

# **Exploring Potentials of Introducing Sustainability in Procurement of Rolling Stock for Bangladesh Railway**

Dissertation submitted to fulfill the  
requirement for the Degree of  
Masters in Procurement and Supply Management

Submitted by  
Jebunnesa Jerry  
Summer 2016  
Student ID No: 16382010  
Batch-12

**Masters in Procurement and Supply Management**

September, 2016



**BRAC Institute of Governance and Development,  
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## **DEDICATION**

My mother who gives me the wings to fly.

## **DECLARATION**

I hereby declare that I am the sole author of this thesis. I confirm that this report has not been accepted for any degree and is not currently submitted in candidature of any degree.

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## CERTIFICATION

This is my pleasure to certify that the dissertation entitled *Exploring Potentials of Introducing Sustainability in Procurement of Rolling Stock for Bangladesh Railway* is an original work from Mrs. Jebunnesa Jerry and it is completed under my direct guidance and supervision. I also certify that I have gone through the dissertation and found it satisfactory for submission to the BRAC Institute of Governance and Development (BIGD), BRAC University in partial fulfilment of the requirements for the degree of Masters in Procurement and Supply Management.

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## **ACKNOWLEDGEMENT**

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## **ABSTRACT**

Sustainability issues should be addressed in designing, manufacturing and vendor selection process in public transport sector. The vision of Bangladesh Railway (BR) is to provide safe, reliable, cost-effective, and time-efficient rail transport service in the country through modernizing, expanding, & maintaining rail system in a manner which supports government strategies for economic, social, & environmental development. To fulfill this vision, BR has to procure rolling stocks i.e. Locomotives, Carriages, Wagons etc.

There are about 272 Locomotives, 1574 Passenger carriages and 6459 Wagons in the fleet of BR. However, most of these have passed economic life and needs to be immediately replaced. Moreover, Traffic demand for both Passenger and freight trains is increasing gradually as railway provides safer, speedier, cost-friendlier mode of transport than other road transports. For these two reasons BR is taking actions to procure various rolling stocks through different projects. Currently 07 (seven) projects are ongoing in the rolling stock department under financing of various development partners conjugating total project cost amounting of BDT 1038441.25 Lakh. The rolling stocks have an economic life of 20 (twenty) to 45 (forty five) years depending on the category. So it is vital to make the procurement judiciously and it can contribute a lot in ensuring sustainability. Hence this dissertation is focusing on the issue of sustainability in procurement of rolling stocks, by the Rolling Stock department of Bangladesh Railway.

The study specifically intended to identify current level of sustainability in procurement, challenges faced in introducing sustainability and finally to suggest ways to improve the level of sustainability in procurement of Bangladesh Railway.

The objectives of the study were achieved through two methods; firstly studying practical cases of procurement of rolling stocks and secondly open ended interviews with the officers of BR involved in procurement of rolling stocks along with the representatives of development partners. All of these were analyzed in the light of sustainable procurement performances. The research work identifies the level of sustainable procurement as per the flexible framework and the steps to be taken for improvement of the status.

Key steps to improve sustainable procurement status involves with the preparation of sustainable procurement policy and successful implementation of the policy to embed sustainability criteria in the procurement of rolling stocks. Bangladesh Railway should give up the complacency of being an environment friendly transport system and strive towards achieving environmental, social and economical sustainability through sustainable procurement.



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## **ABBREVIATIONS**

ADB	:	Asian Development Bank
ADG	:	Additional Director General
BDT	:	Bangladesh Taka
BG	:	Broad Gauge
BIGD	:	BRAC Institute of Governance and Development
BR	:	Bangladesh Railway
BRA	:	Bangladesh Railway Authority
C&W	:	Carriage And Wagon
CIPS	:	The Chartered Institute of Procurement and Supply
CLW	:	Central Locomotive Workshop
CME	:	Chief Mechanical Engineer
DPP	:	Development Project Proforma
EOQ	:	Economic Order Quantity
ERP	:	Enterprise Resource planning
F&C	:	Fraud and Corruption
FC	:	Foreign Currency
FY	:	Fiscal Year
ICT	:	Information and Communication Technology
IFT	:	Invitation for Tender
ISO	:	Organisation for International Standard
KPI	:	Key Performance Indicator
LCC	:	Life Cycle Costing
L/C	:	Letter of Credit
L/D	:	Liquidated damage
MG	:	Meter Gauge
MIS	:	Management Information System
MPSM	:	Masters in Procurement and Supply Management

NOA	:	Notification of Award
PE	:	Procuring Entity
PPR	:	The Public Procurement Rules, 2008
PSI	:	Pre-shipment Inspection
RS	:	Rolling Stock
SP	:	Sustainable Procurement
TCO	:	Total Cost of Ownership
TEC	:	Tender Evaluation Committee
TQM	:	Total Quality Management
WB	:	World Bank
WLC	:	Whole Life Costing

# CHAPTER 1

## INTRODUCTION

---

### **1.1 Background:**

**1.1.1 Sustainability:** Since the industrial revolution, the world's industrialized nations have been founded on access to “cheap” fossil fuel energy. We all know that fossil fuels are a finite resource, and it's alarming that demand for fossil fuels continues to increase. As other nations, such as China and India, become more industrialized, the global demand and price of fossil fuels will further increase, as will emissions of CO<sub>2</sub>. Simply stated, our global future depends on sustainability.

The prevailing approach nowadays is that in order to preserve global resources for future generations – an underlying concept of “sustainability” – business companies and/or Government entities must assume an important role in the process. An entire system is working to provide consumers with extensive and accurate information about the nutrients, enabling them to make informed, healthy nutritional choices, and equipping them with options to dispose of waste with minimal impact on the environment.

**1.1.2 Rolling stock procurement of Bangladesh Railway:** Bangladesh should build on the synergies of growth and poverty alleviation, raising the productivity of the poor while instituting reforms that could promote the sectors of highest efficiency. It is important to recognize that there is a close relationship between the growth in rail freight and economic growth, which is measured by GDP. As such, the growth of the economy will have direct impact on transport demand in Bangladesh. From a sector perspective, the recent GDP growth rate is characterized by incremental growth of industry and services. Bangladesh Railway is wholly Government owned organization operating under Ministry of railways in order to maintain the railway tracks and rolling stocks to provide passenger and freight transport through railway networks. BR is consisted of various specialized departments such as Engineering, Mechanical, Electrical, Signalling & Telecommunication, Transportation, Commercial, Stores, Personnel, Finance, Planning, Medical, Railway Nirapotta Bahini (RNB), Estate department, etc Sustained reform actions are on the card to enhance the contribution of railways to the economy and contain the adverse budgetary impact of its operations. The reconstruction of Bangladesh Railways including corporatization and commercialization, and private participation are

critical to develop the sector and improve efficiency of services. Linking Bangladesh Railway with the railways of neighbouring countries through strategic partnership has a high potential for economic growth, poverty reduction and commercial viability of the sub-sector.

BR operates international, inter-city, and suburban rail systems on its meter gauge, broad gauge and dual gauge network. BR has own workshops under Mechanical department for repair and maintenance works of rolling stocks (locomotives, carriage and wagons). The procurement of rolling stocks is also performed by the Mechanical department. The vision of BR is to provide safe, reliable, cost-effective, and time-efficient rail transport service in the country through modernizing, expanding & maintaining rail system in a manner which supports government strategies for economic, social & environmental development. To support the vision, there are several missions of BR and following is related to procurement of rolling stocks:

- Maintain & upgrade locomotives, coaches & other rolling stocks.

There are 272 locomotives (94 BG & 178 MG) locomotives in the locomotive fleet of BR (Bangladesh Railway, 2018).

That is why the procurement of rolling stock for Bangladesh Railway is crucial for introducing sustainability.

## **1.2 Problem Statement**

The rolling stocks of Bangladesh Railway are very old. A major portion of the rolling stocks have passed their normal economic life-span. Rolling stocks are manufactured by a few numbers of organizations in the world. These goods are highly specified and tailor made. So, rolling stocks are treated as goods of specialised nature. Now it is high time for Bangladesh Railway to procure lots of rolling stocks. Already some procurement is ongoing under some projects. Rolling stock procurement involves a great deal funding from internal and external sources. The public fund should be used responsibly to ensure quality product and sustainable environment.

A large portion of railway assets is rolling stock. To introduce sustainable procurement in Bangladesh Railway the procurement of rolling stock must be procured following sustainable procurement criteria. The rolling stocks is categorized as strategic item.

Hence sustainable rolling stock should be procured sustainably. Introduction of sustainable procurement principles in procurement of strategic items will lead to implementation of sustainable procurement principles in other category of procurement for Bangladesh Railway. Thus lead to a sustainable railway, sustainable transport system for Bangladesh and ultimately enhance sustainability of the whole country. That is why the potentials for introducing sustainability in procurement of rolling stocks for Bangladesh Railway is an important issue.

This study analysed the current practice of procurement of rolling stocks used by the Mechanical Department of BR in the light of sustainability, measured the level of sustainable procurement, identified the challenges and finally suggested some implementable actions to improve sustainable procurement performance.

### **1.3 Research Questions**

Understanding the problem of sustainable procurement of rolling stocks, the research questions were:

- Does the current practices used by BR in the procurement of rolling stock meet the needs of the sustainable procurement principles?
- What are the challenges in achieving sustainability in rolling stock procurement by BR?

### **1.4 Research Objectives**

The purpose of the study was to examine the current procurement practice used by BR for the procurement of rolling stock and assess how much it would meet the sustainability index. The specific objectives were:

- To analyse current procurement method used by BR for the procurement of rolling stock.
- To analyse the compliance to the sustainable procurement regulations
- To identify the risks and challenges in the current procurement system
- To recommend ways for improvement in the sustainable procurement system



## **1.5 Rationale of the Study**

Rolling Stock are the most vital for the operation of Railway. Sustainable procurement is a growing issue. Sustainable procurement of rolling stock means a lot for achieving sustainability of Railway as a whole. Rolling Stock represents % of the asset of Railway.

Moreover, introduction of the Public Procurement Rules, 2008 has become a new source of challenges as it voids the previous practice, which was very specific to the needs of BR. Therefore, this study intended to examine current practice, identify challenges, and suggest more efficient and effective system of procurement.

## **1.6 Scope and Limitation of the Study**

The study revolves around the procurement of rolling stocks only. Other types of procurement were not considered in this study. The study focused on three major dimensions (i.e environmental, social and economical) of sustainable procurement principles. In this dissertation past and present procurement cases of rolling stocks have been studied under the microscope of sustainable procurement principles. Sustainable procurement level has been identified using the flexible framework only. Other model and/or methods have not been consulted to determine the level. The study identified some challenges in developing the level of sustainable procurement and suggests some recommendation to overcome those challenges.

## **1.7 Structure of the Report**

The report consists five chapters. First one is **Chapter One: Introduction** consists of background, scope, rationale, research questions, and objectives, limitation of the study and structure of the report. **Chapter Two: Literature Review** covers the discussion on the existing literatures and conceptual frame work of this research. **Chapter Three: Research Methodology** and contains an explanation on the data collection methods and justification for using the methods. This chapter also contains analytical frame work of the study. **Chapter Four: Data Analysis and Result Discussion** includes analysing the data, interpreting the results and findings. Last but not the least is **Chapter Five: Conclusion and Recommendation** contains a decisive conclusion and recommendation for the improvement of the current procurement system into sustainable procurement system.

## CHAPTER-2

# LITERATURE REVIEW

---

### **2.1 Defining Sustainability and Procurement**

**2.1.1 Procurement** may be defined as ‘the process of obtaining goods or services in any way, including purchasing, hiring, leasing and borrowing’. Procurement is therefore a more accurate term for what organisation’s procurement function actually does. It reflects the more proactive, relational, strategic and integrated role of the function in modern organisation.

**2.1.2 Sustainability** basically means the ability of an activity to be maintained (sustained or 'kept up at a similar level into the future. More specifically, in the present context, it means ensuring that actions taken today do not limit or jeopardize our plans or quality of life in the future. The British Standards Institution's Sustainable Procurement Guide (BIP 2203) defines it as taking 'a longer-term view when making decisions, to ensure that meeting our own needs does not compromise the needs of others both today and for future generations.'

### **2.2 Sustainable Procurement**

Sustainable procurement might be roughly defined as a process where organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organization, but also to society and the economy, while minimizing damages to the environment.

The factors that should be considered by sustainable procurement include renewable and non-renewable material use, manufacture and production methods, logistic systems, recycling options, disposal options and supplier capabilities. At the macro level, sustainable procurement might achieve better economic, environmental and social outcomes. The macro level issues need to be considered while analyzing the impact of sustainable procurement on the purchasing and supply chain environment are, economic impact of sustainability referring to corporate governance, ethical trading and payment on time; environmental impact including biodiversity, climate change and carbon footprints factors; and social impact incorporating diversity and human rights. At the micro/organizational level, sustainable procurement can generate value for money and

raise efficiencies within organizations (i.e. by managing supply risks and increasing resource productivity levels) and lead to cost effective procurement.

## **2.3 Levels of Sustainability**

Sustainability in an organization can be considered across three different levels. Firstly, legal requirements, secondly, cost and waste reduction and mitigation of risks and finally, protection of brand and reputation. Organizations can also use sustainability initiatives to increase employee involvement and participation, and enhance sustainable procurement practices embedded in organizational culture.

The ideas of sustainable procurement need to be treated carefully or it may lead to failure in identifying ways to modify or align sustainable procurement practices in the existing procurement practices. Ideally, sustainable procurement is integrated into an approach that encourages lifecycle systems management.

Presently, legislation is increasingly acting as a driver for adopting sustainable procurement culture and practices in organizations. The core legislations are based on various regulations and directives, such as the Waste, Electrical and Electronic (WEEE) Directive, a Waste Framework Directive and the regulations governing the registration, evaluation, authorization and restriction of chemicals (REACH).

Successful application of implementation sustainable procurement is a tedious job. However, every organization needs to start somewhere, at least starting the process creates some impact on achieving sustainability. Sustainability can be incorporated into different stages of the whole procurement cycle (i.e. defining needs, evaluating options, design and specifying, supplier selection, tender evaluation, post-contract management and supplier development). For example, a company can consider energy efficient products, which often have an increased capital cost but which are offset by lower operating costs, thus reducing the total cost of ownership.

## **2.4 Application of Sustainable Procurement**

**2.4.1 Steps to successful application:** First step of sustainable procurement implementation is to adopt a sustainable procurement policy establishing the role of procurement professionals and buyers, adopting the standards or targets showing what will

and will not be bought (i.e. energy efficient items to be bought, high non-recyclable items not to be bought) and agree on the techniques to be used (i.e. whole life costing, risk assessment). Second step towards achieving sustainable procurement is to challenge current procurement practices of the organization (i.e. introduce digital procurement to get a paperless procurement, increased transparency in the procurement process). Thirdly, Publication of the sustainable procurement policy as a clear commitment to action and ensure that top management visibly pursue this policy and demonstrate their commitment to real action and change. Last but not the least step is to organize a discussion with suppliers (i.e. warn the suppliers about the possibility of a more sustainable version of current purchases. For new procurements, sustainability should be included in the basic design and specification.

For successful application of sustainable procurement top management must understand and endorse the principals for sustainable procurement. Lower level employees must also make aware the sustainable procurement principals in order to implement them successfully. However, it might be difficult to achieve buy-in from lower level employees if the people at the top are not that much concerned about sustainability. Employees at all level require being concern and active towards sustainability agenda.

Implementing sustainable procurement practices will require extensive discussions with major stakeholders identified along the supply chain, for example customers, suppliers, managers, employees, government, banking and financial institutions, shareholders. Motivating suppliers to offer more sustainable products is one of the key activities of sustainable procurement work. Buyers and users should start to define functional performance specifications (including sustainability), rather than just the technical specifications of known products.

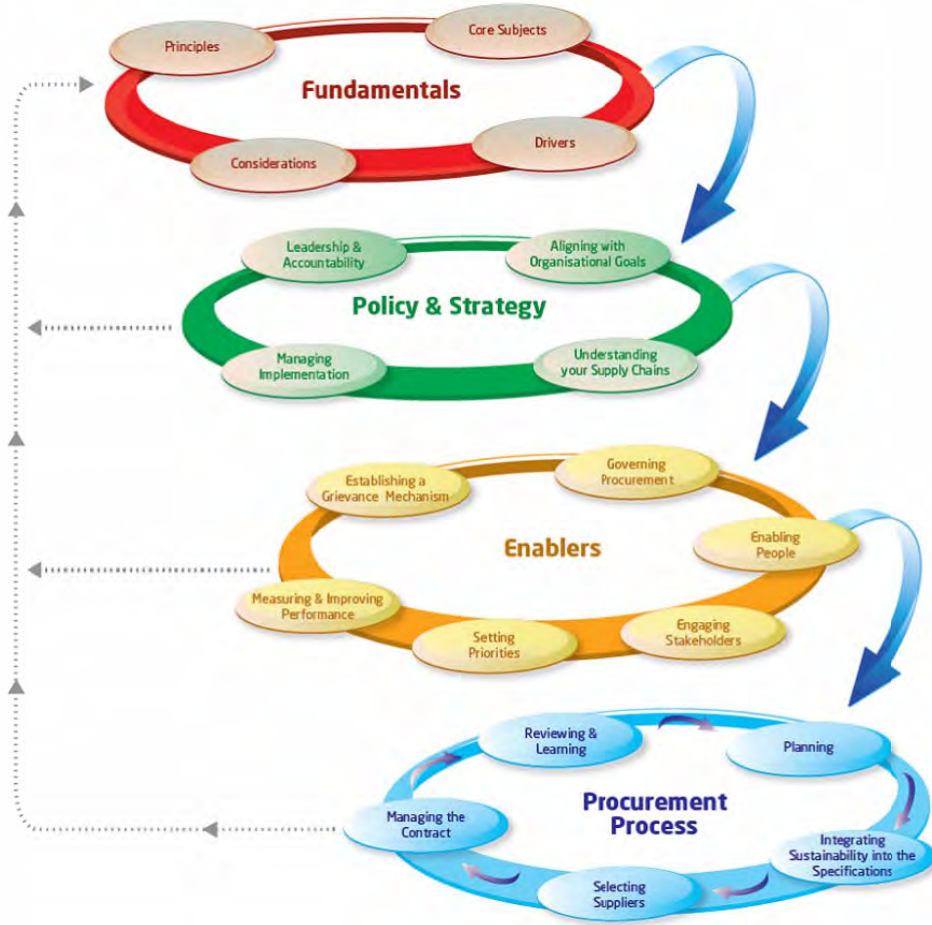
**2.4.2 Potential advantages:** Sustainable procurement approaches can demonstrate purchasing and Supply management's value to the organization and raise corporate image in the market. Sustainable procurement can reduce waste and improve resource efficiency, which ensures that costs are minimized and processes are more efficient. Sustainable procurement ensures lower degree of business risk. Sustainable procurement also enhance strong relationship between supply chain entities which ensures uninterrupted supply of goods and services. Thus inventory can be minimized through sustainable procurement.

**2.4.3 Potential disadvantages:** Additional time and resources need to be continuously invested in aligning internal sustainable procurement practices and those of suppliers with changing legislative requirements. Thus sustainable procurement may be perceived as an option for larger organizations who have the necessary financial, human and other resources to invest in sustainable practices. Achieving sustainable procurement can be difficult for organizations that do not adopt a lifecycle systems approach which can maximize value, transparency and sustainability and reduce costs and risks at every stage of the value chain. Implementation of sustainable procurement might be particularly critical for organizations operating large and complex supply chains spanning various countries where legislation and working practices vary to the home country of business.

## **2.5 Performance monitoring**

**2.5.1 Benchmarking:** Benchmarking is one of the performance monitoring methods used by the organizations. In the benchmarking process the procurement practices (e.g. ethical sourcing, or corporate social responsibility) of the organization is compared with best-in-class performing organization's practices. This provides perceptions of those external to the organization. Then strive begins to close the gap between the practices to raise current level of functioning. In benchmarking business alignment and stakeholder engagement is required to achieve a clear linkage between business strategy, goals and sustainable procurement initiatives.

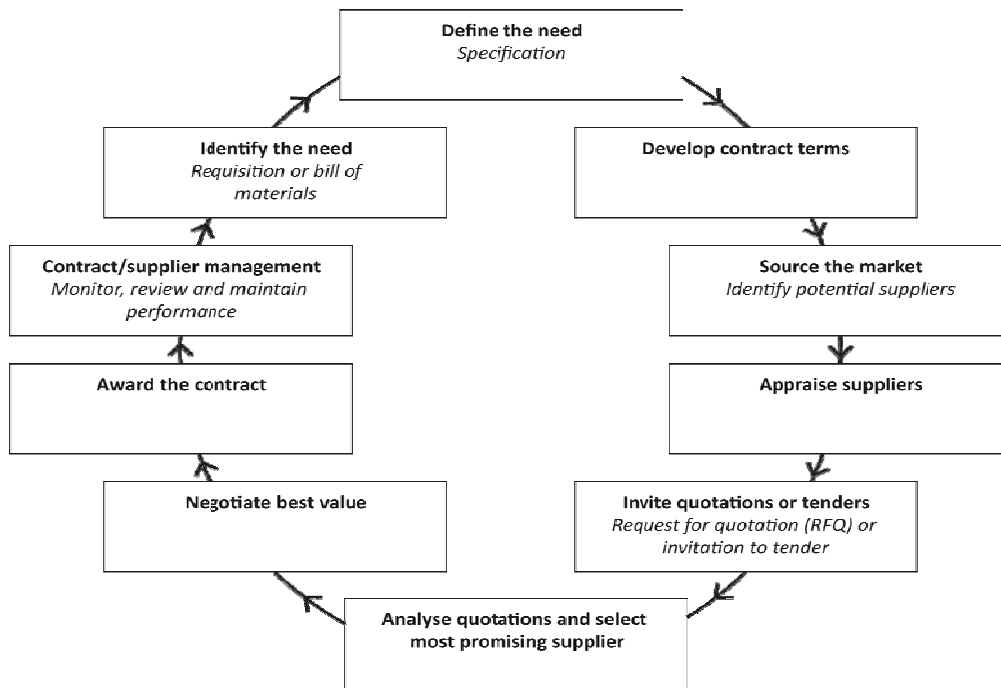
Figure 1: Different levels of sustainability (CIPS)



## 2.6 Generic Procurement Cycle

The generic procurement process may have several stages: from identifying the needs, defining the needs, developing contract terms, source the market, appraise suppliers, invite quotations, negotiate best value, award the contract, contract/ supplier management

Figure 2: Generic procurement cycle (CIPS, 2012)



For the purpose of this dissertation, procurement is ‘the strategic process of set stages, or a chain of events, undertaken by the procurement function as part of the integrated supply chain, to make a purchase or acquisition, sourcing and negotiating with suppliers, placing an order, receiving the ordered supplies, and making payment under a regulatory framework on contractual means; and managing all issues arising thereby.

## 2.7 Overview of some supply chain sustainability issues

To implement sustainable procurement in any organization the following three dimensional issues should be considered beforehand.

Table 1: Some Sustainability Issues (CIPS, 2012)

ECONOMIC ISSUES	SOCIAL ISSUES	ENVIRONMENTAL ISSUES
Job creation (eg creating markets for recycled products and green technology)	Creating a diverse base of competitive suppliers (eg minority owned suppliers)	Emissions to air (eg greenhouse gasses and pollutants)
Achieving Value for money (utilizing whole life costing and value definition)	Fair employment practices (eg fair wages. Avoiding child and bonded labour, workforce equality and diversity)	Releases to water (eg chemical fertilizers)
Supporting SMEs ( eg facilitating access to contracts, paying on time)	Promoting workforce welfare (eg health and safety, freedom to join or form a union)	Sustainable use of resources (eg sustainable forestry, protection of biodiversity)
Reducing barrier to entry (facilitating fair and open competition)	Supporting killing and development (eg apprenticeship)	Energy (support for renewable) and water conservation and management.
Ensuring business viability to provide stable environment	Community benefits (eg investment, volunteering, sponsorship)	Minimization of waste and by-products (eg recycling and waste or landfill prevention)
Ensuring supplier agreements are competitive and fair, to promote business viability.	Fair trade and ethical sourcing practices ( fair pricing policies)	Minimization of impacts (eg noise, vibration, dust, traffic congestion, land degradation)



## 2.8 Segmenting Procurement

### 2.8.1 Procurement Portfolio Segmentation

Segmentation is an approach to analysing expenditure with external suppliers by categorising the procurement portfolio or suppliers according to their priority, value, or importance to the organisation. The segment to which a procurement or supplier is allocated determines the procurement resources and approaches that will be used in each case. Procurement literatures suggest using the following tools for such segmentation: Pareto Analysis, Procurement Positioning Matrix etc.

### 2.8.2 Procurement Positioning Matrix

The Pareto or ABC approach to segmentation is based on the value and volume of business the organisations do with the suppliers. However, this is not only factor that a procurement or supply chain department should consider when segmenting suppliers.

The procurement managers should consider the following two factors:

- **The importance of the items to the organisation:** related to factors such as Value of the annual procurement, its profit potential or cost reductions
- **The complexity of the supply market:** related to factors such as difficulty of sourcing, vulnerability of supply or supplier failure, relative position of purchaser to the supplier or to supply market.

Procurement Positioning Matrix (Kraljick, 1983) is a tool which can be used to map the above two factors to segment procurement portfolio as shown in the next page:

**Figure 3: The Kraljic Procurement Portfolio Matrix**

		<i>Complexity of the supply market</i>			
		<i>Low</i>		<i>High</i>	
<i>Importance of the item</i>	<i>High</i>	<b>Procurement focus</b> Leverage items  <b>Key performance criteria</b> Cost/price and materials flow management  <b>Typical sources</b> Multiple suppliers, chiefly local	<b>Time horizon</b> Varied, typically 12-24 months  <b>Items purchased</b> Mix of commodities and specified materials  <b>Supply</b> Abundant	<b>Procurement focus</b> Strategic items  <b>Key performance criteria</b> Long-term availability  <b>Typical sources</b> Established global suppliers	<b>Time horizon</b> Up to 10 years; governed by long-term strategic impact (risk and contract mix)  <b>Items purchased</b> Scarce and/or high-value materials  <b>Supply</b> Natural scarcity
	<i>Low</i>	<b>Procurement focus</b> Non-critical items  <b>Key performance criteria</b> Functional efficiency  <b>Typical sources</b> Established local suppliers	<b>Time horizon</b> Limited: normally 12 months or less  <b>Items purchased</b> Commodities, some specified materials  <b>Supply</b> Abundant	<b>Procurement focus</b> Bottleneck items  <b>Key performance criteria</b> Cost management and reliable short-term sourcing  <b>Typical sources</b> Global, predominantly new suppliers with new technology	<b>Time horizon</b> Variable, depending on availability vs short-term flexibility trade-offs  <b>Items purchased</b> Mainly specified materials  <b>Supply</b> Production-based scarcity

**(i) For routine items:** (Low importance-low complexity: such as locally available non-critical spare parts having multiple source); procurement focus will be on procurement costs. Arm’s length approached such as VMI, blanket ordering, framework agreements and call-off orders and e-procurement solutions, purchasing cards, will provide routine efficiency. Procurement management is achieved by monitoring expenditure against regular reports received from vendors, end-user, or e-procurement.

**(ii) For bottleneck items:** (Low importance-high complexity: such as propriety spare parts or specialised spare parts having limited source, which could cause operational delays, if unavailable); procurement focus will be on continuity and security of supply. This may be achieved through approaches such as medium to long-term contracts with

selected suppliers; developing alternative or back-up sources of supply; including incentives and penalties in contracts to ensure the reliability of delivery; or keeping higher levels of buffer or safety stock.

**(iii) For leverage items:** (High importance-low complexity: such as propriety spare parts or specialised spare parts having abundant source); procurement focus will be on using purchasing power in the market to secure best price and terms, on purely transactional basis. This may mean taking advantages of competitive pricing through: Standardising specifications to make supplier switching easier; using competitive bidding; forming procurement consortia to secure best deals.

**(iv) For strategic/critical items:** (High importance-high complexity: such as major components of locomotives); procurement focus will be on total costs, security and competitiveness of supply. This may be achieved through approaches such as developing long-term, mutually beneficial strategic relationship and relationships management disciplines.

## **2.9 Methods of Procurement**

The Public Procurement Rules, 2008 describe the context, financial threshold, and procedure to be followed for any specific procurement. According to these rules tendering methods for procurement of goods are:

- i. Open Tendering Method (OTM);
- ii. Limited Tendering Method (LTM);
- iii. Request for Quotation (RFQ);
- iv. Two Stage Tendering Method (TSTM);
- v. One Stage Two Envelope Tendering Method (OSTM); and
- vi. Direct Procurement Method (DPM)

## **2.10 Different standards related to sustainability**

### **2.10.1 Environmental management standards**

An Environmental management systems (EMS) gives an organisation a systematic approach for assessing and managing its impact on the environment; that is the environmental consequences (and risk exposure) of its operation. ISO 14000 is a

series of international standards on the design, implementation and control of Environmental management systems (EMS).

ISO 14001 specifies the practical requirements for an environmental management system, focusing on environmental aspects that the organisation can control, and over which it can be expected to have influence.

ISO 14004 provides guidelines on the development and implementation of environmental management systems.

ISO 14011 provides guidelines on the audit of an environmental management system.

ISO 14020+ provide guidance on eco-labelling

ISO 14040 provides guidance on lifecycle issues

### **2.10.2 Social Responsibility**

The Social Accountability (SA) 8000:2001

SA 8000 was one of the world's first auditable social certification standards, and is now the most widely recognised global standard for managing human rights in the workplace.

It is both:

- A management system standard for addressing workplace conditions and independently verifying factory compliance and
- A code of conduct for workplace conditions and labour rights.

**ISO 26000:2010** Guidance for Social Responsibility

**ISO 26000:2010 is designed to provide:** harmonised, globally relevant guidance for private and public sector organisations of all types based on international consensus among expert representatives of the main stakeholder groups, and so encourage the implementation of best practice in social responsibility worldwide.

## **2.11 The Flexible Framework**

Among the key recommendation of the UK Sustainable Procurement National Action Plan was the building of capacity by introducing a flexible framework to enable public sector organisations:

- To undertake a detailed review and appraisal of their procurement capabilities, against clear benchmarks
- To identify priority areas for change
- To plan improvements
- To measure ongoing progress, using a five-stage monitoring tool
- To 'locate' all organizations within a benchmark standard: encouraging lower-end organizations to get started-while still challenging those at the higher end.

Table 2: The Flexible Framework Levels (CIPS, 2012)

Level Item	LEVEL 1: FOUNDATION	LEVEL 2: EMBED	LEVEL 3: PRACTICE	LEVEL 4: ENHANCE	LEVEL 5: LEAD
People	SP champion identified. Key procurement staff have received basic training in SP principle. SP included in key staff induction programmes.	All procurement staff have received basic training in SP principles. Key staff have received advanced training in SP principles	Target refresher training on latest SP principles. Performance objectives and appraisal include SP factors Simple incentive programmes in place.	SP included in competencies and selection criteria. Sustainable procurement included as part of employee induction programme	Achievements publicised, used to attract procurement professional. Internal and external awards. Focus on benefits achieved. Good practice shared with other organisations.
Policy, strategy and communication	Agree overarching objectives. Simple SP policy in place, endorsed by CEO. Communicate to staff and key suppliers	Review and enhance SP Policy: consider supplier engagement. Check alignment. Communicate to staff, suppliers and key stakeholders.	Augment SP policy in strategy covering risk, process integration, marketing, supplier engagement, measurement and review process. CEO endorsed.	Review and enhance SP strategy: recognise potential of new technologies. Try to link strategy to Environmental Management System (EMS) and include in overall corporate strategy.	Strategy reviewed regularly, external scrutiny, linked to EMS. SP strategy recognised by leaders, communicated widely. Detailed review undertaken to determine future priorities.
Procurement process	Expenditure analysis undertaken, key sust. Impacts identified. Key contracts start to include general sust. Criteria. Contracts awarded on the basis of Value for Money (VFM), not lowest	Detailed expenditure analysis undertaken, key sustainability risks assessed and used for prioritisation. Sustainability considered at early stage in procurement of most contracts. Whole	All contracts assessed for general sustainability risks and management actions identified. Risks managed through all stages of procurement process. Target to improve sustainability agreed with key	Detailed sustainability risks assessed for high impact contracts. Project/contract sustainability governance in place. A lifecycle approach to cost/impact	Lifecycle analysis undertaken for key commodity areas. KPIs agreed with key suppliers. Progress rewarded/penalised. Barriers removed. Best practice shared with other organisations.

Table 2: The Flexible Framework Levels (CIPS, 2012)

Level Item	LEVEL 1: FOUNDATION	LEVEL 2: EMBED	LEVEL 3: PRACTICE	LEVEL 4: ENHANCE	LEVEL 5: LEAD
	price	life cost adopted.	suppliers.	assessment applied.	
Engaging suppliers	Key suppliers spend analysis undertaken and high impact suppliers identified. Key suppliers targeted for engagement and views on procurement policy sought.	Detailed supplier spend analysis undertaken. General programme of supplier engagement initiatives, with senior management involvement.	Targeted supplier engagement programme in place, for continual improvement. Two-way communication between procurer and supplier, with incentives. Supply chain mapped for key spend areas.	Key suppliers targeted for intensive development. Sustainability audits, supply chain programmes in place. Achievements recorded. CEO involved in supplier engagement programmes	Suppliers recognised as essential to delivery of SP strategy. CEO engages with suppliers. Best practice shared. Suppliers recognise they must continually improve sustainability profile.
Measurement and results	Key sustainability impacts of procurement have been identified.	Detailed appraisal of sustainability impacts undertaken. Measures implement to manage identified high risk impact areas.	Sustainability measures refined from general departmental measures to include individual procurers. Linked to Development objectives.	Measures integrated to a balanced scorecard approach. Comparison made with peer organisations. Benefit statements produced	Measured used to drive strategy direction. Progress formally benchmarked. Benefits from SP clearly evidenced. Independent audit reports in public domain.

## **2.12 Railway Rolling Stock**

Dictionary definition of rolling stock is locomotives, carriages, wagons, or other vehicles used on a railway.

Rolling stock is defined in the wikipedia (Wikipedia, 2018) as: The term rolling stock in rail transport industry refers to any vehicles that move on a railway. It usually includes both powered and unpowered vehicles, for example locomotives, railroad cars, coaches, and wagons the wheeled vehicles collectively used on a railway, including the locomotives, passenger coaches, freight wagons, guard's vans, etc.

In Bangladesh Railway Rolling stock includes various model locomotives, passenger carriages, freight wagons, Oil tankers, container trucks etc.

Locomotive is a self propelled, vehicular engine, powered by steam, diesel, or electricity, for pulling, or sometimes pushing a train or individual railroad cars.

Carriage is a railway coach for passengers.

Wagon is a vehicle used for transporting goods or another specified purpose.



## CHAPTER 3

### RESEARCH METHODOLOGY

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#### 3.1 Methodology

The study was explorative in nature and used qualitative data. The main objective of the study was to explore the current practice of procurement i.e. use of sustainable procurement principles, selection of suppliers based on sustainability criteria, major challenges faced by the procurement function in implementing sustainable procurement, to identify the level of sustainable procurement and to suggest ways of improvement in the procurement system such that the level of sustainability in procurement is developed. The study focused on Procurement of rolling stocks only, as it is strategic item of great value and both importance of the item and complexity of the supply market is high. The flexible Framework model has been used in determining the level of sustainable procurement in procuring rolling stocks for BR.

#### 3.2 Data Collection

The determination of current level of sustainable procurement practices involves both primary and secondary data. **Primary data** were collected through study of different present and past procurement cases specially tender documents of the procurement of roiling stock to verify the extent of sustainable procurement principle is reflected there and meeting minutes of the cross functional meetings held between project office and operations department to identify the awareness among the officials about the sustainable procurement principles. **Secondary data** were collected from the published Bangladesh Railway Information Books and Development Project Proforma (DPP) of different rolling stock procurement projects. Collected data were analysed meticulously to determine the level of sustainable procurement

##### 3.2.1 Primary Data

Sources of primary data were: Meeting minutes and Project case study.

###### (i) Case Study of Projects

Procurement of Rolling Stocks projects were studied to gather knowledge about the

sourcing, supplier appraisal, tender evaluation, award criteria and contract management processes. Tender documents used by Bangladesh Railway for procurement of Rolling Stocks.

### **(ii) Meeting on Procurement Position of the Rolling Stocks**

Some cross functional meetings are arranged with the officials of the operations department and the project office carrying out the procurement function. The minutes of these meetings have been studied to understand the present situation prevailing the sustainable procurement, the challenges in the system, and the ways to overcome the challenges.

### **3.2.2 Secondary Data**

Secondary data were collected from: Bangladesh Railway information book, Development Project Proforma (DPP) of Rolling Stock procurement projects.

#### **(i) Bangladesh Railway Information Books:**

Each year BR publishes a book called Bangladesh Railway Information Book which contains a lot of information. Statistics related to locomotive, passenger carriages, freight wagons have been collected from the Railway Information Book, 2017.

#### **(ii) Development Project Proforma (DPP):**

For each procurement a DPP is prepared stating the background, objective of the project and linkage of the project to other policies and projects. Environmental Impact Assessment (EPA) is a part of DPP.

### **3.3 Data Analysis and Reporting**

The primary and the secondary data has been studied thoroughly and emphasise was given to determine the level of sustainable procurement in procuring the rolling stocks for BR. The aspects that were looked into were: People; Policy, strategy and communication; Procurement process; Engaging suppliers; Measurement and results. Furthermore, the challenges in improving the sustainable procurement level as well as the recommendations to overcome the challenges has been identified from the analysis of primary and secondary data.

## CHAPTER 4

### DATA ANALYSIS AND RESULT DISCUSSION

#### 4.1 Status of Rolling Stock

Bangladesh Railway rolling stock includes various locomotives, passenger carriages and freight wagons. Present holding of rolling stock is as bellow:

Table 3: AGE PROFILE OF LOCOMOTIVE, CARRIAGE, WAGON & RELIEF CRANE

Type of Rolling Stock	Unit	Meter Gauge (MG)	Broad Gauge (BG)	Total
Locomotive	nos.	179	94	273
Passenger Carriages	nos.	1146	428	1574
Freight Wagon	nos.	4925	1534	6459
Relief Crane	nos.	9	4	13

Locomotive (nos.)

Sl No.	Gauge	Zone	Total	00-20	21-30	31-40	Above-41
1	MG	East & West	178	39	45	31	63
2	BG	West	94	39	0	24	31
	G. Total =		273	78	45	55	94

Present holding =272
Off Schedule = 00
Active holding =273
Effective =214
In-Effective = 59

Carriage (nos.)

Sl No.	Gauge	Zone	Total	00-10	15-Nov	16-20	21-25	26-30	31-35	Above-35
1	MG	East & West	1146	143	10	69	15	223	166	520
2	BG	West	428	238	0	0	21	0	44	125
	G. Total =		1574	381	10	69	36	223	210	645

N.B: 42 no's lagguge Van (MG) and 10 no's Lagguge Van (BG) are included in the Position.

Status	MG	BG
Effective	911	377
In-Effective	235	51

Wagon (nos.)

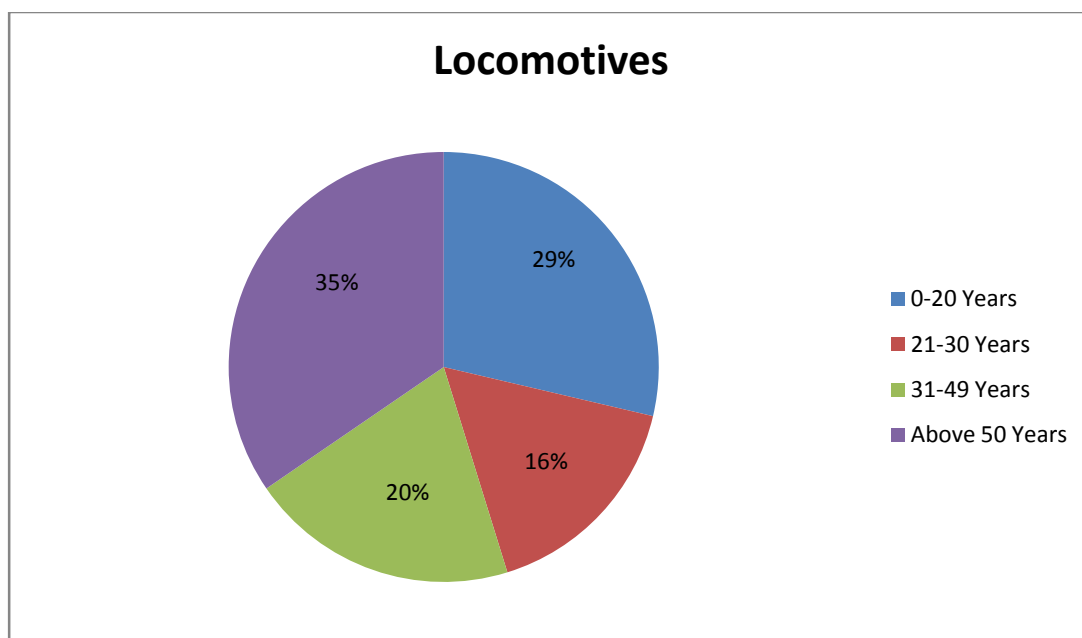
Sl No.	Gauge	Total	00-10	20-Nov	21-30	31-40	41-45	Above-45
1	MG	4925	474	100	278	550	2012	1511
2	BG	1534	171	0	0	1019	0	344
G. Total=		6459	645	100	278	1569	2012	1855

Relief Crane (nos.)

Economic Life- 20 Years

Type	Holding		Age (Year)		Total
	East	West	0-20	Above 20	
MG	7	2	3	6	9
BG	0	4	1	3	4
Total	7	6	4	9	13

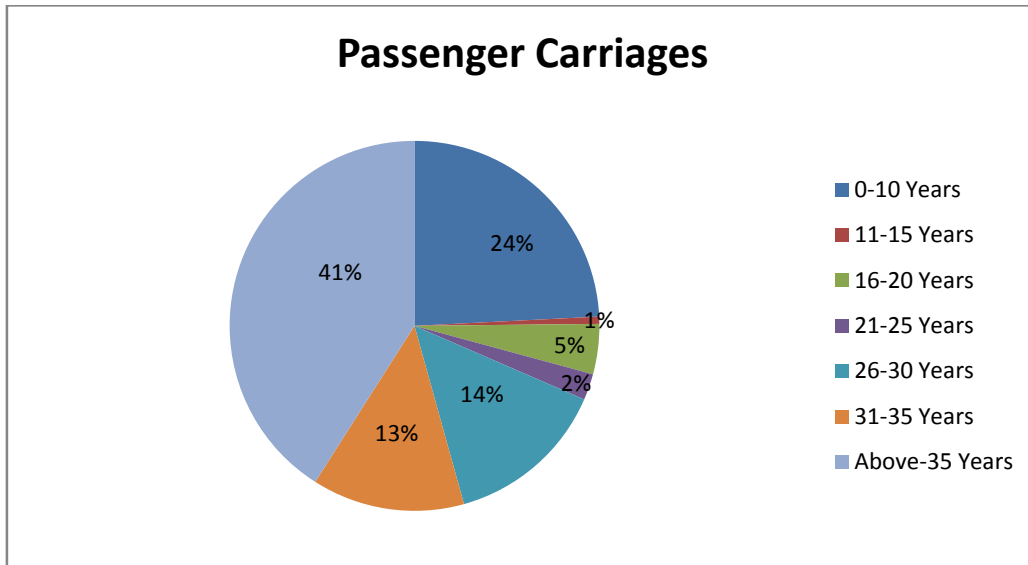
Table 4: Age-wise pie chart of Locomotives



Source: Summarised by author

Only 29% of the locomotives of Bangladesh Railway fleet are within economic life. Economic life described in Mechanical code is 20 years for Locomotives- (Bangladesh Railway, 1974)

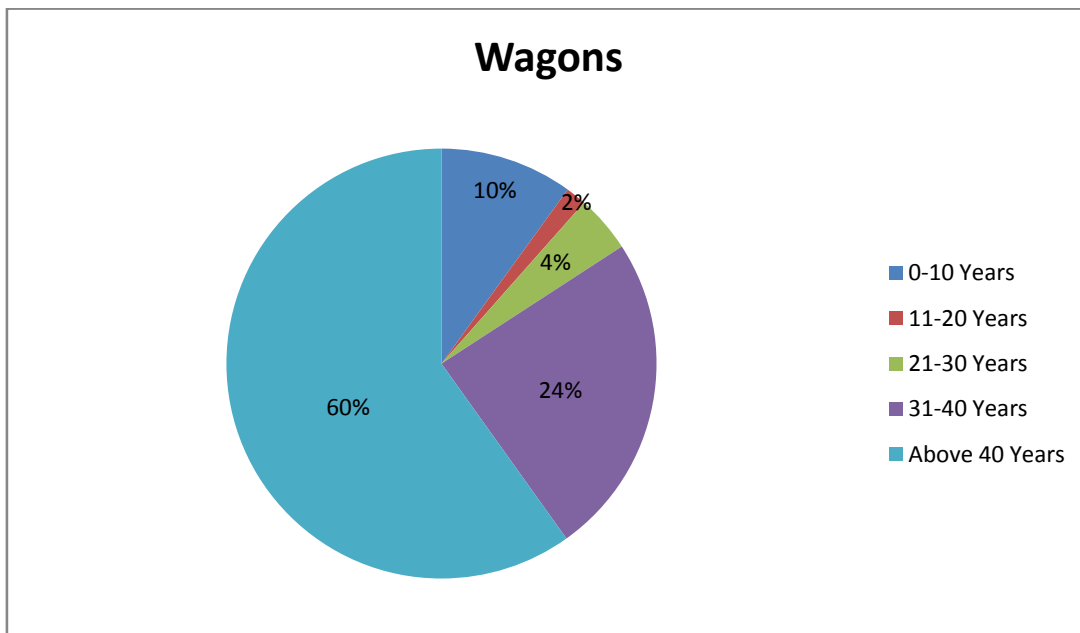
Table 5: Age-wise pie chart of Passenger Carriages



Source: Summarised by author

41% of Passenger Carriages are beyond economic life. Economic life described in Mechanical code is 35 years for Passenger Carriages- (Bangladesh Railway, 1974)

Table 6: Age-wise pie chart of Wagons



Source: Summarised by author

60% of Wagons are on the verge of crossing the economic life. Economic life described in Mechanical code is 45 years for Wagons- (Bangladesh Railway, 1974).

From the above information, it is clear that most of the rolling stock is over aged and need replacement immediately. Procurement of rolling stock is great concern for Bangladesh Railway. Now it is high time to implement sustainability in procurement.

## 4.2 Ongoing procurements

Just now different projects are running for procurement of rolling stock for Bangladesh Railway.

Table 7: Ongoing Procurements of Rolling Stocks by BR

<b>Name of Project</b>	<b>Rolling Stocks to be procured</b>	<b>Implementation period</b>	<b>Project value in BDT Lakh Taka</b>	<b>Budget Allocation in 2018-2019 FY (BDT in Lakh Taka)</b>	<b>Development Partner</b>
Procurement of 70 nos. Meter Gauge (MG) Diesel Electric (DE) Locomotives for Bangladesh Railway	70 MG Locomotives	10.07.2011 to 30.06.2017	194589.48	1591.00	M/s. Hyundai Rotem Company Limited, Korea
Procurement of Meter Gauge (MG) and Broad Gauge (BG) Passenger Carriages for Bangladesh Railway	200 MG and 50 BG Passenger Carriages	01.09.2015 to 30.06.2019	137450.41	42086.00	Asian Development Bank (ADB)
Procurement of Locomotives, Relief Crane and Simulator for Bangladesh Railway	10 MG Locomotives	01.07.2015 to 30.06.2019	73360.63	14200.00	Asian Development Bank (ADB)
Procurement of 20 nos. Meter Gauge Locomotives and 150 nos. Meter Gauge Passenger Carriages for Bangladesh Railway	20 MG Locomotives and 150 MG Passenger Carriages	01.07.2016 to 30.06.2020	179910.53	28748.00	Export Development Co-operation Fund, Korea

<b>Name of Project</b>	<b>Rolling Stocks to be procured</b>	<b>Implementation period</b>	<b>Project value in BDT Lakh Taka</b>	<b>Budget Allocation in 2018-2019 FY (BDT in Lakh Taka)</b>	<b>Development Partner</b>
Railway Rolling Stock Operations Improvement Project (Rolling Stock Procurement)	40 BG Locomotives 75 MG Luggage Vans 50 BG Luggage Vans 580 MG Wagons 420 BG Wagons	01.07.2017 to 30.06.2021	360207.47	0.00	Asian Development Bank (ADB)
Procurement of 200 nos. Meter Gauge (MG) Passenger Carriages for Bangladesh Railway	200 MG Passenger Carriages	01.07.2016 to 30.06.2020	92751.69	1037.00	M/s. CRRC Sifang Company Limited, China
Procurement of 02 sets Broad Gauge (BG) Diesel Electric Multiple Unit to operate a shuttle train between Kaliakeur Hitech Park and Dhaka	02 Sets Diesel Electric Multiple Unit (DEMU)	January, 2016 to December, 2018	171.04	0.00	GoB
Total 7 projects: 100 MG Locomotives, 40 BG Locomotives, 550 MG Passenger Carriages, 50 BG Passenger Carriages, 75 MG Luggage Van, 50 BG Luggage Van 580 MG Wagons, 420 BG Wagons 2 set BG DEMU			1038441.25	87662.00	

**Source: Summarised by author**



## **4.3 Procurement Practices and Methods**

Rolling stock has high importance in the proper functioning of railway. They are highly specialized and customized item manufactured by a handful of manufacturers as per the instruction of the purchaser. Rolling stock also has high complexity in the supply market due to small number of suppliers. Prevailing the mentioned reasons Rolling Stock procurement may be categorized as Strategic item according to Kraljik Procurement Portfolio Matrix. Procurement focus will be on total costs, security and competitiveness of supply. This may be achieved through approaches such as developing long-term, mutually beneficial strategic relationship and relationships management disciplines. Hence implementation of sustainable procurement principals in this segment aspired to contribute a lot in the overall sustainable practices of any organization.

### **4.3.1 Procurement practices**

The study revealed that the procurement of rolling stock mainly conducted through taking different projects. The project offices do not practice the sustainable procurement principles. Tenders are invited only for ‘one-off’ basis, not for long-term collaborative basis. Segmentation of procurement portfolio for strategic procurement planning is not conducted. Whole life cycle costing is not adopted. Awareness about environmental issues are present to some extent but other aspects of sustainability is considerably lacking.

### **4.3.2 Method of Procurement used**

Bangladesh Railway follows international open tender method (preferable single stage two envelope system) in procuring rolling stocks. Single stage two envelope system ensures a quality check as financial offer is opened later after achieving minimum qualifying score in the technical offer. The system is strictly adhered to for getting proven technology rolling stock. In the technical evaluation the criteria selected are designed to give emphasis on experience, previous performance, satisfactory customer service and so on. Since competition is open among the manufacturers, the method of procurement inherently complies some social sustainable criteria. It may be assumed that the manufacturer having a lot of experience and a satisfied customer base has sustainable practices in effect of their operation.

## **4.4 Exploring Current level of Sustainable Procurement**

### **4.4.1 Environmental sustainability**

Environmental management system standards

In terms of greening the transport system research shows that dependency on cars have to be reduced, for this environmentally sound public transport system has to be emphasized. For being an environmentally friendly public transport system Rail is the most effective.

The major cause of the Green House Gas (GHG) impact of the rail investment programme is towards mode-shift from high emitting transport means towards low emitting transport means. The mitigation impact is a resultant of differential GHG emission factors per passenger kilometre and ton kilometre of rail versus road transport. A report in Green Lifestyle Magazine (burn, 2007) shows that for bus emission is 36 gCO<sub>2</sub> per passenger Kilometre whereas for train it is 12 gCO<sub>2</sub> per passenger Kilometre. BR officials seem to be complacent about railway being an environment friendly transport system.

Emission to air, releases to water, sustainable use of resources, energy and water conservation and management, minimisation of waste and impacts are some prominent issues in environmental sustainability, which are not being attended by BR in procuring rolling stocks. In procurement of locomotive emission standard tier-1 is mentioned (Bangladesh Railway, 2018). For carriages environment friendly lavatory is not installed. Awareness about environmental issues are present to some extent but practice of sustainability is considerably lacking. BR has not yet adopted any of the Environmental management system standards (EMSS) as qualification criteria while selecting supplier of its rolling stock. Information and Communication Technology (ICT) tools are not used in procurement process. Electronic procurement is not introduced yet. Use of electronic procedures i.e paperless procurement is vital for sustainable procurement. Use of electronic procurement leads to sustainable operation in both purchaser and supplier end.

### **4.4.2 Social sustainability**

In the social dimension of sustainability important issues are, creating a diverse base of competitive suppliers.

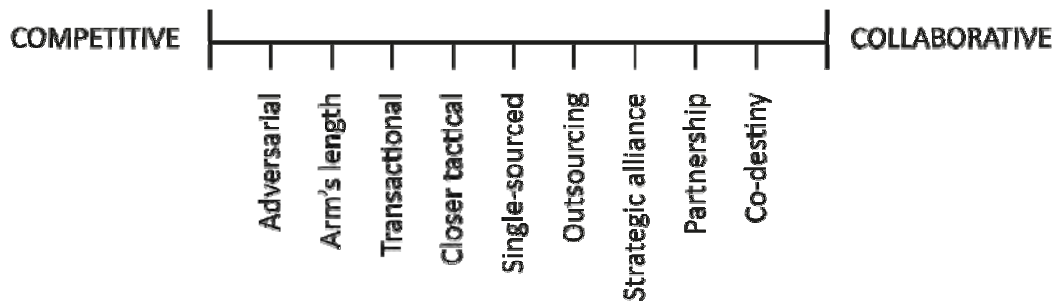
In the tender document of most of the procurement cases social sustainability or responsibility is not addressed in a right manner. A few procurement held under Asian

Development Bank (ADB) incorporates social sustainability issues i.e. Respectful Work Environment. Project personnel are aware of labour rights, health and safety issues of the workers but no standard regarding this has been mentioned in the tender document.

**(i) Supplier Relationships Management**

After signing the contract both supplier and the buyer have to discharge some responsibilities as mentioned in the contract and this is the case of a ‘one-off’ contract. The modern concept of maintaining ongoing supplier relationships, with a view to assess suppliers’ performance so as to engage in long-term collaborative relationship, is not being practised by BR.

**Figure 4: Relationships spectrum**



Relationships with suppliers may extend from ‘one-off’ arm’s length transactions at one end to long-term collaborative ‘partnerships’ at the other end as shown in figure-10. No specific relationship is the best for all procurement. Kraljic portfolio matrix suggests that for rolling stocks, being strategic items, purchasers priority is to ensure long term availability. The appropriate action plan is to make strategic alliance with established global suppliers. This will contribute towards social sustainability. Procurement focus will be on total costs, security and competitiveness of supply. This may be achieved through approaches such as developing long-term, mutually beneficial strategic relationship and relationships management disciplines.

#### **4.4.3 Economic sustainability**

For the procurement of rolling stocks whole life cycle costing is not singled out as an evaluation criteria. Lowest initial price is used in evaluation, which hampers both economic and environmental sustainability

### **4.5 The Flexible Framework**

To clarify the level of performance ‘The Flexible Framework’ performance measurement may be helpful. According to this procurement of Bangladesh Railway is below the foundation level for the following reasons:

**4.5.1 People:** Sustainable procurement champion is not yet identified. For the time being the project directors of rolling stock procurement projects may regard as the sustainable procurement champion. The key procurement staffs have not received any training of procurement let alone training in the basic principles of Sustainable procurement. Sustainable procurement is not included in the key staff induction programmes.

**4.5.2 Policy, strategy and communication:** The objectives of sustainable procurement are not yet agreed among the staff. There is no separate procurement policy for Bangladesh Railway let alone specifically for rolling stock procurement. Procurement of rolling stock is carried out according to the Public Procurement Act, 2006 and Public Procurement Rules, 2008. In some cases procurement guidelines and standard tender documents of different development partners are used in procurement. These documents include some sustainable procurement principles. There is lack of uniformity and consistency among the practices. Each procurement is unique in nature. Not an umbrella policy to cover all the sustainable procurement principle is yet adopted. Communication of Sustainable procurement policy is out of the question.

**4.5.3 Procurement Process:** Expenditure analysis undertaken to some extent. Key sustainable impacts not yet identified. Key contracts do not contain general sustainability criteria. Contracts are awarded still on the basis of lowest price after fulfilling pass score in the technical evaluation. However Bangladesh Railway strives to procure proven technology with long supply record which, by default complies with some sustainable principles.

**4.5.4 Engaging suppliers:** Association with Suppliers is still a taboo in public procurement of Bangladesh. Supplier analysis has not been undertaken, hence key suppliers and high impact suppliers are not identified. The extent of supplier engagement is limited to some presentations by the suppliers about their products. The suppliers are not actively engaged in the bid document preparation stage. Supplier engagement is sought in the pre-bid meeting in some of the procurement, which results in less complicity during the implementation period.

**4.5.5 Measurement and results:** Key sustainability impacts of procurement activity yet to be identified.

### CONCLUSION AND RECOMMENDATION

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#### 5.1 Conclusion

Rolling stock is a strategic item for any railway. High importance of the item and high complexity of the supply market has to be kept in mind. Rolling stock procurement requires special skill. Tender document (i.e the commercial clauses and the technical specification) preparation aligned with sustainable procurement principles can go a long way towards contributing the improvement of level in the flexible framework model.

The challenges faced by procurement of rolling stock by BR, the unique challenges faced the organisations in procuring rolling stocks are as follows:

**Firstly**, there are so many categories of rolling stocks and so many models of each category. **Secondly**, the manufacturers of rolling stocks are a handful. **Thirdly**, new models are introduced to incorporate the design improvements and old models are phased out. **Fourthly**, whole life costing is difficult due to uncertainty of operational life of a rolling stock. **Fifthly**, the environmental impact of the operation of rolling stock as well as the environmental impact of manufacturing the rolling stock is difficult to calculate. **Sixthly** personnel involved in procurement are not specialized.

Rolling stock procurement plays a vital role in achieving availability of rolling stock. The locomotives, carriages and wagons must be compatible to be used together in a rack. Increased variety of models contributes to difficulty in the operation of trains.

Therefore, BR should proceed systematically to establish an uniform rolling stock procurement system as well as universal rolling stock procurement to operate in a sustainable way and also to procure sustainably.

The BR specific rolling stock procurement practices and challenges are summarised below:

- (i) Bangladesh Railway being a client of rolling stock faces difficulty in identifying and tackling hidden impacts associated with the procurement of goods and services from global supply chains. Whereas it is relatively easy for organization's to

understand and manage their direct environmental impacts through energy or water bills.

- (ii) Absence of a sustainable procurement policy endorsed by the Government incorporating sustainable procurement is a major challenge in implementing sustainable procurement principles.
- (iii) Moreover there is a lack of sustainable procurement strategy in the top-level. The policy goals need to be implemented by some strategies. There is no policy and strategy to develop sustainable procurement level in BR.
- (iv) Lack of awareness among the officials about social and economic aspects of sustainability. The procurement is mostly done on least cost basis among the technically responsive bidders. Whole life cycle costing has not been adopted yet. Relationship with suppliers is a taboo. Collaborative relationship is not maintained. Procurement is done in one-off basis. Maintenance contract is not used.
- (v) Lack of sustainability related criteria in defining the technical specification and the qualification criteria. That is why BR fails to procure sustainable items in a sustainable way. Product is defined in characteristic way rather than functional way. Less leeway is provided to the suppliers. Moreover the qualification criteria are based on experience and previous performance. Innovative and sustainable ideas are not encouraged among the suppliers and products.
- (vi) No sustainable procurement related standard is followed to pre-screen suppliers. BR procures from experienced suppliers which ensures sustainability to a small extent as being in the market for a long period does have some qualities. The environmental management system standards or social responsibility standards are not yet recognised by BR as qualification criteria.
- (vii) BR has no sustainability team or access to sustainability consultants, who can provide input into product-level procurement; assessing market capability and best practice, writing specifications, and evaluating solutions and data provided by suppliers during the procurement process.
- (viii) BR currently does not have any effective measurement, reporting and continual improvement system to monitor progress and continually improve.

- (ix) Innovation is feared rather than encouraged by BR. BR is old school, tries to stick to old and proven technology. Innovation is not welcomed from the suppliers as well as the employees.
- (x) Bangladesh Railway follows the Public Procurement Act, 2006 and Public Procurement Regulations 2008 for procurement of rolling stocks which do not identify sustainability as a key procurement criteria. Electronic Government Purchase (e-GP) has been introduced to ensure sustainability by achieving paperless procurement in most of the Government organizations. However, Bangladesh Railway is far from implementing e-GP also.

## **5.2 Recommendations**

Once the challenges are identified it is easy to make recommendations to overcome the challenges. The recommendations are as follows:

- (i) Developing a sustainable purchasing policy for organisation is the first step in ensuring that sustainability is embedded in the procurement process. Hence, at first, Bangladesh Railway should establish and implement a robust top-level sustainable procurement strategy, and secondly, applying sustainability principles when buying specific products.
- (ii) A top-level strategy needs to be developed by BR. The key elements of developing and implementing a robust top-level sustainable procurement strategy might be:
  - (a) Vision and clear objectives – the aim of BR. Set the sustainability principles and standards are to be followed in place for procurement.
  - (b) Leadership and Action plan – the strategy needs to be endorsed from the top, and action plan to implement it need to be devised. A major shift in organizational culture is required to change the emphasis from buying low cost items, to considering whole life economic, environmental and social factors.
  - (c) Communication – both internal and external communication will be key enablers for sustainable procurement strategy. Different departments will have different training needs. Sustainable procurement strategies may be communicated through training and different level. Set the type and frequency of training. The suppliers might be involved in selecting the sustainable procurement principles.



(e) Risk & opportunity identification and management – identify the biggest areas of spend and biggest risks and opportunities. Expenditure analysis and supply chain mapping ought to be done to help strategically identify and manage the most significant issues and opportunities for BR.

(f) Monitoring, reporting and review–Performance measurement is vitally important in sustainable procurement because it supports the planning and control of operations and relationships. Ascertain the organization’s sustainable procurement status and the extent of improvement from time to time. Potential for improvement should be identified and lessons should be learned from other organizations.

- (iii) The personnel involved in procurement of rolling stock should be made aware of all the aspects of sustainability through different policy and strategy. Whole life cycle costing should be used as ward criteria instead of existing least cost method. Collaborative relationship in lieu of one-off purchase should be established with the suppliers to maintain sustainability in supply. Maintenance contract with the supplier of rolling stock might endure sustainability to some extent. Higher degree of engagement and collaboration with suppliers is a key to sustainable procurement
- (iv) Each product has different environmental and social impacts associated with it throughout its life cycle. This should be considered while developing the product specification. Products with less adverse impacts on environment (i.e. less energy consumption, less transport required and so on) are to be selected for sustainable procurement. The supplier’s affinity to sustainability should be set as a qualification criteria and contract should be awarded on the basis of this affinity.
- (v) The sustainability requirements of BR need to be clearly defined in consultation with various stakeholders. It is high time for BR to adopt some standards regarding the environmental and social sustainability (i.e. ISO 14000:2010, ISO26000:2010 and SA 8000:2001) as qualification criteria.
- (vi) BR should immediately engage a sustainability team or gain access to sustainability consultants, who can provide input into product-level procurement; assessing market capability and best practice, writing specifications, and evaluating solutions and data provided by suppliers during the procurement process.

- (vii) An effective measurement, reporting and continual improvement system should be in place to monitor progress and continually improve.
- (viii) To improve in the sustainable level Bangladesh Railway should encourage innovation related to more sustainable rolling stocks, through effective market research and use of outcome specifications from the suppliers as well as the employees of BR. Newer technology should be made welcome to improve sustainable procurement.
- (ix) Steps should be taken to implement e-GP as soon as possible to ensure sustainability in the procurement process. Concern should be raised by Bangladesh Railway officials at different forum of public procurement specialists to revise the Public Procurement Act and Public Procurement Rules incorporating Sustainable Procurement principals.

### **5.3 Limitation and Scope for Further Study**

This study was limited to the procurement of rolling stock for Bangladesh Railway. There are many other categories of procurement performed by Bangladesh Railway. Further study may be conducted for all categories of procurements for Bangladesh Railway.

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