Earth Observation for Urban Management, Land Administration & Spatial Data Infrastructures

International trends & developments

Earth observation applications

Business development

Capacity building

0. Introduction

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HCP international:
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project for promotion & capacity building of earth observation applications

Sequence:

- General assessment of the state-of-the-art of earth observation
- Major trends and developments in the application field
- Description of earth observation solutions
- Assessment of market potential for earth observation solutions and marketing instruments
- Capacity building for successful application of earth observation solutions

Earth Observation helps you:

save money

save lives

save the environment

Earth observation applications

- On the verge of reaching new user communities
- These new user communities need to be involved
- Weakest link / last mile aspects are important
- Marketing needed: promotion & capacity building

Life cycle of products & services

Initialization

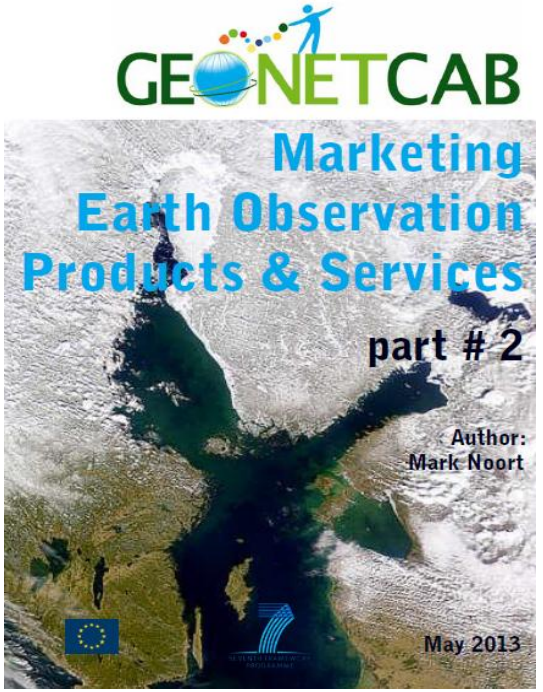
System analysis & design

Rapid prototyping

System development

Implementation

Post-implementation



Scope and definitions

Urban management: a set of instruments, activities, tasks and functions that assures that a city can function.

Land administration: the way in which the rules of land tenure are applied and made operational.

Spatial data infrastructure: is a data infrastructure implementing a framework of geographic data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way.

Data infrastructure: a digital infrastructure promoting data sharing and consumption.

These subjects are transversal and relevant to all other toolkits.

Assessment of business & funding opportunities

- Categories of environmental management products & services
- Life cycle phase of product or service
- Regional context, level of technological & economic development
- Optimum marketing mix

1. International trends & developments in urban management, land administration & spatial data infrastructures

Issues & trends

- **Urban management**: increasing urbanization puts greater demands on urban management'
- Need for proper **land administration**: necessary condition for (sustainable) economic development;
- **Spatial data infrastructures**: needed to manage ever more complicated organizational and spatial structures effectively and efficiently;
- Increasing demands from citizens on government + a trend towards **citizen involvement**.

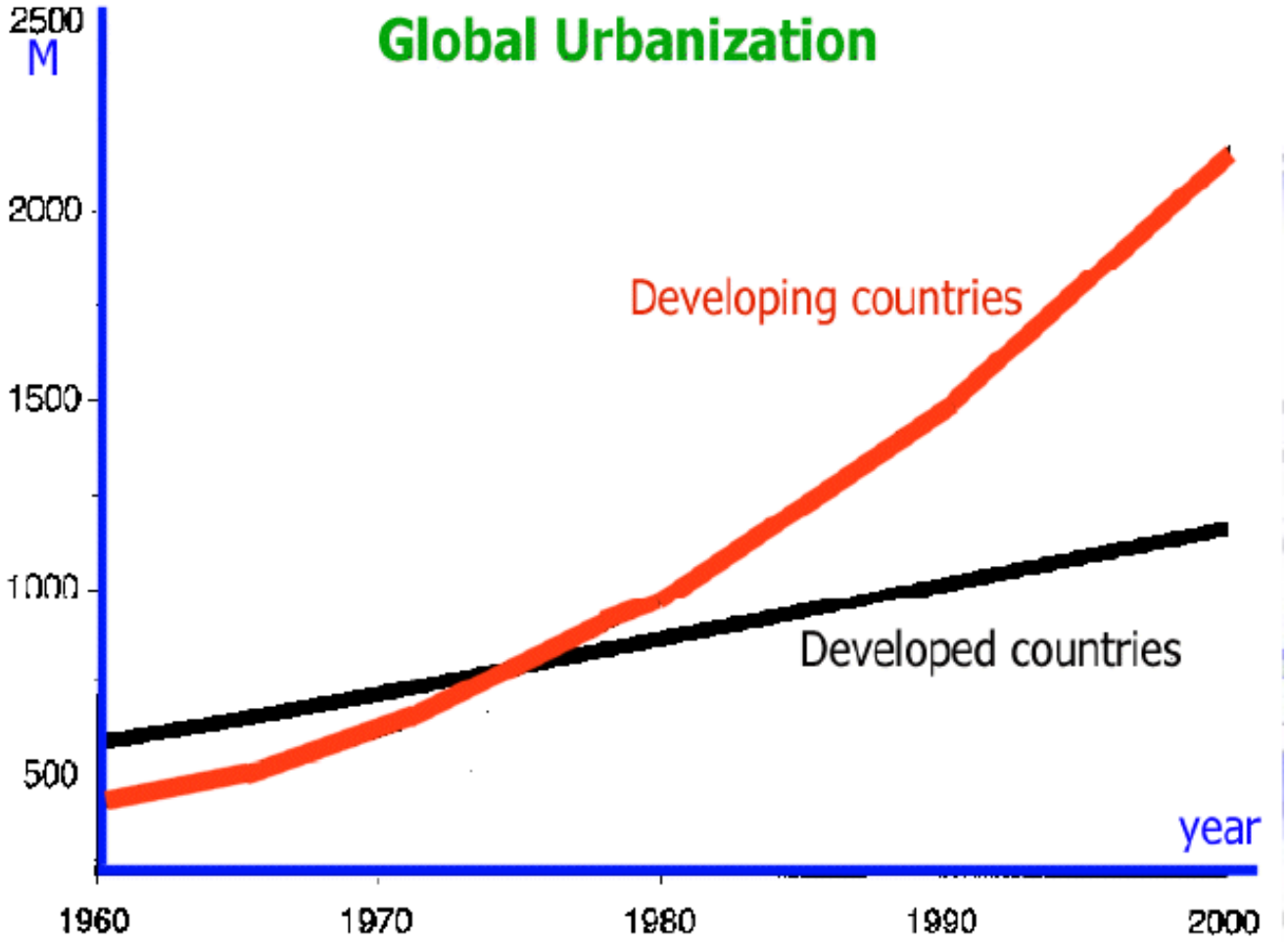
Drivers

- Urban management: increasing urbanisation requires more and improved urban management to cope with challenges;
- Land administration: increased need and importance of fit-for-purpose and transparent land administration as basic condition for economic development;
- Spatial data infrastructures: society is getting more and more complicated and effective and efficient mechanisms are needed for governance.
- At all levels: increased interest in and demand for public participation, interactivity and accountability.

Urban management

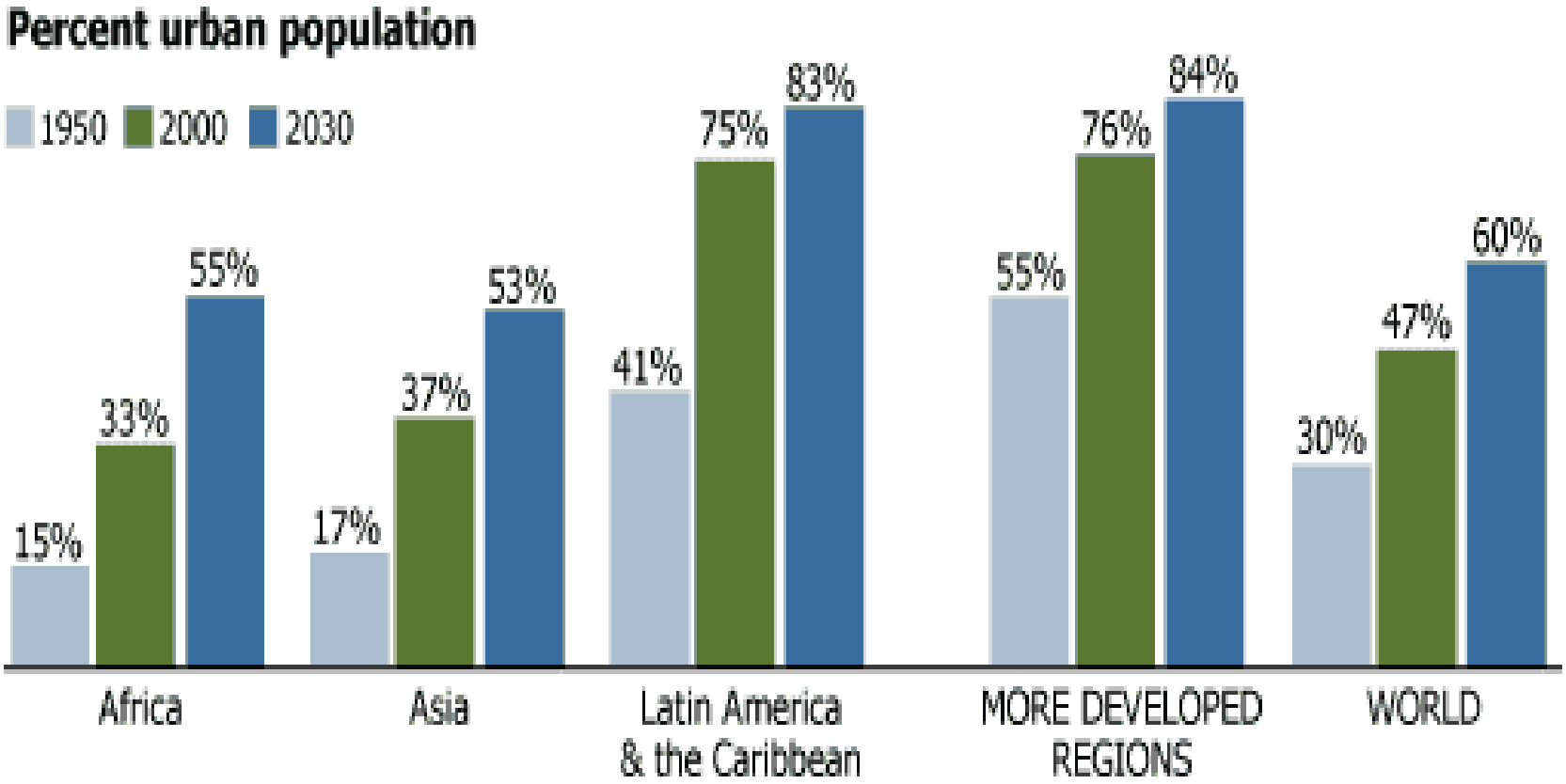
- **Rapid urban growth**: need for management and planning;
- Improve the **urban living environment**: infrastructure, services, health, environment;
- Improve **urban safety**: risk management (natural and man-made disasters), crime, anticipating and mitigating climate change;
- Increase **community participation**: e-governance, web-based consultation.

Absolute urban growth



Source: http://iwrmnotes.blogspot.com

And relative urban growth



Source: www.prb.org

Example urban Africa:

- Diversity of urban sizes
- Large cities are growing at a faster rate than smaller cities
- Great heterogeneity between countries in size distribution of their cities
- Faster urban growth means faster slum growth
- More and better infrastructure and service are needed

Source: Africa's urbanization for development: understanding Africa's urban challenges and opportunities (World Bank)

More information:

Building sustainability in an urbanizing world (World Bank; 2013). *Description of strategy options for smart and sustainable cities*

Systems of cities – Harnessing urbanization for growth and poverty alleviation (World Bank; 2009) *Analysis of the challenges of urbanization and opportunities for economic growth and poverty reduction*

Urban equity in development – Cities for life (UN-HABITAT; 2013) *Analysis of inequality in cities with advice to address the issue*

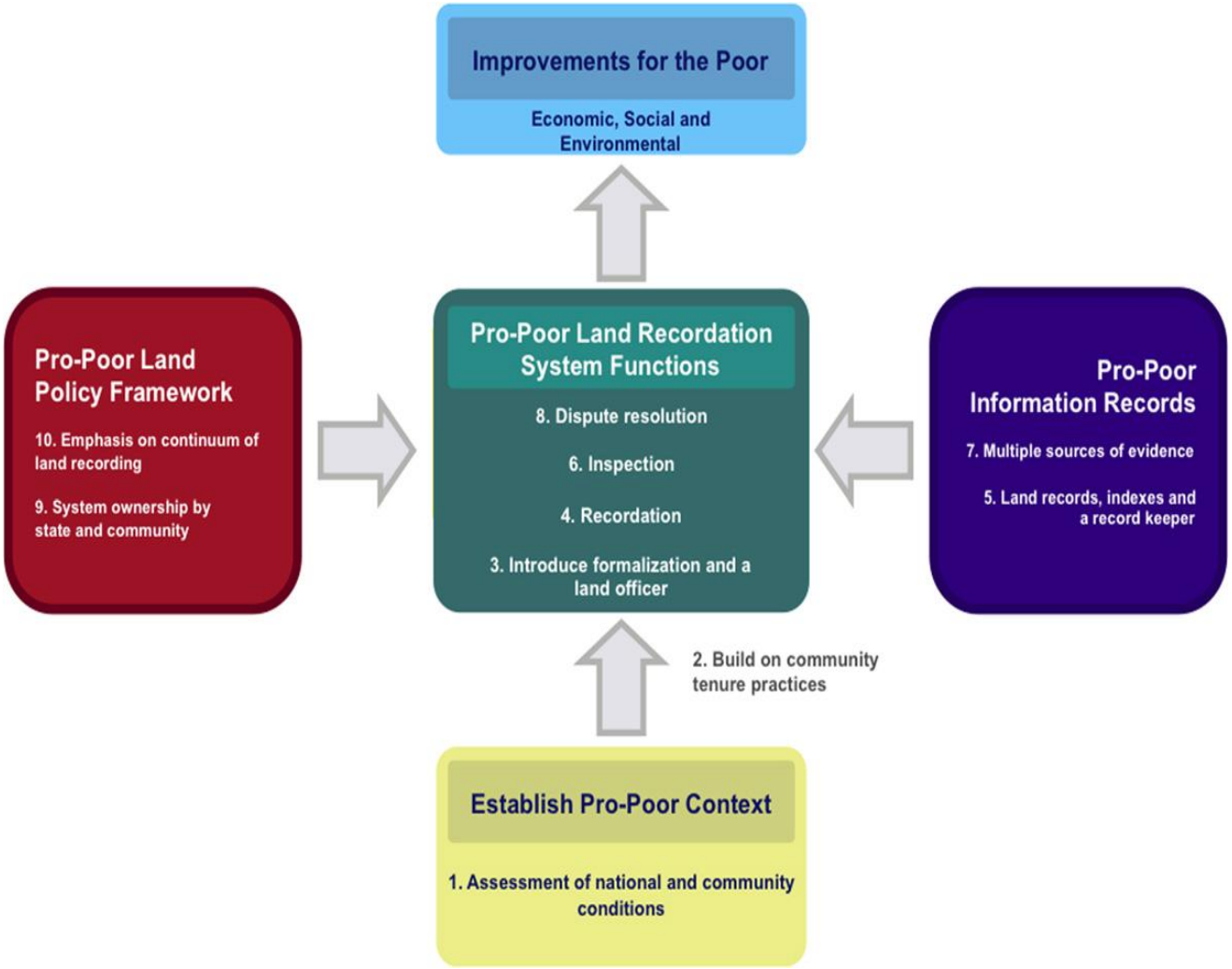
Africa's urbanization for development: understanding Africa's urban challenges and opportunities (World Bank; 2008) *Description of urbanization developments in Africa with advice for policy makers*

Land administration

A **fit-for-purpose** and **transparent land administration system** delivers:

- Improvement of **security of tenure**;
- Improved **land resources management;**
- A **reduction of land disputes;**
- **Increased revenue generation;**
- **Credit security.**

Pro-poor land administration



The ten design elements of the pro-poor land recordation system (re-worked from Williamson et al., 2010: land administration for sustainable development)

Desirable characteristics of property rights to land:

- Long enough horizon to provide investment incentives
- Defined in a way that makes them easy to observe, enforce and exchange
- Administered and enforced by institutions that have both legal backing and social legitimacy and are accessible by and accountable to the holders of property rights
- Rights and duties of individuals, within a group that holds communal rights, have to be clear
- Institutions administering property rights need to be flexible enough to evolve over time in response to changing requirements

Source: Land policies for growth and poverty reduction – executive summary (World Bank)

More information:

Pro-poor land administration: principles for recording the land rights of the underrepresented (ITC; 2013) *Description of a pro-poor approach to land administration, as developed by the global land tool network (GLTN)*

Crowd sourcing support of land administration (RICS; 2012) *Description of opportunities provided by crowd sourcing for land administration, including examples of crowd sourcing with mobile phones for other applications*

Land policies for growth and poverty reduction - executive summary (World Bank; 2003) *Description of the basics for good land policies, showing empirical evidence of the link between tenure security and economic development and poverty reduction + an analysis of land markets and description of the situation in different regions of the world*

Spatial data infrastructures

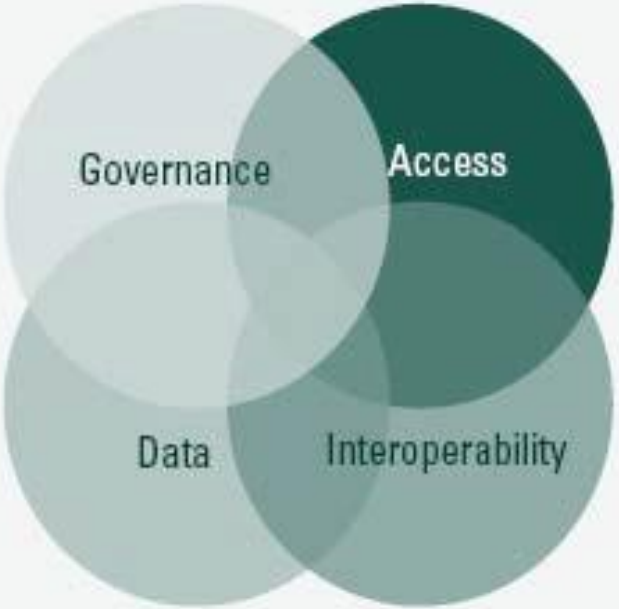
- Implementation of SDI leads to positive cultural change in the stakeholder organizations with **greater willingness to cooperate and share resources**;
- SDIs facilitate **better coordination**, **avoidance of duplication** and **reduction of costs**;
- SDIs improve **shared understanding** among public agencies of the problems and issues;
- SDIs facilitate building and supporting **applications for citizens and local businesses** related to land and property, planning, traffic, local services, as well as allowing **new services from the private sector** to be developed around addresses and locations.

SDI goals

Four Strategic Goals

I.
Governance – establish the governance structure required to optimise the benefits from government's geospatial resources.

II.
Data – ensure the capture, preservation and maintenance of fundamental (priority) geospatial datasets, and set guidelines for non-fundamental geospatial data.



III.
Access – ensure that government geospatial information and services can be readily discovered, appraised and accessed.

IV.
Interoperability – ensure that geospatial datasets, services and systems owned by different government agencies can be combined and reused for multiple purposes.

Spatial data infrastructures: some lessons learned from UK and Europe (Source: 099999uj, 2011)

More information:

Advanced regional spatial data infrastructures in Europe (JRC; 2009) *Comparison of different regional SDIs in Europe (and elsewhere) + recommendations*

The socio-economic impact of the spatial data infrastructure of Catalonia (JRC; 2008) *Study into cost-benefit of SDI in Catalonia: mainly derived from internal efficiency (time saved by government staff) and external effectiveness (time saved by the general public) + potential democracy impact*

Spatial data infrastructures: Some lessons learned from UK and Europe (ConsultingWhere; 2011) *Presentation with practical examples and lessons for setting up an SDI*

More information (2):

Geospatial Science & Technology and Development (UNCTAD; 2012) *Report on the state-of-the-art of geospatial science and applications, including urban management, land administration and SDIs*

Report on user requirements, costs, derived direct benefits, and current obstacles for a European and Global Spatial Data Infrastructure (EuroGEOSS; 2010) *Report describing the user requirements, costs, derived direct benefits, and current obstacles for a European and Global Spatial Data Infrastructure, with special emphasis on GEOSS and INSPIRE, based on a survey of (potential) users*

National spatial data infrastructure: the case of Brazil (World Bank; 2010) *Report on how to establish and sustain a national SDI for Brazil*

More information (3):

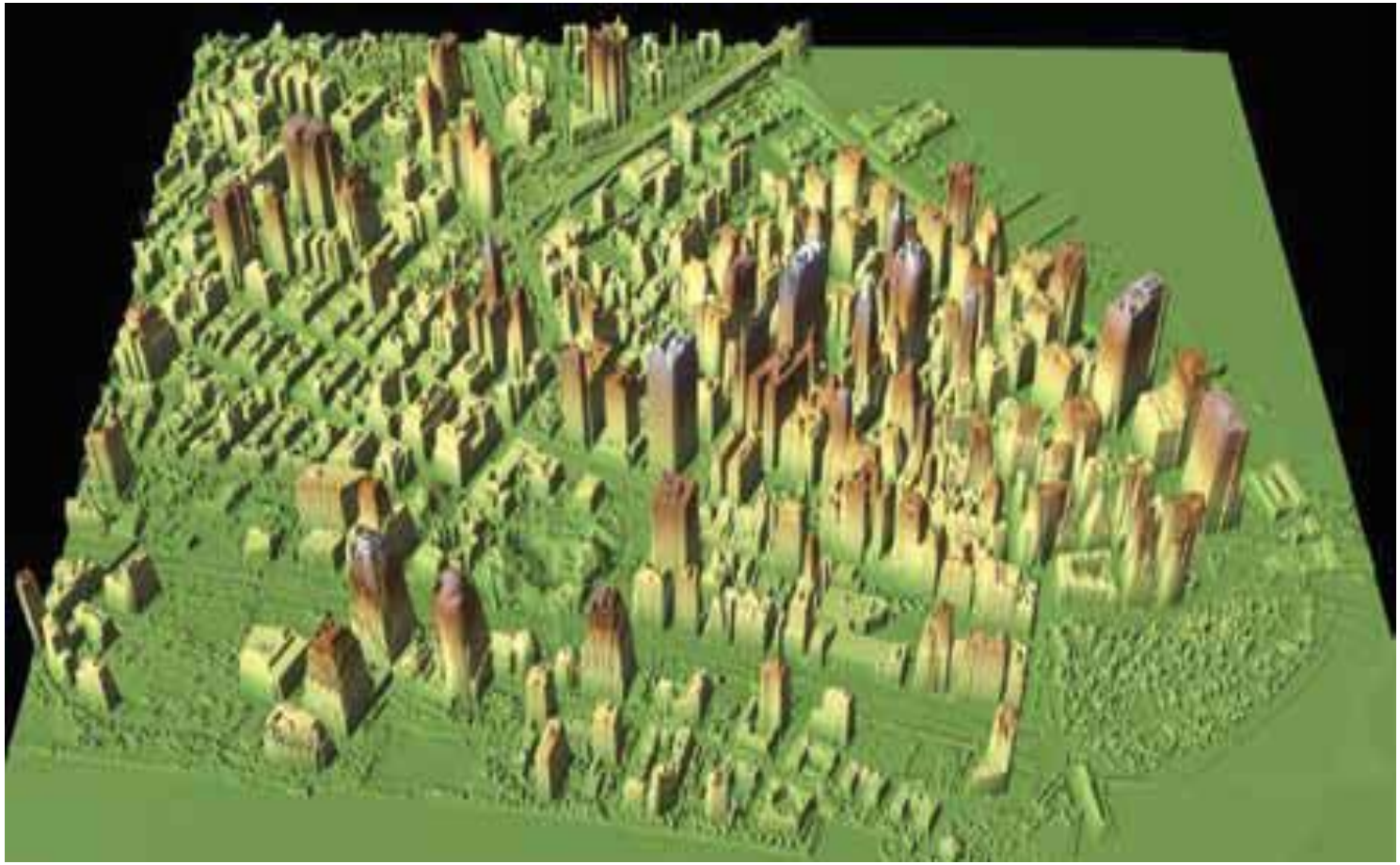
A conceptual model for developing interoperability specifications in spatial data infrastructures (JRC; 2012)
Report describing requirements and best practices for interoperability of geographic and environmental information in Europe

European Directive (2007/2/EC) INSPIRE – update on building European Spatial Data Infrastructure (JRC; 2013)
Presentation explaining what INSPIRE is all about

United Nations e-government survey – E-government for the future we want (UNDESA; 2014)
Report on status of and developments in e-government around the world

2. Earth observation applications

Earth observation for urban management, LA & SDI



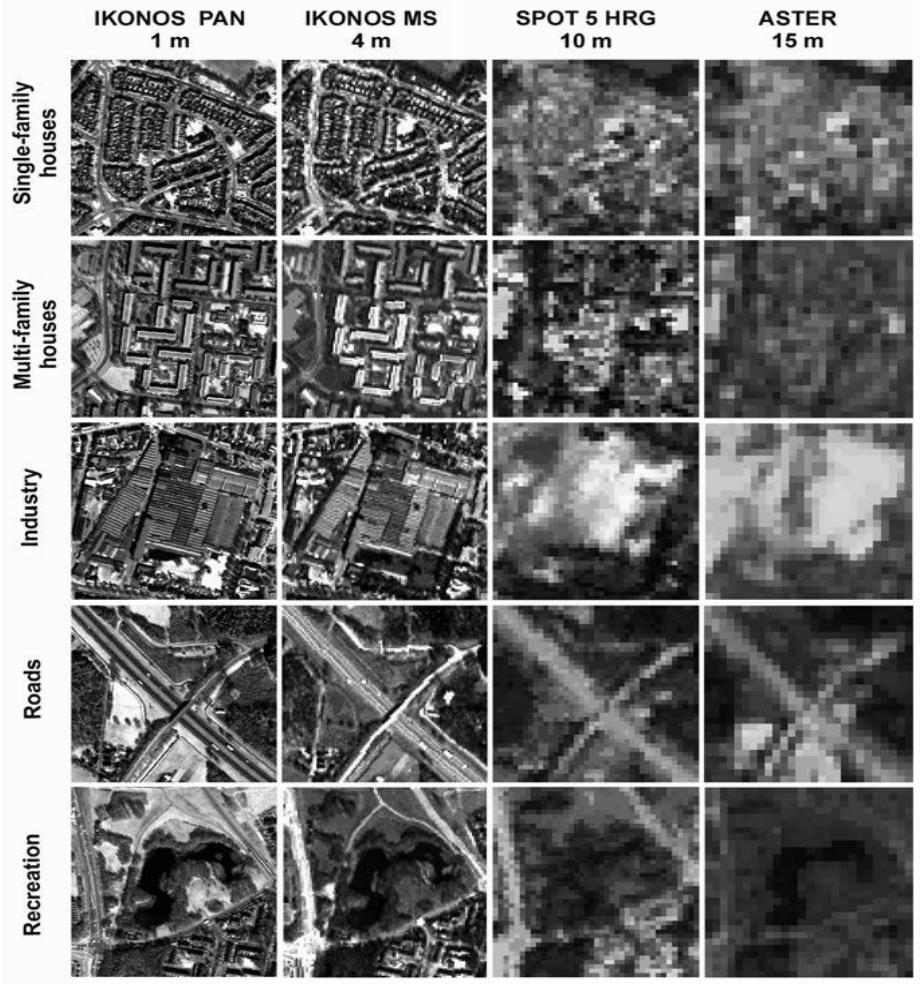
LIDAR map from Manhattan, New York, USA

Earth observation contribution

- **Urban management**
- **Slum mapping and monitoring**,
  as special application of urban management
- **Land administration**

Spatial data infrastructures play a role in all three (and other) earth observation applications

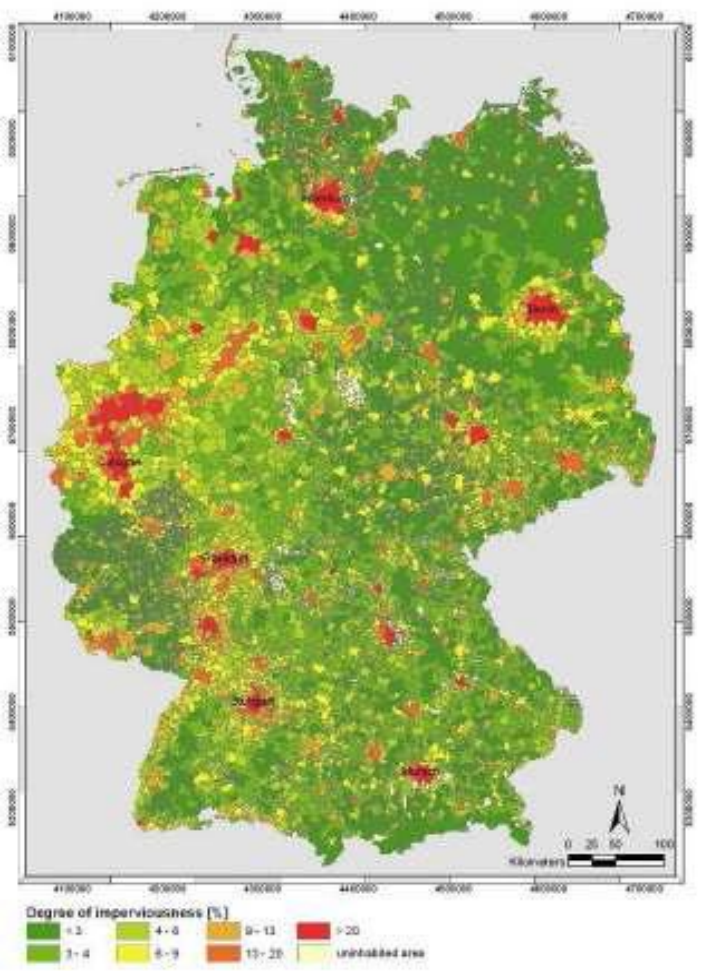
Example urban management

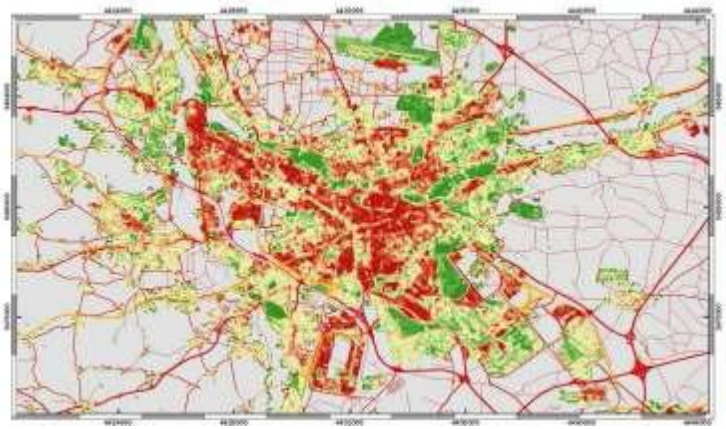


Comparison of urban objects and land uses in Enschede, the Netherlands, by sensor and spatial resolution (each window represents a 400 × 400 m area on the ground)

(source: Remote sensing of urban and suburban areas, 2010)

Example urban management:





Imperviousness (vector lines)

Expressway
Highway
District road
Farm track
Railroad

Imperviousness (raster)

100%

0%

Impervious surfaces in urban Germany (Source: Urban remote sensing, 2010)

Urban management

- Earth observation can provide a useful and direct indication of the physical form and morphology of urban land cover in cities;
- Applications in urban population studies, health, environment, urban land use, heat islands, crime mapping, etc.;
- Earth observation supports “smart growth” (a range of urban strategies that focuses on sustainability of development under different economic scenarios);
- Cost estimate: on case-by-case basis;
- Main challenges: cost, complexity, knowledge transfer.

Examples:

Urban remote sensing: how can earth observation support the sustainable development of urban environments?
(Esch, et al.; 2010) *Article describing opportunities for remote sensing with examples on monitoring of urban sprawl, mapping of the percent impervious surface, mapping of urban heat islands (local heating potential), micro-climate model development and flood vulnerability and risk mapping*

Remote sensing of urban and suburban areas (EARSEL; 2010)
Book with collection of state-of-the-art chapters on urban remote sensing, aimed at capacity building (with references) and a strong focus on science and techniques

Workshop report on sustainable urban development (NASA; 2009) *Urban heat islands, urban vulnerability to climate change, sustainability (including transportation and renewable energy), community participation, sustainable buildings, air quality and urban health, urban risk management*

Examples (2):

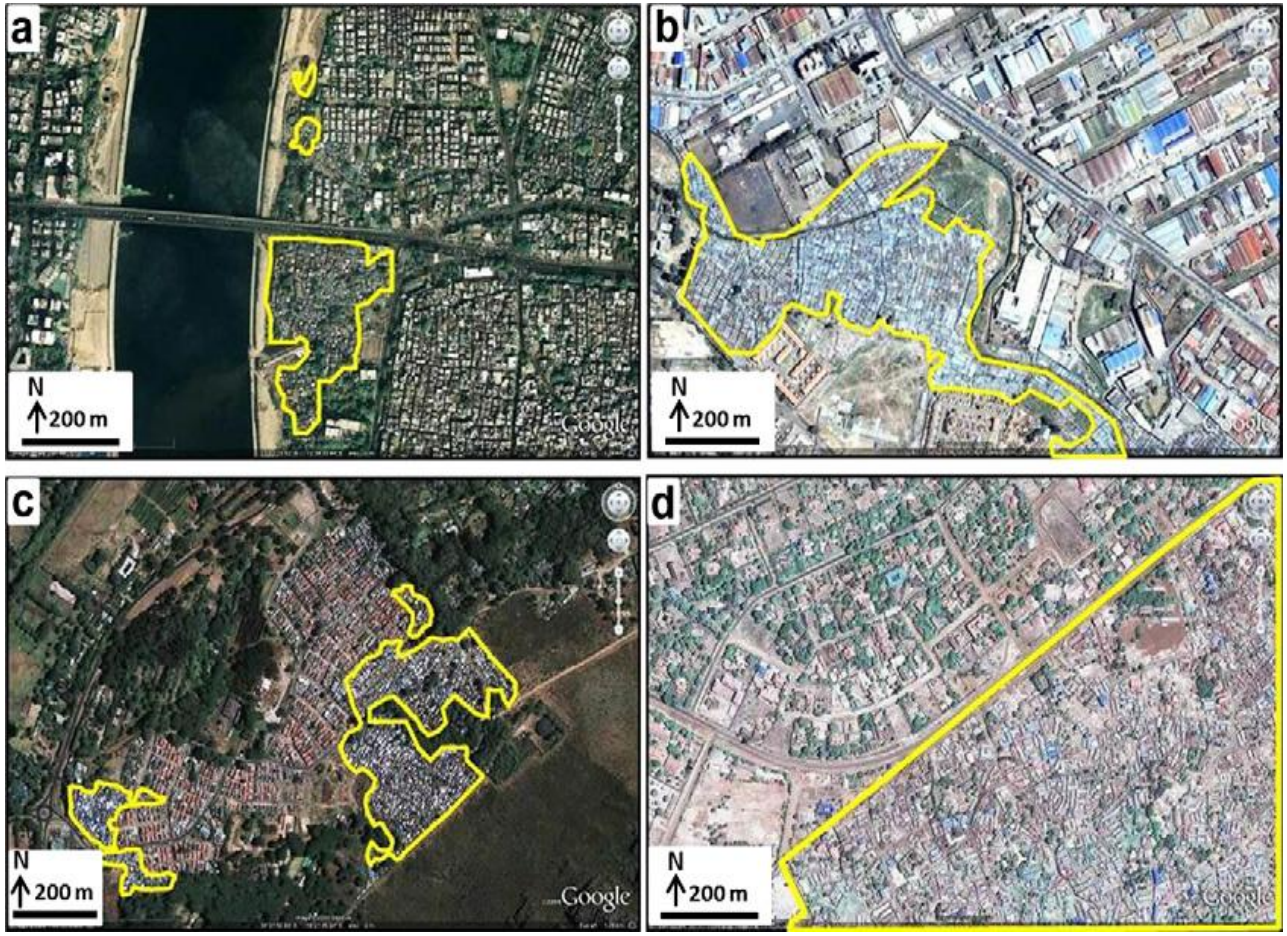
Expanding cities – A growing concern (Copernicus; 2013)
Brochure on monitoring urban sprawl

Satellites help to design more habitable cities (Copernicus; 2013) *Brochure on identification and monitoring of urban heat islands*

Keeping Europe on the move (Copernicus; 2014) *Brochure on monitoring road infrastructure and road planning*

Satellites help to monitor infrastructure stability (Copernicus; 2013) *Brochure on monitoring subsidence of infrastructure in the urban environment*

Example slum mapping



An example of slum delineation in different contexts by an Indian expert.

City names:
(a) Ahmedabad (India),
(b) Nairobi (Kenya),
(c) Cape Town (South Africa) and
(d) Kisumu (Kenya).

(Source: ITC, 2012)

Slum mapping

- Earth observation supports mapping and monitoring of features such as the access network, density of housing (roofs), shape of the area (unplanned), connectivity with neighbouring areas (poor) and location;
- Earth observation facilitates change monitoring to assess the effect of development interventions;
- Cost estimate: on case-by-case basis;
- Main challenges: cost, complexity, knowledge transfer.

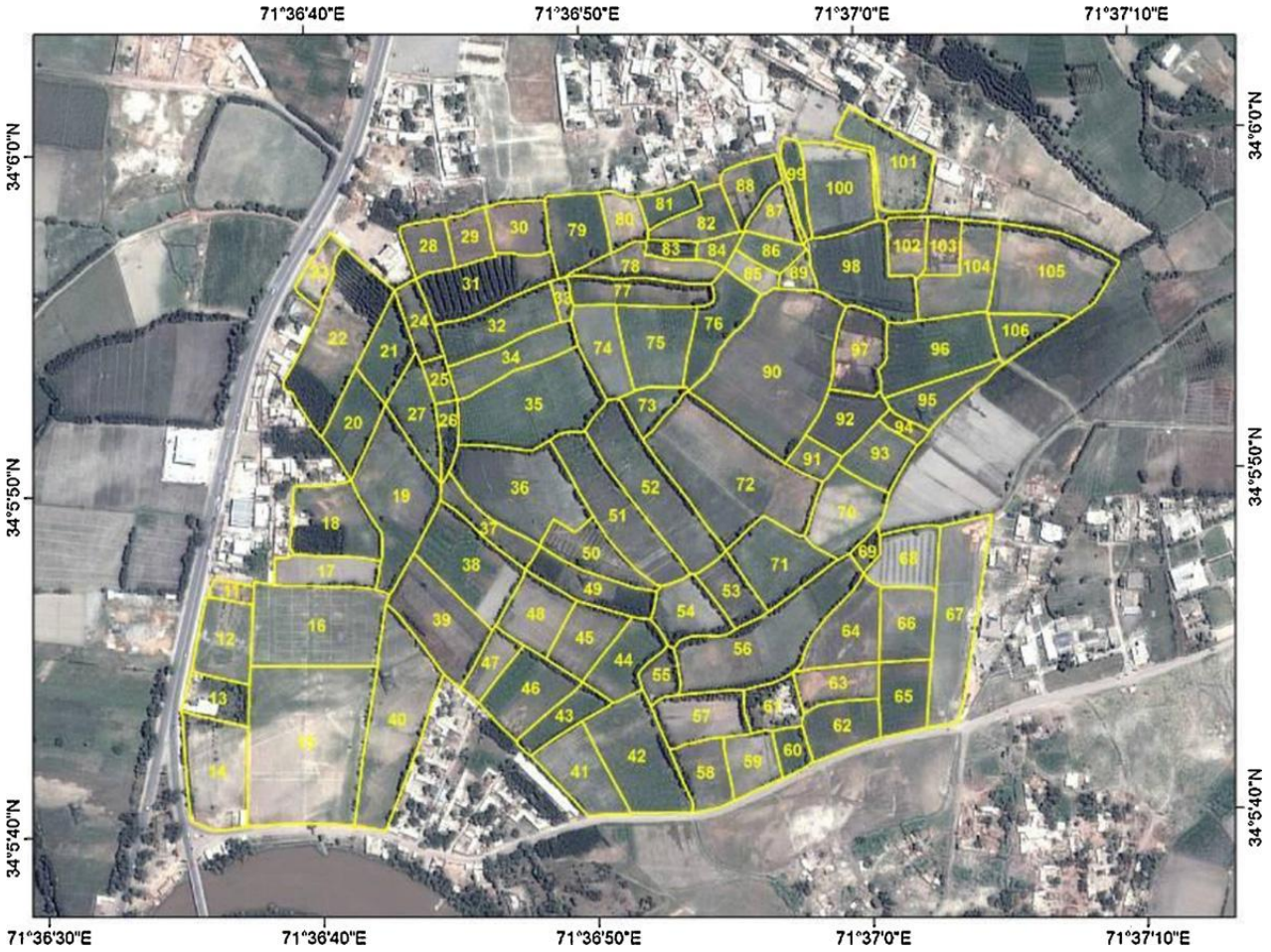
Examples:

An ontology of slums for image-based classification (ITC; 2012) *Article on how slums can be identified and development in slums monitored with the help of satellite images*

Urban slum monitoring (UN-HABITAT; 2004) *Article describing methodology for urban slum monitoring with practical examples*

Analysing sub-standard areas using high resolution remote sensing (VHR) imagery – Case study of Mumbai, India (ITC; 2013) *Same as above, but applied to Mumbai*

Example land administration



Digitised parcel boundaries with the help of satellite images in Ethiopia (source: WB, 2010)

Land administration

- Earth observation facilitates rapid mapping and change monitoring;
- Earth observation supports high-speed cadastral surveying, especially in rural areas;
- Satellite images can provide the base layer for a participatory approach to land administration and increase transparency;
- Cost estimate: on case-by-case basis;
- Main challenges: cost, acceptance, knowledge transfer.

Examples:

An integrated approach for updating cadastral maps in Pakistan using satellite remote sensing data (ITC; 2012) *Article describing the use of remote sensing (aerial survey and satellite images) as part of the workflow for cadastral maps*

The cadastral divide – A view from the bridge (ITC: 2012) *Article on geospatial technology for effective land administration systems*

First experiences with high-resolution imagery-based adjudication approach in Ethiopia (ITC; 2010) *Chapter of the World Bank study 'Innovations in land rights recognition, administration, and governance' on the use of satellite images for a participatory approach with local communities in Ethiopia.*

The Social Tenure Domain Model - A pro-poor land tool (FIG, ITC; 2010) *Description of a land administration methodology that acccomodates communal (and other forms of) land rights (social tenure).*

Growth potential for earth observation

- **Urban management applications**.
  Main clients: municipalities, utilities, international organizations.
- **Slum mapping**.
  Main clients: municipalities, international organizations, NGOs.
- **Land administration**.
  Main clients: national government, international organizations.

Paying clients come primarily from the public sector.

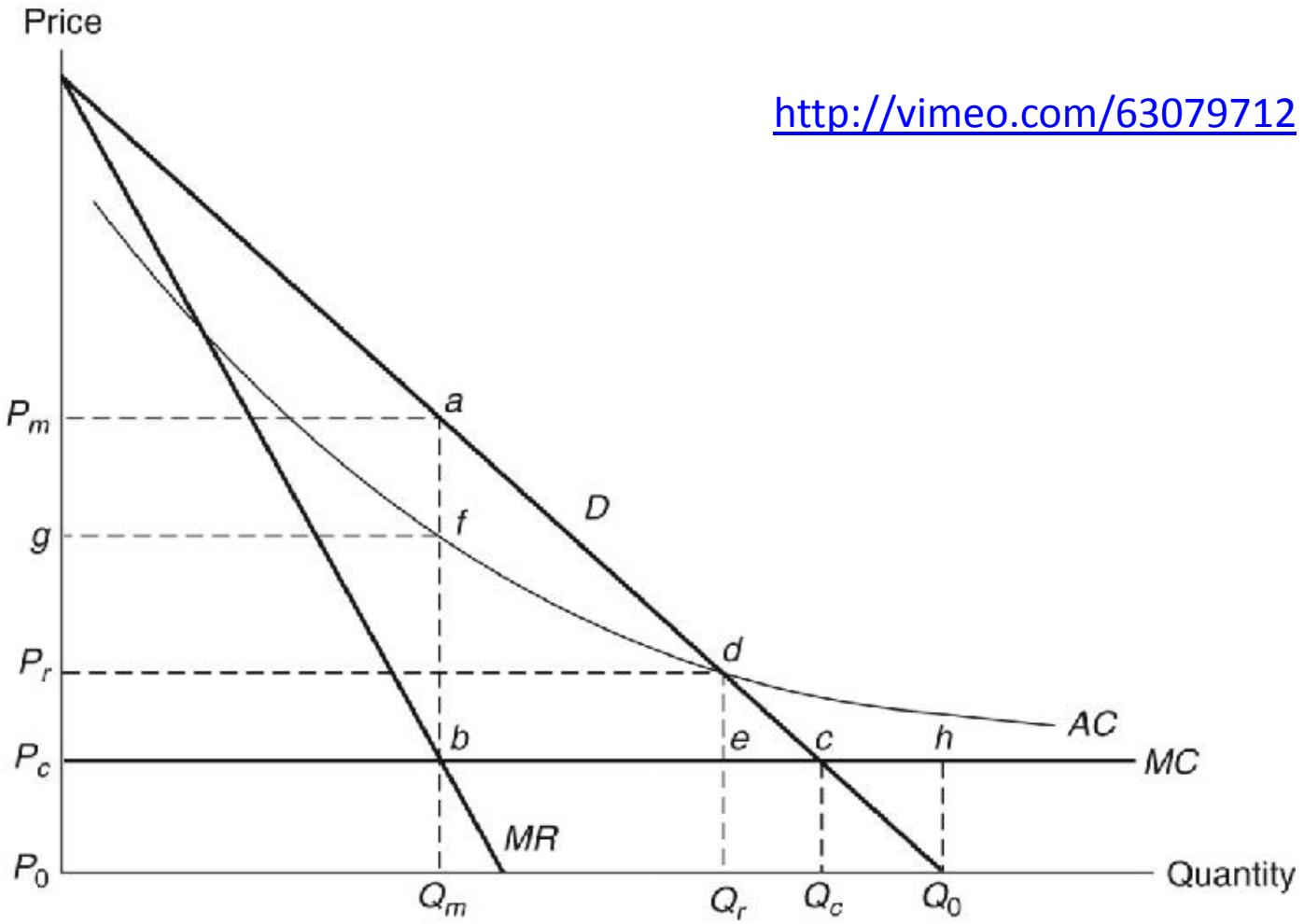
3. Business development

Why is marketing / promotion of earth observation needed?

- Public sector information (PSI)
- Externalities (environmental accounting & payment for ecosystem services)
- Global datasets, open access, data sharing, compatibility (GEO)

If public sector information is made available free-of-charge, demand will increase and, in the end, government revenue also, as companies will derive income from value-added products and services, and consequently pay more taxes (see figures in following slides).

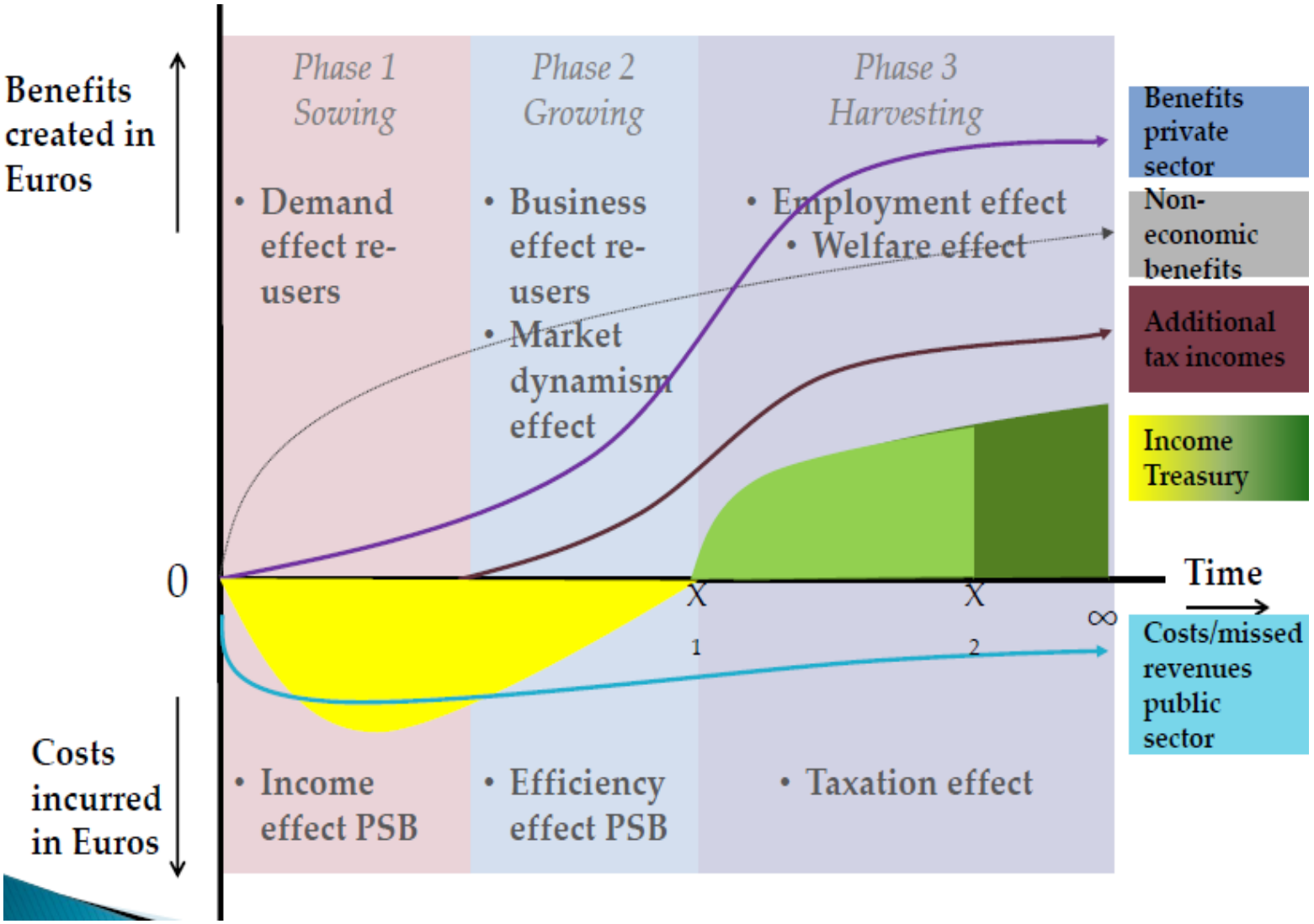
Supply & Demand Public Sector Information



http://vimeo.com/63079712

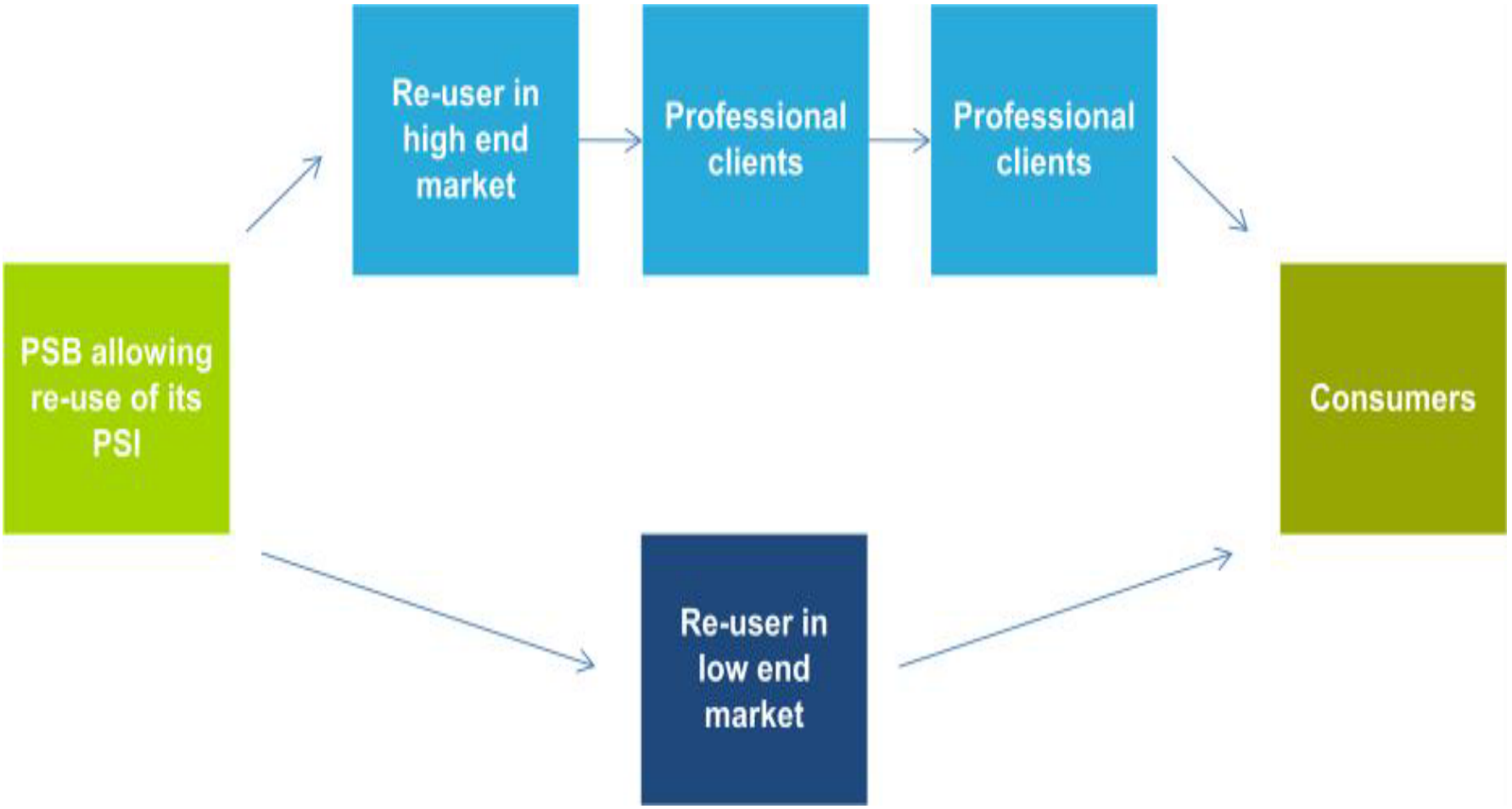
Source: About GMES and data: geese and golden eggs (Sawyer, de Vries 2012)

Cost-benefit Public Sector Information



Source: About GMES and data: geese and golden eggs (Sawyer, de Vries 2012)

Re-use of Public Sector Information

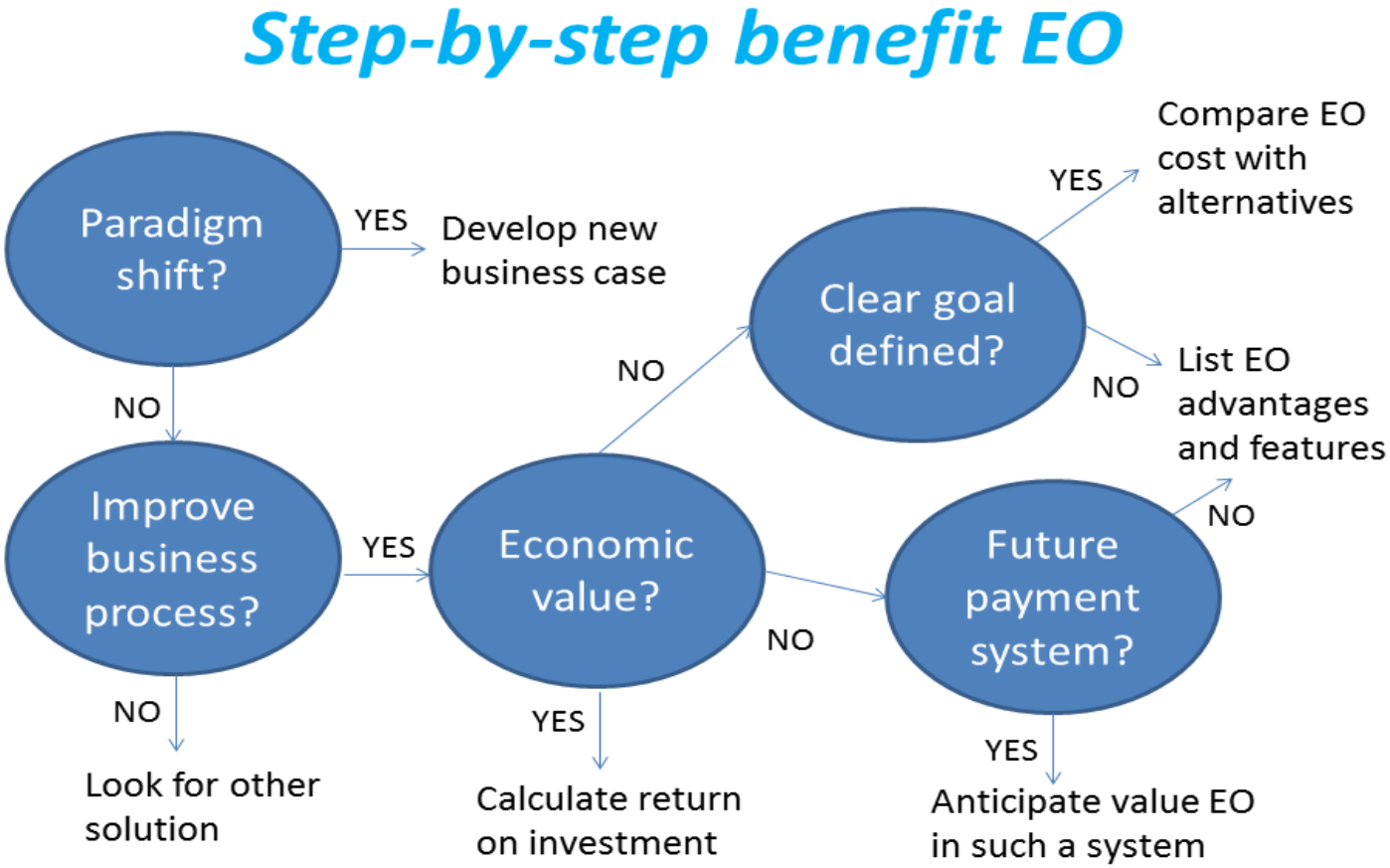


Source: About GMES and data: geese and golden eggs (Sawyer, de Vries 2012)

Most earth observation applications deal with so-called externalities, such as impact on the environment.
It is difficult to capture these in terms of conventional cost-benefit models.

To tackle this, the following framework for analysis of earth observation applications is developed:

Framework for analysis



Step-by-step analysis of the benefits of earth observation (source: GEONetCab, 2013)

Key questions

- Does the new application cause a paradigm shift?
- Is the current business or organization process improved?
- Does the application provide economic value that can be quantified?
- Is a clear measurable goal defined to which the earth observation application contributes?
- Is a future payment scheme or other economic mechanism foreseen in which the earth observation application fits?

Assessment of geospatial solutions

Rating of **characteristics** of geospatial solutions:

- fit-for-purpose
- comparative advantage
- complexity to user / ease- of-use
- elegance
- cost-benefit,
- sustainability
- resilience
- reproduction capacity / flexibility
- acceptance
- level of knowledge transfer required
- ethics, transparency, public accountability, objectivity & impartiality

Rating of **business environment**:

- **Willingness to pay** (by clients)
- **Embedding** (in organizational processes)
- **Openness** (transparency and ease of doing business, access to markets)
- **Institutions** (is the institutional environment conducive to doing business, acceptance of new solutions?)

Fit-for-purpose

An important, but often forgotten requirement:
Does the product or service do what it is supposed to do to solve a certain problem?

In other words: is it really a solution or just an attempt towards a solution?

- Quantitative: not applicable
- Qualitative (on scale of 1 to 5): based on description of what the EO solution actually does

Comparative advantage

What it does significantly better than other solutions to the same problem.

For earth observation usually the comparative advantages of greater accuracy, better resolution in time and space, comprehensive overview of large areas and near real-time information provision are mentioned as comparative advantages.

- Quantitative: calculation of degree in which the EO solution is better than alternatives
- Qualitative (on scale of 1 to 5): based on listing of comparative advantages

Complexity (to user) / ease-of-use

At all levels in the value chain the users (professionals and end-users) are able to work with the product or service.

- Quantitative: not applicable
- Qualitative (on scale of 1 to 5): based on user testimonials and user surveys

Elegance

Once you get the idea behind this product or service, you want to be part of the community that uses it.

This sense of belonging facilitates the formation of user groups that provide valuable feedback.

- Quantitative: none, or it should be the size of the user community
- Qualitative (on scale of 1 to 5): based on user testimonials and user surveys

Cost-benefit

The cost-benefit of the product or service is quantified and sufficiently attractive, also in the long-term.

- Quantitative: cost-benefit calculation
- Qualitative (on scale of 1 to 5): based on quantitative assessment

Sustainability

The product or service can be delivered when it is needed.
There is a long-term perspective that guarantees delivery.

Sustainability concerns the following aspects:

- ✓ Long-term data availability
- ✓ Availability of finance/funds to provide the solution continuously for present and future use
- ✓ Long-term institutional / governmental interest and support
- ✓ Long-term user interest for a solution that addresses real needs

- Quantitative: not applicable
- Qualitative (on scale of 1 to 5): based on sensitivity analysis of the EO solution

Resilience

In case of extremes or breakdown in the value chain, the product or service can still be delivered at an acceptable level. Alternatives (plan B) are available (and developed).

- Quantitative: cost-benefit calculation of plan B
- Qualitative (on scale of 1 to 5): based on risk analysis of the EO solution

Reproduction capacity / flexibility

The product or service can be easily applied or adapted for use in another region or another situation, while still providing the solution without (too much) extra cost.

- Quantitative: calculation of reproduction costs for application in other regions or situations; measurement of spreading of actual use
- Qualitative (on scale of 1 to 5): based on quantitative assessment and description of EO solution

Acceptance

The users intuitively get what the product or service is about and are interested. They accept it as a solution to their problem.

- Quantitative: none, or survey results about acceptance. After introduction of the solution: number of clients and/or users
- Qualitative (on scale of 1 to 5): based on user testimonials and user surveys

Level of knowledge transfer required

The training requirements for professionals and other users along the value chain are clear and associated costs and efforts are acceptable.

- Quantitative: cost and time required to get the users at the desired knowledge and skill level
- Qualitative (on scale of 1 to 5): based on knowledge transfer plans and evaluation of training activities

Ethics, transparency, public accountability, objectivity & impartiality

Application of Earth observation increases the level of objectivity and impartiality in decision-making processes, including conflict resolution. The application improves transparency and public accountability. It raises no ethical issues or if it does, as in the case of privacy concerns, these are resolved in a satisfactory way for all parties concerned.

- Quantitative: not applicable
- Qualitative (on scale of 1 to 5): based on user testimonials and user surveys

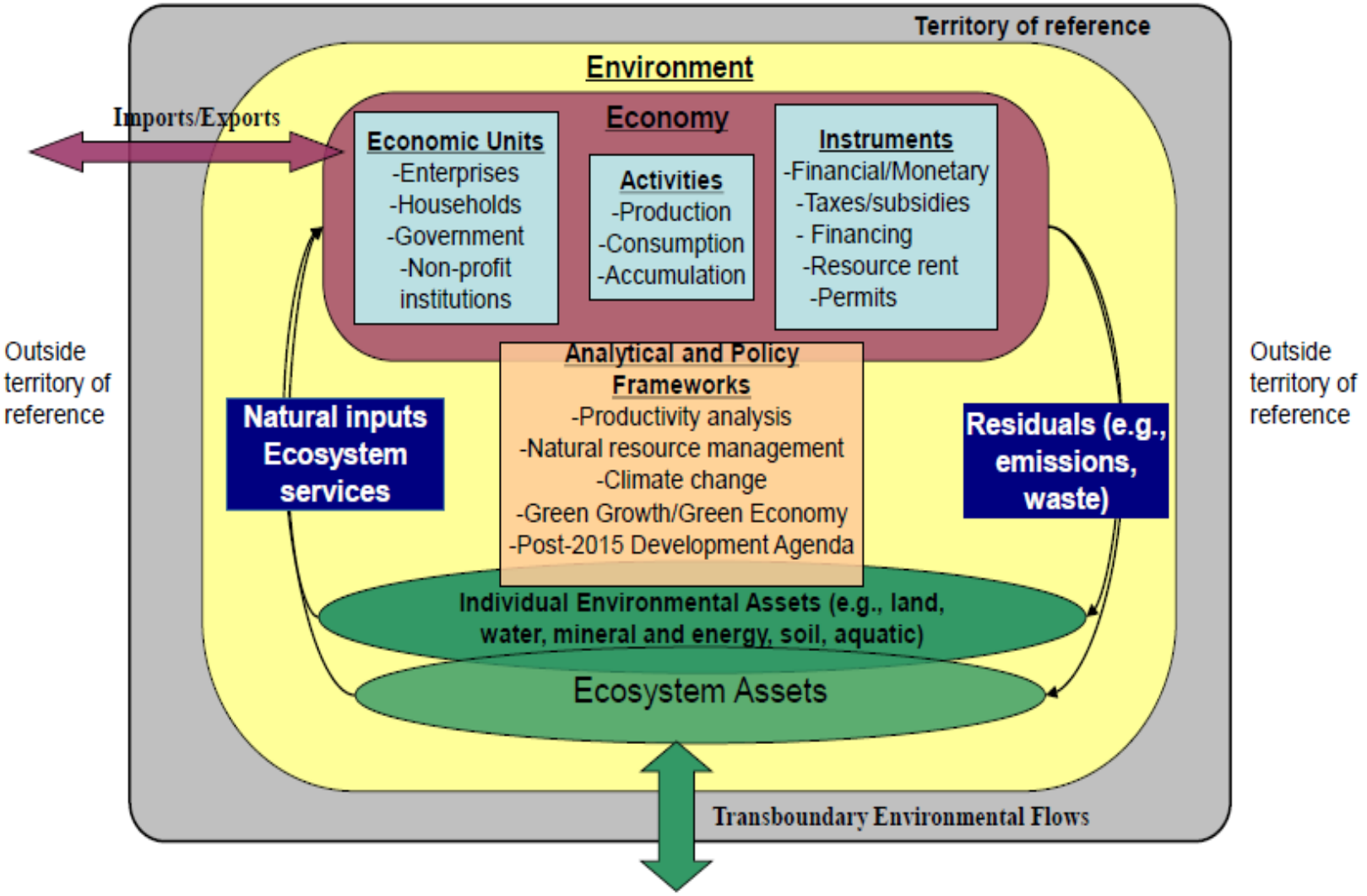
Several attempts have been made to introduce environmental accounting and to enlarge the sphere of the conventional economy to include and quantify impact on ecosystems.

The following slides give some examples:

Environmental accounting & payment for ecosystem services

- **SEEA:**
  System of Environmental-Economic Accounts
  (EC, FAO, IMF, OECD, UN, WB)
- **WAVES:**
  Wealth Accounting and the Valuation of Ecosystem Services (global partnership, led by World Bank)
- **TEEB:**
  The Economics of Ecosystems and Biodiversity
  (group led by UNEP)

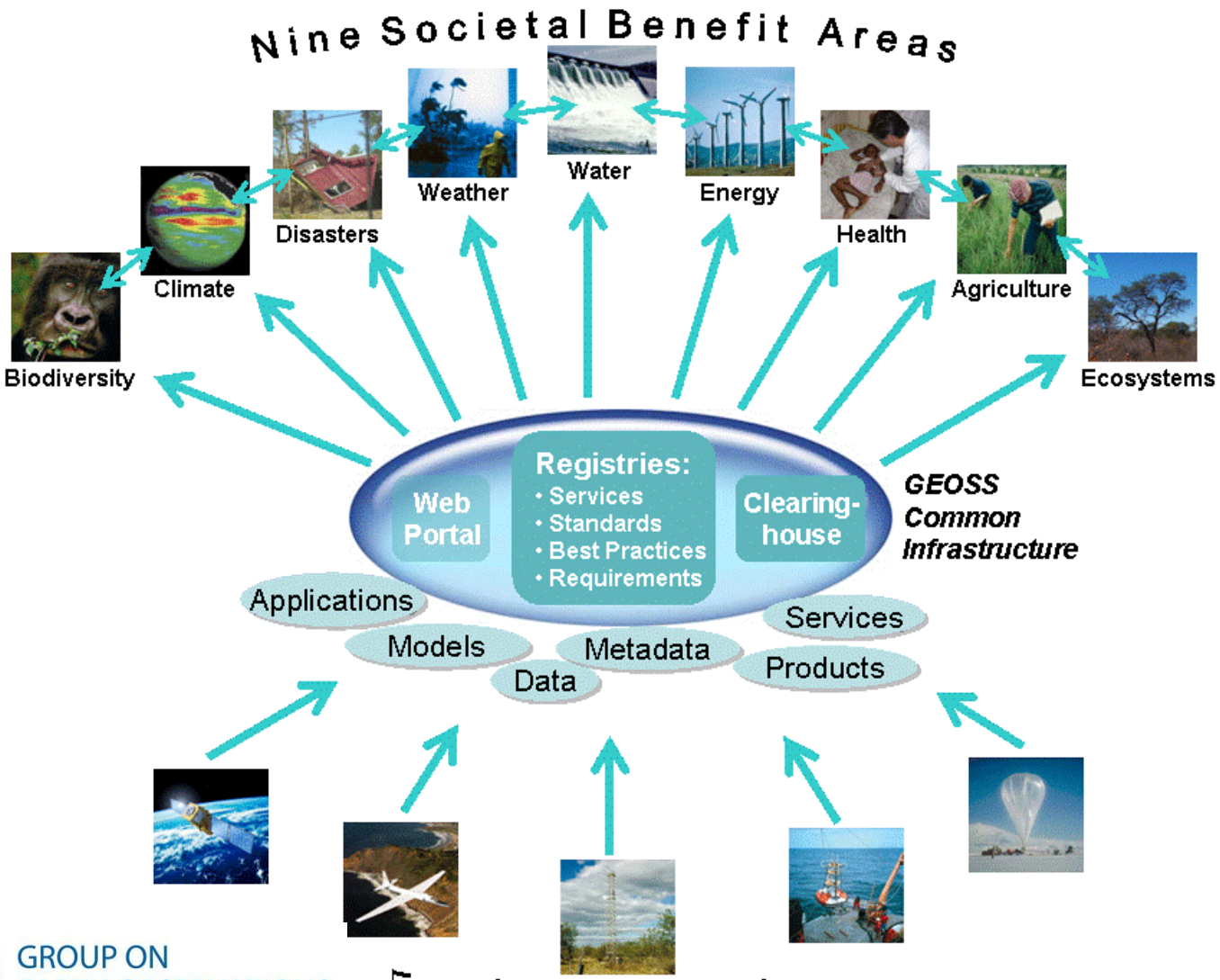
SEEA Conceptual Framework



Source: SEEA conceptual framework report (EC, FAO, IMF, OECD, UN, WB 2012)

For earth observation the work of the Group on Earth Observations (GEO) is essential to achieve the goal of a Global Earth Observations System of Systems (GEOSS), resulting in the shared GEO common infrastructure (GCI):

Group on Earth Observations



GROUP ON EARTH OBSERVATIONS

Marketing elements

- Customer value propositions
- Crossing the technology chasm
- Creating shared value
- Promotion tools

Customer value propositions capture the unique value of a product or services as perceived and appreciated by the customer.

Interestingly, they can differ completely from the features that the provider considers most important:

Customer Value Propositions

VALUE PROPOSITION	ALL BENEFITS	FAVOURABLE POINTS OF DIFFERENCE	RESONATING FOCUS
Consists of:	All benefits customers receive from a market offering	All favourable points of difference a market offering has relative to the next best alternative	The one or two points of difference whose improvement will deliver the greatest value to the customer
Answers the customer question:	"Why should our firm purchase your offering?"	"Why should our firm purchase your offering instead of your competitor's?"	"What is *most* worthwhile for our firm to keep in mind about your offering?"
Requires:	Knowledge of own market offering	Knowledge of own market offering and next best alternative	Knowledge of how own marketing offering delivers value to customers, compared with next best alternative
Has the potential pitfall:	Benefit assertion	Value presumption	Requires customer value research

Source: Customer value propositions in business markets (HBR 2006)

Buyer behaviour & motivation

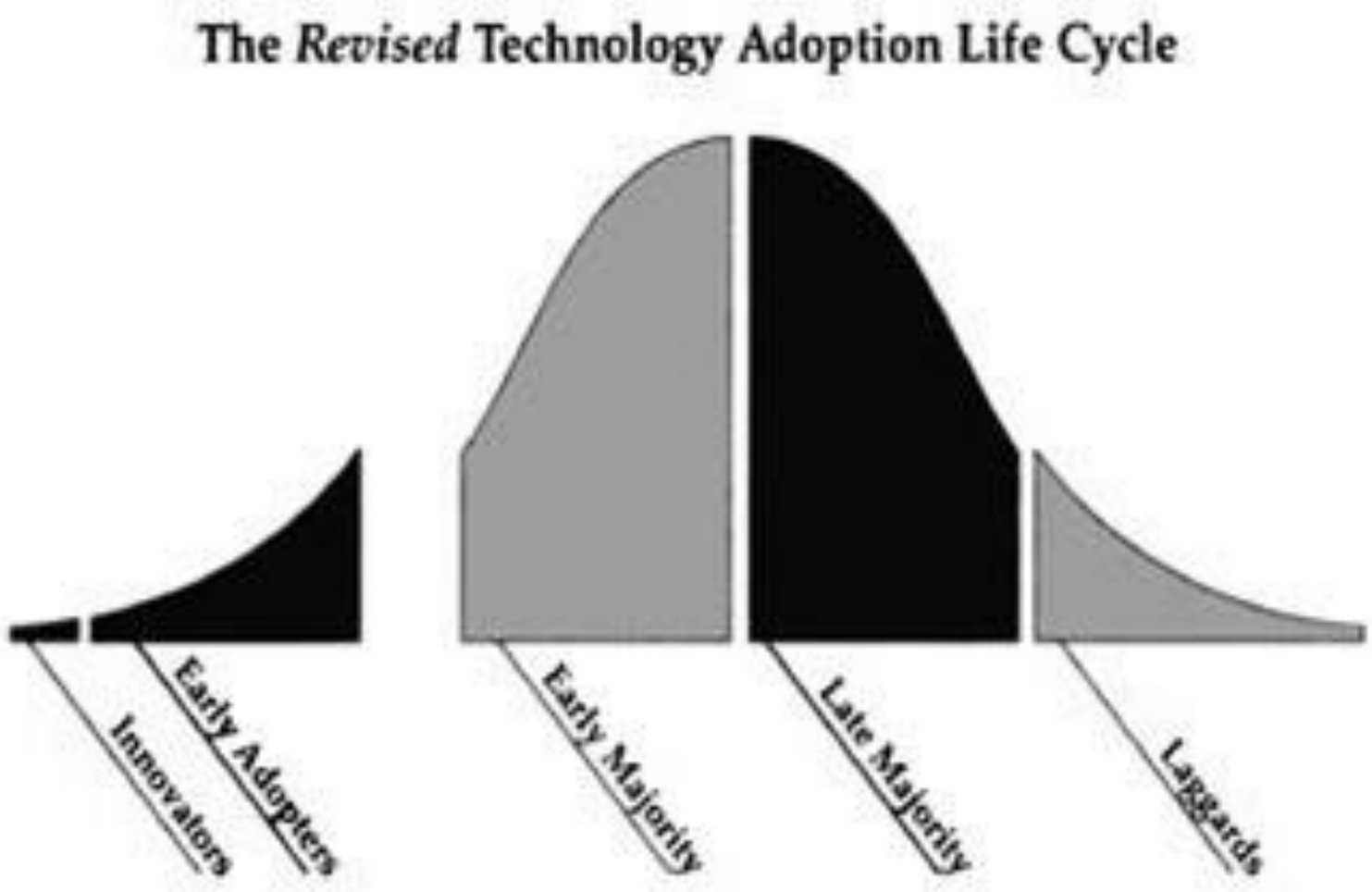
Type	Buyer behaviour	Motivation
Transactional sales	Intrinsic value buyers: “keep it cheap and easy to do business”	Understands the product Perceives it as substitutable Cost focus Resents time ‘wasted’ with sales people
Consultative sales	Extrinsic value buyers: “I don’t know the answer: help me analyse and solve the issue	Focus on how the product is used Interested in solutions and applications Values advice and help Needs the sales person

Source: Rethinking the sales force (Rackham, de Vincentis 1999)

Even when customer value propositions are well captured and formulated, introduction of solutions that involve new technology will have to overcome some hurdles.

This is called “crossing the technology chasm”:

Crossing the technology chasm



Source: Crossing the chasm (Moore 1991)

Crossing the technology chasm

- Most clients of EO products and services belong to the early and late majority,
- They are pragmatists and are not prepared or willing to take substantial risk: the solution should work and be reliable.
- Once convinced, the pragmatists will be long-term clients.

Source: Crossing the chasm (Moore 1991)

More information:

Creating & delivering your value proposition
– managing customer experience for profit
(Barnes, Blake, Pinder; 2009)

Customer value propositions in business markets
(Anderson, Narus, van Rossum [Harvard Business Review]**; 2006)**

Rethinking the sales force:
refining selling to create and capture customer value
(Rackham, de Vicentis; 1999)

Crossing the chasm
– marketing and selling high-tech products to mainstream customers
(Moore; 1991)

Creating shared value is a key element of successful implementation of earth observation solutions.

To achieve this, in most cases earth observation applications have to be integrated into more general (business or organizational) processes:

Create shared value

Involves cooperation between:

- **Public sector**
- **Private sector**
- **Social sector**

Opportunity for earth observation (integrated) solutions:

- Integrate EO in general business / organizational process
- Integrate different EO (and GIS and navigation) functionalities

Based on all considerations dealt with in the previous slides, there are some practical approaches that can be applied in combination to promote earth observation applications:

Tools for earth observation marketing:

- Success stories (in non-technical language, feasible, replication capacity, sustainable)
- Marketing toolkits (international trends, earth observation examples, references)
- Pilot projects, innovation funds, quick-wins (demonstration that EO actually works)
- Promotion outside EO community (fairs, seminars, lunch-bag meetings, magazines)
- Resource facilities for reference and capacity building (distributed, but connected, in different languages)

Source: Marketing earth observation products and services (Noort 2013)

Business elements

Business elements:

- **Proposal writing**
- **Business procedures**

Proposal writing is an art in itself.

During the GEONetCab and EOPOWER projects templates have been developed for writing successful proposals:

Proposal outline

1. Introduction / relevance
2. Objective(s)
3. Activities
4. Output
5. Management & evaluation
6. Risk assessment
7. Time schedule
8. Budget

   Annexes

(more detailed version in separate document,
see www.eopower.eu or www.hcpinternational.com)

Other guides that may be useful:

- Civicus: writing a funding proposal
- Michigan State University: guide for writing a funding proposal
- ESRI: writing a competitive GRANT application
- REC: project proposal writing

If you run a company, compete for assignments and manage projects, a structured approach towards responsibilities, tasks, implementation and documentation is needed.

The following business procedures may be helpful:

Business procedures

1. On acquisition
2. On offers
3. On negotiation
4. On contracts
5. On project management
6. On travel & deployment
7. On deficiencies & complaints
8. On internal organization
9. On finance

(more detailed version in separate document,
see www.eopower.eu or www.hcpinternational.com)

Again:

- **SHARED PROBLEM**
- **SHARED LANGUAGE**
- **SHARED SOLUTION**

4. Capacity Building

General

Marketing is promotion + capacity building.

Especially for the introduction of new technologies capacity building is important at all levels.

Capacity building is the instrument to increase self-sufficiency and make solutions work.

General references for capacity building, open data and success stories

GEO Portal: www.earthobservations.org

Capacity building resource facility www.eopower.eu
compilation of tutorials, references, open-source software, etc.

Satellites going local: *share good practice* **(Eurisy handbooks)**
www.eurisy.org

Earth observation for green growth (ESA, 2013)

General references for capacity building, open data (2)

Bringing GEOSS services into practice:
how to use data from the GEO portal and how to provide input
www.envirogrids.net

Science education through earth observation for high schools:
basic tutorials on all kind of subjects
www.seos-project.eu

Copernicus briefs:
information on satellite applications for different topics
www.copernicus.eu/pages-secondaires/publications/copernicus-briefs/

Capacity building resources for urban management:

Remote sensing of urban and suburban areas (EARSEL; 2010)
Book with collection of state-of-the-art chapters on urban remote sensing, aimed at capacity building (with references) and a strong focus on science and techniques

Remote sensing applications – Chapter 5: urban and regional planning **(NRSC; 2010)**

For slum mapping and land administration:
see earth observation applications references

Further details:

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