

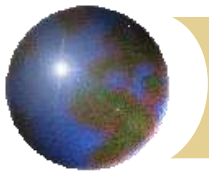


*Generating awareness on ASM  
through Higher Education:  
Contributions to Knowledge  
Economy*



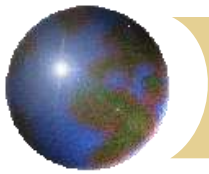
Professor Mihir Deb  
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& Department of Geology  
University of Delhi  
Delhi, India

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## *Structure of the Talk*

- ✚ Knowledge economy
- ✚ LSM vs ASM: present status in India
- ✚ Our efforts towards teaching and research in ASM in the University of Delhi
- ✚ Contribution to knowledge economy



## *Why Promote Awareness of ASM?*

- ❖ India's future growth and development are intimately linked to the creation of a knowledge economy
  - An economy that creates, disseminates and uses knowledge to enhance growth and sustainable development
- ❖ Scientific endeavours in institutions can play a critical role in contributing to this knowledge economy which presents the most attractive opportunity for lifting the underprivileged out of poverty by enhancing productivity and per capita income
- ❖ ASM is a prominent sector in which it finds application

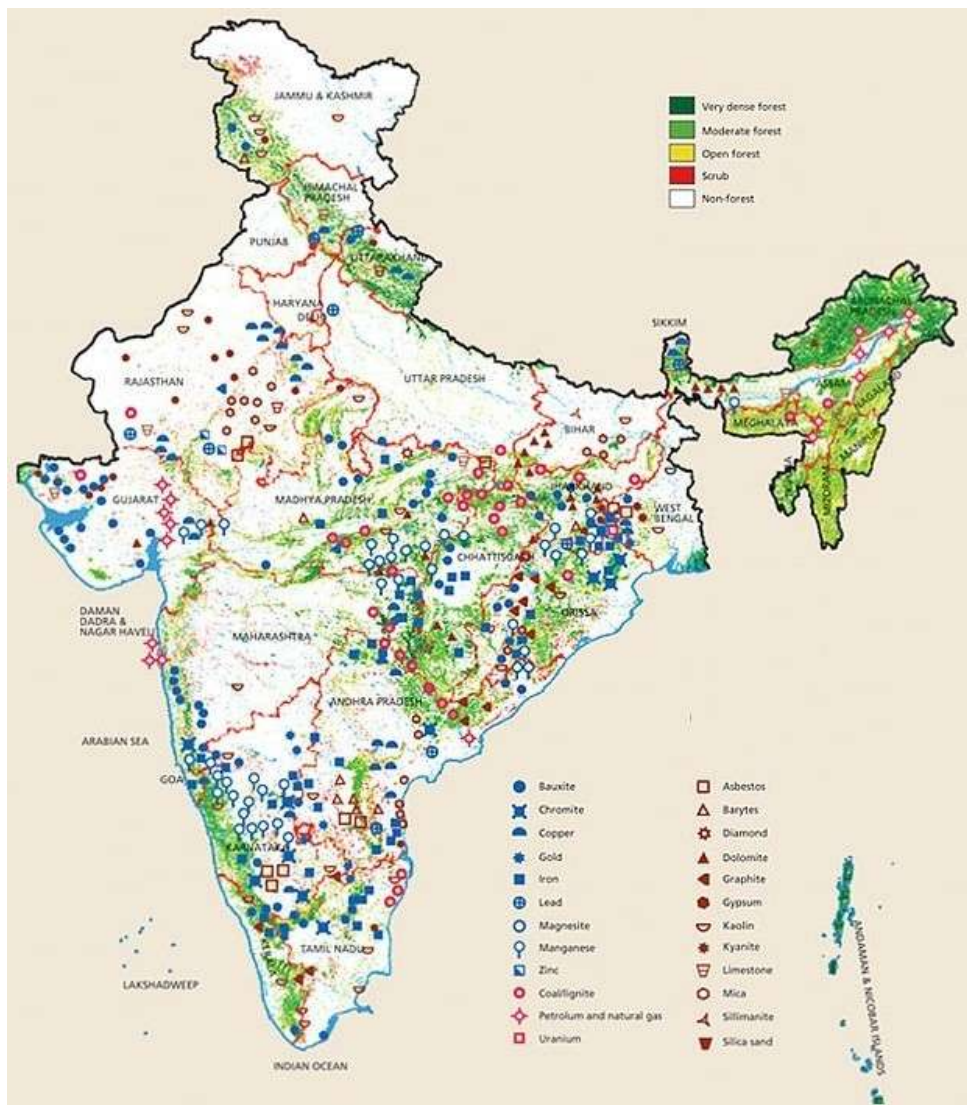
***Mining in India now is a highly complex socio-economic and environmental challenge: at stake are natural resources and people – forests, wildlife, water, environmental quality & traditional livelihood***

- ➊ Hence, viability of many a LSM project is a contentious issue in India in recent years. Strong people's movement has challenged the concept of lopsided development by mining

**Examples:**

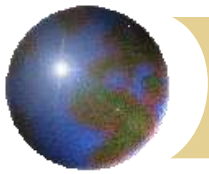
- ❏ POSCO's \$12 billion steel project in Orissa to produce 12m tons of steel/year: Khandadhar (83.65 sq.km) Iron ore block in Sundergarh dist., Orissa is severely affected
- ❏ Vedanta Alumina Ltd.'s Rs 4000 crores Lanjigarh bauxite mining project in Kalahandi dist., Orissa has been struck down by the Supreme Court of India

***In India, the major mineral reserves lie under its richest forests and watersheds of key rivers – these lands are also homes of India's poorest people, the tribals***



## Poverty amidst Plenty

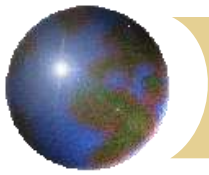
- ✦ Many of the states with vast mineral resources have higher forest cover at 40% than the national average of 18%
- ✦ Nearly 31 of the 50 top mineral rich districts in Orissa, Jharkhand and Chattisgarh fall under the most backward district category, lagging behind in human development index and suffering from economic backwardness
- ✦ 40% of the top 50 mineral producing districts are affected by local extremist forces



## *Artisanal Mining: an unrecognized reality in India*

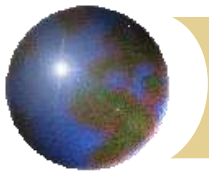
- ✦ A conservative estimate of people involved in ASM is of the order of **3 million**
- ✦ Indirectly, these informal practices (digging, cutting, panning, processing, breaking, amalgamating, carrying, transporting, and marketing ) together provide *livelihood* for at least **6 million** people
- ✦ ASM occurs in scattered ways in **different forms in different regions**: from sand mining to stone quarrying, alluvial gold digging and coal 'collection', to licensed operations in small mines meeting local needs or exporting their products elsewhere within the region or in neighboring countries
- ✦ Recent liberalization of the economies has caused a large number of people to become jobless in the conventional fields. This has caused an **exodus** of labour, seasonally or permanently, **into ASM**





## *History of Artisanal Mining in India*

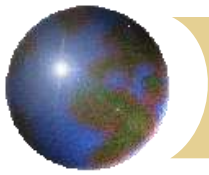
- ✦ Long historical tradition dating back to **400 BC**
- ✦ Extensive ancient workings in different parts of India
- ✦ Modern mining started during **colonial occupation**
- ✦ European models of geology and exploration, labour relations, management techniques and legal frameworks were introduced by the **British Government** which altered many of the earlier systems, rendering **traditional artisanal mining invisible**



## *Status of ASM in India*

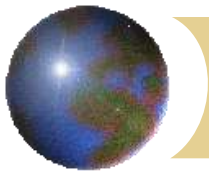
- ❖ No real definition of ASM exists or has been given
- ❖ Presently artisanal mining represents an informal, **illegal (or non-legal)** and unregulated activity
- ❖ Range of minerals mined : High value minerals like **gemstones, diamond, tin, gold** to bulky products such as, **gravels, sand & building stones; coal and lignite**
- ❖ No database on ASM exists even though it is a source of livelihoods for many
- ❖ No government statistics of what is mined and how much
- ❖ ASM remains a neglected, unrecognized sector in the country





Spreading awareness and knowledge  
of ASM is crucial for reversing the  
situation

Inclusion of ASM in University Curricula  
such as, in Mining, Geology,  
Environmental and Development  
Studies is a way forward

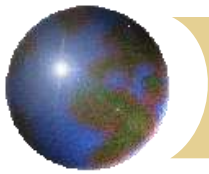


## *MA/MSc Course in Environmental Studies*

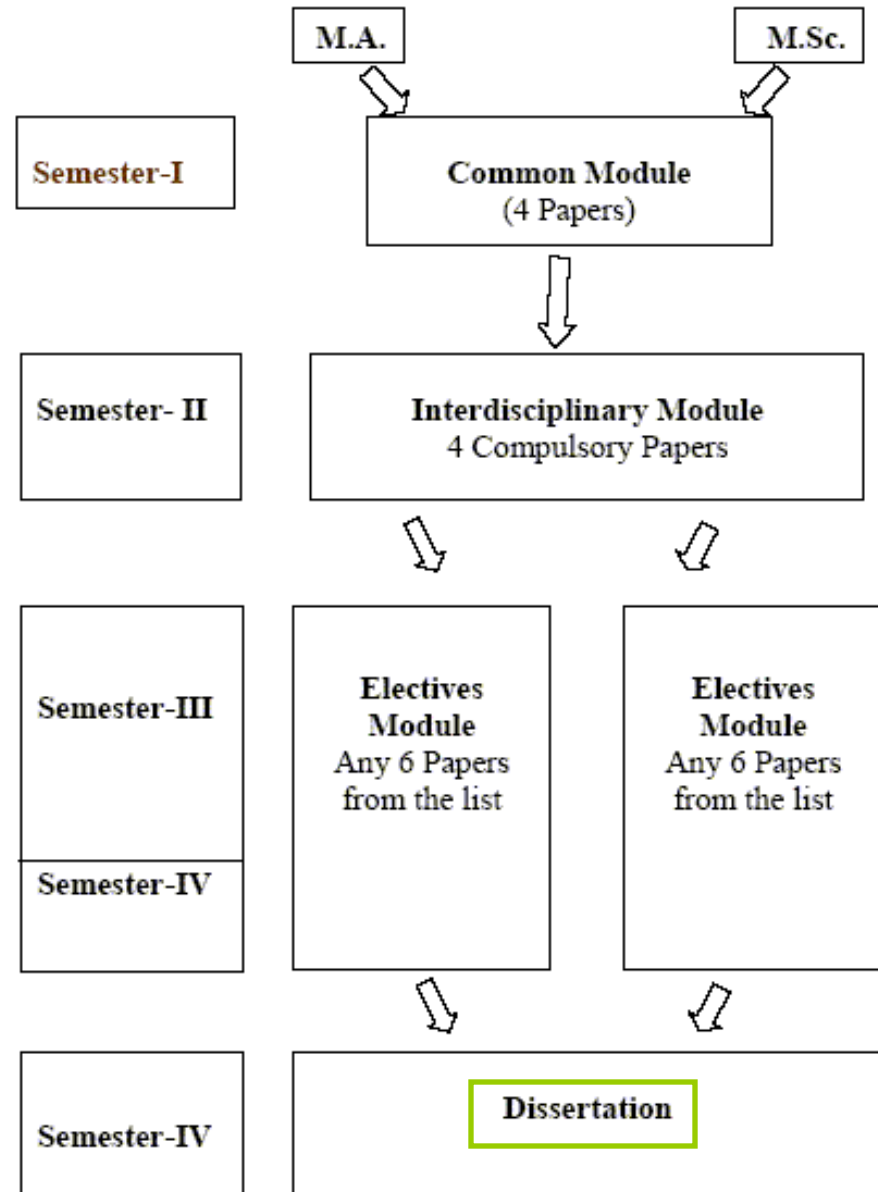
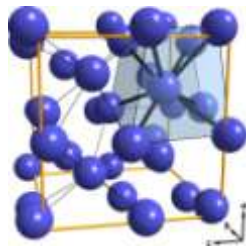
- ✿ An Interdisciplinary Programme in the University of Delhi
- ✿ Introduced with an objective to:

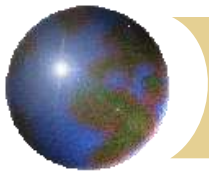
Teach the student to learn, explore and practice  
the art and science of sustainability  
from a variety of angles





# Structure of the MA/MSc. Course in Environmental Studies





## *Basic topics*

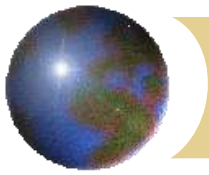
*(Core curriculum for all students in the 1 year)*

### **Common Module**

- Introduction to Environmental Sciences
- Social perspectives on environment
- Environment, development & sustainability
- Methodologies for environmental studies

### **Interdisciplinary Module**

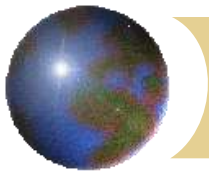
- Environmental impact and risk assessment
- Pollution and health
- Urban ecosystems
- **Natural resources: conservation and management**



## *Social & Legal issues*

*(options to choose any 6 in II year MA)*

1. Environmental & Resource Economics
2. Social Theory, Sociology of Development & Environment
3. Indian & International Environmental Law
4. Environmental Ethics & Philosophy
5. Environmental History & Environmentalism
6. Environmental Policies & Politics
7. Environmental Communications & Education
8. Technology, Environment & Society
- 9. Natural Resource Conflicts & Choices**
10. Gender & Environment
11. Global Environmental Issues
12. Culture & Environment

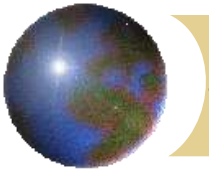


## *Scientific issues*

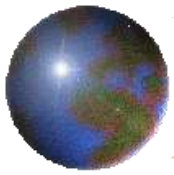
*(options to choose any 6 in II year MSc.)*

1. Atmosphere & Global Climate Change
2. Natural & Managed Ecosystems
3. Biodiversity & Conservation Biology
4. Soil Biology
5. Ecotoxicology & **Environmental Health**
6. Environmental Biotechnology
7. Environmental Chemistry
- 8. Environmental Hazards**
9. Hydrology & Water Resources
- 10. Environmental Geology**
11. Systems Analysis & Modeling
12. Environmental Engineering





*Some Masters level Research on ASM  
(Semester IV Dissertations)*



## *2007: Debobroto Sircar*

# *An overview of the status of Artisanal Mining in different countries*



Primary Gold in Indonesia



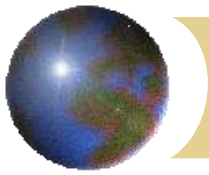
Tin in Malaysia



Alluvial Au in Papua New Guinea



Tungsten in Vietnam

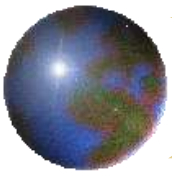


## *2007: Nipun Kumar Mahato*

*A case study of ASM of Gold in Subarnarekha river basin,  
Jharkhand*







*2009: Lingaraj Swarup Mishra*  
*Artisanal mining of gold and mercury pollution: a case study from Attappady and Nilambur areas of East Central Kerala*



# *Contributions to the Knowledge Economy*

## *Recommendations for the ASM sector*

*(Deb, Tiwari & Lahiri-Dutt, 2008)*

- 1. Create a broader information base**, with scientific, social and economic data
  - ASM management system developed in Delhi University
  - Will help policy and decision makers to organise this sector with rules and regulations
- 2. Locate the responsible village-level body** (e.g. Gram Panchayats) within the administration to deal with ASM issues
- 3. Provide** this sector of concentrated poverty with suitable **education, health care and training to mitigate environmental degradation**

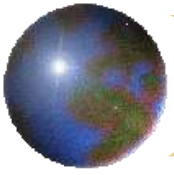
# *Contributions to the Knowledge Economy*

## *Recommendations for the ASM sector*

*(Deb, Tiwari & Lahiri-Dutt, 2008)*

4. **Review** the existing *legal frameworks* in the country relating to mining as a whole and incorporating ASM in it and make them more realistic, unambiguous and pro-poor.
  
5. **Use** ASM wherever feasible for *poverty eradication programme* of the Government
  - ❖ By increasing productivity through technology deployment
  - ❖ Reducing and eradicating exploitation by middlemen, particularly of women miners
  - ❖ Thus finding employment for thousands of jobless rural poor





**Thank You**