Institutul Naţional de Cercetare - Dezvoltare pentru Geologie şi Geoecologie Marină – GeoEcoMar

GeoEcoMar's Strategic Development Plan for the period 2025 - 2030

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Chapter 1. General Framework for Strategic Development

This strategic development plan was developed in accordance with the national, European and international strategic development documents for the second half of this decade but also in the longer term. In defining the strategic directions, important roles are: the National Strategy for Research, Development and Innovation 2022-2027, the National Programme IV for Research and Innovation, as well as the major strategic programmes of the European Union in the field: the Mission for Oceans, Seas, Coastal and Inland Waters of the HORIZON EUROPE Framework Programme of the Directorate-General for Research and Innovation of the European Commission (2021-2027), the new European strategies adopted in June 2025 – European Strategy for Resilience Water (European Water Resilience Strategy) and One Ocean Pact (plan to achieve the goals of the UN World Ocean Decade 2020-2030 but also for the period after 2030). In defining the Development Plan, a major role is played by the Strategic Agenda for Research and Innovation in the Black Sea and the Common Maritime Agenda of the Black Sea, documents also adopted at national level during the Romanian Presidency of the Council of the EU (2019). The plan has been updated to include the opportunities offered by the new European SAFE Programme, given the strategic role of the Black Sea in this context. The Strategic Development Plan was developed taking into account the major problems of the current period. These include the very low level of national funding allocated to research, development and innovation, the difficulties generated by the consequences of the war in Ukraine in the Black Sea, in the Danube Delta and in the Danube River border, as well as the limitations related to the employment bans in the period 2025-2026. Another important element to consider is the efficient management of the transition periods between the European Commission's framework programmes (Horizon Europe continues to 2027, followed by Framework Programme 10 in 2028, with the first projects to be funded in 2029) and from the current National Strategy and Plan IV (which ends in 2027) to the next National RDI Plan.

1.1 GeoEcoMar Mission and Vision for 2030

The main mission is the complex knowledge (geological, ecological, geophysical, geochemical and habitats, as well as conventional and unconventional resources) of the Danube-Danube Delta-Black Sea coastal area-geo-system. GeoEcoMar is the only institute in the country that develops Oceanographic Maps of the Romanian Black Sea Continental Shelf, analyzing global climate

change and environmental effects and monitoring marine geohazards through the National Center for Monitoring-Alarm for Marine Natural Hazards EMSO EUXINUS. Other missions of national importance concern the identification of the changes suffered as a result of anthropogenic interventions and climate changes by the different sectors of the Danube and by the Danube Delta, the integrated management of the coastal area, the study of pollution in various aquatic areas (from the Danube to the delta and to the deepest areas of the Black Sea), the identification of solutions for the geological storage of CO_2 in underground structures, as well as the elaboration of proposals for the establishment of new protected areas and UNESCO Geoparks in Romania.
As coordinator of the efforts to promote DANUBIUS-RI (International Centre for Advanced Studies in River-Sea Systems) on the ESFRI (European Strategic Forum on Research Infrastructures of Global Importance) list and then towards the creation of DANUBIUS-ERIC (European Research Infrastructure Consortium), GeoEcoMar also promotes interdisciplinary research in freshwater, marine and transitional aquatic systems (deltas, lagoons, estuaries).
Vision for 2030: GeoEcoMar is the leading research and development institute in the Black Sea specialized in the geological, geophysical, sedimentological, geochemical and geoecological study of river-delta-coastal-sea systems. GeoEcoMar is one of the main actors in the implementation of European research-innovation strategies in the Black Sea area, but it also operates in other marine basins of the Planetary Ocean.

1.2. Integration of GeoEcoMar's specific research directions into the national and European research, development and innovation space

At European level, the GeoEcoMar strategy is part of the European Union's research policy, which attaches particular importance to scientific research and innovation, as a driving force for the implementation of Horizon Europe's Oceans 2030 Mission (Restoring Our Oceans and Waters). On the other hand, GeoEcoMar can be found in the implementation plans of the Mission on Adaptation to Climate Change, as well as on the Soils of Europe, especially in relation to the dynamics, volume and quality of alluvium in rivers and inland waters.
The recent EU strategic documents – One Ocean Deal and the European Water Resilience Strategy underpin the expansion of GeoEcoMar research directions for the next decade.
Particular opportunities also arise in other sub-programmes supported by DG RTD:

- The sub-programme dedicated to supporting the excellence of Research Infrastructures (in consortia in which it is already a member through participation in ERICs and other pan-European networks);
- The priorities that will implement the concept of "Circular Economy" and the development of Carbon Neutral activities;
- Sub-programmes with a role in increasing the security of the European area (SAFE Programme);
- Priorities dedicated to increasing the resilience of human communities in the face of natural hazards;
- European Research Council Grants, for scientific ideas of excellence;

- The COPERNICUS programme and the new opportunities of the SENTINEL-ESA Missions;
- The priorities that will promote Industry 4.0, the new generations of sensors and those dedicated to "Big Data" (up to EOSC, European Open Science Cloud) – for the marine environment.

Efforts to move towards a carbon-neutral society open up many directions:

- Study and use of marine renewable energies (waves, currents, synergies – offshore wind combined with artificial reefs, algae as biofuels);
- Increasing the use of natural gas as "transition solutions" (which supports the activities of studying conventional and unconventional methane resources);
- Hydrogen – potential resource (large potential in the Black Sea).

Apart from the opportunities contained in DG RTD's future Horizon Europe programme, GeoEcoMar can be found in the plans of other Directorates-General, such as the Directorate-General for the Environment and the Directorate-General for Maritime Affairs and Fisheries (DG ENV and DG MARE) – where GeoEcoMar is already particularly active in projects concerning the transposition of European framework directives. Increased collaboration within Member States' Joint Programming Initiatives will translate into more funding opportunities in internationally funded projects. Currently, JPI Water (Joint Programming Initiative for Water Resources) and SBEP (Sustainable Blue Economy Partnership), are preparing or have already launched joint competitions on topics on GeoEcoMar's list of scientific priorities, as well as other competitions, to fund advanced research using GeoEcoMar's major research infrastructures. GeoEcoMar's international opportunities are also related to the existence of the United Nations Ocean Decade 2020–2030, as well as to the international policy of implementing the UN Sustainable Development Goals (SDGs).

At the national level, both the National Strategy for Research-Innovation and Smart Specialization for 2022-2027 and the National Research-Development-Innovation Plan for the same period are currently in force, as a fundamental tool for the implementation of the Strategy. Several competitions have already been launched through PN IV, GeoEcoMar already participating in them. GeoEcoMar's development strategy is part of the current national research strategy, which concerns research-development-innovation as a major tool for sustainable economic growth and the promotion of the knowledge-based economy.

GeoEcoMar's strategic development plan provides for actions in accordance with its own specificity to contribute significantly to the implementation of each of the 4 General Objectives of the National Strategy (NSMO):

OGSN1. *Development of the RDI system*: especially by opening up new world-leading fields and updating working methods in traditional fields.

OGSN2. *Supporting innovation ecosystems associated with smart specialisations*: in particular by strengthening collaborations with local and regional administrations and private companies with which there are common interests for innovation. GeoEcoMar's research directions will take into

account the areas of Smart Specialization, especially those related to the Main Field Environment and Ecotechnologies, with 2 major sub-fields of interest: Environment and Blue Economy. GeoEcoMar also orients its activities (geological storage of CO_2) towards the sub-field "Modern technologies for low or zero emission power generation".

OGSN3. *Mobilization towards innovation* – by increasing collaboration with the private sector and better technology transfer, both in specific competitions PN IV, the Nucleus Program and Horizon.

OGSN4. Increasing European and international collaboration: by strengthening participation in the European consortia of which it is a member, strengthening its position as a regional leader in geosciences in the Danube-Delta-Black Sea region.

In the National Plan for Research and Development Innovation IV (PN IV), for the period 2022-2027, the Ideas, Human Resources, Challenges, Innovation Partnerships and Research Infrastructures Programs contain numerous opportunities for GeoEcoMar researchers.

The Research Programme in Areas of Strategic Interest contains two key sub-programmes: Sub-programme 5.9.4. DANUBIUS-RI, respectively Subprogramme 5.9.6. for the Blue Economy at the Black Sea.

The Sub-programme Supporting Institutional Excellence is an important point of NP IV, where GeoEcoMar already participates with great chances of success. These projects contribute significantly to the development of institutional capacities, from the training of human resources, to new infrastructure and equipment, dedicated to opening new areas or modernizing existing ones.

1.3. Characteristics of the socio-economic environment and social needs

Romania is in last place, at a great distance from the other member states of the European Union, in terms of public investment in Research and Innovation. PN IV has so far had very few competitions for funding project proposals, usually for large-scale and low-value project proposals, except for Centers of Excellence. The competitions had a very low success rate, due to the massive participation of all the actors involved in Romania, but also the low funding per competition. Public expenditure on research and development stagnates at just over 0.1%, contrary to the national objective of the Research Law (1% of GDP for public expenditure in RDI). That is why Romania is a modest innovator, competitiveness being affected by a reduced research-innovation capacity, combined with a low demand for RDI due to the structure of the economy (multinationals are very active at the level of services but the RDI nuclei are in other states, while most national companies do not have such activities). Thus, attracting private partners in research projects to co-finance the activity in order to quickly transfer RDI results and capitalize on them on the market is difficult. The particularly tense situation in the Black Sea due to the war in Ukraine has created even more difficulties related to scientific collaboration in this region. The return to the rhythm of the works at sea that existed before the war was very slow. On the other hand, it is precisely for this reason that the role of science diplomacy in the Black Sea Region must be intensified.

Domestically, nationally, GeoEcoMar relies on:

- The need to implement European directives and legislation (especially in the marine and environmental fields) - where GeoEcoMar can make a decisive contribution;
- The coordinating role of GeoEcoMar for the ESFRI DANUBIUS-RI project and in the development of the Danube Delta Supersite, but also the strategic importance of DANUBIUS-RI at national and European level;
- Position of partner of the Ministry of Foreign Affairs in the activities of developing specific agendas at the Black Sea and supporting the MFA at global level;
- Continuation of the works for the opening of the Neptun Deep gas field in the Black Sea by OMV-Petrom;
- Continuing the implementation of the structural funds, especially in the PCIDIF Plan (Structural Funds for Research, Innovation, Digitalization 2023-2029) – in which the DANUBIUS-RO project is operational, but also future dedicated calls for projects on the National Research Infrastructure Roadmap (new ship, EMSO EUXINUS);
- Recent plans to open up national legislation for private investments in the Romanian maritime area.

Sources of financing and financial policies

While government contracts will continue to remain the main source of funding, GeoEcoMar supports its research staff to engage in numerous funding proposals from diverse sources. The goal is to attract funding from international research, development and innovation programs, from European structural funds for institutional development or for human resource training, from sectoral funds, together with private sources to the extent that they arise. All the internal uncertainties, but also the stable points for the next period, require GeoEcoMar management to pay special attention to the development of activities. Most national and European research projects supported by public funds receive pre-funding. However, most of the activities of the Structural Funds through the operational programmes are settled after their handover and reception. Likewise, most payments in contracts with private operators are made at the end of the works. That is why planning the financial flows, receipts and payments to be made. GeoEcoMar's management will permanently monitor the smooth running of these financial flows, but will also seek as much as possible that the pre-financing of the works is as high as possible. It is necessary to negotiate and open pending credit lines with banks that can offer good conditions (minimum ineligible costs) so as to avoid default.

Chapter 2. GeoEcoMar Development Strategy until 2030

One of the main directions of GeoEcoMar's development strategy is to strengthen its leading position in the field of marine research, especially in the Black Sea basin, but also in the Danube

Region. This position will be strengthened through multidisciplinary scientific projects, international collaborations and the capitalization of existing research infrastructures. An important pillar of the GeoEcoMar strategy is the development and operationalization of the pan-European research infrastructure dedicated to interdisciplinary studies on river-delta/estuary-marine area systems under the influence of rivers – DANUBIUS-RI. After having proposed and then coordinated the development and consolidation of the scientific case for a pan-European research infrastructure of global importance, exiting the Danube region and attracting other river-sea systems from Europe, it is important that GeoEcoMar successfully coordinates the birth and operation of DANUBIUS-ERIC and the expansion of its activities globally. The development strategy includes the extension of the area of scientific interest beyond the classical river-sea system, by studying the geological-sedimentological-geophysical processes in the entire Black Sea basin, as well as in the Mediterranean, Caspian and Atlantic Oceans.

An important direction of the institutional development strategy is the permanent updating and development of the GeoEcoMar database, so that it is efficient, complex and interoperable with other European databases. The goal is to efficiently capitalize on the accumulated information, both for research and for technological development and innovation. The institution will strengthen the implementation of the FAIR principles and will actively participate in European initiatives such as EOSC (European Open Science Cloud) and the Large European Marine Databases (EMODnet). Through the specifics of its activities, GeoEcoMar maintains a constant collaboration with numerous institutional and private partners. These collaborations must be maintained, new directions must be opened that must be extended and diversified, with particular attention to increasing the quality of services.

Chapter 3. GeoEcoMar Scientific and Financial SWOT Analysis for 2025-2030

STRENGTHS	**WEAKNESSES**
• Expertise in areas of global importance and interest: research provided by GeoEcoMar in the marine field, on the Danube and Danube Delta, in lagoons and coastal areas; research and consultancy/technology transfer projects, in national, European, international programmes, contracts with administrations; consistent participation in projects funded by the EC (DG RTD) for the implementation of the Black Sea Strategic Research Agenda and the *Oceans Mission*; • Reputation: nucleus of highly specialized researchers; about 3 decades of experience through participation	• Insufficient highly qualified human resource for current requests for participation in projects or coordination of proposals and advanced age of some of the senior researchers (full process of transition between generations); • The modest quality of university training of young employees, which requires intensive additional training at work;

and coordination in European projects; GeoEcoMar is the coordinator of the ESFRI DANUBIUS-RI (DANUBIUS-ERIC, coordinated by Romania, from 2025), of the Danube Delta Supersite and of the Geosciences laboratories in the Hub (under construction); • Specialists: high degree of qualification of some researchers; international experience in projects, with articles and citations in WoS listed publications; • Infrastructure: modern and diversified, well integrated into the European Research Area: the multidisciplinary oceanographic research vessel *Mare Nigrum,* the largest in the Black Sea; EMSO-EUXINUS (recently fully modernized), river and coastal research vessel *Istros*; laboratory pontoon for research in the Danube Delta; boats for research for various river, delta, lagoon, coastal environments; specialized laboratories; modernization in the last 4 years of field; • Provider of strategic scientific data in critical areas (Black Sea) • Permanent development of new directions and methods of research and special training of personnel for the use of new equipment. • Competitive salary system, which promotes performance and involvement in projects, application of the basic principles of social protection; • Research activity carried out in Integrated Management System (ISO 9001, ISO 14001, ISO 45001), and in Innovation Management System, European Charter and Code of Conduct for Researchers.	• The age and chronic technical obsolescence of the multidisciplinary oceanographic research vessel Mare Nigrum; • Difficulties in obtaining funds for the construction of a new oceanographic research vessel and/or for its capital modernization; • Difiicile orientation of young researchers as well as many of the mature ones towards rapid publication in journals with a high impact factor of results, with an impact on the visibility of the results; • Difficulties in attracting young seafarers (seafaring personnel) to the multidisciplinary oceanographic research vessel *Mare Nigrum* and to the vessel *Istros* due to competition with the private sector, which ensures higher pay. Thus, 2 aspects are relevant: 1) the competition of multinational shipping companies that ensure clearly higher salaries and 2) on the Danube there is strong competition from grain carriers from Ukrainian ports from the Danube to Constanta, which absorbs the available workforce. In addition to these, the abolition of high schools for seafarers in the Lower Danube area is also relevant.
OPPORTUNITIES	**THREATS**
• The existence within the new National Strategy for Research – Innovation 2022-2027 of two sub-programs in which all GeoEcoMar activities (Blue Growth and DANUBIUS-RI) are found, in addition to other traditional sub-programs for the institute; • The existence of competitions in European programmes by DG RTD, DG MARE, DG, REGIO; • The Mission for the Restoration of Oceans and Inland Waters of HORIZON EUROPE (Danube – Black Sea Lighthouse) and SBEP (Sustainable Blue Economy Partnership) with related competitions; • Adoption (June 2025) of two important strategies of the European Union (One Ocean Pact and EU Water	• The very small national budget allocated to Research and Innovation, compared to the European average and the uncertainty regarding the allocation of amounts for institutes through the Core Program (contract signed until the end of 2026, with reduced amounts and delayed financing at the beginning of each year). Uncertainty of funding mechanisms after the completion of the current Core Programme (from 2027 to 2030); • Lack of predictability in the allocation of research funds for already existing projects,

Resilience Strategy), for the implementation of which funding priorities will be prepared • Creation of DANUBIUS-ERIC (ERIC – European Research Infrastructure Consortium, the first international research organization sponsored by Romania, GeoEcoMar being the coordinating institution of the efforts to include in the ESFRI Roadmap and the preparation of the scientific community for the creation of ERIC) • EU legislation, which allows young people to be attracted from any Member State; • Development of SENTINEL missions, European efforts to impose Open Access policies, FAIR Data, opportunities of the EOSC (European Open Science Cloud) program; • The existence of training mechanisms through ERASMUS+; • The obligation of the Romanian state to implement all specialized European directives, which increases the interest in GeoEcoMar's activities; • Activities for the exploration and exploitation of offshore natural gas (from 2025 also in Bulgarian waters); • Strong interest in the development of offshore wind farms, especially off the coasts of Romania and Bulgaria; • The existence of Asia-Caucasus-Black Sea-Europe reconnection plans (submarine cables); • Existence of plans to launch innovative programs to prevent/mitigate the effects of the war in Ukraine (e.g. for mine identification); • The launch of the SAFE (Security Action for Europe) Program, which finances topics related to supporting security in Europe, the Black Sea being an area of geopolitical and strategic interest; • Science Diplomacy Activities at the Black Sea.	which makes multiannual planning difficult; • Uncertainty regarding the organization, calendar and budget of future national competitions; • The completion of the National Program IV at the end of 2027 and the existence of a transition period until the future National RDI Strategy after 2028, which may lead to other syncope in funding. • Completion of the Horizon Europe Framework Programme at the end of 2027 and transition to the future Framework Programme 10. • The prohibition of hiring new research staff creates problems in maintaining a systematic and permanent training of the new generations; • Possible migration of researchers to the private sector or international institutes; • Permanent changes of rules for national funding of research – innovation and permanent reduction of the RDI budget. The impossibility of financially stimulating deserving personnel due to the ban on prime ministers, the obligation to maintain the salary fund from 2026 at the level of 2025, given that the funding is based on competitions, numerous external ones (restrictions valid until the end of 2026); • Long periods between the submission of statements and the actual payment of the payment for projects from the Structural Funds and the ineligibility of some costs; • Annual fluctuation (generally negative) of the amounts of money allocated to IOSIN; Accentuated political instability in the Black Sea Basin due to the war.

Chapter 4. Strategic development objectives and directions

The specific strategic objectives of GeoEcoMar are:

4.1 Development of specific research-development-innovation themes

A. *Continuing research activities in traditional fields and introducing new study methods and methodologies, which increase the degree of detail and understanding of the studied processes;*
B. *The application of the DANUBIUS-RI Research Agenda in GeoEcoMar but also its permanent updating;*
C. *Modernization and implementation of the FAIR principles in the GeoEcoMar database and its connection to the major European initiatives in the field;*
D. *Opening up new areas of research and specializations, in close connection with the requirements of the current global market.*
E. *Better collaboration to support knowledge transfer for the development of the Blue Economy, by partnering with private companies interested in the business potential of the marine environment.*
F. *Involvement in the restoration of aquatic ecosystems specific to the Danube - Danube Delta - Black Sea system by entering into complex consortia in the Danube - Black Sea Lighthouse (Oceans and Waters Mission - Starfish 2030)*

The new areas and specializations proposed for development within GeoEcoMar, which respond to current global challenges and encompass the use of new technologies, are presented in the following paragraphs. Most of these areas have already been opened in the recent period, but their development in the main body of activities of the institute will have to be continued and emphasized:

(1) Study of emerging pollutants in the Danube – Danube Delta – Black Sea system (e.g. microplastics, substances with harmful impact on organisms, started in the institute but which will also extend to other groups of emerging pollutants);

(1) Study of unconventional marine energy sources (e.g. gas-hydrates, bio-gases) in deep sea areas, as well as renewable energies in the marine environment (waves, offshore wind resources);

(2) EXPANDING THE USE OF SATELLITE TECHNIQUES offered by the SENTINEL missions and the COPERNICUS programme for the detailed study and monitoring of sedimentological, geochemical and biogeochemical processes taking place in the Danube-Danube Delta-Littoral-Black Sea system;

(3) Integrated sedimentology and hydraulics studies by applying new 3D models for the river-sea interaction areas and for the coastal area, in order to scientifically substantiate the restoration plans of specific habitats;

(4) Integration of the most modern satellite and drone observation systems, in situ measurements and hydrodynamic numerical models, for the creation of "Digital Twins" for the Danube – Danube Delta – Littoral – Black Sea system;

(5) Deepening of the new concepts of ecohydraulics and of the "Nature Based Solutions" type protection and adaptation solutions (NbS; e.g. Development of the concept of "green" protection against floods and/or erosion);

(6) Supporting the development of the blue bioeconomy, through partnerships with companies interested in capitalizing on the potential of biological and abiotic resources in the coastal area and the continental shelf (determining the limits of sustainability, in which these resources can be exploited without generating irreversible negative processes);

(7) Integrated biogeochemical study of the processes and phenomena that take place in the abyssal part of the Black Sea, in order to make the connection between the abyssal anaerobic microbiome and the geological processes characteristic of the Euxine environments on the geological time scale;

(8) Extension of the use of genetic methods for the study of organisms in the Danube – Danube Delta – Littoral – Black Sea area;

(9) Expanding the archaeogeophysical studies in the underwater field and studying in order to capitalize on the cultural and archaeological potential of the Danube-Delta system – the littoral area – the continental shelf of the Black Sea, but also deepening the collaborations with teams of historians and other specialists, especially on the archaeological sites in the land part of the Lower Danube - Dobrogea;

(10) Expanding collaborations with industry to identify efficient and useful geological reservoirs for geological CO2 capture, as a geo-engineering method to support the Net Zero Carbon Economy;

(11) Development of studies on underwater noise, an area absent in the Black Sea area and requested by the MSFD (Marine Environment Framework Directive);

(12) Development of activities for the enhancement of the geological heritage, through the rehabilitation of geological reserves, the creation and promotion of geoparks, including through the development of Citizen Science programs.

4.2 Expanding collaborations, partnerships and beneficiaries

(1) Continuing collaborations with institutional partners (public and private), in order to capitalize on the knowledge gained in research projects;

(2) Extending collaborations to other government agencies with common interests, strengthening collaborations with OMV-Petrom for the development of gas fields in the Black Sea;

(3) Strengthening collaborations with private partners interested in the development of offshore energy fields in the NW part of the Black Sea;

(4) Expanding activities throughout the Black Sea basin, in collaboration with European External Action, MFA and DG NEAR;

(5) Expanding the scope of clients and joining clusters to take advantage of the new opportunities offered by national legislation (opening of the offshore area for businesses in the field of Blue Economy) and European legislation (One Ocean Deal, Water Resilience, Ocean Mission).

4.3 Modernization and development of research infrastructure

(1) Replacement or modernization of the two research infrastructures that are Objectives of National Interest and that are included in the National Research Infrastructure Roadmap of 2021 (the future oceanographic research vessel Mare Nigrum 2 – as fast as possible and the Black Sea Security Alert Center – EMSO EUXINUS – in 2030);

(2) Successful completion of the construction of the geoscience laboratories at the Hub and the Danube Delta Supersite (DANUBIUS-RO);

(3) Permanent modernization of existing research equipment and infrastructures and purchase of new equipment.

4.4 Continuation of generational exchange and rejuvenation of GeoEcoMar's research team

Already undergoing a significant rejuvenation process, the GeoEcoMar research team is made up of numerous young researchers. The strategic priority for the next period is their rapid and efficient integration into European, international and national research projects, as well as the accelerated increase of their level of training and competence. Currently, 4 researchers under the age of 40 are partner coordinators for several Horizon Europe projects. The objective is for this core to expand, and for the new generations to take over the responsibilities of coordinating new proposals and then research projects – contributing to strengthening GeoEcoMar's position in international research networks. In order to sustain this process, the young researchers in the institute must meet the conditions for professional advancement at the CIS and CIS levels, and then be actively involved in teaching processes and growth, in turn, of future generations of GeoEcoMar researchers.

As for the recruitment of new staff, unfortunately the legislation in force prohibits hiring. However, as soon as these restrictions end, the process of identifying potential future leaders in marine research must be resumed as soon as possible. It is particularly important that the human resource is not only local and that the search for young people with potential is done both at EU level and in the Eastern Neighbourhood (Moldova, Ukraine, Georgia), through the EURAXESS platform and Social Media. GeoEcoMar's institutional network, with partners from the European Union and the country, allows the schooling and training of young people recruited in some of the best profile centers in the world, in all areas of activity of the institute. It is also a priority to recruit mature research staff, at the level of CIS or CIS, who can quickly take over the coordination of new research proposals, who can train young researchers on the go, who can participate with new ideas in the permanent modernization of GeoEcoMar. For strategic development projects, it is essential to use the experience, vision and wisdom of seniors with international experience or with great experience in the targeted fields.

As for the technical staff – currently the most advanced average age is that of the Technicians, due to the disappearance of schools in the field for many decades. It is necessary to gradually replace them with young engineers, in the initial period a close collaboration between newcomers and those who leave is required, in order to ensure the optimal transfer of knowledge.

4.5 Development of specific research-development-innovation themes

For the development of GeoEcoMar's specific research-development-innovation themes, activities will be carried out on several levels, both domestically and internationally, both by the management of the institute and by the entire R&D staff within GeoEcoMar.

a. Activities to be carried out internally between 2025 and 2030

The management of GeoEcoMar has a fundamental role in the preparation of participation in the competitions within the new National Program IV of Research-Development-Innovation, especially in consortia for subprograms of major interest to the institute, such as Subprogram 5.9.4. DANUBIUS-RI and Subprogramme 5.9.6. for Blue Economy in the Black Sea (competitions launched in SBEP – Sustainable Blue Economy Partnership). We will support the research groups so that they participate in as many competitions as possible, with as many proposals as possible. One of the means by which GeoEcoMar researchers are supported in making research-innovation proposals at all competitions that have been and will be held in PN IV is the Project Management system, which will be developed.

It is important to create opportunities for young GeoEcoMar researchers to develop their ideas in future projects, both national and in future European competitions. Their strategic integration in the projects of the Core Programme, under the guidance of senior colleagues, but also in international projects, in collaboration with colleagues from the European consortia - including the pan-European consortium DANUBIUS-RI and the partners in the H2020 DOORS consortium will strengthen the institutional capacity for research and innovation.

GeoEcoMar will act at all decision-making levels at governmental and parliamentary level to present the opportunities opened by European initiatives (Ocean Mission, One Ocean Deal and European Water Resilience), the special opportunities that Romania has by opening up to the Black Sea, as well as the possibility of implementing EU requests (directives, strategies) by using GeoEcoMar's knowledge resource. The need to build a new research vessel to replace the Mare Nigrum will be permanently supported by GeoEcoMar management at the government level.

GeoEcoMar will continue the relationship with the MFA to strengthen Romania's role in the Black Sea region; the science diplomacy activities will continue and will be expanded. The collaboration with the Navy (Hydrographic Directorate) and the Ministry of Interior (Coast Guard, Border Police, ISU Dobrogea) will be continued and strengthened to increase the security of coastal communities, especially in the current conflict conditions.

GeoEcoMar has been and is already involved in the elaboration of laws and GDs (coastal zone law, drawing and updating the protection limit for the coastal area, the Marine Environment Measures Plan carried out by GeoEcoMar in 2017 transposed into GD 432/2020 on the approval of the Program of measures for achieving the good ecological status of the Black Sea marine

region, the National Coastal Zone Management Strategy, Updating the ARBDD Management Plan). GeoEcoMar will continue the activity of supporting and developing the necessary documentation for the completion of various national strategies, as well as other laws, GDs, plans and regulations regarding especially the marine and coastal area of Romania.

b. Activities to be carried out at European and international level in the period 2025-2030

At European and international level, GeoEcoMar will continue to strengthen its position as a regional leader in the Black Sea region and that of the Lower Danube and Delta in the field of marine geosciences and in river-delta-lagoon-coastal-sea area systems by actively participating in the development and then implementation of dedicated strategies in the field, as well as actively participating in research and development consortia on topics of interest for the future. Thus, the activity of implementing the Strategic Agenda for Research and Innovation in the Black Sea and of developing and updating it until the 2030 time-horizon will be continued. GeoEcoMar, in accordance with its specific objectives, will focus its scientific activity especially on the mentioned directions: the dynamics and ecological health of the marine environment, the geological and geoecological evolution of the Black Sea, its energy resources (conventional and unconventional), the study of the interaction of the Black Sea with riparian river systems, the analysis of the underwater archaeological heritage and its capitalization. An important role will also be played in the creation of the first Digital Twin for the Black Sea Coast system (the Digital Twin at sea basin level, including the coastal area of Romania, the Danube Delta and the Razelm Sinoie Lagoon System) and its extension to the entire Black Sea basin, in pilot areas. The period 2025-2030 is also the period in which DANUBIUS ERIC will become operational, and GeoEcoMar will continue to play its active role in supporting it, as well as the further expansion of DANUBIUS ERIC to other European states and beyond. Towards the end of this period, the full and successful operationalization of the main Romanian components of DANUBIUS-RI will have to be ensured, and GeoEcoMar will play a major role in promoting its specific scientific services to the international user community. The Institute will support the collaboration of DANUBIUS-RI with the other pan-European research infrastructures in the field of environment, the development and implementation of DANUBIUS COMMONS. Through active collaboration with European and international partners from existing consortia, especially through intensive participation with strategic partners in the Black Sea area, GeoEcoMar researchers will be involved in numerous project proposals for both HORIZON EUROPE and Framework Programme 10 and other competitions organized by the EC. In relation to the current situation in the Black Sea area, GeoEcoMar will act at all levels of the European Commission to strengthen the geopolitical role of the European Union in the region, especially in the current situation of war at the basin level.

4.6 Expanding collaborations, partnerships and beneficiaries

The openness to consortia of specific pan-European research infrastructures will contribute to the growth of the community of users of GeoEcoMar infrastructures, along with increasing the involvement of its own R&D staff through a higher number of research projects.

The use of data obtained through EMSO ERIC (including the Romanian component) in Open Access regime will be intensified – which will open the collaboration with numerous categories of new users (especially new private beneficiaries).
Preparing for future competitions on the theme of DANUBIUS-RI is another major objective, aiming to improve the sustainable management of the entire river-delta-sea system, with special attention to the Danube Delta Biosphere Reserve. Increasing and diversifying the number of private partners and clients in the public administration are prime objectives for the institute. The entry into active clusters, which will promote collaboration between the public-private environments will support the implementation of these objectives, together with the measures provided for in the previous point. However, it is also necessary to develop a detailed plan for the individualization and resolution of the problems related to Intellectual Property Rights as well as the way to respect them, both in collaboration with local and national administrations, as well as with private partners. The implementation of this plan will also contribute to the consolidation of the financial situation, in terms of the royalties that will be collected. Participation in as many European research consortia as possible, as well as other programs managed by the European Commission, will be encouraged and collaborations with the private sector and local and national administrations will be continued and expanded. The massive participation of GeoEcoMar researchers in the PN IV and next competitions will be encouraged.

Chapter 5. Human Resources Strategy

GeoEcoMar has adhered to the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. Thus, the institute obtained the Diploma of Excellence for Human Research Resource – HRS4R in July 2025 and is in the HRS4R intermediate phase. That is why efforts for the period remaining until 2030 are dedicated to the full implementation of the demands of this European Charter. We are talking about:

- Introducing clear ethical and professional principles on the rights and responsibilities of researchers;
- Transparent and fair practices in recruitment, selection and evaluation processes;
- Supporting continuous training and professional mobility;
- Improving the working conditions and career path of researchers;
- Promoting international recruitment and an environment that attracts top talent;
- Supporting ethics and integrity, merit-based assessment, gender equality, non-discrimination, continuous professional development.

In addition to the strategic objective of fully implementing the European Charter for Researchers, GeoEcoMar also envisages specific objectives in the field of personnel policy:

- Increasing the number of research staff in relation to the total number of employees;
- Reducing the average age of researchers (increasing the percentage of the group under 35 years old), by attracting young researchers (when hiring will be allowed again);

- Attracting mature staff, capable of coordinating and winning new research proposals, is also a necessity;
- Attracting specialists from EU member countries and the Black Sea basin to the institute, as well as opening up to young researchers from any area of the world;
- Diversification of specializations, including on interdisciplinary fields, openness and better development of new fields;
- Training research staff for the efficient use of newly acquired equipment and infrastructure;
- Poly-qualification of technical personnel, mainly intended for activities carried out on board research vessels and in laboratories;
- Strengthening the training of auxiliary personnel managing national objectives (seafarers, IOSIN EUXINUS personnel), by developing skills for efficient operation and optimal capitalization of specific research, primary processing and data processing equipment;
- Ensuring continuous training and permanent updating of the knowledge of the administrative staff, in order to maintain a high level of operational efficiency of the institute.

Ensuring the exchange of generations and the rejuvenation of GeoEcoMar's research team must continue the evolution of recent years.

The policy of training young staff, including by sending them to courses and specializations at some of the best profile centers in the EU and in the country, will continue, and they will be made responsible both by the obligation to be a partner coordinator in consortia of proposals and by their involvement in the teaching processes, initially occupying positions of assistants and. The training will continue on the necessary line to teach them to master the flow – writing proposal – coordinating activities in projects (field – laboratory – training for writing publications), being mandatory the presentation and capitalization of the results.

We also aim to better communicate GeoEcoMar's job offer to universities in the country and abroad and to expand contacts with both traditional partner universities and new interested centers. In order to be able to expand the range of selection of potential future young collaborators, we will resume collaborations through the ERASMUS+ programs. Thus, in 2024 – 2025, collaborations of this kind resumed (École Nationale des Sciences Géographiques Marne-la-Vallée, France).

The referral to specializations in fields and with top professors, as well as enrolling in doctorates in co-supervision with universities and representative professors in Europe, are other activities that have already started a few years ago and will continue in the period 2025-2030.

An important problem is the lack of a generation of mature researchers (the generation between 50-65 years old is the smallest in the institute) who are also the most experienced in writing, winning and coordinating research projects. When hiring is possible again, discussions with people with outstanding results, wishing to continue their careers at GeoEcoMar, either permanently or for predetermined periods, regardless of country of origin or nationality, will be resumed. An important objective is to train specialists and technicians for the management of the specific high-tech research equipment installed on the Mare Nigrum vessel (and in the case of a new research vessel and the modern equipment that will be installed on it) and laboratory equipment. As technical schools have not been operating for decades, it is important to attract

engineers/physicists/chemists/young graduates in different fields, eager to specialize in operating on specific equipment, or by attracting mature personnel, with higher or post-secondary education, willing and able to re-specialize. Maintaining the incentive salary system in the collective bargaining agreement is an attractive mechanism for most of the institute's members and can be a source of attraction for future researchers. An important aspect is hiring staff only for well-established periods of time, on projects that require their skills, and if the activities become permanent - attracting them to the permanent staff.

The policy for hiring staff at the beginning of the career will include the initial probationary employment, in order to be able to verify the compatibility between the new employee and the institute.

GeoEcoMar also supports the permanent training of its administrative staff to remain in constant contact with the latest information from the world of science or legal and administrative norms, most of the employees being involved in periodic training processes and training courses.

The support of the staff was also stimulated by other methods, from providing material aid to people with health problems (according to medical evidence). The prohibition of granting these incentives in the current period is temporary, and this practice, essential to maintain team spirit in GeoEcoMar, will be resumed as allowed.

Despite the current difficulties, the management of GeoEcoMar, together with the institute's staff, will continue to support the increase of staff excellence but also of the group identity.

Chapter 6. Mechanisms for stimulating the emergence of new research topics and themes

The development of new topics and research themes is achieved by constantly informing about new discoveries and challenges in the relevant fields of activity, but also by constantly informing about the dynamics of European and national environmental policies and the trends of evolution of the main markets (environmental, energy, transport, tourism):

A. Permanent information on trends and scientific discoveries in the specific fields of GeoEcoMar, including the latest scientific articles from specialized journals with major impact (such as Nature and Science), but also on the main opportunities in terms of the use of new technologies, infrastructures or new directions (the best example being the SENTINEL Missions and the COPERNICUS program);
B. The emergence of new European and national policies that either have an impact on the specific field of GeoEcoMar, or allow major contributions from the institute (e.g. – One Ocean Pact, Water Resilience Strategy, SAFE Plan, Blue Economy, Green Deal, plans to make Europe carbon neutral);
C. Dynamics of economic fields, with an impact on demand from the private sector;
D. Identifying windows of opportunity and new directions in existing collaborations.

The Institute benefits from the existence of EU Framework Directives, which require resolution at the level of the member countries. This leads to the emergence of specific requests for the institute, and with the anticipation of the emergence of a new category of requests, the institute plans to develop its competences in that direction. Examples of such directives or legal provisions are, for example, the *Marine Strategy Framework Directive* (Directive 2008/56/EC), which requires Member States to report on the achievement of 'good environmental status' in marine waters by 2030 and their monitoring (COM(2017)3). The new European Water Resilience Strategy will be followed by implementation rules that will become opportunities for the institute.

The way of implementing these new directions will have to be maintained the one that has worked in recent years:

a. Establishing the new area of development, identifying the best interested participants in the European market, establishing contacts with them (or contacting the best partners in the already existing network);
b. Identifying young people with potential who have the capacity to be trained in these areas;
c. Establishing a work plan (internships covered by projects, possibly enrolling in a doctorate) – according to the principle "Learning by doing" and sending young researchers to specialization;
d. Permanent supervision of the evolution of young researchers towards the new and preparation of opportunities for training/scientific collaboration, possibly attracting part-time or for a limited period of time mentors from abroad or from Romania;

This method has already been successfully applied within the institute and has allowed the opening in recent years of new areas of research, such as the use of satellite data to study sedimentary flows, dialogue with local communities and the implementation of sustainable development plans (governance), the study of microplastics in water and sediments, the development of skills in the field of molecular microbiology and the use of genetic methods in the field of marine biology, development of Nature Based Solutions methods (protection based on methods using natural ecosystem services). Numerous other researchers have completed refresher courses to update the working methods in traditional areas of GeoEcoMar.

An important mechanism that has stimulated the activity of researchers in the institute is the remuneration according to the type of project, with special attention being paid (in accordance with the relevant GDs on the payment of researchers) to those who bring and actively contribute to European, international, PN IV or third-party projects. GeoEcoMar's Collective Bargaining Agreement allows all employees to get involved in seeking and obtaining research or technology transfer contracts, services or innovation.

Chapter 7. R&D-Innovation Infrastructure. Research facilities. Investment strategy and plan.

GeoEcoMar has the following specific objectives for RDI infrastructure:

A. *Construction of the national components of DANUBIUS-RI under GeoEcoMar: creation of the Danube Delta Supersite – a living laboratory – and construction of the geoscience laboratories at the Murighiol Hub, using structural funds*

The role of GeoEcoMar in the construction of the International Center for Advanced Studies for River-Sea Systems – DANUBIUS-RI concerns the construction of the Geosciences laboratories in the Murighiol Hub and the Danube Delta Supersite (7 field study areas with 52 in situ measurement stations). The consortium for the construction of the national components of DANUBIUS-RI is led by the National Institute for Research and Development for Biological Sciences, and GeoEcoMar collaborates in this project with the Romanian Academy and the National Institute for Research and Development Danube Delta.

In October 2024, the PCIDIF DANUBIUS-RO Strategic Project was signed, worth 130 million Euro. This project supports the construction of the Murighiol Hub and the Danube Delta Supersite (deadline – end of 2029). GeoEcoMar, responsible for the Danube Delta Supersite and the geoscience laboratories at the Hub, has allocated the amount of 40 million Euros. In addition, for the operationalization of these components, the preparation of the national scientific community for the use of DANUBIUS-RI and for the good start of the DANUBIUS-ERIC activity (main responsible), GeoEcoMar is a member of the consortium of the DANUBIUS-RO2 project (PN IV, 2025 – 2028).

B. *Replacement or modernization of research infrastructures that are Objectives of National Interest and that are included in the National Research Infrastructure Roadmap of 2018 and 2022 (Mare Nigrum 2 and Black Sea Security Alert Center – EMSO Euxinus)*

GeoEcoMar will continue to increase the use and capitalization of the results of the two Research Infrastructures of National Interest (IOSIN): Mare Nigrum – Istros and EMSO-EUXINUS. Their existence helps to integrate into Horizon INFRA-DEV proposals.

However, IOSINs must be permanently modernized or even replaced. This process will have to take place between 2026 and 2030. The EMSO-EUXINUS system has already been upgraded in the period 2021-2023 in the POC program (EMSO-EUXINUS Upgrade Project). Through this project, in addition to the modernization of the existing GNSS beacons and stations and the installation of two new coastal stations (Constanta and Sulina), an underwater ROV robot, with equipment corresponding to the current period, and an AUV (Autonomous Unmanned Vehicle) specialized in marine seismoacoustic measurements were also purchased.

The future application must be prepared in advance to bring the equipment of this IOSIN up to the standards that will appear in the period 2029-2030. Both EMSO EUXINUS and the ship Mare Nigrum 2 are included on the National Research Infrastructure Roadmap, which allows participation in the competitions organized in PCIDIF and next. The major problem is the very high costs of a new ship. The ship Mare Nigrum can operate until the end of 2027 (ship built in 1971, exceptional extension of the age limit due to modernization works in the last decade). It will have to be replaced by a modern research vessel, capable of carrying out multidisciplinary research at the level of the Planetary Ocean. This new ship – temporarily named Mare Nigrum 2 – was included on the 2018 National Research Infrastructure Roadmap, resumed in 2021. Unfortunately,

the cost of the ship (about 50 million euros) was far too high to be included in one of the previous operational programs. GeoEcoMar Management is currently actively taking steps to include it as an objective of national strategic interest in the future European Ocean Pact. The completion of the works for the exploitation of gas in the Black Sea, the study and eventual exploration and exploitation of hydrogen, sapropel and hydrogen gas in the Black Sea, but also of renewable energies and the study of natural hazards for the protection of coastal communities are strategic elements on the governmental and European agenda that support the financing of the future ship. If a new ship is not possible, the full modernization of the Mare Nigrum ship must be considered.

C. *Permanent modernization of existing research equipment and infrastructures, acquisition of new equipment for new research directions*

GeoEcoMar will continue the policy of modernizing field and laboratory equipment by purchasing new and high-performance ones that allow more detailed studies or open up new areas. In recent years, various equipment and devices have been modernized in all laboratories and departments of the institute. Thus, field equipment (multibeam system, ADCP, bathymetric probes, GPS-RTK systems, LiDAR systems, LISST system, other marine geophysics equipment, vibrocorer, other specialized water and sediment sampling devices) were renewed, most of the existing laboratories (geochemistry, biology, particle size) were modernized. Moreover, new laboratories (microplastics, molecular biology) were developed and an electron microscope was purchased. This process must be continued, and where there is an economic justification, certain GeoEcoMar laboratories will have to be RENAR certified.

Priorities for the next period are: (i) permanent modernization of equipment for all laboratories; (ii) streamlining and increasing the degree of use for all research infrastructures (field and laboratory, including for the electron microscope); (iii) permanent development of the IT&C support (hardware and software) necessary for all research activities, permanent modernization of the ZENODO database (FAIR and Open) of GeoEcoMar and the intranet network; (iv) analysis of the opportunity for the development of cloud computing systems. The GeoEcoMar intranet, launched a few years ago, will be extended to all levels of internal communication in the institute. These directions will be implemented through an equipment procurement policy according to the order of priorities (strategic importance for achieving the objectives of the projects, degree of wear and tear of those replaced). Sources of funding: from the Core Program to the Investment Program of the National Research Agency and funds from contracts with third parties.

D. *Completion of the construction of the Building C Bucharest*

Started in 2015 (safety of the previously existing building, seriously damaged), then continued in the following years through the modernization, consolidation and extension works, the construction of the Building C building at the Bucharest headquarters must be completed between 2026 and 2030. The building allows the expansion of research activities at the Bucharest headquarters, through the construction of new laboratories and office spaces. The financing of this construction will be done with funds from the State Budget (National Research Agency) and GeoEcoMar's own funds (collaborations with private companies).

Chapter 8. Supporting innovation and technology transfer. The group of potential users/beneficiaries and the trends of evolution of its configuration and structure.

GeoEcoMar recertified in 2025 an Innovation Management System (NMS) in accordance with the SR 13572:2016 standard.

This plan is based on GeoEcoMar's considerable experience in knowledge activities, technology transfer and innovation support, activities practically started with the creation of the institute. GeoEcoMar's management has permanently supported the collaboration with ministries, specialized administrations, city halls, other institutions, universities, museums, specialized companies, both international and national. Here we can also add the collaborations with other European Directorates-General and with the international institutions of the UN, which have used the knowledge provided by GeoEcoMar on several occasions.

In the next period, GeoEcoMar will permanently maintain contact with all these beneficiaries and will expand collaborations with new partners (public and private) in Romania. The Black Sea region, the Danube Basin and the world.

The list of institutions and companies with which GeoEcoMar has framework collaboration contracts will be expanded, following the model of the previous ones with EXXON and Halcrow UK, which allowed the rapid development of numerous additional works.

An important development direction in the coming period will be the deeper involvement in the development activities of the Blue Economy at the Black Sea. These activities cover areas such as the testing of sensors and scientific equipment for various specialized companies, the study of the offshore energy potential of the Black Sea, for the transition to the possible testing of prototypes and pilots, the development of innovative methods of coastal protection, with an impact in the field of increasing the quality of the environment and marine biodiversity (e.g. testing and development of coastal protection by creating artificial reefs). GeoEcoMar will also continue to provide specialized advice to companies interested in the exploration and exploitation of marine biotic and abiotic resources, from aquaculture farms to the identification of sediment sources for the restoration of beaches and the study of methods of exploitation of hydrogen gas.

Initiator of research on the cultural and archaeological richness of the submerged domain in the western part of the Black Sea, GeoEcoMar has coordinated projects on the scale of the entire basin. GeoEcoMar's expertise in the field of archaeogeophysics – both on land (area of ancient fortresses, ancient sites) and in the aquatic field will continue to be an important driver for increasing collaborations for the development of new economic areas with major potential (cultural and adventure tourism, capitalization of the common cultural identity of the Black Sea). The opportunity for Romania to be, together with Bulgaria, a member of the European Union and, at the same time, a Black Sea riparian state must motivate GeoEcoMar to use all the resources it can benefit from as a research institution from an EU member state to extend its technology transfer and innovation services to the newly established riparian states (Ukraine and Georgia). The

expertise gained by GeoEcoMar during the process of Romania's integration into the EU is an extremely important resource that can support collaborations at the level of the entire basin. The expertise in the study of river and deltaic processes makes GeoEcoMar continue in the immediate period the partnership with the Lower Danube River Administration, the Danube Ports Administration and the Danube Maritime Ports Administration, when plans for the development of port infrastructure and river transport are foreseen.
The collaboration with the Coast Guard, the Border Police and the Hydrographic Directorate must be expanded, GeoEcoMar providing support through its scientific services for more effective surveillance and maintenance of the security of Romania's maritime space. Collaborations will also have to continue in the European SAFE program.
Through IOSIN EUXINUS and Mare Nigrum - Istros, GeoEcoMar, based on collaboration protocols / conventions, or for the elaboration of other official or scientific documents, has in its portfolio of users/beneficiaries numerous national and international public entities. These specific collaborations must be maintained and permanently extended to other beneficiaries.

Chapter 9. Defining scientific and technological identity at national and international level. Promotion and visibility

In recent decades, GeoEcoMar has developed a specific scientific identity, recognized both in the country and in the Black Sea area, the Danube Region and the European Research Area. GeoEcoMar is a traditional partner for most companies and national administrations with a role in the management, protection and/or capitalization of the Danube – Danube Delta – coastal area – Black Sea macrosystem. General or country coordinator of European research projects dedicated to the marine field, participant in all research and innovation competitions in Romania, GeoEcoMar is in permanent contact with its partners to carry out its research – development – innovation activities. Two directions have grown and strengthened in recent years the scientific and technological identity specific to GeoEcoMar:
A. Coordinating all activities for the development of the ESFRI initiative of the International Center for Advanced Studies for River-Sea Systems DANUBIUS-RI, from the definition of the scientific concept, to the entry into the ESFRI 2016 Roadmap and, through the coordination of the H2020 projects DANUBIUS-PP and Horizon DANUBIUS-IP, the preparation for obtaining the status of ERIC (June 2025). In this capacity, GeoEcoMar represented the DANUBIUS-RI consortium both in collaborations with other pan-European research infrastructures of global importance (active ESFRIs and ERICs), in relations with the European Commission, especially DG RTD, collaborates with Member States, the European Commission and the European External Action for the representation of the offers of cutting-edge scientific infrastructures in collaboration with states on all continents. With the operationalization of DANUBIUS-ERIC, GeoEcoMar will continue to support its proper functioning in the coming years.

B. The involvement of GeoEcoMar - together with the European Commission and partners from the states bordering the Black Sea - in the elaboration and official launch of the Strategic Agenda for Research and Innovation in the Black Sea (2016-2019), followed by the active participation of the institute in the implementation of this Agenda, must continue. Between 2020 and 2025 GeoEcoMar was the general coordinator of the H2020 DOORS project and WP leader in the sister project H2020 BRIDGE-BS, which aimed to put into practice this Strategic Research-Innovation Agenda. As a leading research institution in the Black Sea, GeoEcoMar supported the connection of this marine basin with the rest of Europe's seas and coordinated a consortium that brought together the largest marine research institutions in Europe. The project consortium agreed to continue the collaboration, both in the direction of developing a Digital Twin and for the development of the Blue Economy.
Since 2022, GeoEcoMar has been making efforts to include the Black Sea in the Oceans Mission, due to the need to analyze a river-sea system as a unitary whole. Thus, the definition of "Danube – Black Sea Lighthouse" and the organization of dedicated competitions were also accepted in the official European documents, GeoEcoMar being involved in several proposals.
Through its presence in the consortia of EMODNET, EMSO ERIC, EPOS ERIC, alliances of research vessels, deltaic studies, the SedNet network, the EurAqua network, the EurOcean network and all other research projects with European funding, GeoEcoMar will maintain and increase its visibility at European and international level. The application of FAIR and Open Data concepts will be extended to all GeoEcoMar research results, so that they are more visible, recognized, accessible and interoperable at European level. In the country, GeoEcoMar will continue to develop relations with the universities with which it already collaborates (the DANUBIUS-RO2 project, the recently approved PN IV Centers of Excellence), being open to expanding cooperation with other university institutions. Likewise, collaboration with other research or cultural entities will continue, but it will be more active if there were more frequent and financially generous national research competitions.
As for participating in Conferences, Fairs and Exhibitions, it is preferred to participate in events with a major impact, where there are high chances of creating new partnerships.
The events organized by GeoEcoMar in various European projects (the most important being the one organized in the H2020 DOORS project in the European Parliament - https://emso.eu/2025/04/14/doors-projects-results-were-showcased-at-the-european-parliament/), as well as the participation in other such events are important opportunities to promote the identity and activities of the institute at the level of European policy makers and the international scientific community.
The number of articles published in WoS-indexed journals with a high impact factor and influence score will increase, and the number of articles in SCOPUS and Google Scholar indexed publications will also increase, as well as participation in conferences, especially first-rate international ones. The target is to maintain the target of at least one article indexed in WoS/SCOPUS per year per researcher. From 2026, the WoS indexing process of the journal of

the Geo-Eco-Marina institute will resume, which will have to intensify its efforts to attract authors from other parts of the world (a process already started several years ago).
GeoEcoMar's visibility will also increase by intensifying communication with the media, both national and international, but also by its more active presence in online social media (Facebook, LinkedIn). The GeoEcoMar website must be permanently updated and the number and origin of visitors, as well as the most visited pages, will be periodically monitored. Increasing the role of the Public Relations (PR) expert in the institute is crucial in this direction.
The organization of summer schools and the training of students (from Romania and abroad) from the faculties with which GeoEcoMar collaborates, in dedicated internships, must be continued and intensified, also in order to identify potential future researchers of the institute.
The connection with schools will also be strengthened, including involvement in activities such as "Different School", "Green Week". *Ocean Literacy* and *Citizen Science* projects will also be started, to better connect the institute with the general public.

Chapter 10. Plan of measures. Operational planning

Operational planning

The organization of GeoEcoMar must allow the movement of resources (human and material) according to specific needs. Institutional development will follow funding and implicitly excellence, mainly for those areas that have at that time, along with outstanding scientific results, also assured funding (preferably multiannual) or that in the short term can generate significant funding in the medium to long term.
The horizontal departments of the institute (financial-accounting, technical, IT, etc.) will benefit from specific measures. The resources that will be allocated will also be directed towards performance. The permanent training of the staff in these departments is essential to keep up with new tasks and requests. An important point is training for the effective use of digital resources existing or to be implemented for the management of the institute. The human resource in research will continue to have the elastic organization of so far, as resulted from the organization of the institute in research teams. Already one of the elements of success so far, mobility and the ability to quickly associate research staff will be encouraged according to existing projects and new proposals. The Project Management and Marketing Office support the scientific activity of the institute. His competencies concern: managing the institute's project portfolio, market research specific to GeoEcoMar's field of activity, in order to successfully address new segments or areas of interest, permanently informing the management and researchers of the institute, on domestic and international project competitions. This office makes a decisive contribution to increasing the efficiency of participation in national, European and international competitions and will continue to play a major role in the successful management of projects.

Cost analysis

A detailed analysis of the costs that the institute has and that it must cover each month (personnel, utilities, consumables, etc.) is constantly made. The following principles are a priority: a) immediate/concrete needs that are covered in projects/contracts (national or international) according to the commitments concluded, b) strategic needs, for which there is no coverage in projects, but which can create major medium and long term benefits, c) exploratory issues, with benefits for the institute in the future but for which there is no adequate funding and is not foreseen in the short term. Particular attention will be paid to the development of DANUBIUS-RI and the proper functioning of the two IOSINs. It is very important to continue efforts to fund the future research vessel. Increasing the use of the Structural Funds (PCIDIF, PNRR, INTER-REG) requires judicious planning of financial flows. The costs and the status of the works will be permanently monitored, so that no financial problems are generated caused by the appearance of very large payment amounts at different deadlines. Preventive prospections will be made for the opening of credit lines under advantageous conditions (with the preservation of the current one). The repayment of credit lines (if used) will be a priority, in order to keep ineligible costs to a minimum. Cost reduction, an essential measure to increase efficiency, is mandatory for all activities. Plans will continue to concentrate different research teams on board ships if the study area is the same, in order to keep specific expenses under control, taking into account that the highest costs are those of operating the ships.

Sources of funding

Currently, the sources of funding in recent years indicate a percentage of about 80% of national research funds (PN IV Program – including the Core Program, IOSIN), the rest being mainly DG RTD funds (Horizon Europe), and funds from private beneficiaries and public administrations.

In the next period, the policy of obtaining funding from multiple sources – national, European, private – will be continued, with a focus on guiding researchers towards massive participation in the competitions of the European framework programs. Despite the limitations due to the rare competitions in PN IV, GeoEcoMar researchers are encouraged to actively participate in any of the upcoming national competitions.

Through the analysis of the activity of other European Directorates-General, of the new European plans (One Ocean Pact, European Water Resilience Strategy and the SAFE plan), future opportunities will be permanently pursued and of other funders compared to the traditional ones. The conclusion of contracts with a multiannual budget and which can ensure predictability in the financial flows of the institute will be sought. In this way, there will also be a decrease in pressure on Romanian public budgets and de facto and deeper integration into the European Research Area. The existence of offshore wind farm development plans and other investments in the Blue Economy in Romania's Exclusive Economic Zone are also monitored.

Program of administrative measures

For the period 2025-2030, other administrative measures are proposed:

1. *Decrease of some operating expenses of the institute.* It is essential to continuously increase the efficiency of expenditure for RDI activities, as well as for the maintenance of research buildings and vessels. The management must constantly analyse the costs incurred by the institute and reduce them through simple but effective measures, such as: a) rational use of utilities and permanent search for more advantageous utility contracts, b) optimization of travel expenses by purchasing tickets well in advance when the price is lower, c) grouping activities from several projects in the same work area in order to streamline travel expenses. To these we would add the identification of funds for the purchase and installation of solar panels to reduce maintenance expenses.
2. *Awarding the researchers* who – through the activity carried out – increase the visibility of the institute. This policy cannot be applied in the period 2025-2026 following the laws regarding the reduction of the deficit. During this period, legal reward alternatives will be offered, such as financing participation in prestigious training courses/conferences, for employees who deserve the appreciation of the institute. As soon as allowed, the awarding of publications and patents will resume. Also, when the law allows it, the awarding of people from the auxiliary departments will be returned, who stand out through the permanent support of colleagues from the Research department. The provisions of the recent Collective Labor Agreement regarding the awarding of persons who bring contracts with the private sector will be maintained.
3. *Maintaining and developing the motivating salary system for all staff involved in PN IV projects (except the Core Programme) and those with European and private funding.*
   The payment of personnel engaged in European, international and private projects will be made according to the latest rules included in the Collective Labour Agreement. When establishing the hourly payment scales, however, the financial possibilities of the institute must be taken into account, so that the values are motivating, but also maintain the competitiveness of the institute.
4. *Employment within the institute of personalities (Romanians, EU citizens or Romanians in the diaspora),* to ensure the creation of sustainable scientific links with European and international organizations with which externally funded projects can be developed.
5. *Increasing the professional level of the staff in all departments* at specialized courses organized by nationally recognized entities.
6. *Ensuring an appropriate working environment*, by maintaining standards of order, internal discipline and cleanliness related to research activities. Resources will also be provided for those activities with important development potential in the coming years.
7. *Implementation and recertification of the integrated quality management system*, based on the currently existing ones (ISO 9001, ISO 14001, ISO 45001 - systematically updated).
8. *Consolidation and expansion until completion of the digitalization process in GeoEcoMar.* Training courses will be held periodically for the use of all existing or future applications that help with internal administrative organization and project management. The use of GeoEcoMar's intranet and Open and FAIR database will be expanded. The digitization efforts are addressed to all colleagues in the institute.