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EXCELSIOR Project

H2020-WIDESPREAD-2018-2020 | Grant Agreement No 857510	
Project full title:	**ERATOSTHENES: Excellence Research Centre for Earth Surveillance and Space-Based Monitoring of the Environment**
Project acronym:	**EXCELSIOR**
Work Package:	**WP7 ECoE Excellence Research Clusters**
Deliverable:	**D7.1 Report on the ECoE research clusters and research groups: management, function and technical capacity.**
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EXCELSIOR

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Document Sign-off

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Work Package 7: ECoE Excellence Research Clusters

D7.1 Report on the ECoE research clusters and research groups: management, function and technical capacity.

Sections to be protected	Description	Owner	Access Rights	
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Executive Summary

This deliverable focuses on the formation of the Eratosthenes Centre of Excellence thematic research clusters of Environment & Climate, the Resilient Society and Big Earth Data Analytics in terms of the operations, research collaborations, tools to facilitate research, agreeing internal structures and allocating staff responsibilities. This deliverable will focus on the integration of recruited research personnel, research equipment and the Strategic Partners' expertise to meet the needs of the research groups.

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Abbreviations

ACTRIS	Aerosols, Clouds, and Trace gases Research Infrastructure
BoD	Board of Directors of the Eratosthenes Centre of Excellence
CUT	Cyprus University of Technology
DEC- DMRID	Department of Electronic Communications
DLR	German Aerospace Centre
ECoE	Eratosthenes Centre of Excellence
EMMENA	Eastern Mediterranean Middle East and North Africa
EO	Earth Observation
EXCELSIOR	Eratosthenes: Excellence Research Centre for Earth Surveillance and Space-based Monitoring of the Environment
GBS	Ground-based Remote Sensing Station
IPR	Intellectual Property Rights
NOA	National Observatory of Athens
TROPOS	Leibniz Institute for Tropospheric Research

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1 Introduction

This deliverable will focus on the formation of the three thematic research clusters of the Eratosthenes Centre of Excellence in terms of the operations, research collaborations, tools to facilitate research, internal structures and staff responsibilities. Research clusters consist of multidisciplinary, challenge-based groups addressing scientific questions in the different thematic domains of ECoE.

Task 7.1 is responsible for forming the three thematic research clusters of ECoE, namely the Environment & Climate, the Resilient Society and the Big Earth Data Analytics clusters, in terms of the operations, research collaborations, tools to facilitate research, agreeing internal structures and allocating staff responsibilities, etc. This task establishes the ECoE research constituents, its research groups and research laboratories, by building capacity to cooperate and compete on equal terms with leading European research entities. The task consolidates the research modus operandi in ECoE, integrating its research assets, i.e., the recruited research personnel, the research equipment and the Strategic Partners' expertise.

Task 7.1 also coordinates intra-group and intra-cluster interaction for common use of the infrastructure, research osmosis and cross-fertilisation activities between clusters, setting up communication and collaboration lines and preparing an "interaction plan" to multiply the research outcomes of ECoE for ensuring vertical organisation of the group's activities from access to equipment data to research and innovation uptake, etc.

In this deliverable, Chapter 1 provides an introduction to the deliverable. Chapter 2 discusses the Research Clusters and the Functional Areas. Chapter 3 focuses on the Research clusters and thematic areas organizational internal structure chart. Chapter 4 provides detailed information on the Thematic Clusters of Environment & Climate, the Resilient Society and the Big Earth Data Analytics.

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2 Digital Innovation Hub

The ECoE as a Digital Innovation Hub (DIH) adopts a two-axis model, as depicted in Figure 1.

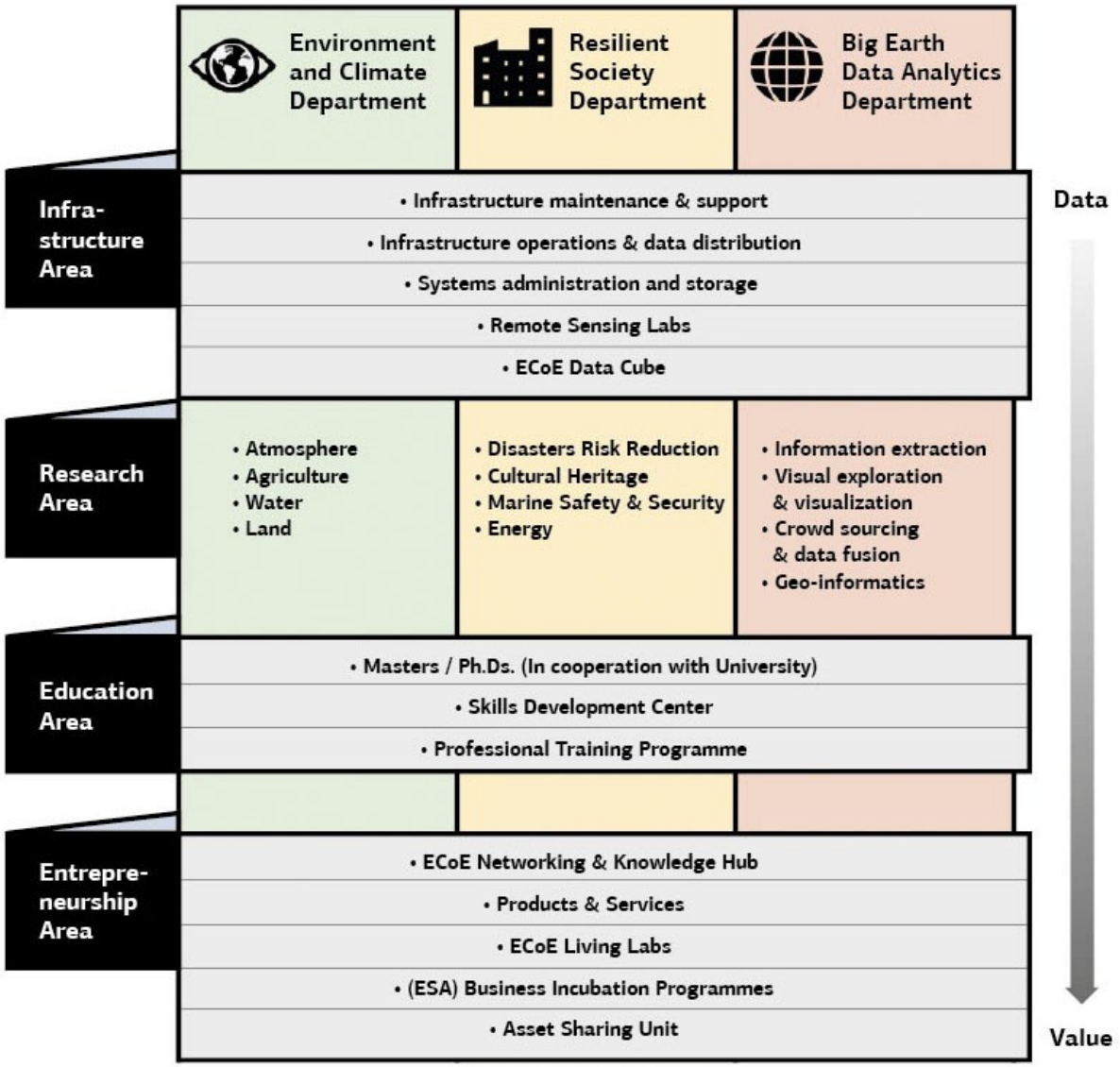

Figure 1: Digital Innovation Hub model

In line with the ECoE's Vision of developing a world-class Digital Innovation Hub, a DIH model was created in order to visualize the interoperability of the Centre. The DIH model is composed of 2 axes, where the vertical axis consists of three Thematic Clusters for sustained excellence in research (Environment and Climate, Resilient Societies and Big Earth Data Management) and the Horizontal axis consists of the four Functional Areas (the infrastructure area, the research area, the educational area and the entrepreneurship area). This results in a two-way axis through both intra-group and intra-cluster interaction for common use of the infrastructure, research osmosis and cross-fertilisation activities between clusters to multiply the research outcomes of ECoE for ensuring vertical

organisation of the group's activities from access to equipment data to research and innovation uptake. As indicated by the arrow on the right side of the DIH model, each Thematic Cluster uses data generated from the infrastructure and research area in order to create value. This model is the essence for creating excellence through research and innovation in order to have the highest social, environmental and economical impact.

2.1 Research Clusters (Vertical Axis)

The Vertical Axis consists of the research clusters that are called departments and are divided into the Environment and Climate Department, Resilient Societies Department and Big Earth Data Management Department. Each department consists of thematic areas, which are staffed by experts in the related field. The interoperability of the DIH model allows for the use of specialists across topics rather than being assigned to only one thematic area. This provides excellence since there is a diversity of knowledge that can be maximized to provide cutting edge research, education and entrepreneurship. Staff can work on topics within their own department or area of expertise and at the same time be involved into activities in cooperation with other topics and thematic areas in other departments. For example, a staff member specializing in water can also work on projects related to agriculture (Environmental and Climate Department), projects related to marine safety and security (Resilient Society Department) and provide data for information extraction (Big Earth Data Analytics Department). Therefore, the ECoE is able to utilize the expertise of staff members throughout all aspects of the thematic clusters. Such interoperability is especially important in research, as it expands the scope of expertise that can be applied to projects. This is expected to provide excellence within and between the thematic clusters and provide integration of knowledge and expertise across the CoE.

2.2 Functional Areas (Horizontal Axis)

The **Infrastructure Area** will be responsible for the seamless use of the existing and future ECoE infrastructure, their proper operations and the unobstructed access to EO data by the ECoE staff and stakeholders. The infrastructure area will include all the relevant state-of-the-art EO equipment that are necessary to process raw data across the thematic research clusters. The ability to maximize the entire state-of-the-art infrastructure resources will result in cutting edge research and services. All three Research Clusters will be able to use the equipment, infrastructure and data of the ECoE and also sharing that information and data to the different Functional Areas. This will provide the possibility of interoperability between different research sectors, thus providing the capability to use the infrastructure and data for research, education and entrepreneurship activities. Among other state-of-the-art equipment to be purchased, the two major infrastructures include the Ground Based Station with atmospheric LIDAR and the Data Acquisition Station for receiving EO image data.

The **Research Area** will be responsible for the development of science and research which later will lead into the development of ECoE services. This area is responsible for basic and applied research of the Centre. It will also focus on attaining research projects, writing research proposals, attending international research conferences, publishing in scientific journals and participating in capacity building. Under the auspices of the ECoE, integrated research between topics can also take place,

through sharing of infrastructure and data. This will lead to excellence, as the possibilities for research innovation are unlimited. Personnel involved in research will be able to access infrastructure and data, as well as teach and also provide services, thereby providing value to the ECoE. The capacity building and research capability obtained through the EXCELSIOR project will provide the tools and skills to the personnel that are necessary to lead and succeed in obtaining competitive research projects.

The **Education Area** will sustain the development and operation of ECoE as a regional knowledge centre. The specific activities of the Education area include the MSc & PhDs hosting programme, a Skills Development Centre and a Professional Training Programme. The research that has been conducted in the ECoE will be used in an educational capacity for graduate and doctoral students and for professional training. Therefore, research will not be conducted for the sake of research, but instead to be used in the EO community. The educational area will be able to use all infrastructure and data of the ECoE, as well as benefit from the results of the research. As a result of their skill training and knowledge transfer, they will be able to create applications and services for the EO community.

The **Entrepreneurship Area** will be responsible for ensuring the sustainability of the ECoE and stimulating national and regional growth, through the exploitation of the IPR, licensing of innovation and market uptake of new EO-based products, services and solutions generated by the ECoE and the Strategic Partners. The research conducted through the ECoE will be used for the development of innovative applications and services to be used by stakeholders, the strategic partners and the EO community. Therefore, the results of the research will be used as the basis for entrepreneurship, which is expected to sustain the ECoE. The Entrepreneurship area will be able to use the state-of the-art infrastructure and data of the ECoE, become involved in research projects, utilize research results and enhance their knowledge through capacity building activities.

2.3 Research Clusters Interaction and Interoperability

The entire ecosystem creates a robust system for developing excellence and providing for the sustainability of the ECoE. The two-way axis provides the ability to involve all Functional Areas and research clusters in order to create value from the state-of-the-art infrastructure through research, education and services.

The vertical axis, which consists of staff members in the three departments, will work within their own department and also with other departments in order to facilitate interoperability within the research clusters. At the same time, the staff members will also work within each of the four Functional Areas. Research personnel can utilize the resources of the infrastructure area and the data generated for research and development. For example, the data from the Ground-based Remote Sensing Station can be used by all departments and thematic areas. This maximizes the use of infrastructure, provides innovative use of equipment and ensures the research interoperability.

Sharing data between departments is expected to enhance the research that will be conducted, as it will provide an additional dimension to the projects. The research area will also include staff collaboration between departments, which will provide a competitive advantage for the ECoE in applying for research projects. In addition, it will provide knowledge transfer to staff members, thereby

increasing their skill set and expertise. It is expected that the diversity in data and staff thematic areas will provide added-value and benefit the ECoE to gain research projects. This will provide funding for the sustainability of the ECoE, as the excellence developed is expected to result to receive funding from more competitive research projects.

The knowledge gained through the use of infrastructure and research is expected to be used in the educational area. Personnel from the three departments are expected to disseminate their expertise to University PhD, Post-Doc students, stakeholders and society through mentoring, training and collaboration. The educational aspect is important, as the skills and knowledge gained through the ECoE are to be shared in order to transfer scientific knowledge to stakeholders, society and the scientific community. The excellence created through data received from infrastructure and the knowledge resulting from research will be shared with the EO community in order to further benefit stakeholders and researchers, as well as foster innovation.

It is expected that the entrepreneurship area will develop based on the knowledge gained through the research conducted at the ECoE. Innovative applications that address the needs of industry, stakeholders and EO community will be developed through the excellence resulting from the research activities of the ECoE. Entrepreneurship activities may be conducted on a local or regional level and will be targeted to the needs of industry, stakeholders and the EO community. The entrepreneurship activities are essential for the DIH model in order to provide sustainability and long-term viability of the Centre.

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3 Research Cluster Organizational Chart

The research cluster organizational chart for the DIH adopts the two-axis model by integrating the personnel into different thematic areas without restricting their ability to cross-over or collaborate with each other. Figure 2 provides the organizational internal structure chart of the Research clusters and associated Functional Areas. The BOD of the ECoE decided to update the names in each research cluster area based on the progress of the new recruited staff and the transferred staff from CUT. The vertical axis consists of the staffing for the thematic clusters, while the horizontal axis provides the staff for the Functional Areas and administration, who will provide support for the thematic clusters.

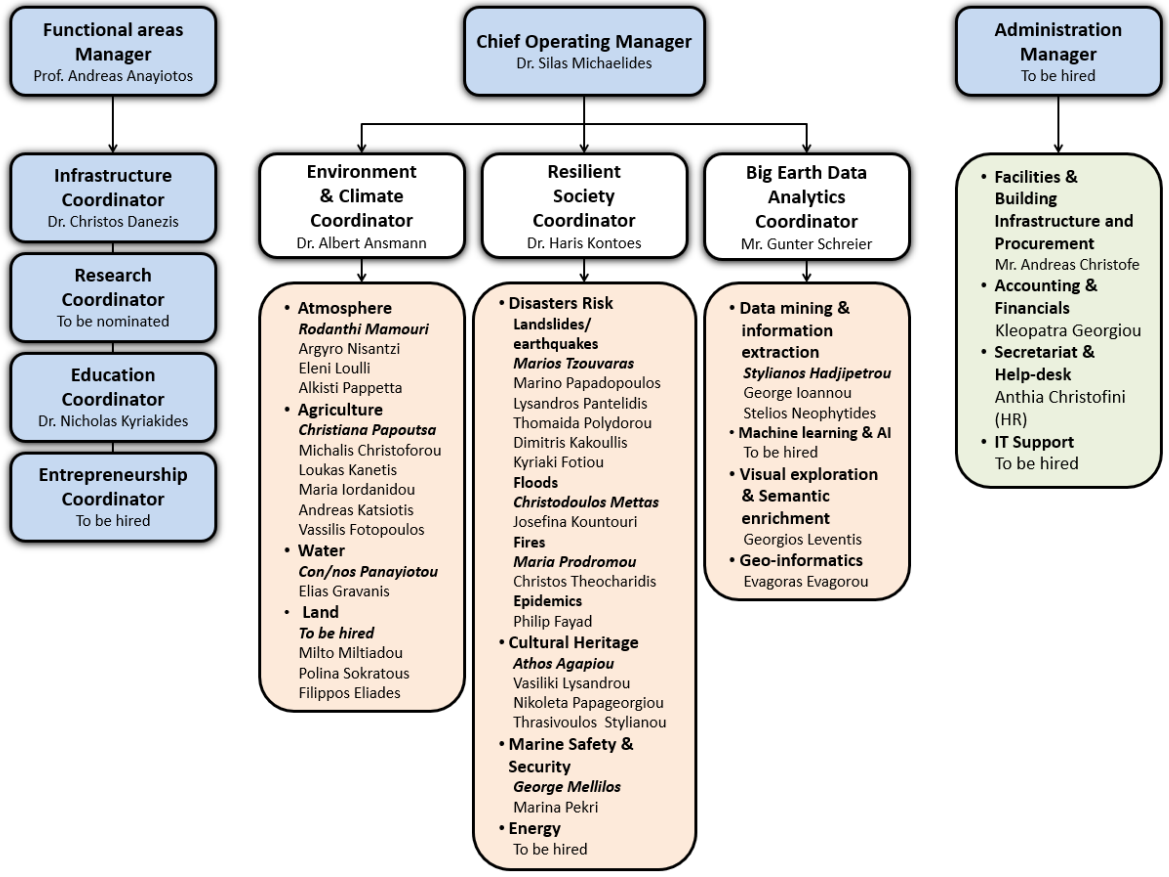

Figure 2: Research clusters and thematic areas organizational internal structure chart

According to the Articles of Association, the Organizational chart of the ECoE (shown in Figure 3) includes a Board of Directors, who are responsible for all strategic and policy decisions. The External Advisory Board includes experts in the field of EO who provide recommendations on all matters in relation to EO. The Managing Director oversees all the activities of the ECoE, with the help of the Executive Committee, External Affairs & Business Development Director, Quality Assurance Manager and Human Resource Manager. The Executive Committee takes decisions on ECoE's financial and administrative management and coordinates its internal and external operations, specifying and exercising financial control. The External Affairs & Business Development Director is responsible for the business development in the ECoE, and external relationships of the Centre. The Quality Assurance manager is responsible for ensuring the quality of all activities. The Human Resources manager will be responsible for all human resources activities of the ECoE.

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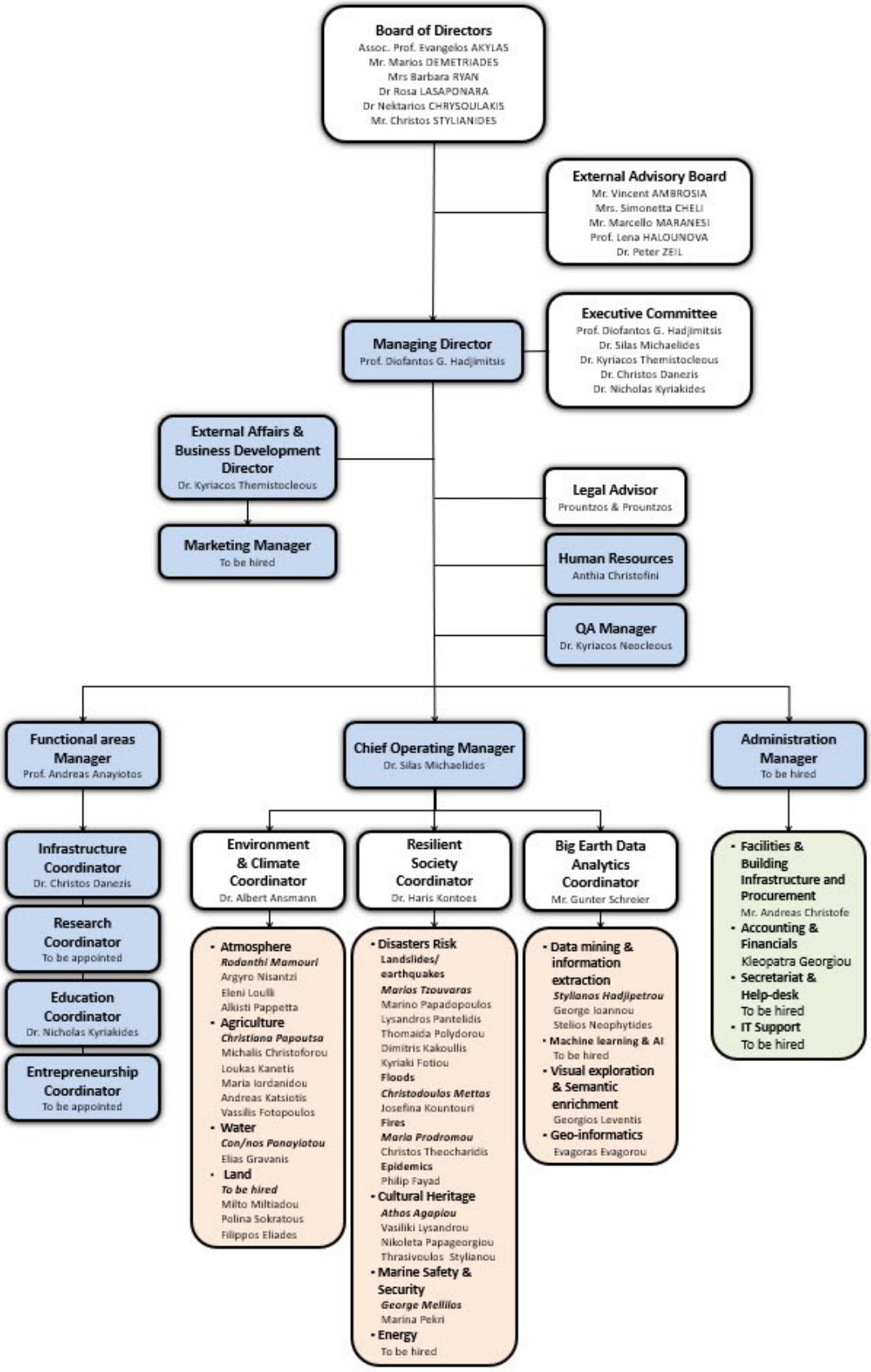

Figure 3: Overall organizational chart of the ECoE

Within the Research clusters and thematic areas' organizational internal structure chart (see Figure 2), the three managers that will oversee the entire staff matrix are the Chief Operating Manager, Functional Areas Manager and the Administration Manager, who all report to the Managing Director and Executive Committee. These three managers will work together for the overall needs of the research departments and will work together with the Managing Director for the effective management of the research clusters and thematic areas.

The Chief Operating Manager works with the three coordinators of the research clusters, who are responsible for the research groups within their department. Within each department, the team leaders report to the department coordinator. The Functional Areas Manager is responsible for the activities of the Functional Areas, that work with the thematic clusters. The coordinator of each of the four Functional Areas work with the Functional areas manager. The Administration manager is responsible for support activities for the smooth operation of the Centre.

The Chief Operating Manager of the vertical axis will be Dr. Silas Michaelides. He will be responsible for the activities of the Departments of Environment and Climate, Resilient Society and Big Earth Data and Analytics. The Chief Operating Manager will work closely with the coordinators of each department. The coordinators consist of the Strategic Partners for the EXCELSIOR project and include Dr. Albert Ansmann, who is the Environment and Climate Coordinator, Dr. Haris Kontoes, who is the Resilient Society Coordinator and Mr. Gunter Schreier, who is the Big Earth Data Analytics Coordinator. The coordinators were chosen due to their expertise in each of the thematic sectors and support the ECoE in the framework as partners in the EXCELSIOR grant. Each of the 12 research areas have been assigned team leaders (noted in bold under each research area in Figure 2) who will assign projects and duties to the research staff. Personnel has been assigned to each research area, based on the skills of the researchers. The team leaders will be responsible for the coordination of the projects of their relevant research area. The researchers will be responsible for meeting the Key Performance Indicators that are used to measure progress, meeting required goals and objectives, advancement in their research areas, writing journal articles and proposals, utilizing the state-of-the-art infrastructure, ensuring the quality of their research, identifying capacity building activities, collaboration with industry and stakeholders and involvement in training activities.

The Functional Areas are involved in every department of the Thematic areas. The Functional Areas Manager will be Professor Andreas Anayiotos. He will be responsible for the activities of the Infrastructure area, Research area, Educational area and Entrepreneurship area. The Functional Areas Manager will work closely with the coordinators of each of the Functional Areas. The functional area coordinators were chosen based on their expertise in the relevant Functional Area and support the ECoE in the framework as partners in the EXCELSIOR grant. Dr. Christos Danezis will be the Infrastructure Coordinator, the Education Coordinator will be Dr. Nicholas Kyriakides and the Research Coordinator and Entrepreneurship Coordinator will be re-appointed at a later date, as the current research and entrepreneurship coordinators have changed duties. The coordinators will work closely with the Department coordinators and the team leaders and researchers in the 12 research areas, in order to provide support and assistance.

The Administrative sector is responsible for providing support to the Centre. The Administration Manager is responsible for the overall function of the administration. The Facilities & Building Infrastructure and Procurement sector will be assigned to Mr. Andreas Christofe. The Accounting manager is Kleopatra Georgiou and the HR manager is Anthia Christofini. Staff will be hired for the sectors of IT support, Secretariat and Help-desk, which are now allocated to different existing personnel.

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4 Thematic Research Clusters

The three thematic research clusters are Environment and Climate, Resilient Society and Big Earth Data Analytics. Within each cluster, there are various research areas addressed within these clusters, as shown in Figure 4.

Figure 4: ECoE Thematic Research Clusters

4.1 Environment & Climate

The research cluster of Environment & Climate focuses on the thematic areas of atmosphere, agriculture water and land. The ECoE can exploit the state-of-the-art infrastructure such as the proposed GBS, Copernicus data and core services, archived satellite images and data from various EO networks, among other equipment, in order conduct cutting-edge applied research in this research cluster, which will result in effective applications, services, education and related start-ups. This can be combined with regional and global EO monitoring with ground-based networks, in addition to long term observations, statistics and trend analysis over the past decades is essential to understand the processes which link environment with climate problems.

4.1.1 Atmosphere

Anthropogenic and natural emissions have a deep impact on local air quality and affect Earth's weather and climate system. Aerosol-cloud-dynamics interactions involve a multitude of complex processes and, hence, pose a great challenge to current atmospheric research. It is challenging to support decision makers with climate-relevant trend analysis and forecast services. European infrastructures like ACTRIS and space agencies like ESA/NASA are in constant need of datasets for calibration and validation purposes. To effectively study atmospheric conditions, vertically resolving instrumentations are needed to cover the mixing layer, free troposphere, and stratosphere, to understand cloud developments and precipitation formation as well as the link to pollution and dust. Long term profiling

and modelling based on the EMMENA region and beyond require profiling, process resolving monitoring, long term observations, statistics, trend analysis, and other techniques to be conducted over decades. In this way, the future impact of climate change on the EMMENA region will be better understood. Cyprus provides a strong environment for demonstrating and further development of climate observation technology in a key region of climate change. This unique position will attract international companies and leading researchers. Air quality monitoring and forecasting will be improved for the whole population of the EMMENA region.

4.1.2 Agriculture

The role of EO information, as an enabler of informed decision making in the domain of food security, the control of sustainable agriculture policies and the increase of agriculture productivity, is of top priority for both Europe and the Mediterranean. In recent years, the Sentinel missions have introduced free data of unprecedented spectral, spatial and temporal characteristics, allowing for the consistent and timely monitoring of the agricultural land. Effective, efficient and timely agriculture monitoring can offer tremendous benefits to the region, including a) cost- and time-effective control of imposed agriculture policies by the respective national/regional policies and/or the CAP (Cyprus); b) increased agricultural productivity and reduced production costs for the farmer, while cultivating under environmentally friendly practices; c) early warning systems and consistent monitoring of food security metrics, at national and regional levels, of invaluable socio-economic impact; d) damage assessment and mitigation strategies under extreme weather events (i.e., drought).

4.1.3 Water

EO techniques can be applied in order to monitor the quality and quantity of water in dams and coastal areas. By exploiting high resolution dense time series for large scale water applications (such as monitoring all the inland water bodies on a national level), improved water management strategies and policies can be developed. Research into water shortages, droughts, climate change, eutrophication, changes in water depth and desertification in the EMMENA region will be better understood through capacity building and knowledge transfer. As well, the ECoE can capitalise the available EO-data combined with sensor-networks and ground-based derived data in order to develop new products which will fulfil the specific needs of the end-users at national and regional level (technological development and innovative products/solutions for commercialisation). Cyprus provides a strong environment for demonstrating and further developing climate observation technology in a key region of climate change, which is expected to attract leading researchers in the field of water resources.

4.1.4 Land

The combination of EO, remote sensing and GIS techniques have provided a useful and detailed way to improve the selection of areas designed for agricultural, urban and/or industrial exploitation in a region. Such techniques can be used for land-cover characterization, mapping and monitoring. In addition to facilitating sustainable management of the land, land cover and land use information can be used for planning, monitoring, and evaluating the development, industrial activity, or reclamation. In addition, remote sensing can be used to monitor forests, forest fires, forestry and environmental management. The assessment of forest information over time enables the comprehensive monitoring

of forest resources. The use of remote sensing in forest resource assessment provides information regarding the spatial extent of forest cover, the forest type and the biophysical and biochemical properties of forests.

4.2 Resilient Society

The research cluster of Resilient Society, with an impact to the public sector and the industry, focuses on research and services tailored to ensure the societies' wellbeing, make economy sectors resilient, exploit efficiently the available resources, and protect civilians and businesses from natural threats and illegal actions in respect to smuggling/refugees trafficking in the surrounding seawith. The research cluster includes a portfolio of several research fields, but the emphasis is on Disaster Risk Reduction and Access to Energy.

4.2.1 Disaster Risk Reduction

In situations of disasters, both environmental and/or anthropogenic, satellite EO data can be used to access and monitor target areas at the right time and the ability to extract the needed information from the collected sensor data. The ECoE will use EO for Disaster Risk Reduction by increasing coordination of EO to forecast and prepare for disasters, to mitigate damage and to better manage and recover from disasters, through enhanced preparedness plans, timely activation and dynamically updated situational awareness throughout the emergency management cycle for early action. Cutting-edge research in this domain can provide improved thematic accuracy, reliability and robustness of disaster risk reduction products and services with the incorporation of uncertainty, for developing resilient cities, shield critical infrastructures, enable business operation continuity after impacted by major disasters. This cluster will focus natural disasters on fires, floods, earthquakes and health issues, such as epidemics.

4.2.2 Cultural Heritage

Cultural Heritage (CH) (both tangible and intangible) is a strategic resource for Europe and the International society with high cultural, social, environmental and economic value. To maximise the benefits of the application of Earth observation and digital technologies to CH, important challenges need to be addressed through research in order to develop approaches which meet the needs of all existing and potential user/stakeholder groups and thereby increases the social and economic value of CH. This will reinforce and expand partnerships and networks, exploiting the unique position of Cyprus in the region, connecting European countries with East and South continents. The UNESCO Chair in Digital Cultural Heritage, held by the Director of DHRLab at CUT, commenced in October 2017 and will address a full range of key aspects of Digital Cultural Heritage (DCH) research and development such as:

- The establishment of a regional hub for digital and EO research in CH on the Eastern Mediterranean and Middle East as a bridge of collaboration between the region and the EU, whilst continuing to actively contribute and act as a focal point at European level;
- The documentation and analysis of cultural heritage data for both tangible and intangible heritage;
- The monitoring of CH sites for damage from looting, geo-hazards, etc.

4.2.3 Marine Safety & Security

The ECoE will establish a satellite based maritime research and services and engage in capacity building and knowledge transfer with the strategic partners, which will include a better understanding of marine and maritime processes in the eastern Mediterranean and contributing to environmental, climate and socio-economic research and studies. The ECoE will support maritime traffic, transport and exploitation regulations at national and European/Global scale. Based on a dedicated ECoE owned direct data acquisition antenna/facility, which will be used for direct data downlink and obtaining near real-time information, Cyprus will be much less rely on third party maritime surveillance and services for local satellite data. The marine safety and security sector will capitalise on secured supply of EO data and rapid development of services and customer needs in this domain and specifically in that geographic area.

4.2.4 Energy

Solar energy is the most abundant renewable resource and therefore much of the focus on sustainable energy is targeting on the optimum solar energy use. Southern Europe, including Cyprus, presents an important solar energy potential and its exploitation is critical for the regional sustainable development through an efficient energy planning and a gradual independence from fossil fuels. The main question in solar radiation and energy research is the better understanding and the improvement of measurement and forecast accuracy of solar radiation related parameters and products. Energy is a top priority in the Smart Specialization Strategy for Cyprus, so solar energy management is crucial in the energy exchange marketplace, where on-the-spot energy prices are defined by supply and demand equilibriums hence, energy ''liquidity'' is vital. Possible end-users can be national transmission system operators, national distribution system operators, environmental, energy related authorities, thematic sectors (Tourism, Agriculture, Health, Energy), industries, value adders, SMEs, decision makers**.**

4.3 Big Earth Data Analytics

The research cluster of Big Earth Data Analytics, tailored to EO data, allows the management and presentation of vast amount of EO data and the discovery of new information that is hidden in the data and promote the value adding combination with non-EO data streams. The cluster will research and develop technologies related to data mining, machine learning, visual spatio-temporal exploration of big geospatial and temporal data, semantic enrichment of EO data and products, fusing EO and crowd-sourced data generated from smart sensor technology and finally geoinformatics. In the last years, different data mining technologies were developed in order to cope with the different volume, variety, velocity and veracity of space-based data, in order to make the EO services and applications development more efficient and to benefit from all the information hidden within the data. The need to move geospatial data analysis, and more specifically EO data processing, into the "cloud" and to store and represent data in formats (e.g. data cubes) has been recognized by many organisations worldwide. Consequently, several organisations and initiatives worldwide have already started, or are preparing for the uptake of EO data into their Big Data infrastructures.

4.3.1 Information extraction

Information extraction refers to techniques such as data mining, machine learning and semantic annotation to extract actionable knowledge hidden in EO data. It is often used with general analytical methods for the exploitation of the information contained in Time Series satellite images. The main focus on the information extraction in the form of "categories of evolution" and elaboration of technologies to classify the evolutions processes of observed scenes.

4.3.2 Visual exploration & visualization

Visual exploration allows interactive data presentation in order to increase users' capabilities to understand the information content of large data sets of images and extract meaningful, relevant semantic clusters, together with quantitative measurements presented in a suggestive, visual way. Visual exploration provides a preliminary insight into optical or radar data by revealing its semantic structure and quantitative estimations regarding the structure, through simple visual representations. The benefit of the technique is that the end-user can make more informed decisions on the feasibility of the desired image processing. 3D visualization techniques provide capabilities for visual analytics of geospatial and time series data and building Augmented Reality application, by using state of the art technologies, thereby enabling flexible and fast interactive visualization of big multidimensional spatial data through linked views.

4.3.3 Crowd Sourcing & Data Fusion

The data fusion process, which combines crowd sourced data with multi-modalEO information, can be used to make a high-resolution value-added map representing the environment at the time at which the observations were made. It requires the analysis of large amounts of data and the use of automatic and semiautomatic tools. Crowd sourcing and data fusion techniques are applied on multisource data for increased accuracy of documentation.

4.3.4 Geo-informatics

Geoinformatics deal with all information infrastructures related to geospatial data, such as acquisition, analysis, processing, evaluation, and visualization, to facilitate the interpretation, management and decision making in basic research, as well as the addressing of complex social and environmental challenges. Geo-informatics can be used to identify property, infrastructure and cultural heritage monuments that are damaged as a result of geo-hazards. It includes the techniques of geoprocessing, geographic information systems, geometry computer modelling, coordinate reference systems and frames, precise position techniques and navigation.

5 Strategy for ECoE's Research Clusters

The ECoE strategy for the development of the research clusters is to integrate the recruited research personnel and the transferred CUT personnel, the research equipment and the Strategic Partners' expertise through the following activities:

1. Management activities, such as assignment of roles and responsibilities in the research groups, setting individual scientific goals and group **KPIs,** establishing a systematic collaboration scheme with the Strategic Partners, harmonising processes for internal and external teamwork, ensuring vertical organisation of the group's activities from access to equipment data to research and innovation uptake, etc.
2. Technical activities that include customisation and calibration of the ECoE infrastructure to meet the ECoE's scientific needs, technical work required to prepare the participation to European and/or global infrastructure networks (e.g., for the atmospheric equipment and receiving antenna foreseen), defining the IT interfaces for the seamless access to EO data from the research equipment, set-up of scientific models and other core tools as research enablers, defining laboratory standards guidelines and best practices, etc.

6 Conclusions

This deliverable focused on the formation of the three thematic research clusters and the four functional areas of the Eratosthenes Centre of Excellence. It described the interoperability of the 2-axis model of the DIH through both the vertical and horizontal axis in order to achieve excellence. It also provided an overview of the research organizational chart for the staff involved in the departments of Environment & Climate, the Resilient Society and Big Earth Data Analytics, the Functional Areas and the administrative areas, in terms of managers, coordinators and staff. The two-axis model, through the Functional Areas, begins with raw data, which are further developed into added value for stakeholders and the greater society. This report will be updated an additional 2 times, with update 1 taking place in month 48 and update 2 taking place in month 84 to show the implementation and adaptation of the internal structure of the research clusters and research groups.