Ramawatar Sharma , SAI India

Audit of Extractive Industries
(*i-CED, April 2024*)
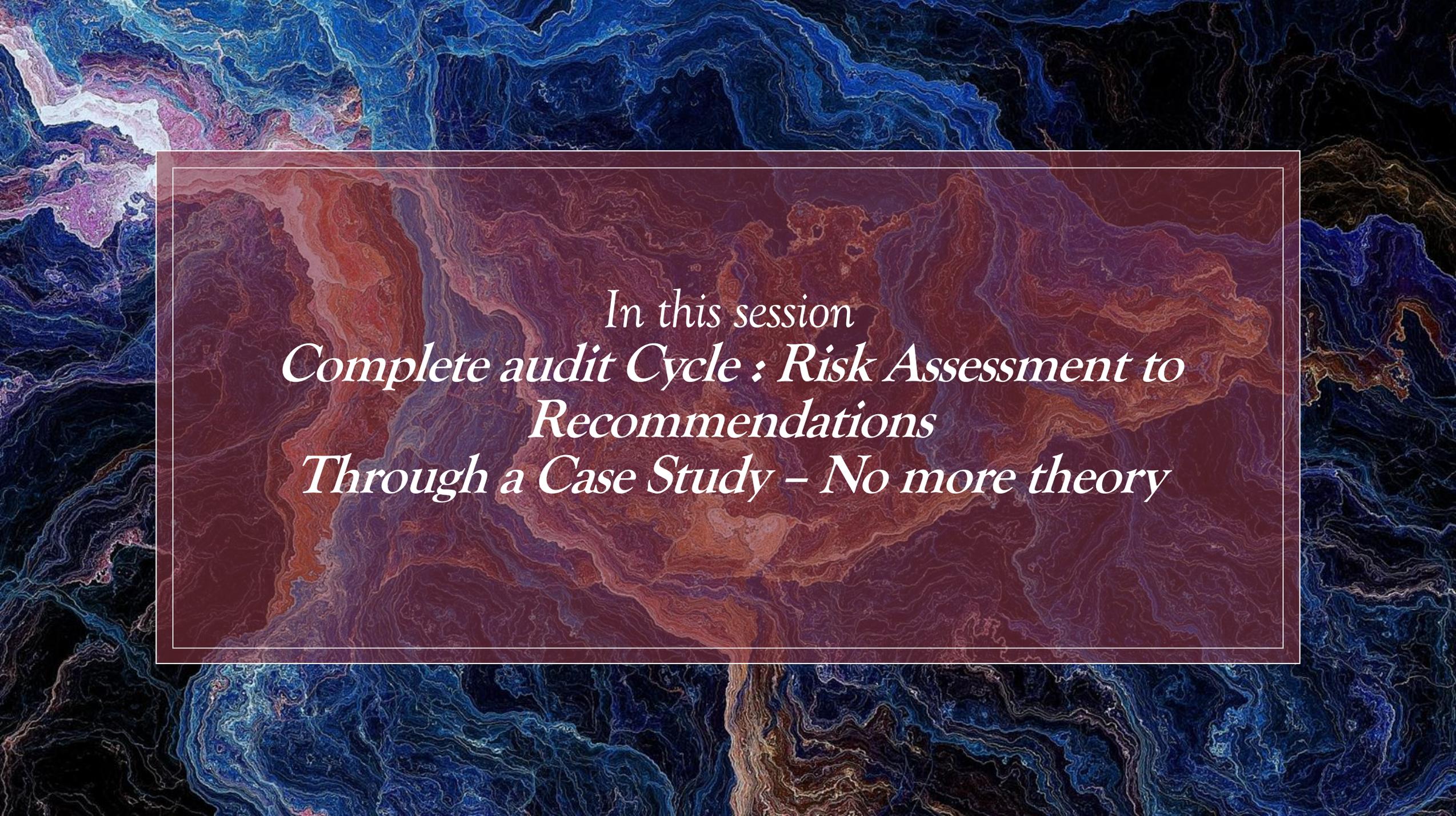
In this session
Complete audit Cycle : Risk Assessment to Recommendations
Through a Case Study – No more theory
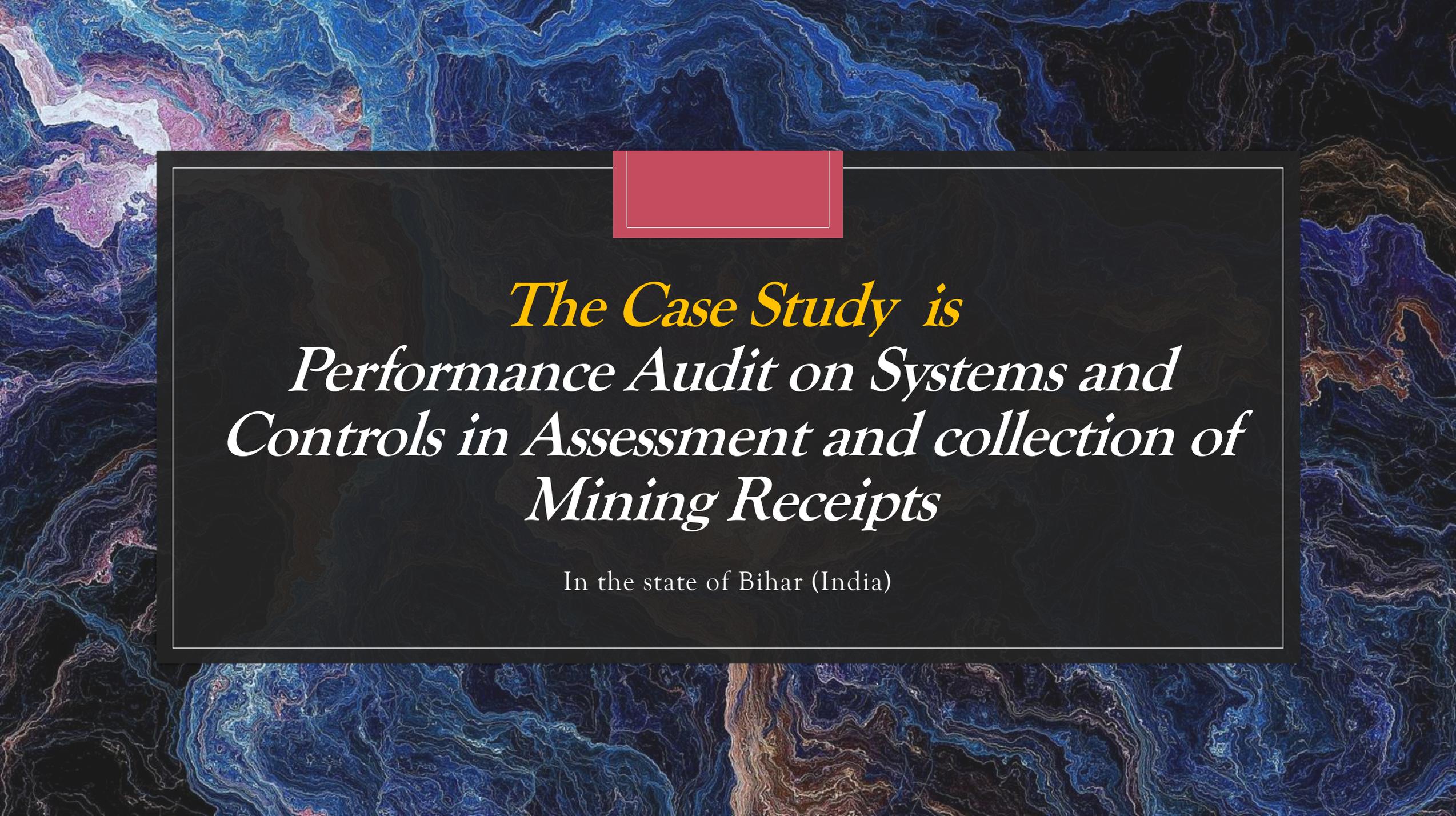
The Case Study is

Performance Audit on Systems and Controls in Assessment and collection of Mining Receipts

In the state of Bihar (India)

Why This Audit : Identifying the Risks

The Receipt profile

Previous audit reports and indicators

Media reports on mining receipts
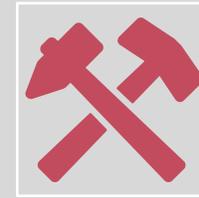
Reports on illegal mining

Introductory Information

◦ Bihar has only limited resources of minerals like *Sand, Stone, Murram, Earth, Lime Stone, Mica, Silica, Quartz and Quartzite* etc.

◦ Mines and Mineral in Bihar are administered by the **Mines & Geology Department, Government of Bihar.**

- Minerals are divided into two categories i.e.
  - **Major Minerals** and **Minor Minerals**.
- Minor minerals include **Sand, Stone, Murram, Earth and Brick earth, Mica, Silica, Quartz and Quartzite**.
- Only **Lime Stone** termed as Major Mineral is available in Bihar.

Receipts from Minerals and other sources for the year 2017-18 to 2020-21

Sand 48.62%

Receipts from Works Department 35.70%

Stone 7.84%

Brick 3.69%

Penalty 2.81%

Legend:
- Certificate Cases (receipts)
- Crusher Fees
- Earth
- Limestone
- Non- Certificate Cases (re..
- Others
- Penalty
- Receipts from Works Depa..
- Sand
- Seigniorage Fee
- Stone
- Transit pass
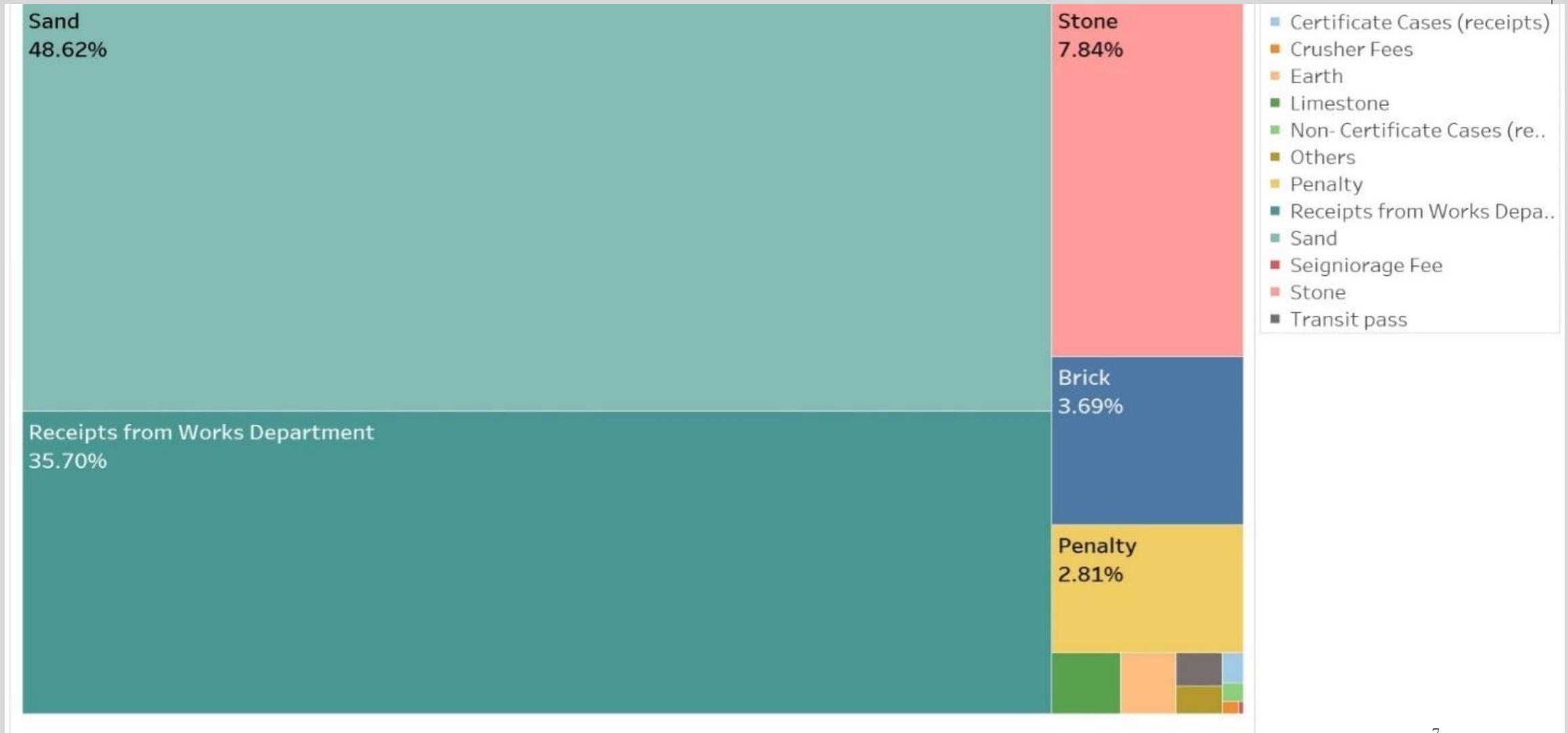
Source: *Budget Estimate and Receipt as per Finance Account and Mines & Geology Department.*

Audit Planning and Execution
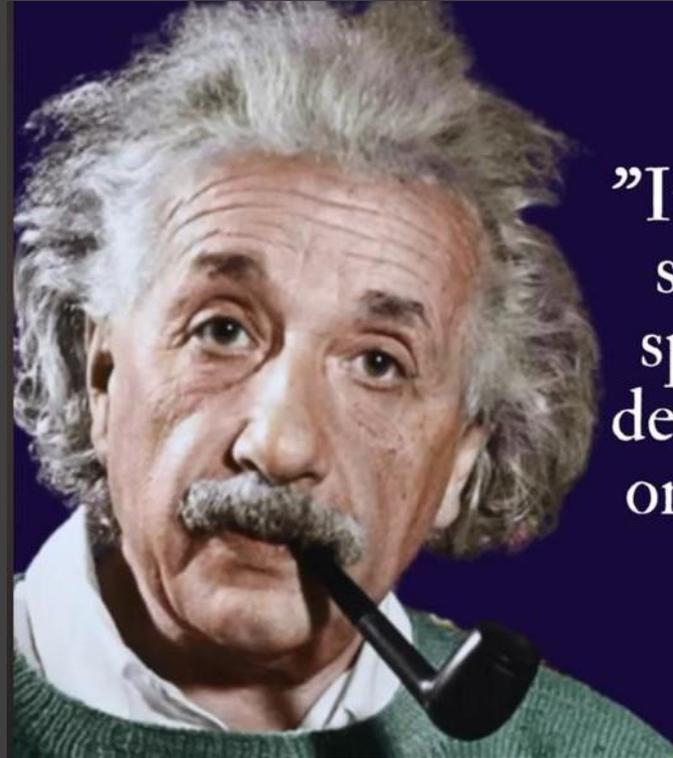
"If I had only one hour to save the world, I would spend fifty-five minutes defining the problem, and only five minutes finding the solution."

Albert Einstein

Audit Objectives

The objectives of Performance Audit were to ascertain the:

➢ Systems and procedures for approval of mining concessions;

➢ Provision for the levy, assessment and collection of mining receipts;

➢ Management of Mines and Mineral Development, Restoration and Rehabilitation Fund;

➢ System for detection and prevention of illegal mining;

➢ Internal control, monitoring mechanism and inter departmental co-ordination.

Overview of the Planning and Execution of Audit

Objectives designed to give a comprehensive picture of mining in Bihar.

Mining activity not seen in isolation and highlighted how it was linked with other departments

Audit teams **focused on the complete chain** – Systemic lapses to Linkages with Illegal mining to impact on overall revenues of the State

Extensive use of available Technical Tools for Data Analysis – IDEA, MS Excel, Tableau

Extensive use of visualizations and images (more than 80 figures) to make content more user friendly.

In-House capacity building of audit teams to use Google Earth Pro- Analysis of 106 Sand ghats (A broader bed of send near the reiver banks)

Engagement of Expert agency-National Institute of Technology Patna as a consultant for GIS Study

Findings of audit teams was corroborated by expert agency and vice-a-versa.

Quantification of extraction of sand by Audit team using Google Earth Pro

Blend of original audit work along with extensive use of IT Tools.

Audit teams manually analysed around 33,191 E-Challans and found 21,192 as fake

Physical verifications were geo-plotted in Google Earth Pro for having double authenticity.

The Blend of original Audit work with extensive use of IT tools was widely appreciated by the State Government

For the detail analysis, the High-Resolution images were procured from National Remote Sensing Centre (NRSC) Hyderabad for 6 different time periods- **Nov 2018, Feb 2019, June 2019, Nov 2019, Jan 2020, March 2020**

Scope of work for Geo Spatial study are as under:

(i) Identification/verification of allotted sand mining areas;

(ii) Comparison of Geo Co-ordinates between actual and approved mining plan.

(iii) Calculation of actual mining area(in hectare).

(iv) Identification of mining in prohibited months (July, August and September).

Major Findings of Performance Audit

- [Systemic lapses](#) in **approval of mining plans**

- Systemic lapses were linked **with the extent of** [illegal mining](#) **observed through GIS study where about 80% of the mining** was found to be carried out illegally.
    - In 86/106 ghats extractions were observed beyond approved area

- **Under reporting of** [actual extractions to the tune of 59](#)% on a conservative basis through Google Earth Pro in 6 sand ghats.

- Data analysis [brought out **use of cars, busses, ambulances**](#), **motorcycles for mining** as well as **irregular generation of E-challans (861 times in a day for single vehicle).**

- [Losses to State Government](#) **owing to non-coordination among the various departments.**

- **Losses** owing to non-compliances to extant rules and procedures.

Challenges to this audit

- Expansive scope of mining Sector and interlinkages with other sectors
  - Novelty of solution in design of audit objectives to cater to specific subject
  - Perusal of guidelines of other State Audit offices to make objectives more comprehensive.

- River bed mining- a yearly exercise where mining history is removed after each flooding season
  - Only historical GIS images could capture the mining history
  - Systemic lapses of mining plans could be found out only with help of GIS

- E-Challan Database of 14 districts- 17 million challans, also required to be joined with VAHAN
  - In-house use of IDEA software for analysis of the above databases

- Mining within a defined boundary of 250 thousand sq meter cannot be visualized with physical verifications
  - Expert agency was hired to give more authenticity to the quantification of areas through GIS study
  - Audit teams self trained through internet to carrying out GIS study of 106 sand ghats through Google Earth Pro

- Mining being sensitive topic- to avoid any security threats
  - Important memos were planned to be issued at fag end of audit

Innovation

- Report of Expert agency not taken in toto but used to substantiate audit observation through in-dept analysis
  - Corroboration of data of NIT Patna with E-challan database by audit teams
  - GIS images are non-refutable audit evidence

- Extensive use of Google Earth Pro- a free of cost tool
  - Highlighted system failure in approval of mining plans as 86/106 ghats had mining beyond approved areas.
  - Extensive use of images made the report simple, attractive and readable.

- Analysis of E-challan database with multiple level of "Why" questioning

- Use of Charts and visualizations through Tableau and Excel made report more communicable and easier to read.

- Safeguarding of Audit teams and obtaining maximum records through delayed release of Audit Memos

Impact of Audit

◦ Mining Department appreciated the audit finding related to illegal mining and the analysis of the E-Challan database

◦ Emphasis on the absence of rules and procedures for checking illegal mining by contractors by comparison with other rules in other states.

◦ Safeguarding of overall revenues of the State Government by highlighting the importance of inter-departmental coordination

◦ The revenue from enforcement on illegal mining saw a jump of **70% post-PA (i.e. from Rs 1650 million in 2021-22 to Rs. 2814 million in 2022-23).**

- *Based on recommendations in the report, the department had already taken the following actions:*
  - *Hiring of experts for monitoring of mining through GIS.*
  - *Validation controls in the E-challan database to stop irregular issues of E-challans*
  - *Directions for use of Google Earth Pro for monitoring mining activities*
  - *Change is software of Mining Challan and Initiation of the process of integration with VAHAN database*
  - *Issued more than 30 orders in light of audit observation in the report*
  - *Raids on Fake challan generators for the first time and high recoveries*

ANY QUESTIONS?

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THANK YOU