GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting, 17-18 Oct 2016, Morocco

GEO-CRADLE:

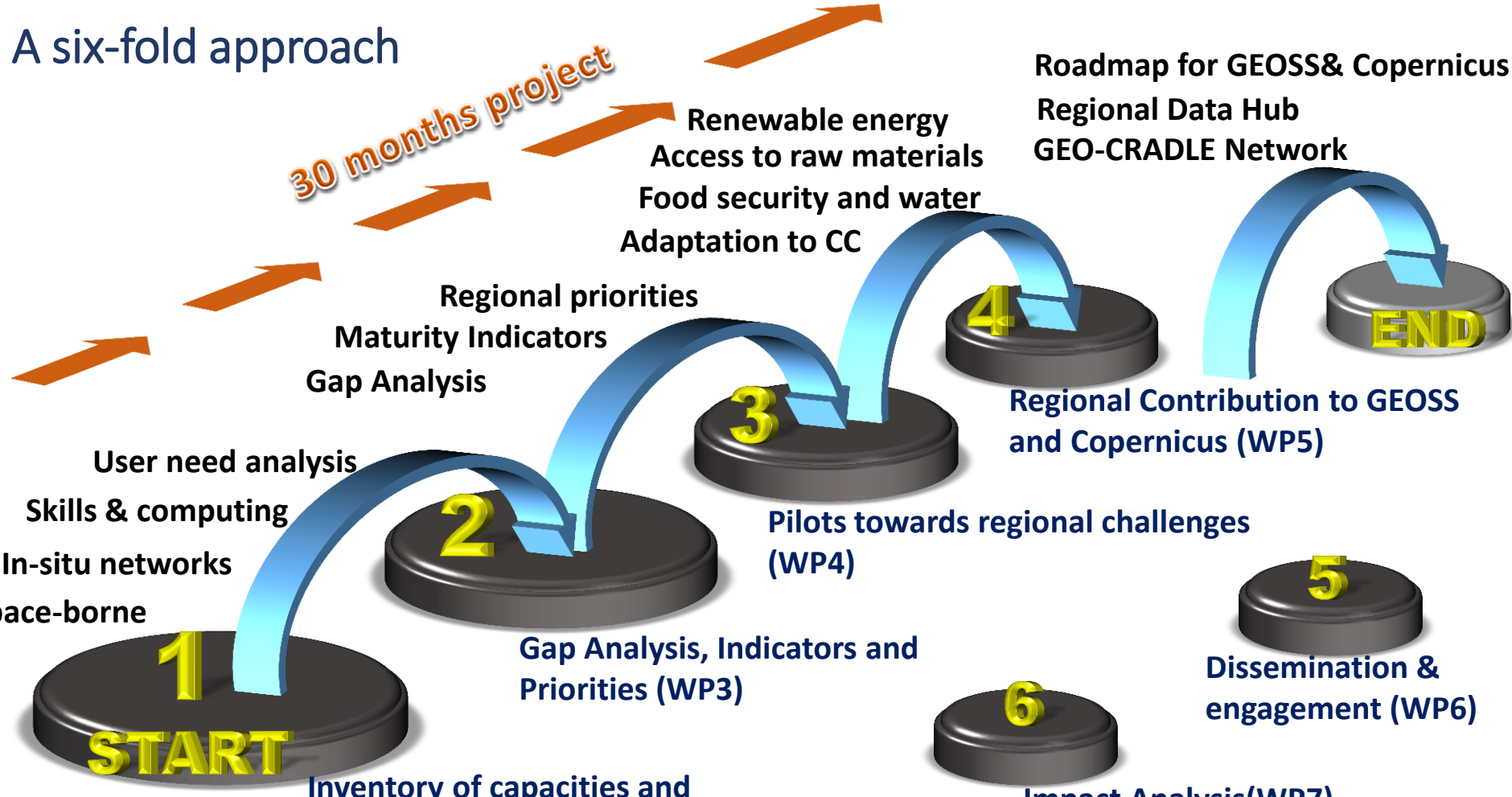
Methodological aspects for assessing the regional gaps and maturity in relation to GEO, GEOSS, and Copernicus

Funded under H2020 - Climate action, environment, resource efficiency and raw materials
ACTIVITY: Developing Comprehensive and Sustained Global Environmental Observation and Information Systems
CALL IDENTIFIER: H2020 SC5-18b-2015 Integrating North African, Middle East and Balkan Earth Observation capacities in GEOSS
Project GA number: 690133
Total Budget: 2,910,800.00 €

Haris KONTOES, Research Director, National Observatory of Athens,

Project Coordinator

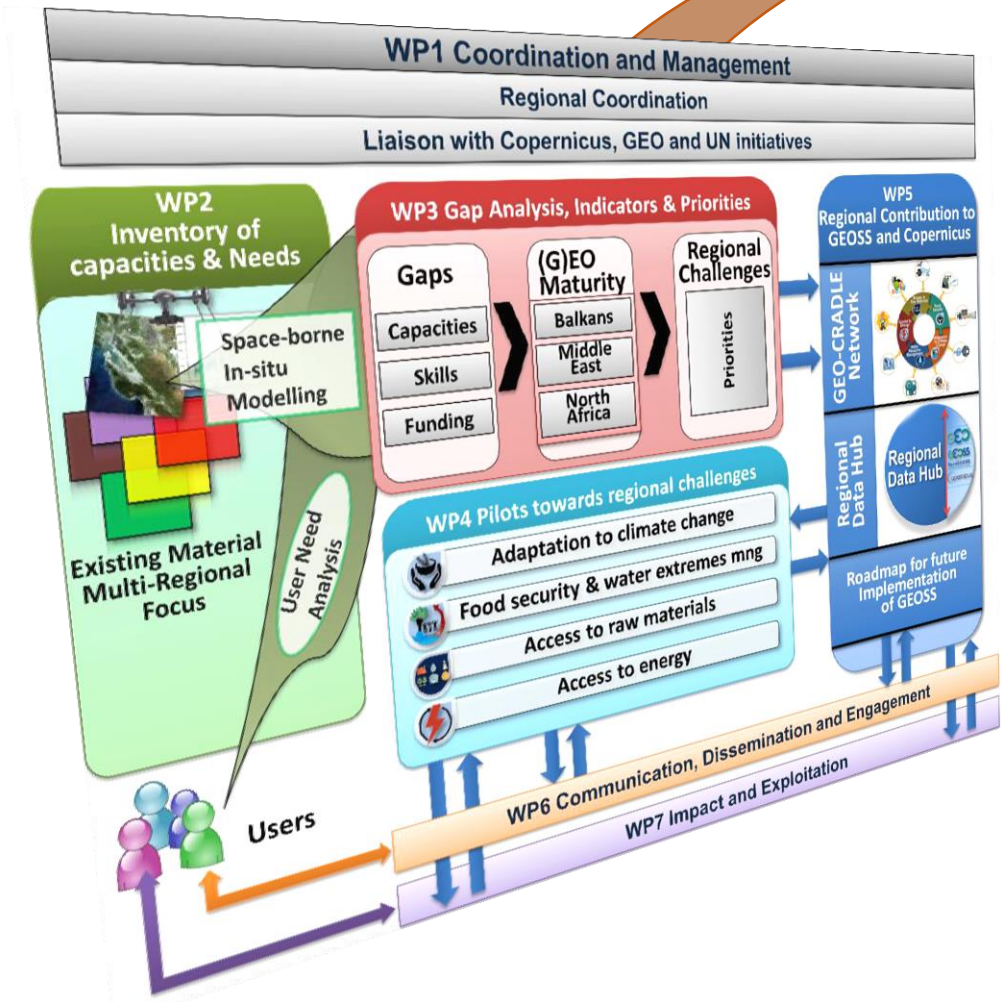
A six-fold approach

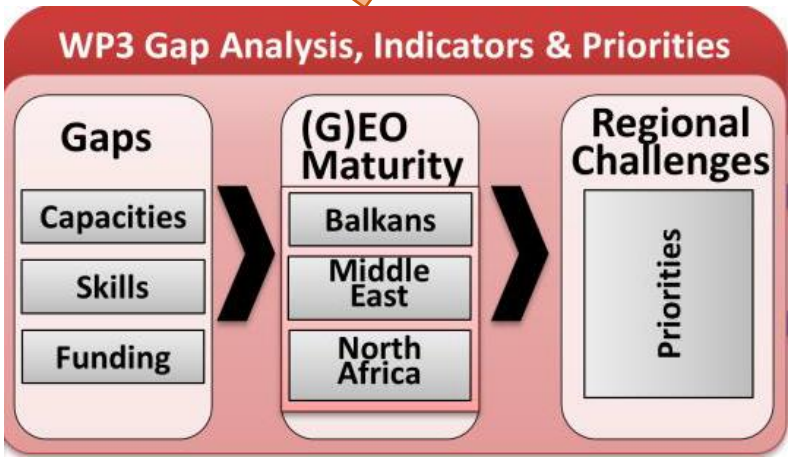


IAASARS

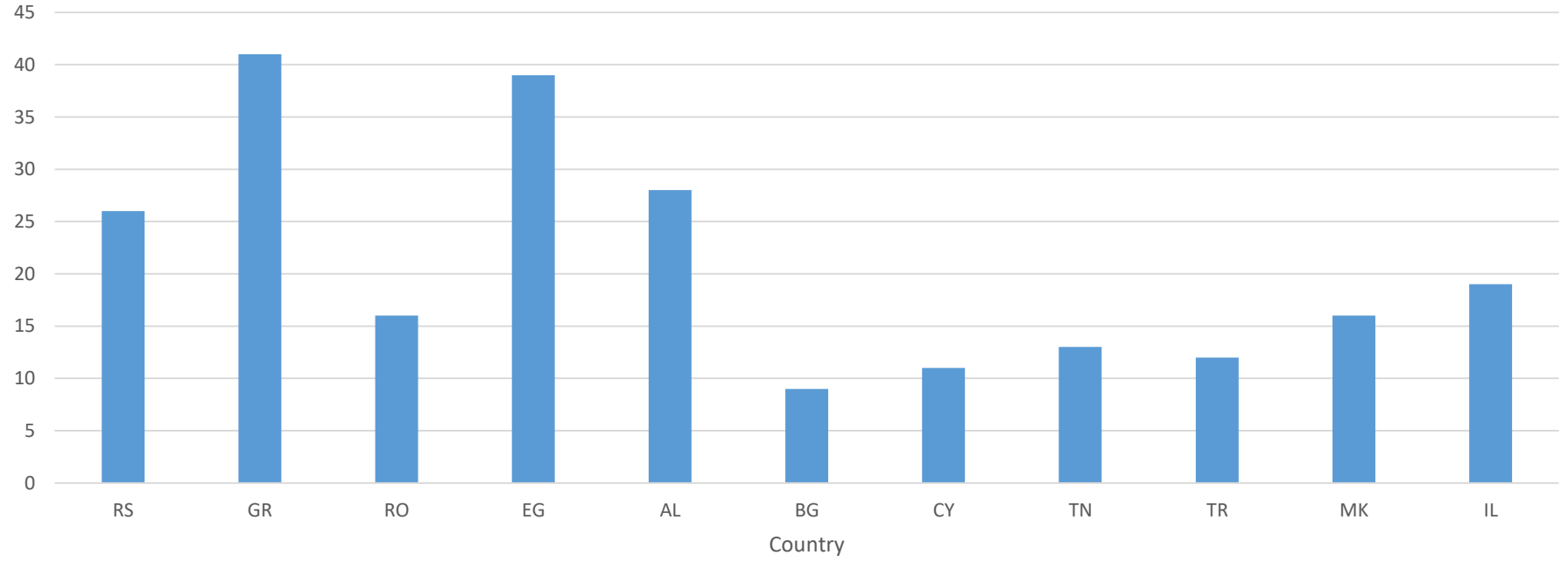
EuroGeoSurveys European Geoscience for Society
The Geological Surveys of Europe

GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting, 17-18 Oct 2016, Morocco





Total Responses and User Type



Total Responses:

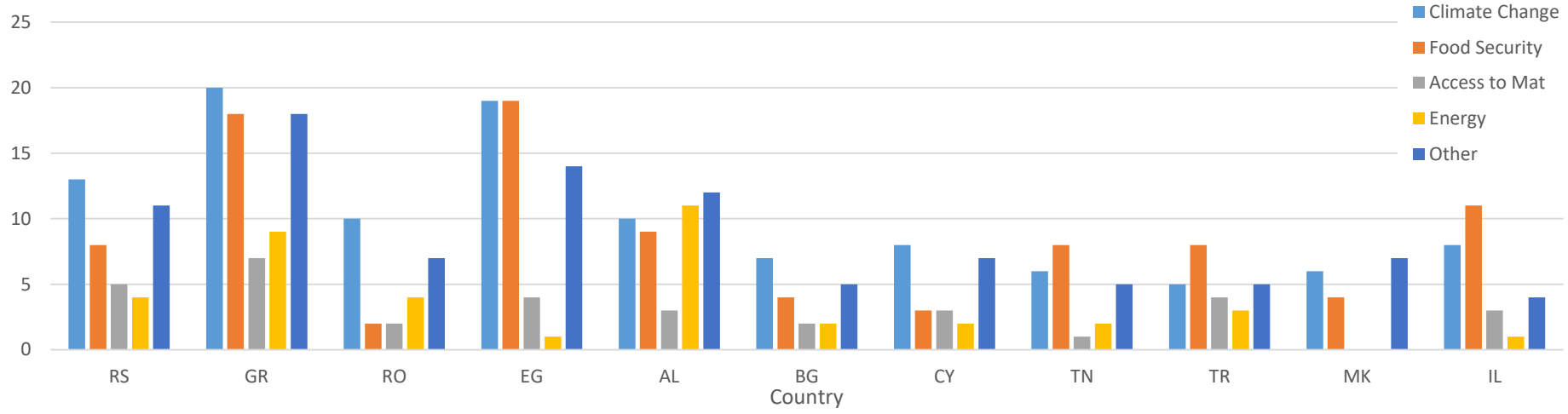
260

Balkans: 183

North Africa: 59

Middle East: 15

Thematic Area



Most responses in:

Food Security &

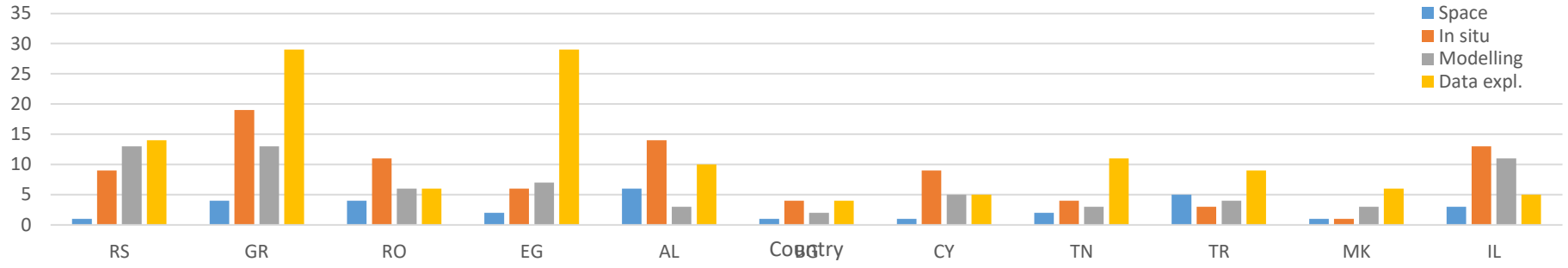
Climate Change

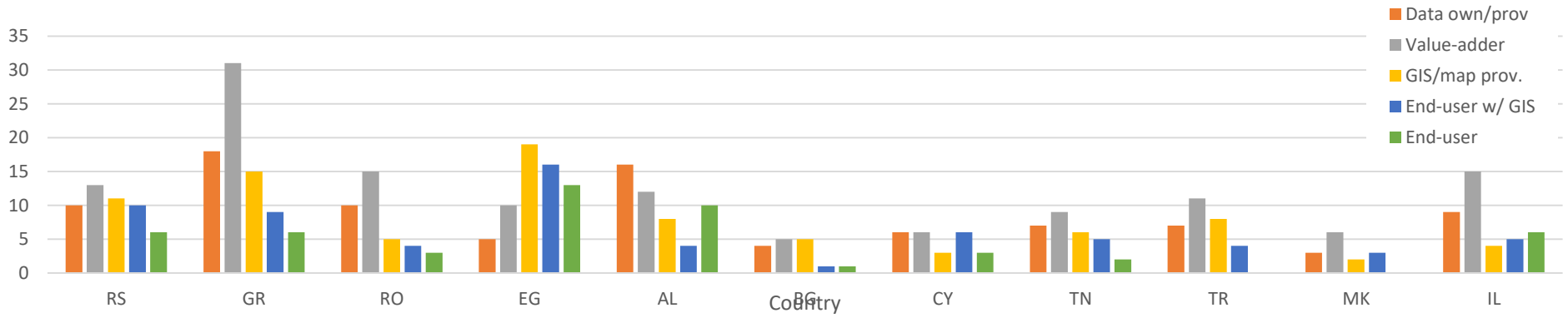
Less responses in:

Access to Raw Materials

Energy

Capacities and Position in Value Chain





Methodological aspects for GAP Analysis

1. EO capacities
   Identified through inventorying of key EO actors
2. EO end-user needs
   Identified through in-depth end-user interviews of a representative sample
3. Indicators
   Characterize identified gaps and pinpoint where in the value chain they occur

Methodological aspects for GAP Analysis

Need for high quality end-user interviews

&

Country partner to drive intensive inventorying

The gap analysis is on-going task and is conducted on the basis of three sources of information:

1. **Results on gaps from previous projects**
2. **Results on gaps from the GEO-CRADLE inventorying phase**
3. **Results on gaps from the intensive desk research conducted to complement inventorying**

Indicators

- EO capacity is a complex term
- During the 19th GEO Executive Committee Meeting, the need to streamline gap analyses in EO was recognized
- An action team was formed to streamline gap analyses in EO

Indicators

Geographic- Spatial discrepancy in the coverage of the observation capacities in regards to availability of data over the RoI.

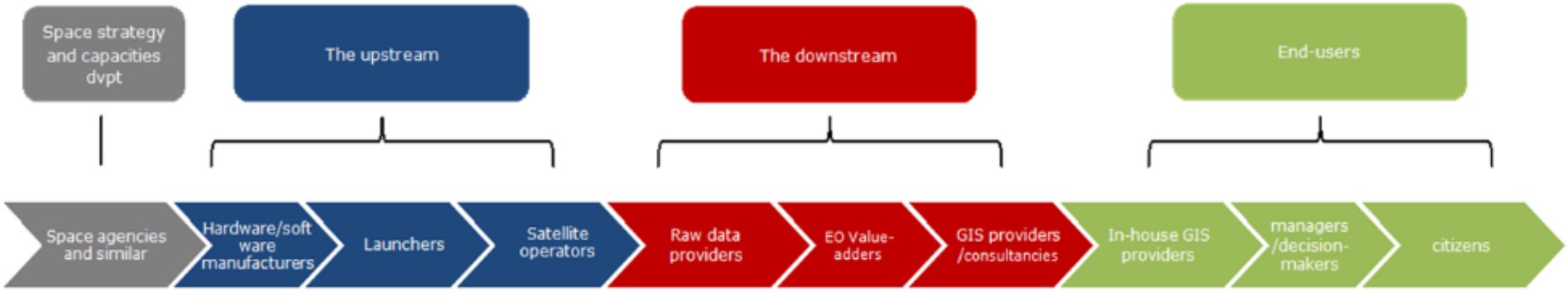
Observational- Technologies and system for EO are not available or insufficient to provide the data and quality needed.

Structural- The connectivity and ability of data to flow freely within organizations or networks.

Qualitative/quantitative- EO products are available but not of sufficient timeliness, frequency or quality to be of use.

Capacity for use- EO products are available but there is insufficient technical capacity in regards to infrastructure and personnel to make use of it.

Indicators



41

Indicators

across the value chain

Data availability (real time, upon request, archives)

Data policy (free and open, commercial, restricted, etc.)

Temporal resolution

Number of geoportals used by end-users

Coordination with decision makers

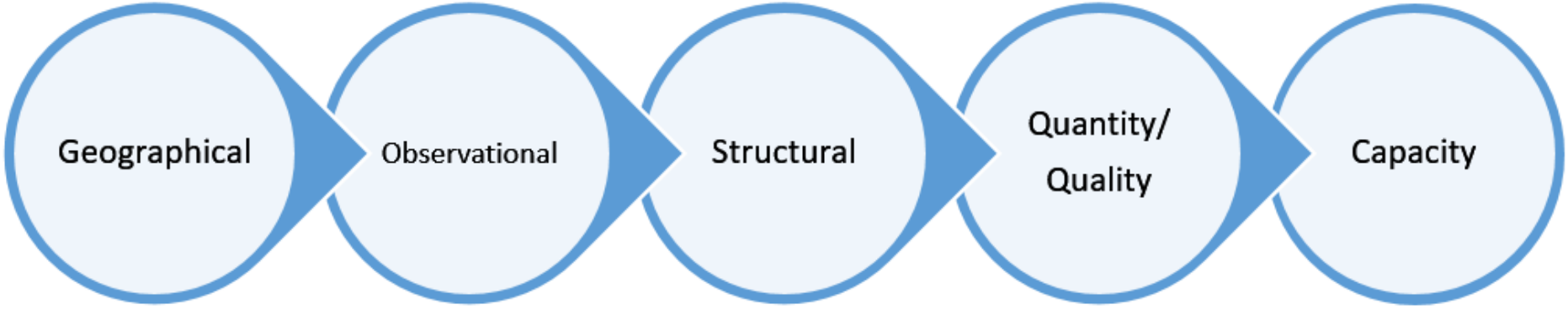
Number of organizations with modelling and processing facilities

Range of satellite coverage

Etc.

Gap Analysis

Start with end-user needs, and successively go through categories of EO capacity



- Is there EO capacity to collect data from the area from which it is needed?
- Is there capacities to measure and model attributes that are needed?
- Is there a problem with connectivity in the EO value-chain?
- Is the quantity or quality of data satisfactory?
- Does the end-user have technical capacity to use the EO product?

Maturity Indicators in relation to GEO & Copernicus

The maturity indicators capture the level, and measure the progress of each country in the implementation of GEO and Copernicus

The assessment on the maturity level per country is based upon the outcomes from the survey and the gap analysis

The Methodology uses the following stages:

- Desk research
- Semi-structured interviews with country partners
- Validation of findings by experts
- Comparative assessment per country level

Maturity Indicators definition

Parameters by which the maturity in Earth Observation and geo-information capabilities can be measured and monitored

Help to understand the capabilities of the country and the country's prospects

Indicators are Grouped by:

- Capacities (including national or regional capacities)
- Cooperation (including international cooperation)
- Uptake (including national uptake and awareness)

For each indicator a table is created providing:

- Description, parameteres, constrains, gap analysis, comments

Capacities

National Infrastructure

- Own space-borne capacity, access to 3rd party missions, ground base/ in-situ monitoring networks, modelling & computing , EO data exploitation platforms

Critical mass of EO researchers

- Nb of public organizations & universities promoting EO, courses offered by universities, diversity & level of courses, Nb of the researchers, papers published

Industry base

- Nb of companies, scale companies, employment numbers, resellers, existence SME clusters

Space authority

- Space policy, organizaiton chart

Capacity building

- National R&D investment, EO focus actions

Cooperation

Impact of GEO

- Participation in GEO, designated GEO Office, actions on SBA´s, provision of data to GEOSS portal

Impact of Copernicus

- Projects using Copernicus data/services, and involved entities

Participation to international efforts

- ESA, WMO, EUMETSAT, CEOSS, UN-system, INSPIRE, OGC

Funding opportunities

- EC R&D participation, ITTs etc

National Uptake & Level Awareness

Events

- Organisation of networking events, and thematic workshops

Dissemination activities

- Networking, and data portals

National policy implementation

- Existence of national Policy, and dedicated budget

Penetration to the market

- Use (awareness, adoption, R&D uptake...)

Indicators' boundaries

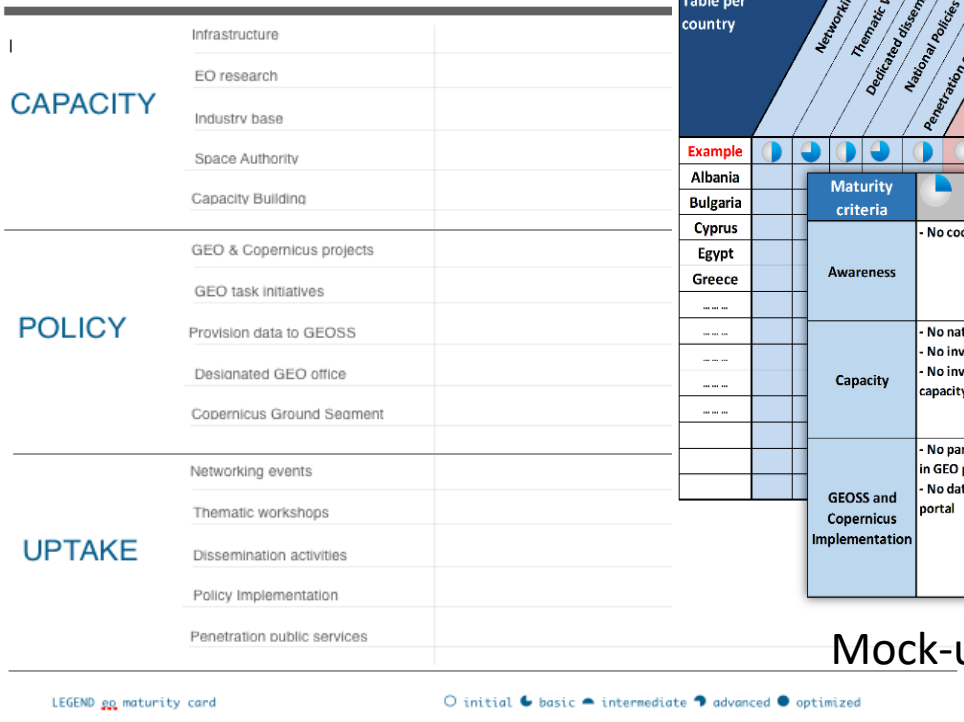
Boundaries relating to the degree of formality and optimization of the group of indicators (capacities, cooperation and uptake)

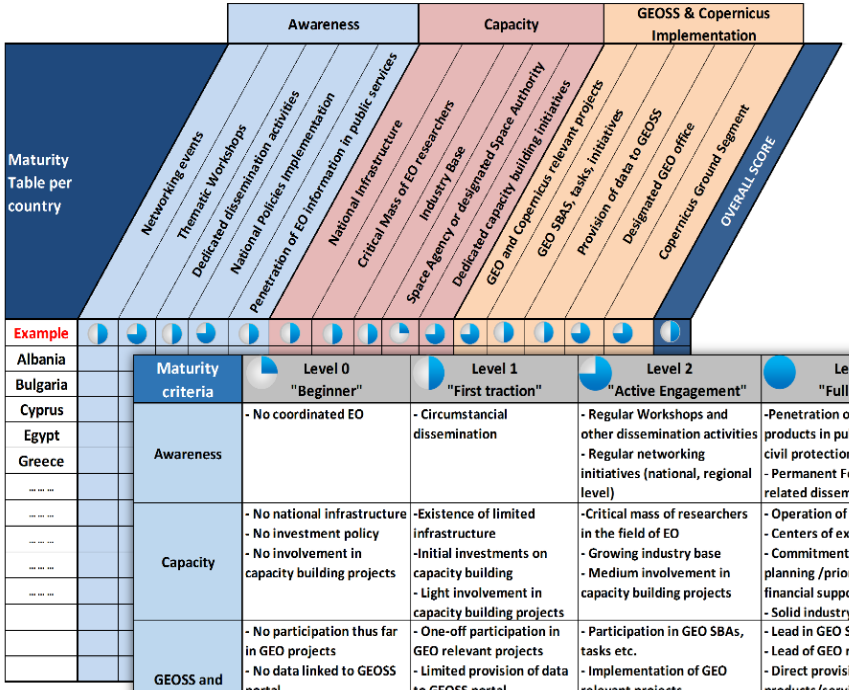
Maturity level:

- Level 0: initial
- Level 1: basic
- Level 2: intermediate
- Level 3: advanced
- Level 4: optimized

Example: (0) no commitment to develop space-borne capacity, (1) there is ability to perform the capacity, (2) the capacity is performed; e.g.at least 1 satellite operated by the country, (3) more than 1 satellite mission exists, future mission planning with improvement degree, (4) well developed capacity in a full integrated structure

Test





Maturity criteria	Level 0 "Beginner"	Level 1 "First traction"	Level 2 "Active Engagement"	Level 3 "Full swing"
Awareness	- No coordinated EO	- Circumstancial dissemination	- Regular Workshops and other dissemination activities - Regular networking initiatives (national, regional level)	-Penetration of EO services and products in public services (e.g. civil protection) - Permanent Fora for EO-related dissemination
Capacity	- No national infrastructure - No investment policy - No involvement in capacity building projects	-Existence of limited infrastructure -Initial investments on capacity building - Light involvement in capacity building projects	-Critical mass of researchers in the field of EO - Growing industry base - Medium involvement in capacity building projects	- Operation of a space agency - Centers of excellence - Commitment, national planning /prioritisation and financial support - Solid industry base
GEOSS and Copernicus Implementation	- No participation thus far in GEO projects - No data linked to GEOSS portal	- One-off participation in GEO relevant projects - Limited provision of data to GEOSS portal	- Participation in GEO SBAs, tasks etc. - Implementation of GEO relevant projects - GEO partner organizations	- Lead in GEO SBAS, tasks, etc. - Lead of GEO relevant projects - Direct provision of data and products/services to GEOSS - Designated GEO office - National representation and participation in HLWG, Plenary meetings, other committees

Mock-up of Maturity table and relevant criteria

Serbia

Capacity = Intermediate

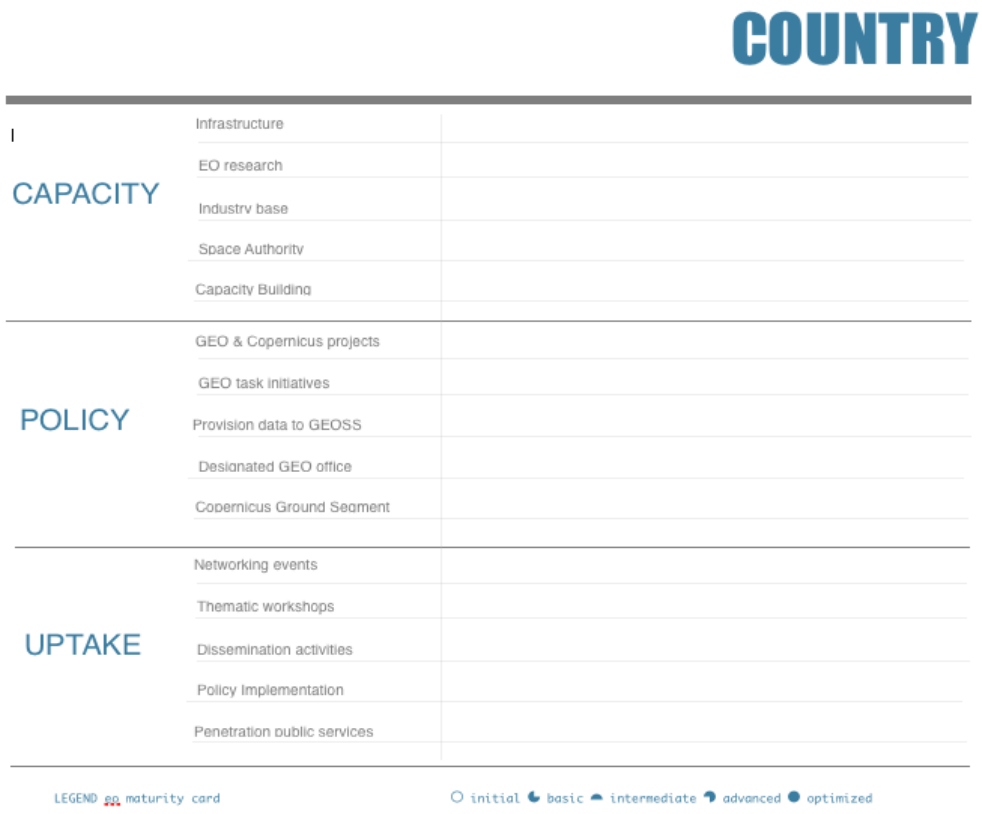
Infrastructure = 2
EO research = 2
Industry base = 2
Space authority = 0
Capacity building = 2

Policy = Basic

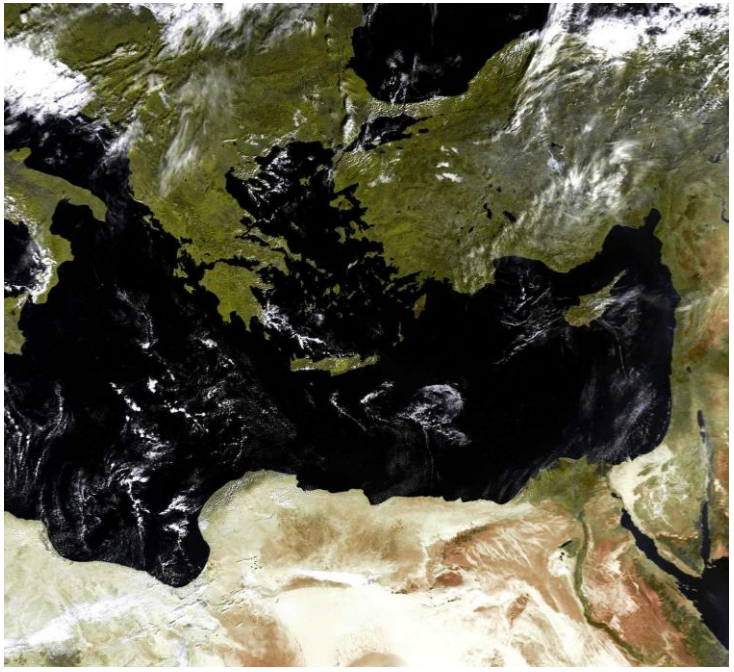
GEO & Copernicus projects = 2
GEO task initiatives = 1
Provision of data to GEOSS = 2
Copernicus ground stations = 0

Uptake = Intermediate

Networking events = 2
Thematic activities = 1
Dissemination activites = 2
Policy implementation = 2
Penetration public services = 2



State of the Art



- Romania, Bulgaria & Cyprus (EU members)
  - Have ground receiving stations that are integrated into European level space programs
- Western Balkans (not EU members)
  - Small countries with no space program and no space strategy

State of the Art

Greece, Turkey & Israel as more advanced

- Turkey has its own satellite program, Greece part of ESA and integrated with European level space missions
- Israel has large degree of maturity

Egypt

- Own space program and space strategy

Tunisia, Morocco, Algeria

- Space strategies, Agencies, and operational programs defined years ago, participation in EO efforts

Gaps Identified

- EO is significantly dominated by the public sector
  - Private companies provide data products and resell satellite imagery to public sector
- Reluctance to share data between organizations
  - Distrust between organizations – success stories based on a large degree on personal connections
  - Red tape for formal sharing between organizations
  - Projects allow for opportunity to cooperate, relationships established live on post-project and encourage data sharing
- Lack of educational capacities (Western Balkans)
  - No life time learning
  - Education centered on geodesy, little remote-sensing capacity building

Gaps Identified

- Large difference between countries and within countries
  - Advanced capacities developed in emergency response
  - Meteorological sector is advanced in most countries
  - UAE has well funded and advanced EO capacities
  - Several in-situ networks in Albania were offline at time of inventorying due to funding problems
- Vulnerability to politics – lack of institutionalization
  - Organizations tend to be centralized and decision making posts are assigned at the political level
  - Changes in government and other political occurrences can stall or backtrack progress in an organization

Sentinel-1A satellite aids flood relief in the Balkans

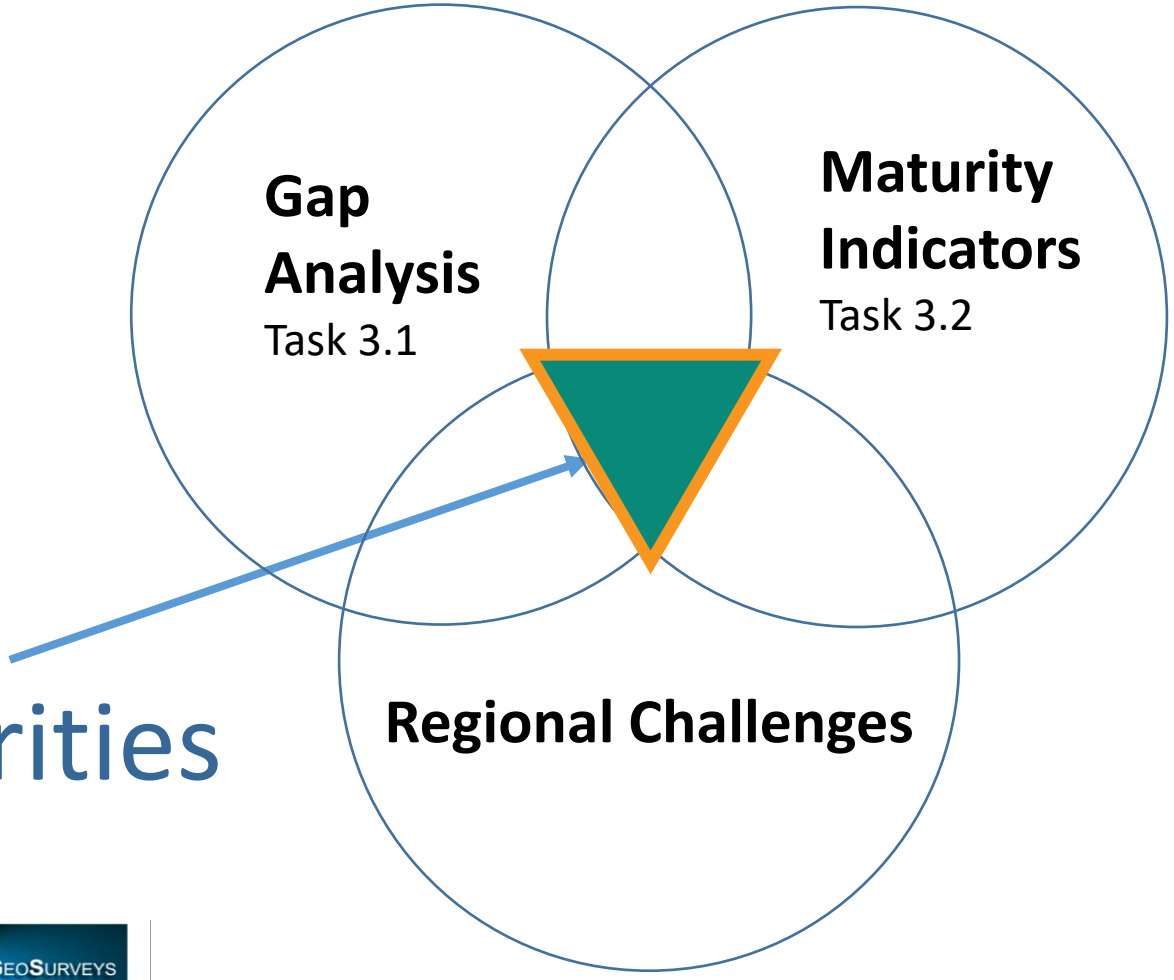
For the first time Sentinel-1A satellite was operationally used to support emergency management operations in the Balkans, where prolonged heavy rainfalls and widespread flooding since the 15th of May 2014 triggered the declaration of the State of Emergency

In order to provide fast and complete map product delivery it is crucial to take into account and use all available sensors. Although the radar sensor carried by Sentinel-1A is still in commissioning stage, its data was integrated into the Copernicus EMS flood maps of the Sava river in the Balatun area in Bosnia and Herzegovina.

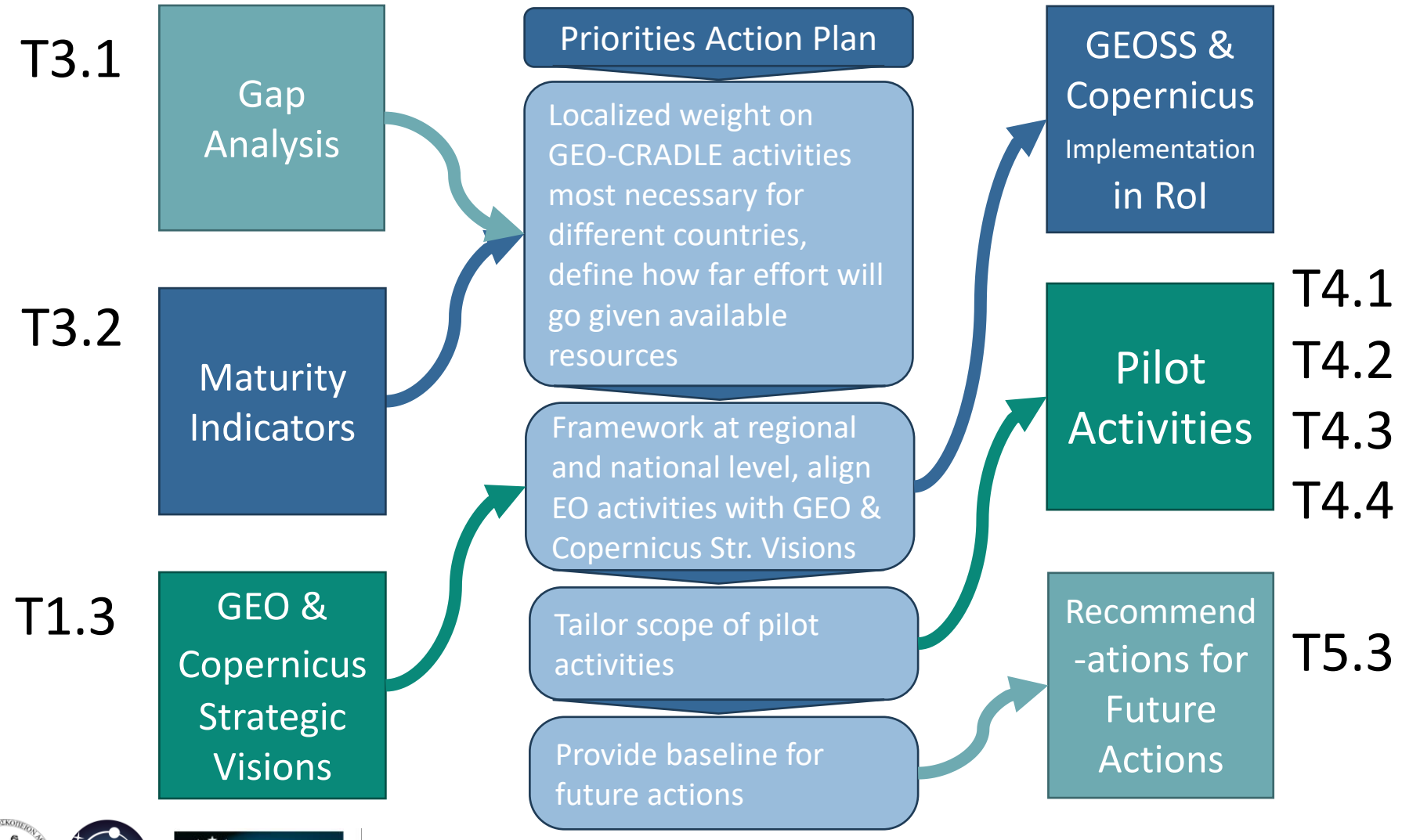
Although the processing chain in use have not yet been tuned to process Sentinel-1A data, and despite the tight timelines for map production, new procedures have been put in place to exploit Sentinel data and to combine them with the pre-event analysis achieved from Spot 6.

Sentinel-1A was launched on April 3rd from the European spaceport in Kourou, French Guiana, and it is the first in a fleet of Sentinel satellites developed for European Copernicus programme.

Where Gap & Maturity Assessments used?
Define the Priorities in Relation to Reg. Challenges



GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting, 17-18 Oct 2016, Morocco



IAASARS

EuroGeoSurveys European Geoscience for Society
The Geological Surveys of Europe

GEO-CRADLE & the 2nd EuroGeoSurveys Networking Meeting, 17-18 Oct 2016, Morocco

thank you!

شكرا