	
Krisnanagar					13.7

Source: Department of Roads & Highway

Table 02 Sample size of the study area

No.	Unit / Study Area	Total Population HH	No. of Sample HH
1	*Krisnanagar*	130	20
2	*Sachibunia*	158	20
3	*Jabusha*	160	20
4	*Lobonchara*	450	40
5	*Rupsha* ferry *ghat* (West)	-	-
6	*Rupsha* ferry *ghat* (East)	-	-
Total		**898**	**100**

Source: Field Survey, 2006 and Population Census 2001

Table 03 Distribution of respondents by number of family members

Household size (person)	Name of the Study Area				Total	%
	Krisnanagar	*Sachibunia*	*Jabusha*	*Lobonchara*		
1-5	13	14	7	23	57	57.0
6-10	7	6	9	14	36	36.0
11-15	--	--	4	3	7	7.0
15+	--	--	--	--	--	--
Total	20	20	20	40	100	
Percentage	20.0	20.0	20.0	40.0		100.0

Source: Field Survey, October 2006

Table 04 Distribution of respondents by occupational pattern

Occupation	Name of the Study Area				%
	Krisnanagar	*Sachibunia*	*Jabusha*	*Lobonchara*	
Service	2	4	--	12	18.0
Small Business	8	10	10	23	51.0
Farmer	7	4	9	3	23.0
Day Labourer	3	2	1	2	8.0
Total	20	20	20	40	100

Source: Field Survey, October 2006

Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.19-28, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

Table 05 Distribution of respondents by house and agricultural land ownership pattern

Ownership Pattern		Name of the Study Area				%
		Krisnanagar	*Sachibunia*	*Jabusha*	*Lobonchara*	
House	Own	13	14	20	32	79.0
	Tenant	7	6	--	8	21.0
Total		20	20	20	40	100
Land	Own land	7	13	6	20	46.0
	Landless	8	4	6	17	35.0
	Tenant	5	3	8	3	19.0
Total		20	20	20	40	100

Source: Field Survey, October 2006

Table 06 Monthly income distribution of respondents in pre construction period of the Bridge

Income Range (Tk.)	Name of the Study Area				%
	Krisnanagar (No.)	*Sachibunia* (No.)	*Jabusha* (No.)	*Lobonchara* (No.)	
0-1000	5	1	3	--	9.0
1000-2000	7	11	12	4	34.0
2000-3000	5	6	5	7	23.0
3000-4000	2	1	--	14	17.0
4000-5000	1	1	--	5	7.0
5000-6000	--	--	--	6	6.0
6000-7000	--	--	--	2	2.0
7000-8000	--	--	--	2	2.0
8000+	--	--	--	--	--
Total	20	20	20	40	100

Source: Field Survey, October 2006

Table 07 Monthly income distribution of respondents in post construction period of the Bridge

Income Range (Tk.)	Name of the Study Area				%
	Krisnanagar (No,)	*Sachibunia* (No.)	*Jabusha* (No.)	*Lobonchara* (No.)	
0-1000	--	1	--	--	1.0
1000-2000	7	3	4	1	15.0
2000-3000	8	10	13	4	35.0
3000-4000	2	4	3	10	19.0
4000-5000	3	2	--	11	16.0
5000-6000	--	--	--	5	5.0
6000-7000	--	--	--	5	5.0
7000-8000	--	--	--	2	2.0
>8000	--	--	--	2	2.0
Total	20	20	20	40	100

Source: Field Survey, October 2006

Table 08 : Probability of house ownership on income changes (Y = 1 If owns house, 0 = Otherwise)

	Before Construction of Bridge	After Construction of Bridge
Equation	$Y_i = -0.627398^* + 0.357469^* X_i$ (0.061380) (0.024817)	$Y_i = -0.877596^* + 0.419310^* X_i$ (0.089749) (0.026652)
N	*100*	*100*

* indicates significance at the 1% level

Parentheses indicate standard error of slope coefficient.
Note: One-unit changes of income represent one thousand taka change

Appendix 2

Table 01
Data of Household (HH) during Post Construction Situation of Bridge on House Ownership (Y = 1 If Owns House,
0 Otherwise) and Income X (Thousand of Taka)

HH No.	Y	X	HH No.	Y	X	HH No.	Y	X	HH No.	Y	X	HH No.	Y	X
1	0	0.90	21	0	2.30	41	1	5.80	61	1	3.90	81	0	1.27
2	1	3.40	22	0	2.35	42	1	6.50	62	1	3.40	82	0	1.19
3	1	3.45	23	0	2.40	43	1	6.80	63	1	3.45	83	0	2.10
4	1	3.50	24	0	2.45	44	1	6.50	64	1	3.50	84	0	2.15
5	1	3.55	25	0	2.50	45	1	6.80	65	1	3.55	85	0	2.20
6	0	1.10	26	0	2.55	46	1	6.50	66	1	3.60	86	0	2.25
7	0	1.58	27	0	2.60	47	0	2.60	67	1	3.65	87	1	5.50
8	0	1.79	28	0	2.65	48	0	2.65	68	1	3.70	88	1	5.80
9	0	1.80	29	0	2.70	49	0	2.70	69	1	3.75	89	1	5.90
10	0	1.90	30	0	2.75	50	0	2.75	70	1	3.80	90	1	5.70
11	0	1.70	31	0	2.80	51	0	2.80	71	1	4.50	91	0	2.30
12	0	1.60	32	0	2.85	52	0	1.90	72	1	4.40	92	0	2.35
13	0	1.78	33	0	2.90	53	0	1.95	73	1	4.80	93	0	2.40
14	0	1.98	34	0	2.95	54	0	1.30	74	1	4.90	94	0	2.45
15	1	4.90	35	0	2.88	55	0	1.35	75	1	4.95	95	0	2.50
16	1	4.95	36	0	2.83	56	1	3.60	76	1	4.70	96	0	2.55
17	1	4.70	37	0	2.10	57	1	3.65	77	1	4.60	97	1	7.50
18	1	4.60	38	0	2.15	58	1	3.70	78	1	4.50	98	1	7.50
19	1	4.50	39	0	2.20	59	1	3.75	79	1	4.40	99	1	9.00
20	1	4.40	40	0	2.25	60	1	3.80	80	1	4.80	100	1	10.00

© Business Review : Volume 06, Number 01 & 02, January to December, 2008. pp.29-39, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

business REVIEW
a journal of business administration discipline

Export Potential of Bangladesh Pharmaceutical Industry: Situational Analysis Using TOWS Matrix

* Saadia Shabnam[1], Kohinoor Biswas[2]

Abstract

Bangladesh pharmaceutical industry of $ 0.5 billion has shown signs of promises since last two decades as it exports to 67 different destinations. This study attempts to explore the underlying potential of Bangladesh pharmaceutical industry to exploit the export opportunities created in the backdrop of WTO/TRIPS waiver until 2016.This study has primarily approached to identify the internal strengths and weaknesses of the industry; secondly, scanned through the export opportunities and threats in the context of other global players; like India, China or African nations. Primary information has been collected through one-to-one in-depth interviews. Major findings are: achievement of world class quality by a handful of firms, cost effective human capital, poor R&D base, lack of API manufacturing ability, lack of govt. support. Lastly, the findings are fit into a TOWS matrix pairing them up into four subgroups as SO, WO, ST and WT. This study provides a meaningful understanding of the complex dynamics of pharmaceutical industry with special reference to its export potential.

Key Words : TOWS Matrix, Pharmaceutical Industry, Export.

Introduction

Bangladesh can take pride of the development and achievement made by her pharmaceutical industry. This is the only knowledge intensive industry to have been able to mark its footsteps in the international market. Since 1982, the industry has come a long way achieving self-sufficiency in the sector. National Drug Policy (NDP) 1982 worked as a growth stimulator for the local companies as it banned many of the combination drugs, multivitamins, tonic preparations of MNCs (since these drugs were proved to be useful as adjunct therapy only not being able to treat any basic medical disorder); also made rules tighter for MNCs, added clauses to facilitate local firms, established DDA (Directorate of Drug Administration) as the highest body authorized to monitor and control quality (Chowdhury, 1996). But in today's globalized world, this industry faces a new set of challenges in the backdrop of WTO/TRIPS ruling. This paper attempts to take a closer look into this industry from perspectives like: how is it adapting itself to the emerging scenario of legal and competitive forces with respect to availing export opportunities.

Focus of the Study

Main objective of the study is to prepare a Threat Opportunity Weakness Strength (TOWS) matrix for Bangladesh Pharmaceutical industry. To meet requirements for the TOWS matrix, some other specific issues must be addressed like-

- to identify the advantages of Bangladesh pharmaceutical industry to exploit the export opportunities
- to explore the bottlenecks that Bangladesh pharmaceutical industry facing in the export market
- to shed light on export potentials created by WTO/TRIPS waiver until 2016
- to find out the prevailing sources of threats that Bangladesh pharmaceutical industry encounters to access export market.

* Corresponding Author
[1]Saadia Shabnam, Lecturer, East West University, Dhaka, Bangladesh.
[2]Kohinoor Biswas, Senior Lecturer, East West University, Dhaka, Bangladesh.

Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.29-39, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

Methodology

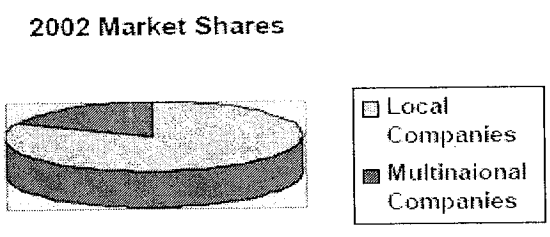
This paper is an attempt to reveal the current situation of the international marketing of Bangladeshi pharmaceutical products. It has mainly used primary information collected through in-depth interviews with several knowledgeable industry persons and academicians. Discussion and subsequent follow up contacts with them enabled us to sum up for designing the relevant TOWS matrix for international marketing dynamics of the industry.

The exploratory nature of our study required some qualitative information regarding the industry phenomenon of the pharmaceutical sector of this country. To gain a qualitative understanding of the whole pharma industry and to shed lights on some issues that are not apparent, one to one depth interviews were ideal (Malhotra, 2000). Unstructured information was collected through a proforma (Appendix) of some specific issues contained general industry information (Malhotra, 2000). We have tried to follow a rough outline but the subsequent direction of the interview, wording of the questions and the order in which they are asked were influenced by experts' initial replies and our probes for elaboration. Issues related to the current and future prospect of the pharmaceutical industry were carefully designed to prepare the proforma to encourage the experts to talk freely and to guide the interview to have successful outcome. A more profound discussion concerning aspects of opportunities and challenges of this sector were then taken place.

In the second phase of study, to form an understanding about more concrete and vivid information about the current scenario and pharmaceutical opportunities in the international market, an extensive desk research was undertaken on every accessible published materials addressing local and other foreign country pharmaceutical industry.

Relevant Discussion on Existing Literatures

The Pharmaceutical Industry of Bangladesh: Drug manufacturing is a 700-million-dollar industry in Bangladesh, according to Nazmul Hassan, Chief Executive Officer of Bangladesh's second largest drug manufacturer, Beximco Pharmaceuticals. As in the global market, the Bangladeshi pharma market shows a fair degree of concentration: In 2002, the top 10 pharma companies accounted for over 60% of the market share. Of those top ten players, two, namely Aventis and Glaxo, are multinational companies, the others are national companies (IMS, 2002)



Source: Draft report on National case studies on the institutional framework and procedures regulating access to pharmaceutical products needed to address public health problems, submitted to Mr. Kosi Latu, Commonwealth secretariat, by Nazmul Hassan, CEO of Beximco Co., Bangladesh, in May 2004.

The largest drug manufacturing company is Square Pharmaceuticals with annual revenues of around 100 million US$, followed by Beximco. Both companies have set up production facilities that are set out to produce in accordance with international quality requirements, aiming at international quality certifications (e.g. US FDA, UK drug authority). Whereas there is very limited experience in Bangladesh with international quality certification, and thus a strong desire for support, the leading companies are doing their best to get the support on their own, for example by recruiting executives from multinationals or from India.

In most cases, Active Pharmaceutical Ingredients (APIs) have to be imported from abroad, which, together with the necessity to import machines, is one of the main disadvantages in terms of cost

© Business Review : Volume 06, Number 01 & 02, January to December, 2008. pp.29-39, Business Administration Discipline, Khulna University. Khulna-9208 (ISSN 1811-3788)

when compared to India. The leading manufacturers are therefore going into API manufacturing, focusing mainly on Antibiotics, but also other drugs, as for example anti-cancer drugs.

Basically, there are three distribution channel systems in Bangladesh: public hospitals, private hospitals and private pharmacies. Public hospitals source mainly from the state-owned EDCL, whereas private hospitals and pharmacies source from the private sector. However, public hospitals can also source from private pharmaceuticals through tender bids.

International Marketing of Pharma Products

Existing Export by Local Companies: Bangladesh exports a wide range of pharmaceutical products (therapeutic class and dosage forms) to 67 countries worth $ 27.54 m.

Bangladesh's exports are growing rapidly, as shown in Table 1-

Table 1 : Bangladesh's Pharmaceutical Exports in USD millions

	1975	1980	1985	1990	1995	2000	2002	2003	2004	2005	2006
Pharmaceutical Exports	0.37	0.15	0.04	0.12	2.74	5.61	6.6	9.05	12.69	21.26	27.54
Pharmaceutical Exports less Novartis/Sandoz	-	-	-	-	-	-	4.09	6.03	-	10.37	14.74
Total Exports	382.6	749.3	934.4	1,524	3,428	5,752	5,986	6,548	7,603	8,652	10,514
Pharmaceutical Exports as a % of total exports	0.1	0.02	0.01	0.01	0.08	0.1	0.11	0.14	0.17	0.25	0.26
Pharmaceutical Exports growth rate (%)	-	-59	-73	200	2183	105	18	37	40	68	30

Source : Bangladesh Export Statistics (2005)

Export Potential for Bangladeshi Pharma Products: In order to export, international certification works favorably. Only 6 firms have achieved this so far. Bangladesh's export potential varies from high towards low depending on how strictly regulated the individual market is. The largest barriers to regulated markets are manufacturing facilities which come at a cost of at least $50 million and know-how. Some markets, such as Tanzania and Malaysia, are moderately regulated. While countries do not always require stringent certification, a certification from a regulated market signifies quality and provides a firm with a competitive advantage. Most Bangladeshi pharmaceuticals are exported to less than fully regulated markets such as Bhutan, Pakistan, Sri Lanka, Nepal, Vietnam and Myanmar (Chaudhury, 2006).

Patent Flexibility and International Marketing of Pharma Products: The competitive advantage for essential drugs manufacturing in Bangladesh as an LDC results from the Doha Declaration on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and public health which states that LDCs are exempted from the obligation to implement patent protection for product patents until 2016, and possibly beyond. The legal opportunities are concentrated around manufacturing of patent-protected drugs for the domestic market and for export to other LDCs without sufficient own production. Bangladesh is in a unique situation as it is the only LDC amongst a total of 49 LDC nations to have the capacity to produce and export to other LDCs legally at least until 2016. Exportation to other developing countries is also legally possible, provided the importing country notifies its need with the WTO. In that case, a non LDC manufacturing country could also export to that country, but it would have to issue a compulsory license specifying exactly the type and quantity of drugs provided. A non-LDC manufacturer

would also have to publish the exports on a website and observe some criteria in terms of packaging. A reasonable royalty will have to be paid to the patent holder. Bangladeshi exporters can get advantage in terms of both cost and flexibility only if the provisions of TRIPs are exercised (WTO, 2006).

TOWS matrix: It has been common in the past to suggest that companies identify their strengths and weaknesses, and the opportunities and threats in the external environment. But what is often overlooked is that combining these factors may require distinct strategic choices. To systematize these choices, the TOWS Matrix is proposed in which 'T' stands for threats, 'O' for opportunities, 'W' for weaknesses and 'S' for strengths (Weirich,1982).

TOWS framework is used to design a consolidated information matrix considering strengths, weaknesses, opportunities and threats of a particular sector/ industry/ individual company that can aid to generate potential feasible strategies. (Koontz, O'Donnell, Weihrich, 1980). The main goal of this study is to provide an accurate picture of the pharmaceutical market conditions, in order to act as a tool to aid the decision making process of both pharmaceutical companies and the country. For that, listing and analyzing the strengths and weaknesses of the pharmaceutical sector, as well as the opportunities arising today and the factors threatening its future development (Kousoulakou, 2007) can make the picture vivid.

Elements of TOWS Matrix *:*In the analysis of the external environment, many diverse factors need to be considered. Today, for Bangladesh, as a country of third world and especially for its pharmaceutical industry, the threats certainly would include the problems of severe inflation, energy and capital requirement, need for technological excellence and government actions. The diverse factors—which can be either threats or opportunities—can be grouped into the following categories: economic, social and political factors, products and technology, demographic factors, markets and competition, plus others. Several studies (Sagar, 2005) attempted to find out the strength, weakness, opportunity and threat factors to shed light on the critical issues for decision making.

Application of TOWS*:* The TOWS Matrix (Weihrich, 1982; 1990) indicates four conceptually distinct alternative strategies, tactics and actions. For our purpose, we adapt the discussion for industry-level analysis. *Firstly*, The WT Strategy (mini-mini): in general, the aim of the WT strategy is to minimize both weaknesses and threats. In case of international businesses the industry facing external threats and internal weaknesses may indeed be in a precarious position. *Secondly*, the WO Strategy (mini-maxi): the second strategy attempts to minimize the weaknesses and to maximize the opportunities. The industry may identify opportunities in the external environment but have internal weaknesses which prevent the industry from taking advantage of market demands. *Thirdly*, the ST Strategy (maxi-mini). This strategy is based on the strengths of the industry that can deal with threats in the environment. The aim is to maximize the former while minimizing the latter. *Lastly*, the SO Strategy (maxi-maxi): an industry should to be in a position where it can maximize both, strengths and opportunities. Such the industry can lead from strengths, utilizing resources to take advantage of the market for its products.

Strengths, Weaknesses, Opportunities and Threats of Bangladesh Pharmaceuitcal Industry

Strengths of Bangladesh Pharmaceutical Industry

Earns Self-sufficiency: According to the Directorate of Drug Administration records, in the year 2002, all the essential drugs were produced locally and about 45% of the local drugs production

concerned essential drugs. Locally produced drugs amount to over 80% of the market share and meet over 90% of the local drug demand. There are over 200 licensed pharmaceutical factories in the country, six of them are owned by multinational companies producing about 10% of the local production. The essential drugs market in Bangladesh is well supplied, and there is no availability problem of essential drugs (gtz, 2007).

Gains World Class Quality Recognition : It can thus be said that there is no doubt that Bangladeshi drug companies are able to or are easily put in the position to manufacture top quality drugs. Square, the leading company, followed by Beximco, both have set up production facilities that are set out to produce in accordance with international quality requirements, aiming at international quality certifications (e.g. US FDA, UK drug authority). Square has already received certification from UNICEF Denmark for one of their plants. Acme Laboratories, has received WHO prequalification. The Orion Group is setting up a completely new company, Beacon Pharmaceuticals, with executives hired from their top competitors also aim at top quality drug manufacturing, focusing especially at anticancer drugs. 8 firms already have WHO pre-qualificatins, other 6 firms are in the process of acquiring WHO pre-qualifications (Sampath, 2007).

Strict Regulation Prevents Spurious Drugs : The Drugs Act permits the import of certain classes of drugs only under the licenses or permits issued by the relevant authority appointed by Government. All classes of drugs imported in the country are required to comply with the prescribed standards and are to be labeled and packed in the prescribed manner. The quality requirements on imported drugs are very strictly controlled, thus successfully preventing Indian spurious drug manufacturers from entering the market, thus protecting the local industry and public health (gtz, 2007).

Lower cost of Human Capital: Bangladesh is internationally very competitive in terms of labor cost. Over the whole value chain, the economies of cheaper labor cost may account for up to 50% of the overall manufacturing cost for APIs. Skilled pharmacists and lab technicians etc. are readily available at low cost in Bangladesh in the pharmaceutical sector, and A-level graduates can be trained to do operative work at low cost (gtz, 2007). Skilled pharmacists are the key resource of the industry which contributes to the innovative efforts. The Bangladesh Association of Pharmaceutical Industries (BAPI) estimates that Bangladesh's labor costs are approximately 20-30% lower than in India (World Bank, 2008).

Weaknesses of Bangladesh Pharmaceutical Industry

Small domestic market size: Bangladesh pharmaceutical industry is worth of $0.5 b (2005 data). Indian pharmaceutical industry was $ 6.9 b (in 2003), the Chinese one was $ 24.27 b in 2004 (World Bank, 2008). Because of this small size, Bangladeshi firms always had to look for international market with their API produce adding extra risk and cost burden for them. Whereas Indian and Chinese firms received extraordinary backup support from their extra large domestic consumption capacity not having to worry at all about foreign market, thus passing through the learning phase successfully and entering into export market with competitive edge in price and quality.

Poor Penetration in the Export Market: Only about 1 % of the locally produced drugs is exported valuing around $ 27m in 2007. Export intensity of local firms in Bangladesh is also quite low when compared to that of the Indian firms. Even the biggest firms like Square and Beximco export 3 per cent and 2.7 per cent of their total output, whereas amongst the Indian firms, the exports can even account of over 70 per cent of total output (Sampath, 2007).

© Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.29-39, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

Lack of API Manufacturing Ability: Because Bangladesh API capacity is insignificant, API firms import approximately 80% of their APIs. Fifteen to seventeen Bangladeshi firms are involved in the manufacture of about twenty APIs, but they usually run the final chemical synthesis stage with API intermediaries, instead of the complete chemical synthesis. The other 1,000 APIs are imported. Approximately 75-80% of the imported APIs are from India and China. The remaining 20-25% is patented for which cost would go up after patent rule applies to them. Though India and China both have entered the WTO/TRIPS regime since 2005 still it has not impacted directly BD pharmaceutical industry threatening its sourcing of raw materials because of this fact. (Interview)

Weak Knowledge Infrastructure: In Bangladesh, enrollment in the tertiary education is only 6.5%, which is 11.8% for India and 19.1% for China (Sampath, 2007; UNCTAD 2007). The pharmaceutical firms have the largest share of personnel with Bachelors' degree. This again is an indicator of the kinds of innovation the firms are engaged in. According to BAPI (Bangladesh Association of Pharmaceutical Industry) the industry spends as mush as 1% in R & D, which may suit to a labor intensive industry like RMG but a serious deterrent for a knowledge based pharmaceutical industry. Governments in India and China deserve a great deal of credit as they have long been emphasizing on the knowledge building mission actively by funding research in the public research institutes, forming collaborations within and outside countries.

In Bangladesh, though pharmaceuticals (a few) gained considerable success in formulation technology, their advancement in reverse engineering has been insignificant over the past decades. This deficiency can be attributed to weak knowledge infrastructure. (Interview)

Unlike the thriving pharmaceutical industries in other countries, in Bangladesh there is very little collaboration between pharmaceutical industry and universities as far as innovation is concerned. Firms tend to collaborate strongly with private laboratories and medical practitioners (for sale of their products,) and moderately with industrial associations and governmental agencies (for lobbying). Public private partnership is critical for acquisition, use and application of knowledge to newer products (Sampath, 2007).

Lack of GMP Standards: There are two ways to assign quality certificate to the manufacturers of Bangladesh; one is by the DDA (Directorate of Drug Administration) and another is given by WHO- called CGMP or GMP certification. DDA certification is easier to obtain as it has been frequently seen to be heavily influenced by various political pressure groups' vested interests having been demonstrated that 95% of the firms inspected by DDA gets a quality certification whereas WHO approves certification to the 63% of the firms investigated. This is the reason of wide variation of quality amongst the drugs produced by the firms of Bangladesh which is a great threat to the public health (Sampath, 2007).

Lack of Bioequivalence Facilities: Bioequivalence laboratories test the availability of the drug in the blood. They determine drug absorption and elimination rates, and other in vivo effects. For a generic final formulation to be approved for import into a regulated market—and some moderately regulated markets such as Tanzania and Malaysia—the drug needs to be tested for bioequivalence. Bangladesh has no bioequivalence laboratory capabilities. Bangladeshi firms that want to export their products send drug samples to an internationally recognized bioequivalence laboratory abroad for testing at a cost of $30,000-$60,000 per drug taking nearly six to eight months for a test (World Bank, 2008).

Under-regulated Market Structure: Bangladesh pharmaceutical industry is under-regulated. Although there are approximately 200,000 private pharmacies in Bangladesh, the government lists officially only 76,000 pharmacies. The rest are illegal, without a license or a licensed pharmacist

on staff. Pharmacists have varying education levels and many lack adequate training. Rural pharmacies may have pharmacists with high school education and approximately two weeks training (World Bank, 2008).

The second tier companies (with no CGMP certification) usually target the rural market not being able to compete with top tier (with CGMP certification) companies. Since the DDA (Drug Directorate Administration) operates within a very loosely held legal frame, these second tier firms taking advantage of it, pursue unethical means for reaching their ends. Moreover, out of 200 plus firms, there are only 6 GMP certified companies, the rest are certified by DDA. Since the DDA certification is not accepted in the export market, export opportunity confines itself only to these 6 GMP certified firms. Furthermore, the overall poor image of the industry stands as a barrier for the rest few to access the export market.

University Curriculum Not Tuned to the Industry Need : There is a lack of university courses that are tailor-made to produce chemistry-based skills of the kind required to reverse engineer in the pharmaceutical sector. Additionally, lack of funding and focus are major handicaps for all the universities. The laboratory facilities in disciplines such as pharmaceutical sciences and biotechnology research, which are being taught in several public and private universities, are also not enough to create human skills that can be directly deployed by the industry. Whereas several universities are only now creating courses for both these disciplines (which implies that it will take several years for competent streams of manpower to develop), the curriculum and quality of the courses also need to be assessed (World Bank, 2008).

Opportunities for Bangladesh Pharmaceutical Industry

Opportunity to Export Anti-diarrhea Drugs : Bangladesh has long been a place where diarrhea has been a major cause of child mortality. Bangladesh has achieved significant achievement in the management of diarrhoea. Bangladesh pharma can capitalize on this competitive edge of having this knowledge and expertise to export oral saline preparations in the eastern Mediterranean and African countries' where diarrhea is a major threat to child death (gtz, 2007; World Bank, 2008).

Opportunity to Export Anti-infectious Drugs : Tuberculosis, respiratory infections are prevalent in the countries of eastern Mediterranean region. African and South Asian countries' children are also affected by infectious diseases. As these markets are relatively less regulated Bangladeshi pharmaceutical firms are expected to gain access with much ease (gtz, 2007; World Bank, 2008).

Export Opportunities for Anti-AIDS, Cardiovascular / Antihypertensive, Antidepressant Drugs: Africa offers big opportunity for the few Bangladeshi firms with HIV/AIDS API facility to explore African market. Companies like Square, Beximco, Skayef have already stated exploring this market. South and South-east Asia has immense need for cardiac drugs, specially ischemic heart disease and cerebrovascular disease. Bangladesh pharma having a good range of drugs in her portfolio can exploit export potential in this category. Market for antidepressants is growing in Southeast Asia that is accessible for Bangladeshi firms. (Interview)

Cost Advantage as License Fee Exempted: Due to its LDC status and the fact that Bangladesh has no patent protection for pharmaceutical products, no license fees are payable for manufacturing and for export to other LDCs. Until 2016, Bangladeshi pharmaceutical firms are in an advantageous position to enjoy this cost benefit (gtz, 2007).

Better Quality Perception than African Nations: When it comes between Bangladesh and any African nation to gain access to other developing nations, situation may come in favor Bangladesh due to better quality image. The global need for essential drugs is huge justified by institutions like the Global Fund to combat AIDS, Malaria and Tuberculosis. It is also to be expected that wherever donor funds are directly used to purchase drugs (as the Global Fund or the Gates Foundation), the demand will come with such quality requirements that would put a country like Bangladesh with a good track record and a lot of experience at advantage over African LDCs that are only just entering the business of pharma manufacturing (World Bank, 2008).

Threats for Bangladesh Pharmaceutical Industry

Lack of Govt. Support than India: Behind India's pharmaceutical achievement, government has always been a strong strategic partner in areas from policy support to providing fund, to tax exemption, to reducing duty for importation of equipments. For Bangladesh, the role of govt. has always been insufficient in that public research institutes received lack of funding, no initiatives taken to acquire knowledge on reverse engineering unlike Indian government (Lalitha, 2002; Sampath, 2007).

In India, 22 industrial parks are created using PPP (public private partnership) model to help boost the industry, whereas In Bangladesh these issues are still on the discussion table (World Bank, 2008).

Lack of Govt. Support than China: In China, 60 industrial parks are created using PPP (public private partnership) model to help boost the industry. Govt. has declared biotech as a major thrust sector (World Bank, 2008).

National Drug Policy (NDP) 1982 was a timely intervention from the govt. which took a protectionist stance helping the domestic industry to grow. But, in last three decades this industry did not receive the proper attention and support to build further on knowledge and technology to become internationally competitive.

Uncertainty beyond 2016: As the patent flexibility will expire from Jan, 2016 Bangladesh will have to face tougher market situation than now. What is coming beyond 2016 mark, depends much on the progress made between this timeline. More Bangladesh can capitalize on the strengths and opportunities (discussed earlier) better will be her competitive position, or else Bangladesh would have to lose on her long and hard earned ground. (Interview)

Business Review : Volume 06, Number 01 & 02, January to December, 2008, pp.29-39, Business Administration Discipline, Khulna University, Khulna-9208 (ISSN 1811-3788)

TOWS Matrix of Bangladesh Pharmaceutical Industry

A Threats, Opportunities, Weakness and Strength (TOWS) matrix is constructed based on the finding:

Internal factors / External factors	**Internal Strengths (S):** -Earns Self-sufficiency -Gains world class quality recognition -Strict regulation prevents spurious drugs -Lower cost of Human Capital	**Internal Weaknesses (W):** -Small domestic market size -Poor Penetration in the Export Market -Lack of API Manufacturing Ability -Weak Knowledge Infrastructure -Lack of GMP Standards -Lack of Bioequivalence Facilities -Under-regulated Market Structure -University Curriculum Not Tuned to the Industry Need
External Opportunities (O): -Opportunity to Export Anti-diarrhea Drugs -Opportunity to Export Anti-infectious Drugs -Export Opportunities for Anti-AIDS, Cardiovascular, Antihypertensive, Antidepressant -Drugs Cost Advantage as license Fee Exempted -More Cost Competitive and Better Quality Perception than African Nations	**SO: Maxi-Maxi** - Access to low-to-moderate regulated market due to world class quality certification - Cost advantage due to license fee exemption	**WO: Mini-Maxi** -Opportunity lost to produce patented drugs due to API capabilities - Opportunity lost of flexibilities (Compulsory licenses, parallel importation, Bolar exeption) due to poor bargaining power
External Threats (T): -Lack of Govt. Support than India and China -Uncertainty beyond 2016	**ST: Maxi-Mini** - Difficult to access in highly regulated market besides proven quality	**WT: Mini-Mini** -Lack of blueprint to face tougher competition beyond 2016 - Outdated patent makes the industry vulnerable to international watchdog - Multiplier effect on cost disadvantage due to incapability in API

Managerial Implication

Several directions have been come out through the study. A list of 'to do's is given below-

Build API Capacity The government has promised the construction of an API park for many years, but little action has been taken. The potential value of the park declines each day that its creation is not realized and the TRIPS' 2016 deadline nears. Prioritizing the API park and starting construction is vital if Bangladesh chooses to manufacture APIs. One way to bridge this gap is to facilitate foreign investment in the form of joint venture, licensing agreement or contract manufacturing. Already this issue has been addressed through NDP 2005.

Update the patent law. The current patent law was written in 1911 needs to be updated to reflect flexibilities afforded Bangladesh under TRIPS. Changes need to be made regarding product and patent law legislation, parallel importation, and Bolar exceptions. In addition, the current compulsory license legislation is extremely cumbersome. The government should immediately pass legislation in this area. Institutional capacity to handle patent issues is also lacking. The Patent Office needs capacity building and training.

Improve negative Country of Origin (CoO) Perception. BAPI considers poor CoO as a significant barrier to enter a moderately regulated market. Export promotion bureau can help to improve this situation through positive branding of the industry's capability built over the years.

Provide Technical Assistance. Firms who already have international certifications are in dire need to explore export opportunities in no time. They should be provided support on regulatory issues and market on a priority basis. For example, our firms are capable of producing ARVs (Antirtroviral drugs to treat HIV/AIDS) which is under patent protection. Since until 2016 our firms are protected from competition from India or China, these local firms should be given all-out support to capitalize on this.

Set Bioequivalence Testing Facilities. Bio-equivalence test is mandatory to gain access to a moderately regulated/highly regulated market. Now top companies like Square or Beximco has to get this test done from outside country in order to export which is a serious cost disadvantage for them. This should be given a top priority and a PPP model can work out this problem

Reduce Bureaucratic inefficiencies. Bureaucratic inefficiency is a general barrier for any industry. To help our firms to compete in the international landscape this needs to be addressed.

Provide Export Incentives. The achievements made by the local pharma industry deserves much credit and appreciation without having the required support from govt. Govt can think to provide export incentives as is being given to RMG .

Conclusion

Out of 49 LDCs, Bangladesh is the only one with a strong pharmaceutical industry. The industry, though achieved remarkable progress, stands now at the juncture of future turn. With the time extension from WTO, the industry has a set of unique opportunities which can only be capitalized on, if the weaknesses be overcome.

On one side, Bangladesh pharmaceutical industry deserves credit for acquiring world class manufacturing know-how and cost-competitive human capital. On the other, the scenario looks quite opposite, in a way, that only a handful companies out of a total 247, has made the achievement. The top companies have gained confidence in many therapeutic areas; like: antibiotics, anti-diarrhoeal, anti-AIDS and anti-depressants. A set of major weaknesses reveals; such as: small domestic market size, lack of API capacity, lack of industry-academia link, poor knowledge infrastructure and under-regulated market. Out of this list of weaknesses, the most

critical one appears to be the lack of API capacity, which needs to be fixed immediately, in order to avail export opportunities. Indeed, it is equally important for domestic business. Govt. has a key role to play in many ways; like: helping to build API capacity, bio-equivalence lab, state of the art labs in the universities. In this regard, there is strong reference from India and China to be followed by Bangladesh.

Since time is ticking towards the end of the WTO given extension and a long list of 'to do's is yet to be done Bangladesh pharmaceutical industry feels vulnerable to diminishing performance. Given the complex scenario unveiled through this research it is hard to foresee the sunny side of the story. The credits of achievements made so far should exclusively go into the accounts of the private sector. The industry now badly needs an extensive guardianship from the govt. in policy matters, knowledge and infrastructural capacity building in order to combat challenges in the post-TRIPS regime.

References:

Gtz (2007) " Study on the Viability of High Quality Drug Manufacturing in Bangladesh" *Federal Ministry for Economic Cooperation and Development*, pp 15-28.

IMS Bangladesh. 4Q, 2002, pp 403

Kousoulakou, H. (2007) "SWOT Analysis of the Greek Pharmaceutical Sector" *oundation for Economic & Industrial Research, Health Economics*. Available at URL: http//:papers. ssrn.com/cf_dev/AbsByAuth.cfm?per_id=676248

Sagar, D. (2005) "Indian Pharmaceutical Industry" *Industry Analysis*. pp 12-18.

Sampath . Padmashree G (2007) "Innovation and Competitive Capacity in Bangladesh's Pharmaceutical Sector" *Working Paper Series 031, UNU-MERIT.* (United Nations University - Maastricht Economic and social Research and training centre on Innovation and Technology). Netherlands. pp. 20-34

UNCTAD (2007) "The Least Developed Countries Report Background Paper Intellectual Property and Innovation in Least Developed Countries: Pharmaceuticals, Agro-Processing and Textiles and RMG in Bangladesh". Padmashree Gehl Sampath. United Nations University MERIT. Series 9. pp. 13-25

Weihrich, H (1990), "The TOWS matrix: A tool for situational analysis" in R G Dyson (editor), *Strategic planning: Models and analytical techniques* (John Wiley & Sons, Chichester), pp17 – 36.

Weirich, H.(1982) "The TOWS Matrix—A Tool for Situational Analysis", *Long-Range Planning*. World Bank (2008). Bangladesh: Public and Private Sector Approaches to Improving Pharmaceutical Quality In Bangladesh- Bangladesh Development Series Paper No. 23. World Bank, Dhaka.

Wright, L.T., (1996), "Exploring the in-depth interview as a qualitative research technique with American and Japanese firms". *Marketing Intelligence & Planning*, (14) 6: pp 59-64

WTO (2006). Trips and Pharmaceutical Patents- Fact Sheet. August. Pp. 2-8

Chaudhury, S. (2006) The WTO and India's Pharmaceutical Industry. Patent Protection, TRIPs and Developing Countries, Oxford University Press, 3rd edition.

Koontz, C. O'Donnell and H. Weihrich, (1980), *Management,* 7th ed., McGraw-Hill, New York, p. 847

Lalitha, N (2002). " Indian Pharmaceutical Industryin WTO Regime- A SWOT Analysis" . Economic and Political Review, August 24, pp. 3542- 3550.

Malhotra, C. (2000) Marketing Research, Mc Graw Hill, 2nd edition. pp 236