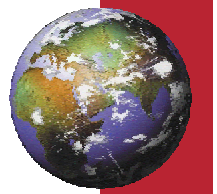
Innovative use of Remote Sensing Images for Pro Poor land Management



Dr. Arbind Man Tuladhar

Department of Urban and Regional Planning and Geo-Information Management,

ITC, Enschede, the Netherlands

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Outline of presentation

- Introduction
- Pro Poor Land Management
- Innovations
- RS images for pro poor land management

Introduction

- 900 million people who live in slums and informal settlement worldwide, and among them are 570 millions that live in the Asia-Pacific region
- No safe and secure land/housing; excluded from city planning; and mostly evicted from their lands
- Specially women, indigenous people and disabled people are not able to defend their rights on land
- Live in health- and life- threatening environments on marginal land, vulnerable to flooding, landslides and other environmental hazards.

Introduction

- Informal and formal systems coincide making difficult to manage land and housing
- UN-HABITAT launches pro poor land management as an effort to achieve MDGs which itself is innovative concept yet flexible approach depending on local situation
- Pro poor land management requires Geo-information that can be derived from many sources.
- Aerial photographs and satellite images are important sources for Geo-information

Problems on Current Urban Land Management

- Centralized decision making; local authorities hardly play a role
- Insufficient use of urban space
- Public sector dominated approaches
- Rigid and costly regulatory frameworks
- land recording systems and centralized information systems:
  - Lack of effective tools
  - Poorly maintained and often coverage incomplete
  - Inefficient, inaccessible and very costly systems
- Unable to deliver secure land tenure

Pro poor land management

- It integrates slums or informal settlement into city planning approaches based socio-legal framework and principle of urban governance
- It has very important characteristics:
  - Gender based approach
  - Appropriate and flexible tenure form
  - Community participatory planning approach including informal land delivery processes
  - linking to service to communities' capacity for sustainability
  - a decentralized land administration that uses local capital, partners with local authorities
  - self reliance or cost recovery approach

Innovations

- Innovations relate to three main issues from Land Administration perspective:
- New paradigm on land tenure concepts according to their norms and values to be incorporated into urban land policy – flexible and incremental approach of Continuum rights and spatial units
- Appropriate use of Geo-information technologies (GIT) including remote sensing (RS) and geographic information systems (GIS) in the processes of land administration
- Local land information systems: affordable and easy access to land information by the poor and civil society; link to central land information to increase reliability and formal recognition of system

RS images for Pro Poor Land Management

- RS images (Digital aerial photographs or high resolution satellite images)
  - Cost effective
  - Digital Processing is rather rapid and reliable to extract geo-information
  - Easily accessible
  - Rectified or ortho images can be used for participatory processes and local LIS
    - Quick visualization of areas to understand extent of problem
    - Adjudication
    - Physical Boundary records
    - Dispute resolutions
    - Community participatory city planning
    - Etc.

Web Application

- Recently Google Earth launched for the purposes of navigation and visualization
- One can easily navigate anywhere around Global via Internet
- Dynamic viewing by zooming
- In some cities, 3D virtual environment available
- For us we can immediately have overview on the extent of land management problems in the area

A part of Bombay Slums from Google Earth

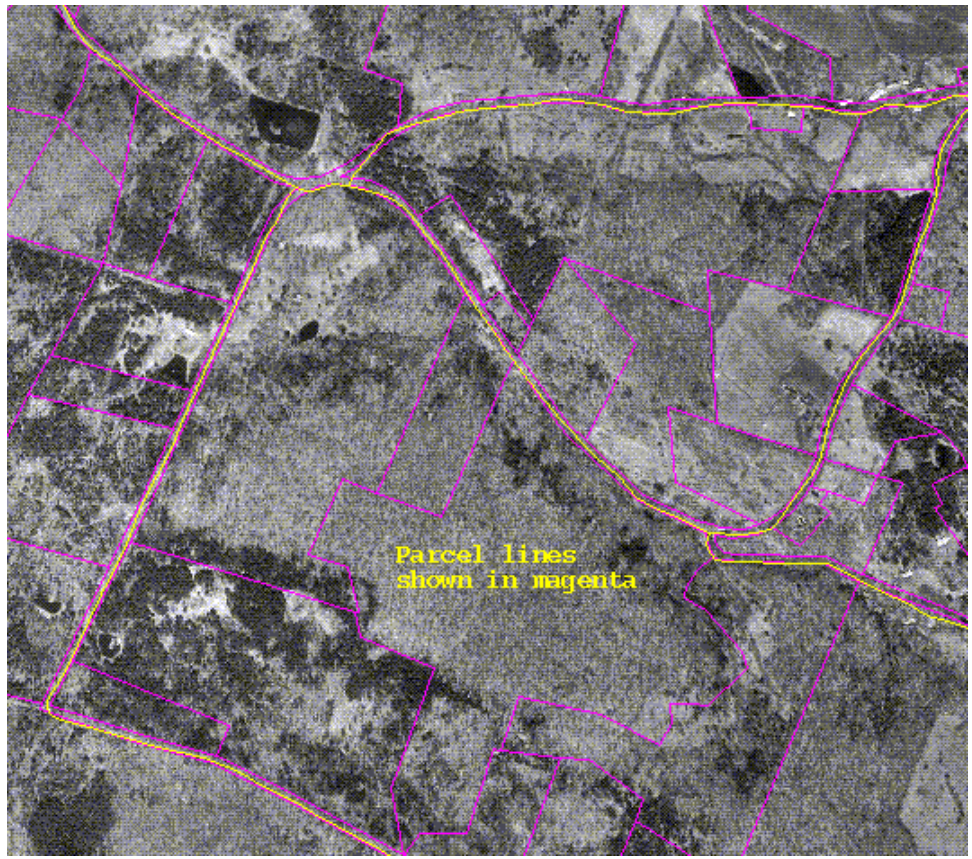
Vertical Colour Aerial Photograph

- Photographs are taken from aircraft mounted with aerial camera
- Digital cameras are also possible and has even better radiometric resolution
- Photographs are digitally rectified to produce orthophoto
- Very high interpretability of topography and physical boundaries
- Valuable for community participatory process
- Scale vs Cost

Enschede,
The Netherlands

Boundary Identification

- Rural or Customary areas
- Boundary identification simple in field
- Involvement of local during adjudication



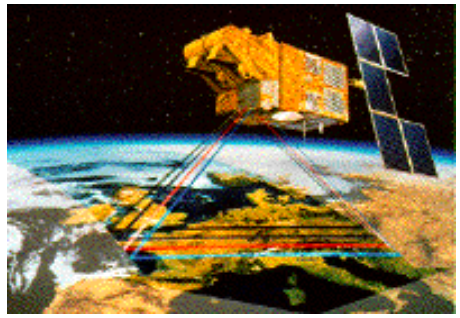
Small Format Aerial Photograph

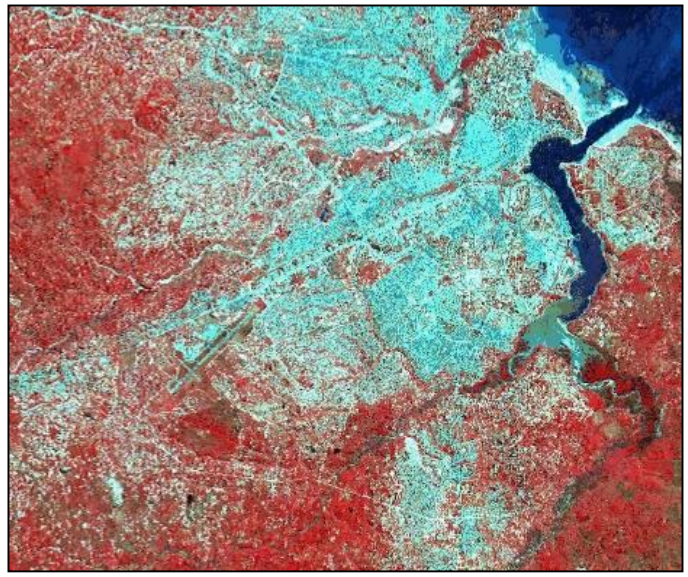
- Cheap way to acquire aerial photo from aircraft using a handheld camera
- Rapid mapping at low cost
- Used for urban planning for informal settlement area

Rectified photographs using DEM in
Keko Mwanga Dar es Salaam, Tanzania

High Satellite Images

- Advantages over Aerial photographs:
  - large areas
  - Digital data continuously captured
  - Easy maintenance of Geo-information
- Many High Resolution Satellites such as
  - SPOT – 10m (P) and 20m (XS)
  - IRS - 5.6m (P)
  - IKONOS – 1m (P) and 4m (XS)
  - Quick Bird - 0.6m (P) and 2.44m (XS)

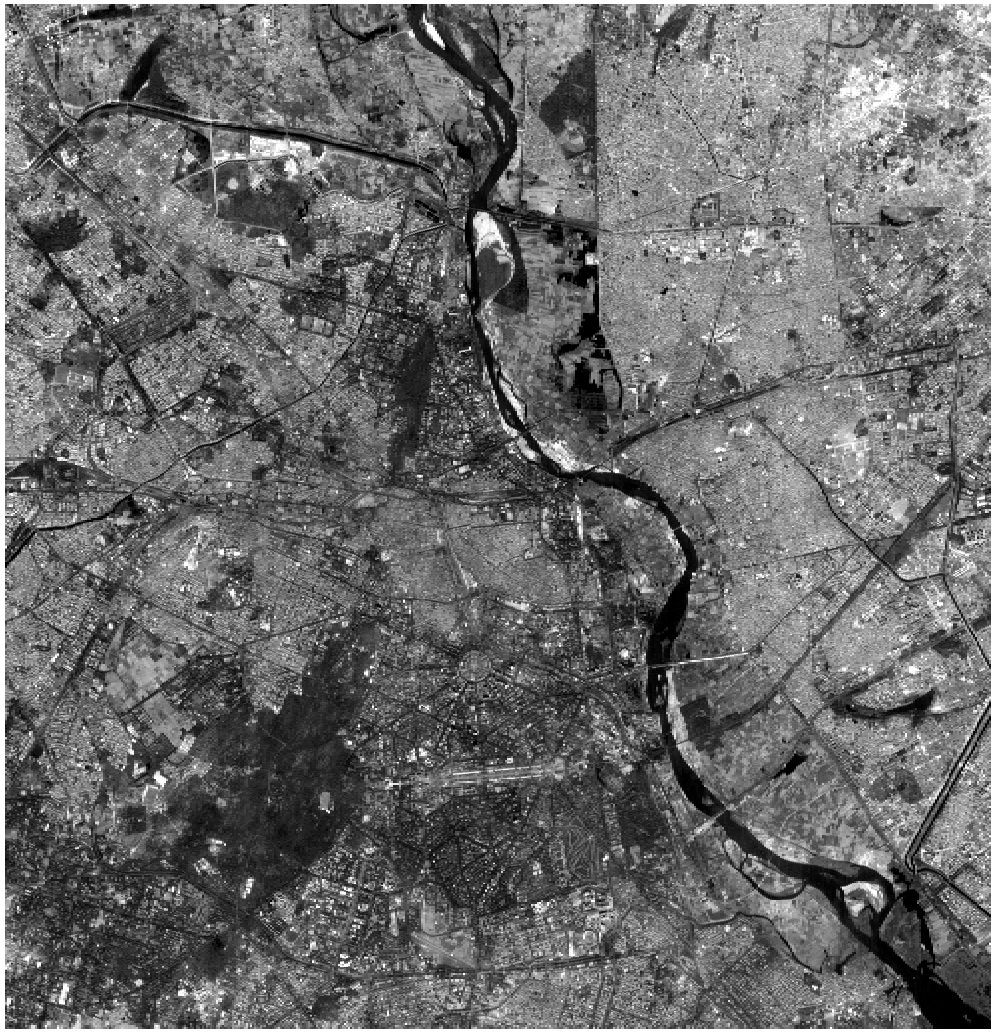




Spot XS/PM 1998

Remote Sensing image– IRS 1C

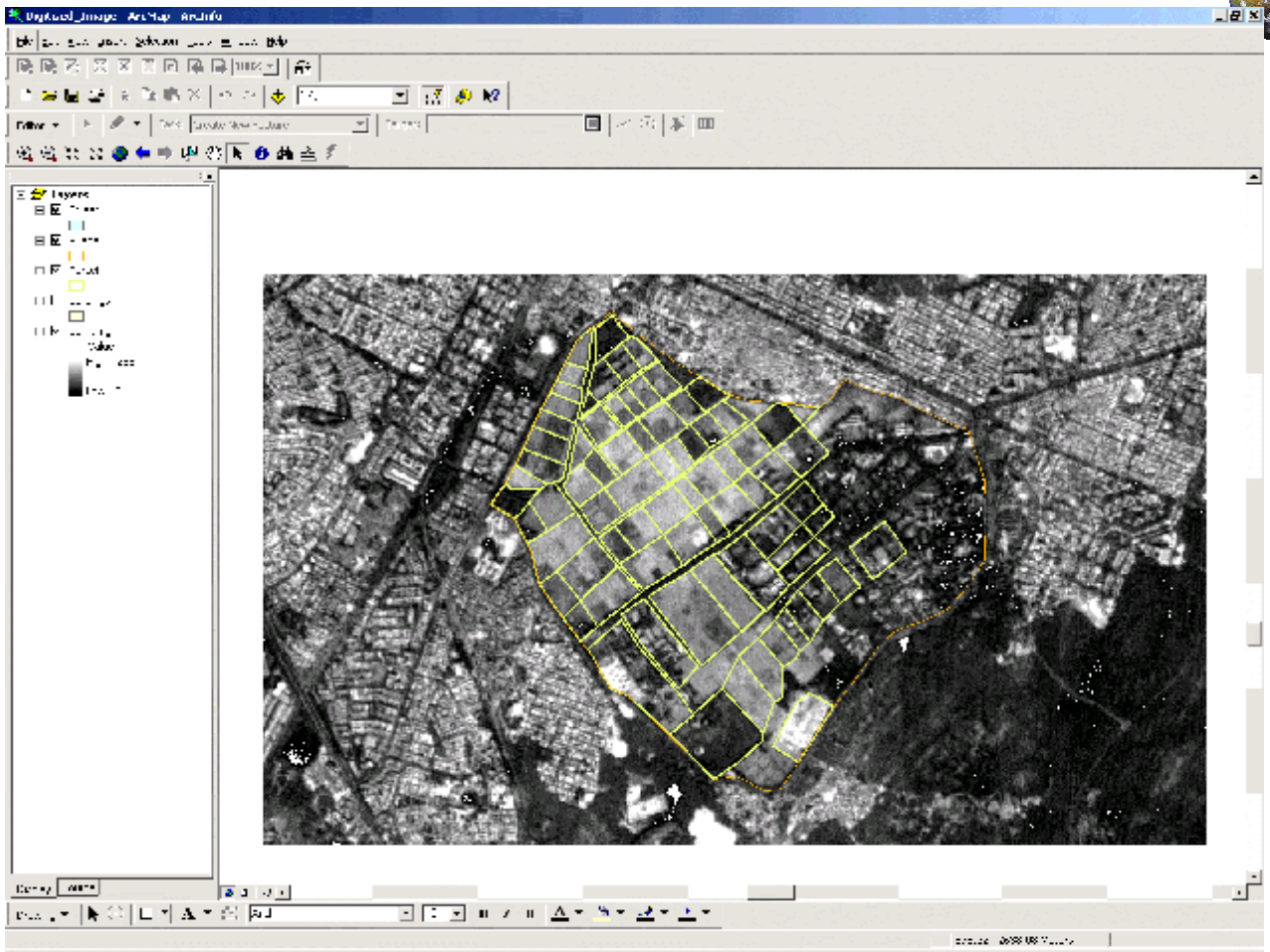
Part of New Delhi, India



Remote Sensing image– IRS 1C

Experiment:

- Aggregated spatial units can be detected
- Individual parcel boundaries not possible
- Suitable for Village Information system

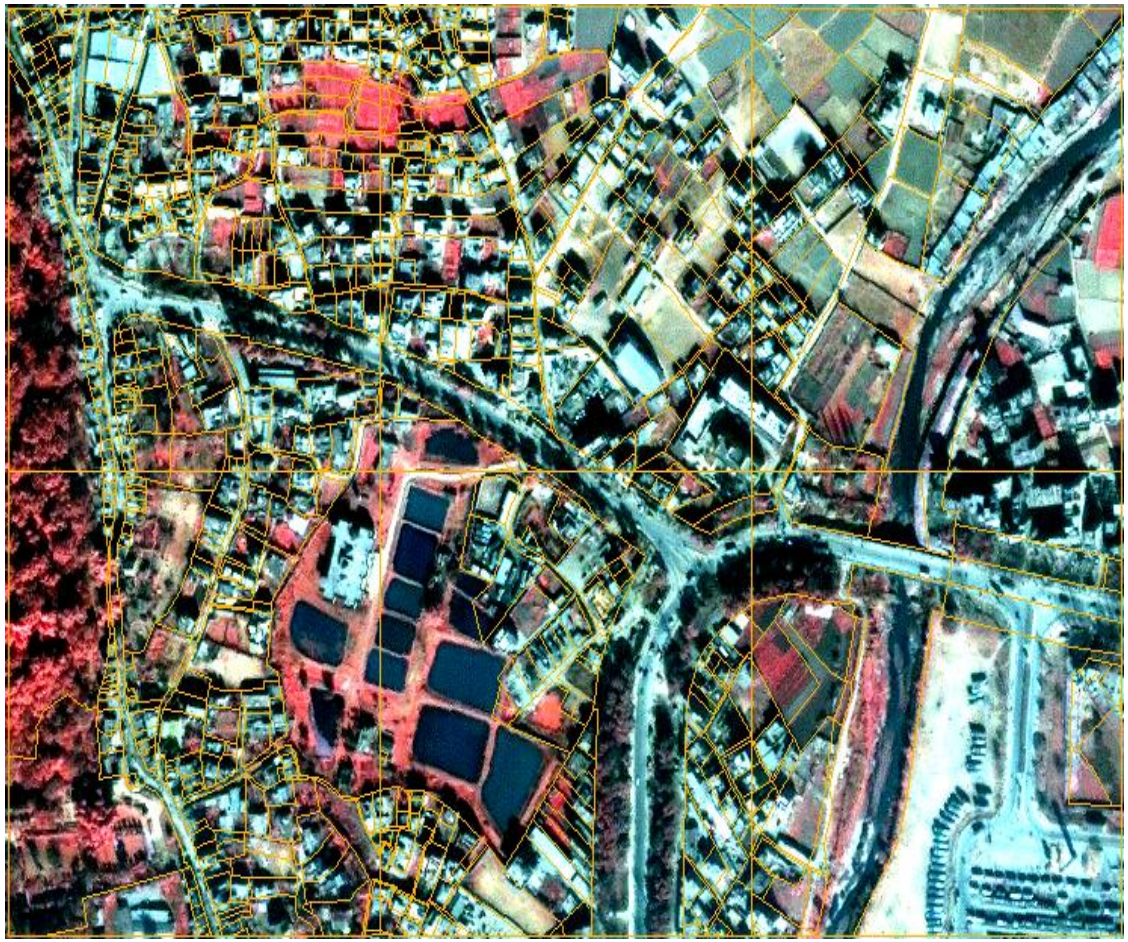


IRS 1c image in GIS environment

IKONOS images

Experiment:

- Geometric quality ±3m
- Parcel boundaries comparable with original cadastral maps
- Topographic objects such as Building, streets, rivers are easily extracted
- For dispute resolving it is a very good tool



IKONOS image in Kathmandu area

Thank you for your attentions