सत्यमेव जयते

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Report of the Comptroller and Auditor General of India for the year ended March 2021

लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

Union Government
Scientific and Environmental Ministries/Departments
Report No. 21 of 2022
(Compliance Audit)

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Preface

This report of the Comptroller and Auditor General of India for the year ended March 2021 has been prepared for submission to the President under Article 151 of the Constitution of India. The report contains the results of compliance audit of the Scientific and Environmental Ministries/Departments of the Union Government, their attached/subordinate offices, Autonomous Bodies and Central Public Sector Enterprises.

The instances mentioned in this report are those which came to notice in the course of test audit for the period 2019-2021 as well as those which came to notice in earlier years but could not be reported in the previous Audit Reports. Matters relating to the period subsequent to 2019-21 have also been included, wherever necessary.

The audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Overview

This report of the Comptroller and Auditor General of India (C&AG) relates to matters arising from compliance audit of the transactions of eight[1] Scientific and Environmental Ministries/Departments of the Government of India as well as of autonomous bodies and Central Public Sector Enterprises under them. The report contains 11 paragraphs relating to environmental issues, weaknesses in procurement and contract management, inefficient project management, irregular financial benefits extended to employees and deficient internal controls. An overview of the main audit findings included in this report is given below.

Management of fabrication activities at Vikram Sarabhai Space Centre

Vikram Sarabhai Space Centre (VSSC) executed contracts for fabrication of structures for its various launch vehicle programmes without ensuring due diligence and strict compliance to the provisions of the Department of Space Purchase Manual. There were cases of single tender contracts continuing for prolonged periods of time, idling of infrastructure created, irregular expenditure in facility augmentation, deviations from codal provisions, as well as poor contract management.

(Page 10, Paragraph 2.1)

Avoidable Investment of ₹ 28.09 crore

VSSC invested for the establishment of a Pure Grade Sodium Chlorate Crystals Manufacturing plant at Travancore Cochin Chemicals Limited (TCC) for ₹ 28.09 crore. The investment was avoidable since alternate suppliers were available in the market. Despite the investment in TCC, VSSC procured these crystals from TCC at higher than market rate, resulting in avoidable excess payment of ₹ 3.23 crore.

(Page 29, Paragraph 2.2)

Avoidable payment of Taxes and Duties of ₹ 69.02 lakh

Due to incorrect classification, VSSC incurred an avoidable payment of safeguard duty ₹ 26.37 lakh in the import of launch vehicle consumables. Further, VSSC also made an irregular payment of IGST amounting ₹ 42.65 lakh on the import of DC converters.

(Page 31, Paragraph 2.3)

[1] 1. Department of Atomic Energy (DAE), 2. Ministry of Science and Technology having Department of Biotechnology (DBT), Department of Science and Technology (DST), Department of Scientific and Industrial Research (DSIR), 3. Department of Space (DOS), 4. Ministry of Earth Sciences (MoES) including India Meteorological Department, 5. Ministry of Environment, Forest and Climate Change (MoEF&CC) and 6. Ministry of New and Renewable Energy (MNRE)

Non-utilisation of GSAT-6 Satellite

Department of Space launched the GSAT-6 satellite at a cost of ₹ 508 crore but was unable to utilise the satellite as envisaged due to non-readiness of the ground segment of the satellite. This resulted in non-utilisation of the satellite for nearly half of its life.

(Page 33, Paragraph 2.4)

Irregular expenditure of ₹ 7.57 crore towards development of Sullurupeta

Department of Space approved the proposal of Satish Dhawan Space Centre for taking up of work related to development of Sullurupeta Municipality in Andhra Pradesh beyond its mandate which resulted in irregular expenditure of ₹ 7.57 crore.

(Page 35, Paragraph 2.5)

Management of Projects under Medical Biotechnology Programme

The Department of Biotechnology did not effectively manage the execution of its Medical Biotechnology programme. Critical processes such as assessment of project proposals, ensuring compliance to mandatory safety protocols, periodic monitoring of projects and timely evaluation of all completed projects was not done. The number of publications in high impact journals was very low, indicating poor quality of the projects. Financial management needed to be improved. Even after disbursement of ₹ 1203.40 crore on projects under Medical Biotechnology Programme, only one patent has been granted with no technology transfer, indicating poor planning and outcomes of the projects for translational research in the area of improving human health and wellness.

(Page 38, Paragraph 3.1)

Irregular grant of incentives and allowances

Council of Scientific and Industrial Research granted incentives viz., Special Pay, additional increments and Professional Update Allowance to Scientists without obtaining the approval of the Ministry of Finance. The financial implication of the payment of irregular Professional Update Allowance alone was to the extent of ₹ 54.60 crore.

(Page 47, Paragraph 4.1)

Assistance to Botanic Gardens Scheme

The scheme 'Assistance to Botanic Garden (ABG)' undertaken by Ministry of Environment, Forest and Climate Change and implemented through Botanical Survey of India at the cost of ₹ 48.07 crore could not achieve the targets of *ex-situ* conservation and multiplication of threatened and endemic plants. Due to non-multiplication of targeted plant species, the same could not be distributed to other organisations for re-introduction. The lead botanic gardens and botanic gardens could not form network with each other and as a consequence, the gardens failed to generate knowledge and exchange plant materials of the species. Moreover, the conserved plant species could not be rehabilitated in natural habitats in collaboration with the State Forest Departments. The gardens also failed to develop propagation techniques which affected the conservation efforts. Thus, the

objective of conserving threatened plant species to avoid the threat of extinction of the species by means of the ABG scheme remained largely unfulfilled.

(Page 49, Paragraph 5.1)

Pollution caused by Plastic

Ministry of Environment, Forest & Climate Change (MoEF&CC) have no action plan for implementation of Plastic Waste Management Rules 2016, as a result, plastic waste management rules could not be implemented effectively and efficiently.

(Page 66, Paragraph 5.2)

Unfruitful expenditure of ₹ 73.35 lakh on a demonstration project

Ineffective monitoring by MoEF&CC and delay in release of financial assistance resulted in non-achievement of environmental benefits from a demonstration project and unfruitful expenditure of ₹ 73.35 lakh.

(Page 85, Paragraph 5.3)

Short recovery of rent of ₹ 96.72 lakh from a bank

Absence of formal lease agreement resulted in loss of rent revenue of ₹ 96.72 lakh.

(Page 88, Paragraph 5.4)

CHAPTER - I

Introduction

1.1 About this Report

Compliance audit refers to examination of the transactions relating to expenditure, receipts, assets and liabilities of Government to ascertain whether the provisions of the Constitution of India and applicable laws, rules, regulations, orders and instructions issued by the competent authorities are being complied with and also to determine their legality, adequacy, transparency, propriety, prudence and effectiveness in terms of achievement of the intended objectives.

The Auditing Standards adopted by the Comptroller and Auditor General of India require that the materiality level for reporting be commensurate with the nature, volume and magnitude of transactions. The findings of Audit are expected to enable the Executive to take corrective actions as also to frame policies and directives that will lead to improved financial management of the organisations thereby contributing to better governance.

This chapter, in addition to explaining the planning and extent of audit, provides a brief analysis of the expenditure of the Scientific and Environmental Ministries/Departments and their financial management. Chapters II onwards present findings/observations arising out of the compliance audit of the Scientific and Environmental Ministries/Departments and research centres, Institutes and Autonomous Bodies along with Central Public Sector Enterprises (CPSEs) under their administrative control.

1.2 Audit coverage

This Audit Report contains Audit findings relating to four Ministries/Departments from the following Scientific and Environmental Ministries/Departments of the Government of India and their units including CPSEs:

1) **Department of Atomic Energy (DAE)**
2) **Ministry of Science and Technology**
    a) **Department of Biotechnology (DBT)**
    b) **Department of Science and Technology (DST); and**
    c) **Department of Scientific and Industrial Research (DSIR)**
3) **Department of Space (DOS)**

4) **Ministry of Earth Sciences (MoES) including India Meteorological Department**
5) **Ministry of Environment, Forest and Climate Change (MoEF&CC)**
6) **Ministry of New and Renewable Energy (MNRE)**

1.3 Planning and conduct of audit

Compliance audit is conducted in accordance with the principles and practices enunciated in the auditing standards promulgated by the C&AG. The audit process commences with the assessment of risk of the Ministry/Department as a whole and of each unit based on expenditure incurred, the criticality/complexity of its activities, the level of delegated financial powers, assessment of internal controls and concerns of stakeholders. Previous audit findings are also considered in this exercise. Based on this risk assessment, the frequency and extent of audit is decided. An annual audit plan is thereafter formulated to conduct audit on the basis of such risk assessment.

After completion of audit of each unit, Inspection Reports containing audit findings are issued to the head of the unit. The units are requested to furnish replies to the audit findings within one month of receipt of the Inspection Report. Whenever replies are received, audit findings are either settled or further action for compliance is advised. The important audit observations arising out of these Inspection Reports are issued separately as draft paras to the heads of the Administrative Ministries/ Departments for their comments and processed for inclusion in the Audit Reports which are submitted to the President of India under Article 151 of the Constitution of India.

During 2019-20, compliance audit of 92 out of 448 units was conducted and during 2020-21, compliance audit of 100 out of 352 units including Central Public Sector Enterprises (CPSEs) of Scientific and Environmental Ministries/Departments was conducted based on available resources and risk assessment of the units.

1.4 Budget and expenditure controls

The position of expenditure of the Scientific and Environmental Ministries/Departments for the year 2020-21 and the preceding year 2019-20 is given in **Table 1.1** below.

Table 1.1: Expenditure of Scientific and Environmental Ministries/Departments

(₹ in crore)

Sl. No.	Ministry/Department	2019-20	2020-21
1.	Department of Atomic Energy	24880.08	22116.83
2.	Department of Space	13033.29	9490.05
3.	Department of Scientific and Industrial Research	4872.51	4244.88
4.	Department of Science and Technology	5453.02	4913.33
5.	Department of Biotechnology	2358.76	2259.72

Sl. No.	Ministry/Department	2019-20	2020-21
6.	Ministry of Environment, Forest & Climate Change	2611.45	2062.93
7.	Ministry of New and Renewable Energy	3562.11	3081.84
8.	Ministry of Earth Sciences	1724.41	1287.95
	Total	**58495.63**	**49457.53**

The total expenditure of the Scientific and Environmental Ministries/Departments of the Government of India during 2020-21 was ₹ 49457.53 crore as against ₹ 58495.63 crore in 2019-20 viz., a decrease of ₹ 9038.10 crore (15.45 *per cent*). Of the total expenditure of ₹ 49457.53 crore incurred by the Scientific and Environmental Ministries/Departments during 2020-21, 44.7 *per cent* was incurred by DAE followed by DOS and DST (19.1 and 9.9 *per cent* respectively).

The actual expenditure of all eight Scientific and Environmental Ministries decreased from 4.19 per cent (DBT) to 27.18 *per cent* (DOS) during 2020-21 over the expenditure during 2019-20. There was a significant decrease in expenditure of DOS (27.10 *per cent*), MoES (25.36 per cent) and MoEF&CC (21 per cent) during 2020-21 over the previous year.

A summary of Appropriation Accounts is given below separately for FY 2020-21 in **Table 1.2** below**.**

Table 1.2 - Details of grants received and expenditure incurred by Scientific and Environmental Ministries/Departments during 2020-21

(₹ in crore)

Sl. No.	Ministry/Department	Grant/ Appropriation (including supplementary grant)	Expenditure	(-) Savings/ (+) Excess	Percentage of Unspent provision
1.	Department of Atomic Energy	26691.73	22116.83	(-) 4574.91	17.13
2.	Department of Space	13479.51	9490.05	(-) 3989.46	29.59
3.	Department of Scientific and Industrial Research	5385.00	4244.88	(-) 1140.12	21.17
4.	Department of Science and Technology	6313.65	4913.33	(-) 1400.32	22.17
5.	Department of Biotechnology	3136.76	2259.72	(-) 877.04	27.96
6.	Ministry of Environment, Forest & Climate Change	3209.81	2062.93	(-) 1146.87	35.73
7.	Ministry of New and Renewable Energy	5871.02	3081.84	(-) 2789.18	47.50
8.	Ministry of Earth Sciences	2074.46	1287.95	(-) 786.51	37.91
	Total	**66161.94**	**49457.53**	**(-)16704.41**	**25.24**

With reference to the total budget allotment of ₹ 66161.94 crore during 2020-21, the Scientific and Environmental Ministries/ Departments had an overall unspent budget of ₹ 16704.41 crore which constitutes 25.24 *per cent* of the total grant/appropriation.

Out of the total unspent budget of ₹ 16704.41 crore, the unspent budget in MNRE (47.50 *per cent*), MoES (37.91 *per cent*) and MoEF&CC (35.73 per cent) were the highest.

1.5 Audit of Autonomous Bodies

There are ten Central Autonomous Bodies (CABs) under the eight Scientific and Environmental Ministries/Departments which are audited under Section 19 (2) and 20 (1) and for which Separate Audit Reports (SARs) are prepared. The total grants released to these ten CABs during 2020-21 were ₹ 5342.64 crore as detailed in **Table 1.3** below.

Table 1.3: Grants released to Central Autonomous Bodies during FY 2020-21

(₹ in crore)

Sl. No.	Name of the Central Autonomous Body	Ministry/ Department	Amount of Grant released during FY 2020-21
1.	Council of Scientific and Industrial Research, New Delhi	DSIR	4201.07
2.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram	DST	310.00
3.	Technology Development Board, New Delhi	DST	10.00
4.	Science and Engineering Research Board	DST	741.18
5.	National Tiger Conservation Authority, New Delhi	MoEF&CC	7.40
6.	Wildlife Institute of India, Dehradun	MoEF&CC	22.00
7.	Central Zoo Authority, New Delhi	MoEF&CC	7.19
8.	National Biodiversity Authority, Chennai	MoEF&CC	10.80
9.	Regional Centre for Biotechnology, Faridabad	DBT	33.00
10.	Compensatory Afforestation Fund Management and Planning Authority, New Delhi	MoEF&CC	Accounts not received
	Total		**5342.64**

In addition, compliance audit of 66 CABs is also conducted under Sections 14 or 15 of the C&AG's (DPC) Act, 1971. The total grants released to these 66 CABs during 2020-21 were ₹ 5650.37 crore respectively. The details are given in ***Appendix I***.

1.5.1 Delay in submission of accounts

The Committee on Papers Laid on the Table of the House in its First Report (Fifth Lok Sabha) 1975-76 and Rule 237 of General Financial Rules (GFR), 2017 mention that every CAB should complete its accounts within a period of three months after the close of the accounting year and make their accounts available for audit.

Out of the ten CAB[1]s, five CABs for the year 2020-21 submitted their accounts after delay of one month or more to audit and accounts of one CAB (CAMPA) was not received. The details of the same is mentioned in **Table 1.4** below.

Table 1.4: Delay in submission of accounts for FY 2020-21 to audit

Sl. No.	Name of Autonomous Body	Ministry/ Department	Date of submission of Accounts to audit	Delay in months
1.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thriruvananthepuram	DST	12.10.2021	3 months 12 days
2.	Wildlife Institute of India, Dehradun	MoEF&CC	25.08.2021	1 month 25 days
3.	National Bio-diversity Authority, Chennai	MoEF&CC	09.09.2021	2 months 9 days
4.	National Tiger Conservation Authority, New Delhi	MoEF&CC	01.12.2021	5 Months
5.	Central Zoo Authority, N. Delhi	MoEF&CC	02.09.2021	2 months 2 days

1.5.2 Delay in presentation of audited accounts of central autonomous bodies before both the Houses of the Parliament

The Committee on papers Laid on the table of the House, in its first Report (1975-76) had recommended that the audited accounts of the autonomous bodies be laid before Parliament within nine months of the close of the accounting year, i.e., by 31 December of the following financial year. Further, as per Rule 237 of the GFR (2017), the CABs have to submit Annual Report and Audited Accounts to be laid by the nodal ministry in the Parliament by 31st December.

The details of delay in presentation of audited accounts for the FY 2020-21 by Central Autonomous Bodies to Parliament is mentioned in the **Table 1.5** below:

Table 1.5: Delay in presentation of audited accounts for FY 2020-21 to Parliament by Central Autonomous bodies

Sl. No.	Name of Autonomous Body	Date of Presentation of Audit report in Parliament		Delay in months
		Lok Sabha	Rajya Sabha	
1.	National Biodiversity Authority, Chennai -MOEF&CC			Awaited
2.	Regional Centre for Biotechnology, Faridabad - DBT	02.02.2022	16.12.2021	Delay of 01 month and 02 days in Lok Sabha
3.	Sree Chitra Tirunal Institute for Medical Sciences & Technology - DST	09.02.2022	10.02.2022	Delay of 01 month 09 days

[1]For which financial audit is carried out by CAG.

Sl. No.	Name of Autonomous Body	Date of Presentation of Audit report in Parliament		Delay in months
		Lok Sabha	Rajya Sabha	
4.	Wildlife Institute of India, Dehradun - MOEF&CC			Awaited
5.	National Tiger Conservation Authority, New Delhi -MOEF&CC			Awaited
6.	Central Zoo Authority, New Delhi – MoEF&CC	11.02.2022	Awaited	Delay of 01 month 10 days in Lok Sabha and awaited in Rajya Sabha
7.	Council of Scientific and Industrial Research, New Delhi - DSIR			Awaited

1.5.3 Significant individual comments on the accounts of the individual Central Autonomous Bodies for the year 2020-21:

Some of the significant audit comments, arising from the financial audit of the CABs are given below in **Table 1.6** below.

Table 1.6: Significant individual comments on the accounts Central Autonomous Bodies

Sl. No.	Name of CAB	Comments
Ministry of Environment, Forest & Climate Change		
1.	Wildlife Institute of India, Dehradun	**A. Balance Sheet** **Assets** **Current Assets (Schedule 11): ₹ 1678.75 lakh** This did not include an amount of ₹ 5316.11 lakh being closing balance of externally funded projects at WII. Hence, current assets and earmarked funds were understated by ₹ 5316.11 lakh. Similar observations were made in the previous years too but no remedial action was taken.
2.	National Biodiversity Authority, Chennai	**Balance Sheet** **Assets** **Current Assets, Loans, Advances – ₹ 8331.94 lakh** Rule 20(9) of Biological Diversity Rules provided for earmarking of 5 percent (₹ 535.69 lakh) of the amount accumulated in the Fund towards administrative and service charges. Out of this, NBA already transferred an amount of ₹ 187.76 lakh. For the remaining amount of ₹ 347.93 lakh, a provision was made in the fund account. This amount, however, was not depicted as receivable in the Authority Account under Current Assets. This resulted in understatement of Current Assets to the extent of ₹ 347.93 lakh and understatement of income under Authority Accounts to the same extent.
Department of Scientific and Industrial Research		
3.	Council of Scientific and Industrial Research, New Delhi	**Liabilities** **Understatement of current liabilities by ₹ 70.35 crore** 14 sampled laboratories/Institutes of CSIR had made advance payments amounting to ₹ 43.54 crore, out of externally funded projects and booked it as final expenditure. Further, these institutes did not account for interest amounting to ₹ 26.81 crore

Sl. No.	Name of CAB	Comments
		accrued on Term Deposits (including deposits in margin Money for opening of Letter of Credit) made out of funds of externally funded projects in their books of accounts. Thus, these institutes understated their current liabilities towards deposit for externally funded projects as well as current assets (Advances) each by ₹ 70.35 crore. Similar observations were also reported in previous Year's Audit Report, but no remedial action has been taken. **Liabilities against Government grants (Schedule-5-₹ 99.84 crore)** As per terms and conditions attached to release of the grants, the unspent grant alongwith interest if any earned thereon, was required to be refunded to the funding agency. However, 14 selected Laboratories/Institutes continued to book interest earned on the grant-in-aid as their income. Consequently, overstated their Income and understated Current Liabilities by ₹ 33.76 crore.
Department of Science and Technology		
4.	Science and Engineering Research Board, New Delhi	**Liabilities** **Corpus/Capital/Fund, Schedule 1, ₹ 37.48 crore** The institute is keeping the unutilized grant under schedule 1 'Corpus/Capital Fund' as 'Corpus Balance'. Since the amount pertains to the unspent government grants only, the same was required to be depicted as unspent grant under schedule 7 'Current liabilities'. Thus, the Current Liability on account of unutilized grants was understated by ₹ 28.10 crore while overstating the Corpus Fund by the same amount.

List of Central Autonomous Bodies where internal audit was not conducted, where physical verification of fixed assets was not conducted and where physical verification of inventories was not conducted during FY 2020-21 are depicted in ***Appendix II*** respectively. Further, Central Autonomous Bodies which have not accounted for gratuity and other retirement benefits on the basis of actuarial valuation during FY 2020-21 is depicted in ***Appendix III***.

1.6 Outstanding Utilisation Certificates

Ministries and Departments are required to obtain certificates of utilisation of grants from the grantees i.e., statutory bodies, non-governmental institutions, etc., indicating that the grants had been utilised for the purpose for which these were sanctioned and where the grants were conditional, the prescribed conditions had been fulfilled. According to information furnished by eight Ministries/Departments, 48,057 Utilisation Certificates (UCs) due for grants released aggregating ₹ 22385.91 crore were outstanding as given in **Table 1.7** below.

Table 1.7: Outstanding Utilisation Certificates

Ministry/Department	Number of outstanding UCs	Share of total outstanding UCs (%)	Amount pertaining to outstanding UCs *(₹ in crore)*	Share of amount pertaining to total outstanding UCs (%)
1) DAE	942	1.9	117.39	0.5
2) DBT	15304	31.9	6114.00	27.3
3) DST	23866	49.7	3782.85	16.9

Ministry/Department	Number of outstanding UCs	Share of total outstanding UCs (%)	Amount pertaining to outstanding UCs *(₹ in crore)*	Share of amount pertaining to total outstanding UCs (%)
4) DSIR	1547	3.2	10834.41	48.3
5) DOS	756	1.6	48.64	0.2
6) MoES	631	1.3	63.70	0.3
7) MoEF&CC	4493	9.3	630.52	2.9
8) MNRE	518	1.0	794.40	3.5
TOTAL	**48057**	**100.0**	**22385.91**	**100**

It can be seen from the above table that the maximum number of outstanding UCs relate to DST and DBT. Ministry/Department-wise and period wise position of outstanding UCs is given in ***Appendix IV***.

1.7 Departmentally Managed Government Undertakings - Position of Proforma Accounts

Rule 92 of GFR, 2017 stipulates that Government Departments working on a commercial or quasi-commercial basis shall be required to maintain such subsidiary proforma accounts in commercial form as may be agreed between Government and the Comptroller and Auditor General of India. This includes the maintenance of suitable Manufacturing, Trading, Profit & Loss Accounts and Balance Sheet.

There were two Departmentally Managed Government Undertakings of commercial or quasi-commercial nature as of 31 March 2021 under DAE, viz. Nuclear Fuel Complex, Hyderabad (NFC), Heavy Water Pool Management, Mumbai (HWPM). The financial results of these undertakings are to be reported through proforma accounts generally consisting of Trading Account, Profit and Loss Account and Balance Sheet.

The proforma accounts of NFC has been certified upto the year 2010-11 and that of Heavy Water Pool Management, Mumbai upto 2012-13. Accounts for subsequent years of both the units have not been submitted to audit for certification.

1.8 Audit of Central Public Sector Enterprises (CPSEs)

The accounts of Government Companies set up under the provisions of the Companies Act (including Companies deemed to be Government Companies as per provisions of the Companies Act) are audited by the Comptroller and Auditor General of India (C&AG) under Section 143(6) of the Companies Act, 2013. The accounts certified by the Statutory Auditors (Chartered Accountants) appointed by the C&AG under the Companies Act are subject to supplementary audit by C&AG whose comments supplement the reports of the Statutory Auditors. In addition, these companies are also subject to test audit by C&AG under Section 143 (7).

Reports in relation to the accounts of a Government Company or Corporation are submitted to the Government by C&AG under the provisions of Section 19-A of

the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

There were 25 CPSEs (Apex) and 16 implementing units/plants under these CPSEs audited under Section 143(6) of the Companies Act, 2013. A list of these Companies is given in ***Appendix V.***

1.9 Losses and irrecoverable dues written off/waived

Statement of losses and irrecoverable dues written off/waived during 2020-21 furnished by eight Ministries/Departments is given in ***Appendix VI***. A total amount of ₹ 10.77 lakh was written off in 12 cases under the category 'other reasons' in DAE.

1.10 Response of the Ministries/Departments to Draft Audit Paragraphs

On the recommendations of the Public Accounts Committee (PAC), Ministry of Finance (Department of Expenditure) issued directions to all Ministries in June 1960 to send their response to the Draft Audit Paragraphs proposed for inclusion in the Report of the C&AG. This has also been prescribed under Para 137 (1) of Regulations on Audit and Accounts, 2020, made by the C&AG.

The Draft Paragraphs are forwarded to the Secretaries of the Ministries/Departments concerned drawing their attention to the audit findings and requesting them to send their response within six weeks. Draft Paragraphs proposed for inclusion in this report were forwarded to the Secretaries concerned between March 2021 and February 2022 through letters addressed to them personally.

This report contains 11 paragraphs. The responses received from concerned Ministries/Departments (except para 4.1) have been suitably incorporated in the Report.

1.11 Follow-up on Audit Reports

In its Ninth Report (Eleventh Lok Sabha) presented to Parliament on 22 April 1997, the PAC recommended that Action Taken Notes (ATNs) on all paragraphs pertaining to the Audit Reports for the year ended 31 March 1996 onwards should be submitted to them, duly vetted by Audit, within four months from laying of the reports in the Parliament.

A review of outstanding ATNs as of 31 March 2022 on paragraphs included in the Reports of the C&AG pertaining to Scientific and Environmental Ministries/Departments (details in ***Appendix VII***) revealed that five ATNs pending from three Ministries/ Departments were not received for the first time even after a delay ranging from 11 months to 17 months. Also, revised ATNs of six cases were pending from four Ministries/ Departments with a delay ranging from 12 months to 55 months as of March 2022 (***Appendix VIII***).

CHAPTER – II

Department of Space

2.1 Management of fabrication activities at Vikram Sarabhai Space Centre

Vikram Sarabhai Space Centre executed contracts for fabrication of structures for its various launch vehicle programmes without ensuring due diligence and strict compliance to the provisions of the DOS Purchase Manual. There were cases of single tender contracts continuing for prolonged periods of time, idling of infrastructure created, irregular expenditure in facility augmentation, deviations from codal provisions, as well as poor contract management.

2.1.1 Introduction

Vikram Sarabhai Space Centre, Thiruvananthapuram (VSSC) is a centre of Indian Space Research Organisation (ISRO) under Department of Space (DOS), responsible for the design and development of launch vehicle technology. The Materials and Mechanical Entity (MME) of VSSC serves as the nodal agency for developing, processing and realizing quality materials and hardware for expendable and re-usable launch vehicles. The activities of MME include fabrication of mechanical hardware required for the launch vehicle programme and the development and manufacture of materials consumed in the fabrication activities. The mechanical fabrication activity consists of external fabrication of hardware including fabrication of strap-on motors, solid motor cases and light alloy structures; and procurement/development/manufacturing of materials, plates, forgings and alloys which are consumed in the process of the fabrication activity.

An audit of the management of fabrication contracts was conducted for the period 2014-15 to 2020-21 to examine whether due process was followed in management of the fabrication activities and whether the management of contracts relating to fabrication activities were in compliance with extant rules. Out of 8088 contracts/supply orders valuing ₹ 7,677.31 crore entered into by VSSC during the said period, Audit selected 52 contracts valuing ₹ 1,156.56 crore. The contracts were selected based on materiality and representation from all areas of mechanical fabrication at MME viz. Fabrication of Motor Cases, Light Assembly Structures, Plates/Forgings/Rivets/Sheets/Jo Bolts and Procurement/development of Materials.

Audit findings are discussed in the following paragraphs.

2.1.2 Audit findings

2.1.2.1 Irregular award of contracts for prolonged durations on the basis of single tendering

As per Rule 160 of General Financial Rules 2005 (Rule 173 of GFR 2017), all government purchases should be made in transparent, competitive and fair manner to secure best value for money and contract should ordinarily be awarded to the lowest evaluated bidder whose bid has been found to be responsive and who is eligible and qualified to perform the contract satisfactorily as per the terms and conditions incorporated in the corresponding bidding document. Para 11.1 (2002/2009 edition) of DOS purchase procedure (Para 3.9 of DOS Purchase Manual 2015) provides that subject to the norms/guidelines approved by the Space Commission, DOS may promote development of cost-effective space industry by associating with Private industry.

Audit noticed from the sample selected instances where VSSC executed its procurements on single tender basis for prolonged periods without exploring alternate vendors, resulting in loss of opportunity for obtaining advantage of competitive pricing and passing on significant benefits to the identified vendors. The cases are discussed below.

2.1.2.1.A Procurement of solid motor case

MME of VSSC had identified (1991) manufacturing facilities for fabrication of solid motor cases for the launch vehicles of ISRO at M/s Walchandnagar Industries Ltd., Pune (WIL) for Head End Segment (HES) and Nozzle End Segment (NES) and M/s Larsen and Turbo Limited, Mumbai (L & T) for Middle Segment (MDS). VSSC had established the testing facilities required for fabrication of the motor cases at a cost of ₹ 4.02 crore[2] at L& T in March 2003 and at a cost of ₹ 8.90 crore[3] at WIL in August 2016. Initially WIL was using the testing facility established at L&T.

It was seen that VSSC initially entered into contracts with WIL and L&T in August 2003 for a duration of 10 years and the prices were fixed at ₹ 1.02 crore per unit for HES, ₹ 93.50 lakh per unit for NES and ₹ 96 lakh per unit for MDS. The contracts provided for price escalation clause. Subsequently, VSSC entered (March 2008)[4] into contracts for the supply of HES/NES with WIL for ₹ 45.01 crore and on L & T for the supply of MDS for ₹ 67.26 crore for a duration of 10 years. The quantity of HES/ NES was increased (amendment in May 2016) from 44 to 78 for a value of ₹ 78.25 crore. Similarly, the contract for supply of MDS was amended (June 2016) from 66 to 123, to cater to the requirement of subsequent years and value of the order increased to ₹ 121.98 crore. While granting approval to the amendment of the contract with WIL, DOS directed (July 2016) VSSC to quickly select additional vendors and float limited

[2] Pressure Proof Testing Facility and Heat Treatment Furnace

[3] Pressure Proof Testing Facility

[4] Supply of 22 HES for ₹ 1.02 crore per unit and 22 NES for ₹ 93.50 lakh per unit and tooling cost of ₹ two crore with escalation from the base year January 2004; and supply of 50 MDS for ₹ 96 lakh per unit with escalation from the base year 2007 and order subsequently amended for supply of 66 MDS.

tenders to all the vendors so as to award the contract to lowest bidder as provided in GFR and DOS purchase Manual.

Subsequently, based on its assessment of need (March 2018), VSSC conducted limited tendering (January 2019) during the procurement of three sets of S139 Hardware (three HES, three NES and nine MDS with a total of 15 units). Four vendors were shortlisted[5] out of which the order was placed (May 2019) on the lowest bidder, M/s Sree Venkateswara Agencies Private Limited (SVAPL) at a cost of ₹ 11.49 crore.

During the period 2008-2019, VSSC incurred ₹ 163.67 crore towards fabrication of solid motor cases.

Audit observed that VSSC continued to place single tender orders on the two vendors (WIL and L&T) since 1991 for 28 years without exploring alternate vendors through limited/open tendering modes for obtaining the advantage of competitive prices. Limited tendering was conducted only in January 2019. Audit worked out the difference in prices of SVAPL (May 2019) against the indexed Contract Price of WIL (March 2008/May 2016) and L & T (March 2008/ June 2016) and found it to be to the extent of ₹ 36.03 crore and ₹ 62.21 crore respectively (**Annexure-2.1)**. Thus, executing the procurement in Single Tender Mode resulted in significant advantage to WIL and L&T. Further, though VSSC established test facility at WIL and L&T from Government funds, the contracts/ orders for the delivery of motor cases however did not provide for discount commensurate with investment of facility as provided under 'Bay Forge Contract' and 'Contracts with MIDHANI' as discussed under Para 2.1.2.15 and 2.1.2.16 of this report. Further, the establishment of facility at the premise of the vendors had resulted in loss of opportunity for obtaining the advantage of competitive bidding and passed on significant advantage to the vendor since Government purchases are to be awarded to the lowest evaluated bidder as per GFR.

VSSC stated (March 2021) that time available between the approval of the project and requirement of the hardware for the mission was just sufficient to realise the hardware from the established source. The reply cannot be accepted, as while contracts were being continued with WIL and L & T since 1991, VSSC was able to identify alternate vendors within three years of receiving such instruction from DOS. The reply also indicates that VSSC was unable to coordinate project approvals with procurement lead times.

DOS stated (March 2022) that the new vendor (SVAPL) whose cost is though lesser than that of the existing larger stabilised vendor is not possible to meet the programme requirements. VSSC however did not identify additional vendors to the award the contract to the lowest bidder as provided in GFR and DOS purchase procedures for a price advantage.

[5](i) L&T (ii) SEC Industries (iii) Sree Venkateswara Agencies Private Limited (SVAPL) and (iv) Brahmos Aerospace.

2.1.2.1.B Procurement of strap on motors

According to GFR, Government purchases are to be awarded to the lowest evaluated bidder. This was reiterated (July 2016) by the Member Finance of the Space Commission (representative of Ministry of Finance in DOS). Member Finance noted that same item is being procured from different vendors with different prices with different terms and conditions and recommended to float limited tenders from the identified vendors with standard procurement terms, subject to matching of the lowest prices. Audit noticed that in the following cases, VSSC executed contracts on single tender basis, even while alternate vendors for the products were available. These cases are discussed below.

(i) VSSC (August 2002) had identified M/s Walchandnagar Industries Limited (WIL) and M/s Ramakrishna Engineering Company (RKE) for the fabrication of PSO Motor cases. VSSC entered (July 2003) contracts with WIL and RKE for fabrication of 12 and 36 numbers of PSLV Strap On (PSO) motor cases respectively. The validity of the contract was 10 years. VSSC decided (January 2007) to switch over from PSO Motor to PSO XL Motors for future PSLV launches and accordingly, amended both the contracts (February/March 2008) to include fabrication of 20 PSO-XL Motor cases each.

Audit observed that there was a variation in the unit price of the PSO-XL motor cases fixed in respect of WIL (₹ 28.80 lakh) and RKE (₹ 19.35 lakh). As such, the unit price charged by WIL was ₹ 9.45 lakh more than that charged by RKE. VSSC awarded two contracts on single tender basis to two vendors, which was in violation of the GFRs. Further, awarding of orders to two different contractors for the same item at different prices resulted in extra payment of ₹ 1.89 crore (excluding price escalation) to WIL for fabrication of 20 PSO-XL Motor cases at the rate of ₹ 9.45 lakh per unit.

DOS/ VSSC (March 2022/ January 2020) stated that price comparison of RKE and WIL was not possible due to the difference in the engineering category and production line of the two different firms. The reply is not acceptable, as orders were placed with both the contractors for the same product. By awarding contracts to two firms on single tender basis, VSSC failed to optimise the procurement at the lowest prices and thereby did not safeguard the financial interest of the Government as provided under GFR.

(ii) VSSC raised (December 2011) another indent for fabrication of 36 PSO XL Motor cases. The indent was processed on single tender basis (2012) and the existing contract with WIL was amended (August 2012) with a price per unit of ₹ 28.80 lakh along with price escalation using the base price as on January 2004. The price charged by WIL as of August 2012 with escalation was in the range of ₹ 43.21 lakh[6] per unit.

Audit observed that VSSC did not invite a quotation from RKE for the above procurement. WIL supplied 36 fabricated units during the period 2012-17 and VSSC

[6] January 2004 and August 2012 working class CPI for Sholapur was 528 and 1031.14 (218 x 4.73) respectively. Basic price of ₹ 28.80 per set lakh escalated by ₹ 14.41 lakh {0.75 x 0.70 x 28.80 x (1031.14-528)/528}.

released a payment of ₹ 18.92 crore. During the same period, the price per unit payable to RKE as of March 2017 would have been ₹ 27.67 lakh[7] including escalation. Accordingly, the charges payable to RKE for the same supply would have been only ₹ 9.96 crore and may have resulted in a cost saving of ₹ 8.96 crore.

Audit observed that awarding of contract on single party basis when an alternate supplier was available at cheaper price was against the GFRs. Audit further observed that VSSC amended the existing contract without proper examination of the financial effect involved in the amendment, which was in violation of the DOS purchase procedure.

VSSC stated (January 2020) that even though they had price advantage from RKE, it was not advisable to fully depend on them as it would affect hardware requirement of PSLV programme. DOS stated (March 2022) that process for distributing the procurement between identified contractors at a competitive price shall be attempted in future orders.

The reply is to be seen in view of the fact that VSSC did not consider matching the lowest prices being offered by WIL, nor did it attempt to distribute the procurement between the two identified contractors for a price advantage.

(iii) While awarding the contract to WIL (March 2008) as mentioned in Sl. No. (i) above, the price for fabrication of each set of PSO-XL Motor case was quoted as ₹ 28.80 lakh plus price escalation as on scheduled date of delivery indexed to the price level as on January 2004. VSSC further amended (August 2012) the quantity of PSO-XL Motor cases from 20 to 56 with no change in the pricing clause. Subsequently, VSSC entered (May 2016 and February 2017) into new contracts with WIL on single tender basis for fabrication of 12 PSO-XL motor cases on the same pricing terms (viz., fabrication of each set of PSO-XL Motor case as ₹ 28.80 lakh plus price escalation as on scheduled date of delivery indexed to the price level as on January 2004). Thus, VSSC continued to source its requirement of PSO-XL motor cases from WIL on the prices fixed in July 2003, with incremental escalation costs. The actual price per unit of PSO-XL motor case of WIL was ₹ 53.64 lakh[8] as on May 2016 and ₹ 53.23 lakh[9] as on February 2017.

Meanwhile, based on the recommendation of a committee, VSSC decided (September 2015) to develop additional sources[10] for fabrication of 12 sets of PSO-XL Motor cases. Accordingly, VSSC undertook limited tendering process (Sept 2015 and August 2016) and identified M/s Kay Bouvet, Satara at a unit price of ₹ 19.50 lakh and M/s ARF

[7] Jan 2004 and August 2012 working class CPI for Chennai was 539 and 994.95 (201 x 4.95) respectively. Basic price of ₹ 19.35 lakh per set escalated by ₹ 5.32 lakh {0.65 x 0.50 x 19.35 x (994.95-539)/539}.
[8] Jan 2004 and May 2016 working class CPI for Sholapur was 528 and 1395.35 (295 x 4.73) respectively. Basic price of ₹ 28.80 lakh per set escalated by ₹ 24.84 lakh [0.75 x 0.70 x 28.80 x (1395.35-528)/528].
[9] Jan 2004 and Jan 2017 working class CPI for Sholapur was 528 and 1381.16 (292 x 4.73) respectively. Basic price of ₹ 28.80 lakh per set escalated by ₹ 24.43 lakh [0.75 x 0.70 x 28.80 x (1381.16-528)/528].
[10] The production capability of the existing three sources were 54 sets. Due to approval of 11 PSLV flights the requirement of PSO XL motor cases are 66 sets (11 x 6 motor cases at the rate of 6 motor cases per flight). Therefore, additional sources to be identified is for fabrication of 12 sets.

Engineering Ltd., Chennai and The KCP Ltd., Chennai at a unit price of ₹ 24.60 lakh per set, with no concept of price escalation.

Audit observed that against the price per unit of ₹ 53.64 lakh charged by WIL, the price per unit charged by other suppliers as in May 2016 was ₹ 19.50 lakh and ₹ 24.60 lakh which was much lower than the price offered by WIL. Despite being aware that much cheaper and competitive new sources were available in the market, awarding a fresh contract with WIL at a price escalation, payable against a 12 year old base price was not prudent, which resulted in incremental payment of ₹ 6.51 crore on account of escalation[11] under the contracts.

VSSC stated (January 2020) that alternate suppliers were identified considering the increased requirement of PSLV in 2017. The reply is not acceptable, as the requirement of PSLV increased from 20 to 56 in the year 2012 itself but VSSC did not attempt to identify alternate vendors at that stage. Further, VSSC already had alternate vendors in 2016 and yet opted to source the requirement from WIL at a higher price in May 2016 and February 2017. Admitting the audit observation, DOS stated (March 2022) that VSSC has taken due initiatives and developed more sources with price level satisfactory.

2.1.2.1.C Fabrication of Light Alloy Structures

The Aerospace Division of Hindustan Aeronautics Limited, Bangalore (HAL-ASD) has a dedicated facility established with ISRO funding for the realisation of Light Alloy Structures (LAS) and Tankages for ISRO's Launch Vehicles programmes. VSSC entered into contracts with HAL for the supply of LAS and Tankages for PSLV and GSLV as shown in **Table 2.1**.

Table 2.1: Contracts & Purchase orders awarded to HAL for fabrication of LAS and Tankages

PSLV		GSLV	
Contract date	**Value (₹ crore)**	**Contract date**	**Value (₹ crore)**
February 1996	**25.07**	March 1997	39.43
March 2004	67.46 (amended to 75.70)	July 2003	46.14
March 2007	4.77	December 2003	46.13
March 2008	55.67	March 2004/ March 2005	92.65
January 2016	298.02	March 2007	40.18
		March 2010	55.39

Thus, VSSC continued to procure LAS and Tankages from a single supplier for almost 20 years from February 1996 to January 2016. In order to meet the urgent PSLV launch requirements, five alternate vendors (Taneja Aerospace and Aviation Ltd., KCP Ltd.,

[11] ₹ 3.27 crore in the purchase order of May 2016 and ₹ 3.24 crore in the purchase order of February 2017.

Gauges Industries, Sree Venkateswara and L & T) were engaged during the period from the year 2008 to 2019 on fast-track mode.

Audit observed that the rates of these alternate vendors were lower as compared to the prices of HAL (**Table 1 and Table 3 of Annexure-2.2**). The difference between prices of HAL and the other vendors was to the extent of ₹ 77.10 crore (**Table 2 and Table 4 of Annexure-2.2**). Audit scrutiny of the fabrication contracts of HAL also revealed that only emergency orders were placed on the alternate suppliers and regular supplies were continued to be sourced from HAL. Awarding of contract on single party basis when alternate suppliers were available at a cheaper price was not in order and resulted in undue benefits to the contractor.

VSSC stated (January 2020) that HAL was the only source available at that point of time capable of delivering LAS structures to the requirement of ISRO and that alternate vendors were developed subsequently to meet the increased demand of the hardware. The reply is not acceptable, as VSSC released purchase order (April 2019) valuing ₹ 387 crore to HAL on single tender basis even after the alternate vendors were identified in the year 2008.

Admitting the audit observation, DOS stated (March 2022) that when additional vendors prove their expertise and rate of production, VSSC expects to arrive at a more competitive price between HAL and these new vendors, as envisaged in the Audit observation. The reply of DOS highlights the need to identify and develop larger heavy industries after careful evaluation of their technical capability and infrastructure, so that these are available to meet the quality required by ISRO and the need for ISRO to have a competitive advantage as to pricing.

2.1.2.1.D Procurement of steel

VSSC entered (February 2016) into a contract with M/s Mishra Dhatu Nigam Ltd. (MIDHANI) for manufacture and supply of six types of forged rings and two types of plates made of M250 grade Maraging Steel[12]. The procurement was executed on proprietary basis by giving the justification that MIDHANI was the only indigenous manufacturer having all the required facilities for realising M250 products to VSSC's specification. The prices under this contract were arrived by increasing the prices under the previous contract (December 2009 to March 2012) with MIDHANI by 25 per cent to 48 per cent.

MIDHANI was also the sole supplier of M250 Maraging Steel rods to VSSC till December 2015. In December 2015, VSSC identified an alternate contractor M/s Star Wire (India) Pvt. Ltd. through limited tendering process and started placing orders for manufacturing and supply of M250 Maraging Steel rods on the alternate contractor also. During the period from December 2015 to August 2017, VSSC procured Maraging steel rods from both MIDHANI and M/s Star Wire (India) Pvt. Ltd. Audit observed that

[12] Maraging steels are a class of low-carbon ultra-high-strength steels

while the prices charged by MIDHANI were higher than those of M/s Star Wire (India) Pvt. Ltd. by 32-34 per cent in three purchase orders placed between December 2015 and May 2016, the prices of MIDHANI fell sharply during December 2017 with a difference of only seven per cent between the two suppliers (**Table-1 of Annexure-2.3**). This indicates that stiff competition from the alternate supplier had an impact on the price charged by MIDHANI, which was earlier the sole supplier.

Audit however, observed that though M/s Star Wire (India) has been an alternate supplier of M250 Maraging Steel rods since December 2015, VSSC did not develop it as an alternate supplier of M250 Maraging Steel rings and plates. VSSC also did not search for any other potential supplier of Maraging Steel rings and plates and continued to source their requirement from MIDHANI at the escalated prices charged by MIDHANI under the new contract (February 2016). The incremental expenditure on the procurement due to the escalation in the prices of December 2009 and February 2016 was to the extent of ₹ 59.79 crore, as detailed in **Table 2 of Annexure-2.3**.

VSSC stated (January 2020) that the price difference was because MIDHANI had indigenously developed Maraging Steel Plates at its facility whereas Star Wire had imported the raw materials directly. VSSC added that import option was not viable considering the larger and time bound requirement of rings and plates for the Launch Vehicle Programme. DOS stated (March 2022) that indigenous development is costlier compared to import since the material processing, right from the raw materials till realisation of the plates, is stringent involving multiple clearances at stages which effects the yield. The reply is not acceptable, as VSSC had established the facility[13] at MIDHANI as an import substitute to save cost.

2.1.2.2 Price escalation in contracts not reported to the Contract Finalisation Committee

According to Para 7.8 of DOS Purchase Procedure (October 2009 edition) and Para 12.5 (f) of DOS Purchase Manual 2015 the purchase committee shall consider the payment terms quoted and decide on their acceptance.

As mentioned in paras 2.1.2.1.A and 2.1.2.1.B, VSSC had identified WIL and L&T for fabrication of solid motor cases and strap on (PSO XL) motors. Contracts for these items were entered in August 2003 and the prices were fixed at ₹ 1.02 crore per unit for HES, ₹ 93.50 lakh per unit for NES, ₹ 96 lakh per unit for MDS and ₹ 28.80 lakh for PSO XL motors. The escalated prices for the subsequent contract were to be reckoned from the base year January 2004 for WIL and Dec 2007 for L&T on the prices of the previous contract (July 2003/ August 2003). However, VSSC did not work out and report the escalated prices viz. ₹ 1.84 crore per unit for HES, ₹ 1.69 crore for NES, ₹ 1.39 crore for MDS and ₹ 1.84 crore and ₹ 53.64 lakh for PSO XL motors to the Contract Finalisation

[13] VSSC established facility at MIDHANI for ₹ 34.30 crore during the years 2005 and 2006.

Committee (CFC-1)/ appropriate approving authorities[14] while finalising the subsequent contracts (May/June 2016).

Thus, VSSC did not disclose the correct cost per unit to the approving authorities to enable them to take a considered decision.

DOS/ VSSC (March 2022/ January 2020) stated that while submitting proposal to the approving authorities, only the base price was included as escalation would be known at the time of segment delivery. The reply is not acceptable, since the escalated price as of May2016/June 2016 was to be reckoned from the base price of January 2004/ Dec 2007. The escalated price on the date of the Purchase committee should have been submitted to the committee for their information.

2.1.2.3 Under utilisation of Titanium Sponge Plant

To meet the strategic and aerospace requirements of the country, a National Committee was constituted (2005) considering the importance of indigenisation of Titanium Sponge Plant[15]. Based on the recommendation of the committee (May 2005), DOS decided (January 2006) to establish a Titanium Sponge Plant at Kerala Metals and Minerals Limited, Chavara (KMML) and signed MoU (January 2006) with KMML for manufacture of Titanium Sponge. KMML was to supply the raw material to MIDHANI for use in fabrication of Titanium Alloy[16] Rolled Rings which are used in launch vehicles. The facility was established by DOS (October 2012) at the premises of KMML at a total cost of ₹ 143.11 crore.

VSSC entered (October 2012) a contract with KMML for a duration of 21 years for supply of Aerospace Titanium Sponge.

Till 2018, nine orders valuing ₹ 54.98 crore were released to the firm during the period from June 2013 to September 2017 and KMML supplied Titanium to VSSC. VSSC reported issues (February 2019) in the Titanium sponge developed by KMML and decided to procure Titanium alloy through import. Subsequently VSSC procured Titanium Products through 21 import purchase orders (from April 2019 to January 2021) having total value of ₹ 13.58 crore. DOS did not order Titanium products during the period from September 2017 to November 2021. As a result, the plant built at the cost of ₹ 143.11 crore was not used to meet requirements of VSSC during the period.

DOS stated (March 2022) that Titanium sponge developed at KMML was used towards requirements of the strategic programmes and the urgent requirements of ISRO were met through import route. DOS added that it issued orders on KMML in November 2021. DOS however did not clearly indicate whether the issues reported in the

[14] Indent Review Committee, Need Aspect Review Committee, Senior Purchase Committee, etc.

[15] Titanium Sponge is not available for import in the open market since 2004 because the production capacities of various sponge produces have been fully booked by the major USA/ UK/ Europe based industries.

[16] Titanium Alloys are unused in Launch Vehicles and Satellites. Titanium Alloys with high purity is Titanium Sponge.

Titanium Sponge developed by KMML in February 2019 were solved especially in the background of the fact that the plant at KMML is being upgraded to cater to the strategic requirements.

2.1.2.4 Non-recovery of penal interest

According to Para 10 (3) (5) (f) read with Para 5.4.1.2 of DOS Purchase Manual 2015, payment of advance against a Contract/Purchase Order in indigenous supplies should be resorted to in select cases. Wherever payment of advance is considered necessary or unavoidable, it should be allowed after getting an acceptable Indemnity Bond in the cases of Public Sector Enterprise.

VSSC entered (January 2011) into a contract with MIDHANI (Central Public Sector Enterprise) on proprietary basis for manufacture and supply of 60 Columbium Alloy C103 sheets/ plates. According to contract terms 40 per cent of the total contract value was to be paid by VSSC on submission of contract confirmation, proforma invoice and Indemnity Bond by MIDHANI. The stipulated date of delivery as per the contract was 31 March 2013. The remaining 60 per cent plus packing charges and taxes was to be paid against acceptance of material and dispatch documents within 30 days.

Accordingly, VSSC released (February 2011) advance amount of ₹ 4.52 crore, which was 40 per *cent* of the total contract value of ₹ 11.30 crore. Delivery, as per contract, was to be completed by March 2013. However, MIDHANI could not complete the delivery on time and was able to supply only five out of 60 sheets as of March 2015. Due to the continuing delay, VSSC short closed (January 2018) the contract and reduced the supply quantity by issuing an amendment and order value reduced to ₹ 2.72 crore.

Reduction in the supply quantity resulted in idling of excess advance of ₹ 3.43 crore[17] with MIDHANI. Though VSSC requested (March 2015) MIDHANI to refund the excess advance along with penal interest, however, MIDHANI (June 2015) did not agree to pay the penal interest. VSSC decided (June 2017) to adjust the excess advance amount against the payment for the delivered items, however the status of such recovery was not available on record.

Audit observed that though the contract envisaged payment of a large advance, there was no provision for obtaining a Bank Guarantee/Indemnity Bond to safeguard the financial interest of the Government. Further, VSSC did not include a clause for levy of penal interest in the event of the contractor's inability to complete the delivery as per contract terms, due to which VSSC was unable to impose the recovery of penal interest from the firm.

[17] 40 per cent of ₹ 1129.82 lakh less 40 per cent of ₹ 272.24 lakh

Admitting the audit observation, DOS/ VSSC (March 2022/ January 2020) stated that suitable penal interest clause will be insisted upon in future contracts. DOS added (March 2022) that excess advance of ₹ 3.43 crore was recovered from the Vendor.

2.1.2.5 Avoidable Payment of escalation in the procurement of PSLV alloy structures

Based on an indent (January 2018) for the procurement of 24 sets of PSLV alloy structures to be processed on single tender basis, VSSC obtained (April 2018) a quote from HAL after taking the approval (March 2018) of DOS.HAL quoted a price of ₹ 451.51 crore for the base year 2018-19 with an escalation of seven per cent per annum payable from the year 2019-20 onwards. VSSC finalised the contract with HAL in April 2019. The time taken at each stage of the procurement was as shown in **Table 2.2.**

Table 2.2: Finalisation of contract with HAL for procurement of PSLV alloy structures

Activity	Date	Time taken (months)
Submission of indent	January 2018	0
Approval of DOS	March 2018	2
Receipt of quote from HAL	April 2018	1
Constitution of sub-committee by CFC-I of DOS to negotiate the quote	August 2018	4
Price of ₹ 427.56 crore negotiated by the Sub-committee	October 2018	2
Purchase proposal sent to DOS for approval	December 2018	2
Approval of the proposal by DOS	February 2019	2
Contract awarded	April 2019	2
Total time taken		**15**

As shown in the table, VSSC took 15 months to release its contract from its date of indent. Audit observed that VSSC did not prescribe a realistic time frame for each stage of procurement in the above case as stipulated in the DOS Purchase Manual. Audit further observed that during negotiations, VSSC did not change the base year indicated in quote of HAL from 2018-19 to 2019-20 with the result that VSSC made escalation payment of ₹ 10.32 crore from the year of entering into the contract (May 2019) itself. The price negotiation exercise undertaken by VSSC was deficient to this extent.

VSSC stated (March 2021) the escalation payment to HAL occurred as a result of the procedural delays in the contract finalisation. The reply only serves to reinforce the need to adhere to a prescribed time line for each stage of the procurement which serves to reduce or avoid delays and the resulting increase in costs. DOS while accepting (March 2022) the audit observation furnished a reply generally that best efforts will be ensured in future to reduce the time for getting clearances and approvals. However, DOS was silent on its strategy and action taken to streamline the underlying contract management issues.

2.1.2.6 Augmentation of facility for Light Alloy Structures without approval of Law Ministry

According to Rule 204 (iii) of GFR 2005, In cases where standard forms of contracts are not used, legal advice should be taken in drafting the clauses in the contract.

As mentioned in Para 2.1.2.1.C of this draft report VSSC issued (August 2002) a single tender enquiry to HAL for fabrication and supply of 62 (11 types) Light Alloy Structures (LAS) for the GSLV MKIII project at an estimated cost of ₹ 81.80 crore. While submitting the tender, HAL expressed the requirement of facility augmentation by way of machineries and building requirements for Computer Numerical Control (CNC) machines, assembly hangar, stores for raw materials/ finished hardware, etc.

The proposal for facility augmentation was sent to Ministry of Law & Justice (MoLJ), Department of Legal Affairs, which did not agree (March 2003) with undertaking civil works, plant and machinery in the land belonging to HAL. MoLJ stated that being the licensee, VSSC had no right to construct building or any other machinery or to effect improvements in the land and suggested that VSSC should have a lease agreement with HAL.

DOS, however conveyed the sanction (March 2003) for entering into a contract for fabrication of 62 LAS (11 types) and also approved the facility augmentation, stating that the proposal of VSSC to enter into the contract was similar to a contract cleared by MoLJ in 1996. Accordingly, VSSC entered (March 2003) into a contract with HAL for the procurement at a cost of ₹ 120.06 crore[18] including cost of facility augmentation cost of ₹ 70.60 crore towards machinery and civil works. The cost of contract was amended twice (March 2004 & March 2005) to ₹ 152.49 crore[19] including cost of facility augmentation of ₹ 82.95 crore.

Audit observed that sanction of facility augmentation in HAL when MoLJ had specifically disagreed with the same was not in order and resulted in irregular expenditure of ₹ 82.95 crore.

VSSC stated (January 2020) that the decision taken by DOS was final. The reply is not accepted, as the decision of DOS to carry out facility augmentation in HAL was based on an old (1996) proposal concurred by MoLJ. However, the most recent proposal for facility augmentation was refused by MoLJ. Relying on an old order defeated the due diligence carried out by MoLJ, as required by GFR in the present case. DOS did not furnish (March 2022) reasons as to why the department entered into lease agreement with HAL against the instructions of MoLJ.

[18] Fabrication cost ₹ 49.46 crore and cost of facility augmentation of ₹ 70.60 crore towards machinery and equipment of ₹ 40.91 crore and civil works of ₹ 29.69 crore.

[19] Fabrication cost of 96 LAS ₹ 69.54 crore and cost of facility augmentation of ₹ 82.95 crore towards machinery of ₹ 47.51 crore and civil works of ₹ 35.44 crore.

2.1.2.7 Irregular payment of manpower charges in the thermal painting for Light Alloy Structures

As mentioned in para 2.1.2.1.C, HAL-ASD has a dedicated facility for the realisation of Light Alloy Structures (LAS) for ISRO's Launch Vehicles programmes. DOS entered a contract (October 2011) with HAL towards application of Thermal Protection painting on 148 LAS of ISRO's Launch Vehicles programmes viz. PSLV (62), GSLV MK II (30) and GSLV MK III (56) for a total contract value of ₹ 18.49 crore. Against the order value, payment of ₹ 53.66 crore including seven per cent escalation, was made to HAL (March 2021).

The contract with HAL was a manpower contract (materials were issued as free issue), as the facility was established by DOS. However, the basis on which the man hour rates and number of man hours required for the job was worked out was not available on record. In the absence of records, Audit could not ascertain whether the contract value negotiated by VSSC was fair and competitive. Further, though the contract provided for thermal painting of only LAS, VSSC made payment of ₹ 34.86 crore towards thermal painting of additional structures also. However, revision in the scope of work in the contract was not on record.

DOS stated (March 2022) additional work were carried out based on the logged hours at HAL and certified by VSSC resident engineer. The reply is not acceptable as according to Para 11.4 of the agreement, any work which is beyond the scope of the work of the contract can be carried out by HAL based on specific written instruction of Contract Manager (Deputy Director, MME) or as decided in the periodic review meetings between VSSC and HAL and not based on logged in additional hours.

2.1.2.8 Irregular Clubbing of procurements

As per Para 1.5 of DOS purchase Procedure 2009 (Para 4.5.1 of DOS Purchase Manual 2015); the Centres/ Units shall club the requirements considering the consumption pattern of the item, shelf life, obsolescence, etc. However, VSSC did not club the requirements in two cases, as discussed in **Table 2.3**.

Table 2.3: Procurements not clubbed

Item	Vendors	Loss of discount (₹ lakh)	Remarks
Jo bolts	M/s WESCO and M/s Avdel	56.61	Both vendors offer quantity discount ranging from one to four *per cent* on their quoted prices and also offered additional discounts for increase in the quantity. During 2013-14 to 2015-16[20], VSSC did not club its requirements of Jo Bolts and was therefore unable to avail of the quantity discount to the extent of ₹ 56.61 lakh.

[20] FY 2013-14, 2014-15 & 2015-16 for WESCO and 2014-15 and 2015-16 relating to AVDEL.

Item	Vendors	Loss of discount (₹ lakh)	Remarks
Aluminium Alloy Sheets	M/s Kalapurna and M/s Val-Met	41.68	Audit scrutiny of the orders relating to Aluminium Alloy sheets revealed that ALCAD sheets were procured within short gaps (one day to nine months) through both vendors, but the requirement was not clubbed due to which quantity discount of ₹ 41.68 lakh could not be obtained.

DOS stated (March 2022) that Jo Bolt requirement were projected by various project divisions at different time frames and common items were not there in most of the cases to obtain the quantity discount. The reply is not acceptable as the annual requirements of various project divisions are to be clubbed for the general consumables such as 'Jo bolts' to obtain the benefits of bulk discount. Further, out of 18 purchase orders for Jo Bolts issued during the period, 17 purchase orders were released from the same division of VSSC.

DOS added (March 2022) that the requirement of Aluminium Alloy sheets were projected by different projects at different time frames hence could not be clubbed to obtain the quantity discount. The reply is not acceptable as the annual requirements of different projects are to be clubbed to obtain the benefits of discount. Further, considering the short gaps of one day to a few months in issuing the purchase orders for Aluminium Alloy sheets, VSSC may have managed the procurements to club requirements from the various projects.

2.1.2.9 Inadequate Indigenization efforts

Para 2.1 of DOS Purchase Manual stipulates the policy of DOS to develop indigenous sources of supply such as import substitution, identification of dependable source, ensuring quality of products ordered and their timely supply. Though VSSC had indigenously developed Jo bolts, Aluminium Alloy, further developmental efforts, as detailed in **Table 2.4** were not found on record.

Table 2.4: Partial indigenisation efforts

Item	Audit Observation
Jo Bolts	VSSC successfully developed (Annual Report for the Year 2015-16) Jo bolts (Part No PLT 215 0812) in-house at one of its work centres M/s Ankit Fasteners. However, further developmental efforts by signing an MOU/Agreement with the firm did not materialise. VSSC stated (March 2021) that qualification testing and approval of the product in line with international standards were being reviewed by an expert committee for induction into program. DOS stated (March 2022) that indigenous Jo bolts will be inducted shortly.
Aluminium Alloy	VSSC had indigenously developed (Annual Report for the Year 2015-16) AA2014-T651 alloy required for fabrication of strap on of Launch Vehicle Mark 3 (LVM3) in-house. The annual requirement of AA2014-T4/T6 sheets (as of February 2018) was to the extent of ₹ 2.84 crore. Audit observed that VSSC reported in September 2019 that it had commissioned a facility at BALCO which is not operational. VSSC had finalised transfer of the facility to HINDALCO but this was yet to materialise (March 2021). DOS stated (March 2022) that an integrated proposal to transfer ISRO funded facilities from BALCO to HINDALCO is under its consideration.

Thus, VSSC was not able to utilise indigenous products in its launch vehicles.

2.1.2.10 Loss of interest on receipt of royalty

According to GFR (Rule 64 of GFR 2005) the Ministry/ Department shall ensure that the procurement of supplies are made in a cost-effective manner.

VSSC entered (February 2002) into a contract with M/s Fomas, Tamil Nadu (presently M/s Bay Forge Limited - BFL) for establishment of ring roller mill and supply of seamless rolled heat treated and proof machined rings for a duration of 21 years from the date of commencement of production (July 2004) i.e., up to 2025. According to Clause 31 of the contract, BFL was to pay royalty of six per cent of ex-factory value of domestic sales of rolled rings and 4.5 per cent for export orders. In addition, the scrap metal at the premises of M/s Bay Forge were also to be auctioned and revenue generated was to be transferred to VSSC. According to Clause 31 of the Contract, BFL shall make payment on quarterly basis to VSSC.

Audit scrutiny however revealed that in order to recover the royalty from sales and receipts from auction of metal scrap, VSSC neither raised its quarterly demands nor collected the due receipts in time (March 2021). As a result, payment of revenue to VSSC was delayed from one to 14 months. The loss of interest was to the extent of ₹ 80.51 lakh.

Admitting the audit observation (March 2022), DOS stated that Bay Forge has been strictly instructed to credit the proceeds promptly to VSSC every quarter without fail. Audit however observed delay in remittances of the revenue from one month to 14 months from the month in which it is due till its receipt.

2.1.2.11 Non-revision of rate of cost benefit

VSSC established (February 2004/March 2005) melting and heat treatment facilities at MIDHANI to enhance manufacturing capacity of M250 Maraging steel products required for various launch vehicle programmes of DOS at a cost of ₹ 60 crore. According to the terms of the MoUs, MIDHANI would pass on certain benefits to VSSC in lieu of the funding, such as cost reduction of ₹ 300 per kg of rings and plates on account of melting facilities and ₹ 50,000 per plate on account of heat treatment carried out in Roller Hearth Furnace.

VSSC entered (February 2016) a contract with MIDHANI on proprietary basis for manufacture and supply of six types of forged rings and two types of plates made of M250 Maraging Steel. Prices under this contract were arrived at by increasing the prices under the previous contract (December 2009) by 25 to 48 per cent. Audit observed that though the prices charged under the new contract were increased when compared to the previous contract, the cost benefit to be passed on to VSSC was indicated as per the rate fixed in February 2004/March 2005. Though VSSC accepted the escalated/revised price quoted by MIDHANI, it did not ensure commensurate increase in the rate of obtaining cost benefit from MIDHANI. Instead, it obtained the

cost benefit at an 11-year-old rate. This resulted in excess payment of ₹ 4.35 crore to MIDHANI under this contract as detailed in **Annexure-2.4**.

While admitting to the Audit point that MIDHANI continued to provide the same price reduction to VSSC, DOS stated (March 2022) that there is also a clause that MIDHANI shall not include depreciation and financing cost in its price. Reply is not acceptable. The exemption of depreciation and financial cost on prices however is a benefit provided by MIDHANI since the equipment is financed by DOS and this benefit is in addition to rate of cost benefit. The reply, however, was silent on the revision in cost benefit rates.

2.1.2.12 Undue benefit to contractors in cases of delayed deliveries

According to para 10.3 (5) (e) read with Para 10.3 (6) (c) of DOS purchase Manual, 2015 (Para 13.3.4 of DOS Purchase Procedure – October 2009 Seventh Edition) contracts with provision for advance payments shall invariably incorporate Liquidated Damage (LD) clause at the rate of 0.5 per cent for the undelivered portion of the order value per week subject to a maximum of 10 per cent. Rule 204 of GFR 2005 (Rule 225 of GFR 2017) further envisages that no price variation will be admissible beyond the original scheduled delivery date for defaults on the part of the supplier.

Audit test checked compliance to these provisions in eight out of 47 contracts (pertaining to items for which complete data was available) and found that VSSC either did not levy or under levied LD to the extent of ₹ 18.26 crore in spite of delays in deliveries attributable to the contractors. Further, VSSC fixed the maximum rate of recovery of LD as 2.5 per cent in two contracts and five per cent two more contracts, as against the prescribed rate of 10 per cent. VSSC did not incorporate LD clause in one contract. Audit further observed that VSSC paid ₹ 11.44 crore on account of price variation for the period of delay where in the delay was on the part of the contractor, in contravention to the GFRs. This resulted in undue benefit of ₹ 29.70 crore, as detailed in **Annexure-2.5**.

Thus, under levy/non-levy of liquidated damages and releasing payment on account of price variation for the period of delay on the part of contractors resulted in undue benefit of ₹ 29.70 crore to the contractors. Without furnishing specific reply to the eight cases observed in Audit, DOS furnished a general reply (March 2022) that LD recovery is done based on the percentage incorporated in the purchase order and appropriate approvals.

2.1.2.13 Idling of defective material

VSSC issued (November 2018) purchase order for the procurement of steel plates from M/s Jindal Stainless Hisar Limited at a cost of ₹ 1.59 crore, to be supplied as Free Issue Material (FIM) to the fabricators of PSO XL. Para 4 of the terms and conditions of the tender stipulates that the contractor shall guarantee the product for a period of 12 months after acceptance of the stores and defects discovered if any will be rectified by

the contractor at his own cost. Further, as per the terms of the purchase order issued to M/s Jindal, all sheets shall be ultrasonically inspected either at final product stage or intermediate stage, the dispatch shall be affected after obtaining pre-dispatch clearance from VSSC and after inspection of the plates in the presence of the VSSC engineers. Against the supply (July 2019) of plates, an amount of ₹ 1.40 crore was paid to the firm. FIM was supplied to three fabricators and processing charges of ₹ 35.26 lakh was reimbursed to them.

VSSC reported (November 2019) that the steel plates were rejected due to unacceptable low density inclusions in the material and consequently the material could not be put to use. Audit noticed that VSSC did not take action to obtain replacement for the entire defective material, as the supplier had provided replacement of only 64 fresh sheets worth ₹ 39.93 lakh. The remaining material worth ₹ 99.85 lakh[21] remained unutilised.

DOS stated (March 2022) that these sheets met all acceptance criteria but due to the low-density inclusions, they had been kept aside as a measure of abundant precaution. DOS added that additional tests are being carried out on this to ascertain its quality. The reply is not accepted, as the material supplied was not to the requirement of ISRO and remained unutilised.

2.1.2.14 Non stipulation of Maximum ceiling on Price Variation Clauses in contracts

In terms of Para 10.10 (h) (iv) of DOS Purchase Manual 2015 read with Rule 204 of GFR, 2005, the price variation clause should provide for a ceiling on price variations, particularly where escalations are involved. It could be a percentage per annum or an overall ceiling or both.

Audit scrutiny of 52 contracts revealed that while in 32 contracts there was no price variation clause, in 10 contracts[22], price variation clause was incorporated at fixed annual rate on cumulative basis. In remaining 10 contracts, price variation was incorporated using different formulae based on price indices. Further, there was no ceiling on price variations in these 10 contracts. Price variations to the tune of ₹ 11.70 crore were paid in four out of these 10 contracts. Price variations in remaining six contracts could not be arrived at due to inadequate information. The details are given in **Annexure-2.6.**

VSSC did not record reasons for not adopting uniform standard price variation clause and ceiling on price variations. Admitting the audit observation for future guidance and adoption, DOS stated (March 2022) that the price variation formula varies in different contracts, the essence of the formula is drawn from that stipulated in the GFR with minor variation. Reply of DOS is not acceptable. The department did not adopt

[21] ₹ 1.40 crore less ₹ 39.93 lakh
[22] Sl. Nos 2, 3, 6, 7, 8, 10, 13, 14, 17 and 20 of Annexure-2.6

unform standard price variation clause and ceiling on price variation as provided under DOS purchase manual and GFR.

2.1.2.15 Blocking of Government money in Advance payments to suppliers

(i) VSSC enters into various long-term contracts with private contractors for fabrication, testing and supply of various segments/components for the satellite launch vehicles. Scrutiny of 21 such long-term contracts revealed that while VSSC released huge advance payments to the tune of ₹ 127.83 crore on signing of the contracts, supplies commenced after a lapse of seven to 73 months from the date of release of advance, resulting in blocking of Government money for such periods. In 20 out of these 21 contracts, supply commenced only after 12 months from receipt of advance. The details are given in **Annexure-2.7**. The interest on this amount alone was to the extent of ₹ 36.53 crore[23]. Further, in 11 cases the advances were released in the last week of March, indicating poor budgetary management.

VSSC justified (March 2021) payment of advance to the time required by contractors in the delivery of the product, development of process, change in the design of the product, delay in supply of FIM and in conducting qualification tests. Without furnishing specific reply to the 21 cases observed in Audit, DOS furnished a general reply (March 2022) that the delay in delivery of the hardware is generally due to a new vendor development that has to realize tooling and process, or due to delay in FIM issue.

The reply is viewed in light of the fact that fabrication contracts are mainly labour intensive, as required facilities are established with support from ISRO and raw materials are supplied by VSSC as FIM. Thus, huge advances were blocked due to management issues at VSSC. As such, VSSC needs to manage the supply of FIM and process development and thereby bring about better financial management of the contracts. Further, in three cases, there was no provision for advance payment in the contracts and in another case, the supplier did not claim any advance amount.

(ii) VSSC issued (June 2016/October 2017) a purchase order on MIDHANI for the supply of six units of Titanium Alloy Sheets for PS4 Propellant Tank for ₹ 76.91 lakh. VSSC released (October 2017) advance payment of ₹ 20.94 lakh to MIDHANI however, the Tank was not supplied by MIDHANI as of March 2021. No action was taken by VSSC to obtain refund of the advance payment made.

VSSC stated (January 2020) that the existing facility at MIDHANI was not able to convert Titanium sponge to Titanium Plates. DOS added (March 2022) that a wider mill was under commissioning at MIDHANI. The fact remained that the advance payment remained blocked with the supplier for nearly four years.

[23] calculated at the rate of 10 per cent per annum which is three per cent above GPF interest rate of seven per cent.

2.1.2.16 Irregular Changes in the technical specification in the purchase of Aluminium Alloy

According to Rule 225 (xiv) 2017 the terms of the contract including the scope and specification once entered into should not be materially varied. Wherever material variation in any of the terms and conditions becomes unavoidable, the financial and other effects involved should be examined and recorded and specific approval of the authority competent to approve the revised financial and other commitments obtained before varying the conditions. All such changes should be in the form of an amendment to the contract duly signed by all parties of the contract.

Audit scrutiny of contract entered into between VSSC and M/s Kalapurna Steel (February 2018) revealed that against the ordered quantity of five types alloy sheets, the vendor offered alternate size different from the size of the purchase order with a discount ranging from 7.5 to 17 per cent. Audit observed that VSSC agreed to the revision proposed by the vendor without placing on record justification of how the alternate size would serve the intended purpose. Audit further observed that a formal amendment to the order was also not issued.

DOS stated (March 2022) that the discount offered by the party is reasonable. DOS added that Purchase order amendment proposal was duly discussed, reviewed and approved in detail by the purchase committee. However, the fact remains that the revision of the scope and specification is against the provisions of the General Financial Rules.

2.1.3 Conclusion

VSSC executed contracts for fabrication of motor cases, light alloy structures and steel structures for its various launch vehicle programmes without ensuring due diligence and strict compliance to the provisions of the DOS Purchase Manual. There were cases of single tender contracts continuing for prolonged periods of time. VSSC did not explore alternate vendors for these items, which resulted in loss of opportunity for competitive pricing.

There were non-following of the due process and codal provisions in procurement. Due to which there were avoidable and excess payments in the procurement of solid motor cases, strap on motors, light alloy structures and steel, avoidable payment of escalation due to undue time taken (15 months) in the finalisation of tender, irregular expenditure due to augmentation of facility without approval from Law Ministry, etc.

Audit also observed instances of poor contract management. Lack of better financial management of the contract resulting in loss of interest on receipt of royalty, loss due to non-revision of cost benefit, undue benefit to the contractors in delayed deliveries and idling of defective material, etc.

There were also instances of violation of provisions of the DOS Purchase Manual, due to lack of internal control such as price escalation not reporting to the contract

committee, irregular clubbing of requirements, inadequate indigenisation efforts, non-stipulation of maximum ceiling on price variation clauses in contracts, underutilisation of Titanium Sponge established at the premises of the third party, irregular changes in the technical specification of the purchase order, etc.

As such, VSSC may put in place a mechanism to ensure that provisions of the DOS Purchase manual are adhered to, before any decision to purchase is made.

2.2 Avoidable Investment of ₹ 28.09 crore

VSSC invested ₹ 28.09 crore for the establishment of a Pure Grade Sodium Chlorate Crystals Manufacturing plant at Travancore Cochin Chemicals Limited (TCC). The investment was avoidable since alternate suppliers were available in the market. Despite the investment in TCC, VSSC procured these Crystals from TCC at higher than market rate, resulting in avoidable excess payment of ₹ 3.23 crore.

Rule 160 of General Financial Rules 2005 (Rule 173 of GFR 2017) states that all government purchases should be made in transparent, competitive, and fair manner to secure best value for money. Contract should ordinarily be awarded to the lowest evaluated bidder whose bid has been found to be responsive and who is eligible and qualified to perform the contract satisfactorily as per the terms and conditions incorporated in the corresponding bidding document.

Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram, a unit of Indian Space Research Organisation of Department of Space (DoS) is responsible for the design and development of launch vehicle. VSSC procures Sodium Chlorate[24] for its launch vehicles. VSSC, citing uncertainty involved in the import of the material and ambiguity in the domestic market as only one indigenous source[25] was available, decided (March 2010) to establish a manufacturing plant for Sodium Chlorate in the campus of M/s Travancore Cochin Chemicals Limited (TCC), Kochi, a Government of Kerala Undertaking, at a cost of ₹ 28.09 crore. After approval for setting up the plant by DoS, VSSC entered an MoU with TCC in March 2010[26] which provided that VSSC would buy Sodium Chlorate crystals of 1000 MT per annum at the rate of ₹ 52587.25 per MT for 15 years from the date of commissioning of the plant (January 2014).

In this regard, audit observed the following:

a) There was no uncertainty involved in obtaining the material since there were identified Indigenous and foreign sources[27] available in the market at the time. VSSC

[24] Sodium chlorate is one of the basic raw materials (Launch Vehicle consumables) used for the manufacturing of ammonium per chlorate in VSSC Ammonium Perchlorate Experimental Plant at Aluva. Ammonium per chlorate is used as an oxidizer in the solid rocket motors of ISRO.

[25] Gujarat Alkalis and Chemicals Limited (GACL), Vadodara

[26] MoU was amended in May 2011, January 2013, and April 2014.

[27] VSSC was procuring space grade Sodium Chloride from different sources even prior to March 2010 (prior to entering into MoU with TCC) from indigenous sources (M/s Chemfab Alkalies, Puducherry and M/s Sree Chlorate Industries, Indore) and foreign sources through Indian Agents at the rate of ₹ 33442 to ₹ 42000.

carried out a survey to identify a manufacturer from its known three firms only. Hence, its decision to set up the plant at the of ₹ 28.09 crore was not based on facts about the supply of Sodium Chlorate crystals and was avoidable.

b) VSSC neither factored its investment of ₹ 28.09 crore at TCC while fixing the contract price of sodium chlorate crystals nor obtained any discount[28] from TCC. The establishment of the plant at the premises of one vendor and purchase commitment of 15 years with assured procurement of 1000 MT annually when other identified suppliers were available was against the provisions of GFR that Government procurements shall be from the lowest evaluated bidder.

c) The Member Finance[29] of the Space Commission had pointed out to VSSC (July 2016) that the procurement of the launch vehicle consumables on single tender basis, when alternate vendors were available in the market, was against financial provisions of the GFR that government purchase are to be from the lowest evaluated bidder. Member Finance had further reiterated that using different vendors with different prices for the supply of the same item is against the provisions of GFR and DoS was instructed to float limited tenders from the identified vendors with standard procurement conditions, subject to lowest prices being matched.

d) While the plant at TCC was operational in January 2014, the plant at Gujarat Alkalies and Chemicals Limited (GACL), a state PSU of the Government of Gujarat was also operational from March 2014 from which VSSC could have sourced the sodium chlorate at lower prices. Audit observed that during the period March 2014 to March 2021, sodium chlorate was available from the alternate vendors in price range of ₹ 39800 per MT to ₹ 48500 per MT[30]. However, due to its decision to set up the manufacturing plant, VSSC had to buy a total of 7900 MT from TCC at a much higher rate of ₹ 52587.25 thereby incurring avoidable excess expenditure[31] of ₹ 3.23 crore.

VSSC replied (Sept 2021) that in terms of MoU, VSSC is bound to buy 1000 MT annually from TCC. The reply of VSSC is not acceptable. Establishment of the plant was without following due process and did not ensure purchase at lowest price, which was contrary to the GFR provisions. Thus, even after investing ₹ 28.09 crore in the establishment of the plant, VSSC had to buy the material at a much higher cost from TCC.

DOS stated (Feb 2022) that a national survey was conducted in 2009 to find potential industries from three manufacturers. The committee assessed the potential and selected TCC as a long-term source. The reply is not acceptable as the National Survey conducted by VSSC was a limited one since the survey was from the three known sources only, out of which one (TCC) was selected. DOS further stated (Feb 2022) that TCC was the only available flight qualified indigenous assured source for the

[28] The MoU entered with TCC did not provide for any discount/credits to VSSC in the supply of Sodium Chlorate Crystals VSSC.
[29] Representative of Ministry of Finance
[30] M/s Chemstar Marketing Private Limited, Chennai at the rate of ₹ 41851.88 per MT and M/s Gujarat Alkalies, Vadodara at the rate of ₹ 39800 per MT from Aug 2017 and ₹ 48500 per MT from Nov 2019.
[31] 7900 MT x ₹ 4087.25 (₹ 52587.25 minus ₹ 48500) per MT

procurements done during the cited period (2014-21). The reply is not acceptable as TCC was not the only indigenous source during the period 2014-21. While the plant at TCC was operational in January 2014, the plant at GACL was also operational from March 2014 from which VSSC could have sourced the sodium chlorate. Further, VSSC was already procuring sodium chlorate from GACL also for the same purpose.

Although the establishment of plant at the cost ₹ 28.09 crore was avoidable however, VSSC should have sought discounted rate from TCC instead of paying of much higher rate than prevailing market rate which resulted in avoidable excess payment of ₹ 3.23 crore by VSSC in the procurement of sodium chlorate crystals.

2.3 Avoidable payment of Taxes and Duties of ₹ 69.02 lakh

Due to incorrect classification, VSSC incurred an avoidable payment of safeguard duty ₹ 26.37 lakh in the import of launch vehicle consumables. Further, VSSC also made an irregular payment of IGST amounting ₹ 42.65 lakh on the import of DC converters.

Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram a unit of Indian Space Research Organisation (ISRO) of the Department of Space (DOS) is responsible for the program for the design and development of launch vehicles. VSSC procures launch vehicle consumables from various agencies for this program. We examined selected purchase files during the audit of VSSC, PAO (Project) pertaining to the period 2017-19 and observed two instances of avoidable payment of safeguard duty and IGST as discussed below: -

(i) Avoidable payment of Safeguard Duty

A purchase order for the procurement of 1500 numbers of MOSFET (a type of solid-state Devices) amounting to USD 451500 (₹ 2.97 crore) was placed (May 2018) on M/s Irys Electronics Engineering Services Private Limited, Pune. These devices were received between August to December 2018 against the stipulated delivery of Feb 2019 and an amount of ₹ 3.69 crore was paid against the supply.

A duty called 'Safeguard duty' is levied to safeguard the domestic industry against the market disruptions due to increased import of an article to India. As per the customs Act[32] 'Safeguard Duty' (for the items manufactured in India) is payable for the item manufactured in India as per safeguard duty notification mentioned in Bill of Entry (BE). Further, Custom Notification No 01/2018 (SG) dated 30 July 2018 imposed safeguard duty on goods falling under the heading 8541[33] with effect from 30 July 2018.

Audit observed that while importing 497 numbers of MOFSET, pertaining to the order mentioned above, in August 2018, the custom housing agent of VSSC i.e. M/s Aspinwall wrongly classified the item under tariff '8541 1000' in Bill of Entry and an amount of

[32] Customs Notification No. 34/2002 dated 11 June 2002)

[33] Diodes, transistors and similar semi-conductor devices; Photosensitive semi-conductor devices, including photovoltaic cells whether or not assembled in modules or made-up into panels; Light emitting diodes; Mounted piezo-electric crystal

₹ 26.37 lakh was paid towards safeguard duty without any protest. The duty was paid despite the fact that safeguard duty is not payable for 'MOSFET' and the tariff item '8541 1000' was meant for imposing safeguard duty[34] on 'Solar Cells whether or not assembled in modules or panels and other such components'.

The matter was subsequently taken (July 2019) up by VSSC with customs authorities and a request for refund was filed as safeguard duty is not payable for 'MOSFET'. The customs authorities refused refund (March 2019) on the ground that; (a) importer (VSSC) opted for self-classification and self-assessment (b) custom housing agent of VSSC had misclassified the item in BE; and (c) the duty was paid without any protest. The request of VSSC (July 2019) was also rejected by Customs (Feb 2020) in its order. Thus, wrong classification of the item by the custom housing agency of VSSC had resulted in avoidable payment of safeguard duty of ₹ 26.37 lakh.

According to clause 9.9.2 of the Rate Contact entered by VSSC with M/s Aspinwall (June 2015), expenses incurred on losses occasioned on account of clearing agents negligence or failure have to be re-imbursed by the agent. On being pointed out by audit, VSSC claimed compensation (October 2021) of ₹ 26.37 lakh from the clearing agent, which has not been realised yet.

DOS replied (Feb 2022) that though an appeal (July 2019) filed with the Customs was refused (Feb 2020), a request for refund is now pending for personal hearing at customs end.

Thus, VSSC made a payment of ₹ 26.37 lakh as safeguard duty, which was avoidable.

(ii) Avoidable payment of IGST of ₹ 42.65 lakh

VSSC placed another purchase order in August 2017 for the procurement of Inter Point converters on M/s Irys Electronics Engineering Services Private Limited, Pune for ₹ 236.92 lakh. These converters are procured for fabrication of interface units of ISRO's launch vehicles (PSLV & GSLV). These converters were received in October 2017 and payment of ₹ 2.8 crore was released (December 2017) to the firm.

As per Custom Notification[35] No.50/2017 dated 30 June 2017, the raw materials and consumables required for launch vehicles; the integrated tax (IGST) leviable under section 5 of the Integrated GST Act, 2017 was 'Nil'.

Audit scrutiny of the import of these converters revealed that for the items received in October 2017, VSSC paid (December 2017) IGST at the rate of 18 per cent amounting to ₹ 42.65 lakh, even though IGST was not payable for the import of raw materials and consumables for the launch vehicles. Audit observed that VSSC did not obtain refund from the supplier, resulting in avoidable payment of IGST of ₹ 42.65 lakh. VSSC replied

[34] The notification No.01/2018-Customs (SG) dated 30 July 2018 imposes safeguard duty on "Solar Cells, whether or not assembled in modules or panels" falling under heading 8541 or tariff item 8541 4011

[35] Sl. No.539 of Table Annexed to the Notification

(October 2021) that for the 'electronic circuits' (HSN Code 8542) and 'electrical machines and apparatus' (HSN Code 8543) the applicable IGST is 18 per cent as per Custom Notification of June 2017. VSSC added that the IGST was reduced to five per cent in Custom Notification of Nov 2017.

Reply of VSSC is not acceptable as these converters are consumables used in launch vehicles. As per the custom notification of June 2017 (Sl.No.539 of the Table), the applicable IGST for the consumables required for launch vehicles is 'Nil'.

DOS replied (Feb 2022) that though the item is being directly imported by the supplier from its foreign principal against necessary custom duty exemption certificate, but IGST at 18 per cent was leviable as per the quote, since the sale from the supplier to VSSC was second sale. The Reply is not acceptable since the applicable IGST for the import of the item to the ultimate buyer (VSSC) was Nil. Further, the import of the item by the Indian Agent from its principal for VSSC being the ultimate buyer could not be treated as a second sale.

As such, the payment of IGST of ₹ 42.65 lakh was avoidable.

2.4 Non-utilisation of GSAT-6 Satellite

Department of Space launched the GSAT-6 satellite at a cost of ₹ 508 crore but was unable to utilise the satellite as envisaged due to non-readiness of the ground segment of the satellite. This resulted in non-utilisation of the satellite for nearly half of its life.

Department of Space (DOS) issued (December 2005) a financial sanction of ₹ 269 crore for undertaking the GSAT-6 satellite mission for providing Satellite Digital Multimedia Broadcasting (S-DMB) services for mobile communication applications as well as for strategic and societal applications. The operational life of the satellite was expected to be 12 years from August 2015. For commercial exploitation of the S-DMB services, M/s Antrix Corporation[36] had entered (January 2005) into an agreement with a private firm, M/s Devas Multimedia Private Limited. Due to issues in lack of transparency[37] in the Antrix-Devas agreement and citing the demand for strategic and societal applications, the Antrix-Devas agreement was terminated (February 2011) and subsequently, a revised utilisation plan was mooted (December 2013) for GSAT-6 satellite which was approved (February 2015) at a revised cost of ₹ 235 crore[38] for the satellite development (space segment) by DOS and ₹ 63 crore for the ground segment development to be borne by DRDO.

[36] A Public Sector Undertaking under DOS responsible for promoting and delivering space products and services from the Indian Space Programme.

[37] These issues have been brought out in the CAG's Audit Report no. 4 of 2012-13 on Hybrid Digital Satellite Multimedia Broadcasting Service Agreement with Devas.

[38] The cost estimate was reduced due to removal of the cost of insurance (₹ 34 crore) which was no longer relevant for strategic sector.

GSAT-6 had two main components; space segment[39] and ground segment[40]. Under the revised utilisation plan, it was proposed to utilise the space segment capacity for meeting communication needs of the strategic sector[41] and societal sector[42]. DOS was responsible for the space segment comprising of realising and launching the satellite. The Defence Research and Development Organisation (DRDO)[43] was responsible for ground segment with the technical support of DOS which consisted of development of hub station and associated network management.

Audit observed that under the space segment, the satellite which was proposed to be launched by DOS in the second quarter of 2014 was actually launched in August 2015 after a delay of more than one year. The reasons for delay were not on record.

Further, the ground segment of the satellite mission was to be carried out in two phases by DRDO. Audit observed that DOS did not enter into any Memorandum of Understanding (MoU)/ Agreement with DRDO for the development of the ground segment. It also failed to devise a target-based action plan, in consultation with DRDO. As a result, DRDO was not able to complete the activities of ground segment before the launch of the satellite (August 2015) as discussed below:

- Under Phase I, DRDO entrusted the completion of two projects to Defence Electronics Application Laboratory (DEAL) a unit under DRDO. The first project which was awarded in January 2013 involved development of S-Band Hub and satellite communication terminals. The project was completed after a delay of more than two years (January 2018). The second project sanctioned to DEAL in August 2013 involved development of a dedicated hub for providing services to the three services, civil society agencies and strategic users. This project was to be completed by January 2015 but was however, delayed by more than five years and completed only in July 2020. Reasons for the delayed completion of these two projects were, however, not furnished. An expenditure of ₹ 40.17 crore was incurred in phase of I of the ground segment.
- DoS was not aware about the present status of Phase 2 (operational phase) which involved the induction of GSAT-6 into the network centric operations of the three services, civil society agencies and strategic users.

Therefore, objective of GSAT-6 satellite which was launched in August 2015 after incurring an expenditure of ₹ 508 crore[44] was not fulfilled due to non-completion of the activities to be carried out under ground segment as the satellite has remained unutilised since its launch.

[39] The satellite itself
[40] Consists of fixed or mobile transmission, reception, and ancillary equipment
[41] Defence and Paramilitary forces
[42] Disaster Management Support and Indian Railways
[43] The Research and Development wing of Ministry of Defence.
[44] Comprising of ₹ 232 crore towards the satellite and ₹ 276 crore towards the launch vehicle

Audit observed a lack of coordination between the activities of DOS and DRDO. Though the satellite was launched in August 2015, even the first phase of the ground segment was not completed until July 2020. As the architect of the GSAT-6 mission, DOS did not ensure that the systems required for successful implementation of the mission were available and were utilised.

DOS stated (March 2021) the ground station established by DEAL was verified by DOS (November 2015) and cleared for operationalisation. DOS added (November 2021) that the department has optimally used 20 per cent of the capacity in its societal applications and research projects. DOS, however, admitted (March 2021) that the present status of the operationalisation and utilisation of the ground station was not available with the Department. Thus, DOS was not aware of the utilisation of the balance 80 per cent capacity of the satellite.

The reply corroborates the audit observation that there was a lack of coordination between DOS and DRDO for the successful realisation of the mission. As a result, the satellite has remained largely unutilised since its launch. This is particularly significant, as half of the operational life of the satellite has already been spent idle.

2.5 Irregular expenditure of ₹ 7.57 crore towards development of Sullurupeta

Department of Space approved the proposal of Satish Dhawan Space Centre for taking up of work related to development of Sullurupeta beyond its mandate which resulted in irregular expenditure of ₹ 7.57 crore.

Satish Dhawan Space Centre, Sriharikota (SDSC-SHAR) is one of the major centres of the Indian Space Research Organization (ISRO) under Department of Space (DOS). SDSC-SHAR, Sriharikota is the rocket launch site of India and located adjacent to Sullurupeta town in Andhra Pradesh and there are frequent visits of VVIPs to SDSC-SHAR/ Sullurupeta town at the time of launches. According to Government of India)Allocation of Business(Rules, 1961; the Department of Space (DOS) shall execute the works debitable to the budget of Department of Space.

Audit scrutiny revealed that SDSC-SHAR, in May 2013, proposed to take up the works of 'Local Area Development of Sullurupeta[45] Municipality and adjoining area of SDSC-SHAR'. This was based on the request (Aug 2011/January 2013) received from Collector and District Magistrate of Nellore district[46], and Municipal Commissioner of Sullurupeta Municipality, Government of Andhra Pradesh. Two works were proposed to be taken up

[45] Municipality of Sullurupeta is the gateway to SDSC where majority of the employees of SDSC, SRICITY and Mambattu Special Economic Zone are settled.
[46] officially Sri Potti Sriramulu Nellore district

by SDSC-SHAR at Sullurupeta viz, (1) Improvements to RTC[47] Bus stand and lighting system (2) Improvements to Drainage System and were approved by DOS in June 2013.

Further, audit scrutiny showed that SDSC also proposed to take up the work 'Construction of New Vegetable Market at Sullurupeta', based on requests (Jan/November 2015) received from the MP of Tirupati, MLA of Sullurupeta, and Sullurupeta Municipality. This was approved by Department of Space in July 2016. The fourth work, 'Development of Earthen approach road from Kammakandriga to SHAR pumping station at Taniyali DV Sataram Mandal' was approved subsequently in September 2016.

All these four major works were approved by DOS at an initial budget estimate of ₹ 6.01 crore which was revised to ₹ 7.88 crore. The Construction and Maintenance Groups/ Divisions (CMG/ CMD) of DOS, which executes the works of DOS undertook these four works and completed them after a total expenditure of ₹ 7.57 crore from the head of account -- Capital Outlay on Space Research, Space Technology, Satish Dhawan Space Centre- SHAR, Major works[48].

As per Government of India)Allocation of Business(Rules 1961, the Department of Space shall execute the works debitable to the budget of Department of Space. With reference to the works executed above, the expenditure of ₹ 7.57 crore was debited to the budget of DoS, despite these not being related to the mandate/functions of DoS. The works undertaken by SDSC-SHAR and approved by DoS were in the nature of development works/creation of assets/ major improvements in existing assets in Sullurupeta Municipality. The developmental works of the Sullurupeta Municipality and adjoining areas of SDSC are the responsibly of the Municipality and agencies of the Government of Andhra Pradesh and any expenditure incurred on developmental work should have been debited to their account.

Thus, DOS approved the proposal of SDSC-SHAR for taking up of work related to development of Sullurupeta beyond its mandate which resulted in irregular expenditure of ₹ 7.57 crore.

SDSC-SHAR replied (June 2019) that according to clause 5 of Allocation of Business Rules; all matters relating to the personnel of DoS are under the control of the Department. SDSC added that the activities, though undertaken for the public of Sullurupeta, would benefit the SDSC community of around 2000 families residing in three residential colonies in Sullurupeta. SDSC further stated that the work was done with the requisite approval of the DoS. DoS replied in January 2022 that though the works appear to be

[47] Road Transport Corporation
[48] 540200101.17.00.53

local development of Sullurupeta and surrounding areas of SDSC-SHAR, in true sense, all the said works were carried out in the greater interest of SDSC-SHAR and its employees.

The reply is not acceptable as the mandate of Department of Space is to accord approval for taking up works debitable to 'Department of Space/ Space Research' budget. Similarly, the mandate of the civil engineering division of SDSC is to undertake the work debitable to 'Department of Space/ Space Research' budget which are part of SDSC Assets; and not to undertake the 'local development' work of Sullurupeta and adjoining area.

CHAPTER – III

Department of Biotechnology

3.1 Management of Projects under Medical Biotechnology Programme

The Department of Biotechnology did not effectively manage the execution of its Medical Biotechnology programme. Critical processes such as assessment of project proposals, ensuring compliance to mandatory safety protocols, periodic monitoring of projects and timely evaluation of all completed projects was not done. The number of publications in high impact journals was very low, indicating poor quality of the projects. Financial management needed to be improved. Even after disbursement of ₹ 1203.40 crore on projects under Medical Biotechnology Programme, only one patent has been granted with no technology transfer, indicating poor planning and outcomes of the projects for translational research in the area of improving human health and wellness.

3.1.1 Introduction

The Department of Biotechnology (Department) was set-up under Ministry of Science and Technology to achieve excellence in the promotion of biotechnology in the country with the mandate, inter alia, to promote large scale use of biotechnology, support to research and development (R&D) and manufacturing in biotechnology. Medical Biotechnology is a programme through which the Department provides grants-in-aid to various agencies for R&D projects in the areas of biomedical engineering[49]; human developmental and disease biology; human genetics and genome; infectious and non-infectious diseases; stem cell biology; vaccine research and diagnostics; RNA technology; HIV AIDS and microbicides; neuroscience and public health, food and Nutrition. Emphasis is to be placed on building a skilled workforce as well as undertaking technology-oriented research aimed at improving lives and living of millions.

During 2012-17 Department sanctioned 793 projects and disbursed total grant of ₹ 1,203.40 crore under different sub-programmes of the medical biotechnology programme. We audited 155 projects[50] under various components of the medical biotechnology programme, which were sanctioned during 2012-17 to assess the project approvals, their implementation including the outcome, financial management

[49] *Biomedical engineering* is the application of the principles and problem-solving techniques of engineering to biology and medicine.

[50] All the selected projects were considered as completed projects corresponding to their sanctioned duration. Among these projects only 1 (one) project was 'foreclosed' due to undue delay in implementation.

and monitoring. Our findings on these aspects are discussed in the following paragraphs.

3.1.2 Project approvals

A. Absence of Peer Review recommendation on project proposal

The project proposal is to be sent to external experts in related field of research for peer review. We observed that in 41 (26 per cent) projects out of 155 projects, no peer review by the external experts was done. This significant gap indicates lack of expert guidance on the usefulness and viability of these projects, before these projects were taken up.

The Department in its reply (April 2022) stated that all projects are sent for peer review but on several occasions, no comments are received. As the project review process is time-bound, the projects are subsequently discussed and recommended, based on comments of the Technical Expert Committee/ relevant Program-specific Committee.

The reply is not acceptable, as the Department had bypassed the mandatory peer review process for evaluation of the project proposal before submitting the same to Expert Committee/Task Force. As such, the department had no expert guidance on the viability/usefulness of these projects.

B. Non-obtaining of Statutory Clearances

Medical biotechnology research project involving hazardous microorganisms, experiments on animals, participation of human beings, stem cell related research activities, etc., require certain statutory approvals before commencement. We observed in many of the selected projects, these prior approvals were not submitted by the project implementing agencies, as shown in **Table-3.1.**

Table 3.1: Statutory approvals for projects

Sl. No.	Nature of approval	No of projects in which approval not obtained
1.	Breeding of and Experiments on Animals (Control and Supervision) Rules, 1998[51] requires that an Institutional Animals Ethics Committee be constituted for the purpose of control and supervision of experiments on animals performed in an establishment[52].	13
2.	National Ethical Guidelines for Biomedical Research, 2006 requires that institution carrying out research activities involving human participants to	14

[51] Experimentation on animal in the course of medical research and education is covered under provisions of "Prevention of Cruelty of Animal Act, 1960".

[52] To secure that every experiment on animals should be performed by and under supervision of a person duly qualified in that regard and with due care and humanity. Institutional Animals Ethics Committee (IAEC) reviews and approves all types of protocols for research involving small animal experimentation before the start of research.

Sl. No.	Nature of approval	No of projects in which approval not obtained
	establish an Ethical Committee[53] for ensuring an appropriate and sustainable system for ethical reviewing and monitoring.	
3.	Rules, 1989[54] for the manufacture, use/import/export and storage of hazardous microorganisms/ genetically engineered organisms or cells requires establishing an Institutional Bio-safety Committee for ensuring all activities are compliant with these rules.	13
4.	National Guideline for Stem Cell Research, 2013 requires institutes engaged in stem cell research to establish an Institutional Committee for Stem Cell Research to ensure that review, approval, and monitoring of all research projects in the field of stem cell research is done rigorously and effectively.	3

Audit observed that the Department approved these projects without ensuring that the mandatory pre-requisites had been fulfilled by the project implementing agencies. As such, the Department had no assurance that the projects would be implemented with due regard to ethical principles for animal and human trials or safety of the researchers who would handle hazardous microorganisms.

The Department stated (April 2022) that the host institutions are advised to follow the statutory guidelines and obtain the necessary clearances, as applicable while sanctioning the project. The sanction order incorporates clauses to that effect, to ensure compliance by the host institutions. The reply is not tenable, as mere incorporation of clauses in sanction order is not enough to monitor ethical principles by the implementing agencies. Violation of ethical principles would lead to vitiating the project result, leading to unviability of the project.

3.1.3 Project Implementation

The primary objective of the programme was technology-oriented research along with building a skilled workforce to meet the national requirements. However, we observed significant gaps in implementation of these projects against the set objectives. Some of these issues have been discussed below:

3.1.3.1 Development and Commercialization of technologies

National Biotechnology Development Strategy (2015-20) of the Department stressed on innovation for socially relevant biotech products with primary thrust on

[53] It is required for all research proposals on biomedical, social and behavioral science research for health involving human participants, their biological material and data to be reviewed and approved by the appropriately constituted EC to safeguard the dignity, rights, safety and well-being of all research participants.

[54] Rules for the manufacture, use/import/export and storage of hazardous microorganisms/ genetically engineered organisms or cells, 1989 (commonly referred as Rules, 1989) notified by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India under the Environment (Protection) Act (1986).

translational research[55] and commercialization of technologies. Biotechnology Patent Facilitation Cell (BPFC) was established (July 1999) by the Department to bridge the gap between the research outcome and its use for the benefit of the stakeholders by facilitating patent filing through BPFC on priority basis.

We observed that out of 107 projects in which project completion reports were submitted, 16 provisional patents were filed in 11 projects, of which only one[56] patent had been granted. Further, only two[57] patents were filed through BPFC which indicates the sub-optimal usage of the facilitation centre.

The Department stated that BPFC was set up to facilitate the patent filing process for patents and its use is not mandatory. The reply is not acceptable, as the Department established BPFC with an aim to provide a single window awareness-cum-facilitation mechanism about Intellectual Property Rights (IPRs) among the scientists and researchers. Non usage of BPFC would lead to the Department being unaware of development in the area of IPRs and thus, unable to bring important issues to the attention of policy makers, scientists, biotech industries etc.

Further, the Department was silent about the poor rate of success of patents filed from projects. Since this was a major thrust area, the Department's lack of success in this area would impact its emphasis on translational research. Non commercialisation of technologies also had a direct impact on broader objectives of the scheme for promoting technology-oriented and translational research in the area of human health and wellness.

3.1.3.2 Publications

Impact Factor (IF)[58] is generally used as an indicator to evaluate the relative importance of a journal in its field. In most of the scientific fields, impact factor of 10 or more is considered excellent.

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[55] Translational research is research aimed at translating results in basic research into results that directly benefit humans.

[56] One American patent in the project "Translational Research on root knot Nematode tolerant RNAi transgenics based on vital parasite gene targets from validation to proof-of concept to selection of event (s) in the field under confined conditions".

[57] (i) One Indian patent in the project "Translational Research on root knot Nematode tolerant RNAi transgenics based on vital parasite gene targets from validation to proof-of concept to selection of event (s) in the field under confined conditions. (ii) One American patent in the project "Translational Research on root knot Nematode tolerant RNAi transgenics based on vital parasite gene targets from validation to proof-of concept to selection of event (s) in the field under confined conditions.

[58] The **impact factor (IF)** is a measure of the frequency with which the article in a journal has been cited in a particular year. The calculation is based on a two-year period and involves dividing the number of times articles were cited by the number of articles that are citable. **Calculation of 2010 IF of a journal:** A = the number of times articles published in 2008 and 2009 were cited by indexed journals during 2010. B = the total number of "citable items" published in 2008 and 2009. A/B = 2010 impact factor

We observed that in 20 projects, no publications were made in any peer reviewed journal[59]. In 66 projects a total number of 261 publications were made in peer reviewed journals out of which IF of 242 publications were available. Analysis of the IF of these 242 publications is given in **Table-3.2**:

Table 3.2: Impact factor of publications

IF Range[60]	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	>11	Total
Number of Publication	16	23	46	56	43	23	15	02	06	07	00	05	242
Percentage	07	10	19	23	18	10	06	01	02	03	00	02	--

It can be seen from the table that only five publications had an IF of more than 10, whereas 75 per cent of publications were made in journal of IF less than five which indicates less quality of evaluation of research work.

The Department stated (April 2022) that publications in high Impact Factor journals, although desirable, is not essential as the same is dependent on a number of variables and IF is just one of the measures to assess the quality of the journal and may not necessarily be indicative of the quality of the work. The reply should be viewed in the light of the fact that major achievements of a scientific research organisation are reflected in its research publications. High impact factor journals are usually considered more prestigious than lower-impact journals, subsequently**,** Impact factor indicates standing of the journal in the world and is indicative of the quality of research outputs.

3.1.4 Financial management of projects

3.1.4.1 Non-adherence of timeline for final settlement of account

The norms for Extramural research Projects funded by the Department stipulate (July 2015) that on acceptance of the Project Completion Report, the Final Settlement of Accounts (FSA) of the project is to be completed within nine months from the completion of project. Further, terms and conditions of grants stipulated that in case the whole or a part of the amount of grants-in-aid is being refunded, an interest at the rate of 10 per cent per annum thereon shall be recovered.

In 142 projects, the final settlement of accounts was either not done or had been done after nine months from completion of project. In 91 percent of projects, the Department could not adhere to stipulated timeline for final settlement of accounts. Thus, the Department did not assess total amount remained unspent, if any, with the implementing agencies, which should be recovered with interest.

[59] A peer-reviewed publication is also sometimes referred to as a scholarly publication. The peer-review process subjects an author's scholarly work, research, or ideas to the scrutiny of others who are experts in the same field (peers) and is considered necessary to ensure academic scientific quality.

[60] Impact factor of 10 or greater is considered as 'excellent'. Similarly, score of 3 is flagged as 'good' and score of less than 1 is considered as 'average' (source: https://manuscriptedit.com/scholar-hangout/good-impact-factor-journal)

The Department stated (April 2022) that the final settlement of accounts (FSA) is a financial process which is often delayed for want of documents such as Utilization Certificate, Statement of Expenditure, Manpower Statement, Asset Acquired Certificate etc. from host institutes. Audit is of the view that total amount remained unspent, if any, after completion of project must be assessed in time and recovery of such amount should be made as per terms and conditions of grants.

3.1.4.2 Re-appropriation between Revenue and Capital

According to the provisions of GoI's decision (4) below Rule 10 of the Delegation of Financial Power Rules (DFPR), 1978, in the same Demand for Grants, savings in the funds provided in Revenue Section are not available for re-appropriation to meet additional requirements in the Capital Section or vice versa.

In 55 projects, re-appropriation from Capital Head to Revenue Head was done by the Department in violation of above said Rules as shown in **Table-3.3**.

Table 3.3: Re-appropriation from Capital Head to Revenue Head

Year	No. of Re-appropriation	Amount. (₹ in lakh)
2013-14	05	01.628
2014-15	11	05.539
2015-16	11	16.027
2016-17	15	41.759
2017-18	10	08.022
2018-19	03	09.965
Total	**55**	**82.94**

Thus, the sanction and expenditure of ₹ 82.94 lakh was irregular, and no action was taken to regularize these re-appropriations by the Department.

The Department stated (April 2022) that re-appropriation of funds was done with the concurrence of Department's - Integrated Finance Division (IFD). The reply is not tenable, as approval of Ministry of Finance is required for re-appropriation of funds from Capital to Revenue Heads.

3.1.5 Project Monitoring

3.1.5.1 Non monitoring of project at required intervals

The Task Force/Project monitoring Committee[61] of the Department was to monitor the project at least once in a year. The Department was also to designate experts to visit the implementing agencies periodically for reviewing the progress and for suggesting

[61] The Task Force/Project monitoring Committee/TEC had been constituted with a composition of one chairperson, one co-chairperson, having 8-10 members of the respective field and a member secretary from Department. Generally, TEC evaluate the proposal for taking them to next stage i.e., short listing of proposal for presentation, recommending projects to STAG committee for consideration. It also review /monitor ongoing, completed projects with total sanctioned budget up to ₹ 5.00 crore.

measures for early realisation of project objectives. We observed that these conditions were not fulfilled in many projects, as discussed below.

Implementing agencies of all the 155 projects did not submit half-yearly project progress reports to the Department. Instead, the progress reports were submitted annually, which was not in accordance with the terms and conditions of the grants. The Department stated (November 2019) that as per normal practice, progress of almost all projects were monitored on yearly basis. The reply is not acceptable, as the terms and conditions of the grants required that progress reports be submitted on half yearly basis, which were to be reviewed by the Department at least once in a year. Delayed monitoring has consequential effect in achieving the project outcome and does not leave any scope for course correction.

We further observed that Department did not conduct site visits in any of these 155 projects. Department stated (in April 2022) that site visits are also carried out based on the specific recommendations of the Expert Committee during review of the progress of the projects. However, the Department could not provide any documents in support of site visits carried out. As such, due to lack of timely monitoring, the department was unable to undertake course corrections, or provide feedback to the working of the projects.

3.1.5.2 Evaluation of completed projects

The norms for Individual Centric Extramural Research Projects (July 2015)[62] funded by the Department stipulate that on conclusion of project, Project Completion Report (PCR) is to be submitted by Project Investigator (PI) within six months from the completion of the project. Task Force or Expert Committee is required to complete the evaluation of the PCR within nine months from the completion of project. We observed that:

(i) In 47[63] projects PCRs were not submitted by the implementing agencies after completion of project due to which the final outcome of project was not evaluated.
(ii) Of the 107 projects in which PCRs were submitted to the Department, no evaluation was carried out by the Task Force/Expert Committee in 34 projects. Consequently, performance of these projects was not assessed.
(iii) The Task Force or Project Monitoring Committee of the Department is required to evaluate the PCRs received from the implementing agencies[64] and assign grading in five categories on the basis of performance of the projects. For 107 projects, PCRs were received by the Department. Of these, Department evaluated the performance of 73

[62] Department OM No. BT/2/2015-IFD dated 14.07.2015 sl. no. (XII)(d)
[63] Excluding one project titled "Cluster randomised controlled trial of home-based modified existent practices vs home based Ready to Use Therapeutic Food (RUTF) for management of uncomplicated Severe Acute Malnutrition in Indian urban" was foreclosed. Total duration of the project was 3 years and the project was foreclosed after 2 year of commencement due to undue delay in implementation of the project.
[64] As per terms of reference of the Technical Expert Committee.

projects but assigned grading in 62 projects only. The grading assigned by task force on the performance of these projects is shown in **Table-3.4**.

Table 3.4: Evaluation of projects by Department

Grading	No. of Projects	Percentage
Outstanding/Excellent	08	05
Very Good	12	07
Good	13	08
Satisfactory	28	18
Not satisfactory	01	01

From the table it can be seen that only five percent of projects were outstanding while almost 18 percent of the total 155 projects performed satisfactorily and in 15 per cent projects (i.e., 11 projects out of 73 evaluated projects) the quality of project output could not be ascertained.

The Department stated (April 2022) that in some cases, the compilation and interpretation of the findings take time which may result in delay in submission of the completion report. The reply is not tenable as the Department should ensure timely submission of PCRs from implementing agencies to avoid delay for evaluation of the completion report. Lack of PCRs would inhibit the department from assessing the quality of the research projects.

3.1.6 Conclusion

Department of Biotechnology undertakes the Medical Biotechnology Programme with the aim of promoting technology-oriented/translational research in the area of human health and wellness. Audit observed deficiencies in the management of projects sanctioned by the Department under this programme. Many projects were sanctioned for implementation without ensuring compliance to prescribed procedures such as review of project proposals by experts and observance of mandatory protocols for undertaking such research. The progress of projects was not monitored half yearly, as stipulated. Of the 154 completed projects sampled in audit, completion reports were received for only 107 projects, of which the department was able to assess only 73 projects.

The overall outcomes of the projects were also not found to be commensurate with the envisaged objective of the programme. From the 155 sampled projects, only 1 patent was obtained. By the Department's own assessment, only 12 per cent (of the project assessed by the Department) were graded as outstanding/very good. In this scenario, achievement under the Medical Biotechnology programme fell short of the objective of fostering technology-oriented/translational research in the area of human health and wellness.

Audit also observed deficiencies in financial management of the sanctioned projects. There were delay in final settlement of the accounts of completed projects and irregular re-appropriation of project grants to the extent of ₹ 82.94 lakh.

Incomplete assessment of project proposals and irregular monitoring of ongoing projects vitiated the responsibility of the Department towards ensuring that only the most viable projects having a potential for significant outputs were sanctioned and implemented. Lapses in these key processes led to adverse impact on the outcomes from the projects.

Due to deficiencies in project management and poor monitoring, despite incurring ₹ 1203.40 crore on projects under the scheme, the broader objectives related to improvement of human health and wellness through translational research could not be achieved.

CHAPTER – IV

Department of Scientific and Industrial Research

4.1 Irregular grant of incentives and allowances

Council of Scientific and Industrial Research granted incentives viz. Special Pay, additional increments, and Professional Update Allowance to Scientists without obtaining the approval of the Ministry of Finance. The financial implication of the payment of irregular Professional Update Allowance alone was to the extent of ₹ 54.60 crore.

Rule 4(2)(c) of the Transaction of Business Rules, 1961 states that unless a case is fully covered by powers to sanction expenditure conferred by any general or special orders made by the Ministry of Finance (MoF), no Department shall, without the previous concurrence of MoF, issue any orders relating to pay & allowances of Government servants or any other conditions of their service having financial implication. In respect of Autonomous Institutions, the Governing Bodies may exercise powers up to the limit of powers enjoyed by the Administrative Ministry/Department concerned, except with regard to creation of posts[65].

The Council of Scientific and Industrial Research (CSIR), an autonomous society under the Department of Scientific and Industrial Research (DSIR) granted incentives and allowances to its employees in contravention of the extant rules and orders, as discussed in the following paragraphs.

MoF conveyed (January 2001) approval to a proposal submitted by CSIR for grant of incentives to the Scientists (Group IV) viz., Special Pay of ₹ 2,000 per month[66], two additional increments[67] and Professional Update Allowance (PUA) of ₹ 5,000 per annum[68] on the pattern of those approved for Defence Research and Development Organisation (DRDO). The approval of MoF was subject, inter alia, to the condition that the additional financial implications on account of the incentive scheme would be met by CSIR from their own resources. Accordingly, the Governing Body of CSIR approved (February 2001) granting of these incentives to the Scientists in Group IV.

While implementing the recommendations of the Sixth Central Pay Commission, CSIR approved (November 2008) the continuation of the above incentives to Scientists (Group IV) in the revised pay structure and enhanced the rates of Special Pay to ₹ 4,000

[65] Department of Science and Technology OM No. AI/Misc./002/98 dated 27 January 1999 on Guidelines for enhancement of functional autonomy of R&D Autonomous Institutions under the S&T Departments/Institutions.
[66] To Scientists (Group IV) in the pay scale of ₹ 18,400-22,400
[67] To Scientists (Group IV) in the pay scales of ₹ 10,000-15,200, ₹ 12,000-16,500, ₹ 14,300-18,300 and ₹ 16,400-20,000 after their normal pay fixation.
[68] To all Scientists (Group IV)

per month and PUA to ₹ 10,000 – 30,000 per annum[69]. No further revision was done after implementation of the recommendations of the Seventh Central Pay Commission. During the period from 2009-10 to 2019-20, CSIR Hqrs and its 40 laboratories incurred expenditure amounting to ₹ 54.60 crore towards payment of PUA to their Scientists (Group IV). The expenditure incurred on Special Pay and grant of two additional increments was not available with CSIR Headquarters, as these were accounted under the Salary head of the respective laboratories.

Audit noticed that CSIR approved the incentives under the revised pay structure after the Sixth Pay Commission recommendations (2008) based on similar orders issued by DRDO for their Scientists. Audit however, observed that DRDO along with the Departments of Space and Atomic Energy had specifically sought the approval of MoF for continuation of these incentives and MoF had granted the same only to these three Departments. CSIR adopted these incentives under the revised pay structure without obtaining the approval of MoF, which was in contravention of the extant rules, thereby resulting in irregular grant of incentives. Audit further observed that the expenditure incurred by CSIR towards these incentives were not met out of the own resources of CSIR but were charged to grants-in-aid received from the Government.

CSIR stated (July 2021) that CSIR paid the Professional Update Allowance to its Scientists on the pattern of DRDO and with the proper approval from Govt. of India, Ministry of Finance. The reply is not acceptable, as the incentives were approved by MoF specifically for DRDO and the Departments of Space and Atomic Energy and were not applicable to CSIR. As such, CSIR needs to recover the amount paid to the employees towards these incentives.

CSIR further stated (November 2021) that note would be sent to MoF for concurrence and its approval before implementing the revised rate of Professional Update Allowance to CSIR scientists. The para was issued to the Department (March 2021), however, no response has been received (May 2022).

[69] ₹ 10,000 per annum for Scientists in PB-3 with Grade Pay of ₹ 5,400, ₹ 6,600 and ₹ 7,600; ₹ 20,000 per annum for Scientists in PB-4 with Grade Pay of ₹ 8,700 and ₹ 8,900 and ₹ 30,000 per annum for Scientists in PB-4 with Grade Pay of ₹ 10,000 and ₹ 12,000 and above.

CHAPTER – V

Ministry of Environment, Forest and Climate Change

5.1 Assistance to Botanic Gardens Scheme

The scheme 'Assistance to Botanic Garden (ABG)' undertaken by Ministry of Environment, Forest and Climate Change and implemented through Botanical Survey of India (BSI) at the cost of ₹ 48.07 crore could not achieve the targets of *ex-situ* conservation and multiplication of threatened and endemic plants. Due to non-multiplication of targeted plant species, the same could not be distributed to other organisations for re-introduction. The lead botanic gardens and botanic gardens could not form network with each other and as a consequence, the gardens failed to generate knowledge and exchange plant materials of the species. Moreover, the conserved plant species could not be rehabilitated in natural habitats in collaboration with the State Forest Departments. The gardens also failed to develop propagation techniques which affected the conservation efforts. Thus, the objective of conserving threatened plant species to avoid the threat of extinction of the species by means of the ABG scheme remained largely unfulfilled.

5.1.1 Background and Introduction of the Scheme

In May 1992, Convention on Biological Diversity (CBD) was adopted in the United Nation's (UN) Nairobi Conference. This Convention was in response to the growing concern regarding extinction of biological resources caused by human activities and the need for its conservation, sustainable use and for the recognition of biological diversity as global assets**.** On 05 June 1992, India became a signatory to the CBD, which came into effect on 29 December 1993. With the purpose of conservation of biological diversity, Government of India identifies and maintains the databases of the extinct species as per the guidelines of International Union for Conservation of Nature (IUCN)[70] .

According to the Article 6 of the CBD, the signatory States shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt the existing strategies, plans or programmes. Further, Article 9 ibid states that governments are to establish and maintain facilities for research on plants, animals and micro-organisms and to recover and rehabilitate the threatened species for their re-introduction into natural habitats. Article 9 also states that governments need to regulate and manage collection of biological resources from natural habitats

[70] IUCN was established on 5 October 1948. As the first global environmental union, it brought together governments and civil society organisations with a shared goal to protect nature. The IUCN classifies species on the basis of their extinction/conservation status as extinct (EX), extinct in the wild (EW), critically endangered (CR), endangered (EN), vulnerable (VU), near threatened (NT), least concern (LC), data deficient (DD) and not evaluated (NE)

for ex-situ[71] conservation purposes so as not to threaten ecosystems and in-situ[72] populations of species.

A scheme of "Assistance to Botanic Gardens (ABG)" was introduced in 1992[73] to promote ex-situ conservation and propagation[74] of threatened and endemic plants through a network of Botanic Gardens (BGs) and Centres of ex-situ conservation. The original guidelines of the ABG scheme were issued in July 2007. Subsequently, the guidelines were revised in May 2013 with more focus on ex-situ conservation of threatened plants. The revised guidelines lay an emphasis on the importance of biodiversity conservation in the wake of India's commitment to CBD. It was to be implemented by the Ministry of Environment, Forest and Climate Change (MoEF&CC), the nodal agency in the administrative structure under the Government of India for the planning, promotion, co-ordination and overseeing the implementation of India's environmental and forestry policies and programmes.

Under the Assistance to Botanic Gardens (ABG) scheme, a network of botanic gardens/botanic sections was envisioned in popular horticulture or thematic gardens[75] all over the country and thereby cover 40 per cent of the civil districts of the country by the end of the 12th Five Year Plan. Financial assistance was provided to various botanic gardens through this scheme for the promotion of *ex-situ* conservation and propagation of threatened and endemic plants of the country through a network of Botanic Gardens (BGs) and Centres of *ex-situ* conservation with the following main objectives:

- *ex-situ* conservation and multiplication of Threatened and Endemic[76] plants
- establishment of seed banks (short term), arboreta[77] and mist propagation facilities[78]
- reintroduction and rehabilitation of said plants in natural habitats in collaboration with State Forest Departments.

[71] Ex-situ conservation is an 'off site' conservation policy that involves a couple of techniques linking the transfer of an objective species, experiencing various threats, away from its native habitat to a much safer abode, like in a Botanical Garden, Zoological Garden, Seed Bank or Gene Bank etc.
[72] In-situ conservation is the on-site conservation or the conservation of genetic resources in natural populations of plant or animal species.
[73] Scheme was launched in 1992 and the scheme guidelines was revised in May 2013, which draws reference to the CBD.
[74] The controlled perpetuation of plants in horticulture practices. Its two objectives are to achieve an increase in numbers and to preserve the essential characteristics of the plant.
[75] Thematic gardens are unique places where all the elements support a single purpose. In other words, it's a garden where every plant fits into one particular theme. There are total 279 gardens under the scheme to whom the financial assistance was given since inception upto March 2021 for promoting ex-situ conservation by forming a network.
[76] Endemic species are the plants that exist only in one geographic region
[77] Botanical collection composed exclusively or very largely of trees of a variety of species.
[78] Mist propagation is the professional way of rooting cuttings and germinating seedlings. Combined with bottom heat for a warm root system, the mist propagation keeps the leaves of the plants cool and moist.

Ministry decided in December 2012 that Botanical Survey of India (BSI)[79] would be the implementing agency for the Scheme "Assistance to Botanic Garden". Besides headquarters at Kolkata, there are 11 circle offices in Itanagar, Shillong, Gangtok, Allahabad, Solan, Dehradun, Jodhpur, Pune, Hyderabad, Coimbatore and Port Blair.

The total sanctioned amount of the scheme was ₹ 48.07 crore since inception (1991-92) up to March 2021, out of which ₹ 10.07 crore was disbursed after 2013. However, the amount of expenditure incurred during the said period could not be furnished by BSI**.** Grants were given to 279 Botanic gardens of BSI as well as other gardens and Centres functioning under other organisations for *ex-situ* conservation since inception to March 2021. Out of 279 Botanical Gardens and Centres which received grants, 20[80] were Lead Botanic Gardens (LBGs) which were attached to Institutes/Organizations in each phyto-geographic[81] zone. While Botanic Gardens (BGs) with a threshold area[82] are gardens maintained by various organisations such as Universities, Town Planning authorities, NGOs etc., Lead Botanic Gardens (LBGs) are those gardens which are adequately equipped with attached laboratory facilities and expertise in different phyto geographic regions of the country. The role of these LBGs is to serve as a referral centre and a model with respect to conservation of threatened and endemic species of different phyto-geographic regions of the country.

5.1.2 Audit Objectives

To check the successful accomplishment of the scheme and its objectives, the audit objectives were to assess:

- Adequacy of planning in execution of projects.
- Existence of an efficient system of execution of projects.
- Adequacy and efficacy of monitoring system
- Achievements of project objectives, outputs & outcomes.

5.1.3 Scope of audit

Since the Botanical Survey of India (BSI) became the implementing agency for the Grants-in-Aid Scheme "Assistance to Botanic Garden" in December 2012, Audit scope encompassed examination of projects carried out during the period 2012-13 to 2020-21.

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[79] The Botanical Survey of India was established in 1890 with the objectives of exploring the plant resources of the country and identifying plant species with economic virtue. In 1954, the Government reorganised the BSI with the objectives of: (1) undertaking intensive floristic surveys and collecting accurate and detailed information on the occurrence, distribution, ecology and economic utility of plants in the country; (2) collecting, identifying and distributing materials that may be of use to educational and research institutions; and (3) acting as the custodian of authentic collections in well planned herbaria and documenting plant resources in the form of local, district, state and national flora.

[80] As observed in Audit. Though BSI intimated the no. of total lead botanic gardens as 19, as per the records the total no. of lead botanic gardens were found to be 20. The additional lead botanic garden found in the record is Pilikula Nisagra Dhama Society Science Centre, Mangalore.

[81] A territory concerned with the geographic distribution of plant species and their influence on the earth's surface.

[82] Minimum area of 2 acres, preferably 5 acres and above in size.

5.1.4 Audit sample

Five[83] Lead Botanic Gardens (LBGs) i.e., 25 per cent of the total 20 Lead Botanic Gardens were selected as the sample for the Audit. Out of five selected LBGs, two LBGs located at Coimbatore and Shillong were also Regional centres of BSI. BSI, Arid Zone Regional Centre, Jodhpur (BSI-AZRC) was also selected in the audit sample to cover the western region of India, though BSI-AZRC was a botanic garden (not Lead Botanic Garden).

Further, MoEF&CC also disbursed funds to 23 Botanic Gardens (including BSI-AZRC, Jodhpur) from 2012 onwards. Audit selected 12 out of 23 Botanic Gardens (including BSI-AZRC, Jodhpur) for detailed examination. Thus, records of total 12 botanical gardens and 5 LBGs were examined in the Audit.

5.1.5 Audit Methodology

(i) Collection of records from Botanical Survey of India/Ministry of Environment, Forest and Climate Change/Lead Botanic Gardens by issuing audit requisitions.
(ii)Examination of records relating to sanction, creation of infrastructure, conservation/multiplication, Red Data Sheets[84], rehabilitation with Forest Department/other organization/Publication of Documents etc.

(iii) Physical verification of the area of propagation and of sites where infrastructure was created in aforesaid six regional units.

5.1.6 Audit Findings

Based on the audit objectives, observations arising from the audit in the area of Planning, Execution, Monitoring and Outcome have been discussed in the following Audit paragraphs.

5.1.6.1 Adequacy of planning in execution of projects

5.1.6.1.A Inadequate project screening mechanism

After MoEF&CC decided that BSI would be the implementing agency for the scheme in December 2012, funds were sanctioned and released by MoEF&CC to BSI. BSI would release these funds to the LBGs/BGs for taking up projects for ex-situ conservation and survey of threatened plant species, improvement of infrastructure facilities like fencing, irrigation, green/glass house in existing gardens. As an implementing agency of the scheme, BSI was to ensure preliminary scrutiny of project proposals and release

[83] Five selected LBGs are: (i) Institute of Forest Productivity (IFP) under the administration control of Indian Council of Forestry Research & Education Ranchi (Eastern Region), (ii) BSI, Southern Regional Center, Coimbatore (Southern Region) (BSI-SRC), (iii) Institute of Himalayan Bio-resource Technology, Palampur (Northern Region) (IHBT) under the administrative control of Central Industrial and Research Institute (CSIR), (iv) BSI, Eastern Regional Centre, Shillong (North-Eastern Region), (v) National Botanic Research Institute, Lucknow (Central Region) under CSIR.
[84] The Red Data Book is a public document that is created for recording endangered and rare species of plants, animals, fungi as well as some local subspecies that are present in a particular region.

of funds to the approved projects. As per the scheme guidelines (May 2013), the responsibilities of BSI was to:

- Receive the proposal of the projects from the LBGs/BGs for preliminary scrutiny of the project proposals and check the LBGs/BGs in terms of the competence/infrastructure etc. to undertake the proposed activities in accordance with the guidelines of the scheme.
- Conduct a technical scrutiny of the Action Plan of the LBGs/BGs before the release of funds to the approved project. The action plan was to be accompanied by the budgetary estimates for the implementation of action plan.
- Place the proposal before the Expert Group (EG) of the MoEF&CC for appraisal and recommendation.

The recommendations of the Expert Group were to be incorporated in the Action Plan by the LBG/BG and the final proposal was to be submitted by the LBG/BG to MoEF&CC, through BSI, for obtaining concurrence and approval of MoEF&CC.

Audit examined the records of the 12 BGs and observed the following:

- Out of the 12 BGs, project proposals in respect of 4[85] gardens were directly received by MoEF&CC without routing it through BSI in contravention of the Guidelines. As such, in these four cases, no oversight could be exercised on the adequacy of the Action plan by BSI/EG.
- The scheme guidelines stipulated that the BGs which had proven track record in undertaking conservation and propagation of indigenous, particularly threatened and endemic species would be given priority. Audit, however, observed that out of 12 gardens, physical verification/inspection was undertaken in respect of 7[86] gardens only. Further, out of the 7 gardens, Inspection Reports of only 4[87] gardens were furnished to Audit. Scrutiny of these Physical verification/Inspection Reports revealed that no comments were offered on the verification of proven track record. This indicated that normally the aspect of proven track record was not physically verified.
- With regard to technical scrutiny on action plan, Audit observed that no technical scrutiny of action plans of the BG was conducted by BSI. BSI, however, stated that it had conducted technical scrutiny and vetting of budget estimates. BSI also added that this was done in consultation with the Ministry. BSI, however, failed to produce supporting documents in this regard. Audit examined the records of MoEF&CC also where it was observed that out of the 12 gardens, budget estimates had been vetted

[85] 1. BSI, Arid Zone Regional Centre, Jodhpur (BSI, AZRC), 2. Maharashtra Udaygiri Mahavidyalaya, 3. Society for Conservation and Resource Development of Medicinal Plants, Ashok Vihar and 4. Centre for Plant Molecular Biology, Osmania University, Hyderabad (CPMB)

[86] 1. Guru Nanak Dev University (GNDU), 2. Divisional Forest Officer, Kotgarh Forest Range, 3. Himalayan Botanic Garden in Nainital, Kumaun University, 4. Modern College, Nagaland, 5. Central University of Punjab, Bhatinda, 6. Udaygiri Mahavidyalaya, Maharashtra ,and 7. Kerala Forest Research Institute

[87] 1. Himalayan Botanic Garden in Nainital, Kumaun University, 2. Kerala Forest Research Institute, 3. Modern College, Nagaland and 4. Divisional Forest Officer, Kotgarh Forest Range

by BSI in respect of 8[88] gardens, but no evidence of conduct of technical scrutiny on Action Plan could be found.

Thus, in four cases BSI had no scope to scrutinize the proposals of the project. In none of the cases, the Action Plan along with budgetary estimate were examined. Actual status of proven track record on competency to undertake conservation and propagation of indigenous, particularly Threatened & Endemic species of the garden was also not physically verified by BSI. Thus, before sanctioning the grants, screening was not conducted in an effective manner.

Ministry stated in January 2022 that the observations raised by audit team in connection to screening project, budgetary estimate, action plan and their inspection report would be taken seriously in future projects**.**

5.1.6.1.B Inadequate planning in formation of network

As per the Guidelines of the ABG scheme, after receiving financial assistance, the Botanic gardens (BGs) were to ensure conservation, multiplication of the RET[89] plant species and coordination with the concerned State Forest Department and LBGs for successful rehabilitation of the RET species in their natural habitats. The LBGs would serve as nodal agencies and play an important role in terms of exchanging knowledge and plant material of the RET species with BGs and also ensuring maintenance of such plant species populations. Further, the Guidelines also stipulated that the network between LBGs and BGs would cover approximately 40 *per cent* of the civil districts of the country by the end of 2017, i.e. by the end of 12th Five Year Plan period.

Considering the fact that BGs and LBGs had to work together closely forming a network, audit observed that there was no formal agreement/MoU between the two entities which defined the roles and responsibilities and timelines. Audit also observed that information related to the activities of the BGs funded under the scheme were not available with the concerned LBGs. This indicated that the LBGs failed to work as the nodal institute and could not establish a network with the BGs. This was despite the fact that the formation of a network in terms of knowledge generation activity was linked to the ultimate management objective of ex-situ conservation. No monitoring of the BGs was also conducted by the LBGs, the details of which have been discussed in paragraph 5.1.6.3. As of October 2021, only 150 out of a total 724 districts i.e. only

[88] 1. Guru Nanak Dev University (GNDU) 2. Divisional Forest Officer, Kotgarh Forest Range, 3. Himalayan Botanic Garden in Nainital, Kumaun University, 4. Modern College, Nagaland, 5. Central University of Punjab, Bhatinda, 6. NRC, Dehradun 7. Kerala Forest Research Institute, and 8. BSI, AZRC, Jodhpur

[89] Initially RET was described as Rare, Endangered and Threatened species. In order to categorize threatened species, IUCN (International Union for Conservation of Nature) had updated the categories on the basis of geographical range, population and fragmentation. The threatened species categories now used in the Red Data Books and the Red List are critically endangered (facing an extremely high risk of extinction in the wild in the immediate future), endangered (not critical, but facing a very high risk of extinction in the wild in the near future) and vulnerable (not critical or endangered but facing a high risk of extinction in the wild in the medium-term future).

21 percent of civil districts could be covered under the scheme. This clearly shows that the scheme could not expand the network of BGs with respect to the conservation of threatened and endemic species of different phyto-geographic regions of the country.

Ministry intimated (February 2022) that low coverage of districts may be attributed to scant budget provision, lack of suitable manpower, lack of experts in the universities dealing with the conservation programme, lack of permanent facility and infrastructure in host institutions**.** From the reply, it appears Ministry itself is not sure of what was happening on the ground.

However, the fact remains that due to the nonexistence of a formal network among the LBGs and other botanic gardens, the LBGs could not serve as a referral centre with respect to the conservation of threatened and endemic species of different phyto-identified threatened and endemic species. As a result, the objective of exchanging knowledge and plant material of the RET species with BGs and also ensuring maintenance of such plant species populations could not be achieved.

MoEF&CC stated in January 2022 that in future it would made sure that MoU would be executed between Botanic Gardens and Lead botanic gardens for better execution of management objectives of ex-situ conservation.

5.1.6.2 Existence of an efficient system of execution of projects

The BSI management was to ensure controls were in place to provide reasonable assurance with regard to reliability of financial reporting, effectiveness and efficiency of operations and compliance with applicable laws and regulations. We observed following cases which indicated lack of internal controls, improper execution of projects and irregular sanction of projects:

5.1.6.2.A Misappropriation of fund due to lack of internal control

We observed three cases during Audit in respect of the Botanic Gardens which were under examination of Central Bureau of Investigation (CBI) as discussed below:

Table 5.1: Misappropriation of fund due to lack of internal control

Sl. No.	Name of the Garden	Project title	Sanctioned cost (in ₹)	Irregularity
1.	BSI, WRC, Pune	"Development of Arboretum of the Indigenous Threatened and Endemic Plants of Western Ghats through ex-situ conservation of botanic garden"	14.66 lakh	Though the sanction order of MoEF&CC for the project mentioned BSI WRC Pune, the payment was passed to an account of a fictitious Project titled "Development of E-Network of Botanic Garden". The fund was not received by BSI, WRC Pune and was thus misappropriated.

Sl. No.	Name of the Garden	Project title	Sanctioned cost (in ₹)	Irregularity
2.	Kumaun University, Nainital	"Conservation, propagation and rehabilitation of rare, endemic and threatened plants species in Himalayan Botanical Garden in Nainital of Uttarakhand"	40.96 lakh	Bank interest of ₹ 0.33 lakh was generated on an unspent amount of grants during 2019-20. The interest was remitted to a fictitious account "DDO, Botanical Survey of India" instead of authorized account of "Pay and Account Office, BSI/ZSI".
3.	Centre for Plant Molecular Biology (CPMB), Osmania University, Hyderabad	"Improvement and up-gradation of the facilities and infrastructure in the botanical garden of the Centre for Plant Molecular Biology (CPMB), Osmania University, Hyderabad"	34.80 lakh	Accrued interest of ₹ 26.79 lakh on unutilized grant was refunded vide demand draft in favor of fictitious account "DDO, Botanical Survey of India, Kolkata" though there was no provision for opening any account in the name of DDO, BSI as DDO, BSI was a non-cheque drawing DDO.

Ministry replied in January 2022 that a departmental enquiry had been conducted and charges were fully proved. Ministry added that an FIR had also been lodged and the matter was under investigation by the Detective Department, Bidhannagar Police Commissionerate, Kolkata, West Bengal.

The misappropriation, however, indicated the lack of supervision by the management during execution of projects under the scheme.

5.1.6.2.B Irregular sanction of projects

Divisional Forest Officer, Kotgarh Forest Division[90], Himachal Pradesh submitted a project proposal titled "Establishing Botanical Garden at Oddi in Kumarsain Range, Kotgarh Forest Division" in July 2018 under the ABG Scheme. The total cost of the project proposed was ₹ 85.00 lakh. Though the main objectives of the project were mentioned as ex-situ conservation and multiplication of RET plants, establishment of seed banks, improvement and strengthening of existing botanical garden etc. the proposal mainly contained particulars on development of infrastructure like fencing, building structures like gate, glass house, toilet, topiary, signage, purchase of garden equipment, manpower etc. The details of activities to be undertaken under the project did not include any activities relating to issues like ex-situ conservation, multiplication of RETs, establishment of seed banks etc. Despite this, the Expert Group (EG) in its meeting held in July 2018, approved the project at a cost of ₹ 79.00 lakhs. This indicated that the Expert Group did not identify and clearly list out explicitly, the eligibility

[90] One of the 279 gardens to whom financial assistance was given under the ABG scheme. Kotgarh forest division is a Botanic Garden (BG).

criteria for the recipient gardens before recommending activities under the ABG scheme for sanction.

While admitting the fact, Ministry stated (January 2022) that in future, it would take adequate measures to stop such sanction and internal scrutiny committee would be constituted to critically examine proposals.

5.1.6.3 Adequacy and efficacy of monitoring by LBGs

As per the Guidelines of the scheme (May 2013), BSI had the duty to ensure monitoring through LBGs and review of the ongoing projects and to also physically verify the facilities created, number of threatened and endemic species conserved/ rehabilitated and survival in the field and then submit the performance report to the Expert Group for annual review. In the above connection, audit examined the records of BSI Southern Regional Center Coimbatore (BSI-SRC), BSI Eastern Regional Centre Shillong (BSI-ERC) and BSI Arid Zone Regional Centre Jodhpur (BSI-AZRC). The observations on review and monitoring by the above organizations are as follows:

a) BSI, SRC, Coimbatore was to monitor 4[91] gardens receiving grants within its jurisdiction in Tamil Nadu, Kerala, Puducherry and Lakshadweep. Inspection/physical verification was to be undertaken to evaluate the progress and achievement of the targets proposed in the projects. BSI SRC informed that physical verification of the 4 gardens has been undertaken by them and submitted the physical verification reports as the documentary evidence. Scrutiny of the reports, however, revealed that out of four gardens, inspection in respect of only one garden - Kerala Forest Research Institute (KFRI) was conducted and that too for another project titled 'Taxonomic botanic garden at KFRI, Sub centre, Nilambur' which was not part of the ABG scheme. Audit observed that KFRI had received ₹ 19.37 lakh and ₹ 4.25 lakh during 2018-2019 and 2020-2021 respectively and the evaluation report as submitted in October 2019 was related to another project which did not fall within the ambit of the scheme. Thus, BSI, SRC not only failed to monitor the four gardens receiving grants but they even submitted false evidence of their physical verification.

b) BSI, ERC, Shillong was to monitor 2[92] gardens receiving grants within its jurisdiction in Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura. BSI ERC Shillong stated that physical verification in respect of the two gardens was conducted and submitted the supporting papers. Examination of those records revealed that instead of physical verification of the facilities created along with number of threatened and endemic species conserved rehabilitated and their survival in the field, only preliminary inspection cum feasibility study was conducted which was required to be done prior to

[91]1) Garden of M.S. Swaminathan Research Foundation, Wayanand, Kerala, 2) Malabar Botanical Garden & Institute for Plant Science, Kozhikode, Kerala, 3) Lead Botanic Garden of Sadakathullah Appa College, Tirunelveli, Tamil Nadu & 4) Taxonomic Botanic Garden of KFRI Sub Centre, Nilambut, Kerala

[92]1. Modern College, Kohima, Nagaland and 2. Foundation for Environment and Economic Development Services (FEEDS), Manipur

the sanction of the grant. As such, no monitoring of activities was conducted by BSI ERC Shillong.

c) BSI, AZRC, Jodhpur was to monitor the activities in respect of 20 gardens receiving grants within its jurisdiction in Rajasthan and Gujarat. Audit observed that no garden was monitored by BSI AZRC Jodhpur also. On being pointed out, BSI-AZRC stated in October 2021 that there were no records with them regarding the physical verification and monitoring of gardens in Rajasthan and Gujarat which received grants-in-aid under the scheme.

Ministry stated in January 2022 that they have limited manpower and sometimes they engaged a third party evaluator to inspect the gardens under its jurisdiction. However, BSI, SRC, ERC and AZRC could not furnish any record in support of the monitoring activities undertaken by third parties. Ministry further stated that the observation raised by audit team in connection with the monitoring of gardens would be taken seriously in future projects.

Thus, due to lack of monitoring and evaluation, the extent of achievement of objectives of the scheme could not be ascertained by the Ministry.

5.1.6.4 Achievement of project objectives, outputs and outcomes by LBGs

In terms of the guidelines of the scheme (May 2013), the LBGs were to conserve threatened and endemic species through multiplication and subsequently rehabilitate them in their natural habitats. Thus, carrying out rehabilitation/recovery programmes for threatened and endemic species was the primary need to fulfil the commitment of CBD. This would lead to building up of information on in-situ as well as ex-situ conservation of the threatened and endemic species and their habitats.

Further, LBGs were to undertake botanical research resulting in an excellent referral system for plants as authentically identified, classified and labeled live collection in gardens and as dry collections[93] in herbaria; both for monitoring and documentation of threatened and endemic plant resources.

5.1.6.4.A Non-conservation of targeted threatened and endemic species

5.1.6.4.A.1 Elite provenances of highly endangered species of trees of Western Ghat not conserved

While conveying the administrative approval and expenditure sanction in July 2015, MoEF&CC instructed BSI Southern Regional Center Coimbatore (BSI, SRC) to collect, conserve and maintain elite provenances[94] of at least 20 highly endangered species of trees of Western Ghats, a hot spot of Global Biodiversity under the scheme. The cost of the project was ₹ 99.83 lakh, against which an expenditure of ₹ 82.46 lakh was

[93] Pressed, processed and mounted specimens

[94] Provenance refers to the place of origin or source of something — e.g., a collection; a species, an area containing a population of a species that is assumed genetically distinct from other populations. It is important for conservation purposes.

incurred as of September 2021. MoEF&CC sanctioned the project for 5 years in July 2015, to be completed in July 2020. On receipt of the sanction, BSI prepared a Plant List and Fact Sheet of 24 plant species. Audit observed the following:

a) Examination of Plant List and Fact Sheet revealed that BSI, SRC, Coimbatore proposed to conserve 24 species (3 trees, 20 herbs (orchids) and 1 shrub) which were not 'highly endangered' species in contravention of the Ministry's instructions. Thus, the objective of collecting, conserving and maintaining elite provenances of *at least* 20 highly endangered species of trees of Western Ghat remained unachieved.

   Ministry stated in January 2022 that the collection, conservation and maintenance of highly endangered tree species of Western Ghats was achieved by BSI, SRC but it had forgotten to include this in the progress reports. Ministry however failed to provide any documentation in this regard.

b) Out of 24 proposed species, BSI, SRC collected only 12 species of Orchids, leaving 12 species remaining to be collected. While visiting the garden in which the above 12 species were stated to be conserved, it was noticed that out of 12 species, labels were exhibited only for 10 species leaving 2 without any label. As such, authentication of the two conserved species could not be ascertained in Audit. Ministry did not offer any relevant comments on this issue.

c) Out of the 10 conserved species, scrutiny revealed that Herbarium Sheets[95] in respect of six species were available at BSI, SRC and Herbarium Sheets in respect of remaining four species were not available. Audit scrutiny revealed that the herbarium sheets of the said six species were collected during the year 1964, 1969, 1972, 1980, 1990 which indicated that these species were collected long ago before the commencement of the project.

The Ministry did not address the issue in its response.

5.1.6.4.A.2 Elite provenances e.g. Citrus, Musa, Rhododendrons, Dioscorea, Turmeric of North East being a global biodiversity hotspot not conserved

BSI Eastern Regional Centre Shillong (BSI-ERC) submitted a proposal in December 2014 for undertaking the project titled "Ex-situ conversation of Rare, Endangered, Threatened (RET), Endemic & Economic Plants of Northeast Region through Botanical Garden Assistance Scheme". In its proposal, BSI, ERC proposed to conserve 58 Rare, Endangered, Threatened and Economically important plant species at an estimated cost of ₹ 1.37 crore for a period of 5 years. MoEF&CC while examining the proposal

[95] Collection of dried plant specimens mounted on sheets of paper. The plants are usually collected in situ , identified by experts, pressed, and then carefully mounted to archival paper in such a way that all major morphological characteristics are visible .The mounted plants are labeled with their proper scientific names, the name of the collector, and, usually, information about where they were collected and how they grew and general observations. These sheets are available for ready reference.

decided that since the botanical garden at Shillong had adequate land at its disposal, there was an imminent need for BSI to collect, conserve and maintain five elite provenances viz (i) Citrus, (ii) Musa species, (iii) Rhododendrons, (iv) Dioscorea species and (v)Turmeric so that the breeders could obtain new diseases/pest resistant and high yielding varieties from the gene pool. However, MoEF&CC did not specify the target in number of species under these five elite provenances.

Ministry accorded administrative approval and sanction for ₹ 1.31 crore in July 2015 and the project was scheduled to be completed in June 2020. First instalment of ₹ 40.00 lakh was released in the same month. While sanctioning the second instalment of ₹ 35.81 lakh in September 2016, the Ministry reiterated that collection and conservation of all the proposed targeted RET plants in addition to five elite provenances as mentioned above should take place. The third and fourth instalment of ₹ 10.77 lakh and ₹ 13.17 lakh was released during August 2018 and September 2019 respectively. Thus, a total amount of ₹ 99.75 lakh was received for the project out of which an expenditure of ₹ 88.43 lakh was incurred, leaving an unspent balance of ₹ 11.32 lakh. The project was completed in 2020. It was observed in Audit that out of 58 species proposed, only 22 species were collected, leaving 36 species unexplored. Among the collected 22 species, though 28 saplings of one species of citrus and two species of rhododendron were collected during 2016 and 2017, the number of plants could not be increased by way of multiplication as of October 2021, even after lapse of almost five years. Further, out of the 5 targeted species of elite provenances, only three species (2 Rhododendrons and 1 Citrus) were collected.

Thus, the need for BSI to collect, conserve and maintain elite provenances so that the breeders could obtain new diseases/pest resistant and high yielding varieties from the gene pool could not be fulfilled.

Ministry in January 2022 stated that any research proposal is a hypothesis and the findings do not necessarily follow the assumptions. Therefore, species were selected keeping in mind their ecological importance with the assumption that if the same were collected and conserved, this will highly enrich the germplasm collections. But the exploration survey effort is a continuous process and attempts will always be made to collect them. While statement of BSI claimed that the project was hypothetical in nature, audit found that the objectives of the project were clearly expressed and not expressed as a hypothesis.

As regards multiplication efforts, though the Ministry stated (January 2022) that the same had been carried out successfully, no comment regarding the collection and multiplication of 28 saplings of only one citrus and two Rhododendrons species collected during the field survey was offered. The Ministry was silent on the issue of non-achievement of the objectives of collection, conservation, and maintenance of elite provenances of important plant species.

As such, the stated objectives of project were only partially achieved.

5.1.6.4.B Permanent loss of national wealth

Institute of Forest Productivity (IFP), Ranchi submitted a proposal titled "Improvement of infrastructural facilities in the Botanical Garden of Institute of Forest Productivity, Ranchi" in September 2010. Since the proposal submitted by IFP was lacking several mandatory details, the proposal was revised in January 2011 and was approved in the Expert Group meeting during the same month. While recommending the proposal, EG suggested that BSI would provide additional ten RET species and same would be conserved. BSI in December 2012 proposed a list of 21 RET species out of which ten had already been incorporated in the proposal submitted by IFP. The project was started in May 2011 and was scheduled to be completed in March 2014 at a cost of ₹ 44.00 lakh. The first instalment of ₹ 20.00 lakh was received by IFP in May 2011 followed by second instalment of ₹ 19.00 lakh in July 2012, pending non release of ₹ 5.00 lakh.

It was observed during Audit that:

- Out of 21 species recommended by BSI, IFP Ranchi considered only 13 species for conservation. The Institute did not conduct any survey for collection of rest of the 7 species and in respect of one species[96] though the same was collected, the status of number of multiplications was not provided to Audit.
- Though total 395 saplings pertaining to 13 RET species were collected, only 78 saplings of 12 species have survived. This fact indicated that instead of increase in population, the same has decreased and in the instant case the percentage of mortality was 80[97]. Moreover, none of the collected 78 saplings were distributed by IFP, Ranchi for in-situ conservation.

Ministry stated (January 2022) that the rate of mortality was dependent upon edaphic[98], climatic conditions and adoptions of such collected species. The survival of such species cannot be guaranteed in toto as calculated by audit in terms of percentage.

The fact remains that IFP, Ranchi was able to conserve only 20 percent of the saplings. Due to this, the first and foremost objective of the scheme (i.e., conservation and multiplication) remained unachieved.

5.1.6.4.C Proposed species already existed

CSIR-Institute of Himalayan Bioresource Technology Palampur (CSIR-IHBT) in January 2013, proposed to collect, conserve, multiply and reintroduce 14 threatened species in its natural habitats out of 41 proposed by BSI, North Regional Centre (NRC) Dehradun. In September 2016, the Ministry sanctioned the project for 3 years and

[96] *Salix terasperma Roxb.* (Name of the RET Species collected as per progress report)
[97] {(395-78)/395}*100
[98] A condition of the soil, whether physical, biological or chemical, that influences the organisms and processes that occur in the soil.

allotted a total of ₹ 107.72 lakh (₹ 33.51 lakh & ₹ 42.61 lakh for 1st and 2nd installment respectively) and installment for the 3rd year was pending as on September 2021.

- Audit observed that out of 14, only 10 threatened species were collected, leaving four species outside the scope of research work. Further, for the 10 species collected, dates of collections mentioned in the herbarium sheets were ranging from the year 1997 to 2019. One in the year 1997, four in the year 2003, three in 2004 and two in 2019. As such, it was evident that the collection was made prior to the period of commencement of the project in September 2016.

- The facts indicated that the 8 out of 10 species were already conserved in the IHBT garden and were not the product of collection for the project for which the funds were released. Remaining 2 species were collected during November 2019 i.e., after the scheduled date of completion of the project and that too from IHBT's existing Botanic Garden.

Audit noticed that no tour was conducted during the tenure of the project on the specific locations as proposed by IHBT. Instead of collecting the new 41 species recommended by BSI, IHBT undertook the project on the existing species which were already conserved in its garden.

On being pointed out, IHBT stated in September 2021 that the collection of remaining species would be pursued after release of further installments.

Ministry in January 2022 stated that Expert Group would look into the shortcomings.

5.1.6.4.D Non-development of propagation technique

As per guideline of the scheme, the LBGs were to study the bottlenecks for propagation, multiplication, rehabilitation and recovery programmes for identified threatened and endemic species. The LBGs were also allocated responsibility to standardise the propagation technique for endemic and threatened plant species of the particular region.

Audit observed out of 149 species proposed by the gardens[99], only 64 species were introduced out of which only one[100] propagation technique was developed and published. The benefit of the developed propagation techniques could only be utilized after its publication and placing in the public domain; therefore, the impact of the scheme was not much as only one technique was published.

Ministry stated in January 2022 that BSI Arid Zone Research Centre (AZRC) had consulted Arid Forest Research Institute (AFRI) for rehabilitation of plants in natural habitats as AFRI had some experimental plots near the forest areas. However, this could not materialize as the seedlings were in initial stage in 2019-20 and due to COVID

[99] CSIR-IHBT Palampur, BSI SRC Coimbatore, BSI ERC Shillong, IFP Ranchi, CSIR-NBRI Lucknow and BSI AZRC Jodhpur

[100] CSIR-IHBT Palampur. Name of the publication: Jasminun parkeri

situation in 2020-21. In case of BSI Southern Regional Centre (SRC), the distribution of multiplied species would be taken up gradually. Further, in respect of BSI ERC, some of the listed species were multiplied through seeds and their saplings distributed to the local people and forest department. A total of 405 saplings of other species multiplied through the project were distributed to the Forest Department.

The reply needed to be viewed in light of the fact that though the LBGs were responsible for standardising the propagation technique for endemic and threatened plant species of the particular region, the technologies/techniques for propagation of threatened and endemic species could not be developed. This was one of the identified thrust areas of the research and was linked with the goal of ex-situ conservation of the plant species. However, this was not done.

5.1.6.4.E Transfer and rehabilitation of ex-situ collections to natural habitat

One of the most important objectives after conservation and multiplication involved the reintroduction and rehabilitation of the said plants in natural habitats in collaboration with the State Forest Departments. It was stipulated that every garden receiving grant has to coordinate with the State Forest Department to ensure transfer/reintroduction and rehabilitation of ex-situ collections into natural habitat. It was also stipulated that it was needed to link up ex-situ conservation with in-situ transfer by developing an arrangement with the State Forest Departments. Audit observed that no coordination was developed with State Forest Department by the gardens.

5.1.6.4.E.1 BSI, SRC stated in September 2021 that some species were introduced in the reserve forest areas of Salem, Tamil Nadu and Kerala by contributing plant saplings. As mentioned in para 5.1.6.4.A.1 BSI, SRC, Coimbatore proposed to conserve 24 plant species. Audit however, observed that the distributed species were different from the 24 proposed species except 145 saplings of one species e.g. *Bentinckia condapanna* which was distributed to Tamil Nadu Forest Department, Kerala Forest Department and Jawaharlal Nehru Tropical Botanical Garden and Research Instt. Kerala during May 2019 to July 2019. Also, two saplings of another species named *Monosis Shevaroyensis (Gamble) H.Rob & H. Robl & Skvarla* distributed to Tamil Nadu Forest Department in July 2019 were not collected during the period of survey for the collection of the 24 proposed RET species under the scheme.

5.1.6.4.E.2 Though BSI, AZRC Jodhpur introduced five species in its garden, no link with the forest departments was established to complete the chain between ex-situ conservation and in-situ conservation in the wild. BSI distributed the rare plants without maintaining the formal official procedure i.e., receiving the requisition, documentation of the distribution of rare plants to the potential organization on demand etc.

BSI stated that mostly the visitors demanded the plants during their visit to the garden and it was not possible for them to provide the official requisition. The BSI's reply indicated the lack of accountability in the custody of RET plants. BSI needs to establish

a conventional practice of keeping records of the distribution of rare plants to monitor the progress of the distribution, as it is one of major objectives of the scheme. Due to non-establishment of link with the forest departments, the species could not be distributed and rehabilitated in the natural habitat for in-situ conservation.
Ministry stated (January 2022) that the observation of audit was noted and formal official procedure showing distribution of rare plants to the potential organisation on demand would be recorded in future.

5.1.6.4.E.3 BSI, ERC Shillong stated that 405 seedlings pertaining to 10 species were supplied to the forest department for reintroduction. Scrutiny however, revealed that none of the 10 species distributed were the targeted species proposed to be conserved by BSI ERC in December 2014.

Ministry stated (January 2022) that the distribution would be taken up in the near future.
As such, the transfer and rehabilitation of ex-situ collections to natural habitat under the ABG scheme was not effective in the absence of linkages.

5.1.6.4.F Non establishment of seed bank

Seed banks are established to store seeds to preserve genetic diversity. Seed Banks are set up with the objective of minimizing the loss of viability and genetic integrity of seed material during storage and regeneration. As per the Guidelines of the Scheme (May 2013), though Seed banks (short term) were to be established, no timeline was indicated for the same. Seeds of live materials of the targeted species conserved were to be sent for maintenance and storage in the regional stations of BSI or National Bureau of Plant Genetic Resources (NBPGR), New Delhi. It was observed that none of the five LBGs established seed banks. Also none of the five LBGs sent seeds to NBPGR, New Delhi. As such, preservation of seeds of targeted plant species in the national seed bank could not be maintained for further research and the live existence of seeds is doubtful.

Ministry stated in January 2022 that in a short period it was not practical to establish a seed bank immediately. However, the guidelines stated that holding important collections of living plants, seeds and other germplasm could be of great value in supporting both in-situ and ex-situ conservation efforts. As such, due to the non-establishment of the seeds banks and non-transfer of the seeds of live materials to NBPGR for maintenance and storage, the objective of minimizing the loss of viability and genetic integrity of seed materials during storage and regeneration was not achieved.

5.1.6.4.G Non preparation of Red Data Sheet

The IUCN Red List[101] of Threatened Species™ is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of quantitative criteria to evaluate the extinction risk of thousands of species. These criteria are relevant to most species and all regions of the world. With its strong scientific base, the IUCN Red List is recognised as the most authoritative guide to the status of biological diversity. IUCN Plant Red data Book comprises Red data sheets on plants threatened on a world scale.

As per the guidelines, the roles of LBGs were to compile information on the area of occurrence, area of occupancy, number and size of populations, spatial distribution of populations, identification of important associates such as pollinators and dispersers, reproductive and breeding systems, population trends in relation to habitat changes and pattern of disturbance, etc., and to prepare Red Data Sheets for the selected species, as per IUCN format. Scrutiny revealed that none of the five LBGs had prepared Red Data Sheet in respect of any of the targeted species.

As regards preparation of Red Data Sheet, Ministry stated (January 2022) that it is a lengthy and time consuming process. It requires rigorous field survey and funds to assess each species as per the IUCN guidelines. The reply needed to be viewed in light of the fact that failure to maintain the red data sheets would result in lack of information about vulnerable and endangered species and thus hinder their conservation.

5.1.6.5 Conclusion

Audit observed that adequate action was not taken by MoEF&CC and BSI, the implementing agency to conserve and multiply the RET plants as envisaged in the scheme. The Lead botanic gardens and botanic gardens were not networked with each other and as a consequence, the gardens failed to generate their knowledge and share the plant materials among one another and were unable to ensure the maintenance of such plant species at different places. Instructions of MoEF&CC to maintain the elite provenances of prescribed plant species were not adhered to by the gardens. In most of the cases, the collected RET plant species could not be multiplied and propagated. Though few were multiplied, mortality percentage was too high to have a positive impact on conservation. Further, no coordination was developed with the State Forest Departments by the gardens for linking the ex-situ conservation with in-situ conservation. As a result, conserved plants could not be rehabilitated in natural habitats. Few RET plants were distributed to individuals, that also without recording status of distribution which vitiated the very purpose of in-situ conservation. Due to non-multiplication of plants the same could not be distributed to other organisations. Propagation techniques were not developed and documented. As a result, knowledge

[101]Source: https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species

base gathered was not disseminated. In some cases, even herbarium sheets were not prepared putting collection of species under doubt. Preservations of seeds was not done, thus not providing any scope for further research/utilisation. Finally, rehabilitation in the natural habitats was not done and for that the logical chain between ex-situ and in-situ conservation was not established. Moreover, status survey was not conducted and Red Data Sheet was not prepared. Thus, the objective of the scheme remained largely unachieved, also impacting the achievement of objectives of CBD to which India was a party.

5.2 Pollution caused by Plastic

Ministry of Environment, Forest & Climate Change (MoEF&CC) have no action plan for implementation of Plastic Waste Management Rules 2016, as a result, plastic waste management rules could not be implemented effectively and efficiently.

5.2.1. Introduction

According to United Nations Environment Programme (UNEP), of the seven billion tonnes of plastic waste generated globally so far, less than 10 per cent is recycled. Millions of tonnes of plastic waste are lost to the environment, or sometimes shipped thousands of kilometres to destinations where it is mostly burned or dumped. If incinerated, its toxic compounds are spewed in the atmosphere to be accumulated in biotic forms throughout the surrounding ecosystems. When buried in a landfill, plastic lies untreated for years. In the process, toxic chemicals from plastics drain out and seep into groundwater, flowing downstream into lakes and rivers. The seeping of plastic also causes soil pollution the presence of micro plastics in soil. Rivers and lakes carry plastic waste from deep inland to the sea, making them major contributors to ocean pollution.

5.2.2. Audit objectives, scope and methodology

Audit objectives were to assess effectiveness and compliance of the provisions of Plastic Waste Management Rules[102], in order to examine their adequacy in management of plastic waste and to address the risks posed by plastic waste to environment and health. Eighteen wards from six selected zones of three Urban Local Bodies (ULBs) in Delhi, eight ULBs & thirty Rural Local Bodies (RLBs) from six sampled districts in Punjab and four ULBs & nine Panchayati Raj Institutions (PRIs) from three sampled districts in Sikkim were selected for review of records pertaining to the period 2015-16 to 2019-20.

Audit covers the activities carried out for the management of plastic waste in Ministry of Environment, Forest & Climate Change (MoEF&CC), Central Pollution Control Board

[102] MoEF&CC under the provisions of the Environment (Protection) Act, 1986 (EPA 1986), notified the Plastic Waste (Management and Handling) Rules, 2011. To implement these rules more effectively and to give thrust on plastic waste minimization, source segregation, recycling, involving producers, manufacturers, importers, brand owners, waste pickers, recyclers and waste processors in collection of plastic waste, amended Plastic Waste Management Rules (PWM), 2016 was notified which was further amended in March 2018.

(CPCB), State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) of the selected states, Panchayati Raj Institutions, Gram Panchayats (GPs) and Urban Development Departments (UDDs) of the selected states.

5.2.3 Audit Findings

Audit findings are discussed below:

5.2.3.1 Assessment of plastic waste being generated

A reliable assessment of waste generated is essential for planning and effective implementation of waste management, which can guide in decision-making. Hence, data of assessment of plastic waste is the first step towards effective policymaking.

Rule no. 17 of PWM Rules 2016 requires every recycling/ processing unit, local body, PCB/ PCC and CPCB to provide the information on use and management of plastic waste annually to the next higher authority in hierarchy[103] in the forms prescribed for the purpose.

(A) Data inconsistencies

During audit, MoEF&CC provided the details of plastic waste generated across the country during 2015-16 to 2019-20, which it received from CPCB[104] , as shown in the table below:

Table 5.2: Details of plastic waste generated across the country during 2015-16 to 2019-20

(Tonnes per day)

Year	Plastic waste generated
2015-16	4,354.57 (information from 19 states/UTs
2016-17	4,297.80 (information from 21 states/UTs)
2017-18	1,810.30 (information from 14 states/UTs)
2018-19	9,205.59 (information from all 35 states/ UTs)
2019-20	9,506.20 (information from all 35 states/ UTs)

The data reported by CPCB to MoEF&CC was based on the inputs provided by the SPCBs or PCCs to CPCB. However, on scrutiny of records of PCBs/PCCs, Audit found that PCBs and PCCs of many states and UTs[105] did not provide data on plastic waste generation for the period 2016-18 to CPCB. Further, during 2018-20, although all the states and UTs provided the data of plastic waste generation, the reported data did not include plastic waste generated by all the ULBs and RLBs. As such, there were data gaps due to which CPCB as well as MoEF&CC did not have complete and comprehensive picture of Plastic Waste generation in entire country during the period 2015-20. Audit also observed that the data received from SPCBs and PCCs was not validated by CPCB to assess its authenticity and correctness.

[103] Plastic waste recycling/ processing units ***to*** Local Bodies ***to*** PCBs/ PCCs ***to*** CPCB ***to*** MoEF&CC

[104] through Annual Reporting under Rule 17(4) of Plastic Waste Management Rules, 2016

[105] Out of 35 SPCBs/ PCCs all across the country, 16 in 2015-16, 14 in 2016-17 and 21 in 2017-18 did not submit the data of plastic waste generation to CPCB.

Further, the following inconsistencies were observed in the data of plastic waste generation provided to Audit and reported to nodal agency/ PCB/ CPCB by sampled states:

- All the three sampled ULBs of Delhi did not furnish the data of plastic waste generated to DPCC every year during 2015-20. East Delhi Municipal Corporation (EDMC) did not furnish data for the period 2015-20, North Delhi Municipal Corporation (NDMC) for 2015-16 and 2017-18 and South Delhi Municipal Corporation (SDMC) for 2015-16. However, on comparison of the data made available to DPCC with that provided to audit, variation of 45.97 per cent was observed in the data of NDMC; while, in case of SDMC, the variation in the figures was 40 per cent.
- The data of plastic waste generation provided to Punjab Municipal Infrastructure Development Company[106] (PMIDC) by ULBs of Punjab vary from 12.04 per cent to 51.93 per cent from that provided to Punjab PCB by these ULBs which was ultimately reported to CPCB during 2015-16 to 2019-20.
- Sikkim PCB did not report the quantum of plastic waste generated in the years 2015-16 and 2017-18 to CPCB. While generation of 177.38 tonnes of plastic waste was reported to CPCB by Sikkim PCB for 2016-17, 2018-19 and 2019-20 in lieu of 116.53 tonnes reported to Audit which was 52.22 per cent in excess to the actual generation.

As such, due to lack of validation of the data on plastic waste generated in these states, MoEF&CC and CPCB would remain unaware of the quantum of the waste being generated and its decision making on addressing the problem of disposal would remain constrained by the poor data.

(B) Method of assessment of plastic waste not uniform

Audit further found that there is no uniform method for assessment of plastic waste generation within a state. The data of plastic waste generation reported by ULBs was based on assumptions without any sound rationale. In Delhi, East Delhi Municipal Corporation (EDMC) and NDMC assumed the plastic waste generation to be 10 per cent of the total municipal solid waste. On the other hand, SDMC calculated it at the rate of 4.4 to 6 per cent of the total waste generated. In Punjab, PMIDC provided the quantum of plastic waste generation computed at seven per cent of total municipal waste generated.

CPCB admitted that it was not aware of the methodology being adopted by ULBs for calculation of quantity of plastic waste generated by them. In absence of any standard/ uniform methodology for assessment of quantum of plastic waste generated, it is

[106] Nodal Agency designated for implementation of Plastic Waste Management Rules, 2016 in Urban Areas. All the funds under Swachh Bharat Mission are disbursed to ULBs through PMIDC. PMIDC monitors all the ULBs there on daily basis and receives primary data from ULBs regularly.

impossible to obtain a clear and comprehensive status of plastic waste generated in the country. Further, this lacuna will hinder the preparation of any action plan or strategy for the effective implementation of PWM rules.

5.2.3.2 Collection, processing and disposal of plastic waste

Waste collection, recycling, co-processing and its ultimate disposal in scientific and environment friendly manner are essential elements of plastic waste management system. Rule 6 and 7 of PWM Rules, 2016 clearly define the responsibilities of Local Bodies (LBs) and Gram Panchayats for setting up, operationalization and co-ordination of the waste management system in their areas.

Regarding availability of data of plastic waste collection, recycling, co-processing and its ultimate disposal, MoEF&CC replied that SPCBs and PCCs every year provided the data regarding status for implementation of Plastic Waste Management Rules, 2016 in Form VI to CPCB, which compiles the same and submits a consolidated report to it. Form VI comprises of data fields like estimated Plastic waste generation, Action Plan for collection & disposal of Plastic waste, number of registered Producers, Importers, Brand Owners etc.

In this regard, Audit noticed that Form VI does not include data fields of plastic waste collected, uncollected and utilized[107] in the states and Union Territories (UTs); hence, the same is not reported to CPCB by states and UTs. Audit further noticed that CPCB had also pointed out the deficiencies in Form VI and requested (March 2021) MoEF&CC to revise the same by including the desired data fields for effective implementation of PWM Rules. However, revisions suggested by CPCB, are yet to be adopted by MoEF&CC, as of October 2021.

The details of plastic waste generated, collected, and utilized, provided by all the three sampled states during 2015-16 to 2019-20 are detailed below:

[107] Utilization of plastic waste means fraction of collected plastic waste which is either recycled or used for other purposes such as road construction, cement kiln, waste to energy plants etc.

Table 5.3: Details of plastic waste generated, collected and utilized by all the three sampled states during 2015-16 to 2019-20

(Tonnes per Year)

Year	Delhi			Punjab			Sikkim		
	Plastic waste generated	Plastic waste collected	Plastic waste utilised	Plastic waste generated	Plastic waste collected	Plastic waste utilised	Plastic waste generated	Plastic waste collected	Plastic waste utilised
2015-16	Not available			100010.00	100010.00	29930.00	96.70	96.70	39.36
2016-17	Not available			102200.00	102200.00	30660.00	102.70	84.86	30.83
2017-18	Not available			104755.00	104755.00	31390.00	1315.40	803.20	335.40
2018-19	644.00	598.92	119.78	106580.00	106580.00	32120.00	5.66	5.40	0.02
2019-20	1060.00	985.80	197.16	109135.00	109135.00	32850.00	8.22	8.22	6.92
Total	**1704.00**	**1584.72**	**316.94**	**522680.00**	**522680.00**	**156950.00**	**1528.68**	**998.38**	**412.53**

Source: ***Delhi:*** *Data provided by Delhi PCC;* ***Punjab:*** *Data provided by PMIDC;* ***Sikkim:*** *Data provided by Sikkim PCB*

In this context, audit observed the following:

- PMIDC without providing any documentary evidence in support, reported that 100 per cent plastic waste generated by ULBs during 2015-20 had been collected. It further stated that the plastic waste collected contained 25 to 30 per cent fraction of recyclable plastic, all of which was picked and segregated by the informal sector viz., rag pickers, junk dealers etc., and channelized to recyclers directly. However, it did not state what happened to the rest 70 per cent [108] plastic waste, which was predominantly non-recyclable. In the absence of any data regarding its status, it is safe to assume that the leftover 70 per cent of waste was indiscriminately dumped.
- ULBs of Sikkim collected only 65.31 per cent (i.e. 998.38 tonnes) of the total plastic waste generated during 2015-20. This plastic waste was collected and segregated by scrap vendors at landfill sites and recyclable fraction of plastic waste was sent to Siliguri, West Bengal as there are no recycling or processing units in the state, as stated by Sikkim PCB. In the absence of any data about the safe disposal of the balance portion of plastic waste, which was predominantly non-recyclable, it is assumed that this was indiscriminately dumped.
- In Delhi, PCC expressed unavailability for the data of plastic waste generation, collection and utilization during 2015-18. However, the available data indicates that only 20 per cent of the collected plastic waste was utilized during the period

[108] i.e. 3,65,730 tonnes

2018-20. In the absence of any data about the status of the rest, it can be assumed that these would have been indiscriminately dumped.

5.2.3.3 Projections of the quantities of plastic waste to be generated

Waste generation projections inform waste policy formulation and are an indispensable process in waste management planning. Hence, to make realistic projections about the growth of waste in the future, the dominant parameters should be identified and their expected influence on the waste amounts should be described and evaluated.

In this regard, MoEF&CC carried out a study on "Assessment and Characterization of Plastic Waste generation in 60 major cities" undertaken by CPCB in January 2015; wherein, the assessment of plastic waste was carried out at dumpsites to suggest roadmap and recommendations for plastic waste management in the country. However, Audit did not find that any projections about the growth in plastic waste to be generated in future was made by MoEF&CC, based on the results of this study. CPCB also admitted to have not made any projection of the plastic waste generation based on population size, geographical size of the area, economic growth, increased demand for consumer goods and change in manufacturing methods etc.

In Punjab, none of the sampled Gram Panchayats nor PMIDC (for urban ULBs) made any projections for plastic waste likely to be generated in future taking into account the stated parameters. Audit observed that Delhi and Sikkim had carried out projections of plastic waste generation in the future, further action taken on these projections remained to be verified.

5.2.3.4. Absence of a policy and action plan for plastic waste reduction, reuse or recycle

MoEF&CC is the nodal agency in the administrative structure of the Central Government for planning, promotion, co-ordination and overseeing the implementation of India's environmental policies and programmes. MoEF&CC was silent about the existence of a policy for plastic waste reduction, reuse and recycling. However, it stated to have adopted a three-pronged strategy for effective implementation of PWM Rules that includes (i) behavioural change, (ii) strengthening of institutional system for collection, segregation and recycling of plastic waste and (iii) engagement with producers, importers and brand owners through Extended Producer's Responsibility. Audit noticed that MoEF&CC did not have any action plan in place for effective implementation of the said strategy during the period 2015-20. The preparation of a comprehensive action plan was initiated in May 2021 and is still underway (October 2021).

Further, in all the three sampled states, no action plan was found in place for management of plastic waste, except in Punjab that too only for urban areas since April 2019. On perusal of the action plan, Audit found various activities proposed therein for

effective and efficient management of plastic waste with a target date of 31 December 2019. However, some major activities[109] (as discussed in para 5.2.3.5 and 5.2.3.7.D) could not be completed even by November 2021. There was no policy/ strategy/ action plan in place for reduction, reuse or recycle of plastic waste in the state of Sikkim as of February 2022. However, action plan for urban areas is under preparation as stated by Gangtok Municipal Corporation.

The reply of Department of Urban Development, Delhi is awaited on the issue.

5.2.3.5. Non-formulation of bye-laws incorporating the provisions of Plastic Waste Management Rules by Local Bodies

In terms of Rule 6(4) of Plastic Waste Management Rules 2016, each local body has to frame bye-laws incorporating the provisions of these rules.

Audit found that in Punjab, Delhi and Sikkim, all the sampled ULBs had framed their bye-laws incorporating the provisions of PWM Rules, 2016. However, the same are yet to be notified by their respective Departments of Urban Development. Further, none of sampled GPs of Punjab and Sikkim framed their bye-laws incorporating the provisions of PWM Rules, 2016 as of now.

In the absence of bye-laws ULBs and GPs could not implement the PWM Rules effectively and levy the penalty for violation of rules.

5.2.3.6 Delay in taking initiatives for elimination of Single Use Plastic

Hon'ble Prime Minister of India during World Environment Day (05 June 2018) pledged India's commitment to phase out Single Use Plastic (SUP) by January 2022. In order to make India free of SUP and taking action on the clarion call of Prime Minister, the first step which needed to be taken was to identify the SUP items and prohibit their manufacture, import, stocking, distribution, sale and usage.

Audit observed that no action was taken by by MoEF&CC to translate the pledge of the PM into reality. MoEF&CC had not identified the SUP items till July 2021. The SUPs were only notified in August 2021, and Audit observed MoEF&CC had not yet devised a comprehensive action plan for completely phasing them out, as of October 2021.

In this regard, action taken by the states is as follows:

- Sikkim in July 1998 introduced amendments in the Sikkim Trade License and Miscellaneous Provisions (Amendment) Rules, 1998 to ban the delivery of any good or material purchased/ otherwise to any person, firm, shop, company or any other agency or organization in plastic wrappers or plastic bags.

[109] Framing of bye-laws by ULBs incorporating provisions of PWM Rules, 2016, channelization of recyclable plastic waste to registered recycler and channelization of non-recyclable plastic waste for use in cement, kilns, road construction, or as Refused Drive Fuel.

- In Punjab, it was noticed that there were no ban on manufacturing, stocking, distribution, recycling and sale or use of one time use products made from thermocol[110] and the same were easily available in the market.
- Delhi Govt[111] in 2012 imposed a ban on manufacturing, sale, storage and use of all kinds of plastic carry bags in National Capital Territory (NCT) of Delhi which was reaffirmed by the Hon'ble National Green Tribunal (NGT) by prohibiting the use of plastic carry bags of thickness less than 50 microns and non-compostable plastic carry bags for any purpose.

5.2.3.7. Compliance of Plastic Waste Management Rules, 2016

5.2.3.7.A Registration of Producers, Importers, Brand Owners, manufacturers and recyclers

5.2.3.7.A.1 Non-registration of Plastic units[112]

Rule No. 13(1) of PWM Rules, 2016 provided that no person shall manufacture carry bags or recycle plastic bags or multi-layered packaging without obtaining a registration from the State Pollution Control Board or the Pollution Control Committee of the Union Territory concerned, as the case may be, prior to the commencement of production. Producers or brand owners operating in more than two states or UTs need to apply to CPCB for the purpose of registration and renewal in terms of Rule 13(2).

Audit observed that during 2018-20, 88 brand owners and four producers were granted registrations by CPCB. The status of registration of the plastic units (Producers, Importers, Brand Owners, manufacturers and recyclers) in the sampled states during the period 2015-20 is as shown in **Table 5.4**:

[110] Thermocol is an EPS (Expanded Polystyrene) and Styrofoam is an XPS (Extruded Polystyrene). Both these polystyrene products are derived from petroleum, just like plastic. Thermocol is so popular that any EPS/XPS is generically called 'Thermocol'.

[111] vide notification dated 23/10/2012

[112] Plastic units include Producers, Importers, Brand Owners, manufacturers and recyclers

Table 5.4: Position of Plastic units registered in sampled states during 2015-20

At the end of March	Punjab			Sikkim			Delhi		
	Total plastic units	Registered plastic units	Registration (% age)	Total plastic units	Registered plastic units	Registration (% age)	Total plastic units	Registered plastic units	Registration (% age)
2016	479	0	0	Registration process not initiated			Registration process not initiated		
2017	491	3	0.61						
2018	493	9	1.83						
2019	497	24	4.83				1804	1	0.06
2020	502	139	27.69				1804	220	12.20

It can be seen from the table above that Punjab PCB registered only 27.70 per cent of the total plastic units identified by it till March, 2020. Delhi PCC initiated the registration process in 2018-19 only (i.e. after two years of issue of PWM Rules) and could register only 12.20 per cent identified plastic units as of now. Sikkim PCB has not yet identified plastic units functioning in the state.

In response, Punjab PCB had assured to make the efforts to register the plastic units; while Sikkim PCB informed to have initiated Extended Producer's Responsibility (EPR) registration activity online.

5.2.3.7.A.2 Delay in application for registration

Rule 9(4) of PWM Rules, 2016 states that the producer, within a period of three months from the date of publication (18 March 2016) of these rules shall apply to SPCB and PCC, for grant of registration. Rule 13 of PWM Rules 2016 amended in March 2018 requires Producers and Brand Owners (PBOs) operating in more than two States or UTs to register with Central Pollution Control Board.

Test check of records of 45 PBOs registered with CPCB during the period 2018-20 disclosed that these units were in operation at the time of notification of rules. Further, they had applied for registration with a delay ranging nine days[113] to more than a year[114].

In sampled states, Punjab PCB granted registrations to 83 producers during 2016-20 which had applied for registration, with a delay ranging from four months to over 3.7 years. Delhi PCC registered 77 producers during 2019-20 but the records relating to their registration were not provided to Audit, citing unavailability of the same. As a result, delays, if any, in applying for registration couldn't be assessed in Audit.

[113] M/s Haldiram Foods International Pvt. Ltd., Nagpur,
[114] M/s Pidilite Industries Limited, Mumbai

However, claim of Delhi PCC of unavailability of data was unjustified, as being the only authority for registration of plastic units in Delhi, it should have possessed these records.

5.2.3.7.A.3 Irregular grant of registration

Rule 13(5) of PWM Rules, 2016 provides the State PCBs and PCCs shall not issue or renew registration to plastic waste recycling or processing units unless the unit possesses a valid consent under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981.

Audit observed that Punjab PCB in contravention of provisions ibid, granted registration or renewal of registration to seven producers and three recyclers beyond the validity period of their consents, under the Water and Air Acts.

On being pointed out, Punjab PCB assured that the plastic units would be persuaded for renewal of their Air and Water consents.

Delhi PCC did not provide the records relating to date of registration and consents to Audit.

5.2.3.7.A.4 Irregularities in renewal of registrations

Rule 13(11) of PWM Rules, 2016 provided that every application for renewal of registration shall be made at least one hundred twenty days before the expiry of the validity of the registration certificate.

Test check of records relating to renewal of registration of PBOs registered with CPCB disclosed that the registration of 14 PBOs[115] had already expired as of March 2020, yet they did not apply for renewal; while, the applications for renewal in 33 PBOs[116] whose registrations had expired before March 2020 are pending with CPCB till date. Although CPCB served show cause notices to the PBOs who did not apply for renewal of registration, it did not offer any comments on the issue of pendency of applications for renewal of registration of Brand Owners.

In Punjab, 24 plastic units[117] whose registration had expired during the period 2018-20 did not apply for renewal of registration as of March 2020. Moreover, ten plastic units[118] applied for renewal with Punjab SPCB during 2017-20, with a delay ranging from 04 months to over 1.3 years.

In case of Delhi, PCC did not provide the information regarding renewal of registrations of the plastic units functioning in its jurisdiction.

[115] 13 Brand Owners and one Producer
[116] 32 Brand Owners and one Producer
[117] One brand owner, two manufacturers, 14 producers and seven recyclers
[118] five producers and five recyclers

5.2.3.7.B Extended Producer's Responsibility

Extended Producer's Responsibility (EPR) is shifting of the responsibility of the end-of-life management of products and materials to their respective producers. Its objective is to establish a system reducing the burden of municipalities and placing a shared physical and/ or financial responsibility for waste management on producers and providing incentives for manufacturers to design resource efficient and low impact products.

Rule 3(h) of PWM Rules, 2016 further defines Extended Producer's Responsibility as responsibility of a producer for the environmentally sound management of the product until the end of its life.

5.2.3.7.B.1 Absence of a uniform framework for Extended Producers Responsibility

It was observed that there were unlimited numbers of Brand owners/ producers across the country. However, these rules did not prescribe a framework to define the interlinkages between the different stakeholders for effective fulfillment of EPR liability by producers, importers and brand owners as well as for the actors involved in plastic waste management.

In absence of a uniform framework to implement EPR, the SPCBs/ PCCs could not fix the responsibilities or liabilities of Producers and Brand Owners operating in the respective states and UTs with regard to PWM Rules, 2016. On the direction of National Green Tribunal (December 2019), MoEF&CC notified an EPR framework in October 2021.

5.2.3.7.B.2 Non-submission of modalities for waste collection by Producers

Rule 9(1) of PWM Rules, 2016 provided that the producers, within a period of six months from the date of publication of these rules, shall work out modalities for waste collection system based on Extended Producer's Responsibility (EPR) and involving State Urban Development Departments, through their own distribution channel/ through the local body concerned, as per guidelines issued under these rules from time to time.

Audit observed that till March 2020, 144 producers[119] were registered with Punjab PCB and Delhi PCC. However, none of them had submitted the modalities for waste collection to their respective PCB or PCC, so far.

On being pointed out, Punjab PCB stated that efforts would be made to ensure necessary compliance. No comments were offered by Delhi PCC in this regard.

[119] Punjab PCB: 67 producers and Delhi PCC : 77 producers

5.2.3.7.B.3 Non-establishment of system for collecting back the plastic waste by Producers, Importers and Brand Owners

In terms of Rule 9(2) of PWM Rules 2016, the primary responsibility for collection of used multi-layered plastic sachet or pouches or packaging is of brand owners, importers and producers, who introduce the products in the market. Further, they need to establish a system for collecting back the plastic waste generated due to their products. This plan of collection is to be submitted to the SPCBs while applying for Consent to Establish or Operate or Renewal. Similarly, those registered with CPCB in terms of rule 13(2) of PWM (Amendment) Rules, 2018 need to submit the Action Plan to CPCB.

CPCB stated that it had received the Action Plan from all the 92 Producers, Importers and Brand Owners (PIBOs)[120] registered with it during 2018-20, which were found inadequate. Accordingly, directions for renewal and levying Environmental Compensation[121], serving show cause notices etc., were issued to them.

Test-check of the records of 45 PBOs revealed that–

- 15 PBOs[122] did not furnish their progress reports pertaining to plastic waste generated and collected by them to CPCB since their registration.
- 14 PBOs[123] submitted their progress report for plastic waste generation and collection intermittently to CPCB. As a result, the quantum of plastic waste generated and collected by them could not be assessed in Audit.
- Out of 16 PBOs[124] who duly submitted their progress reports, 11 PBOs could not collect back entire plastic waste generated by them and there was a shortfall up to 85 per cent in collection of plastic waste generated by them.

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[120] 88 Brand Owners and four Producers

[121] A compensation regime based on 'Polluter Pays' principle. The funds collected under environmental compensation shall be utilized in collection and recycling/ end of life disposal of uncollected and non-recycled/ non-end of life disposal of plastic packaging waste on which the environmental compensation is levied.

[122] M/s Abbott Healthcare Pvt. Ltd., M/s Cargill India Pvt. Ltd., M/s Abbott India Ltd., M/s Perfetti Van Melle India Pvt. Ltd., M/s Dabur India Ltd, M/s GlaxoSmithKline Consumer Healthcare Ltd., M/s Marico Ltd, M/s ITC Ltd, M/s Jubilant Agri and Consumer Products Ltd., M/s Modern Food Enterprises Pvt. Ltd, M/s Johnson & Johnson Pvt. Ltd., M/s Hershey India Pvt Ltd., M/s LG Electronics India Pvt. Ltd, M/s Ajanta Pharma Ltd, M/s ICA Pidilite Pvt Ltd

[123] M/s Mother Dairy Fruit & Vegetable Pvt. Ltd, M/s Tata Chemicals Ltd, M/s Nestle India Ltd, M/s General Mills India Pvt Ltd, M/s Parle Products Pvt Ltd, M/s RSPL Ltd, M/s Tata Global Beverages Ltd, M/s Haldiram Foods International Pvt. Ltd, M/s McCain Foods India Pvt Ltd, M/s Procter & Gamble Home Products Pvt Ltd, M/s S.C. Johnson Products Pvt Ltd, M/s Murugappa Morgan Thermal Ceramics Ltd, M/s Lupin Ltd., M/s Hetero Labs Ltd.

[124] M/s. Amway India Enterprises Pvt. Ltd., M/s. Dharampal Satyapal Ltd, M/s. Dharampal Satyapal Ltd. (Silver Foil Division), M/s. DS Spiceco Pvt. Ltd, M/s. Pidilite Industries Ltd, M/s. Bisleri International Pvt. Ltd, M/s. Asian Paints Ltd, M/s. Reckitt Benckiser (India) Pvt. Ltd, M/s. Mahindra and Mahindra Ltd, M/s. Mead Johnson Nutrition (India) Pvt. Ltd, M/s. Torrent Pharmaceuticals Ltd, M/s. Glenmark Pharmaceuticals Ltd, M/s. Harita-NTI Ltd, M/s. Louis Dreyfus Company India (P) Ltd., M/s. Cadila Healthcare Ltd., M/s. J.K. Cement Ltd

- Registration of nine[125] PBOs were renewed by CPCB, yet they either did not submit their progress reports or submitted these intermittently.

In sampled states, Audit observed that none out of 77 registered producers had submitted their system of collecting back the plastic waste caused by their products to Delhi PCC. Only seven Brand Owners, out of total 87 registered PIBOs could submit their plan of collection to Punjab PCB.

5.2.3.7.C Non-setting up of system for PWM by local bodies

Rule 6(3) of PWM Rules 2016 stipulates that the local body shall set up system[126] for the plastic waste management by seeking assistance of producers and such system shall be set up within one year from the date of publication of these rules, i.e., by 17 March 2017.

Audit observed that the selected ULBs in Punjab and Sikkim did not set up a system for the plastic waste management by seeking assistance of producers, as they were not aware of the producers functioning under their jurisdiction. It was observed that in Delhi, the selected ULBs stated to have set up their own infrastructure. However, no documentary evidence in support of this comments was provided to Audit.

On being pointed out, ULBs in Sikkim and Punjab replied that the details of producers would be obtained from their respective PCBs and efforts would be made to ensure setting up of system for the plastic waste management with producers.

5.2.3.7.D Discrepancies in recycling of plastic waste

Rule 5(1)(a) of PWM Rules, 2016 envisages that the plastic waste, which can be recycled, shall be channelized to registered plastic waste recycler by the Urban Local Bodies and recycling of plastic shall conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastics, as amended from time to time.

Audit found that in Punjab and Sikkim, ULBs were not involved in the process of segregation and channelization of plastic waste and the same was done by the rag pickers, informal sectors, junk dealers. Hence, these ULBs could not ensure whether the segregated recyclable plastic waste of 0.16 million tonnes was being channelized only to registered recyclers complying with the Indian standard. Moreover, Sikkim does not have recycling or processing units in the state and recyclable fraction of plastic is being sent to waste dealers in Siliguri, West Bengal. In Delhi, sampled ULBs did not provide any records regarding channelization and recycling of plastic waste.

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[125] M/s. General Mills India Pvt Ltd, M/s. Dabur India Ltd, M/s. Jubilant Agri and Consumer Products Ltd., M/s. McCain Foods India Pvt Ltd, M/s. Mahindra and Mahindra Ltd, M/s. Hershey India Pvt Ltd, M/s. LG Electronics India Pvt. Ltd, M/s. Ajanta Pharma Ltd, M/s. ICA Pidilite Pvt Ltd

[126] System of setting up of infrastructure for segregation, collection, storage, transportation, processing and disposal of the plastic waste either on its own or by engaging agencies or producers.

5.2.3.7.E Non-disposal of inert[127] as per SWM Rules

Rule 5(1)(d) of PWM Rules, 2016 provides that the inert from recycling or processing facilities of plastic waste shall be disposed of in compliance with the Solid Waste Management Rules 2000, which inter alia provided that land filling shall be restricted to non-biodegradable inert waste and other waste that are not suitable either for recycling or for biological processing.

Audit found all the three sampled ULBs of Delhi claimed to have complied with the Solid Waste Management Rules in disposal of inert from recycling or processing facilities, however no evidence was provided to audit to back up this claim.

5.2.3.7.F Non-utilization of plastic waste for road construction or energy recovery or waste to oil etc.

Rule 5(1)(b) of PWM Rules, 2016 provided that the local bodies shall encourage the use of plastic waste (preferably the plastic waste, which cannot be further recycled) for road construction as per Indian Road Congress guidelines or energy recovery or waste to oil etc. The standards and pollution control norms specified by the prescribed authority for these technologies shall be complied with.

Audit observed that the selected ULBs of Punjab did not utilize the plastic waste for road construction or energy recovery or waste to oil etc. during 2015-20. Sikkim could utilize the plastic waste for road construction only once in 2020, when Gangtok Municipal Corporation handed over 500 kgs. of plastic waste to National Highways & Infrastructure Development Corporation Ltd. (NHIDCL) for road construction. ULBs in Delhi utilized 4,83,625 tonnes of plastic waste in the production of Refused Drive Fuel to be used in waste to energy plant during 2015-20.

On being pointed out, ULBs of Punjab assured to explore the possibilities for utilization of plastic waste.

5.2.3.7.G Phasing out of non-recyclable multilayered plastic

PWM Rule 9 under sub-rule (1) directed the PIBOs who introduce multi-layered plastic[128] (MLP) in the market to phase out manufacture and use of non-recyclable multi-layered plastic, if any.

CPCB provided year-wise data of 1187 producers involving in manufacturing of MLP registered with SPCBs or PCCs across the country during 2015-20. However, it acknowledged that it was not aware of those producers who had completely stopped or phased out manufacturing of non- recyclable MLP. Delhi PCC denied the existence of PIBOs involved in manufacture or use of non-recyclable multi-layered plastic in the

[127] Inert waste is waste which is neither chemically nor biologically reactive and will not decompose or only very slowly.

[128] Any material used for packaging and having at least one layer of plastic as the main ingredient in combination with one or more layers of materials such as paper, paper board, polymeric materials, metalised layers or aluminium foil, either in the form of laminate or co-extruded structure.

state. In Punjab, the information of the PIBOs involved in manufacturing or using non-recyclable MLP was not provided by PMIDC. In Sikkim, PCB and ULBs are not aware of the producers, if any operating in the state.

5.2.3.7.H Processing and disposal of thermo-set plastic waste

Rule 5(1)(c) of PWM Rules, 2016 stipulates that the thermo-set[129] plastic waste shall be processed and disposed of as per the guidelines from time to time by the Central Pollution Control Board.

CPCB accepted that it does not receive any information on processing and disposal of thermo-set plastic waste from the state. Hence, it is unaware of the compliance of its own guidelines in processing and disposal of thermo-set plastic waste by local bodies.

In sampled states, Audit did not find any record maintained in Punjab PCB and the selected ULBs of Delhi regarding processing and disposal of thermo-set plastic waste. No data was made available for Sikkim.

5.2.4 Absence of clear provision for penalty for violation in PWM Rules, 2016

In exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act 1986, Government of India published Plastic Waste Management Rules (PWM), 2016. Section 15(1) of the Act provided that whoever fails to comply with or contravenes any of the provisions of this Act, or the rules made thereunder, shall, in respect of each such failure or contravention, be punishable with imprisonment for a term which may extend to five years with fine which may extend to one lakh rupees, or with both. In case the failure or contravention continues, the additional fine may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention.

In sampled states, SPCBs and PCC stated that they have not penalized violators of the rules in absence of any such provision in PWM Rules 2016. Audit too noticed that PWM Rules lacked clarity on this issue because these rules neither prescribed any penal provision for violations nor made any reference to the provisions contained in Environment (Protection) Act for the purpose. Later, CPCB framed an Environmental Compensation Regime (ECR)[130] for violators of PWM Rules in December 2020 when directed by NGT in September 2020. However, this regime came into force in October 2021 only with the notification of EPR.

Thus, lack of clarity on imposition of penalty in the PWM Rules not only allowed the violators of these rules to let off unpunished but also mitigate the effectiveness of

[129] A plastic which becomes irreversibly rigid when heated and hence cannot be remoulded into desired shape

[130] A Regime for imposition and collection of Environmental Compensation on PIBOs, recyclers and end of life processors, in case of non-fulfilment of obligations set out in PWM Rules and also for violations of conditions or false information/ certificates.

these rules.

5.2.5 Non-identification of risks to the environment and health posed by plastic waste

Water and soil contamination and air pollution have direct consequences on human health. Contaminants in the soil can harm plants when they take in the contamination through their roots. This apart, micro-plastics[131] are also a huge problem, found in both the air and water including oceans, lakes. Micro-plastics are small enough to be inhaled straight into our lungs. These can also be harmful when they get into our airways like any other foreign object. Identification of risks is required to control loss or damage or to plan for the minimisation of damage or loss. Hence, identification of risks to environment and health posed by waste is essential to minimize damage to health and environment.

Pollution Control Boards are mandated to provide technical assistance and guidance to carry out, sponsor investigations and research relating to water and air pollution and prevention, control or abatement of air and water pollution. However, Audit found the only piece of work done to identify the effects of plastic waste on environment and health was undertaken in December, 2015 when CPCB conducted a study 'Impact of Plastic Waste Disposal on soil and water quality at Lucknow dumpsites'. In the study, it was recommended that dumping of plastic waste should not be allowed as it deteriorates soil and underground water quality due to leaching of additives, colours, stabilizers and fillers present in different categories of plastic products.

However, CPCB accepted to have not conducted the assessment of pollution of plastic waste in air and human health for the entire country, so far. In the sampled states, Department of Environment, Government of NCT Delhi and Punjab PCB admitted that no such study has been undertaken till date.

5.2.6. Monitoring

Monitoring helps in assessing the level of pollution in relation to prescribed standards. Standards are a regulatory measure to set the target for pollution reduction and achieve clean environment. Robust monitoring helps to guard against extreme events by alerting people and initiate action.

Since ULBs and RLBs in any state or UT are responsible for the waste management at the ground level, it is important to ensure, through monitoring, that implementing bodies are following the prescribed rules. For this, there are provision in PWM rules for formation of a State Level Advisory Committee for each state and UT. However, Audit noticed that these rules are silent on identification of a nodal department or body for overall monitoring of implementation at Central level.

[131] chunks of plastic that measure less than five millimetres (mm) across, less than a quarter of an inch.

In order to strengthen the monitoring mechanism, MoEF&CC in March 2021 directed each State/ UT to constitute a Special Task force for preparation of a comprehensive Action Plan for implementation of PWMR 2016 and phasing out of SUPs, with identified activities and timelines and synergizing efforts and resources of various Departments/Agencies at State, District and City level. Similarly, to prepare a Comprehensive Action Plan for implementation of Plastic Waste Management Rules, 2016 and phasing out of identified Single Use Plastic items, MoEF&CC constituted (June 2021) a National Task Force under the chairmanship of Cabinet Secretary with overall participation[132] of ministries/ departments of Government of India and states or UTs. However, National Task Force has not yet produced an action plan for the purpose so far and only 23 states and UTs have formed their respective task forces. In the absence of data, any kind of monitoring would be ineffective.

5.2.6.1 Annual Reports

PWM Rules, 2016 under rule 17 laid down a bottom-up hierarchical annual reporting framework from the plastic units to ministerial level for the implementation of plastic waste management rules. As per the rule, the recycling and processing units of plastic waste are supposed to submit their annual reports to the local body concerned by 30th April every year. The local bodies in turn would submit their annual report to the concerned SPCB or PCC by 30th June. All SPCBs or PCCs are required to submit their annual reports to CPCB by 31st July which shall be consolidated and forwarded annually to the Central Government, along with the recommendations before the 31st August of every year.

It was seen that CPCB submitted the annual reports to MoEF&CC with delays ranging from six months to one year during 2015-16 to 2019-20. CPCB attributed these delays to late submission of the annual reports by SPCBs and PCCs and shortage of manpower required for timely and efficient execution of multiple tasks related to PWM. In this regard, Audit also observed non-submission or delayed submission of Annual Reports up to one year by many state PCBs and PCCs (inclusive of the sampled states) during 2015-20.

In these cases, CPCB issued the reminders to the concerned SPCBs and PCCs from time to time. It also communicated with the Ministry for creation of additional posts in October 2020. Approval of the Ministry is awaited till date.

Further examination of non-submission/ delayed submission of annual reports in the sampled states revealed the following:

[132] Secretary, Ministry of Environment, Forest and Climate Change (as Chairman) and representative of Secretary, Ministry of Housing and Urban Affairs; Ministry of Micro, Small and Medium Enterprises; Department of Commerce; Department for Promotion of Industry and Internal Trade; Ministry of Road, Transport and Highways; Ministry of Earth Sciences; Department of Consumer Affairs; Department of Drinking Water and Sanitation; Department of Science and Technology; Department of Chemical and Petrochemicals and representatives of Chief Secretary/ Administrator of all the State/ UT Governments (as Member)

- none of the ULBs in Punjab and Delhi received annual reports from recyclers or processors of plastic waste during 2015-20. Moreover, the selected ULBs in Punjab were not aware of the recyclers functioning in their jurisdiction; while in Delhi, SDMC was not even aware of such annual reporting.
- five out of 18 selected ULBs in Punjab did not submit annual reports to the Secretary of the Local Government Department and Punjab PCB. In 2015-16, all the ULBs of Delhi did not submit the Annual Reports to DPCC. Further, two ULBs (SDMC & NDMC) submitted the annual report of 2016-17 and 2017-18 with a delay ranging from 37 to 172 days.
- In Sikkim, all the selected ULBs had submitted annual reports to the Secretary, UDD and its PCB during 2015-20.

Because of the above discrepancies, CPCB received incomplete and delayed information regarding plastic waste management in the country and consolidated the same to forward to the Ministry for decision making.

5.2.6.2 State Level Advisory Committee and its meetings

Rule 16(1) of PWM Rules, 2016 provided that the State Government shall for the purpose of effective monitoring of implementation of these rules, constitute a State Level Advisory Committee with prescribed composition. The Committee shall meet at least once in six months and may invite experts, if it considers necessary.

Audit observed that in Delhi, SLAC was constituted in July 2016 and since then 13 meetings of SLAC were conducted against the eight mandatory meetings during 2016-20. However, minutes of meetings of SLAC were not made available for verification of recommendations, if any made and follow up action thereupon taken by ULBs.

In Punjab and Sikkim, the SLACs were constituted with a delay of over a year and both states failed to hold the meetings as per the prescribed frequency. Punjab could convene only three[133] meetings; Sikkim could manage just one[134] meeting of SLAC during 2017-20. Further, there was no representation of rural local bodies in SLAC, Punjab.

5.2.6.3 Absence of guidelines and standards for monitoring of plastic pollution

CPCB which is the organization at union level to assess the pollution caused by plastic, admitted that it had not prepared any guidelines or standards for monitoring of plastic pollution in surface water, soil and micro plastics in air. It had also not constituted a body for this purpose so far. Audit observed that a Joint Committee was constituted by National Green Tribunal vide order dated 16.06.2021 to inspect the presence of micro-plastics in wells near dumpsites in Chennai. However, the report is yet to be

[133] As against six meetings, only three (February 2019, August 2019 and March 2020) were to be convened during 2017-20

[134] As against six meetings, only one (March 2018) were to be convened during 2017-20

submitted by the Committee as it has sought an extension of time up to October 2021 for the purpose.

Punjab PCB also admitted to have not taken any step in this regard. Delhi PCC stated to have neither prepared guidelines/ standards for monitoring of plastic pollution in surface water, soil and microplastics in air nor constituted a body for the purpose so far.

5.2.6.4 Absence of national inventory of PIBOs at central level

An inventory or database of PIBOs, manufacturers, recyclers etc. at the Central level is a very useful tool for the assessment of quantum of plastic waste generated and processed across the country. It may also help CPCB to keep track of non-registered PIBOs and those due for the renewal of registration with it or SPCBs or PCCs.

MoEF&CC stated that the responsibility of maintaining the inventory of PIBOs lies with CPCB, SPCBs and PCCs, as they are the registering authorities. CPCB admitted that it had not maintained the annual inventory of Producers, Importers, Brand Owners, manufacturers and recyclers. However, CPCB provided a list of 1419 recyclers in 31 States and UTs based on the information uploaded on the websites by respective SPCBs and PCCs.

Hence, in absence of the inventory, MoEF&CC cannot ensure whether the registrations or renewal of registrations were going on in the states at a brisk pace and compliance to PWM rules are being made in effective and efficient manner.

5.2.7 Conclusion

A robust mechanism for assessment of generation of plastic waste, its collection and safe disposal is not in place. The stakeholders, MoEF&CC, CPCB, SPCBs/ PCCs are not working in tandem to control generation, putting effective system for collection and safe disposal of plastic waste. Plastic Waste Management Rules framed by MoEF&CC lack comprehensiveness to give thrust to effective implementation and monitoring thereof. Bye-laws of local bodies incorporating provisions of PWM Rules have not been notified by state urban departments. In absence of uniform methodology for assessment, incomplete and invalidated data is channelized to the Ministry for decision making. Lackadaisical approach of CPCB and SPCBs/ PCCs allowed the plastic units to function without valid registrations. There was no action plan in place for effective implementation of the three-pronged strategy thereby leading to ineffectiveness in the implementation of PWM rules. Non-framing of a uniform framework of Extended Producer's Responsibility resulted into non-development of a system of collecting back and processing of plastic waste with assistance of PIBOs as per PWM Rules. Deficient system of monitoring rendered the implementation of PWM Rules ineffective to contribute in abatement of pollution caused by plastic waste. Failure in the safe management of plastic waste has detrimental long term health and environment concerns and this issue needs to be taken up on a priority basis by the Government.

5.2.8 Recommendations

(i) MoEF&CC needs to put a system in place for effective data collection in relation to generation, collection and disposal of plastic waste, through its agencies (CPCB, SPCBs/ PCCs) and monitor their performance.

(ii) CPCB and State PCBs/ PCCs in coordination Local bodies need to carry out, periodically, a comprehensive assessment of the quantity of plastic waste being generated and collect data according to parameters like population size, geographical size of the area, economic growth, increased demand for consumer goods and change in manufacturing methods etc.

(iii) CPCB and State PCBs/ PCCs may identify and register all the PIBOs operating under their jurisdiction, so as to comply to the provisions of Extended Producer's Responsibility.

(iv) Local bodies may expedite the process of notifying their bye-laws by incorporating Plastic Waste Management Rules.

5.3 Unfruitful expenditure of ₹ 73.35 lakh on a demonstration project

Ineffective monitoring by MoEF&CC and delay in release of financial assistance resulted in non-achievement of environmental benefits from the demonstration project and unfruitful expenditure of ₹ 73.35 lakh.

Central Leather Research Institute, Chennai, (CLRI) an autonomous body under the Ministry of Science and Technology was set up to meet the needs of the leather and allied sectors through research, technology development and transfer, training and industrial support and formulation of policies and plan of action that ensures a technology based competitive advantage for Indian leather. In December 2015, the Ministry of Environment, Forest and climate Change (MoEF&CC) granted approval to a lab cum demonstration project titled '*Sequential production of Bio-Diesel, Bio-Ethanol, Bio-Hydrogen and Methane from leather solid wastes and effluent treatment sludges*' to Central Leather Research Institute, Chennai at a total project cost of ₹ 77.11 lakh. The objectives of the project were to demonstrate treatment of leather wastes in an environmentally sustainable manner. The project was approved in Public Private Partnership (PPP) mode and one of the conditions of the approval was that the industry partner (RANITEC CETP Pvt Ltd) was to contribute ₹ 35 lakh in addition to the ₹ 77.11 lakh sanctioned by MoEF&CC. Considering the environmental benefits of the expected outcome, the project was approved through a technical committee for a duration of three years; but was extended from time to time until March 2020. Being a demonstration project, the project entailed specific physical deliverables as given below:

Table 5.5: Project entailed specific physical deliverables

Sl. No.	Name of the Unit	Output
1.	Bio-Diesel recovery	80-110 ltr/dry tonne of waste per day
2.	Bio-Ethanol recovery	150 ltr/dry tonne of waste per day
3.	Bio-Hydrogen recovery	55 cubic metre/dry tonne of waste per day
4.	Bio-Methane recovery	70 cubic metre /dry tonne of waste per day

It also entailed generation of minimum 10 international publications in high impact factored journals and three PhD degrees. The project envisaged delivery of environmental benefits like effective solid waste management technique for tanneries, better pollution abatement technique, avoidance of ground water contamination and efficient greenhouse emission control techniques. This project was to be led by a Principal Investigator[135] (PI) with support of an industry partner (RANITEC CETP Pvt Ltd).

Audit observed (January 2022) that against the expected physical outputs of four distinct fuel recovery units, only one unit (Bio-Diesel recovery) had been established in March 2018 which was producing 80 litres of bio-diesel, as per the projected output in the project proposal. None of the other three units had achieved fruition as of May 2022. Further, the deliverables of 10 international publications in high impact factored journals and three PhD degrees had also not been achieved.

This project involved huge data, design, commission and execution works as well as dedicated technical manpower for successful implementation of the project. We however, observed several deficiencies in the management of the project by MoEF&CC, such as inaction in processing the request of CLRI to revise the amount of project fellowships, due to which CLRI was unable to retain the project fellows who were engaged on the project; failure to obtain a formal commitment from the industry partner, which resulted in limited participation by the industry partner; and a lack of regular monitoring of the progress of the project, which affected the timely implementation of the project. These audit observations are detailed below:

A) During 2015-17, several requests were received by MoEF&CC from the Principal Investigator (PI) for release of fellowships at revised rates and enhanced budget for the project, on account of cost escalation of the equipment. Audit observed that the requests were not put up for consideration of the Expert Committee[136] and approval of the competent authority. Hence the Integrated Finance Division (IFD) did not accord concurrence. Instead, the IFD stated (January 2020) that the revision of fellowship and release of the next installment may be considered after utilization of the unspent balance[137]. Without the formal approval of MoEF&CC, CLRI was unable to revise the

[135] PI is the individual responsible for the preparation, administration and execution of a research grant and is the lead researcher for the project.
[136] Expert Committee was formed to evaluate Research & Development projects of research in environment Division of MoEF&CC
[137] Unspent balance of ₹ 18,96,783 from FY 2018-19 to FY 2019-20.

fellowship amount. We also observed that against the total revised budget of ₹ 27.22 lakh for fellowships, only ₹ 5 lakh was released and remaining ₹ 22.22 lakh was released by MoEF&CC as late as January 2020, after almost four years of project duration. Consequently, some project fellows resigned due to non-payment of fellowships. Thus, administrative lapses on the part of the ministry, delayed the release of financial support to the project.

B) One of the key conditions for approval of the project was to implement the same in PPP mode. We observed that rather than signing a MoU with specific responsibilities and recourse in case of a default, M/s RANITEC CETP Pvt Ltd merely submitted an undertaking to contribute ₹ 35 lakhs towards equipment, which was accepted for approval of the project. However as of July 2019, only ₹ 15 lakhs had been received from the industry partner. Though the industry partner stated (January 2022) that a total of ₹ 65 lakhs (including ₹ 15 lakhs) was incurred on the project, nothing on record indicated receipt of a contribution of ₹ 50 lakhs in cash or kind. In the absence of an MoU with clear responsibilities and mechanism for enforcement, the effective participation of the industry partner could not be ensured, thus defeating the whole purpose of the PPP mode of execution of the project.

C) Audit observed that the monitoring of the project by MoEF&CC was not effective as after the approval of the project in December 2015, the first review of the project was done by the Steering Committee only in September 2018. This was followed up by a review by the Technical and Financial Appraisal Committee in July 2019, after a gap of almost four years. In the review held in July 2019, the PI was asked to complete the project by March 2020. Thereafter there was no follow up by the Ministry. PI in January 2022 asked the Ministry to extend the project upto March 2022. As of May 2022 the project is still not complete.

In response of these observations, MoEF&CC (May 2022) stated that the remaining three plants i.e., Bio-ethanol, Bio-hydrogen and Bio-methane plants are at different stages of completion and the PI has sought another six month extension to the project, which, MoEF&CC has not accorded as yet. Thus even after many extensions, only one facility has been established till date. MoEF&CC remained silent on the issue of delay in release of fellowships.

Thus, despite release of funds of ₹ 73.35 lakh, the project objectives and deliverables are yet to be achieved, even after five years. There were lapses on the part of MoEF&CC in timely release of funds, effective monitoring to ensure utilisation and setting up of a working linkage with private industrial partner. All these resulted into inordinate delay in the implementation of the project leading to non-completion of the project that had immense environmental benefits like effective solid waste management technique for tanneries, better pollution abatement technique, avoidance of ground water contamination and efficient greenhouse emission control techniques besides generation of 10 minimum international publications in high

impact journals and three PhD degrees. In addition, it also resulted in unfruitful expenditure of ₹ 73.35 lakh on the project.

5.4 Short recovery of rent of ₹ 96.72 lakh from a bank

Absence of formal lease agreement resulted in loss of rent revenue of ₹ 96.72 lakh.

Rule 208 (iii) of GFR 2005 and Rule 229 (iv) of GFR 2017 stipulate that all autonomous organizations, new or already in existence should be encouraged to maximize generation of internal resources and eventually attain self-sufficiency.

As per the Directorate of Estates, Ministry of Urban Affairs & Employment's (presently Ministry of Housing & Urban Affairs) OM dated 16 March 1999, the market rate of license fee needs to be charged from commercial organizations operating from the official premises, with revision of same every three years at 8 percent per annum. Subsequently, the Directorate of Estates (DoE) further revised these rates from time to time.

Wildlife Institute of India (WII)-Dehradun, an autonomous institute under the administrative control of the Ministry of Environment, Forest & Climate Change (MoEF&CC) had provided (December 1993) space measuring 54.39 sq. mtrs. (585.45 sq. ft.) to Union Bank of India (UBI) for opening of its Extension counter within its campus at Chandrabani, Dehradun.

Audit observed that:

- On the allotted space, WII charged (December 1993) the license fee of ₹ 2175.60 per month on the basis of rates prescribed by the DoE and license fee was paid by UBI accordingly. However, WII did not enter into any lease agreement with UBI for providing this space.
- WII further allotted additional accommodation to UBI in April 2006, May 2010 and May 2012. However, the license fee for this space was fixed at the old rates and not as per the revised rates issued by DoE. WII also did not enter into any lease agreements with UBI for providing the additional space.
- In July 1999, WII requested UBI for increased license fee to match the rates prescribed by DoE but UBI did not agree to this.
- WII followed up with UBI to increase the license fee in May 2012 but afterwards no follow up action was taken to raise the rent since January 2013.

After pointed out by Audit (June 2019), WII signed a lease agreement with UBI for aforesaid property having floor area of 1444.08 sq. ft[138] with rent of ₹ 47,654.64/- per month[139] commencing from April 2019. An amount of ₹ 16.58 lakh had been paid by UBI to WII as license fee from April 2019 to December 2021.

[138] Equal to 134.20 sq mtr
[139] @ ₹ 33/- per sq. ft. plus GST

Audit observed that the license fee payable, in accordance with the license fee fixed by DoE for the period January 1996[140] to December 2021, worked out to be ₹ 122.23 lakh. Out of this, WII received only ₹ 25.51 lakh, resulting in short recovery of License fee of ₹ 96.72 Lakh due to absence of formal lease agreement.

The short recovery of license fee may be seen in light of the fact that another Government autonomous institution under the MoEF&CC (Wadia Institute of Himalayan Geology-Dehradun) is currently getting a reasonable amount of ₹ 62,016/- per month from the same bank for a smaller area in its premises.

In its reply MoEF&CC stated (February 2022) that based on market rate and license fee paid by UBI in their nearby branches, license fee amounting to ₹ 47,655 + GST has been agreed by the Bank & WII from April 2019. However, the fact remains that the agreed amount of license fee is only 53 per cent of the rate prescribed by DoE. Further, no recovery for short license fee has been made for the previous periods i.e., from January 1996 to March 2019.

Thus, due to absence of formal lease agreement, WII lost rent revenue of ₹ 96.72 lakh.

It is recommended that WII may fix accountability for the lapse pointed out above.

New Delhi
Dated: 06 September 2022

(SANJAY KUMAR JHA)
Director General of Audit
Environment and Scientific Departments

Countersigned

New Delhi
Dated: 09 September 2022

(GIRISH CHANDRA MURMU)
Comptroller and Auditor General of India

[140] From December 1993 to December 1995, UBI paid rent as per the DoE rates.

ANNEXES

Annexure-2.1

[*Referred to in paragraph no.* 2.1.2.1.A]

Management of fabrication activities at Vikram Sarabhai Space Centre

Table 1: Difference in Price of SVAPL (May 2019) against price of WIL (March 2008/May 2016)

Sl. No.	Segments	Month/ Year	Base Price per Unit (in ₹ lakhs) of WIL	Number of Units ordered as per the above contract	Base Price per Unit (in ₹ lakhs) of SVAL	Difference in Base price per unit (in ₹ lakhs) of WIL compared to per unit of SVAPL	Total Difference (in ₹ lakhs)
(1)	(2)	(3)	(4)	(5)	(6)	(7) = (4) - (6)	(8) = (7)x(5)
1.	HES	March 2008	116.05[141]	22	98.50	17.55	386.10
2.	NES	March 2008	106.37[142]	22	88.40	17.97	395.34
3.	HES	May 2016	184.10[143]	17	98.50	85.60	1455.20
4.	NES	May 2016	168.76[144]	17	88.40	80.36	1366.12
Total							**3602.76**

(Source: Compiled from information provided by VSSC)

Table 2: Difference in Price of SVAPL (May 2019) against price of L&T (March 2008/June 2016)

Sl. No.	Segments	Month/ Year	Base Price per Unit (in ₹ lakhs) of L&T	Number of Units	Base Price per Unit (in ₹ lakhs) of SVAL	Difference in Base price per unit (in ₹ lakhs) of L & T compared to per unit of SVAPL	Total Difference in ₹ lakhs
(1)	(2)	(3)	(4)	(5)	(6)	(7) = (4) - (6)	(8) = (7)x(5)
1.	MDS	March 2008	96.00	66	65.40	30.60	2019.60
2.	MDS	June 2016	139.10	57	65.40	73.70	4200.90
Total							**6220.50**

(Source: Compiled from information provided by VSSC)

[141] E=0.7 x 0.7 C x (Ix-Ib)/Ib; 0.7 x 0.7 x 102 x [(143x4.73)-528)]/528=14.05; 102 + 14.05 = 116.05

[142] 0.7x0.7x93.50x[(143x4.73)-528]/528= 12.87; 93.50 + 12.87 = 106.37

[143] 0.49 x 102x [(295x4.73)-528]/528 = 82.10; 102 + 82.10 = 184.10

[144] 0.49 x 93.50 x [(295x4.73)-528]/528 = 75.26; 93.50 + 75.26 = 168.76

Annexure-2.2

[*Referred to in paragraph no.* 2.1.2.1.C]

Management of fabrication activities at Vikram Sarabhai Space Centre

Table 1: Difference in rates of PSLV LAS of HAL against rates of other parties (₹ in lakh)

Sl. No.	Name of Light Assembly Structure	Rate as per contracts with M/s HAL			Rate as per contract with other parties			
		2007	2008	2016	2008	2009	2016/2017	2018/2019
1.	Heat Shield	170.21	190.00	412.41	-	-	-	278.11
2.	IS 1/2 L	72.47	81.00	178.69	-	-	-	78.50
3.	IS 1/2 U	55.73	59.63	130.96	40.70	-	-	-
4.	IS 2/3 U			124.93			53.00	71.88
5.	IS 2/3 L	48.76	52.17	120.75	31.23	-	36.93	-
6.	Thrust Frame Assembly	34.83	37.27	105.22	22.75	-	-	-
7	AFT End Closure	13.93	-	27.46	-	3.00	-	-

Table 2: Avoidable payment to HAL in fabrication of PSLV LAS (₹ in lakh)

Sl. No.	Name of PSLV Light Alloy Structure	Quantity (in Nos.)	Rate of HAL	Rate of other party	Difference	Total
(1)	(2)	(3)	(4)	(5)	(6) = (5) - (4)	(7) = (3) * (6)
1.	Heat Shield	17	412.41	278.11	134.30	2283.10
2.	IS 1/2 L	17	178.69	78.50	100.19	1703.23
3.	IS 1/2 U	9	59.63	40.70	18.93	170.37
4.	IS 2/3 L	8	120.75	36.93	83.82	670.56
5.	IS 2/3U	18	124.93	53.00	71.93	1294.74
6.	Thrust Frame Assembly	9	37.27	22.75	14.52	130.68
7.	AFT End Closure	9	13.93	3.00	10.93	98.37
					Total	**6351.05**

Table 3: Difference in rates of GSLV LAS of HAL against rates of other parties (₹ in lakh)

Sl. No.	Name of Structure	Rate as per HAL contracts			Rate as per contracts with other parties	
		2003	2007	2010	2004	2018
1.	IS 1/2 U	52.08	53.93	68.40	-	57.73
2.	IS 2/3 L	52.73	54.60	69.25	-	42.50
3.	L40 Inter Tank Structure	61.04	-	-	34.60	-
4.	L40 Strapon Nose Cone	76.50	-	-	39.60	-
5.	L40 Strapon Base Shroud	78.12	-	-	46.90	

Table 4: Avoidable payment to HAL in fabrication of GSLV LAS (₹ in lakh)

Sl. No.	Name of Light Alloy Structure	Qty.	Rate of HAL	Rate of other party	Difference	Total
(1)	(2)	(3)	(4)	(5)	(6) = (5) - (4)	(7) = (3) * (6)
1.	IS 1/2 U	6	68.40	57.73	10.67	64.02
2.	IS 2/3 L	6	69.25	42.50	26.75	160.50
3.	L40 Inter Tank Structure	12	61.04	34.60	26.44	317.28
4.	L40 Strapon Nose Cone	12	76.50	39.60	36.90	442.80
5.	L40 Strapon Base Shroud	12	78.12	46.90	31.22	374.64
					TOTAL	**1359.24**

(Source: Compiled from information provided by VSSC)

Annexure-2.3

[*Referred to in paragraph no.* 2.1.2.1.D]

Management of fabrication activities at Vikram Sarabhai Space Centre

Table 1: Avoidable payment due to non-competitive bidding for procurement of rods

M/s Star Wire (India) PO No. and date	Item	Price per unit (in ₹)	MIDHANI PO No. and date	Item	Price per unit (in ₹)	Difference in price (in ₹)	Difference in price (in percentage)
20150035730 101; 02/12/15	Dia 35 mm M250 rods 1 to 3 m long	2430	2015E019070101; 31/12/15	Dia 30 and 40 mm M250 rods 1 to 3 m long	3700	1270	34.32
2015E031640 101; 05/05/16	Dia 22 mm M250 rods 1 to 5 m long	2450	2015E019070101; 31/12/15	Dia 22 mm M250 rods 1 to 3 m long	3950	1500	37.97
2015E031640 101; 05/05/16	Dia 50 mm M250 rods 1 to 4 m long	2430	2015E019070101; 31/12/15	Dia 50 mm M250 rods 1 to 3 m long	3600	1170	32.50
2017E061060 101; 09/08/17	Dia 160 mm M250 rods 1 to 3 m long	2079	2017E072940101; 20/12/17	Dia 160 mm M250 rods 1 to 2 m long	2250	171	7.60

Table 2: Avoidable payment due to non-competitive bidding for procurement of rings and plates

Sl. No.	Item	Unit price as per contract No. 20090028030101 (in ₹) dated 21/12/2009	Unit price as per contract No. 20140024040101 (in ₹) dated 12/2/2016	Increase in price (in ₹)	Percentage increase in price	Quantity as per contract No. 20140024040101 dated 12/2/2016	Avoidable price paid (in ₹)
1.	Ring F1	493200	721020	227820	46.19	15	3417300
2.	Ring F2	1641300	2054175	412875	25.16	30	12386250
3.	Ring F3	6518800	9362280	2843480	43.62	30	85304400
4.	Ring F4	4151400	5776395	1624995	39.14	60	97499700
5.	Ring F5	4212900	5845935	1633035	38.76	60	97982100

Sl. No.	Item	Unit price as per contract No. 20090028030101 (in ₹) dated 21/12/2009	Unit price as per contract No. 20140024040101 (in ₹) dated 12/2/2016	Increase in price (in ₹)	Percentage increase in price	Quantity as per contract No. 20140024040101 dated 12/2/2016	Avoidable price paid (in ₹)
6.	Ring F6	3433600	5076420	1642820	47.85	15	24642300
7.	Plate P22	6278500	8214870	1936370	30.84	135	261409950
8.	Plate P26	6152000	8057490	1905490	30.97	8	15243920
Total							**597885920**

(Source: Compiled from information provided by VSSC)

Annexure-2.4

[*Referred to in paragraph no.* 2.1.2.11]

Management of fabrication activities at Vikram Sarabhai Space Centre

Excess payment due to less passing of cost benefit by M/s Midhani

Sl. No.	Item	Quantity (in No.) as per Feb 2016 contract	Weight (in kgs) per unit	Percentage increase in price in Feb 2016 contract compared to Dec 2009 contract	Less passing on of benefit on account of melting facilities (in ₹)	Less passing on of benefit on account of heat treatment facilities (in ₹)
(1)	(2)	(3)	(4)	(5)	(6)= 300 x (3) x (4) x (5)/100	(7) = 50000 x (3) x (5)/100
1.	Ring F1	15	106	46.19	220326.3	--
2.	Ring F2	30	279	25.16	631767.6	--
3.	Ring F3	30	1604	43.62	6296983	--
4.	Ring F4	60	962	39.14	6777482	--
5.	Ring F5	60	957	38.76	6676798	--
6.	Ring F6	15	888	47.85	1912086	--
7.	Plate P22	135	1405	30.84	17548731	2081700
8.	Plate P26	8	1660	30.97	1233845	123880
Total					**41298018.9**	**2205580**

(Source: Compiled from information provided by VSSC)

Annexure-2.5

[*Referred to in paragraph no.* 2.1.2.12]
Management of fabrication activities at Vikram Sarabhai Space Centre
Undue benefit to contractors due to delayed delivery

Sl. No.	PO Number and date	Item	Supplier	Range of delay (in days)	Non/under levy of LD (in ₹ lakh)	Excess payment on account of price variation due to delay (in ₹ lakh)
1.	20130032460101; 01-08-2016	Proof Pressure Testing	Walchandnagar Industries Ltd. (WIL)	2 to 78	3.74	3.32
2.	20150076800101; 31-05-2016	Motor Case PSOXL	Walchandnagar Industries Ltd. (WIL)	6 to 112	12.74	51.50
3.	20070060500101; 25-03-2008	S139 High End and Nozzle End	Walchandnagar Industries Ltd. (WIL)	18 to 922	635.41	263.04
4.	20070060520101; 25-03-2008	S139 Middle Segment	Larsen & Toubro Ltd.	3 to 1046	767.96	804.28
5.	20070063960101; 27-03-2008	Honey Comb Decks	Hindustan Aeronautics Limited	42 to 1074	235.48	**
6.	20040042270101; 09-03-2005	GSLV L40 Light Alloy Structures	Sri Venkateswara Aerospace (P) Limited	21 to 1016	95.77	**
7.	20110071950101 Order Ref No. PUV/1402/02/01/151 DT 30-07-2003	Motor Case PSO/PSO-XL	Walchandnagar Industries Ltd. (WIL)	7 to 650	19.59	15.37
8.	20100026700101; 31-03-2011	S139 Middle Segment	Larsen & Toubro Ltd.	641 to 802	55.47	6.05

Sl. No.	PO Number and date	Item	Supplier	Range of delay (in days)	Non/under levy of LD (in ₹ lakh)	Excess payment on account of price variation due to delay (in ₹ lakh)
		Hardware in ESR Mod. 15CDV6				
Total					**1826.16**	**1143.56**

*** Could not be evaluated due to inadequate information.*

(Source: Compiled from information provided by VSSC)

Annexure 2.6

[*Referred to in paragraph no.* 2.1.2.14]
Management of fabrication activities at Vikram Sarabhai Space Centre
Information on Price variation Clause

Sl. No.	PO Date	Supplier	Order value in ₹ lakh	Actual expenditure against col (6) in ₹ lakh up to March 2021	Price Variation Clause in each Contract with details
(1)	(2)	(3)	(4)	(5)	(6)
1.	01-03-2017	L & T	669.00	681.74	30% amount to be paid as advance. Price escalation formula for 60% payment: $V = 0.8 \times 0.6 \times$ contract price $\times (I_x - I_b)/ I_b$ and same formula for 10% payment. I_b = CPI for Mumbai for January 2016
2.	30-12-2003	HAL	4613.12	730.48	7% escalation from 2006-07 onwards.
3.	19-01-2016	HAL	4881.00	6378.07	30% amount payable as advance. 7% escalation applicable from 2006-07 onwards.
4.	31-01-2011	MIDHANI	1129.82	622.50	$P_1 = P_0/100 \{50 \times Nb_1/Nb_0 + 16 \times Hf_1/Hf_0 + 34\}$ P_1 and P_0 are escalated price and price as on May 2010 respectively. Nb_0 = ₹ 9051 estimated per Kg cost of Niobium Hf_0 = ₹ 26496 estimated per Kg cost of Hafnium Nb_1 and Hf_1 = Actual costs of Niobium and Hafnium respectively in ₹ per Kg at production. However, no payments were made due to price variation under this contract.
5.	12-02-2016	MIDHANI	26247.77	25881.65	30% amount payable as advance. Prices to be paid after two years applying escalation on balance 70% payment were arrived and indicated in the contract.

Sl. No.	PO Date	Supplier	Order value in ₹ lakh	Actual expenditure against col (6) in ₹ lakh up to March 2021	Price Variation Clause in each Contract with details
(1)	(2)	(3)	(4)	(5)	(6)
6.	25-02-2016	HAL	22232.73	19479.75	30% advance payable and 7% escalation from 2016-17 onwards.
7.	29-03-2010	HAL	5539.56	5973.68	40% to be paid as advance. 7% escalation on outstanding payments applicable from 2010-11 onwards.
8.	20-10-2011	HAL	1848.60	5366.31	7% escalation from 2011-12 onwards.
9.	31-05-2016	WIL	345.60	788.14	Price escalation to be paid on 75% (being balance after advance) of 70% of Fabrication cost with respect to working class CPI for Sholapur for the month of Jan 2004 (I_b). E= 0.70 x 0.75 x C(I_x-I_b)/ I_b
10.	27-03-2008	HAL	5567.00	6736.52	7% annual escalation on 70% of fabrication cost from 2010-11 onwards.
11.	04-01-2017	SVAL	396.23	494.76	Price escalation to be paid on 70% (being balance after advance) of Fabrication cost with respect to working class CPI for Hyderabad for the month of Jan 2016 (I_b). E= 0.70 x C x (I_x-I_b)/ I_b
12.	14-03-2007	SIFL	275.00	275.00	30% to be paid as advance. The price escalation for conversion charges: Revised conversion charges = Present rate (0.4 x P1/P0 + 0.3 x L1/L0 + 0.3) Present power tariff and labour cost per employee is for the base year 2005-06
13.	12-07-2013	HAL	820.40	685.65	7% escalation from 2013-14 onwards.

Sl. No.	PO Date	Supplier	Order value in ₹ lakh	Actual expenditure against col (6) in ₹ lakh up to March 2021	Price Variation Clause in each Contract with details
(1)	(2)	(3)	(4)	(5)	(6)
14.	22-03-2007	HAL	477.43	156.50	7% escalation from 2007-08 onwards.
15.	30-07-2003	WIL	1695.60	1980.77	Price escalation to be paid on 75% (balance after advance) of 70% of Fabrication cost with respect to working class CPI for Sholapur for the month of Jan 2004 (I_b). E= 0.70 x 0.75 x C(I_x-I_b)/ I_b
16.	31-03-2009	L & T	599.00	591.60	50% of total cost payable as advance payment. For 30% prorate payment E= 0.80 x 0.30C (Ix-Ib)/Ib and similar formula for remaining 20% payment. Ib is the CPI for Mumbai working class for Feb 2009.
17.	22-03-2007	HAL	4018.01	3637.14	7% escalation w.e.f. 2007-08 onwards.
18.	30-03-2017	RK Aerospace	133.98	171.58	Price escalation to be paid on 50% (balance after advance) of 65% of Fabrication cost with respect to working class CPI for Chennai for the month of Jan 2004 (I_b). E= 0.65 x 0.5 x C (I_x-I_b)/ I_b
19.	18-12-2015	KMML	1719.53	1712.86	Based on actual variation in input cost.
20.	02-01-2017	Taneja	301.42	359.11	Price is fixed for 18 months. In case of delivery of hardware is beyond 18 months escalation of 8% per annum shall apply on outstanding payments.

Annexure-2.7

[*Referred to in paragraph no.* 2.1.2.15]

Management of fabrication activities at Vikram Sarabhai Space Centre
Cases in which advances were blocked

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
1.	20140044860101 Order Ref No. PUV/02/1405/02/410 dt 26-03-03	26.03.03	GSLV Light Alloy Structures	Hindustan Aeronautics Limited	1264.96 (30%)	31.03.03	31.03.09	73.07	770.26
2.	20150010120101 Order Ref No. PUV/02//1694/02/466 dated 30.03.04	30.03.04	PSLV Light Alloy Structures	Hindustan Aeronautics Limited	2023.77 (30%)	31.03.04	19.08.05	16.87	284.51
3.	20130032460101	01.08.16	Proof Pressure	Walchand Nagar	55.50 (30%)	08.11.16	30.11.17	12.90	5.97

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
			Testing Facility	Industries Ltd. (WIL)					
					42.75 (15%)	08.11.16	30.11.17	12.90	4.60
					114.00 (40%)	12.04.17	30.11.17	7.73	7.34
					38.54 (40%)	12.04.17	30.11.17	7.73	2.48
4.	2009003 6000101	29.03.10	GSLV MK II Light Alloy Structures	Hindustan Aeronautics Limited	1202.08 (21.70%)	31.03.10	07.10.11	18.50	185.32
					1013.73 (18.30%)	29.04.10	07.10.11	17.53	148.09
5.	2015007 6800101	31-05-16	Motor Case PSOXL	Walchand Nagar Industries Ltd. (WIL)	86.40 (25%)	08.09.16	22.06.17	9.47	6.82
6.	2007006 0500101	25-03-08	Fabricatio n of S 139 Head End and Nozzle End	Walchand Nagar Industries Ltd. (WIL)	997.05 (30%)	31.03.08	08.10.11	43	357.28

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
			Segment Hardware						
					293.25 (30%)	25.09.08	08.10.11	36.13	88.29
7.	20070060520101	25-03-08	Fabrication of S 139 Middle Segment Hardware	Larsen & Toubro Ltd, Mumbai	2400 (50%)	31.03.08	03.05.12	49.80	996.00
8.	20070063960101	27.03.08	PSLV Light Alloy Structures	Hindustan Aeronautics Limited	16.70 (30%)	31.03.08	27.10.11	43.50	6.05
9.	20040042270101	09.03.05	GSLV L40 Light Alloy Structures	Sri Venkateswara Aerospace (P) Limited	267.12 (30%)	24.03.05	08.01.08	34.00	75.68
10.	20090039690101	10.05.10	GSLV Honey Comb Deck Plates	Tata Advance Materials Ltd.	148.62 (30%)	01.07.10	05.03.14	44.77	55.45

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
11.	2012001 2030101	12.07.13	HSP Crew Module Structure	Hindustan Aeronautics Limited	126.12 (30%)	18.10.13	12.05.16	31.23	32.82
12.	2006001 4600101	22.03.07	PSLV Light Alloy Structures	Hindustan Aeronautics Limited	148.25 (30%)	27.03.07	04.05.11	49.97	61.73
13.	2010002 6710101	31-03-11	Fabrication of S 139 Head End and Nozzle End Segment Hardware in ESR MOD 15CDV6	Walchand Nagar Industries Ltd. (WIL)	73.50 (30%)	31.03.11	01.05.17	73	44.71
14.	2011007 1950101 Order Ref No. PUV/02/ 1402/02/ 151 DT 30-07-03	30-07-03	MOTOR CASE PSO	Walchand Nagar Industries Ltd. (WIL)	62.10 (25%)	03.09.03	29.03.08	55.63	28.79

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
					62.10 (25%)	15.04.04	29.03.08	48.13	24.91
15.	2008004 3080101	31.03.09	PSLV Honey Comb Decks	Larsen & Toubro Ltd	299.50 (50%)	31.03.09	29.04.10	13.13	32.77
16.	2005007 6310101	22.03.07	GSLV Light Alloy Structures	Hindustan Aeronautics Limited	1205.403 (30%)	27.03.07	22.09.08	18.17	182.52
17.	2010002 6700101	31-03-11	Fabricatio n of S 139 Middle Segment Hardware	Larsen and Turbo Ltd., Mumbai	284.10 (30%)	31.03.11	27.03.17	72	170.46
18.	2015004 1330101 Order Ref No. PUV/02/ 1402/02/ 150 DT 30.07.03	30.07.03	Motor Case PSO-XL	RK Aerospace	270 (50%)	07.08.03	13.10.04	14.43	32.47

Sl. No.	PO Number	PO Date	Item Description	Supplier	Percentage of Advance amount (in ₹ Lakh)	Date of payment of advance	Date of commence-ment of supply	Duration of blocking of advance (in months)	Interest income in ₹ lakh (@ 10 percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (8) - (7)	(10) = 0.1 x (6) x (9)/12
19.	2016003 4950101	02.01.17	PSLV Interstage 2/3U STR	Taneja Aerospace and Aviation Ltd.	90.43 (30%)	06.02.17	05.11.18	21.23	16.00
20.	2015004 1060101	08-04-16	Motor Case PS0XL	Kay Bouvet Engineering Ltd. (Unit-1)	53.70 (20%)	06.06.16	21.12.17	18.77	8.40
21.	2018E14 1440102	30-07-19	Fabricatio n and Supply of S200 Nozzle Dive	Walchand Nagar Industries Ltd. (WIL)	153.00 (30%)	03.09.19	Not Supplied (Position as of March 2021)	18	22.95
Total									**3652.67**

APPENDICES

***Appendix I*: Grants released to Central Autonomous Bodies auditable under Section 14 &15 of Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971**

(Refer to Paragraph 1.5)

(₹ in crore)

Sl. No.	Ministry/ Department Name of Central Autonomous Body	Amount of grants released in FY 2020-21
Central Autonomous Bodies under DEPARTMENT OF ATOMIC ENERGY		
1.	Atomic Energy Education society, Mumbai	103.25
2.	Harish Chandra Research Institute, Allahabad	30.42
3.	Institute of Mathematical Science, Chennai	38.17
4.	Institute of Physics, Bhubaneswar	30.66
5.	Institute for Plasma Research, Gandhi Nagar	645.65
6.	Saha Institute of Nuclear Physics, Kolkata	96.07
7.	Tata Institute of Fundamental Research, Mumbai	506.97
8.	Tata Memorial Center, Mumbai	888.63
9.	National Institute of Science Education and Research, Bhubaneswar	139.32
10.	Homi Bhabha National Institute, Mumbai	1.01
	Sub-Total	**2480.15**
Central Autonomous Bodies under DEPARTMENT 0F SPACE		
11.	Physical Research Laboratory, Ahmedabad	146.84
12.	National Atmospheric Research laboratory, Gadanki	29.55
13.	North Eastern Space Applications Centre, Shillong	26.50
14.	Semi-Conductor Laboratory, Chandigarh	360.91
15.	Indian Institute of Space Technology, Thiruvananthapuram	69.25
	Sub-Total	**633.05**
Central Autonomous Bodies under DEPARTMENT OF SCIENCE AND TECHNOLOGY		
16.	Agharkar Research Institute-MACS, Pune	32.16
17.	Aryabhatta Research Institute of observational sciences, Nainital	39.01
18.	Bose Institute, Kolkata	100.08
19.	Birbal Sahni Institute of Palaeosciences, Lucknow	55.75
20.	Centre for Nano and Soft Matter Sciences, Bengaluru	16.40
21.	Indian Association of Cultivation Sciences, Kolkata	130.30
22.	Indian Institute of Astrophysics, Bengaluru	112.02
23.	Indian Institute of Geomagnetism, Navi Mumbai	48.88

Sl. No.	Ministry/ Department Name of Central Autonomous Body	Amount of grants released in FY 2020-21
24.	Institute of Advanced Study in Science & Technology (IASST), Guwahati	33.47
25.	Institute of Nano Science and Technology, Mohali	64.56
26.	International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad	63.83
27.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru	105.34
28.	Raman Research Institute (RRI), Bengaluru	63.95
29.	S.N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata	47.36
30.	Wadia Institute of Himalayan Geology, Dehradun	43.56
31.	Technology Information, Forecasting & Assessment Council (TIFAC), New Delhi	21.01
32.	Northeast Centre for Technology Application and Reach (NECTAR), Shillong	2.50
33.	Vigyan Prasar, Noida	19.64
34.	Indian Academy of Sciences, Bengaluru	6.30
35.	Indian National Academy of Engineering, New Delhi	4.06
36.	Indian National Science Academy, New Delhi.	23.05
37.	Indian Science Congress Association, Kolkata	6.64
38.	The National Academy of Sciences, India, Prayagraj	8.25
	Sub-Total	**1048.12**
Central Autonomous Bodies under DEPARTMENT OF BIOTECHNOLOGY		
39.	National Institute of Immunology, New Delhi	71.55
40.	National Centre for Cell Science, Pune	47.10
41.	Centre for DNA finger printing & Diagnostics, Hyderabad	43.50
42.	National Brain Research Centre, Gurgaon	27.45
43.	National Institute for Plant Genome Research, New Delhi	31.50
44.	Institute of Bio resources & Sustainable Development, Imphal	12.76
45.	Institute of Life Science, Bhubaneswar	39.50
46.	Translational Health Science & Technology, Faridabad	35.50
47.	Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram	91.42
48.	National Institute of Biomedical Genomics, Kalyani	19.75
49.	National Agri-food Biotechnology Institute, Mohali	15.75
50.	Institute for Stem Cell Research and Regenerative Medicine, Bengaluru	38.72

Sl. No.	Ministry/ Department Name of Central Autonomous Body	Amount of grants released in FY 2020-21
51.	National Institute of Animal Biotechnology, Hyderabad	23.00
52.	Centre for Innovative and Applied Bio Processing, Mohali	12.00
53.	International Centre for Genetic Engineering and Biotechnology, New Delhi	33.50
	Sub-Total	**543.00**
Central Autonomous Bodies under MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE		
54.	Indian Council of Forestry Research and Education, Dehradun	218.03
55.	Central pollution Control Board, New Delhi	99.50
56.	G.B. Pant National Institute of Himalayan Environment, Almora	16.70
57.	Indian Institute of Forest Management, Bhopal	23.50
58.	Indian Plywood Industries research and Training Institute, Bengaluru	10.25
	Sub-Total	**367.98**
Central Autonomous Bodies under MINISTRY OF NEW AND RENEWABLE ENERGY		
59.	National Institute of Wind Energy, Chennai	13.50
60.	National Institute of Bio Energy, Kapurthala	4.70
61.	National Institute of Solar Energy, Gurugram	13.00
	Sub-Total	**31.20**
Central Autonomous Bodies under MINISTRY OF EARTH SCIENCES		
62.	National Centre for Polar & Ocean Research, Goa	172.87
63.	Indian Institute of Tropical Meteorology, Pune	131.23
64.	National Institute of Ocean Technology, Chennai	172.42
65.	Indian National Centre for Ocean Information Services, Hyderabad	47.60
66.	Centre for Earth Sciences Studies, Thiruvananthapuram	22.75
	Sub-Total	**546.87**
	Total	**5650.37**

***Appendix II*: Central Autonomous Bodies where internal audit was not conducted, where physical verification of fixed assets was not conducted and where physical verification of inventories was not conducted during FY 2020-21**

(Refer to Paragraph 1.5.3)

Central Autonomous Bodies where internal audit was not conducted during 2020-21:

Sl. No	Name of CAB	Ministry/Department
1.	Wildlife Institute of India, Dehradun	Ministry of Environment, Forest & Climate Change
2.	National Biodiversity Authority, Chennai	Ministry of Environment, Forest & Climate Change
3.	Central Zoo Authority, New Delhi	Ministry of Environment, Forest & Climate Change
4.	National Tiger Conservation Authority, New Delhi	Ministry of Environment, Forest & Climate Change
5.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thriruvananthepuram	Department of Science & Technology
6.	Technology Development Board, New Delhi	Department of Science & Technology
7.	Science and Engineering Research Board, New Delhi	Department of Science & Technology
8.	Regional Centre for Biotechnology, Faridabad	Department of Biotechnology
9.	Council of Scientific and Industrial Research, New Delhi	Department of Scientific and Industrial Research

Central Autonomous Bodies where physical verification of fixed assets was not conducted during FY 2020-21

Sl. No	Name of CAB	Ministry/Department
1.	National Tiger Conservation Authority, New Delhi	Ministry of Environment, Forest & Climate Change
2.	Council of Scientific and Industrial Research, New Delhi*	Department of Scientific and Industrial Research

*****Verification of eight labs out of selected 14 labs was not conducted

Central Autonomous Bodies where physical verification of inventories was not conducted during FY 2020-21:

Sl. No	Name of CAB	Ministry/Department
1.	Wildlife Institute of India, Dehradun	Ministry of Environment, Forest & Climate Change
2.	National Tiger Conservation Authority, New Delhi	Ministry of Environment, Forest & Climate Change
3.	Council of Scientific and Industrial Research, New Delhi*	Department of Scientific and Industrial Research

***Verification of eight labs out of selected 14 labs was not conducted

***Appendix III*: Central Autonomous Bodies which have not accounted for gratuity and other retirement benefits on the basis of Actuarial valuation during FY 2020-21**
(Refer to Paragraph 1.5.3)

Central Autonomous Bodies which have not accounted for gratuity and other retirement benefits on the basis of Actuarial valuation during FY 2020-21:

Sl. No.	Name of CAB	Ministry
1.	Wildlife Institute of India, Dehradun*	Ministry of Environment, Forest & Climate Change

*****Non-provisioning of terminal benefits viz. gratuity, accumulated earn leave encashment of its Officials and a 'NIL' balance/figure was reflected in both schedule-7 'current liabilities and provisions' and schedule-20 'Establishment expenses' of the accounts. Therefore, liabilities as well as expenditure were understated to that extent.

***Appendix IV*: Outstanding Utilisation Certificates**
(Refer to Paragraph 1.6)

(₹ in crore)

Sl. No.	Ministry/Department	Period to which grants relate (upto March 2020)	Utilisation Certificates outstanding in respect of grants released upto March 20 which were due by 31st March 2021	Amount (in Crore)
			Number	**Amount**
1.	**Department of Atomic Energy**			
		Up to March 2014	240	18.45
		2014-2019	579	82.94
		2019-20	123	16.00
		Sub-Total	**942**	**117.39**
2.	**Department of Space**			
		Upto March 2014	139	3.99
		2014-19	387	19.34
		2019-20	230	25.31
		Sub-Total	**756**	**48.64**
3.	**Department of Scientific and Industrial Research**			
		Upto March 2014	210	1596.48
		2014-19	1307	8988.12
		2019-20	30	249.81
		Sub-Total	**1547**	**10834.41**
4.	**Department of Science and Technology**			
		Upto March, 2014	00	00
		2014-19	17436	2262.36
		2019-20	6430	1520.49
		Sub-Total	**23866**	**3782.85**
5.	**Department of Biotechnology**			
		Upto March 2014	00	00.00

Sl. No.	Ministry/Department	Period to which grants relate (upto March 2020)	Utilisation Certificates outstanding in respect of grants released upto March 20 which were due by 31st March 2021	Amount (in Crore)
		2014-19	12396	4281.00
		2019-20	2908	1833.00
		Sub-Total	**15304**	**6114.00**
6.	**Ministry of Environment, Forest & Climate Change**			
		Upto March 2014	3791	163.25
		2014-19	514	385.49
		2019-20	188	81.78
		Sub-Total	**4493**	**630.52**
7.	**Ministry of New and Renewable Energy**			
		Upto March, 2014	114	79.08
		2014-2019	319	504.82
		2019-20	85	210.50
		Sub-Total	**518**	**794.40**
8.	**Ministry of Earth Sciences**			
		Upto March 2014	464	31.95
		2014-19	96	11.00
		2019-20	71	20.75
		Sub-Total	**631**	**63.70**
	Total		**48057**	**22385.91**

***Appendix V*: List of Central Public Sector Enterprises**
(Refer to Paragraph 1.8)

Sl. No.	Ministry/Department	Apex CPSE/Implementing Unit or Plant	Name of CPSE
1.	MNRE	Apex	Himachal Renewables Limited, Shimla
2.	MNRE	Apex	Indian Renewable Energy Development Agency Limited, Delhi
3.	MNRE	Apex	Solar Energy Power Corporation of India Limited, Delhi
4.	MNRE	Apex	Lucknow Solar Power Development Corporation Limited
5.	MNRE	Apex	Rewa Ultra Mega Solar Limited, Corporate Office
6.	MNRE	Apex	Karnataka Solar Power Development Corporation Limited, Bengaluru
7.	MNRE	Apex	Renewable Power Corporation of Kerala Limited, Kasargod
8.	MNRE	Apex	Andhra Pradesh Solar Power Corporation Private Limited, Vijayawada
9.	DBT	Apex	Biotechnology Industry Research Assistance Council, Delhi
10.	DBT	Apex	Bharat Immunological & Biological Corporation Limited, Delhi
11.	DBT	Apex	Indian Vaccines Company Limited, Delhi
12.	DSIR	Apex	Central Electronics Limited, Ghaziabad
13.	DSIR	Apex	National Research Development Corporation, New Delhi
14.	MoEF&CC	Apex	A&N Islands Forest and Plantation Dev. Corporation Limited, Port Blair
15.	DOS	Apex	Antrix Corporation Limited, Bengaluru

Sl. No.	Ministry/Department	Apex CPSE/Implementing Unit or Plant	Name of CPSE
16.	DOS	Apex	New Space India Limited, Bengaluru
17.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited, Narora
18.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited, Kaiga
19.	DAE	Implementing Unit/Plant	Indian Rare Earths Limited, Chavara
20.	DAE	Implementing Unit/Plant	Indian Rare Earths Limited, Aluva
21.	DAE	Implementing Unit/Plant	Electronics Corporation of India Limited, Zonal office, Bengaluru
22.	DAE	Apex	Bhartiya Nabhikiya Vidyut Nigam Limited (Bhavini), Kalpakkam
23.	DAE	Apex	Electronics Corporation of India Limited, Hyderabad
24.	DAE	Implementing Unit/Plant	Electronics Corporation of India Limited, Chennai
25.	NPCIL (DAE)	Implementing Unit/Plant	Kudankulam Nuclear Power Project, Kudankulam
26.	DAE	Implementing Unit/Plant	Indian Rare Earths Limited, Manavalakuruchi Kanyakumari
27.	DAE	Implementing Unit/Plant	Madras Atomic Power Station, Kalpakkam
28.	DAE	Implementing Unit/Plant	Uranium Corporation of India Limited, Tummalpalle, Andhra Pradesh.
29.	DAE	Apex	Anushakti Vidyut Nigam Limited, Corporate Office, Mumbai
30.	DAE	Implementing Unit/Plant	Electronics Corporation of India Limited, Mumbai
31.	DAE	Apex	Indian Rare Earth (India) Limited, Head Office, Mumbai
32.	DAE	Apex	Nuclear Power Corporation of India Limited - Indian Oil Nuclear Energy

Sl. No.	Ministry/Department	Apex CPSE/Implementing Unit or Plant	Name of CPSE
			Corporation Limited, Mumbai
33.	DAE	Apex	Nuclear Power Corporation of India Limited - NALCO Power Company Limited, Mumbai
34.	DAE	Apex	Nuclear Power Corporation of India Limited, Corporate Office, Mumbai
35.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited - Contract and Material Management, Mumbai
36.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited - Kakrapar Atomic Power Station (Units 1 & 2), Gujarat
37.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited - Tarapur Atomic Power Station (Units 1 & 2), Maharashtra
38.	DAE	Implementing Unit/Plant	Nuclear Power Corporation of India Limited - Rawabhata Rajasthan Site
39.	DAE	Implementing Unit/Plant	Indian Rare Earths Limited (IREL), Ganjam, Odisha
40.	DAE	Apex	IREL-Industrial Development Corporation of Odisha Limited, (Corporate Office)
41.	DAE	Apex	Uranium Corporation of India Limited, (UCIL Corporate Office)

***Appendix VI*: Statement of losses and irrecoverable dues written off/waived during 2020-21**
(Refer to Paragraph 1.9)

(Amount in ₹ lakh)

Name of Ministry/ Department	Write off of losses and irrecoverable dues due to									
	Failure of system		Neglect/fraud etc.		Other reasons		Waiver of recovery		Ex-gratia Payments	
	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
Department of Atomic Energy	-	-	-	-	12	10.77	-	-	-	-
Department of Bio-Technology	NIL									
Department of Science and Technology	NIL									
Department of Scientific and Industrial Research	NIL									
Department of Space	NIL									
Ministry of Earth Sciences	NIL									
Ministry of Environment, Forest and Climate Change	NIL									
Ministry of New and Renewable Energy	NIL									
Total					**12**	**10.77**				

Appendix VII: Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments as of March 2022- ATNs which have not been received from the Ministry/Department even for the first time

(Refer to Paragraph 1.11)

Sl. No.	No. & Year of Report	Para No.	Para title	Date of laying in the Parliament	Delay in submission of ATNs (months)
Department of Atomic Energy					
1.	6 of 2020	4.2	Commissioning of Ion Trap System	23.09.2020	17 months
2.	2 of 2021	3.2	Short realisation of lease rent	24.03.2021	11 months
3.	2 of 2021	3.3	Payment of House Rent Allowance at higher rates	24.03.2021	11 months
Department of Biotechnology					
4.	6 of 2020	14.2	Extra expenditure towards grant of allowances to employees	23.09.2020	17 months
Department of Scientific and Industrial Research					
5.	2 of 2021	11.1	Functionality of IT Application System 'One CSIR'	24.03.2021	11 months

Appendix VIII: **Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments as of March 2022- ATNs on which Audit has given comments/observations but revised ATNs have not been received**

(Refer to Paragraph 1.11)

Sl. No.	No. & Year of Report	Para No.	Para title	Date of issue of vetting comments on the ATN	Delay in submission of revised ATNs (months)
Department of Atomic Energy					
1.	2 of 2018	3.2	Short realisation of ground rent	18.09.2018	41 months
Department of Biotechnology					
2.	2 of 2018	4.2	Irregular grant of promotion and entitlement	01.10.2019	29 months
Ministry of Earth Sciences					
3.	2 of 2018	8.2	Irregular protection of pay	25.03.2019	35 months
Ministry of Environment, Forest and Climate Change					
4.	21 of 2013	Standalone	Compensatory Afforestation in India	03.08.2017	55 months
5.	39 of 2016	Standalone	Environment and sustainable development	18.07.2018	44 months
6.	6 of 2020	7.1	Additional expenditure on electricity charges consumed for residential purpose	05.03.2021	12 months