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The Issues and Challengers of Ferrous/Scrap Industry in Sri Lanka: Policy Analysis

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ABSTRACT : According to the interim budget proposals put forwarded for end of year 2015, an import duty concession has been given to imported billets which are being used as a raw material for the steel industry. As a result of this duty concession there is a tendency to create a freezing status in the entireferrous scrap recycling industry starting from collection to final smelting. Thus, the main objective of this study to study the present status of the iron/ferrous scrap industry in Sri Lanka and to observe whether the given duty concession has impact on present freezing status in the entire ferrous scrap recycling industry in Sri Lanka.The study was applied baseline survey for a data collection and used several instruments of data collection such as formal questionnaires, interview guide, participatory appraisal techniques, document perusal and direct observations. In order to get more insight into the organizational and practical aspects of current status of iron scrap industry in Sri Lanka , a number of interviews were hold with Government Officials, Scrap metal recycling companies, collectors, exporters and billets importer. Finally, the study proposed short-term and long-term policy options for further enhance the scrap industry in Sri Lanka

KEYWORDS: *Scarp industry, interim budget, duty concession, ferrous scrap recycling, policy analysis*

I. INTRODUCTION

According to interim budget speech in year 2015, by Hon Minister Ravi Karunanayaka "Today, the progress of the construction industry has hindered due to the high cost in the inputs such as cement, steel and sand. In order to address this issue, I propose to remove the customs duty applicable on cement and steel billets. Further, we would take every step to ensure that sand, which is another key input in the construction industry, is mined without harming our environment"(Interim Budget,2015). With this new custom duty local steel producers have changed their row material sources from scarp steel to billets.

With custom duty reduction, reduced the price of billets which can be substituted for scrap metal in the steel industry. According to the Sri Lanka Scrap Traders Association their trade has been severely affected due to the downward revision of import duties on steel, proposed by the 2015 interim budget. The association states that the local industry is facing a collapse as a result and claimed that the price of a kilogram of scrap metal which stood at Rs.63 has fallen down to Rs. 23.

In 2003 Sri Lanka exported scrap metal to India and ferrous scrap recycling industry did not face any problems at the time. According to the idea of scrap collectors, after custom duty reduction on the billet type material it was a blow to the stomach for the traders who dealt with this material. So, Sri Lanka Scrap Traders Association call on the government to put a stop to this because of the impact it has on all scrap metal dealers. Now the price of scrap metal has rebounded to about $100/metric ton. While China‟s steel production growth will now be much slower than in the last decade, it will continue to rise over the next few years from 823 Mt in 2016 to a plateau of around 900 Mt/a in the early 2020s (Global Steel Trade Monitor, 2016). Beyond that, it should show gradual decline through 2030 and beyond. Although they will drive future long-term demand, India and other emerging economies will not generate the same level of growth as the China boom. In 2020, the World steel consumption increased by 7.8% and China has increased its share of global metal consumption from 10% to 25% (World Steel Associatiom, 2016). The demand for metal in Asian market will remain strong in China, South Korea, India and Japan. Thus, it is a vital requirement to promote the recycling industries in the country as they contribute in fluxing national resources in to the country‟s economic mechanism and also contributes to the waste management as the secondary role.

II. LITRATURE REVIEW

Brief History of Ferrous Industry

The world steel production landscape has been changing dramatically since the 1980s. One notable trend is for firms in industrialized countries to reallocate iron and steel production facilities to developing countries. Growing production capacity in developing economies, especially China, has been fostering their economic growth and expanding their exports on low- value-added steel products.

The history of the world steel industry can be divided into three periods: two booms and one transformation (Worldsteel Association, 2011). The first steel industry boom lasted from 1950 until the first oil crisis in 1973. This period witnessed a flourishing world steel market sustained largely by the reconstruction of European countries after the Second World War and their automotive industry boom. However, the 1973–4 oil crisis put a brake on the fast pace of steel production growth and further led the global steel industry into a transformation era lasting two decades. The period 1975–2000 was characterized by production stagnation, in terms of scale, and structural transformation driven by widespread technological innovation which created 75% of the categories of steel products used today (Global Steel Trade Monitor, 2016). The second steel industry boom started at the beginning of the 21st century. Since 2000, world crude steel production has risen at an unprecedented rate. According to the International Iron and Steel Institute (IISI), world steel production has increased by nearly 63% from 750.1 million tonnes to more than 1.22 billion tonnes between 2000 and 2006 (Global Steel Trade Monitor, 2016). This dramatic growth was especially remarkable during the period 2002–06, when production rose at an annual rate of 8%. Developing countries such as China, India and Brazil were the main contributors to this second steel industry boom (Global Steel Trade Monitor, 2016). The value of world exports of iron and steel (Standard International Trade Classification (SITC) position 67) doubled in the period 1985–2002 from US$70.3 billion to US$143.2 billion, while their share in total world merchandise exports fell from 3.64% to 2.27% and their share in world commodities exports rose by 0.5% (from 10.2% in 1985 to 10.7% in 2002 (Prakash, 2012).

Current Market Power

Over the last 35 years, the iron and steel market has seen significantly changers. In 1980 716 Million tons of steel was produced and the following countries were among the leaders: USSR (21% of global steel production) Japan (16%), U.S.A (14%), Germany (6%), China (5%), Italy(4%), France and Poland (3%), Canada & Brazil (2.1%) (Taylor, 2016). According to the World Steel Association (WSA), in 2015 world steel production amounted to 1663 million tons – a 2% reduction in comparison with 2014. The list of leading countries has changed significantly. China ranks first and is far ahead of other countries (60% of global steel production), the share of the other countries from the top-10 is 2-8% - Japan (8%), U.S.A and India (6%) , South Korea and Russia (5%), Germany (3%) Turkey, Brazil and Taiwan (2%) (Pandey, Chakarborty, &Abhisar, 2009) (See figure 01). Besides China, other countries that have strengthened their positions in the top-10 are India, South Korea, Brazil and Turkey.

Table 01: Global Steel production – 2012 - 2015

Geography	Steel Production							
	Volume (Million Mt)				Changes			
	2012	2013	2014	2015	2012	2013	2014	2015
European Union	162.9	160.4	169.2	166.1	-0.05	-0.02	0.05	-0.45
Other Europe	38.7	37.6	36.2	36.2	0.05	-0.03	-0.04	0.0
CIS	82.1	80.4	105.1	101.5	-0.01	-.0.02	0.31	0.003
North America	118.6	116	119.9	110.9	0.03	-0.02	0.03	-0.08
Central and South America	46.1	45.9	45.2	43.9	-0.03	0.0	-0.02	-0.02
Africa	15.2	15.8	15.6	13.7	-0.02	0.04	-0.01	-0.12
Middle East	22.1	23.4	28.1	29.4	0.06	0.06	0.20	0.03
Asia & Oceania	989.4	1043.3	1116.3	1118.5	0.04	0.05	0.07	0.02
Others								
World	1480.4	1,528.4	1637	1620.4	0.0	0.0	0.1	-0.01
China	731	822	822.7	816.6	0.06	0.12	0.0	-0.007
World Exc. China	749.9	706.4	814.3	803.8	0.0	-0.1	0.2	-0.01

Source: Author computation based on WSA data -2016

At the beginning of 2015 the production of steel decreased by 1,8% in comparison with the first quarter of 2014. The production in terms of volume (for January to April 2015) amounted to 536,485 million tonnes. As particularly China along was sustaining the positive dynamics in the industry over previous decades the decrease in global production can be explained by the fall in steel prices and by the sales slowdown in China (Global Steel Trade Monitor, 2016).

Global SteelPrices.

Steel prices dropped in 2015 for one simple reason: Oversupply. A slowdown in the real estate and auto industries in China and a lackluster recovery in construction in Europe are contributing factors on the world market. (Kumar Amit, Associate Specialist at The Smart Cube. China, the largest producer in the world, is reacting by exporting large volumes of steel). Meanwhile, the price of iron ore, a key raw material, fell below $50 per metric ton in the first half of 2015, prompted mills to keep operating rates high, driving up supply (Worldsteel.org, 2016).It does not appear demand will increase in 2016, pointing out that the World Steel Association in its Short Range Outlook (October, 2015) expects global steel demand to grow approximately 0.7% year-over-year in 2016, after registering a drop of approximately 1.7% year-over-year in 2015 (Worldsteel.org, 2016).

Analysts at IBISWorld use three-year periods to measure activity in the steel market. In the current period, 2012-2015, Sean Windle, Procurement Research Analyst, estimates that steel prices have fallen 4.9% on average per year (Worldsteel Association, fact Sheet , Steel Industry By- Products, 2016) (Worldsteel.org, 2016). Like his counterparts at IHS and The Smart Cube, he cites oversupply due to the slowdown in demand from China, and the glut of iron ore and coal used to makesteel.Another factor, which is always present and definitely having an impact on the past three years, isthedollar‟sappreciationrelativetoSLR.“ThathasmadeU.S.-madesteelmoreexpensive relative to countries such as China.” IBISWorld‟s forecast has steel prices rising on average 6.1% per year during the next three-year period, 2015-2018. Windle tempers that: “As a commodity, steel is subject to volatility so the forecast couldchange.”Prices are expected to rise, because the market is going to work through the oversupply. “We will probably see supply match more closely with demand over the next three years, starting in 2016. It‟s already happening, but we won‟t feel the effects on price until the new year.”(IBSI World Report2016)Prices have fallen mainly because of a downturn in global demand from manufacturers, especially in China, pressure on supplies, and the increased use of substitutes (Taylor, 2016). An index kept by the trade organization showed a downward trend in ferrous scrap metal commodity prices for several years until a plunge in 2015 made it probably the industry's worst year in decades.Forexample,thepriceforindustrybenchmarkNo.1heavymeltscrapmetalwasabout$500 a ton in 2008 before sliding to about $330 at the beginning of 2015. It then fell toabout$170 by the end of the year (Institute of Scrap Recycling Industries – 2016 . The fall in base metal and steel prices over the past two years has been the biggest and longest rout since the 2008 global financial crisis, as China's slowing economic growth has fueled concerns about waning demand for industrial metals.

Production Forecast for Next Two Years

Despite the trend towards decreased steel production in the global market, Economic Intelligent Unit (EIU) experts still forecast a rise in steel production over the next two years in 2017, the expected growth is 2.2%, in 2018 – 2.8% (Global Steel Trade Monitor, 2016).

Table No 02: Trends of Steel Production in year 2016

Geography	Increased by	Decreased by
European Union		0.3%
France		3.6%
Italy		9.6%
Germany		2%
Poland	14.8%	
North America		7.2%
USA		8.5%
South America	0.2%	
Brazil	1.6%	
Asia		1.3%
African Countries		8.5%
China		1.3%
Oceania		5.9%
Russia	5.2%	
Ukrain		29.8%
World		6.8%

Source: Author computation based on WSA data -2016

The forecast predicts slow world market resuscitation the next year, including China. Positive growth in some other key regions especially in NAFTA and EU is expected

Global SteelConsumption

Iron in all its forms (cast iron, steel and rolled metal) is the most used construction materials in the modern global economy (McLaughlin, 2010). It retains the leading place in construction ahead of wood, competing with cement and interacting with it (ferroconcrete) and still competing with new types of construction materials (polimers, ceramics) (Muchove& Eder, 2012). For many years the engineering industry has been using ferrous materials more than any other industry.

Global steel consumption is characterized by upward trend. The average growth rate of consumption in 2014 was 3%. A lower growth rate can be seen in developed countries (2%). Developing countries have a higher level of consumption (1,133 Millions Mt) (World Steel Associatiom, 2016).

Future SteelConsumption

The forecast for steel consumption over the next two years are ambiguous. According to the WSA, in 2016 the trend of increasing steel consumption will continue the expert forecast an increase in steel consumption by 2.4% (Global Steel Trade Monitor, 2016). But this forecast assumes the relative stability of demand in China, which represent half of the global demand for steel. The main share of steel consumption in china relates to the construction sector in which the situation in 2016, is uncertain (Worldsteel Association, fact Sheet, 2016). The expert do not make definite forecast and say that the current macro-economic condition will have a significant impact on the balance production and consumption of the global steelmarket.

Table No 03: Global Steel Consumption – 2012 - 2015

Geography	Steel Consumption							
	Volume (Million Mt)				Changes			
	2012	2013	2014	2015	2012	2013	2014	2015
European Union	140	135	138	138	0.02	-0.04	0.02	0.00
Other Europe	35	37	38	39	0.04	0.05	0.03	0.03
CIS	57	59	61	62	0.03	0.03	0.03	0.02
North America	132	132	136	138	0.01	0.00	0.03	0.01
Central and South America	47	49	51	53	0.03	0.04	0.04	0.04
Africa	27	28	30	32	0.04	0.04	0.07	0.06
Middle East	49	49	53	54	0.01	0.00	0.08	0.02
Asia & Oceania	943	986	1016	1022	0.03	0.04	0.03	0.01
World	1430	1475	1523	1538	0.04	0.03	0.03	0.01
Developed Countries	390	384	390	392	-0.02	-0.02	0.02	0.01
Developing Countries	1040	1091	1133	1146	0.04	0.05	0.04	0.01
China	660	715	710	702.2	0.05	0.06	0.03	-0.001
BRIC	799	843	871	890	0.03	0.05	0.03	0.02
MENA	63	64	69	72	0.02	0.02	0.07	0.04
World Exclu. China	770	760	813	835.8	0.01	0.01	0.03	0.02

Source: Author computation based on WSA data -2016

Note: CIS = Commonwealth of Independent States, BRIC = Brazil, Russia, India and China, MENA = Middle East and North Africa.

WAS experts agree that growth will continue, but they forecast a slowdown in the growth of apparent global steel consumption in 2016 in comparison with 2015 - to 1.2% (to 1,521 Million tons. (WorldsteelAssociatin, 2016). WAS and EIU experts explain this is due to the slowdown as the real estate market. At the end of 2014, the slowdown in demand for steel in China amount to 3.3% (to 710.8 Million tonnes) for the first time since 1995 (Pickard, 2014) (World Steel Associatiom, 2016). In 2017 it is expected that the trend will remain the same and decrease will amount to 0.7% to 703.2 mlstonnes. The forecasted global steel consumption trends presented in table no5.

Brief Overview – Sri Lankan Context

The Metals Recycling Industry will increasingly play a valuable role in Sri Lankan economy. However, due to lack of reliable information on this sector policy makers were faced difficulties during recent decades. According to this study, there over 600 ventures which are functioning under ferrous scrap industry in Sri Lanka and provide employability for more than 40,000 workers. Officially, there are 42 registered steel millers in the country and more than 95% of those industries are locating in Colombo and Gampaha Districts. Balance industries are locating in Kandy and Kegalla. Annual Steel production is around 1.4 Million tonnes and around 40% of this output comes through the ferrous scrap. The Ceylon Steel Corporation Limited (LANWA) is capture 15% of domestic production. There are few Indian companies (Confeb Steels) being engaged in steel recycled industry and jointly they have contributed to local steel industry and it is around 20% of the local steel production. Besides, S.R Steel Pvt Ltd takes the significant component of the local steel production (35,000 Mt per annum). (See list of steel millers in Annex 01 table 02), Currently in Sri Lanka approximately more than 3,500 scarp collectors are located all over the country and annual scrap collection capacity is around 0.78 million tonnes in year 2005. However due to huge price reduction of ferrous scrap both collection and employment have reduced drastically in end of year 2016.

Challengers or ferrous Scrap Industry in Sri Lanka

In Sri Lanka we do not have any formal organized Metals Recycling industry structure in Sri Lanka. The industry is not highly regarded and there are no specially designated zones/areas for Metals Recycling. The country need domestic laws and legislation to drive the metals recycling industry by way of greater generation of metals scraps. For example, we need definitive end of life vehicle legislation, which would scrap a vehicle after say 15 years. There has also been a palpable lack of Central and State Government support to promote recycling of metals. Despite being environmentally benign import duty is levied on Metals Recycling Equipment/Radiation Detection Equipment. Carbon Credits for the Recycling Industry needs to be promoted. Forming specially designated zones/areas for Metals Recycling on outskirts of each major city should be taken up on priority. There is no policy per se on scrap recycling and there is a dire need for it. Finally scrap also needs to be defined properly.

Steel Production in Sri Lanka

Steel can be produced from iron ore or recycled scrap metal. In the case of the former, steel is manufactured by the chemical reduction of iron ore using the more traditional integrated steel manufacturing process or the more advanced technique of direct reduction using natural gas to produce direct reduced iron (DRI) or hot briquette iron (HBI) (World Bank, 1998; Metals Industry Research and Development Center, Department of Science and Technology, 2004).

Scrap Sources in Sri Lanka

One way of classifying scrap according to its source is to distinguish scrap from steel plants and rolling mills, scrap from the steel processing (new scrap), and scrap from products after their use (old scrap).
New scrap is generated during the initial manufacturing processes. The composition of new scrap is well known and in principle new scrap does not need any pre-treatment process before it is re-melted, although cutting to size might be necessary. Even new scrap with paint or coating (with the exception of cable which does need treatment prior to input into a furnace) does not generally need any waste-related pre-treatment before being sent to the furnaces, since many furnaces can melt such new scrap directly if required**.**

Old scrap is collected after a use cycle, either separately or mixed, and it is often contaminated to a certain degree, depending highly on its origin and the collection systems used. Since the lifetime of many metal products can be longer than 10 years and sometimes longer than 50 years, for instance products for building and construction, there is an accumulation of metal in use since the beginning of the industry.Another way to classify scrap sources is according to the products in which the metal was used before it became a waste. The main iron and steel scrap sources in this sense are vehicles (including ships and aeroplanes), metal products for construction, machinery, electrical and electronic equipment and packaging.

Vehicles and Transportation

Approximately 0.2 million end-of-life vehicles (ELVs) are discarded every year . Cars are primarily composed of metal (about 75 per cent) and a range of other materials. Currently, the metal components can be separated and completely recycled but this leaves a mainly organic residue, which is disposed of in landfills or is incinerated. The metallic parts are separated by physical processes and recovered as ferrous scrap (iron and steel, comprising 70 per cent of the total vehicle waste) and non-ferrous metals (5 per cent), all of which are recycled. The 25 per cent remainder is the automotive shredder residue (ASR), which is composed mainly of plastics, contaminated with any metallic and other parts that could not be separated.

Construction and Building

Steel has been used as beams, reinforcement bars, and other structural parts in building and construction since its industrial production. The amount of steel scrap generated during the demolition of a building varies greatly by type of building and geographical location. On average, steel accounts for slightly less than 1 per cent of the mass of a residential building. Almost all steel parts are recovered, with good quality beams for direct re-use and the rest for recycling in a steelworks.As per international standards, every five tonnes of cement used in infrastructure projects require one tonne of steel. This means an increase in domestic sales of 2.1m tonnes of cement during the first half of 2016 would have created demand for an additional 427,000 tonnes of steel during this period.

Large equipment and machinery

This category covers the industrial and agricultural machinery and structure, such as earthmoving and quarrying equipment, cranes, farm vehicles and machinery, storage tanks, tools, etc. On average, steel accounts for almost half of the content on a weight basis in electrical equipment. However, without information on collection rates, it is difficult to estimate the actual amount of steel scrap from waste electrical and electronic equipment (WEEE).

Packaging material

Steel packaging includes food cans, beverage cans, aerosols, etc. The Chairman, Sri Lanka steel Association show that around 60 % of steel packaging is recycled in Sri Lanka. This represents over 0.6 tonnes of food and drinks cans and other steel containers recycled in 2015.

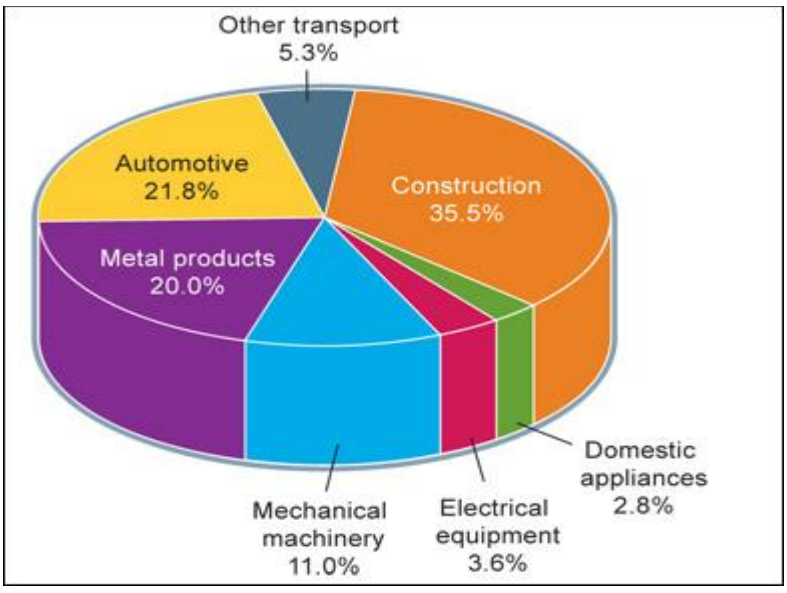
Used Beverage Cans

In most countries, used beverage cans (UBCs) are made both from steel and aluminum and are collected by local authorities as part of the municipal solid waste, although increasingly industry is involved in the collection of the UBCs.

Electronics and electrical equipment

The waste stream of electronics and electrical equipment covers a wide variety of end-of-life products mainly from households and offices. The WEEE Directive (waste electrical and electronic equipment) also requires that hazardous components, such as batteries, printed circuit boards, liquid crystal displays, etc. be removed with the proper techniques.After depollution, WEEE consists chiefly of a mixture of metal, plastics and glass. From here, the treatment of WEEE in general has the following steps, though the process may vary with different combinations: shredding, granulating (more than once), magnetic separation, and eddy current separation (more than once); there is also the possibility of density separation on the separation table and/or hand separation.

Figure No 1: Sources of Scrap in Sri Lanka



Sources : Based on Survey Data 2016

Recycling Process in Sri Lanka

In general, iron and steel scrap recycling involve collection, sorting, baling, packetting, cutting, shearing, shredding and/or sizing, possibly also cryogenic processes, and final melting at the steelworks. This process is summarized below**.** Ferrous scrap metal is collected either separately or mixed and is then sorted in the scrap yard and then sold to scrap treatment plants or is sent directly to a steelwork.

Once the scrap arrives at the scrap treatment plant, different types of metals are further separated and prepared for shredding/sizing. Shredding and sizing is often needed for a further stage of separation. While shredding and cutting, magnetic separation is used to single out the ferrous metal (carbon steel).

Ferrous scrap metal is collected either separately or mixed and is then sorted in the scrap yard and then sold to scrap treatment plants or is sent directly to a steelworks. Once the scrap arrives at the scrap treatment plant, different types of metals are further separated and prepared for shredding/sizing. Shredding and sizing is often needed for a further stage of separation. While shredding and cutting, magnetic separation is used to single out the ferrous metal (carbon steel).

The value of Local Steel Based Production

Due to lack of official information on iron-ferrous scrap industry in Sri Lanka, the value of following sub categories which has been mentioned by Central Bank annual report under national income and accounting calculation was used to measure the value of local steel production in Sri Lanka.

Manufacturing of Basic Metals and fabricated metals products

Manufacturing Machinery and Equipment

Other manufacturing, and repair and installation of machinery and equipment

The basic metals production grew by about 1.8 per cent during 2015 compared to the growth of 10.3 per cent in 2014. The contraction in the manufacturing of basic iron and steel products owing to the lower demand from the construction activities of the country, which experienced a setback during the early part of the year, led to a lower output during the first half of the year. However, increased demand during the latter part of the year supported the overall growth in this subsector.

III. METHODOLOGY

Sampling Framework

Following sampling framework was applied by the study team for gathering data/information from different stakeholders in the iron/ferrous industry in Sri Lanka.

Table 04: Sampling framework

Type of Stakeholders	Sample Size	Tools applied to data gathering
Ferrous Scrap Collectors	119	Structured questionnaire/Observation
Recyclers/ Steel Millers	10	Discussion and Observation
Exporters	5	Check list and observation
Importers	5	Check list and observation
Experts in Steel Industry	3	Key informatics interviews
Government officers	10	Check list and observation

The study covered 16 districts and met 119 ferrous scrap collectors. The sample size and population for each district are given in table no.14.

Table 05: Sample Size by Districts

District	Sample Size	District	Sample Size
Colombo	10	Nuwaraeliya	06
Gampaha	10	Badulla	08
kalutara	08	Rathnapura	07
Anuradhapuraya	07	Kegalla	07
Polonnaruwa	03	Ampara	07
Kurunagela	07	Monaragala	07
Jaffna	11	Galla	07
Kandy	07	Matara	07
Total (119)			

No of ferrous scrap collectors

Until this study forecasted, there was no official records or data on scrap collectors in Sri Lanka. Having meeting with large scale, medium scale and small-scale leaders in the districts and observing there records the study was proximately identified the number of collectors under different operational size as follows.

Data Analysis

Table No 06: Total Collectors and Operational Size by Districts

Districts	No of Collectors	Operational Size		
		Small Scale	Medium Scale	Large Scale
Colombo	360	240	92	28
Gampaha	361	253	87	21
kalutara	248	172	62	14
Anuradhapuraya	154	125	23	6
Polonnaruwa	127	102	21	4
Kurunagela	263	189	62	12
Jaffna	297	213	68	16
Kandy	261	187	59	15
Nuwaraeliya	162	123	32	7
Badulla	176	142	28	6
Rathnapura	167	132	26	9
Kegalla	224	165	47	12
Ampara	168	128	34	6
Monaragala	110	89	17	4
Galla	164	135	20	9
Matara	203	167	24	12
Total	3445	2562	702	181

Source : Field Survey 2106

Note: Small scale = Home to home collector and no yard for storage, monthly collection is less than 50,000kg. Medium scale = Monthly collection is more than 50,000 and less than 200,000 and having yard to storage. Large scale = Wholesale collector and monthly collection is more than 200,000 kg.

Collection Capacity by Districts

According to field survey, ferrous scrap collection has drastically reduced during the period of year 2015 and 2015. On average it has reduced by 50.1% among observed districts. Besides, substantial number of small scale collectors have been fastened there collection activities and approximately it is around 20 to 30 percent. Further more than 25% of medium scale collectors and around 10% large scale collectors have been shut-down there collection yards**.**

Table 07: Average Collections per Collector (Mt/Year)

Districts	Sample Size	Before tax Concession (2005)	After tax Concession (2016)	Percentage Changes
Colombo	10	1825	1234.2	-47.9
Gampaha	10	1965	1223.1	-47.9
kalutara	08	1620	1146.8	-60.7
Anuradhapuraya	07	1345	978.9	-41.3
Polonnaruwa	03	1235	967.5	-37.4
Kurunagela	07	1678	1024.5	-27.6
Jaffna	11	1789	1034.5	-63.8
Kandy	07	1567	1089	-72.9
Nuwaraeliya	06	1450	976.8	-43.9
Badulla	08	1235	880	-48.4
Rathnapura	07	1568	1076.5	-40.3
Kegalla	07	1678.9	1089.4	-45.7
Ampara	07	1534	1097.5	-54.1

Monaragala	07	1560	990.5	-39.8
Galla	07	1765.9	1134	-57.5
Matara	07	1876	1132.9	-55.7
Average		1,605.7	1,010.1	-50.16

Recent Price and Profit Margin Changers

Bothe purchasing price as well as sold price of scarp collectors have been substantially reduced in year 2016 . On average, the purchasing price of steel by medium scale collectors was Rs.42.12 per kg and it has reduced up to Rs.15.56 per kg in year 2016. The reduction is 170.7% during respective period. Further, their re selling price too have been reduced by 167% during same period. The ultimate impact of this reduction is profit merging of his industry has substantially reduced and the percentage of reduction is around 244%,

Table No 08: Average Purchasing Price of Steel (Rs/Kg) – Before and After Tax concession

Districts	Sample Size	Before tax Concession (2005)	After tax Concession (2016)	Percentage Changes
Colombo	10	45	16	-181.3
Gampaha	10	45	16	-181.3
kalutara	08	43	16	-168.8
Anuradhapuraya	07	40	15	-166.7
Polonnaruwa	03	40	15	-166.7
Kurunagela	07	42	16	-162.5
Jaffna	11	42	16	-162.5
Kandy	07	43	16	-168.8
Nuwaraeliya	06	40	15	-166.7
Badulla	08	42	15	-180.0
Rathnapura	07	43	16	-168.8
Kegalla	07	42	15	-180.0
Ampara	07	41	15	-173.3
Monaragala	07	40	15	-166.7
Galla	07	43	16	-168.8
Matara	07	43	16	-168.8
Average		42.12	15.6	-170.7

Table No 09:Average Selling Price of Steel (Rs/Kg) – Before and After Tax concession

Districts	Sample Size	Before tax Concession (2005)	After tax Concession (2016)	Percentage Changes
Colombo	10	55	20	-175.0
Gampaha	10	55	20	-175.0
kalutara	08	52	18	-188.9
Anuradhapuraya	07	49	18	-172.2
Polonnaruwa	03	48	18	-166.7
Kurunagela	07	51	18	-183.3
Jaffna	11	52	18	-188.9
Kandy	07	51	18	-183.3
Nuwaraeliya	06	49	17	-188.2
Badulla	08	48	17	-182.4
Rathnapura	07	49	17	-188.2
Kegalla	07	51	18	-183.3
Ampara	07	48	18	-166.7
Monaragala	07	47	18	-161.1
Galla	07	52	19	-173.7
Matara	07	52	20	-160.0
Average				-177.3

Table No 10: Average Profit Margin (Rs/Kg) – Before and After Tax concession

Districts	Sample Size	Before tax Concession (2005)	After tax Concession (2016)	Percentage Changes
Colombo	10	10	4	-150.0
Gampaha	10	10	4	-150.0
kalutara	08	9	2	-350.0
Anuradhapuraya	07	9	3	-200.0
Polonnaruwa	03	8	3	-166.7
Kurunagela	07	9	2	-350.0
Jaffna	11	10	2	-400.0
Kandy	07	8	2	-300.0
Nuwaraeliya	06	9	2	-350.0
Badulla	08	6	2	-200.0
Rathnapura	07	6	1	-500.0
Kegalla	07	9	3	-200.0
Ampara	07	7	3	-133.3
Monaragala	07	7	3	-133.3
Galla	07	9	3	-200.0
Matara	07	9	4	-125.0
Average		8.40	2.8	-244.0

Case Studies

Case Studies with Collectors

Case Study -01 – Small Scale Collector – Mr Milanarden, Colombo

Mr. Milardan spends four hours daily walking miles of Punchiwatta streets and alleys, digging through garbage and stuffing her red plastic grocery cart with aluminum cans and other small metal items to sell to support her three children.The 44-year-old scrap collector has had to work longer and harder over the past year, underlining how a drastic decline in scrap metal and commodity prices has hurt even the poor who collect discarded metal to sell to scrap yards.Two years ago, Milanardan, who declined to give her last name, would have earned about Rs.2500 per day for collecting scrap. Now she makes about Rs.500 per day due to the plummeting prices.m"It is tougher to feed my family," Milanardan, who wanders the streets while her children attend school. "I have to panhandle and do other things to make ends meet now, or make more trips."

Case Study 02 : Main Collector
General information of respondent

Owner of the company who has O/L education qualification, received ownership of business from his family and has 26 years iron scrap collection experience.

What are the effects of decreasing iron scrap prices?

Owner of the company mentioned that "price changing of iron scraps seriously effect on my business and assets". Before declining prices of iron scraps, I collected around 45 tons of iron scraps, 20 tons of iron tine and 1.5 tons of copper per month. After changing prices of iron scraps, our ground level collectors were discouraged due to low income of iron scrap collection. They found new jobs which can earn higher income, therefore our quantity of iron collection has been decreased rapidly. For an example: Last month, scrap collection was only 10 tons of iron scraps, 5 tons of iron tins and 500 kg of copper. Before changing prices of iron scraps, I had 20 permanent employees and they were engaged in various duties in my scrap collection business. After declining prices of iron scraps, I have removed 16 permanent employees and sold two Lorries and a van to recover my loss of iron scrap business.

What types of problems do you face when you reselling scrap?
Due to long que of scraps unloading Lorries, my drivers and helpers spend around three to four days to complete the unloading process of iron scraps. I must spend salaries and other expenses for those days without any gain for my business. Further unreasonable categorizing methods were used for iron scrap purchasing. According to my memory before change the scrap prices, they had categorized all scraps into 4 or 05 types, but now iron

scraps were categorized into more than 20 types and some types of iron scraps were received very low price. On the other hand, they had increased return percentage of their purchasing process.

What are the suggestions for developing iron scrap recycling industry?

I suggest that government must alter present iron scrap export policies to encourage Iron scrap exports. On the other hand, iron billet import tax should be increased, so that recyclers will decrease the use of import iron billets. Somehow, government must create the competitive iron scrap purchasing market within Sri Lanka. For this purpose, government should take the necessary steps to increase the number of recyclers.

Case Study 03: Main Collector

General information of respondent

He started his iron scrap business before 16 years and purchase huge quantity of scrap Iron to supply recyclers. He has massive yard to store iron scraps and his family totally depend on iron scrap business.

What are the effects of decreasing iron scrap prices?

I have been conducted my business successfully until reducing iron scrap prices. Price decreasing was directly affected to diminish my monthly iron scrap collection. As an example, before declining scrap prices total monthly iron collection was 200 tons, now it is around 30 tons. When scrap prices were around Rs.50, I have purchased huge quantity of iron scraps using loans. After the price cut around 20 to 25, I suffered huge loss. I sold my assets to recover huge loss and I am suffering financial problems due to this situation. Before reducing scrap prices, about 25 employees worked under my permanent employee carder, now only three permanent employees and few temporary employees are working under me.

What types of problems do you face when you reselling scrap?

"There's a long que for unloading iron scraps since my drivers and helpers face various problems without basic facilities, and it directly affects to a higher labourer turnover of employees. Further I want to spend additional expenses for two or three days."

Recyclers utilize unreasonable categorizing method for iron scraps purchase and it seriously affects to total income of scrap collectors (E.g. before several years categorized in to 4 or 05, now more than 20 types of iron scrapes). Some item's payment prices are not enough to cover even their cost. Further, additional payments are charged for cutting, wastage etc. These charges seriously affect to reduce total scrap resale income. As about ninety days are taken for their payments, it seriously affects to my working capital.

IV. CONCLUSION AND RECOMMENDATION

Conclusion

The main objective of this study was to assess how the tax concessions gives on importation of iron billets and the global scenario of iron scrap market value affect the iron scarp recycling industry in Sri Lanka and make recommendation to take policy decision overcome the drawbacks and loopholes associated with the present iron scarp management scenario. The study found that during last year (2015 December to 2016 December) iron scrap industry in Sri Lanka have faced drastic decline in scrap metal prices due to following major reasons.

- The world is facing a huge overcapacity of steel production whereas the demand has not kept pace with capacity addition.
- Prices have fallen mainly because of a downturn in global demand from manufacturers, especially in China, pressure on supplies, and the increased use of substitutes.
- An index kept by the trade organization showed a downward trend in ferrous scrap metal commodity prices for several years until a plunge in 2015 made it probably the industry's worst year in decades.
- For example, the price for industry benchmark No. 1 heavy melt scrap metal was about $500 a ton in 2008 before sliding to about $330 at the beginning of 2015. It then fell to about $170 by the end of the year.
- The government was temporarily ban the export of ferrous and non-ferrous scrap to overcome a severe shortage of raw materials in the Foundry industry. Previously ferrous scarps export to India at higher price while now it is very limited due to export restriction.
- Sri Lanka had signed Free Trade Agreement (FTAs) with India which duties on most of the steel based products, traded between the countries, are either eliminated or reduced sharply. Thus, Indian products have substantially captured the Sri Lankan steel market.
- Apart from the above, few Indian steel companies being worked in the Sri Lankan steel industry. The Indian steel companies enjoy some inherent advantages in terms of abundant availability of raw materials at cheap price and workforce at low cost apart from the presence of a strong steel market in India.

- Besides, there are many local construction projects which have been undertaken by Chinese companies and these companies directly imports require amount of steel for those construction from China at lower price.
- Market Uncertainty

Of the different variables of market uncertainty, macroeconomic instability is considered to be the heaviest obstacle. Macroeconomic instability, referring to inflation, exchanges rates, and political instability, is ranked as a major obstacle. Risk of political instability is high, increasing the cost of doing business and the reducing the inflow of foreign investment. Political instability also deteriorates the country's credit standing, increasing the cost of borrowing funds from abroad.

- Finally, the decision of duty concession for iron billets import with interim budget in 2015 was also adversely impact on domestic ferrous scrap industry.

Thus, drastic decline in scrap collection and recycling industry during last two years in the country is not only the impact of duty concessions given on importation of iron billets but also due to several reasons as above mentioned. However, as combined effect of all those identified reasons, the ferrous scraps collection and recycling capacity has reduced by more than 50% during year 2016.

Recommendation

This study mainly attempted to assess how the tax concession impact on importation of iron billets and the global scenario of iron scrap market value affect the iron scrap recycling industry in Sri Lanka. The study found few justifiable reasons for drastic decline of metals scrap prices in Sri Lanka during last five years and based on the study observations, following short-term and long-term recommendations were proposed for enhancing local ferrous scrap industry.

- **Short-Term Solutions**
- To convene a meeting at the earliest, to be chaired by top level policy makers and with the authorities of relevant institutions and representatives of local manufactures who utilize scarp metals for their industries, with a view to formulating suitable mechanism to purchase domestic scrap metals at a reasonable price.
- The locally unrefinable scrap namely Stainless Steel Scrap, Mill Scale and Ash, Copper dross and Ash be permitted to export since processing such metal scrap into usable from may require very high degree temperature with advanced recycling technology, which is not available within the country at present and attracting an investment also appears to be not commercially feasible due to the low quantities of such scrap generated.
- Metal Scraps such as Aluminum, Copper, Brass, Pewter, Aluminum alloys, special kind of iron, Cast iron and steel Scraps are still being suspended for export with a view to support the local small scale domestic industries who are depending on such metal scarp. However due to duty concession of import billets, now such domestic industries could be able to purchase import billets at a lower price compare to scrap metal and they are gradually moving from metal scrap to import billets. Thus, this study propose to do further study as regards to quantify the type of local metal scarp domestically used by local small scale industries, the quantity requirement by the local industries, the quantity of imports billets used by the local industries, and the amount of metal scarp generated domestically on an annual basis.
- In the case of domestic companies which do not have sufficiently purchase domestic metal scraps as their row materials at reasonable price, study proposed to remove export band for a period of one year and observe the market behavior.. However, this decision need to be taken based on proper analysis of raw materials supply chain with the consultation of respective companies.
- As a short term solution study proposed a custom duty or additional tax for importation of billets in order to enhance the demand for domestic metal scraps of local small scale manufacturers who utilize such metals as their raw materials. The propose tax rate or custom duty would be effective if the price of import billets are substantially over and above the domestic metal scraps prices.
- **Long- Term Solutions**
- Since, steel is a deregulated sector; there is a need for an independent regulator for effective regulation, which the sector presently lacks.
- Metal recycling zones and facilities be set up and supported by the state government.
- Promoting and providing incentives for metal recycling industries.
- Until, settle the short term global crisis of steel industry, study propose a unit subsidy for recycled metal scrap for enhance the local scrap collection and recycling.
- Import duty levied on metals recycling equipment and on radiation detection equipment has to be abolished.
- Make actions to reduce the Market Malpractices

- Competition in the domestic market is also affected by various underhanded measures practiced by some firms in trying to capture a larger portion of the market for local steel products. Incidences of technical smuggling occur in both semi- finished and finished steel product categories, posing a problem to both the upstream and downstream steel sectors.

REFERENCES

[1]. Central Bank of Sri Lanka (CBSL). (2015). *Annual Report.* Colombo: Central Bank of Sri Lanka.

[2]. Dohrn, R., & Kratschell. (2013). *Long Term Trends in Steel Consumption- The Diversing Paths of Steel Makers in Developed and Developing Countries.* Dortmund - Germany: Department of Economics, Ruhr-Universital Bochum (RUB).

[3]. Global Steel Trade Monitor. (2016). *Global Steel Report.* Washigton D.C: International Trade Administration.

[4]. McLaughlin, D. (2010, March 24). *Deloitte*. Retrieved December 12, 2016, from www.deloitte.com.

[5]. Muchove, L., & Eder, P. (2012). *End-0f Waste Criteria for Iron and Steel Scrap.* Seville (Spai): Institute of Prospective Technological Studies, JRC European Commission.

[6]. OECD Steel Committee, 74th session. (2013). *Competitiveness and Chalangers in the Steel Industry.* Paris: Mckinsey & Company.

[7]. Pandey, P., Chakarborty, G., & Abhisar, J. (2009, May 13). *ICICI direct.com.* Retrieved December 08, 2016, from Online Share Trading.

[8]. Pickard, J. (2014). Recycling Economics and Markets:Scrap Recycling IndustryTrade and Outpool. *Annual Conference on Scrap Recycling Industries* (pp. 24-36). Caroline: Institute of Scrap recycling (ISRI.

[9]. Prakash, V. (2012). Asian Steel Scrap Market and Outlook. *Steel Markets Asia Conferences 2012* (pp. 46-57). Belgiam: Steel Market Asia Conferences.

[10]. Reimink, H. (2013, May 22). *A chalange for thenIron and Steel industry.* Retrieved December 03, 2016, from WWW.Worldsteel.org.

[11]. Taylor, B. (2016). *Recent Issues of Recycling* . Valley View: Today Global Edition.

[12]. Van, O., & G, H. (2012). *US Geological Survey - Minerals yerabook.* Washinton D.C: Minerals Yearbook.

[13]. World Steel Associatiom. (2016). *Indirect Trade in Steel.* Brussels: World Steel Association.

[14]. Worldsteel Associatin. (2016). *Steel Statistical yerabook.* Beijine: Worldsteel Association.

[15]. Worldsteel Association. (2011). *Use of Trade Data in Steel Industry - Regional Seminar on International Trade Statistics.* Beijine: Worldsteel Association.

[16]. Worldsteel Association. (2016). *fact Sheet , Steel Industry By- Products.* Beijine: Worldsteel Association.

[17]. Zhu, Y. (2008). *Sectoral Study on the Iron and Steel Industry.* London: Independencies on Energy and Climate Security - Chatham House.