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Building Capacity in Geospatial Information Management: Lessons from Africa *****

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Building Capacity in Geospatial Information Management: Lessons from Africa

Presented on Behalf of
UNECA Committee on Development Information,
Science & Technology for Africa

Presentation Outline

- Review of GIM capacity building efforts in Africa
- Capacity for what?
- Capacity for whom?
- Elements of GIM Capacity Development
- Way forward: Agenda for Action

GI Capacity Development in Africa

- Regional training centres (UNECA)
- WMO (weather/climate) and IMO (marine) training programmes
- UNITAR/UNEP training programme
  - GIS capacity building in the area of the environment
- EIS Program (Multi-donor, including World Bank and bi-laterals)
  - Capacity for production and application of geospatial information for environmental management
- Environment and Natural Resources Information Network (UNEP)
  - Capacity for the effective use of environmental information
- AFRICOVER (FAO)
  - capacity to establish and maintain an Africa-wide digital geo-referenced database on land cover and a geographic referential base
- Environmental Information System on the Internet (UNITAR)
  - Capacity for integrated internet-based data and information management to support implementation of multilateral environmental instruments

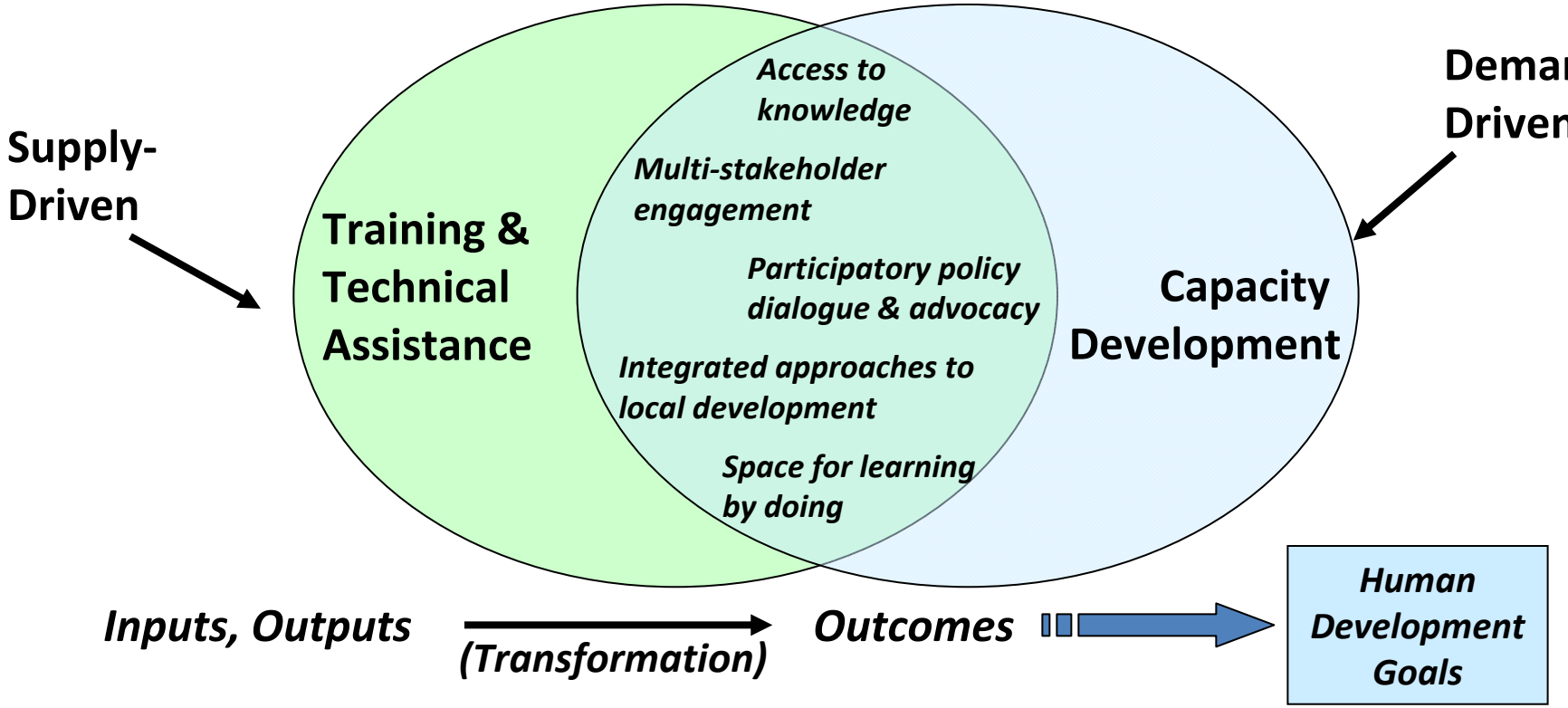
Capacity outcomes

- Development of a cadre of GI professionals across Africa from a wide variety of backgrounds and application areas
- Strengthening existing GI institutions, creation of new institutions for the purpose of training and providing GI services
- Policy frameworks to support the development, exchange, and application of geospatial data put in place in some countries
- Institutional arrangements to facilitate the production and exchange of harmonized geospatial datasets
- Regional networks established (African Association of Remote Sensing of the Environment (AARSE) and EIS-AFRICA
- Learning and knowledge exchange/sharing platforms established (bi-annual AfricaGIS AARSE conferences and exhibitions)

Some important lessons

- Capacity does not happen by chance; it should be planned for
- Know what you want to achieve in order to be able to negotiate (with donors) for successful capacity outcomes
- Several factors determine a country's ability to use geospatial information effectively, including:
  - Existence of 'core' geospatial datasets
  - Documentation about existing geospatial information
  - Adherence of geospatial information to standards
  - Existence of policies and practices promoting the exchange and reuse of information
  - Sufficient human, technical, and financial resources to collect, manipulate, and distribute geospatial information
  - Existence of supporting infrastructure
- Capacity development is more than training.

Shift in paradigm



- Assumes nothing exists
- Project-driven
- Creates duplication
- Disjointed efforts, creates distortions
- Usually unsustainable

- Recognises and builds on existing assets
- Addresses country needs, is country-driven
- Aligns with national development priorities
- Promotes SDI
- Endogenous and creates internal capacity for change from within

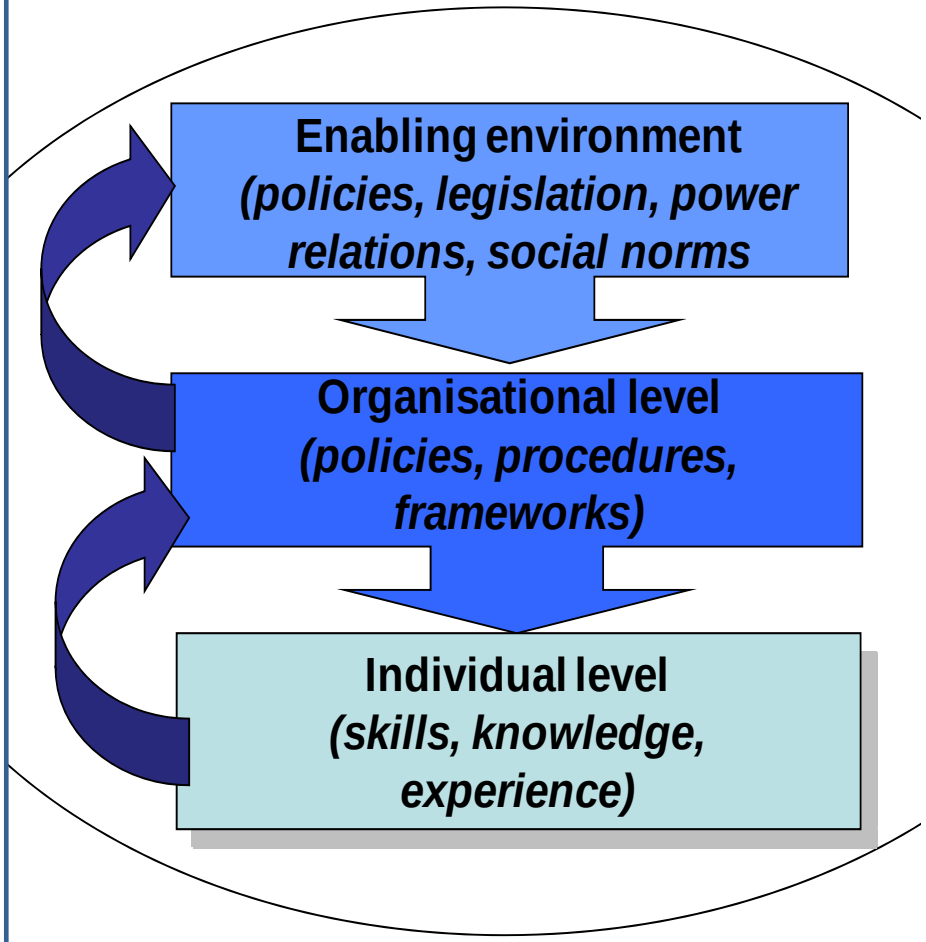
Levels of capacity

The enabling environment:	The broad social system and political economy within which people and organizations function — rules, laws, policies, power relations and norms that govern civic engagement, as well as infrastructure.
Organizational level:	Internal structure, policies, systems (including technology and infrastructure), processes, and procedures that determine an entity's effectiveness.
Individual level:	Skills, experience and knowledge that allow each person to perform acquired formally through education and training, or informally, through doing and observing.

The levels influence each other, and the strength of each depends on, and determines, the strength of the others.

What capacity?

- The area where most success was achieved from investment in GIM was at the **individual** level.
- Not the same level of investment was made at the two other levels:-
  - Some **institutions** were strengthened, new ones were established
  - Much less sustained efforts and success have been recorded at level of **enabling environment**
- Investments in individual capacities do not always **translate into institutionalisation of knowledge, policies, systems , and processes**.



Changing landscape, new capacities

- The internet and the way information is exchanged and used
- Dynamic infrastructure for managing and using information
- Collection and use of geospatial data is no longer the exclusive preserve of GI specialists
  - Location-specific data increasingly created by a growing range of technologies.
- Ability to handle location-specific data on the fly
- Map-enabled applications and location services now commonplace
  - New computing capabilities
    - Cheap, portable storage devices
    - Cloud computing
    - Mobile and powerful platforms designed explicitly for data consumption
    - Tactile systems

Key questions

- Effective capacity development response should always begin with fundamental questions:
  - Capacity for what?
  - To what end do we need to develop this capacity?
  - What will be its purpose?
- What do shifts in ICT mean for the geo-information management?
- What are the implications for capacity development?
- What kind of institutions and institutional capacities needed to make the most of these technologies in the area of geo-information?
- What business and management models are necessary to enable traditional mapping agencies to become innovative to build on existing and new geospatial data resources?

Core issues in capacity development

Knowledge underpins people's capacities and hence capacity development.

Policies, practices and systems that allow for effective functioning of an organization or group.

Leadership is the ability to influence, inspire and motivate others to achieve or even go beyond their goals.... Leadership is not necessarily synonymous with a position of authority; it can also be informed and be held at many levels.

Accountability is about the willingness and abilities of public institutions to put in place systems and mechanisms to engage citizen groups, capture and utilize their feedback as well as the capacities of the latter to make use of such platforms.

Capacity for whom?

CDSF Cornerstone	Suggested GI CD Target
Leadership Transformation	▪ Senior sector policy makers ▪ Legislature (Parliamentary Committees) ▪ Industry leaders
Citizen Transformation	▪ Professional associations, e.g., Institutes of Surveyors, Engineers, Architects, etc.; ▪ Trade Associations (Chambers of Commerce, Mines, etc.) ▪ Providers of location-based services

Capacity for whom?

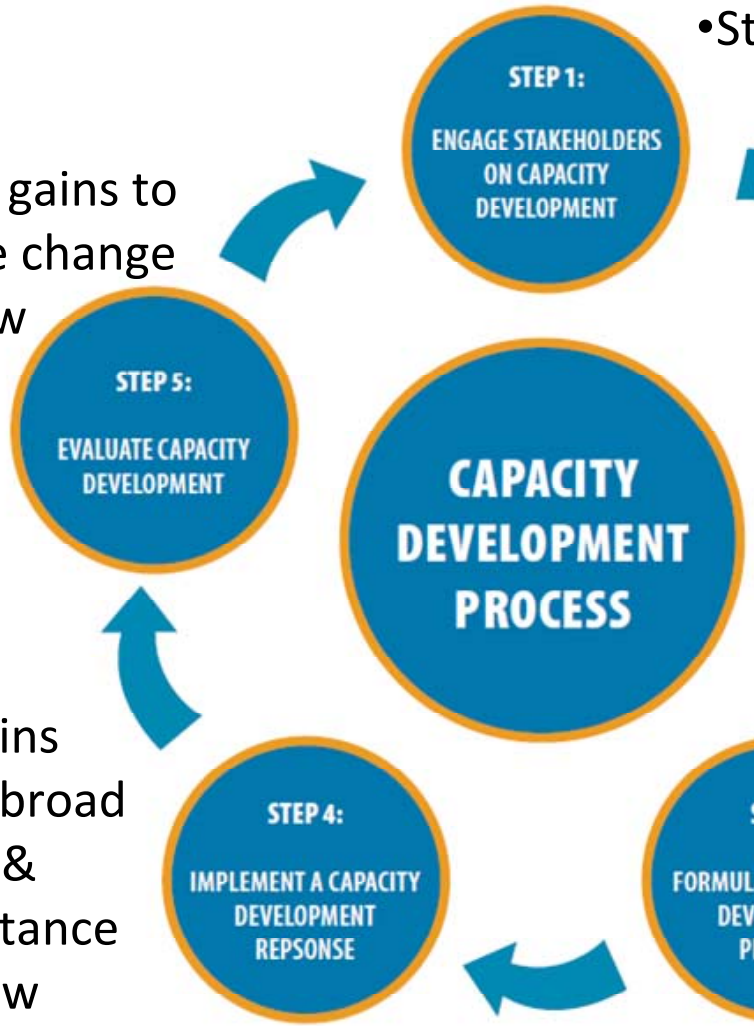
CDSF Cornerstone	Suggested GI CD Target
Evidence-Based knowledge and Innovation	▪ Academics ▪ Technicians and earth scientists ▪ Researchers ▪ Experts in thematic application areas ▪ Management and professional staff ▪ ICT sector professionals ▪ Technical support staff
Utilizing African potentials, skills and resources	
Capacity of Capacity Developers	
Integrated Planning and Implementation for Results	▪ Planners ▪ Policy-makers ▪ Mid-level development managers ▪ Technical support staff

Types of capacities

Need to distinguish between:-

- **Technical capacities:** subject-matter knowledge, such as geodesy, surveying, remote sensing, GIS, etc.
  - These are 'expertise' required to provide necessary information, techniques and approaches for problem analysis, and identifying and implementing solutions.
- **Functional capacities:** the essential catalytic and management skills that allow for planning, implementing and monitoring and evaluating GIM initiatives.
- **Functional capacities** are at the heart of **transformation** and drive the process; without these **technical capacities alone do not translate into tangible results**.

Capacity development process



- Stakeholder analysis
- Case for change
- Change readiness
- Change vision, budget and plan
- Creating infrastructure & capacity for change
- Short term wins
- Empowering broad based action & manage resistance
- Anchoring new approaches
- Communication
- Consolidating gains to produce more change
- Anchoring new approaches

Capacity assessments

- An analysis of desired capacities compared with existing capacities.
- Offers a systematic way to collect information regarding existing assets and gaps in capacity.
- Information and knowledge generated used to formulate capacity development responses that
  - Allow the strengthening of capacities in areas that are necessary; or
  - Optimisation of use of existing capacities
- It is not always necessary to start with a comprehensive assessment
  - Approach to capacity development assumes existence of some capacity
  - Assessments can be undertaken at any point in the development cycle
  - It is best to identify an “entry point” based on what exists already
  - Use entry point that to identify and understand issues related to capacities at the three levels: individual, organisational, and enabling environment

Agenda for action in Africa

- Africa is the least mapped continent
- GGIM provides opportunity to build upon decades of effort and to reinvigorate GIM activities in Africa to support needs-driven development priorities
- Need for a programme of action to provide a strategic and structured approach to the development of holistic capacity for GIM across Africa
- Adopt and scale up the Mapping Africa for Africa (MAFA) as the basis of engaging Africa's leadership

Mapping Africa for Africa

- Launched in 2003 by the UNECA in collaboration with the International Cartographic Association
- Objective to address the lack of accurate, reliable and up-to-date fundamental geo-spatial data sets
- Fundamental geospatial datasets for Africa defined
- Available fundamental datasets determined and inventoried, and gap analyses undertaken

Fundamental datasets for Africa

Level	Category	Datasets
0	Primary reference	Geodetic control points
		Height datum
		Geoid model
I	Base geography	Aerial photography
		Satellite imagery
		Digital elevation models
		Spot heights
		Bathymetry
		Coastline
		Natural water bodies

Fundamental datasets for Africa

Level	Category	Datasets
II	Administration and spatial organisation	Government units
		Populated places
		Enumeration areas
		Place names
		Feature names
		Land parcels/cadastre
		Land tenure
		Street addresses
		Postal or zip code zones
		Land use planning zones

Fundamental datasets for Africa

Level	Category	Datasets
II	Infrastructure	Roads
		Road centre lines
		Railways
		Airports and ports
		Bridges and tunnels
		Power
		Telecommunications
III	Environmental information	Land cover
		Soils
		Geology

Programme approach

- Engage political leadership at highest level
- Investigate the current capacity assets, undertake assessments of gaps and needs
- Develop multi-stakeholder, multi-donor, country-specific strategies to address gaps consistent with MAFA objective
- Fill data gaps at the national and sub-national levels
- Ensure data outputs are firmly anchored on regional priorities, and capacity outcomes align with CDSF cornerstones

Programme details

The action plan should provide for the following:

- Updating national geodetic reference systems;
- Completion of work on the African Geodetic Reference Frame;
- Building the fundamental datasets for each country in Africa at sub-national and national levels;
- Data exchange platforms;
- Institutional mechanisms for effective coordination with key stakeholders including private and academic sectors;
- Incorporation GIM issues within national ICT policy frameworks;
- Engaging ICT sector players and building partnerships;
- Programme should be supported by aggressive advocacy and a clear communication strategy should be developed alongside it.

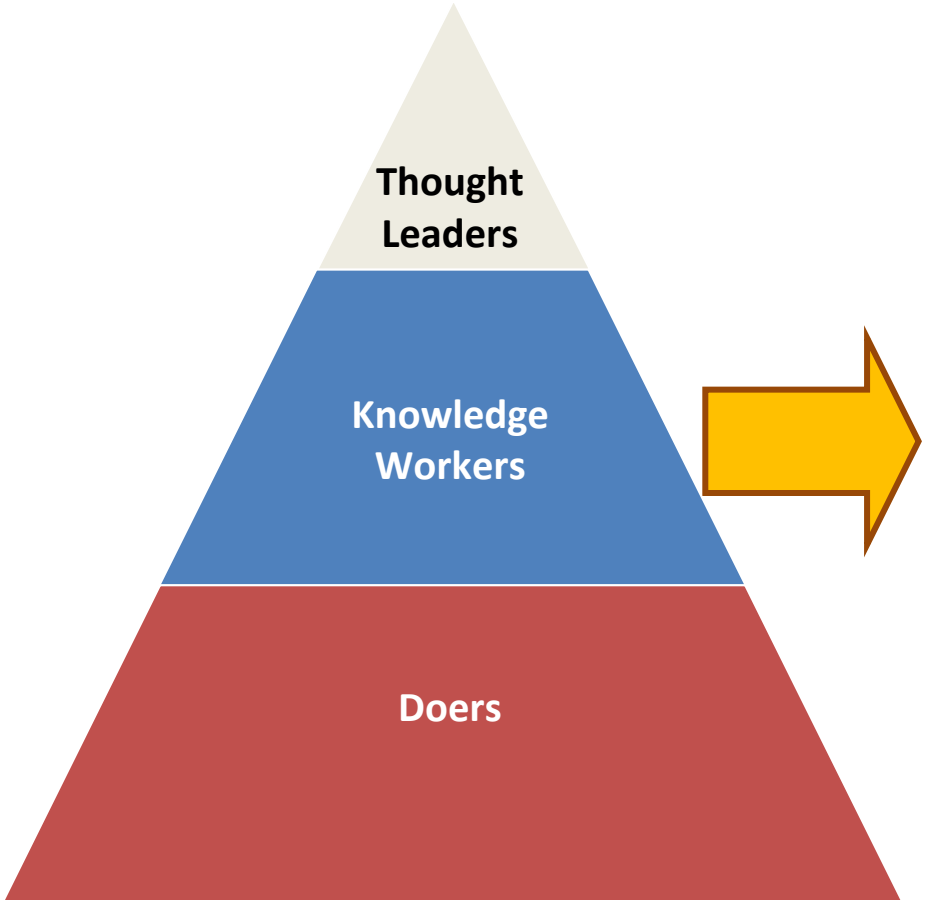
Programme details

- Creating conditions to sustain geospatial information management activities, including:-
  - Developing skills for building required datasets, management and interpretation of data;
  - Establishment of partnerships, long-term training, and application development services;
  - Establishment of GI applied research programmes;
  - User-group awareness and capacity to make appropriate use of analytical tools and data sets;
  - Establishment and/or strengthening of key institutions to function as GIM service centres to provide support and expert advisory services;
  - Technology support by local IT firms, including hardware and software maintenance systems
  - Mechanisms and support for learning and knowledge exchange such as the AfricaGIS and AARSE conferences and exhibitions

Change and Change Readiness

- Transformative capacity development maintains a focus on institutions and development results, fosters national ownership, and ensures alignment with national development priorities, strategies, processes and systems.
- The whole society needs to be capacitated in order to bring this about.
  - People at all levels of society should be exposed to the process
- Capacity development itself entails change — a change from one state to another that is more desirable, and should therefore be managed as such.
- It is necessary develop and/or strengthen capacities to embrace change, innovation, and adaptation

Change and Change Readiness



Typical Capacity Building areas
Setting the scene for the change
Adapting to change
Driving culture transformation
Communicating to facilitate change
Receiving and giving feedback
Overcoming resistance
Commitment and action techniques (group level)
Commitment and action techniques (individual level)
Follow up and reinforcement activities