

Report On
Procurement Risk of SPARRSO and its mitigation approach

By

Mohammad Masudur Rahman Mollah
Student ID: 22382007

A report submitted to the BRAC Institute of Governance and Development (BIGD)
in partial fulfillment of the requirements for the degree of
Masters in Procurement and Supply Management

BRAC Institute of Governance and Development (BIGD)
Brac University
April, 2024

© 2024. Brac University
All rights reserved.

Declaration

It is hereby declared that

1. The internship report submitted is my own original work while completing degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

Student's Full Name & Signature:

Mohammd Masudur Rahman Mollah

Student ID: 22382007

Supervisor's Full Name & Signature:

Masud Akhtar Khan

Chartered MCIPS, PMP

Additional Secretary,

Ministry of Primary and Mass Education

Bangladesh Secretariat, Dhaka

Declaration

It is hereby declared that

1. The internship report submitted is my own original work while completing degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

Student's Full Name & Signature:

Mohammd Masudur Rahman Mollah

Student ID: 22382007

Workplace Supervisor's Full Name & Signature:

M. Mahmud Ali

Member (Additional Secretary)

Bangladesh Space Research and Remote Sensing Organization (SPARRSO)

Agargaon, Sher e Bangla Nagar, Dhaka-1207

Letter of Transmittal

08 April 2024

Masud Akhtar Khan

Chartered MCIPS, PMP

Additional Secretary,

Ministry of Primary and Mass Education

Bangladesh Secretariat, Dhaka

& Faculty

BRAC University, Dhaka.

Subject: Submission of Report/Practicum for PSM-665

Dear Sir,

With due respect and humble submission, I would like to take the privilege of submitting my internship report entitled 'Procurement Risk of SPARRSO and its mitigation approach' as a partial requirement for achieving the degree of Master's in Procurement and Supply Management. It is a great opportunity for me to work under your active supervision, care, and guidance.

I have tried my best to complete the report with the essential information and suggested proposition in the exceedingly vital, compact, and comprehensive manner possible. I believe that this report will meet the benchmark of the academic report in the best possible manner.

Sincerely yours,

Mohammad Masudur Rahman Mollah

Student ID: 22382007

Masters in Procurement and Supply Management

BRAC Institute of Governance and Development (BIGD)

BRAC University.

Acknowledgement

I would like to express my utmost gratitude to Almighty Allah for granting me the opportunity of successfully completing this report. I express my sincere gratitude, profound respect and heartfelt thanks to my respected supervisor, **Mr Masud Akhtar Khan**, Chartered MCIPS, PMP, Additional Secretary, Ministry of Primary and Mass Education Bangladesh Secretariat, Dhaka & Faculty, BRAC University, Dhaka, for his invaluable guidance, supervision and motivation for successful completion of this report.

I express my deep sense of gratitude to **Mr. Md. Rashedul Islam**, Chairman (Additional Secretary), SPARRSO, for his candid support, inspiration and valuable suggestions for me to enrich the report. A special note of respectful thanks to **Mr. M. Mahmud Ali**, member (Joint Secretary), SPARRSO and workplace supervisor for his enormous support, thoughtful guidance and inspiration for the report.

I am also grateful to all respecter faculty of MPSM and, importantly, all of my coursemates for their continuous efforts, thoughtful insights and courageous support in steering me towards the completion of my report.

Mohammad Masudur Rahman Mollah

Student ID: 22382007

BRAC Institute of Governance and Development (BIGD)

BRAC University

Executive Summary

Bangladesh Space Research and Remote Sensing Organization (SPARRSO), operating under the Ministry of Defense, plays a pivotal role in harnessing space technology for peaceful purposes, contributing to various fields such as agriculture, forestry, hydrology and more. This report delves into the procurement risks faced by the SPARRSO and outlines a comprehensive approach to mitigate these challenges.

The research was conducted using a mixed-methods approach, combining primary data from interviews and discussions with SPARRSO employees and secondary data from the literature. This comprehensive methodology allowed for a thorough assessment of the procurement risk landscape at SPARRSO and the efficacy of implemented risk mitigation strategies.

The Key findings of this research reveal that SPARRSO primarily procures research equipment, software, materials, and services to support its mission. However, inherent risks such as delays, cost overruns, and quality issues necessitate a strategic mitigation approach.

The report suggests several measures to mitigate procurement risks effectively, such as Supplier diversification to spread risks, Rigorous evaluation and qualification of suppliers, Emphasis on supply chain transparency, Continuous monitoring and management of risks, Adoption of technology solutions for efficiency, and Ensuring sustainable procurement practices.

Additionally, the report has emphasised capacity building within SPARRSO's procurement department through training and development initiatives. Collaborative engagement with suppliers and stakeholders and adopting dispute-resolution techniques are recommended to address issues proactively.

Overall, SPARRSO's proactive approach to risk management, including robust policies, capacity building, stakeholder engagement, and technological advancements, has not only been proven essential for ensuring successful project execution but also instils confidence in its ability to maintain competitiveness in the global space sector.

Keywords: *Public Procurement, Risk Management, Supply Chain, Bangladesh, SPARRSO, Risk Factors, Procurement Methods, Procurement Risk Reduction, Procurement Challenges, Procurement Risk Mitigation.*

Table of Contents

Declaration.....	i
Letter of Transmittal	iii
Acknowledgement.....	iv
Executive Summary	v
Table of Contents	vi
List of Tables	viii
List of Figures.....	ix
List of Acronyms.....	x
Chapter 01 Introduction	1
1.1 Background.....	1
1.2 Objective of the Study	1
1.3 Rationale of the study	1
1.4 Limitations	1
1.5 Methodology	2
1.6 Data Analysis.....	2
1.7 Organization of the Study	2
Chapter 02 Literature Review	3
2.1 Introduction.....	3
2.2 Basic Concept of Risk.....	3
2.3 Main Categories of Risk	3
2.4 Risk Assessment	3
2.5 Risk Assessment Grid.....	4
2.6 Risk Management Strategies.....	4
2.7 The risk management cycle	5
2.8 Termination.....	5
2.9 Sustainable Procurement.....	6
Chapter 03 Risk Factors in Public Procurement Processes and their remedies.....	10
3.1 Generic Steps of Public Procurement and their Risk Factor.....	10
3.1.1 Step 1: Need Assessment	10
3.1.2 Step 2: Cost Estimate	10
3.1.3 Step 3: Procurement Planning.....	10
3.1.4 Step 4: Specification/ ToR	10
3.1.5 Step 5: Official Cost Estimate.....	11

3.1.6 Step 6: Standard Tender Document (STD) preparation.....	11
3.1.7 Step 7: Advertisement.....	11
3.1.8 Step 8: Tender Evaluation.....	11
3.1.9 Step 9: Approval	12
3.1.10 Step 10: Issue Notification of Award (NoA)	12
3.1.11 Step 11: Contract Signing	12
3.1.12 Step 12: Warranty Clause (Warranty/ Defect Liability)	12
Chapter 04 Choice of Procurement Methods: Limitations and Risk Factors.....	13
4.1 Introduction.....	13
4.2 Methods: Goods and Works.....	13
4.3 Methods: Consultancy Services	13
4.4 Limitations and Risk factors of Procuring Methods	13
Chapter 05 Procurement Risk at SPARRSO: Overview, Data Analysis and Findings	15
5.1 Introduction.....	15
5.2 Data Analysis	15
5.3 Procurement Risk Analysis on the basis of Fiscal Year	19
5.4 Findings from Data Analysis	26
Chapter 06 Challenges of Procurement in SPARRSO	27
Chapter 07 Recommendations for Procurement Risk Mitigation	29
Chapter 08 Conclusion	31
References	32

List of Tables

Table 01: Category of Risk.....	3
Table 02: SPARRSO Budget allocation, APP and Expenditure for last 6 years	15
Table 03: APP Budget Distribution for last 6 Financial Years	17
Table 04: Audit Observations on Procurement.....	18
Table 05: State of eGp procurement at SPARRSO.....	25

List of Figures

Figure 01: Risk Management Cycle.....	5
Figure 02: Sustainable Procurement	6
Figure 03: Triple Bottom Line	6
Figure 04 : The Kraljic Matrix.....	8
Figure 05: Strategic Risk Management Framework	9
Figure 06: SPARRSO Budget Allocation vs Expenditure.....	16
Figure 07: SPARRSO Budget, APP Budget & APP Expenditure (Procurement).....	16
Figure 08: Procurement of Goods, Works and Service (2019-2023).....	17
Figure 09: Conventional Procurement vs eGp Procurement (2018-2023).....	18
Figure 10: APP Budget vs Audit Observations (BDT).....	19
Figure 11: Procurement types in 2017-18.....	19
Figure 12: Procurement Methods in 2017-18	20
Figure 13: Procurement Types in 2018-19	20
Figure 14: Procurement Methods in 2018-19	21
Figure 15: Procurement Types in 2019-20	21
Figure 16: Procurement Methods in 2019-20	22
Figure 17: Procurement Types in 2020-21	22
Figure 18: Procurement Methods in 2020-21	23
Figure 19: Procurement Types in 2021-22	23
Figure 20: Procurement Methods in 2021-22	24
Figure 21: Procurement Types in 2022-23	24
Figure 22: Procurement Methods in 2022-23	25
Figure 23: Trend of eGp procurement over years.....	26

List of Acronyms

AA	Approving Authority
APP	Annual Procurement Plan
BPPA	Bangladesh Public Procurement Authority
CSOS	Community Service Organization Selection
DCS	Design Contest Selection
DPM	Direct Procurement Method
eGp	E Government Procurement
FBS	Fixed Budget
FY	Fiscal Year
GIS	Geo Informatics System
ICS	Individual Consultant Service
IFT	Invitation For Tender
KPI	Key Point Installation
LCS	Least Cost Selection
LTM	Limited Tendering Method
MRO	Maintenance, Repair And Operation
MEAT	Most Economically Advantageous Tender
NoA	Notification Of Award
OCE	Official Cost Estimate
OCEC	Official Cost Estimate Committee
OEM	Original Equipment Manufacturers
OSTETM	One Stage Two Envelop Tendering Method
OTM	Open Tendering Method
PASTLE	Political, Economic, Social, Technological, Legal And Environmental
PCC	Particular Condition Of Contract
PPA	Public Procurement Act
PPR	Public Procurement Rules
PWD	Public Works Division
QCBS	Quality And Cost Based Selection
RFQM	Request For Quotation Method
SBCQ	Selection Based On Consultants Qualification
SPARRSO	Bangladesh Space Research And Remote Sensing Organization
SSS	Single Source Selection
STD	Standard Tender Document
SDG	Sustainable Development Goals
TD	Tender Documents
TEC	Tender Evaluating Committee
TS	Tender Security
TIAC	Technical Inspection And Acceptance Committee
TOC	Tender Opening Committee
TOR	Terms Of References
TSC	Technical Sub Committee
TSTM	Two Stage Tendering Method

Chapter 01

Introduction

1.1 Background

Procurement is purchasing, buying, hiring and acquiring goods, execution of works and performance of services by any contractual means [1], [2]. When the public fund is used for procurement, it is called Public Procurement [3], [4], [5]. Procurement always involves uncertainty and vulnerability, which we call risk. Risk is the effect of uncertainty on objectives. Risk is effectively unavoidable[6]. It can never be eliminated; it can only be reduced or mitigated. So, procurement risk mitigation has been a burning issue for all organizations in recent years[7], [8].

Bangladesh Space Research and Remote Sensing Organization (SPARRSO) is a multidisciplinary research organization established in 1980 [9]. As a space research organization, it faces procurement and supply risks when procuring different types of Goods, Works, and Services. This study aims to identify those procurement risks and recommend mitigating approaches to risks and vulnerability.

1.2 Objective of the Study

1.2.1 Primary Objectives

To find out the scope of procurement risk reduction after taking risk mitigation approach at SPARRSO.

1.2.2 Secondary Objectives

- 1) To identify the position of procurement risk before taking mitigation approach at SPARRSO.
- 2) To identify the scope of risk reduction after taking mitigation approach at SPARRSO
- 3) To what extent the mitigation approach helps to reduce procurement risk.

1.3 Rationale of the study

Procurement is always lying with huge complexity, uncertainty and risk. If we don't address risk properly in procurement methods and processes at the proper time limit within the legal framework, the whole project will be in ruin[7], [8]. SPARRSO is a unique organization that has the mandate for the peaceful application of Space Research and Remote Sensing Technology in Bangladesh. Space Economy will be one of the major sectors in future to compete with the emerging power and global leader among the global giant developed countries. In this case, SPARRSO has a scope to equip itself to face the upcoming global challenge and to compete with global giant countries [9].

1.4 Limitations

- Time and Resource Constraints
- Small sample size
- It is a special type of research organization,
- It remains some legal and administrative restrictions as a KPI (Key Point Installation) organization.

1.5 Methodology

Methodology constitutes the study of methods and delves into the philosophical underpinnings that shape the research process. A research method entails a deliberate and systematic strategy for investigation, encompassing the detailed framework for unit analysis, data collection techniques, sampling focus, interpretation strategy, and analysis plan, as articulated by Aminuzaman (1991)[10].

Both primary and secondary data have been used in preparing this report. The primary data was collected directly from the employee of the organization through interview, discussions and case study. Secondary data was collected from books, journals, documents, websites etc.

1.6 Data Analysis

The collected data have been analyzed to find out the practical scenario of the extent of procurement risk reduction after mitigation approach have been executed. For better interpretation, the collected data have been presented in the tabular form. Again, sometimes data have been presented in graphical or chart form. Sometimes some matrix and related theories are used for analytical purpose and for better understanding.

1.7 Organization of the Study

This report has been compiled with ten chapters; each of which has been focused on a distinctive aspect. Chapter one introduces the topic of the report. It also covers objectives, rationale of the study, limitations, methodology and lastly organization of the study. The second chapter named 'Literature Review' that has been arranged with related theories, concept and works. It focuses on the term risk, risk assessment grid, Risk management strategies and cycles, Sustainable procurement, Kraljic Matrix etc. The third chapter has been furnished on Public Procurement Acts and Rules in Bangladesh. The fourth chapter is on 'Risk Factors in Public Procurement and their remedies'. The fifth chapter focus on procurement methods. The sixth chapter describe an overview of SPARRSO. The seventh chapter is the most important one of this paper. This chapter has been described on 'Procurement Risk Factors & Risk Reduction at SPARRSO: Data Analysis and Findings.' The eighth chapter has been furnished with Challenges of Procurement in SPARRSO. The ninth chapter is on 'Recommendations for Procurement Risk Mitigation.' The last chapter has drawn an ending line with Concluding Remarks.

Chapter 02 Literature Review

2.1 Introduction

This literature review delves into the multifaceted dimensions of procurement risk encountered by SPARRSO, exploring its procurement processes, identifying potential risk factors, and examining existing approaches for risk mitigation. This review endeavours to provide a holistic understanding of procurement risk at SPARRSO and illuminate effective strategies for its mitigation, thus contributing to enhanced operational resilience and organizational excellence.

2.2 Basic Concept of Risk

Risk is the probability of an unwanted outcome happening. Probability measures the likelihood that a given event or result might occur (Charter Institute of Procurement and Supply). ISO31000:2009 defines Risk as the effect of uncertainty on objectives [11]. Risk is the combination of the probability of an event and its consequences [12]. Risk is effectively unavoidable. It can never be eliminated from business.

2.3 Main Categories of Risk

Table 01: Category of Risk

No.	Risk	Sources
01	Strategic Risk	vision and direction of an organization
02	Operational Risk	functional, operational and administrative procedures.
03	Financial Risk	financial structure of business and financial transactions.
04	Compliance Risk	compliance with laws, regulations, policy framework, etc.

2.4 Risk Assessment

Risk can be assessed by multiplying the Likelihood (probability) and Impact (adverse consequence) of any risk [13], [14]. Risk Likelihood is the probability of occurrence, given the nature of the risk and current risk management practices.

$$\text{Risk} = \text{Likelihood (Probability)} \times \text{Impact (adverse consequence)}$$

2.5 Risk Assessment Grid

		Impact / Adverse consequence	
		Low	High
Likelihood of occurrence	Low	A	C
	High	B	D

2.6 Risk Management Strategies

There are 4T's of risk management, these are;

- Tolerance (or accept) the risk
- Transfer (or spread) the risk
- Terminate (or avoid) the risk
- Treat (or mitigate) the risk

		Impact or Effect on organization	
		Low	High
Likelihood of occurrence	Low	A Tolerance	C Transfer
	High	B Treat	D Terminate

2.7 The risk management cycle

The risk management cycle can be plotted by the following way[15];

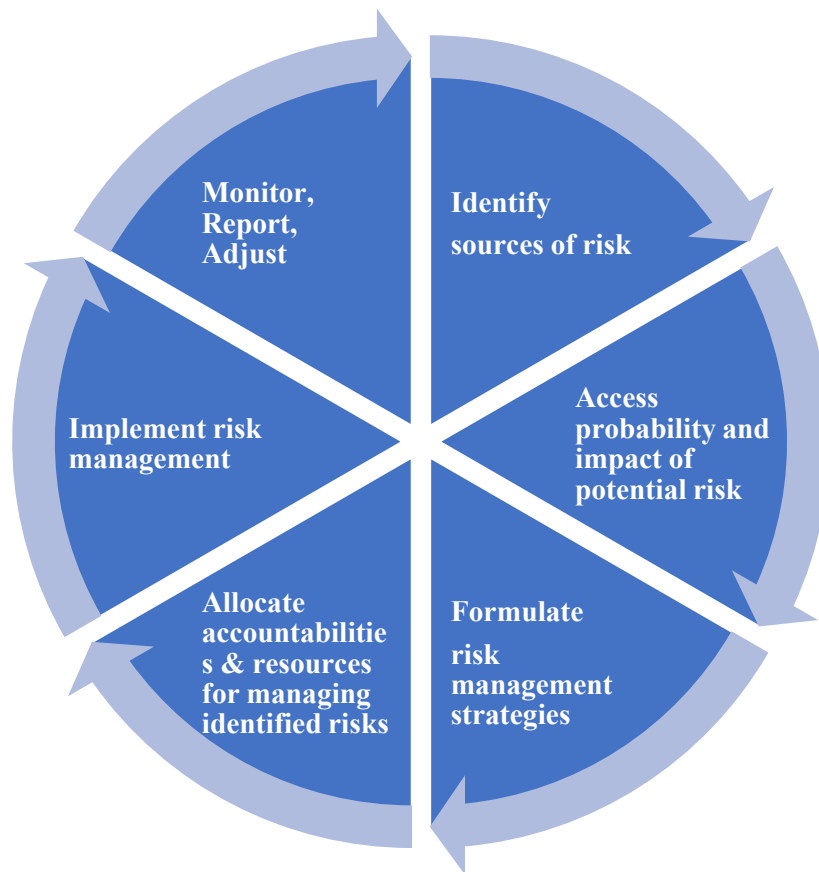


Figure 01: Risk Management Cycle

2.8 Termination

If there is no scope for the remedy of contract failure, then the contracts ultimate goal may be the termination of contract. Contract may be terminated by one of the following ways;

- By default
- For Insolvency
- For Convenience

(Reference: STD- PW3)[16]

2.9 Sustainable Procurement

Sustainability activities are being made of three main pillars- Social, Environmental and Economic[17].

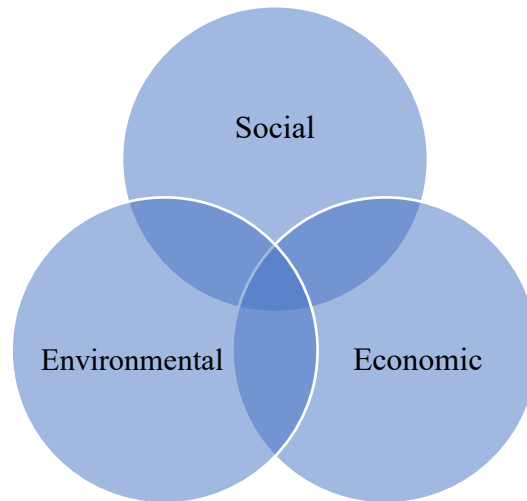


Figure 02: Sustainable Procurement

Again, sustainability is related to TBL (Triple Bottom Line). It is also called 3P[15], [18].

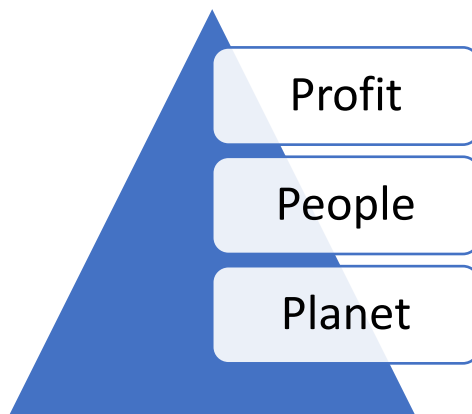


Figure 03: Triple Bottom Line

Sustainable procurement Initiatives and challenges:

1. Life Cycle Costing
2. Climate Change resilient structure.
3. Most Economically Advantageous Tender (MEAT).
4. Policy support for women entrepreneurship and SME
5. Carbon abatement and green environment.
6. Ensure circular economy.

2.10 Strategies in Procurement Risk Management

PASTLE Analysis

A PASTLE Analysis is a framework used in business and strategic planning to identify and analyze the external factors that can impact an organization's success. The acronym of PASTLE stands for Political, Economic, Social, Technological, Legal and Environmental[19].

Categories	Descriptions
Political	Government policies, regulations and political stability
Economic	Economy such as inflation, unemployment, economic growth, and exchange rates
Social	Social, demographic, cultural trends, lifestyle changes, and consumer attitudes
Technological	Innovations and developments in technology.
Legal	Rules, regulations, legal frameworks, and compliance
Environmental	Environmental and ecological issues, such as climate change, sustainability, and resource scarcit.

Kraljic Matrix

The Kraljic matrix is developed in 1983 by Peter Kraljic. It is a supplier positioning tool. It allows a buyer/ purchaser to classify its purchases and select appropriate procurement strategies[20].

		Buyer's perspective	
		High	Low
Risk	High	Strategic Security Bottleneck Protect	Strategic critical Core Collaborate
	Low	Tactical acquisition Routine Avoid	Tactical profit Leverage Compete
		Expenditure	

Figure 04 : The Kraljic Matrix

Bottlenecks: Low value items that are crucial to the wellbeing of the business. Security of supply is more important than price. A hard negotiation would not be appropriate

Quadrant	Bottleneck
Type	<ul style="list-style-type: none"> High risk and low value but relatively rare in terms of the supply market
Examples	<ul style="list-style-type: none"> Original Equipment Manufacturers (OEM) parts Computer chips

Routine: Low value, low risk and exposure. Unimportant items which are not essential to the business. Buyer can put the supplier at some distance.

Quadrant	Routine
Type	<ul style="list-style-type: none"> Low risk and low value
Examples	<ul style="list-style-type: none"> Stationery supplies Consumable Materials such as maintenance, repair and operation (MRO) Low level temporary labor

Core: These are key items which are both high cost and essential to the business. They are of the highest importance. Suppliers must be treated with care.

Quadrant	Core
Type	High Risk High Impact on profitability
Examples	Major outsourcing providers such as IT

Leverage: Items not of crucial importance to the business but the high spend means that the buyer can play the market. Spot buying and hard negotiation are obvious tactics.

Quadrant	Leverage
Type	Market risk low and the cost or value is high
Example	Product specific material

Strategic Risk Management Framework

Strategic risk management framework is the framework where the process of recognizing risks, identifying their causes and effects, and taking the relevant actions to mitigate them takes place.. Strategic Risk Management Framework is such an inclusive system that helps to address all the factors in holistic manner.



Figure 05: Strategic Risk Management Framework

Chapter 03

Risk Factors in Public Procurement Processes and their remedies

3.1 Generic Steps of Public Procurement and their Risk Factor

According to Public Procurement Act 2006 and Public Procurement Rules 2008, there are different steps and cycles as follows;

3.1.1 Step 1: Need Assessment

Risk Factor	Reducing Risk
<ol style="list-style-type: none"> 1. Under/ over assessment of needs 2. Misinterpretation of user needs 3. Insufficient funding 4. Insufficient market knowledge 	<ol style="list-style-type: none"> 1. Analyze need accurately 2. Consultation with users 3. Market analysis 4. Obtain budgetary approvals before undertaking the process.

3.1.2 Step 2: Cost Estimate

Risk Factor	Reducing Risk
<ol style="list-style-type: none"> 1. Inappropriate procurement planning 2. Improper allocation of budgeting 3. Wastage of money 	<ol style="list-style-type: none"> 1. Follow the methodical procedure of cost estimation 2. Balancing between budget and needs/ necessities. 3. Analyze the market rate, exchange rate, etc.

3.1.3 Step 3: Procurement Planning

Risk Factors	Reducing Risk
<ol style="list-style-type: none"> 1. Inappropriate procurement method 2. Package manipulation 3. Insufficient market knowledge 4. Under estimating cost and time frame 5. APP not published within the due date. 	<ol style="list-style-type: none"> 1. Make careful cost estimation 2. Select the appropriate method as per PPR 3. Carefully determine the package/ lot. 4. Carry out market analysis 5. Use of conformance and performance.

3.1.4 Step 4: Specification/ ToR

Risk Factors	Reducing Risk
<ol style="list-style-type: none"> 1. Narrow definition, commercial specification 2. Biased/Locked/Restricted specification 3. Insufficient knowledge of the market 4. Inadequate requirements 	<ol style="list-style-type: none"> 1. Define specification in terms of required outputs and performance, 2. Ensure specification with needs analysis 3. Observe budget/ resources 4. Be familiar with requirements.

3.1.5 Step 5: Official Cost Estimate

Risk Factor	Reducing Risk
<ol style="list-style-type: none"> 1. Don't form an official Cost Estimate Committee (OCEC). 2. Improper market assessment 3. Not appropriately prepared OCE. 4. Disclosure of OCE 	<ol style="list-style-type: none"> 1. Operate OCE committee as per rules 2. Proper market assessment by OCEC. 3. Ensure confidentiality about OCE as it is a secret document up to a specific period of time.

3.1.6 Step 6: Standard Tender Document (STD) preparation

Risk Factor:	Reducing Risk:
<ol style="list-style-type: none"> 1. Proper STD may not be selected to prepare TD. 2. Provide inadequate information 3. Inconsistent requirements 4. Unacceptable terms and conditions 5. Biased criteria given on PCC. 	<ol style="list-style-type: none"> 1. Implementation of procurement policies, guidelines and practices 2. Market knowledge 3. Collect information from potential tenderers 4. Provide staff with appropriate training

3.1.7 Step 7: Advertisement

Risk Factors:	Reducing Risk:
<ol style="list-style-type: none"> 1. Advertisements not published in at least two widely circulated daily newspapers. 2. Manipulated publicity 3. advertisements may not posted on BPPA's website. 	<ol style="list-style-type: none"> 1. The Advertisement procedure should follow the corresponding rule.

3.1.8 Step 8: Tender Evaluation

Risk Factors:	Reducing Risks:
<ol style="list-style-type: none"> 1. Evaluation criteria sometimes are not clear to tenderers 2. Too limited evaluation criteria 3. Failure by TEC to follow an effective evaluation procedure 4. Inadequate time for evaluation- delay 5. Breaches of confidentiality by TEC 	<ol style="list-style-type: none"> 1. Clarity in tender requirements 2. Unbiased evaluation criteria 3. Well-defined evaluation framework 4. Competent stakeholders' engagement 5. Strict compliance with PPR 2008, especially Rule 98.

3.1.9 Step 9: Approval

Risk Factors:	Reducing Risks:
<ol style="list-style-type: none">1. Evaluation report not processed for approval2. Delayed3. Rejected without explaining reasons	<ol style="list-style-type: none">1. Strict compliance of PPR 2008

3.1.10 Step 10: Issue Notification of Award (NoA)

Risk Factors:	Reducing Risks:
<ol style="list-style-type: none">1. Delayed2. Not as per format3. Unwillingness of the tenderer to accept the award	<ol style="list-style-type: none">1. Strict compliance of PPR 20082. NoA in the specified format

3.1.11 Step 11: Contract Signing

Risk Factors:	Risk Reduction:
<ol style="list-style-type: none">1. Signing delayed2. Tender validity period over3. Performance security not authentic	<ol style="list-style-type: none">1. Strict compliance of PPR 2008

3.1.12 Step 12: Warranty Clause (Warranty/ Defect Liability)

Risk Factors:	Reducing Risk
<ol style="list-style-type: none">1. Warranty clause not followed2. Collusion3. Vague	<ol style="list-style-type: none">1. Following Industrial norms2. Strict compliance with contract documents

Chapter 04

Choice of Procurement Methods: Limitations and Risk Factors

4.1 Introduction

Procurement Method is the Procedure used in converting requirements or requisitions into Contracts. Choosing procurement method is closely related to procurement planning. Procuring Entity must know the market condition, nature and size of the procurement.

4.2 Methods: Goods and Works

Methods of Procurement: Goods and Works					
OTM	OSTETM	TSTM	LTM	RFQM	DPM

4.3 Methods: Consultancy Services

Methods of Procurement: Consultancy Services							
QCBS	FBS	LCS	SSS	CSOS	ICS	SBCQ	DCS

4.4 Limitations and Risk factors of Procuring Methods

Procurement Method	Limitations & Risks
OTM	<ul style="list-style-type: none"> ▪ Not applicable for low budget procurement ▪ Not feasible for emergency purchase ▪ Not feasible for special nature / single sourced procurement
LTM	<ul style="list-style-type: none"> ▪ Tender is not possible exceeding the threshold limit. ▪ In normal situation (except disaster), this method is not normally used. ▪ Threshold: Maximum BDT 25 lac for Goods and maximum 3 crore for works.
DPM	<ul style="list-style-type: none"> ▪ Procurement from one source ▪ Not competitive & not transparent process ▪ Could encourage abuse or fraud ▪ Chance for favoring/ discriminating a supplier/ contractor.

OSTETM	<ul style="list-style-type: none"> ▪ Promising tenderers may be eliminated if technical offers are not evaluated properly. ▪ Tender will be ruined if specification is not properly addressed. ▪ Experts of related field needed for successful run of the tender.
TSTM	<ul style="list-style-type: none"> ▪ Not possible in advance to articulate/ assess complete technical specification. ▪ Procuring Entity (PE) lacks the capability to prepare specification. ▪ Alternative technical approach is not within the knowledge of PE.
QCBS	<ul style="list-style-type: none"> ▪ QCBS will not be appropriate for fixed or low budget procurement. ▪ Not applicable for non-professional service procurement.
FBS	<ul style="list-style-type: none"> ▪ Quality is ignored in this method ▪ It is not applicable highly complex nature projects ▪ It never addresses the cost of uncertainty.
LCS	<ul style="list-style-type: none"> ▪ Not applicable for complex nature of service ▪ Never crosses threshold limit (50 lac BDT) ▪ Never addresses the cost of uncertainty.
SSS	<ul style="list-style-type: none"> ▪ It is against competitive system ▪ It hinders the transparency of procurement ▪ Not applicable for large budget and complex nature of procurement.
CSOS	<ul style="list-style-type: none"> ▪ This is special type of procuring system which is only used to select NGOs or community service organizations. ▪ There may have scope of biasness on selection process.
ICS	<ul style="list-style-type: none"> ▪ Assignment duration should be less than 6 months. ▪ Applicable for urgent basis due to natural disaster. ▪ Personal biasness may arise.
SBCQ	<ul style="list-style-type: none"> ▪ Preparation of TOR is not so easy ▪ Scope of negotiation comparatively less. ▪ Not applicable for firm
DCS	<ul style="list-style-type: none"> ▪ Cost of procurement cannot be assessed previously ▪ No standard boundary of price for aesthetic beautification, technical excellence or innovations

Chapter 05

Procurement Risk at SPARRSO: Overview, Data Analysis and Findings

5.1 Introduction

SPARRSO is a statutory body under the ministry of Defense. It is governed by a Board of Management consisting of a chairman and four members appointed by the government. SPARRSO is a multi-disciplinary research organization established in 1980. It began its journey as a statutory body in 1992 under the Act 29 of 1991. SPARRSO conduct research work to assess the arable areas for food security planning, blue economy, identification of potential fishing zones in the sea and ground station management.

SPARRSO is continuing its research activities and future plans with a view to attain its mandate under the Sustainable Development Goals (SDG). In recent years, SPARRSO has procured research related goods like procurement of Server, image processing software, GIS processing software, equipment/ materials for research projects, satellite and tidal data for research, raw materials for Space Technology Research Lab etc.

5.2 Data Analysis

Though SPARRSO has been started its journey from early eighty's, a speculation on procurement of this organization has been given here for recent 6 years (from FY 2017-18 to FY 2022-23).

Table 02: SPARRSO Budget allocation, APP and Expenditure for last 6 years

FY	Budget Allocation	Budget Expenditure	Unspent Budget	Budget Exp (%)	APP (Amount)	APP Expenditure	APP Exp (%)
2017-18	180428000	119377197	61050803	66.16	51526000	1123786	2.18
2018-19	178325000	158368025	18506975	88.81	40440000	11280653	27.80
2019-20	171112000	135876769	35235231	79.41	50998000	5443985	10.67
2020-21	189050000	181683699	7366301	96.10	12151000	11055455	90.98
2021-22	192600000	154615229	37984771	80.27	31036000	23041390	74.24
2022-23	179857000	163485370	16371630	90.89	35816000	32742929	91.41
2023-24	208500000	---	---	---	50450000	---	

Figure 06: SPARRSO Budget Allocation vs Expenditure

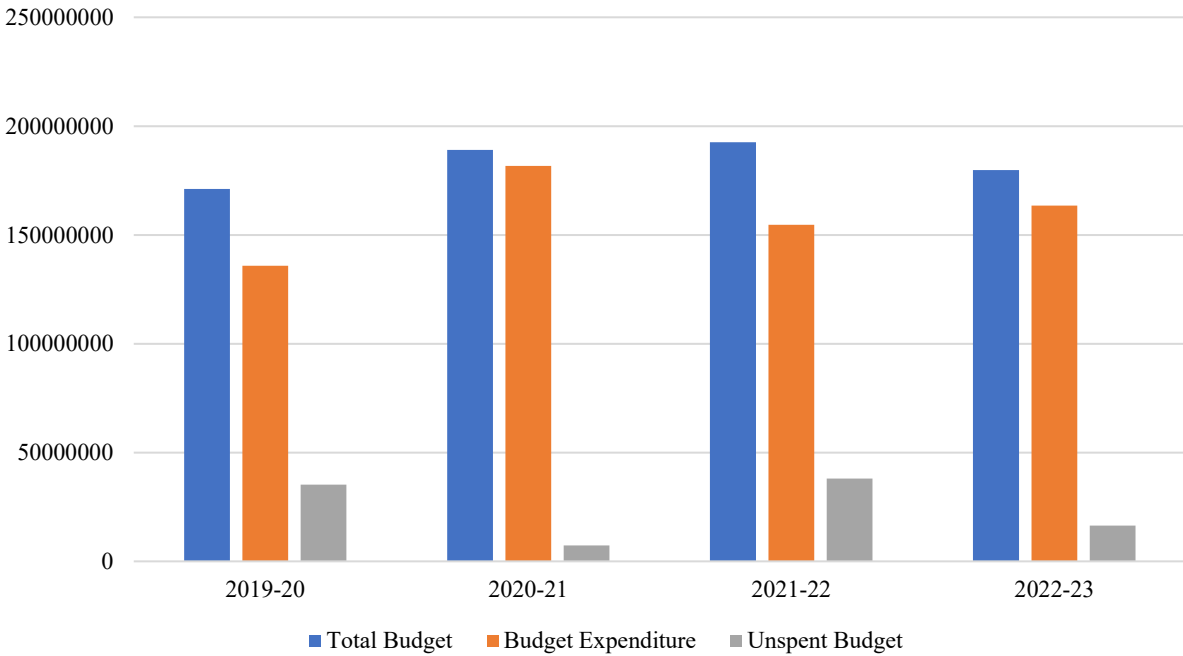


Figure 07: SPARRSO Budget, APP Budget & APP Expenditure (Procurement).

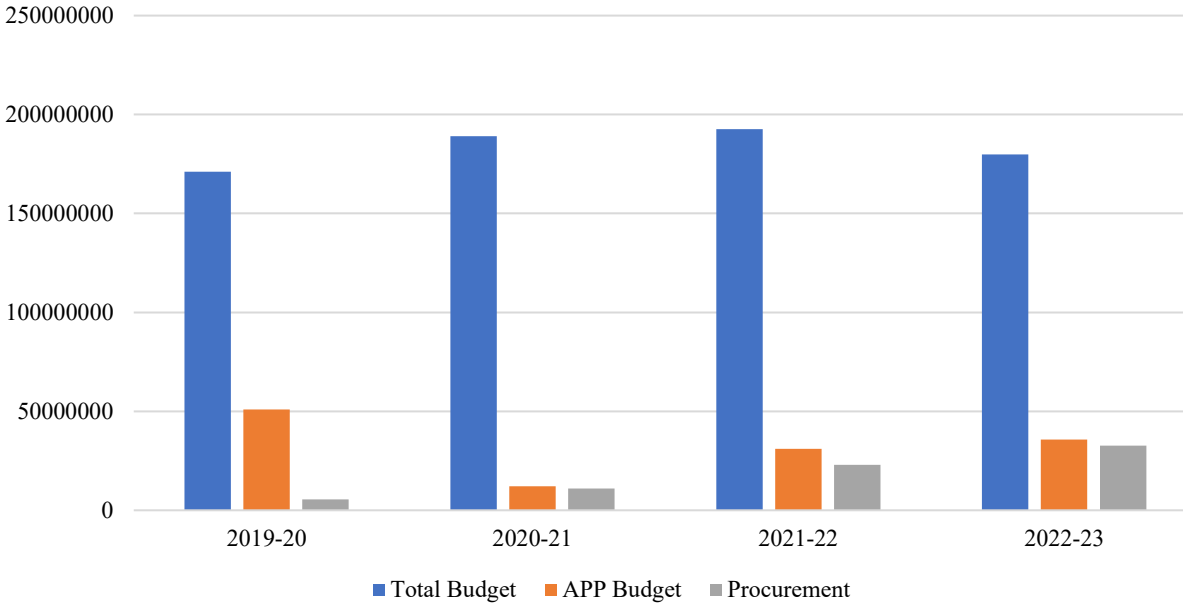
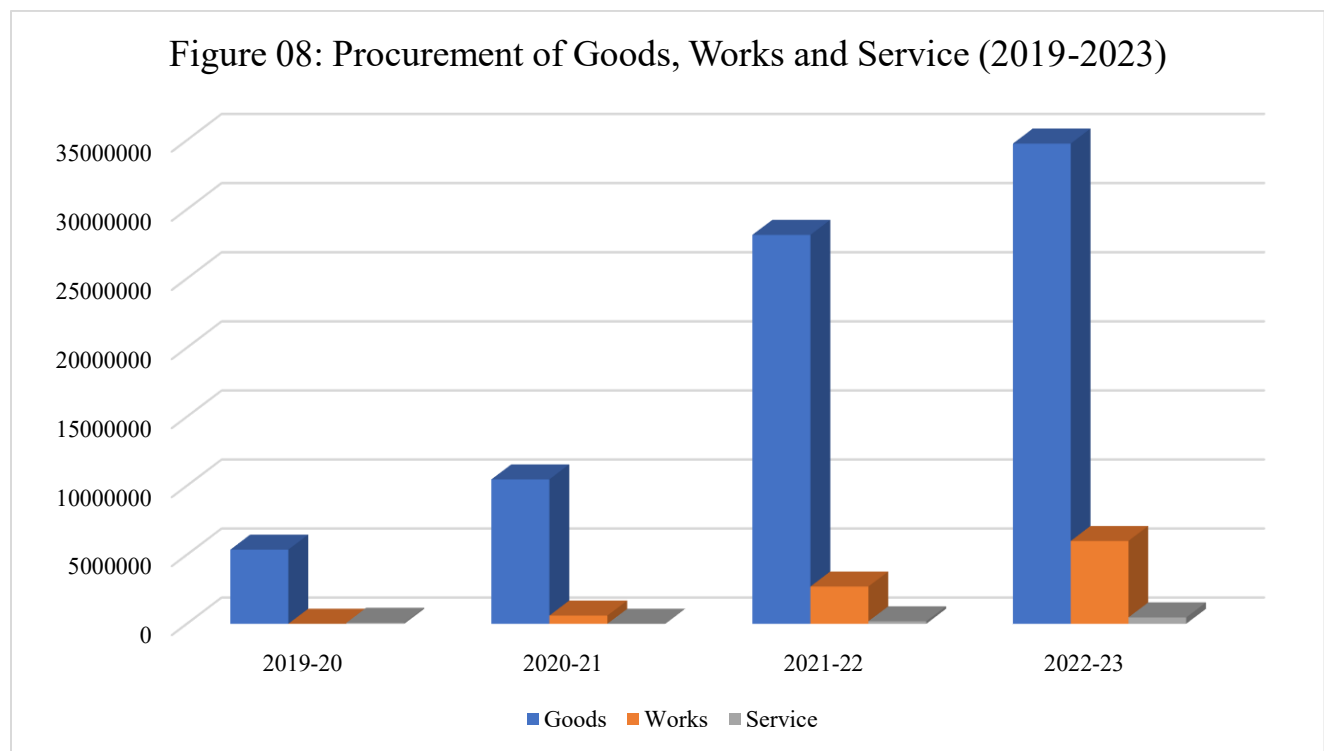


Table 03: APP Budget Distribution for last 6 Financial Years

FY	APP Budget	Goods Procurement		Works Procurement		Service Procurement		eGp		Re Tender /Tender Rejected
		No.	Amount (BDT)	No.	Amount (BDT)	No.	Amount (BDT)	No .	Amount (BDT)	
2017-18	51526000	05	767524	02	356262	01	450000	---	---	01 (Rejected)
2018-19	40440000	16	11280653	---	---	---	---	04	5241598	01 (Retender)
2019-20	50998000	13	5372985	---	---	01	71000	---	---	---
2020-21	12151000	17	10461625	01	593830	---	---	---	---	---
2021-22	31036000	17	28156000	05	2700000	02	180000	03	12800000	---
2022-23	33816000	20	34756000	06	6000000	02	460000	02	1200000	01 (Retender)

Figure 08: Procurement of Goods, Works and Service (2019-2023)



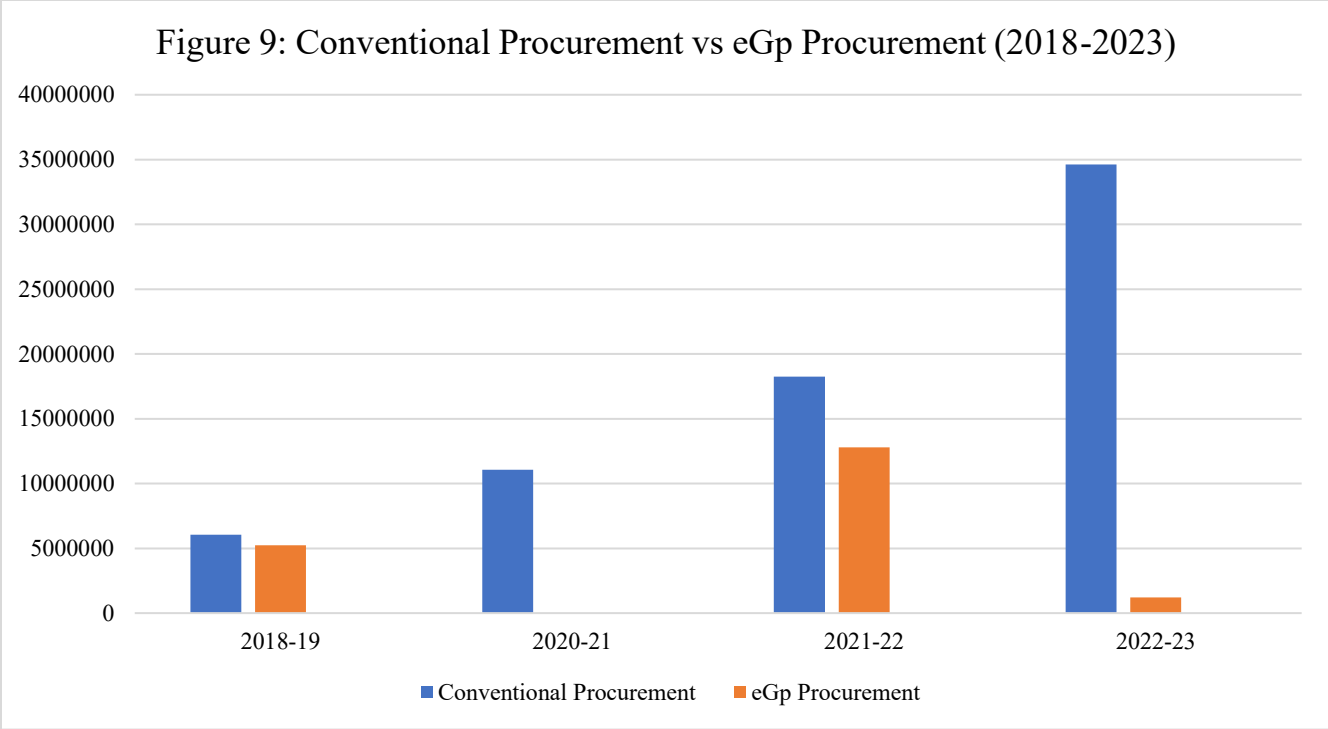
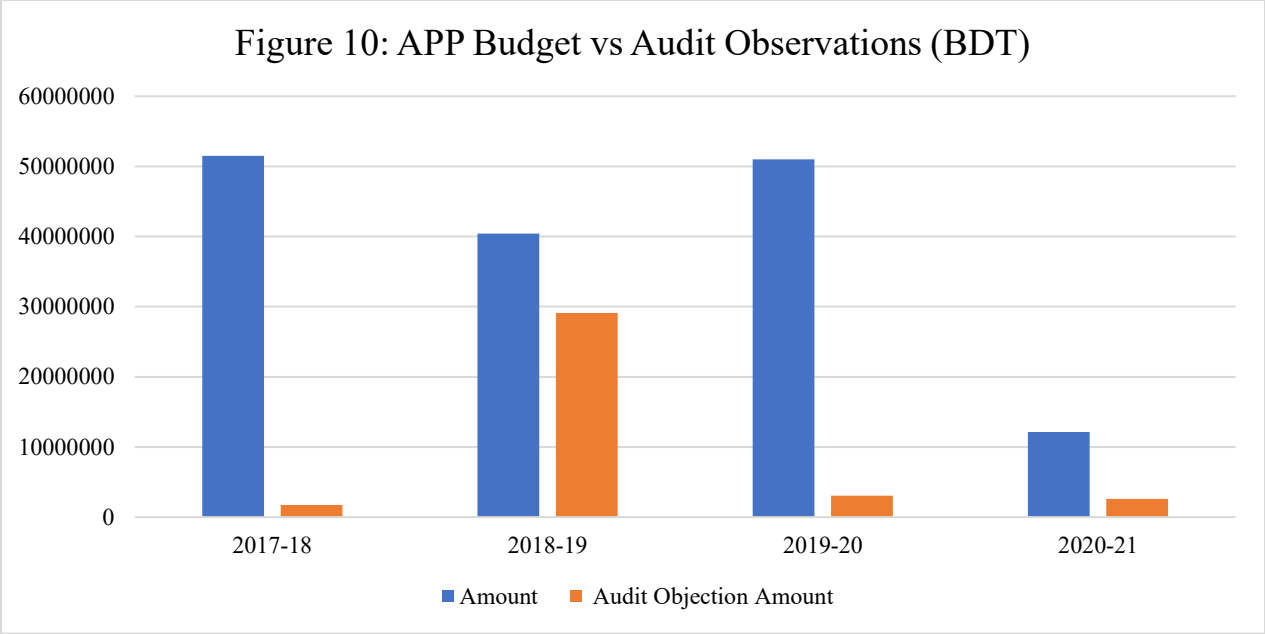


Table 04: Audit Observations on Procurement

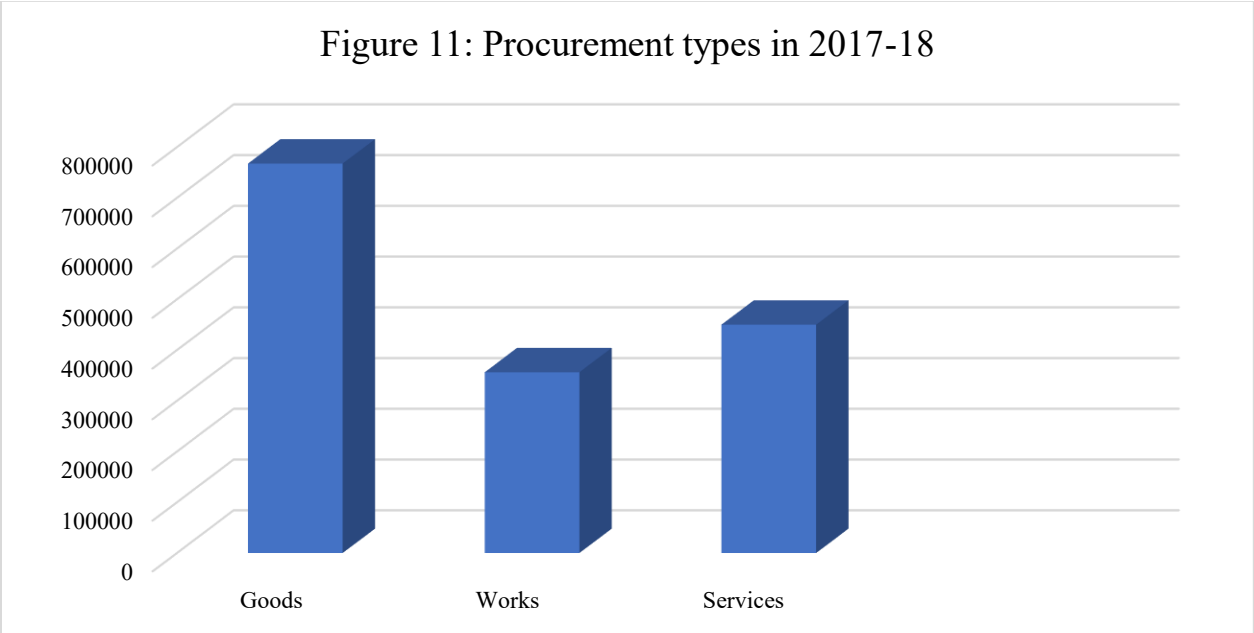
FY	APP Budget	Audit Objection		
		No.	Amount	Reason
2013-2017 (04 years)		---	---	No objection, because no audit take place
2017-18	51526000	01	1723696	No Vat reduction on Car Purchase
2018-19	40440000	01	29122837	Transferred issues on PWD
2019-20	50998000	02	3060542	Procedural mistake
2020-21	12151000	---	2623337	Violation of PPR for RFQ

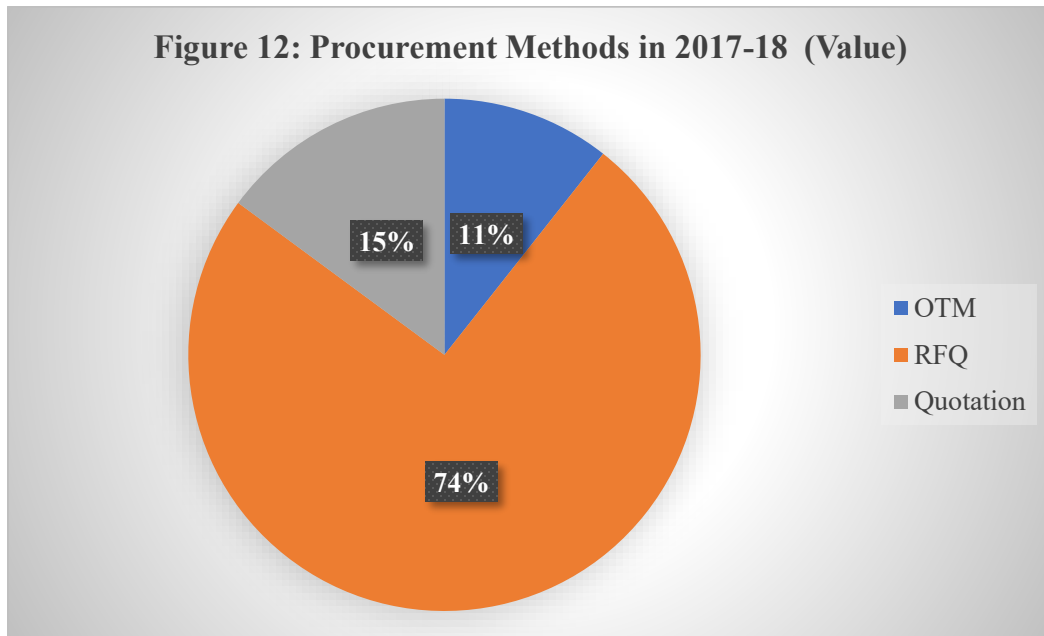


5.3 Procurement Risk Analysis on the basis of Fiscal Year

Procurement of 2017-18

Major procurements are research materials like Forest measuring instruments, photo lab materials & accessories, supply and installation of ERP software; stationary and furniture items; Renovation of lab, substation and switch gear servicing etc.





Procurement of 2018-19:

Major procurements are research materials like equipment & parts of ground station, photo lab materials, graphics work station; car purchase, supply and installation of VCB, electric control of electric substation, supply of computer and accessories & digital display board, furniture and stationary items etc.

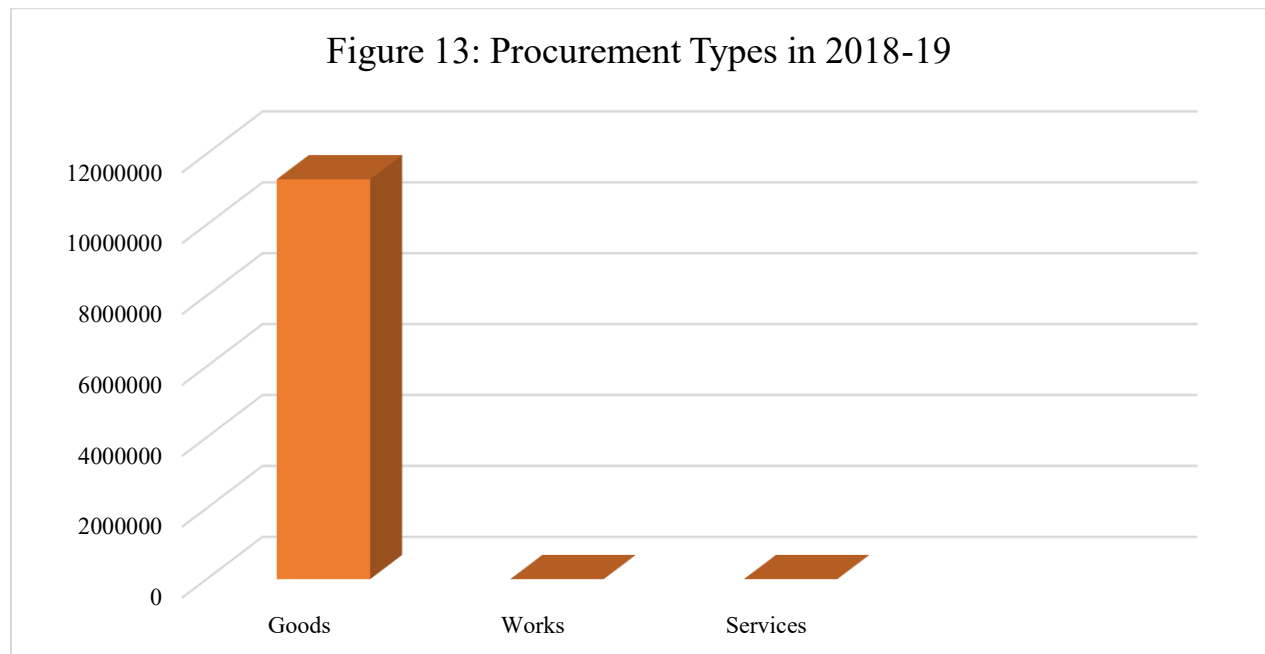
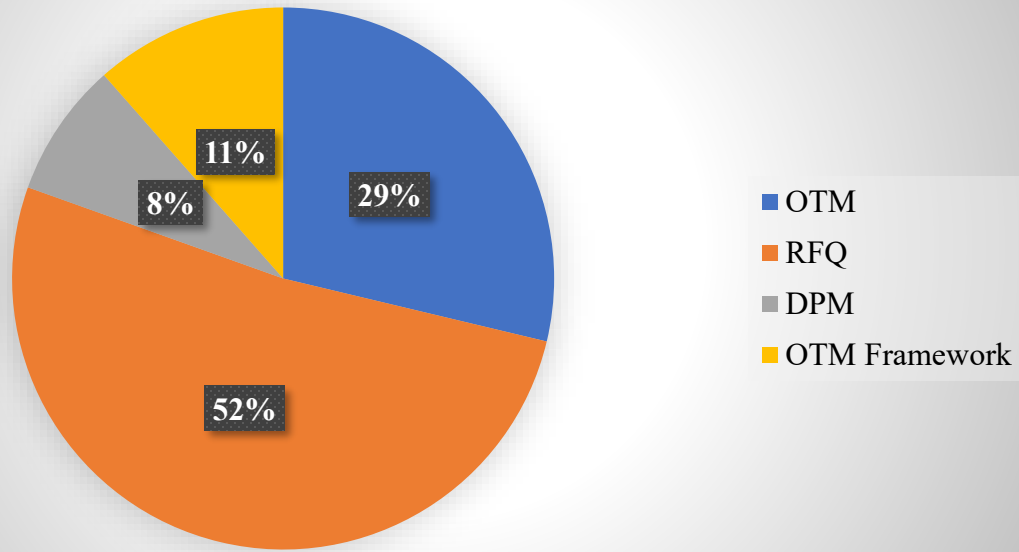


Figure 14: Procurement Methods in 2018-19 (Value)



Procurement of 2019-20:

Major procurements are research materials like supply of image processing software, software procurement for networking system development, stationary items and electric works etc.

Figure 15: Procurement Types in 2019-20

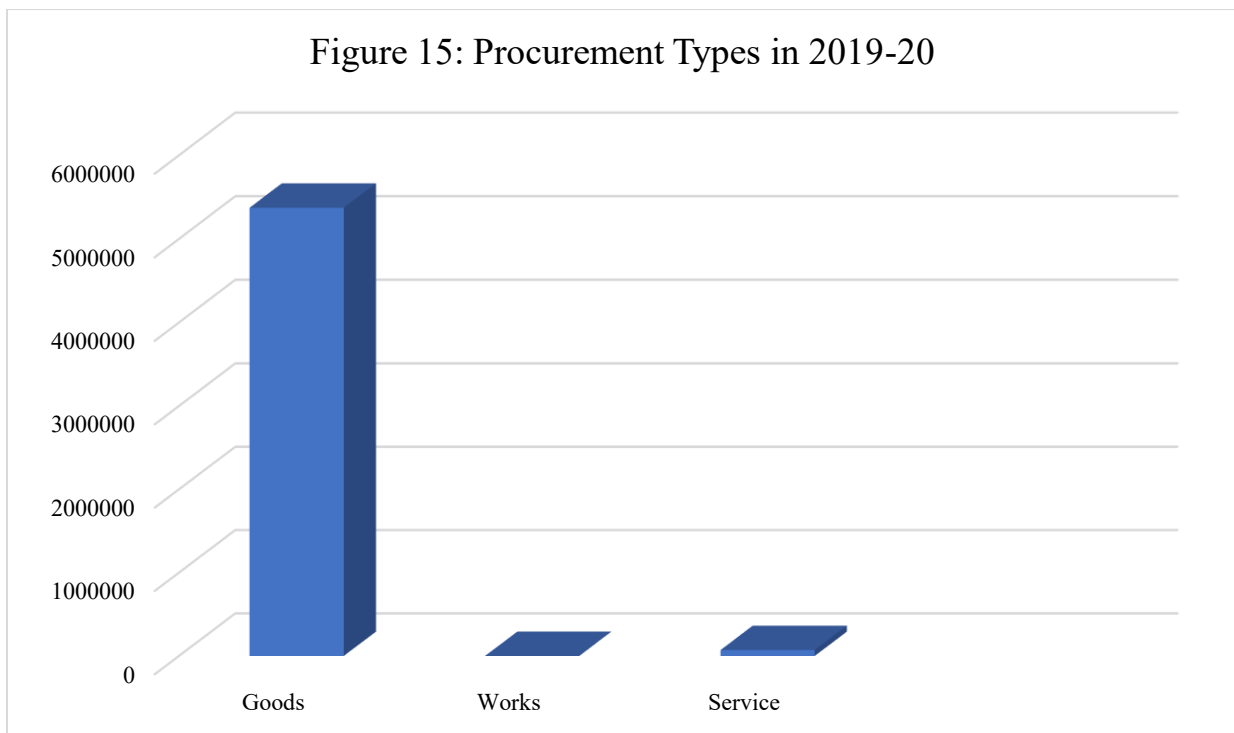
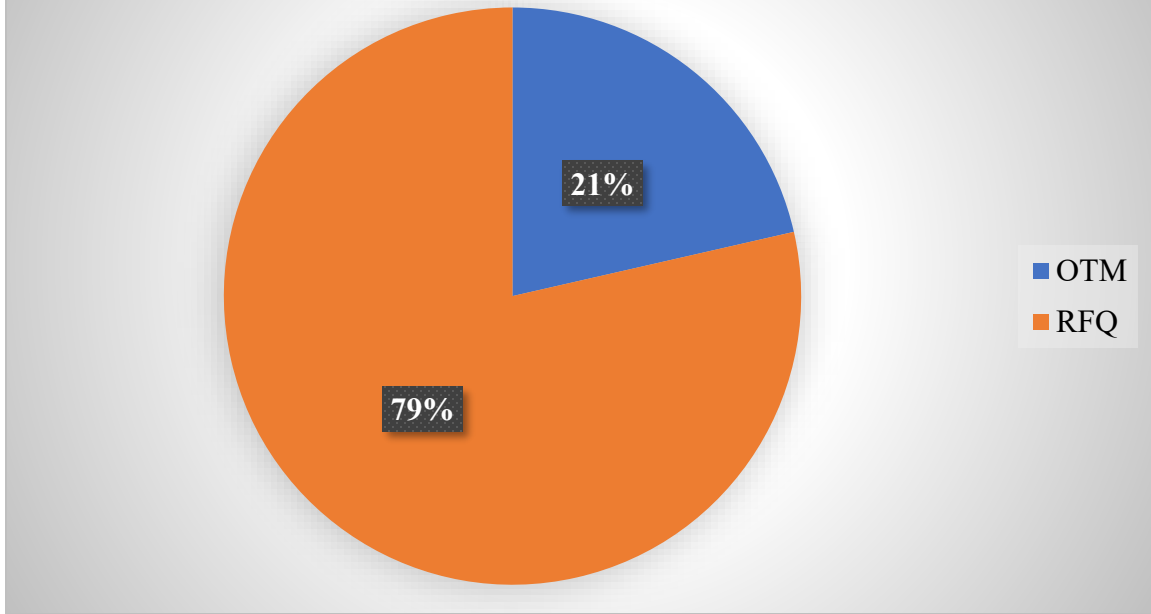


Figure 16: Procurement Methods in 2019-20 (Value)



Procurement of 2020-21:

Major procurements are research materials like procurement of computer software, equipment and network items; interior designing, stationary and furniture items etc.

Figure 17: Procurement Types in 2020-21

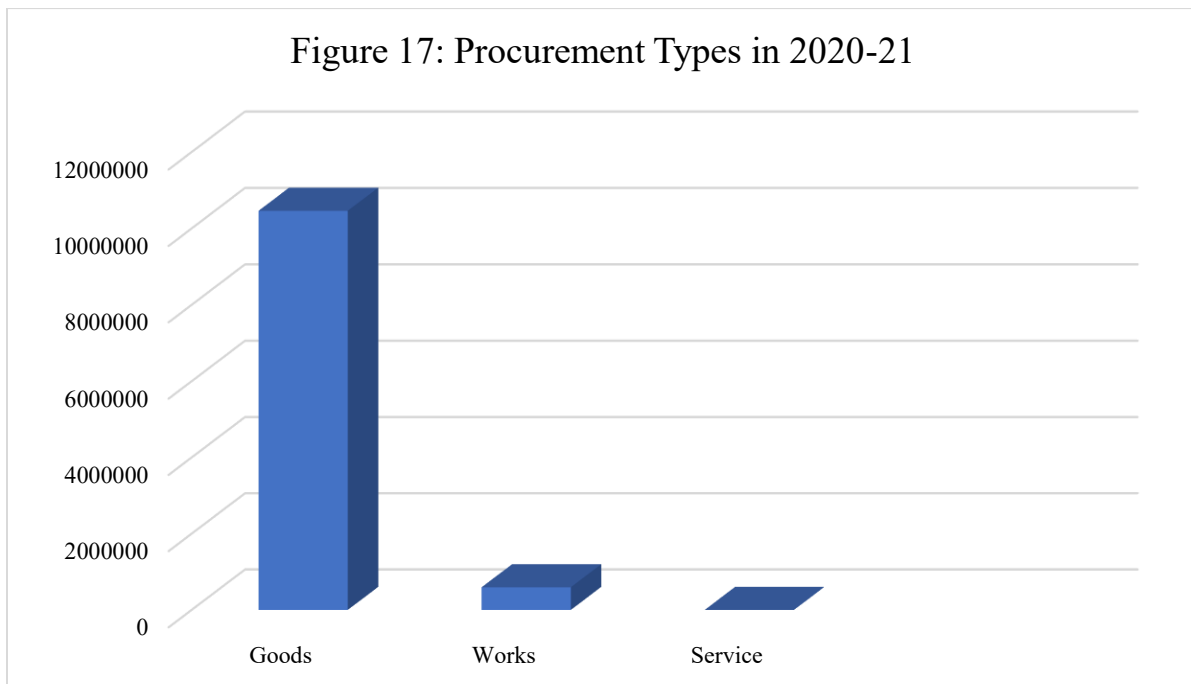
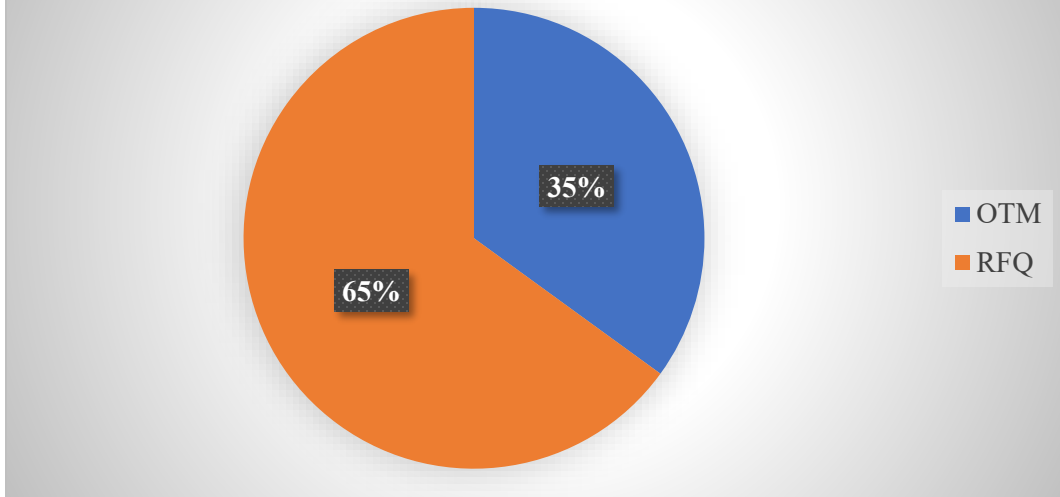


Figure 18: Procurement Methods in 2020-21 (Value)



Procurement of 2021-22:

Major procurements are research materials, image processing software, GIS processing software, procurement of internet service, office management software, renovation of board room, renovation of lab, stationary and furniture procurement etc.

Figure 19: Procurement Types in 2021-22

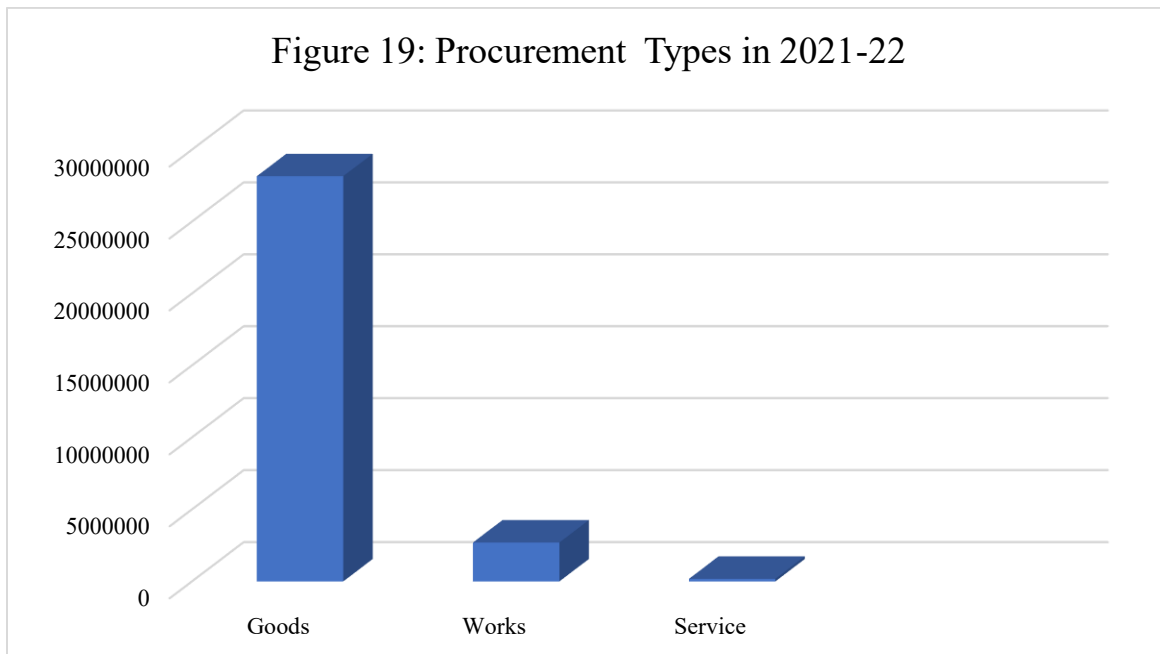
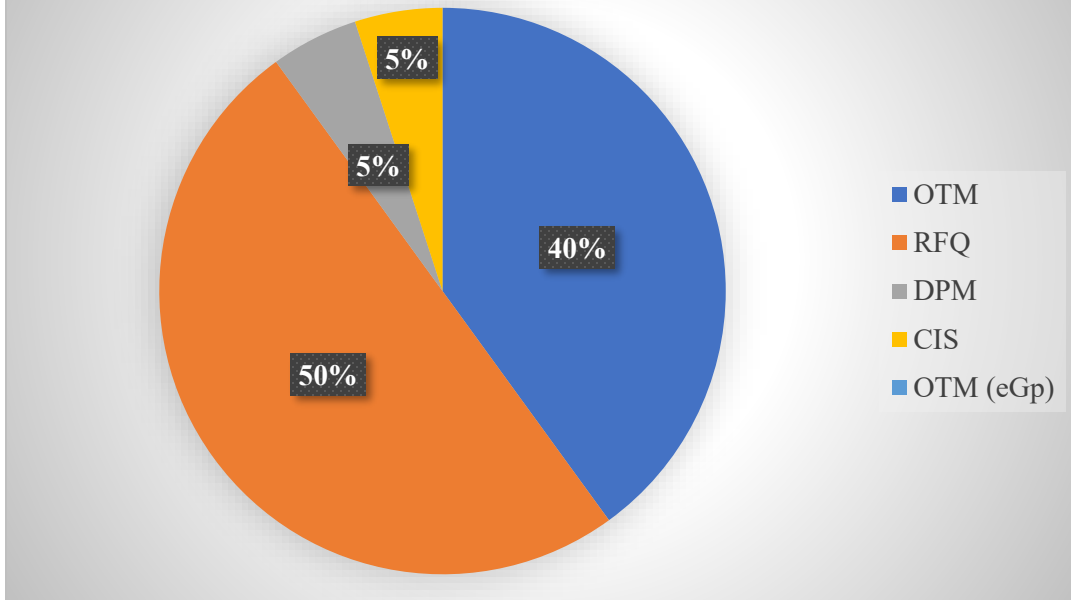


Figure 20: Procurement Methods in 2021-22 (Value)



Procurement of 2022-23:

Major procurements are research materials like procurement of ArcGIS Desktop software, IMAGINE ATCOR software, COMSOL Multiphysics software, procurement of instrument for STRL lab, electric materials, stationary & hygiene materials etc.

Figure 21: Procurement Types in 2022-23

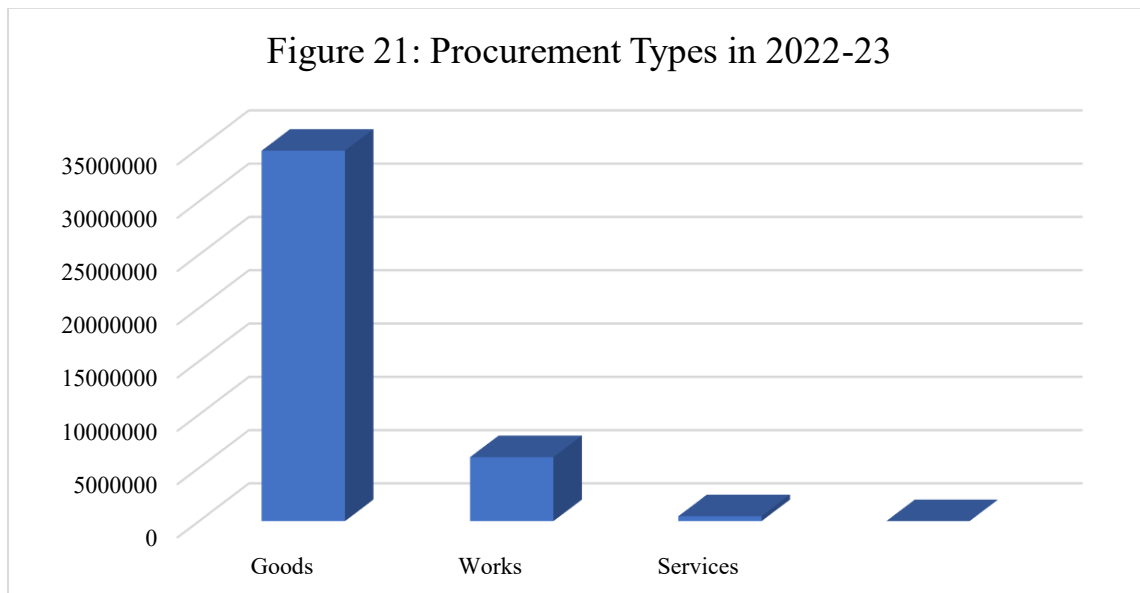


Figure 22: Procurement Methods in 2022-23 (Value)

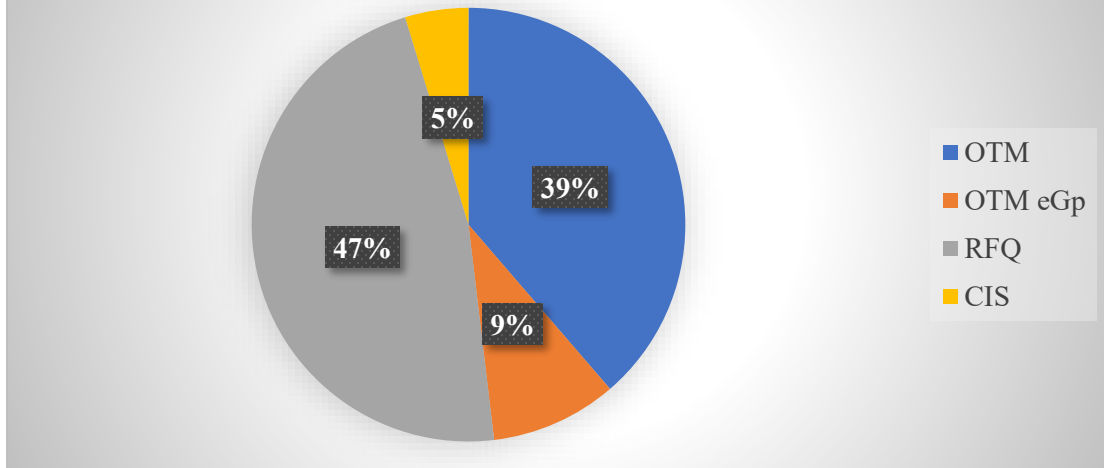
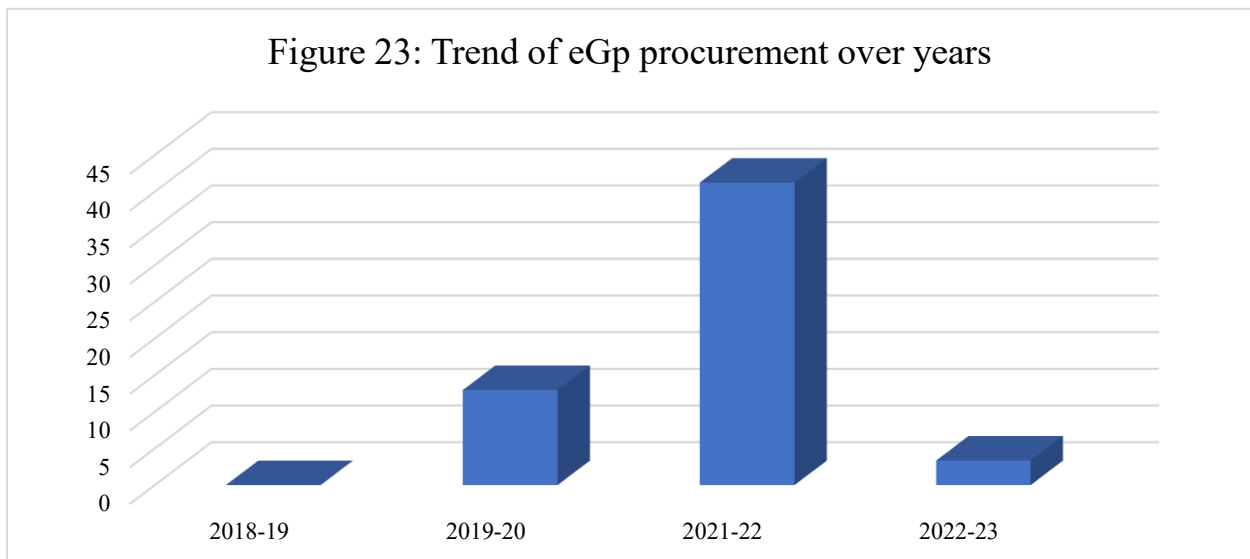


Table 05: State of eGp procurement at SPARRSO

FY	Total procurement amount (BDT)	Procurement through eGp (BDT)	Percentage of eGp procurement
2017-18	51526000	0	0
2018-19	40440000	5241598	12.96
2019-20	50998000	0	0
2020-21	12151000	0	0
2021-22	31036000	12800000	41.24
2022-23	35816000	1200000	3.35

Figure 23: Trend of eGp procurement over years



5.4 Findings from Data Analysis

- 01:** Yearly Budget allocation of SPARRSO in recent years (from 2017-18 to 2022-23) is around BDT 17 to 20 crore. APP budget is around 20% of the yearly total budget. The average expenditure is 83% of the total budget. However, the trend of APP budget expenditure is increasing.
- 02:** SPARRSO mainly procure Goods. Procurement of works and service is negligible as compared to Goods procurement. Goods are generally procured around 80% of total procurement.
- 03:** SPARRSO is lagging behind the eGp procurement. Most of the procurement is carried by conventional system.
- 04:** There were no Audit observations from 2013 to 2017, because no audit has been taken place on that period. In 2018-19, there was huge amount of audit observations/objections raised. Audit observation indicates the violation of procurement rules or the bad management of procurement.
- 05:** It is observed that, in 2017-18, around 74% procurement was run by RFQ methods, whereas only 11% procurement was carried out by OTM. RFQ has a limit of use. It is seen that the limit of RFQ ceiling has crossed that fiscal year.
- 06:** For the competitive, transparent and open tendering, OTM should always be preferential method. RFQ is an emergency method where procurement need to be within short time to meet the emergency demand.
- 07:** In FY 2019-20, all the procurement is for Goods purchase except one service procurement of only 71000 BDT. There is no Works procurement. Around 80% procurement done by RFQ, whereas 21% OTM procurement. It indicates the lack of harmonization in procurement. Most preferred method OTM is neglected.
- 08:** In 2020-21 FY, it has been found that, RFQ is 65%, whereas preferred method OTM is only 35%. Most procurement has performed for goods purchase, whereas a small portion was for Works and tiny number was for service procurement.
- 09:** In 2021-22 FY, it is observed that, 50% procurement done by RFQ, 40% by OTM, 5% by CIS and 5% by DPM. CIS & DPM is not commonly used method, and these are not as competitive and transparent like OTM. However, the trend is that OTM is increasing gradually by decreasing the RFQ methods in recent years.
- 10:** In 2022-23 FY, OTM and RFQ methods are 39% and 47% respectively. Goods are purchased a large amount. Works procurement is around 1/6 as compared to Goods procurement.
- 11:** The eGp procurement is not up to the mark in SPARRSO. Out of recent 6 years (2017-2023), SPARRSO was out of eGp for 3 fiscal years. Except in 2021-22, eGp condition are very poor

Chapter 06

Challenges of Procurement in SPARRSO

1. **Need Assessment:** If need assessment is not properly done, overassessment or under assessment results mismanagement of procurement. SPARRSO's need assessment is not properly done in some FY, as a consequence APP budget expenditure is not satisfactory.
2. **Preparation of APP:** APP is prepared according to the budget and needs of the organization. If budget is insufficient, needs to be prioritized and APP has to prepare accordingly.
3. **Choice of Procurement Methods:** SPARRSO usually apply OTM, RFQ, DPM, ICS, SSS etc. methods for procurement. This organization usually procure Goods. Here RFQ is the most dominating method, even from OTM. RFQ should be less than OTM. If other methods have to be used except OTM, there should be particular logic to use that methods.
4. **Committee formation:** According to PPR 2008 (Rule 7,8,16 &52), SPARRSO has formed OCEC, TOC/POC, TEC/PEC, TSC, and TIAC committees, but SPARRSO has not formed Enlistment Committee.
5. **Preparing Official Cost Estimate (OCE):** OCEC prepares official cost estimates. The risk area is that OCEC sometimes doesn't count overhead cost or vat /tax or estimate market price properly. As a result, retender takes place.
6. **Preparation of Specification/ TOR:** Specification Committee sometimes do not aware of the user demand as well as the product availability of the desired specification in the market. Most of the tender fall in risk due to improper specification by Specification Committee and under/ overestimate of price by OCEC.
7. **Preparation of Tender Document (TD):** TD has to prepare by PE before advertisement published in the newspaper. Particular Condition of Contract (PCC) should be properly and clearly declared in TD according to General Condition of Contract (GCC).
8. **Advertisement / Invitation for Tender (IFT):** For OTM (National) tendering Advertisement /IFT has to published in two highly circulated Daily Newspaper(One Bangla and one English Newspaper). Risk area is that, sometimes advertisement was published less circulated dailies or published in one newspaper.
9. **Addendum / Corrigendum:** Corrigendum is mainly given if any correction is needed in the advertisement alluded before. Addendum is given when more extra information or terms needed to add in the advertisement. SPARRSO can publish addendum/ corrigendum to reduce risk in procurement.
10. **Tender Submission:** Tender should be submitted on or before the deadline of submission. No tender after the deadline is accepted.

11. Tender Security (TS): Tender security is mandatory to add with the Tender. Without Tender security no tender will be accepted. Tender Security is usually given in the form of Bank Draft or Pay Order. No Cheque is accepted as TS.

12. Tender Opening: Tender opening should be within one hour from the time of tender dropping deadline in case of single dropping. For multiple dropping, the time is three hours from the tender dropping deadline.

13. Evaluation of Tender: Main stages of evaluation are

- a) Preliminary Examination
- b) Technical Examination and responsiveness
- c) Financial Evaluation
- d) Negotiation if necessary
- e) Post qualification

Risk factors are all stages of evaluation are not sequentially maintained all time. Evaluation Committee is responsible for Negotiation. EC will send recommendation to Approving Authority (AA) for Approval of Tender.

14. Tender Approval: AA is authorized for approving the tender. Considering the recommendation of TEC, AA may-

- 1) Approve the recommendation
- 2) Seek any clarification from the TEC/PE.

Risk factor is that, AA sometimes reject the TEC/PEC without explanation.

15. Checking the Black Listed Tenderers on BPPA website: During evaluation, the bidding tenderers should check in Bangladesh Public Procurement BPPA website whether they are blacklisted or not. This was not previously done

16. Issue Notification of Award (NoA): PE has to issue NoA within 7 working days of receipt of Approval of Award by AA. NoA will be issued if no complaint or appeal pending or being pursued.

17. Acceptance of NoA: After Approval, NoA has to be accepted by the Supplier/ Contractor/ Consultants within 7 working days from the date of issuance of NoA.

18. Signing of Contract: Contract is a big area of risk. Contract terms should be explicit and self-explanatory. Implicit terms often may make confusion between buyer and supplier and become reason for dispute. Use of proper Standard Tender Document (STD) is important in Contract signing.

Chapter 07

Recommendations for Procurement Risk Mitigation

Reducing procurement risks at SPARRSO (Bangladesh Space Research and Remote Sensing Organization) requires a strategic approach to mitigate potential challenges and ensure smooth operations. Here are some recommendations:

1. **Supplier Diversification:** Relying on a single supplier for critical components or services can expose SPARRSO to significant risks. Implement a supplier diversification strategy to spread risks across multiple suppliers. This approach can help mitigate disruptions caused by supplier bankruptcy, quality issues, or geopolitical events.
2. **Supplier Evaluation and Qualification:** Develop a robust supplier evaluation and qualification process to assess the financial stability, technical capabilities, and adherence to quality standards of potential suppliers. Conduct regular audits and performance reviews to ensure compliance with contractual requirements.
3. **Contractual Agreements:** Draft comprehensive contractual agreements that clearly outline the rights, responsibilities, and expectations of both SPARRSO and its suppliers. Include provisions for dispute resolution, delivery schedules, quality standards, and penalties for non-compliance. Legal review of contracts is essential to ensure enforceability and protection of SPARRSO's interests.
4. **Supply Chain Transparency:** Gain visibility into the entire supply chain to identify potential vulnerabilities and dependencies. Collaborate closely with suppliers to understand their sub-tier suppliers and assess their resilience to risks such as natural disasters, political instability, or supply shortages.
5. **Risk Monitoring and Management:** Implement a risk management framework to identify, assess, and mitigate procurement risks proactively. Establish key performance indicators (KPIs) to monitor supplier performance, delivery times, quality issues, and cost fluctuations. Develop contingency plans to address potential disruptions and minimize their impact on SPARRSO's operations.
6. **Technology Adoption:** Leverage technology solutions such as procurement software, supply chain analytics, and electronic sourcing platforms to streamline procurement processes, enhance transparency, and improve decision-making. Automation can reduce manual errors, improve efficiency, and provide real-time insights into procurement activities.
7. **Training and Capacity Building:** SPARRSO should invest in more training programs to enhance the procurement team's skills and capabilities in risk management, negotiation and contract management.
8. **Collaboration and Knowledge Sharing:** Foster collaboration with other space agencies, industry partners, and relevant stakeholders to share best practices, lessons learned, and emerging trends in procurement risk management.
9. **Ensure Sustainable Procurement:** SPARRSO should integrate sustainability criteria into its procurement processes to promote environmental responsibility, social equity, and economic viability through reducing carbon emissions, promoting diversity and inclusion, and adopting eco-friendly manufacturing practices.

- 10. Ensure Value for Money:** To mitigate risks in procurement, it's essential to adopt practices that prioritize economy, efficiency, and effectiveness within the procurement system. Economy (getting the best price), focusing on efficiency (doing things rightly), and emphasizing effectiveness (doing the things right) combindly ensure value for money.
- 11. Collaboration of Innovation and Sustainability:** Collaborate with suppliers to identify opportunities for innovation and sustainability improvements throughout the supply chain, such as reducing waste, minimizing energy consumption, and sourcing ethically produced materials.
- 12. Most Economically Advantageous Tender (MEAT):** Adopt a MEAT approach in procurement evaluations, which goes beyond simply selecting the lowest-priced tender and considers other factors such as quality, innovation, and lifecycle costs.
- 13. Applying Dispute Resolution Techniques:** Establish effective dispute resolution mechanisms, structured negotiation processes to resolve disputes amicably and avoid costly litigation.
- 14. Always Follow STD (Standard Tender Documents):** Ensure strict adherence to standard Tender Documents (STD) and procurement guidelines, including document templates, approval workflows, and reporting procedures, to minimize errors and ensure uniformity across procurement processes.
- 15. Monitoring Control and Compliances:** Implement robust controls and oversight mechanisms to monitor compliance with STD, conduct periodic audits, and address any deviations or non-compliance promptly to mitigate risks and maintain integrity in procurement operations.
- 16. Recruitment of Procurement Specialists:** Invest in recruiting and retaining qualified procurement specialists with expertise in relevant field of technical knowledge and proficiency in procurement best practices and regulations.

By implementing these recommendations, SPARRSO can strengthen its procurement processes, reduce risks, and enhance its resilience to external disruptions, ultimately supporting its mission of advancing space research and remote sensing capabilities in Bangladesh.

Chapter 08 **Conclusion**

Procurement risks at SPARRSO pose significant challenges that can hinder procurement success and efficiency. These risks may include delays of product delivery, cost overruns, quality issues, and potential corruption or unethical practices. However, SPARRSO has implemented a robust mitigation approach to address these risks effectively.

SPARRSO has established stringent procurement policies and procedures to ensure transparency, fairness, and accountability in the procurement process. This includes thorough vendor selection criteria, competitive bidding processes, and regular audits to detect and prevent any irregularities. SPARRSO emphasizes capacity building within its procurement department to enhance expertise and knowledge in risk management. This includes providing training on procurement best practices, contract management, and compliance with relevant regulations. SPARRSO already has started a capacity building project by which an inclusive action plan will be formulated.

Furthermore, SPARRSO actively engages with suppliers and stakeholders to foster strong relationships and communication channels. This collaborative approach helps mitigate risks by addressing issues proactively and resolving conflicts efficiently. Additionally, SPARRSO leverages technology solutions such as e-procurement systems to streamline processes, improve efficiency, and reduce the likelihood of errors or fraud.

Overall, SPARRSO's proactive approach to risk management in procurement, including robust policies, capacity building, stakeholder engagement, and technological advancements, helps mitigate potential risks effectively, ensuring the successful execution of its procurement process.

References

- [1] A. URGESA, “Assessment Of Purchasing Practice And Its Challenges In The Case Of Ethiopian Construction Works Corporation.” st. mary’s University, 2019.
- [2] E. N. Wambui, “Role of procurement on organization performance; a survey study of public secondary schools in Imenti North District, Kenya,” *Int. J. Soc. Sci. Entrep.*, vol. 1, no. 3, pp. 289–302, 2013.
- [3] J. Raymond, “Benchmarking in public procurement,” *Benchmarking An Int. J.*, vol. 15, no. 6, pp. 782–793, 2008.
- [4] Government of Bangladesh, *Public Procurement Act 2006*. Dhaka, 2006.
- [5] Government of Bangladesh, *Public Procurement Rules 2008*. 2008.
- [6] D. Cleden, *Managing project uncertainty*. Routledge, 2017.
- [7] Economic Relations Division, “Steps in Procurement Cycle Risk Factors,” 2015. [Online]. Available:
[https://erd.portal.gov.bd/sites/default/files/files/erd.portal.gov.bd/page/030349ec_5223_4253_aa57_58ecc3aacd4a/Steps in Procurement Cycle.pdf](https://erd.portal.gov.bd/sites/default/files/files/erd.portal.gov.bd/page/030349ec_5223_4253_aa57_58ecc3aacd4a/Steps%20in%20Procurement%20Cycle.pdf)
- [8] Asian Development Bank, “Bangladesh: South Asia Subregional Economic Cooperation Dhaka–Northwest Corridor Road Project, Phase 2,” 2019.
- [9] Government of Bangladesh, “Bangladesh Space Research and Remote Sensing Organization (SPARRSO).” Accessed: Apr. 20, 2024. [Online]. Available: sparrso.gov.bd
- [10] S. M. Aminuzzaman, *Introduction to Social Research*. Bangladesh Publishers, 1991. [Online]. Available: <https://books.google.com.bd/books?id=ptzltwAACAAJ>
- [11] S. Curkovic, T. Scannell, and B. Wagner, “ISO 31000:2009 Enterprise and Supply Chain Risk Management: A Longitudinal Study,” *Am. J. Ind. Bus. Manag.*, vol. 03, pp. 614–630, Jan. 2013, doi: 10.4236/ajibm.2013.37072.
- [12] Institute of Risk Management, “Risk Management.” Accessed: Apr. 20, 2024. [Online]. Available: <https://www.theirm.org/>
- [13] J. Hull, *Risk management and financial institutions, + Web Site*, vol. 733. John Wiley & Sons, 2012.
- [14] M. Crouhy, D. Galai, and R. Mark, *The essentials of risk management*, vol. 1. McGraw-Hill New York, 2006.
- [15] F. Muharam, “Assessing Risk for Strategy Formulation in Steel Industry through Real Option Analysis,” *Procedia - Soc. Behav. Sci.*, vol. 24, pp. 991–1002, Dec. 2011, doi: 10.1016/j.sbspro.2011.09.080.
- [16] Bangladesh Public Procurement Authority, *Standard Tender Documents (STD)*. Dhaka, 2024. [Online]. Available: <https://cptu.gov.bd/standard-documents/standard-tender-document.html>
- [17] B. Purvis, Y. Mao, and D. Robinson, “Three pillars of sustainability: in search of conceptual origins,” *Sustain. Sci.*, vol. 14, no. 3, pp. 681–695, 2019, doi: 10.1007/s11625-018-0627-5.
- [18] M. Arslan and H. Kisacik, “The Corporate Sustainability Solution: Triple Bottom Line,” *Muhasebe ve Finans. Derg.*, pp. 18–34, Jul. 2017, doi: 10.25095/mufad.402214.
- [19] F. J. Aguilar, “Scanning the business environment,” (*No Title*), 1967.
- [20] P. Kraljic, “HBR,” *Harv. Bus. Rev.*, 1983.