Mining Surveillance System (MSS)
Challenges & Way Forward

By
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Director, Ministry of Mines
Need of MSS

- Illegal mining - an endemic problem in many mineral-rich areas.
- Present checks inadequate.

**FIRs registered on Illegal Mining**

Cases of Illegal Mining (Major & Minor Minerals combined) reported by State Govts.

Number of illegal mining cases CAGR of around 7% over the last 5 years
Need of MSS (Contd.)

Space science has an important role in achieving good governance: PM

Hon’ble Prime Minister, Shri Narendra Modi
Addressing the National Meet on Promoting Space Technology based Tools & Applications in Governance and Development, New Delhi, September 07, 2015
Development of MSS

- MoM through IBM has developed the MSS in collaboration with BISAG and MeitY based on the Space Technology
- Basic principle - most minerals occur in continuity and their occurrence is likely to extend in the vicinity of existing leases
- Surveillance of area up to 500m outside the lease boundary using the satellite imagery
The geo-referenced mining lease is superimposed on a satellite scene.

NRSC Hyderabad provides satellite scenes over a period of time regularly.

Trigger generated.
MSS - Checking unauthorized mining in vicinity of existing leases

<table>
<thead>
<tr>
<th>No.</th>
<th>Details</th>
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<tbody>
<tr>
<td>1</td>
<td>Name Of Regional Office</td>
<td>Hyderabad</td>
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<tr>
<td>2</td>
<td>Name Of Mine</td>
<td>Gundlapalli</td>
</tr>
<tr>
<td>3</td>
<td>Mine Code</td>
<td>38APR14018</td>
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<tr>
<td>4</td>
<td>Registration No.</td>
<td>No</td>
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<tr>
<td>5</td>
<td>Mineral</td>
<td>Limestone</td>
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<td>6</td>
<td>Name of lessee</td>
<td>M/s. NCL Industries LTD.</td>
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<tr>
<td>7</td>
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</tr>
<tr>
<td>8</td>
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<td>9</td>
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<td>Gundlapalli</td>
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<td>11</td>
<td>Trigger Number</td>
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</tbody>
</table>

Legend:
- Village Location
- Road
- 500 Meter Buffer Form Lease Boundary
- Lease Boundary
- Unauthorized Activity

Unauthorized Mining Activity to be Checked in Field:
- 79°52'2.758"E
- 16°42'31.874"N
- Area Ha:3.31

Ministry of Mines
Launch of MSS

MSS was launched on 15th October, 2016 by Hon’ble Minister
Generation of Triggers

• 296 Triggers delineated on the satellite imagery on 20th October, 2016

• Auto detection system being developed by BISAG –
  – by automatic comparison of spectral, tonal, temporal characteristics of the satellite imagery
  – Mineral Specific
  – For Iron Ore, Bauxite & Limestone in testing phase
User-friendly Mobile App

- **Complain**
- **Mines GIS Map**
- **Google Map**

- **Inspection report by the State Government Officials**
- **Complaints by Citizens**
- **Plotted Mining Leases on Satellite image**

Indian Bureau Of Mines, Ministry Of Mines, Government Of India
Complaints on Mobile App by citizens

Geo-Tagged photograph

Inspection to be done by mining officers

2 citizen complaints – field verification being done by State
User Reviews on MSS Mobile App

**Manoj Pandya  December 19, 2016**
⭐⭐⭐⭐

Mining surveillance system A citizen centric app. providing assistance to indicate mining related actives. **Endeavour taken by ministry and respective stakeholders is praiseworthy.**

**Nupur Patel  December 1, 2016**
⭐⭐⭐⭐⭐

Very useful application Good step taken by mining department and also well done by the developers... **Nice work... Keep it up..**

**Vikas Choubey  November 22, 2016**
⭐⭐⭐⭐⭐

Mining Surveillance System MSS is a satellite based monitoring system for curing illegal mining activity ... **Great effort by Govt ...Awesome**

**Nehani Parmar  December 1, 2016**
⭐⭐⭐⭐⭐

Cool app Very good initiative by gov nd mining department... kudos to developer...simple and useful app..I have submitted my illegal mining repot by this app..
MSS Advantages

• **Deterrence Effect**: ‘Eyes watching from the sky’

• **Transparency**

• **Participatory**: Citizens can report unusual mining activity

• **Bias-free**: No human interference

• **Quicker Response and Action**: Sensitive areas can be monitored more frequently.

• **Effective Follow-up**: Action on triggers monitored through Dashboard
Unauthorized Mining detected in 16% cases confirmed after the field inspections

MSS Triggers depicted mining activity is more than 75%
Challenges

• **Field Verification of Triggers by the State Officials**

• Nodal officers in States for MSS implementation and follow up

• Maps for plotting of other leases to improve MSS effectiveness
  – Non-working leases of Major minerals
  – All leases of minor minerals in the vicinity of major mineral leases
Status of Triggers

<table>
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<tr>
<th>State</th>
<th>Total Trigger</th>
<th>Total Inspection</th>
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<td>Total</td>
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</table>

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Way Forward

• State Government to implement MSS for the minor minerals
• Existing Mining Lessees to use MSS Mobile App to report likely unauthorized mining activities outside their lease
• Feedback for improvement of the new system
• Leveraging UAV-Drones
Thank You