BRIEFING PAPER

CUTS International

No. 3/2012

Trade and Environment Linkages

Empirical Evidences from Textiles & Clothing Sector in India

Manbar Khadka*

A nation prospers if its developmental process allows for an efficient allocation of resources. Such a developmental process will not only alleviate poverty but also raise resources needed for environmental protection. It is only through environmental protection that trade flourishes and a sustainable economic growth becomes feasible (Verbruggen et al., 1995).

At present, rapid industrialisation is occurring in the South at the cost of environmental degradation. As such, there is a growing concern about the need for compliance to environmental standards by industries to minimise their environmental impacts. Given this backdrop, this Briefing Paper empirically analyses the effect of environmental standards in Indian Textiles & Clothing (T&C) sector.

Introduction

Environmental standards have been initiated to protect the environment. This is reflected in Environmental Product Information Schemes (EPIS) or eco-labels. Eco-labels inform consumers and policy makers about environmental characteristics of products and services. Eco-labelling began with the introduction of the German Blue Angel in the late 70s. The third-party eco-labelling schemes came into existence in the late 80s and 90s. Box 1 illustrates major objectives of eco-labelling schemes.

Box 1: Objectives of Eco-labelling Schemes

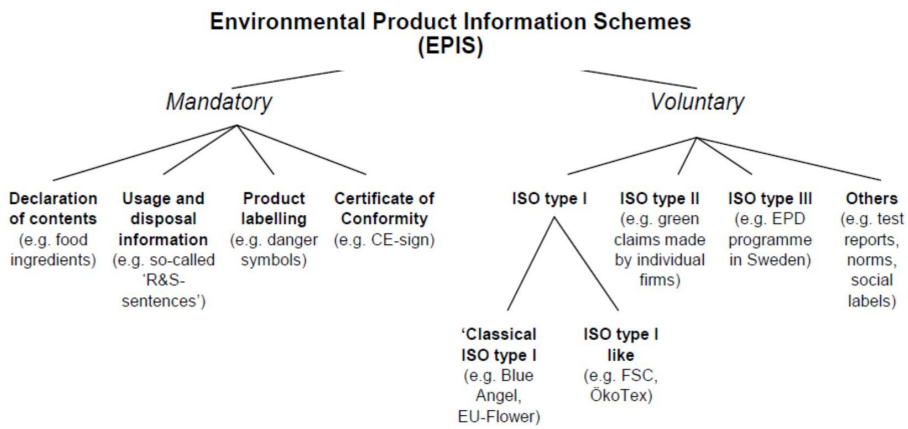
i. Guide the consumer in purchasing quality products with fewer adverse environmental impacts, in respect to the products of the same category available in the market
ii. Encourage manufacturers to develop and supply environmentally sound products, and
iii. Use the eco-label as a market-oriented instrument of environmental policy

Source: Adapted from Scheer et al., 2008

In 1989, the Nordic Council of Ministers established an official Nordic eco-labelling scheme called White Swan. The scheme was initially practiced by Denmark, Finland, Iceland, Norway, and Sweden (Scheer et al., 2008). The product criteria for White Swan is based upon the product's lifespan. The eco-labeling scheme covers paper, household chemicals, among others.

In 1992, the EU eco-labelling scheme also known as EU Flower came into existence. The voluntary eco-labelling scheme was designed for a wide range of daily products. The product criterion for EU Flower is based upon the product's life cycle. The eco-labelling scheme includes textile products,

Figure 1: Classification of Environmental Product Information Schemes (EPIS)



Source: Rubik / Frankl 2005

* *Research Associate, CUTS International (mk3@cuts.org)*

paints and varnishes and cleaners, among others (Scheer et al., 2008).

Given the fact that the EU is a major market, the adoption of European Type I Eco-labels by Indian T&C sector provides an opportunity for the sector not only to suffice the European demand for an environmentally sound product but also to preserve the local environment. In doing so, T&C industries should take into account not only their own competitive economic interests but also the interests of the surrounding society (Scheer et al., 2008).

Data & Research Methodology

With an objective to promote the optimal use of eco-labels so as to enhance environmental sustainability, consumer welfare in the North, and producer profitability in the South, CUTS International conducted this study with the support from Norwegian Ministry of Foreign Affairs. The study particularly aims to ascertain trade impacts of eco-labelling on Indian T&C sector, thereby recommending policy implications on environmental standards to bolster net welfare of stakeholders associated with T&C sector.

A total of 105 manufacturing and exporting firms consisting of small, medium, and large scales are surveyed from the following major production locations: NCR (Delhi, Gurgaon, and Noida), Ludhiana, Panipat, Coimbatore, Tirupur, Ahmedabad, Mumbai, and Surat. The selection of these clusters is a purposive one as they are major centers of T&C production. The firms' owners/managers are interviewed face to face regarding firms' adoption of environmental standards, their trade impacts, and others. The firms' annual turnover has increased over the years. The average annual turnover of the surveyed firms was ₹152 million in 2008-09. It soared to ₹237 million in 2010-11.

Table 1 (see annexure) depicts the number of firms manufacturing and exporting various textiles and clothing products. Table 2 (see annexure) show the surveyed firms' sizes in terms of annual turnover.

Econometric Estimation

In order to analyse the impact of environmental standards on Indian T&C sector, the study employs an instrumental variable strategy in a cross-sectional data set. Environmental standard is instrumented and a 2SLS regression is run using cross-sectional data set. The study is based upon a homogeneous group of T&C firms – firms that manufacture and export similar products of similar designs. Cost of tariff measures is same for all T&C producers of India but different based upon export destinations. Since tariffs will be different for each product, the study uses average tariff rate for analysis.

Environmental standards vary by product type and export destinations, but same environmental standards apply to all exporting firms irrespective of their location. In this analysis, environmental standard is a dummy variable. The survey asks whether or not a firm has complied with a set of nationally and internationally approved environmental standards.

$$ES_{ij} = \pi\,[\text{Access to Information}_{ij}] + \gamma\,[\text{Credit}_{ij}] + U_{ij} \quad \text{.....(1)}$$

$$LN\,X_{ij} = \alpha + \gamma\,LN\,T_{ij} + \delta\,ES_{ij} + \phi\,FC_{ij} + \psi\,Y_{ij} + \epsilon_{ij} \quad \text{.....(2)}$$

ES refers to environmental standards implemented by firm i exporting to location j (say France). Environmental standards (ES) will be highly correlated with the error term, ε_{ij}. As such, the ordinary least squares regression estimation will be biased. To overcome such bias estimation, the study instruments environmental standards with a set of regressors as shown in equation (1). Firms adjustment behaviour, i.e. compliance with environmental standards can be explained by better access to information, availability of credit and others. These regressors are assumed to have an association with the export indirectly via environmental standards.

In equation (2), the dependent variable is natural logarithms (LN) of exports of firm i exporting to location j. T refers to tariff measures faced by firm i exporting to location j. Here, the instrumented variable Environmental Standards from equation (1) is thus available for use within the second stage of regression. FC refers to financial slowdown faced by the firm. Y refers to firm i's number of years of compliance with environmental standards.

Figure 2 illustrates the relationship between exports and environmental compliance of T&C firms. There is an upward sloping relationship between the two indicating that exports do increase with environmental compliance.

Figure 3 illustrates the relationship between exports and tariff measures in terms of import duty faced by T&C firms. With an exception to an outlier, the figure shows that exports slightly decrease with increased import duty.

Figure 2: Exports and Environmental Compliance

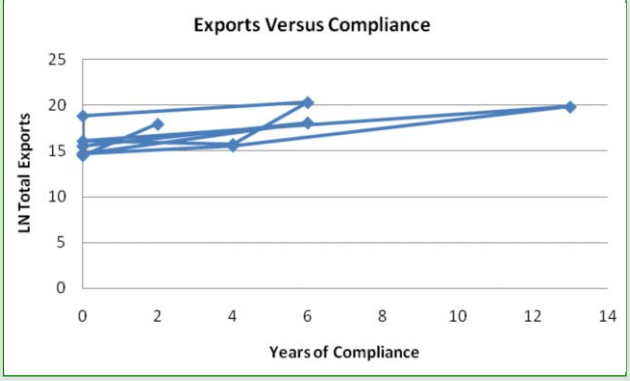
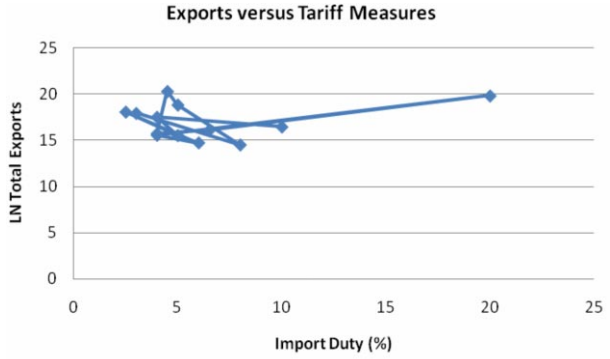


Figure 3: Exports and Tariff Measures



Survey Findings

i. Impact of Economic Recession

With economic downturns in the Western World especially in the US and the EU, Indian T&C sector too felt the heat of financial crisis. The US and the Western Europe are the major export destinations of Indian manufactured T&C products. Findings show that 21 percent of the respondents have felt the impact of recession upon their businesses. While the firms did not disclose the monetary impact, the recession largely affected their capacity utilisation.

In 2007-08, 9 firms faced export order cancellation amounting to ₹20 million. In 2010-11, 5 firms faced export order cancellation amounting to ₹8 million and yet another 5 firms faced the similar consequence amounting to ₹40 million in the same period. This setback has resulted in substantially reduced capacity utilisation for the firms (Table 4, see annexure).

ii. Competition

With increased trade liberalisation, companies across the globe compete among each other on quality, price, labour cost, and environmental standards, among others. In a level playing field, only those companies survive that can provide cost effective and quality products that comply with environmental standards. However, in reality, the scenario is quite different. Differential freight cost, duties, and taxes across the borders distort trade volume. For the sake of protectionism, non-tariff measures such as antidumping too distort trade volume. Table 5 (see annexure) summarises the various nature of competition faced by Indian T&C sector.

Tables 5 and 6 (see annexure) show that Indian T&C sector faces biggest competition from China and Bangladesh. For example, Table 4 (see annexure) shows that 31 Indian T&C firms face competition from China on price for the finished materials. Similarly, 10 Indian T&C firms face competition from Bangladesh on labour cost. It is noteworthy that China is one of the top cotton producers in the world with an extensive T&C manufacturing sector. Chinese textiles are cheaper than Indian textiles because of low production cost in China (Table 5, see annexure).

Bangladeshi textiles have an advantage over Indian textiles in terms of freight cost and taxes. And US products have an advantage over Indian products in terms of quality (Table 5, see annexure).

iii. Tariff and Non-tariff Measures

Various export destinations where Indian T&C sector faces tariff measures. Only 10 percent of the respondents have indicated tariff barriers faced in the export destinations. The products that fall under category HSCODE 6103 face high tariff in Brazil amounting to 33 percent. Similarly, products that fall under categories HSCODES 6108 and 5209 face high tariff in Italy and US respectively. These tariff figures are in accordance with official data, thereby reinforcing the existing findings on tariff measures.

Respondents reported non-tariff measures in major destinations like Dubai, US, and UK. But the respondents did not identify types of non-tariff barriers (NTBs) faced by Indian T&C products.

iv. Environmental Standards

Among several environmental standards, majority of respondents are aware about International Organisation for Standardisation (ISO) 14001 and Registration, Evaluation, Authorisation, and Restriction of Chemical (REACH). 73 and 65 percent of the respondents are aware of ISO 14001 and REACH respectively.

Table 7 (see annexure) shows that environmental standards such as REACH and GOTS that are applicable to EU are widely complied with by Indian T&C sector. While 32 percent of the firms surveyed have not complied with any environmental standards applicable to EU, 22 percent of the firms surveyed have not complied with any environmental standards applicable to other export destinations. Other equally acceptable environmental standards in the EU are WRAP and FLO.

T&C firms face NTBs in the absence of certification of environmental standards. When asked whether or not firms have obtained certification for environmental standards, a large number of respondents did not disclose their certification status. Less than 20 percent of the respondents indicated obtaining such certification. WRAP and FLO certifications are obtained by only five percent of the respondents. Overall, the results show that firms' level of acquiring certification is very low.

Table 1: Number of Firms Complying with Environmental Standards

Conclusion

The survey findings shed light upon range of issues associated with T&C sector in India. The sector faces competition from major cotton producing countries like Bangladesh and China. In today's age of cutthroat competition, the sector needs to focus on content and design to meet the requirements of foreign demand. T&C manufacturers are aware of environmental standards, but they lag behind in acquiring certification of environmental standards. The sector needs to acquire certification for greater penetration in the international market.

The findings further shed light upon the effect of environmental standards upon trade. Environmental standards have been imposed upon internationally traded goods. This is done mainly to protect the environment and 'to level the playing field' from the point of view of international competitiveness (Verbruggen et al., 1995).

But by enforcing environmental standards on internationally traded goods, the developed world has been suppressing export prospects of the developing world. And so, developing countries have time and again argued against stringent environmental standards that limit their development aspirations (Verbruggen et al., 1995).

Nonetheless, the regression results show that compliance with environmental standards positively impact the trade of T&C sector. This finding can be one of the principal guidelines to advance the optimal use of eco-labels, thereby enhancing environmental sustainability, consumer welfare in the North, and producer profitability in the South.

Annexures

Table 1: Manufacturers/ Exporters (Sample Size: 105)

T&C Production Centers	Sample Size (n)
Ahmedabad	10
Surat	10
Tirupur	18
Coimbatore	7
Mumbai	10
Panipat	15
Noida	10
Gurgaon	10
Ludhiana	15

Note: All T&C firms surveyed here are both manufacturers and exporters

Figure 1: Textiles & Clothing Products	
Products Manufactured and Exported	**Number of Firms**
T-shirts, singlets and other vests, knitted or crocheted	18
Men's or boys' shirts, knitted or crocheted	16
Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib, etc	15
Men's or boy's suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches etc	14
Women's or girls' slips, petticoats, briefs, panties, night dresses, pajamas, negligees, bathrobes etc.	13
Women's or girls' blouses, shirts and shirt-blouses, knitted or crocheted	11
Men's or boys' suits, ensembles, jackets, blazers, trousers bib and brace overalls, breeches	10
Men's or boys' shirts	10
Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib	10
Women's or girls' blouses, shirts and shirt-blouses	9
Other furnishing articles (excluding those of heading 9404 - Mattress supports; articles of bedding etc.	9
Carpets and other textile floor coverings, knotted, whether or not made up	8
Men's or boys' underpants, briefs, nightshirts, pajamas, bathrobes, dressing gowns and similar etc.	8
Women's or girls' singlets and other vests, slips, petticoats, briefs, panties, nightdresses, pajama	7
Textile fabrics, impregnated, coated, covered or laminated with plastics, other than those of heading 5902	6
Babies' garments and clothing accessories, knitted or crocheted	6
Babies' garments and clothing accessories	6
Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m2 Unbleached	5
Yarn (other than sewing thread) of synthetic staple fibres, not put up for retail sale	5
Woven fabrics of synthetic filament yarn , including woven fabrics obtained from materials of heading 5404	4
Other carpets and other textile floor coverings , whether or not made up	4
Embroidery in the piece, in strips or in motifs	4
Other garments, knitted or crocheted	4
Shawls, scarves, mufflers, mantillas, veils and the like	4
Curtains (including drapes) and interior blinds: curtain or bed valances	4
Cotton yarn (other than sewing thread), containing 85% or more by weight of cotton	3
Track suits, ski suits and swimwear; other garments	3
Woven fabrics of silk or of silk waste	2
Cotton, not carded or combed	2
Woven fabrics of cotton, contains 85% or more by weight of cotton, weighs more than 200 g/m2 Unbleached	2
Synthetic filament yarn not put up for retail sale, including synthetic monofilament of less than 67 decitex	2
Artificial filament yarn (other than sewing thread) including artificial mono filament of less than 67 decitex	2
Bed linen, table linen, toilet linen and kitchen linen	2
Sacks and bags, of a kind used for the packing of goods	2
Other made up articles, including dress patterns	2
Cotton yarn (other than sewing thread) put up for retail sale	1
Yarn (other than sewing thread) of artificial staple fibres, not put up for retail sale	1
Woven fabrics of syn staple fibres, containing 85% or more of syn staple fibres C and polyester staple fibres:	1
Other woven fabrics of synthetic staple fibres Of polyester staple fibres:	1
Carpets and other textile floor coverings, tufted, whether or not made up	1

Table 2: Summary Statistics (Econometric Results)					
Variables	**Observation**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
LN Total Exports	13	16.99	1.88	14.50	20.29
Import Duty (%)	13	6.34	4.58	2.5	20
Financial Setback	13	0.23	0.43	0	1
Years of Compliance	13	3.92	4.21	0	13
Environmental Standards	13	0.61	0.50	0	1
Access to Information	13	0.69	0.48	0	1
Availability of Credit	13	0.15	0.37	0	1

Table 3: Instrumental Variables (2SLS) Regression *(Dependent Variable: Natural Log of Total Exports)*		
VARIABLES	**COEFFICIENTS**	**STANDARD ERRORS**
Constant	17.40629	1.075715
Environmental Standards (Dummy)	-2.162441	1.652786
Import Duty (%)	-.2651492**	.1164254
Financial Setback (Dummy)	3.195991***	.3740551
Years of Compliance (Dummy)	.4760921**	.2187554
Number of Observations	13	
Wald chi2 (4)	106.61	
Prob > chi2	0.000	
R-Squared	0.7115	
Root MSE	0.9738	

Note: ** represents significance at 5 percent level and *** represents significance at 1 percent level.
The 2SLS regression results have some important implications upon Indian T&C sector. The results show that the total export of T&C firm increases by nearly 47 percent points with years of compliance to environmental standards. And it is statistically significant at 5 percent level. Similarly, the total export of T&C firm decreases by 0.26 percent points for 1 percent increase in import duty. And this is statistically significant at 5 percent level. These results corroborate the notion that tariff measures such as import duty hinder the export sector of T&C firms. However, in contrary to popular belief, the results show that compliance with environmental standards positively impacts the export sector of T&C firms.

Table 4: Impact of Economic Recession				
Export Order Cancellation (INR)	**Number of Firms**			
	2007 - 08	**2008 - 09**	**2009 - 10**	**2010 – 11**
8 million	-	-	-	5
10 million	-	-	5	-
15 million	-	5	5	-
20 million	9	-	5	-
35 million	-	-	5	-
40 million	-	5	-	5
50 million	5	-	-	-
60 million	-	5	-	-
80 million	5	-	-	-
90 million	-	5	-	-
DON'T KNOW CAN'T SAY	82	82	82	91
Average Amount of Cancellation (Million)	**43**	**51**	**20**	**24**
Capacity Utilisation (in %)				
Less than 10 %	-	5	-	-
10-25 %	9	9	23	5
More than 25 %	5	5	9	14
DON'T KNOW CAN'T SAY	86	82	68	82
Average Change in Capacity Utilisation (%)	**23**	**21**	**23**	**38**
Change in Employment (%)				
Less than 10 %	9	9	9	-
10-25 %	9	5	18	14
More than 25 %	-	5	18	36
DON'T KNOW CAN'T SAY	82	82	55	50
Average Change in Employment (%)	**9**	**13**	**29**	**43**
Change in Production (in value)				
Rs 20 million	5	-	-	-
Rs 25 million	-	5	-	-
DON'T KNOW CAN'T SAY	95	95	100	100
Average Change in Production (Million)	**20**	**25**	**-**	**-**

Table 5: Nature of Competition									
Competitors	**Quality (n=44)**	**Price (n=45)**	**Labor cost (n=47)**	**Raw material availability (n=28)**	**Raw material cost (n=23)**	**Freight cost (n=25)**	**Duties & Taxes (n=28)**	**Antidumping (n=14)**	**Certification (n=20)**
Australia	1	1	-	-	-	-	2	1	-
Bangladesh	3	5	10	8	3	11	8	4	10
Canada	1	-	-	-	-	-	-	-	-
China	11	31	22	7	7	9	6	7	5
Europe	-	-	-	-	-	-	-	-	1
Germany	4	-	2	-	1	1	2	1	4
Indonesia	-	-	-	3	2	-	-	-	-
Italy	4	2	-	-	2	-	-	-	-
Japan	3	-	-	-	-	-	-	-	-
South Korea	-	-	-	2	2	-	-	-	-
Malaysia	1	-	-	-	-	-	-	-	-
Nepal	-	-	3	-	-	-	-	-	-
Pakistan	1	1	5	3	3	1	1	1	-
Russia	1	-	-	-	-	-	-	-	-
Singapore	-	3	-	2	1	-	-	-	-
Spain	2	-	1	1	1	-	-	-	-
Sri Lanka	-	-	4	2	1	-	-	-	-
U K	3	-	-	-	-	2	7	-	-
U S A	9	2	-	-	-	1	2	-	-
Note: n represents number of firms									

Table 6: Other Forms of Competition									
Competitors	**Customs (n=31)**	**Documentation (n=50)**	**Environmental (n=27)**	**Import Restriction (n=18)**	**Labeling (n=16)**	**Labor (n=25)**	**MFN (n=9)**	**Minimum Import Price (n=7)**	**Rules of Origin (n=7)**
Australia	-	-	-	-	-	-	-	-	-
Bangladesh	4	12	2	2	-	4	3	2	3
Canada	-	-	-	-	-	-	-	-	-
China	9	7		7	-	8	4	1	4
Europe	5	-	-	-	-	-	-	-	-
Germany	4	4	6	1	-	1	-	-	-
Greek	-	-	-	-	-	-	-	-	-
Indonesia	-	-	-	-	-	-	-	-	-
Italy	1	7	-	3	1	1	-	-	-
Japan	-	4	-	-	-	-	-	-	-
Jordan	-	-	-	-	-	4	-	-	-
Korea	-	-	-	-	-	-	-	-	-
Malaysia	-	-	-	-	-	-	-	-	-
Nepal	1	-	-	-	-	4	-	1	-
Pakistan	1	4	1	1	1	2	1	3	-
Russia	-	-	-	-	-	-	-	-	-
Singapore	-	-	-	-	-	-	-	-	-
South Africa	-	3	3	-	3	-	-	-	-
Spain	-	-	7	2	3	-	1	-	-
Sri Lanka	-	-	1	-	2	1	-	-	-
Thailand	-	-	-	-	-	-	-	-	-
Turkistan	-	-	-	-	-	-	-	-	-
U K	5	2	3	1	3	-	-	-	-
U S A	1	7	4	1	3	-	-	-	-
Note: n represents number of firms									

Table 7: Awareness on Environmental Standards	
Environmental Standards	**Number of Firms Aware about Environmental Standards**
ISO 14001	73
REACH (Registration, Evaluation, Authorisation, and Restriction of Chemical)	65
GOTS (Global Organic Textile Standard)	63
SA 8000 (Social Accountability)	61
WRAP (Worldwide Responsible Accredited Production Principles)	61
Oeko-Tex Standard 100	51
FLO (Fair-trade Labeling Organisations International)	37
Cedex	5
SSI	3

Table 8: Certification as per Environmental Standards			
Has Environment Standard?			
Environmental Standards	**Number of Firms**		
	Yes	**No**	**Cannot Disclose**
ISO 14001	18	55	27
SA 8000 (Social Accountability)	17	44	39
GOTS (Global Organic Textile Standard)	17	46	37
Oeko-Tex Standard 100	10	42	49
REACH (Registration, Evaluation, Authorisation, and Restriction of Chemical)	16	49	35
WRAP (Worldwide Responsible Accredited Production Principles)	5	56	39
FLO (Fair-trade Labelling Organisations International)	5	32	63

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This Briefing Paper has been prepared by CUTS Centre for International Trade, Economics & Environment (CUTS CITEE) as part of the project entitled, 'A Study of Environmental Standards and their Trade Impact: Case of India' is supported by Norwegian Ministry of Foreign Affairs (MFA) through Royal Norwegian Embassy, New Delhi, India. The field survey was conducted by ACE GLOBAL, New Delhi.

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