



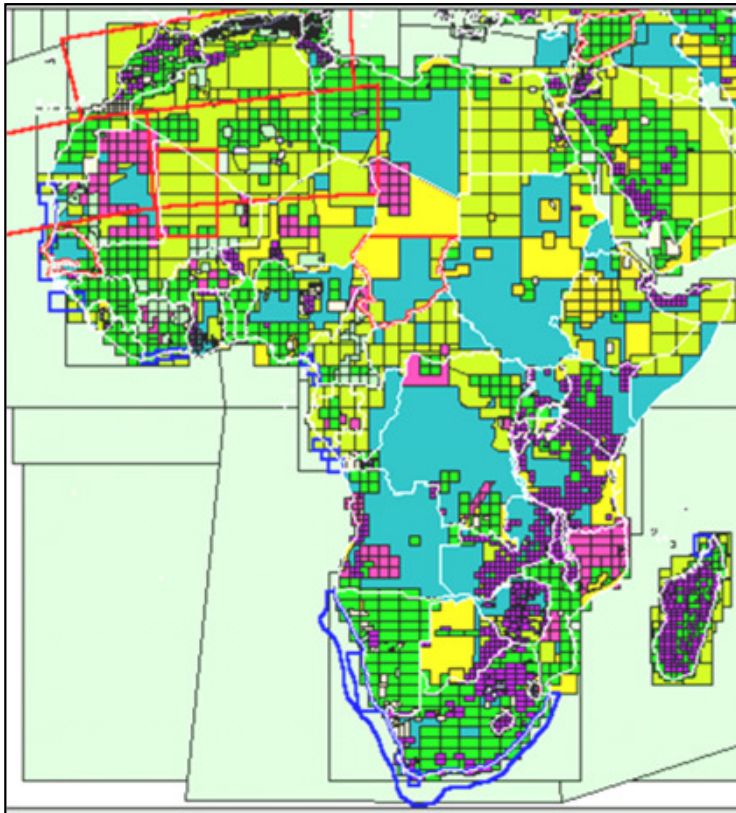
The Spatial Data Infrastructure for Mineral Resources in Africa

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Global Geospatial Conference (GSDI) / AfricaGIS Conference 2013
4th – 8th November 2013
UNECA Conference Center
Addis Ababa, Ethiopia



Africa's main known mineral deposits (2008 status, all commodities – BRGM SIGAfrique database)

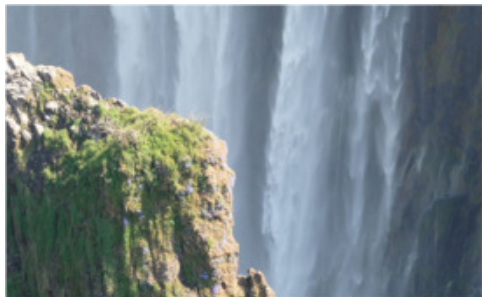
- **Africa has an important share** of the global mineral resources and reserves: **40% of the world known reserves in bauxite, manganese, gold and diamond; 36% cobalt, 45% vanadium, 77% platinum, and 79% rhodium.**
 - necessary for national and international economies
 - significant part of the Gross Domestic Product in most of the African countries
 - Missions of Geological Survey Organisations:
 - **Collect data** (national inventories)
 - **Store & Manage** (national custodians)
 - **Valorise** (generate added value)
 - **Ensure availability** (in paper & digital form)
 - **Promote sustainable use of non-renewable resources** (attractivity development)
- **Availability of reliable** information represents an important part of the **infrastructure a country has the duty to supply.**

EU – ACP initiative in the EC 7th Research and Technological Development Framework Prog.

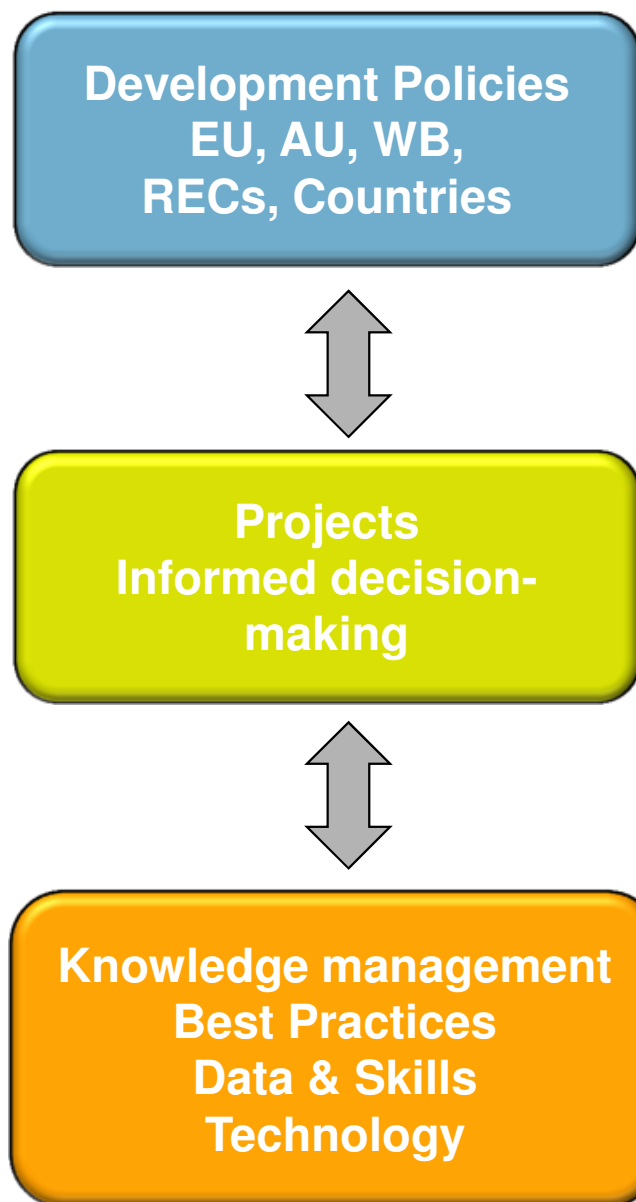


- **Consortium** of 23 partners + 6 subcontractors
 - **12 European** geological surveys, university and research centre
 - **11 African** counterparts: geological surveys, ministries of mines, school of mines, universities
 - **5 International** organisations: European Commission-Joint Research Centre, EUMETSAT, CIFEG, UEMOA, SEAMIC
- **Work package co-leadership** EU + Africa
- **9 Advisors:** GSAf, UNECA, African Union, OAGS, ACP Secretariat, EuroGeoSurveys, UNESCO/IHP, GEO Secretariat, ICSU/ROA
- **Two Phases:**
 - (1) **Design** - 2008-2012 / European Commission/FP7
 - (2) **Implementation** - 2014-2016 / European Commission/10th EDF?

African-European Georesources Observation System



- Strengthen the sustainable use of underground resources in Africa by **setting up the SDI for Georesources** based on interoperable geoscience data and user-oriented products & services
- **Safeguard, share and valorise** the knowledge and data archived in African and European geological surveys
- **Support geoscientific communities and institutional decision-makers** for sustainable development public policies
- **Implement** common strategies for **capacity building** and **training** programmes
- **Provide geological knowledge & skills** to the geoscientific communities, institutional decision-makers, public and private enterprises and investors, education and research



- **Joint Africa-EU Strategy Action Plan** (EC and AUC, 2010): **Africa-EU Partnership on Raw Materials** incl. Mineral Resource Wealth, through “Good Governance”, “Investment” and “Geological Knowledge and Skills”
- **“Raw Material Initiative”** (European Commission, 2008 & 2011)
- **Horizon 2020** (European Commission 2014-2020) including the European Innovation Partnership on Raw Materials
- **“Africa Mining Vision 2050”** (African Union and UN Economic Commission for Africa, 2009)
- **“Action Plan for Implementing the African Mining Vision”** (African Union Commission, 2011)
- **Framework of Action for the Development of Mineral Resources Sector** (ACP Group of States, 2011): an implementation Road Map is being defined (*in preparation*)

Links & contributions of geoscience and AEGOS SDI to other programmes



- **GEO – GEOSS** (Group on Earth Observations – Global Earth Observation System of Systems): AEGOS integrated in GEO work plan 2009-2011 and 2012-2015
- **INSPIRE** (Infrastructure for Spatial Information in Europe): specifications for implementing the interoperability of metadata, data and services through open systems
- **OneGeology-Global & OneGeology-Europe**: “Making geological map data for the Earth accessible”. Practical implementation of relevant state-of-the-art standards and methodologies through web map portal, web services
- **GIRAF** (Geoscience information in Africa): Network of geoscientists supporting with their know-how the dissemination of geoscience information in Africa through workshops
- **Africa Union and ACP Group of States**: Action Plans for the sustainable development of the mineral resources sector
- **Geo-Information policies and SDIs in Africa** initiated and supported by AUC and UNECA: African Regional Spatial Data Infrastructure (**ARSDI**) and national SDI plans; UNCTAD Natural Resources Information Exchange (**NRIE**)

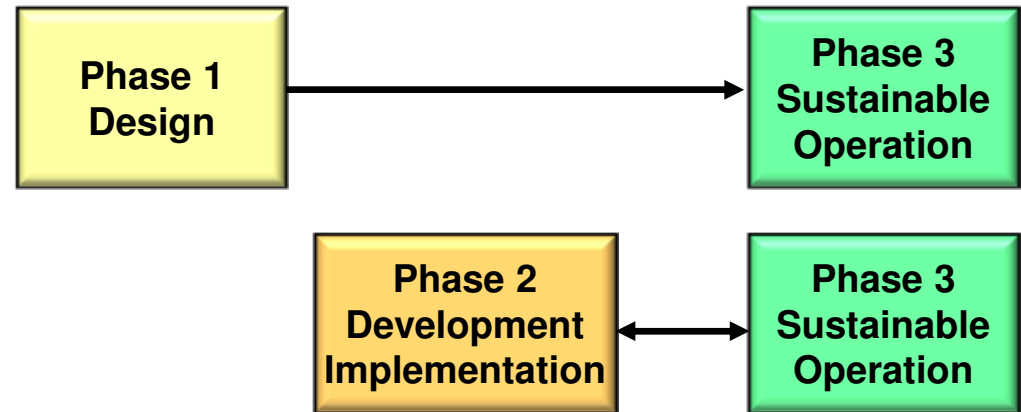


Towards AEGOS Phase 2 and ... 3



AEGOS – Phase 1, 2008-2012

- **Design, Networking and Strategic Positioning**



AEGOS – Phase 2, 2014-2016

- **Develop and implement:**
 - AEGOS spatial data infrastructure
 - Knowledge transfer & best practices
 - User-oriented products and services
- **Facilitate** the data discovery & access
- **Extend the network** at national and regional levels (e.g. Regional Economic Communities)
- **Set up / contribute** to spin-off projects as part of the development programmes in line with EU-AU partnership, WB programmes, etc.

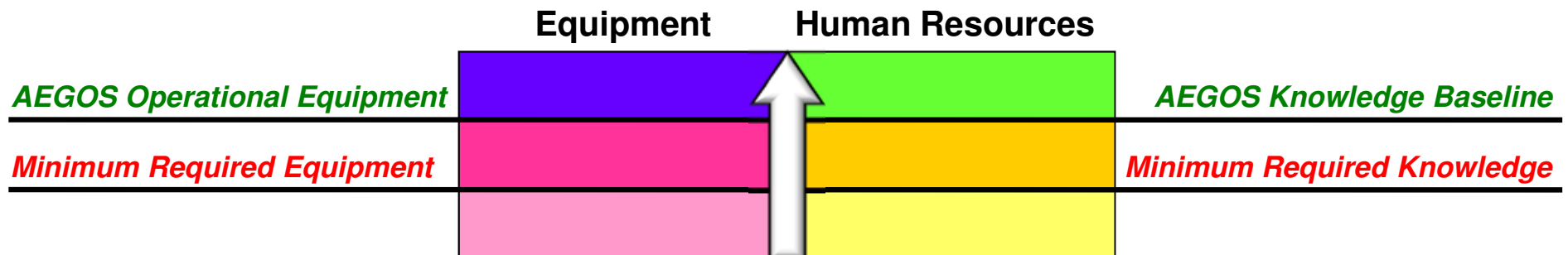
AEGOS – Phase 3

- **Operational**
- **Autonomous**
- **Permanent**
- **African driven**
- **Under pan-African umbrella**

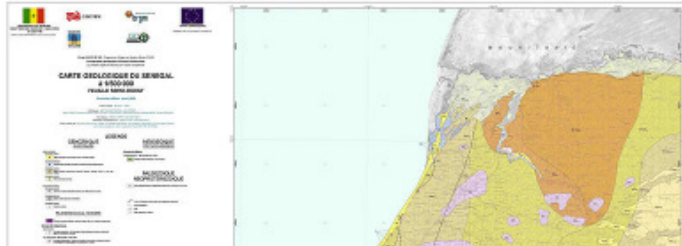
AEGOS Phase 1 achievements



- **Assessment of existing situation** and **requirements identification** about technical infrastructure, information systems, human resources and skills
- **Definition of data specifications** for the AEGOS SDI, a common Reference Model and metadata profiles
- Technical design: **system architecture** and **data flows**
- Proposals for **capacity building strategies, training reference institutions**
- **Pilot studies** on governance maps (Senegal and Ghana)
- **Innovative user-oriented products** and **services**
- **Outlines of spin-off projects proposals** based on AEGOS
- **Charter of Partnership** including data sharing recommendations (Intellectual Property Right Management)
- **Plan for Sustainable Operation** of AEGOS as an organisation
- **Stakeholders workshops – Public Conferences – Strategic positioning**



Build on the results of “sustainable management of mineral/groundwater resources” programmes



Cartes de Documentation et du Cadastre Minier

Accueil | Lois et règlements | Projets | Le CDCM | Informations utiles | Catalogue de données | Actualités | Archives ouvertes

La Direction des Mines et de la Géologie

La Direction des Mines et de la Géologie (DMG) a pour mission de contribuer à l'élaboration et à la mise en œuvre de la politique et des stratégies minières.

A cet effet, elle est chargée :

- d'élaborer la réglementation en matière de recherche et d'exploitation minière ;
- d'assurer le contrôle et le suivi de l'exécution des activités minières ;
- d'assurer la liaison et la collaboration avec les organismes sous régionaux intervenant dans le domaine des mines ;
- d'élaborer des plans et programmes de développement géologique et minier ;
- de mettre à jour les cartes géologiques et métallogéniques, la documentation géologique et minière de base et d'établir les fiches d'indices des gîtes minéraux ;
- de mettre en œuvre la gestion d'un système d'informations géologiques et minières et d'un cadastre minier ;
- d'assurer le suivi sur les sociétés et autres administrations autonomes intervenant dans les secteurs de la recherche et de l'exploitation minière.

Dans le cadre du 9ème FFD, l'Union Européenne a programmé un financement SYSMN d'un montant de 13

Welcome to the Mining Portal of Ghana

Thematic layers

- ShowActiveName
- Mines
- Mineral Deposits - Occurrences

Topography

- ShowActiveName
- Regions
- Districts
- Roads
- Hydrology

Geoscientific Maps

- ShowActiveName
- Geology

Topographical raster data

- ShowActiveName
- Elevation model

Development and Cooperation Programmes: Senegal, Ghana, Niger, Guinea, Mali, Burkina Faso, Ethiopia, Tanzania, Uganda, Mozambique, Angola, Gabon, Madagascar, South Africa, RD Congo, Namibia, Morocco, Ivory Coast, Central African Rep., Algeria, Botswana, Kenya, ...

Web Portal for georesources in Africa



AEGOS test bed

Documentation | Map services | Catalog service | Map of Africa

Map services - presentation layer

Data sample is based on real set of the existing hydrogeological maps in the Ethiopia .

(C) Aquatest Praha.

Overview of the services - proposed service layer

In the test bed we use the sample of the real existing hydro-geological data. We have converted them from the vector-based source (ESRI personal geodatabase project) - store inside the spatial database and published them using the Geoserver 2.0. As the data is published, the various (WMS, WFS responses can be obtained using the map server software). When is set the Geoserver's Application schema plugin, it will be possible to provide complex GML responses with GML-based ML (Geoschem, GroundWaterML, EEarthML, e.t.c.)

Dynamic legend for the area [42.2]

B2 Qal2 - Quaternary alluvium	Ex
2 alluvium	pr
B3 Mst - Lower limestone limestone	Ex
pr	pr
B4 Mst - Lower Sandstone sandstone	Ex
or	or
B5 Pgd1 - Foliated granodite intrusive rocks	Ex
or	or

GeoNetwork
Geographic data sharing for everyone

WHAT? Either of the world
Title:
Abstract:
Keywords:
Map Topic:
Search criteria:
WHERE?

Layer: HYDROGEOLOGICAL MAP BY 15/01/12

Abstract: The [501015] metadata standard is the preferred metadata standard for use. (For more what templates to start with, see this link.)

Keywords: Hydrogeology, Ethiopia

Metadata:

Identifications info:
Title: Hydrogeological map in 2004/12/04
Date: 2011-02-02T12:00:00
Publication: Code identifies when the map is published. Map represented in raster or the ISO19115 metadata standard if the get-start-with, see this link.
Status: In going. Data is continuously being update.

Point of contact:
Name: Organization Party who created the resource

Maintenance and update:
Frequency: As needed. Data is updated as directed by Ethiopia (Beneh).
Description: Metadata.
Access constraints: Copyright: Creative right to the publisher or author work, or to the use of a content as military, proprietary, embel, distribution.

Scale of representation form: Vector. Vector data is used to represent g.
Equivalent scale:
Scale denominator: 200000

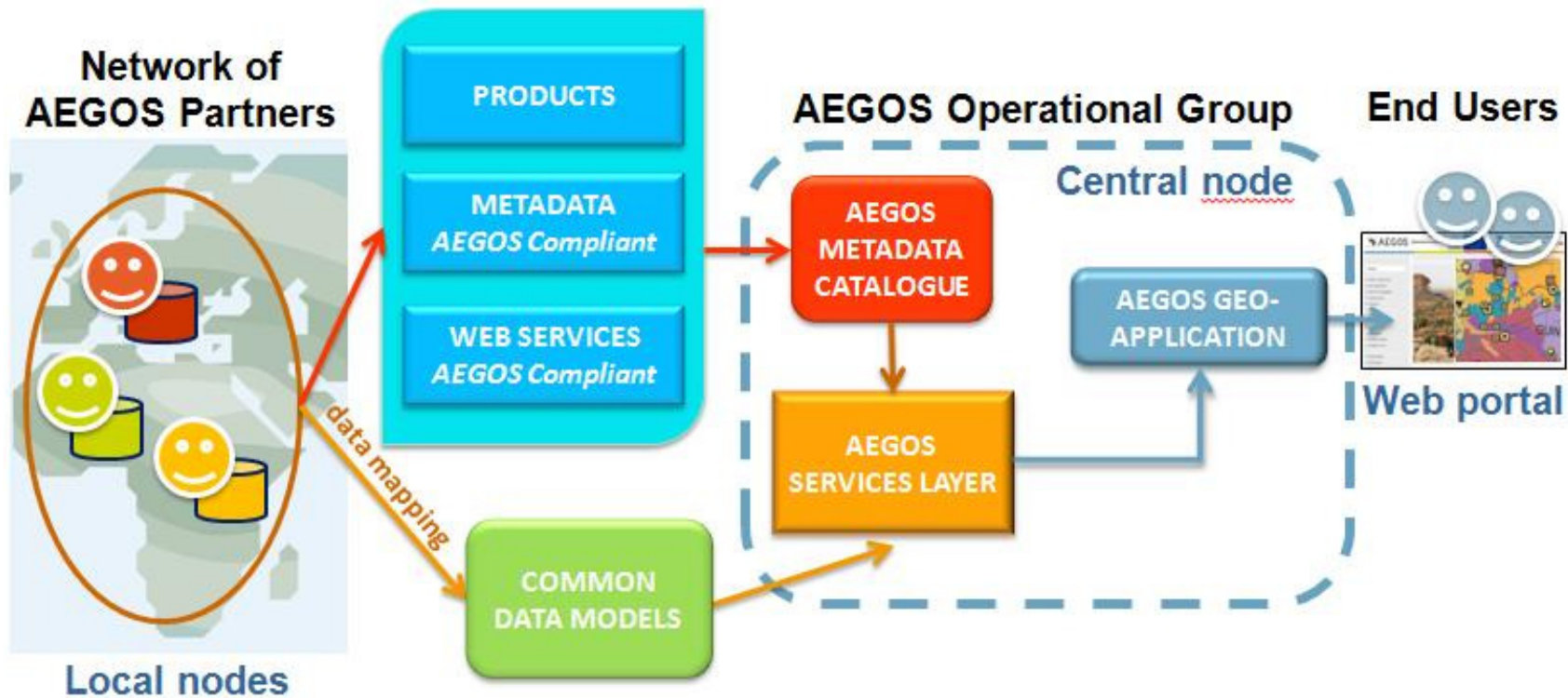
Language: English
WWW: www.aegos.com

africa_agos - Gaia 3.4.2 - www.TheCarbonProject.com



Map Layer:
aegos_map_sheets
aegos_gou_rndwater_fm
aegos_bod_or
aegos_snap_sheets
aegos_hyd_0
Africa SIKKique
Ocean features
spa data
hydo
viller
Africa SIKKique

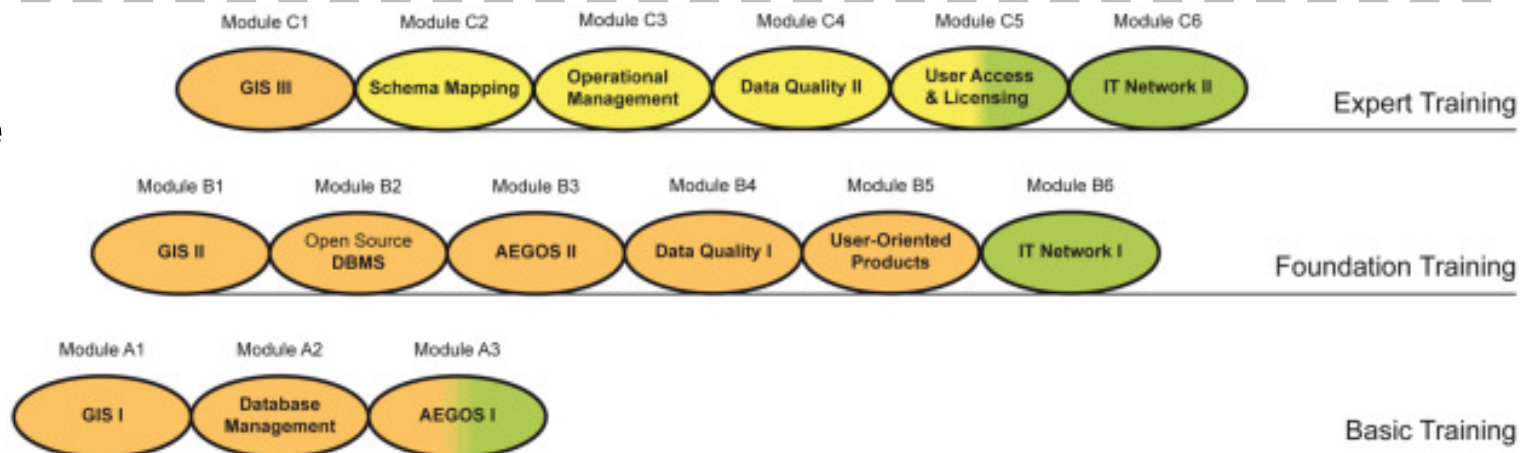
Geospatial Session File loaded successfully
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AEGOS distributed infrastructure



Capacity Building through multi-stage training modules

-  Geoscientists / GIS Technicians
-  IT Personnel
-  Geoscientists



Key issue in the SDI: Data sharing



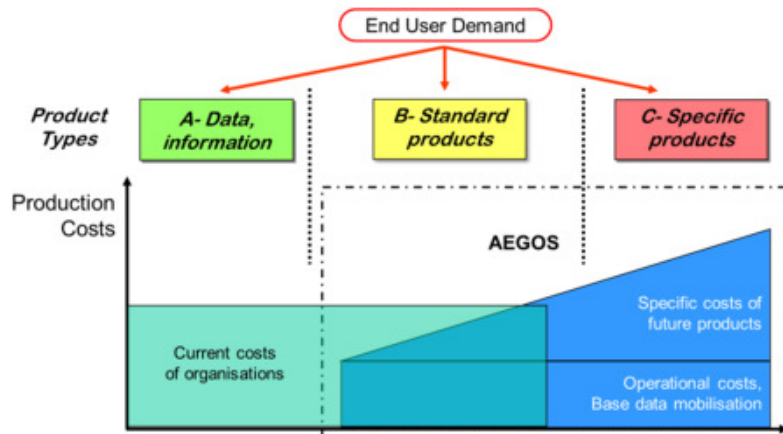
Charter of Partnership: “Protection of intellectual property and access to geospatial digital data, while being respectful of the data owners’ interests.”

- **AEGOS recommends the GEOSS Data Sharing Principles:**
 - Full and open exchange of data, metadata and products shared within GEOSS, recognising relevant international instruments and national policies and legislation;
 - All shared data, metadata and products made available with minimum time delay and at minimum cost;
 - All shared data, metadata and products being free of charge or no more than cost of reproduction will be encouraged for research and education.
- Implementation and achievement by the AEGOS community collectively and by the AEGOS partners individually
- Distinguish between the data sets been fully and openly exchangeable vs. those with access and/or distribution restrictions
- Requires a categorisation process (metadata) and attached license for identification/selection by the end users
- GEOSS Data-CORE (Data Collection of Open Resources for Everyone): distributed pool of documented datasets with full, open and unrestricted access at no more than the cost of reproduction and distribution.
- Facilitated implementation for AEGOS partners being also GEO Members

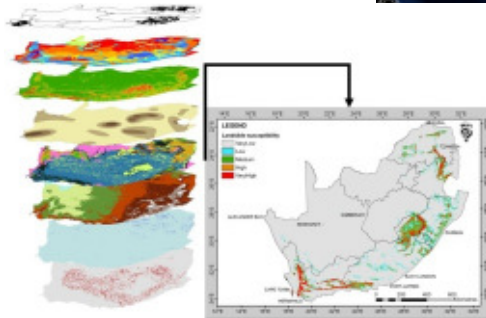
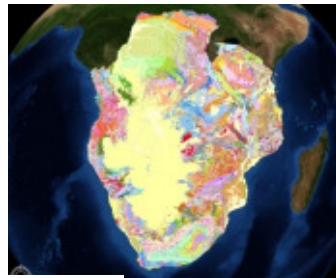
Proposed organisation



Prepare for financial independence



Product A:
e.g. geological
map



Products B & C:
e.g. predictability map

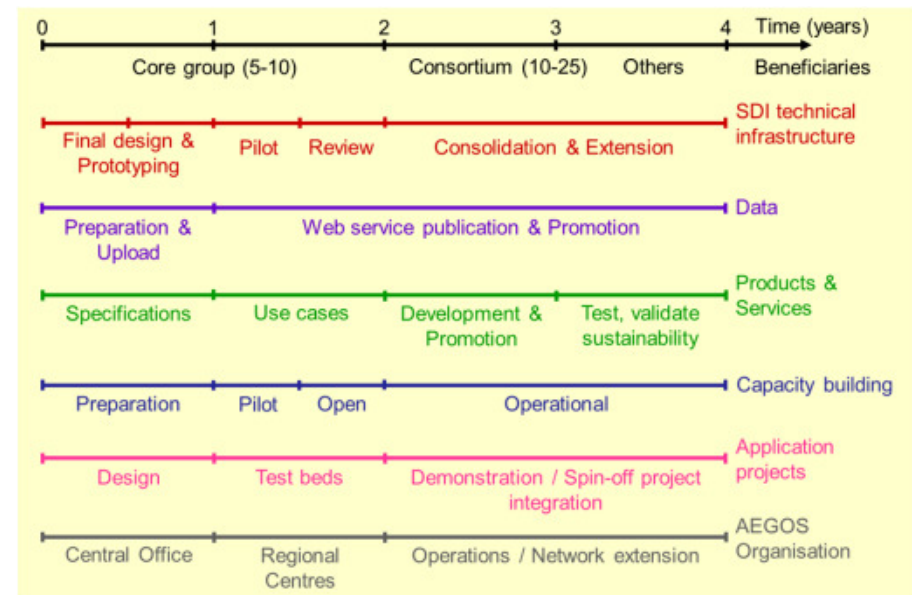
Sustainability => several funding components:

- Support by the national governments through **adequate budget allocation induced by commercial growth** based itself on the availability of high quality data and information on georesources
- Income from **sales of added-value products and advanced services**
- Income from **long term contracts for regular users** to access value-added products and services
- Support from **cooperation/development funds**: donations and/or participation via **spin-off projects using AEGOS SDI** and organisation

The wealth generated by mineral resources can financially benefit to prioritise the digital information management and contribute to a continental SDI

Phase 2: How to get there?

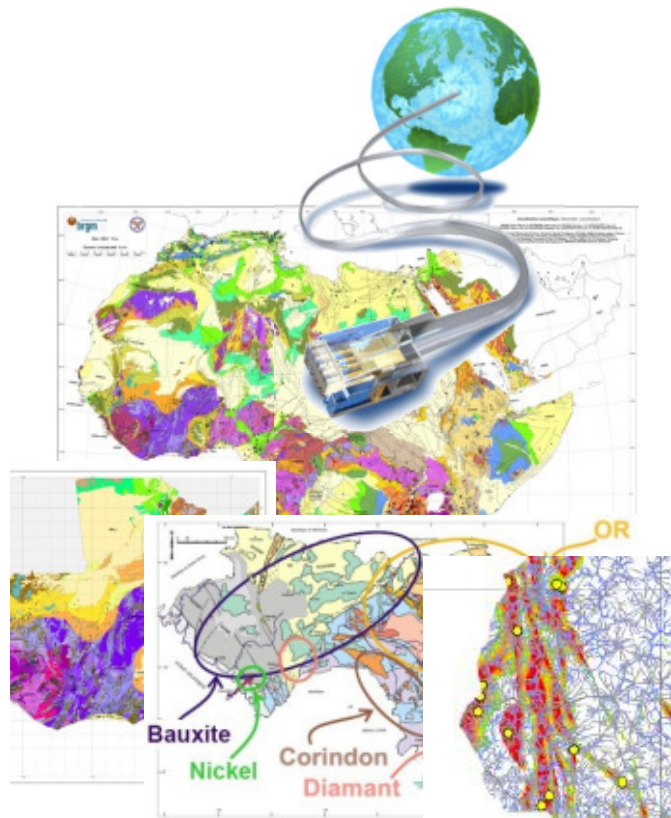
- Initiated with minimum required topics
 - **Focus** first on quick and visible benefits of AEGOS to a maximum of user communities:
 - IT infrastructure
 - Data and Products
 - Applications / Use Cases
 - Training
 - **Select** test organisations/ countries for first implementation
 - **Extend** the experiences and successes to the remaining partners after lessons learned and feedback
- **Contributors:** Partners / Subcontractors / Data and Services Providers / Trainers / End-Users
- **African Leadership from Phase 2 onwards**



Conclusion: AEGOS will be...



- a **pan-African spatial data infrastructure** of public geology-related metadata, data and user-oriented products & services;
- a **web-based multilingual portal** for controlled access to a **network of interoperable databases** distributed over Europe and Africa;
- a **one-stop information system to share knowledge on georesources in Africa**: maps, reports, data, added-value products and services, downloads, access conditions, contacts;
- a **charter of partnership** re. data sharing principles and data right management;
- a **network of geoscientific institutions and skilled geoscientists** to support informed decision-making, investments and education.



An operational AEGOS, permanent, autonomous, African-driven and with a pan-African umbrella organisation

Thank you for your attention



www.aegos-project.org