المركز الجهوي للإستشعار عن بعد لدول شمال إفريقيا

Regional Center For Remote Sensing Of North Africa States (C.R.T.E.A.N)

General Strategy

Of the Regional Center For Remote Sensing Of North Africa States

Prepared by

Regional Center Administration

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Prelude:

The implementation of the decision of the Board of Directors of Regional Center for Remote Sensing of the North African countries, held in Tunis in its nineteenth regular meeting on April 20 and 21, 2010 was based on what has been agreed upon in the twenty-first session the Board of Directors, held in Khartoum on April 27 and 28, 2013 concerning the adoption of the strategy proposed by the Centre administration. After the auditing done by the administration and enhancing the outstanding effort made in the preparation of the mentioned strategy project, the current administration decided to make some useful modifications of growing importance in the context of the aspiration of the center successive administrations to improve the performance of the center on scientific and practical levels in order to achieve its objectives and advance the current and future business efforts according to the aspirations of the centers and the agencies of member states on the one hand and following global developments on the other hand. The document containing the strategy is put forward again by the center's administration within the framework of developing the strategy already adopted by the Board of Directors which was amended and associated with a (three year) future action plan covering the years from 2014 to 2016 to be a work platform and a path to follow for the center.

God bless us.
Dr. ElHadi Gashut.
General Director of the Center.

1. Introduction

God the creator entrusted human beings with the complex mission of reconstruction since the creator of mankind alone knows the extent of the ability of human mind. What we are witnessing today as product of human mind on the intellectual, scientific and technical level lies in this divine mystery which induced man to a relentless pursuit to explore the depths of the universe and discover the available knowledge and secrets. Space has been an unknown field and it represents a big challenge for whoever wanted to explore it. However, the human mind based on capacities which God gave him accepted this cognitive challenge. This challenge resulted in the emergence of the space age, including seeking to know its laws and to discover its components' details and the potential of these components or some of their parts to be used for a civilian or military purpose. After this stage, human activity was devoted to win the race in this area. Space exploration is considered as a milestone which represents a qualitative move from scientific research to practical application. These two phases are inter-independent even though the first one may be leading to the second one. Whatever secret the stages of scientific research and laboratory experiments were, they had led in their turn to sample the manufacturing and commercial applications which relate to the welfare of human. Man can acquire this technique and becomes able to deal with it provided that his cognitive abilities and skills are developed. Therefore, we can confirm that space information, technology and industry are the most important features and indicator of scientific progress in contemporary societies. It depends, of course, on the good management, the ability to use it effectively and the success achieved in consolidating its basic concepts among the members of civil society.

The last quarter of the twentieth century has witnessed tremendous changes in the economic, social, technological and political systems, whose implications extended to cover all aspects of life. Although developed countries are the main source of these changes, the developing countries, including the Arabic countries find themselves in a situation where they need to adjust their conditions with these changes, and even actively work to ensure more efficient participation in its making whenever possible.

Research and Applied Studies have evolved in this field, especially when the Arabic countries of North Africa which increased the ability to use this technology to meet the challenges and find solutions to the problems and difficulties facing development project plans; as well as working on the management of these technologies and the preservation of national security in various fields. Even we find that some of these countries had already acquired their own artificial satellites to control its territory and other countries possess receiving stations for artificial satellites systems of developed countries. But in fact, the North African countries still suffer from slow technical acquisition and academic achievement, as well as the use of this technology and its optimal implementation, particularly with regard to the purpose of exploring resources, controlling its territory

and maintaining the economic and social security in general on the one hand and lack of orientation aiming at collective capacity to possess this technology and benefit from on the other hand. These reasons have led to the inability of these countries to enter the field of space industry and to have access to optimal use of this technology in addition to the lack of real effective cooperation between them.

Based on this situation, the mentioned above facts and the Constitutive Act of the Regional Centre for Remote Sensing of North African States takes into account its tasks and objectives which consist on assisting Member States in all matters relating to the implementation of technologies and the use of space science and its various applications in many sustainable development projects in these countries.

It is this vision to provide a future strategy aligned with regional and global transformations which adapt with it taking into account national centers and agencies, their sophisticated means, available equipment, and scientific experience and competencies, based on scientific progress in the sector of remote sensing at all national levels and the extent of its contribution in vital areas which include regional and international disaster management, planning and development.

2. Vision

The Member States of Regional Center for Remote Sensing of the North African States attempt each one on his side to catch up with scientific progress in the field of space technology and science. But the experience has imposed a necessary approach to adopt based on coordination, cooperation and integration within this area to take the initiative through collective efforts to bridge the gap which separates them from other nations in all scientific fields related to space technology, since that individual efforts did not result in convincing intellectual and practical outcomes .It also did not contribute to the evolution of technology, research and studies used by these countries based on space technologies available for each individual State. This make it necessary for the countries in the region to combine efforts in the field of space technologies and their applications with each other on the one hand and with the international community on the other hand, in a unified regional framework that includes all aspects relating to space activities. It starts from raising awareness and educating civil societies in these countries, then the transfer and implementation of this technology into our private and public institutions, ending with effective participation in designing technology and proposing innovations and application according to its situation and its future ambitions. This collective action needs an institutional framework that enables this regional group to work together. The Regional Center for Remote Sensing represents the only institutional framework on the scene for the its Arabic Member States; so that these countries can achieve its targets entirely or partially through different ways of cooperation and coordination where the Center shall have an effective role in the provision of collective mechanisms. However, the center cannot play the expected role unless there are deliberate initiatives to

develop and support this center and draw up action plans to achieve the hopes and aspirations of these countries.

3. Sources and references

The strategy of the future action plan of the regional center is based on several sources and references which include the mechanisms and orientations of Regional Center. Among these references:

- Constitutive Act of the Regional Centre for Remote Sensing of North African States
- The decisions and recommendations of the Regional Center Board of Directors
- Cooperative business strategy project with Arabic, regional and international institutions issued by the Arabic League Educational, Cultural and Scientific Organization
- National strategies and plans of the Member States (development programs, schemes, ...)
- The resolutions of scientific conferences and meetings.
- Publications of United Nations organizations on this matter

4. Foundations

The proposal of a strategy for the regional Center for Remote Sensing of North African States for cooperative work with specialized institutions of the member states and the involvement of regional and international organizations and centers could not be done unless in accordance with a set of principles and contexts in which the center will be able to act, especially in this particular stage.

4.1. Principles

The coordination functions and activities of the Regional Center of Remote Sensing of North African States related to Arabic, regional and international cooperation are based on principles present in its Constitutive Act which gives priority to achieve integration and cooperation between the various centers and the bodies of the Member States, specialized in this field so that this cooperation also extends to the Arabic regional and international level. Therefore, cooperation and joint action are located at the heart of a message of the Regional Center which has the responsibility to develop and implement the most effective methods in order to achieve this message.

4.2. Context

In addition to the above-mentioned principles, there is a specific context in which the Regional Center should work at the current stage at local, regional and international levels with focus on cooperation.

4.2.1. At the local level

Many challenges arise in the fields related to Regional Center scope which should be addressed by the national authorities efficiently with an important contribution of the center. Some of the internal challenges deal with the educational, cultural and scientific aspect. The biggest challenge is the integration of space science teaching in the educational programs and making a greater effort to intensify work in the fields of scientific research and the development of its application in order to assist Member States to face environmental challenges such as desertification, drought, pollution and scarcity of resources and water which have a significant impact on sustainable development projects in these countries.

4.2.2. At the regional and international levels

The formation of the members of the international community in institutions, organizations or groups, whether political or economical has imposed a new global reality in regards with international relationships and thus created a challenge to be dealt with in a different way. When making a work strategy for this center the principle of cooperation with the world should be established, whether in a regional or international context. This is due to several reasons:

- The rapid development in the field of space science requires the Regional Center to be present and to participate in one way or another in the most important international conferences and forums related to its competence in order to narrow the digital, scientific and cultural gap between of the Member States and the leading countries in this field
- To take advantage as much as possible of the programs offered by the international community within the institutional framework for this regional group especially the programs related to the massive information revolution and the implementation of international strategies to cope with natural disasters, reduce their risks and ensure early warning for them. The international programs to build national capacity in these areas in order to keep pace with the evolution aim to achieve positive change among member states.
- Work through the Member States and the Center administration to undertake an active role along with the organizations and think tanks and specialized legal and technical working groups to help develop norm projects governing space activities taking into account international obligations so that Member States would be guided by the center when developing local legislation. Thus contribution enables them to keep up in the areas of international space laws and how to deal with them through the development of a space laws project which aims to achieve legislative unification.

Tackling crucial issues such as bridging the digital and scientific gap, and confronting the downsides of globalization and building a society of knowledge can only be done in the context of a global system and with an international or regional effort least because of the universality of these issues. The Regional Center is expected today to be an effective part in all the regional and international initiatives on behalf of Member States in order to ensure joint implementation of actions and activities resulting from those decisions.

5. Current situation

The idea of establishing the Regional Centre for Remote Sensing of the North African States was launched under the supervision the African Organization for maps and remote sensing based on the recommendations of the meeting of the North African countries during the period from November 9 to12, 1989, held in Tunis which was followed by a meeting in Tunis of experts from the same countries during the period from November 2 to 4, 1990 where the draft of the Constitutive Act, headquarter and structure of the center were discussed, and which was approved and adopted at a meeting of the commissioners of North African States, which took place during the period from November 5 to 6, 1990 in Tunis. The main objectives of the establishment of the regional center at that period were the promotion, support and coordination of Member States policies related to remote sensing to achieve harmony and integration among them.

Since the Regional Center started operations assumed by its board consisting of representatives of the Member States and through its scientific board and his chairman, it undertook the development of annual plans and programs necessary to achieve the objectives. Its most important activities during the previous period, for almost twenty years, are the following:

1- Organizing dozens of special science workshops about remote sensing and spatial sciences in order to contribute to the development of these fields among Member States
2- Organizing dozens of training sessions related to remote sensing and spatial sciences to build structures of Member States national institutions
3- Organize and participate in several seminars and conferences held by the countries of the region of which national institutions specialized in the center areas of work have benefited
4- The establishment of youth camps for the Member States in order to raise the culture in this field and to present remote sensing technology and space science to the public
5- Supervision of the management of some regional projects related to space applications and development at the local and bilateral level

Despite these efforts, the benefit was unconvincing to the Member States as it remained limited to the center framework and their national institutions, in addition to participation in these activities where some institutions managed to develop themselves to keep up with this technology development.

These data monitoring on the ground calls urgently to have a closer look to the goals of the center and his current strategy, which has become incompatible and inefficient in the current and future period. The administration of the center considers expanding these objectives to be centered in the advancement of the science of remote sensing and the engagement in other space technologies. This would convince Member States to meet the requirements of the current situation and the aspirations of the future and to work on the interaction and excellence among international and global institutions.

6. General principles

The work methodology of Regional Center for Remote Sensing of the North African States in the field of space science aims to reach a level where these sciences contribute in economic, social and cultural development process of its member states according to clear priorities and a specific time frame. It is based on:

- typical change of the Center's work and targets with the addition of real value to its specialty in line with scientific realism and international developments
- working through regional groupings in a complementary and cooperative manner with institutions specialized in space sciences, according to the need of corresponding international organizations
- drawing clear spatial scientific policy and plans for a long or short-term milestones and identify their implementation methods
- connect applied and research activities qo development requirements of Member States and meet the needs of the community in matter of scientific knowledge and application technology
- providing all available information on space activities for the Member States and ensuring data exchange between them
- autonomy in the sourcing of information and data basing by possession of the target technologies in the field
- the use of information and data sources (sensory and non-sensory) to preserve the environment
- participation in international and regional programs (particularly the United Nations programs) for the benefit of the countries of the region
- support international cooperation in the field of space technology, strengthen ties with foreign space agencies and try to benefit from them as much as possible through the creation of programs between Member States and these agencies

7. Main objectives

The strategy of Regional Center for Remote Sensing of the North African States aims to achieve the following objectives:

- Build real effective cooperation between Member States in space science and technology
- Contribute to the development of national and local specialists in the areas of space science so that to meet the needs of Member States in accordance with the specific and chronological development strategy
- Establishment of research, development and innovation systems in space science related to economic and social development in order to support economic growth, enhance national security, ensure food security and support economic integration
- Creation and adoption of national and regional projects in coordination with Member States and search for the necessary funds
- Assisting Member States in the development and organization of frameworks on the administrative and legal level to keep up with the growing need for space applications and to encourage the formation of national structures competent in this field
- The development of education systems and the introduction of space science within the curriculum of educational institutions at all stages
- Increase scientific knowledge among specialized national institutions on the territory of the member states by optimizing the use of space applications
- Exchange of practical experience in specific areas between the institutions of the Member States
- Conduct training courses and workshops developed by famous and prestigious international experts in the development and modernization of these sciences
- Create and establish solid foundations and renewed frameworks to ensure effective coordination, cooperation and integration between Arabic member states thanks to collective efforts in scientific fields related to space technology
- Contribute to global space programs and technology development, consistent with the geographic area of the Member States and partners, with its potential and with the expected role within the international community
- Play a greater role in specialized regional and international organizations in the field of space science and regulate its usage for peaceful purposes
- The use of international strategies through implemented networks for monitoring natural disasters and reducing its risks
- Organize specialized conferences, seminars and exhibitions from time to time with international and regional institutions which would help the center and the Member States scientifically and financially

- Follow-up work on the involvement of the center on the African level through counterpart African organizations and centers in projects established within the African Union
- Work through the project of geodetic reference frame for Africa to unify the reference frames in the Member States, in collaboration with the Economic Commission for Africa
- Upgrading scientific and technical publishing in the field of space science by using high quality means of publication in proportion with the human and economic potential
- The development of systems and mechanisms to create and strengthen the protection of intellectual property in the fields of research, development and innovation in space science between Member States
- Assist States to master, manufacture and test remote sensing technologies, in order to be able to use it on field
- Participation in international programs aimed at the development of regulatory and legal frameworks
- Contributing with the expected role of Member States as a grouping through Regional Center in global space programs, and the development of space technologies, in order to increase cooperation among them on the one hand and among the rest of the world on the other hand
- Enhance the participation of members of the new generation in space and cultural related activities and the cooperation with the Advisory Council for the younger generation with respect to the development of space technology
- The introduction of the regional center and its activities, and the increasing of members and partners through participation in relevant Arabic and international scientific meetings

8. Strategy axes

After a review of the current functions and objectives of the Regional Center for Remote Sensing of the North African states set from the beginning which do not fit to the actual situation of the Member States because of the evolution they made while the center tasks and objectives did not keep pace with global developments. Through the objective of this strategy we can focus on the following bases and make new strategic targets for the center through the adoption of certain policies, according to following themes:

8.1. The development of remote sensing, geo-sciences and space-based information systems in line with the current and future global space technologies

The adoption of a comprehensive approach for the development of these systems leads to synergy of components of the system and consistency of plans, in addition to

their interaction with economic, social and cultural activities through the implementation of the following policies:

- Work with Member States in cooperation with their institutions specialized in this field on the coordination of national policies for science, technology with sectoral policies of space science and its various applications
- Urging countries in the region to adopt an administrative mechanism at the national level to enhance the effectiveness of the management, planning, coordination and follow-up of space science and technology activities and encouraging innovation and supporting its resources
- To encourage Member States and help them to find the necessary mechanisms to strengthen the ties between the main components of the national system, such as research, development, education and training institutions, specialized companies, investors, innovators, suppliers of this technology, consulting offices, scientific media and others
- Importance of relying on national elements by providing education, training, rehabilitation and encouragement to give them more confidence which will lead to progress
- The adoption of programs of experienced and leading countries in matter of regional and international cooperation which helps to unite the targeted systems, programs and efforts to reduce individual burden and start technical and developmental group projects that have a comprehensive and effective benefit for the grouping countries
- Enhance means of awareness and cooperation with Arabic and international specialized organizations in order to spread space culture and to raise the awareness of the community in general and private decision-makers in particular in both governmental and non-governmental sectors. Progress and innovation play a crucial role in improving production efficiency, increasing competitiveness of the national economy and preserving the environment and natural resources aiming at improving citizen living conditions.

8.2. Create means to strengthen and develop national capacity of Member States to meet the needs of the community for sustainable development in these countries

The focus on national capacities and coordination of its efforts by ensuring advanced training in line with the scientific and technical desired progress and the emphasis on being up to date with global scientific and technical developments are necessary to ensure the integration and meet with community requirements of sustainable development. The following policies should be implemented:

- Helping to activate the role of national educational institutions and introducing the necessary specialized courses in this field to be developed gradually in order to get outputs which meet the requirements of society and to facilitate their development in the future
- Cooperate with international, regional and United Nations centers specialized in short and long-term teaching and training of space science and technologies to meet the national requirements of the member states
- Focusing on specialized training programs in the so-called training while working within the framework of operational projects at both national and regional level
- Integration of national elements in workshops and seminars and scientific conferences specialized in this field, whether local, regional or global in order to create a capable and active research element
- Facilitate the publishing of scientific articles for specialists and qualified researchers in the world's most prestigious scientific journals which will lead to global scientific competition required for development and innovation
- Encouraging gifted persons and innovators in this field by motivating them financially and morally

8.3. The adoption of main directions of scientific research and technical development and the establishment of practical projects which meet national security priorities and requirements of sustainable development in coordination with Member States bodies, institutions and centers specialized in this field

- Directing research and study to secure the strategic needs in coordination with the Member States
- Search on scientific and technical development programs in space science and attempt to implement them locally. Stimulate the competitiveness of creative national scientists and encouraging them to keep up with this technology
- Create research projects and scientific studies for environmental preservation. Exploration, development and rational use of natural resources
- Establish the necessary studies for applied projects by using remote sensing technologies and science to monitor and predict natural disasters and propose scenarios to reduce their risks and impact on society
- Providing necessary conceptions by the use of space science technologies through the rehabilitation of some of the affected areas
- Tracking the promising opportunities offered by scientific and technical contemporary and emerging developments, especially those affecting the national economy for the next two decades
- The development of effective methodologies and the involvement of specialized foreign institutions in setting up projects of regional and

international Interests that are beneficial to all parties, especially countries of this grouping

8.4. The development of various aspects of scientific and technical cooperation at the national, regional and international level with focus on the selection of countries leader in scientific and technical fields, especially those related to space science

The cooperation between the states members within the Arabic, regional and international framework has a distinguished place in the work of the Regional Center for Remote Sensing of the North African states and it represents a part of a comprehensive and integrated perception leading the Center in the regional and international surroundings. This cooperation enables the center to be the actively present in Arabic, regional and international frameworks of competence, in order to remain up to date with the movement of change in this field and be able to contribute in it effectively. International cooperation represents on the other hand an actual scope for partnership between the center and his counterparts at the Arabic, regional and international levels for the establishment of joint activities serving the interests of all cooperating parties on the basis of equality and mutual respect. From this perspective, the international cooperation with strong global institutions and leading countries in space science would be one of the main activities of the center, especially in terms of providing additional resources to ensure expansion of existing programs or the advancement of new joint activities connected with the interests of center. The following policies can be adopted:

- Gradual transition from the current status to complete and fruitful cooperation between the Member States in addition to the development of scientific and technical cooperation between them to reach the level of scientific and technical complementarily in areas of common interest
- Create the necessary mechanisms to take the maximum benefit from bilateral and multilateral agreements with scientifically and technically advanced countries and institutions in remote sensing and spatial sciences as well as regional and international organizations in different areas, especially the ones of priority
- Regional Center effective presence in the Arabic, regional and global frameworks such as scientific forums, international conferences or any other scientific activities related to its regional role and in accordance with the requirements of the Member States
- Cooperation in the monitoring and follow-up of international scientific and technical developments
- Cooperation with developed countries to benefit from the their expertise and the transfer of scientific research and aerospace industries techniques

- Creating productive international relations to encourage and stimulate scientific and technical cooperation at the individual level between scientists and researchers within the region and with their counterparts in the world
- Establish cooperation with global scientific publishing departments and urging scientific institutions in particular Arabic institutions to convert the published Arabic scientific magazines to the digital format and made them available on the Internet

8.5. Inventory of human resources specialized in this field with the ability to provide scientific and technical information to overcome accessibility difficulties by States Members and to benefit from them in the most convenient ways within the objectives and conditions of the region

- Publish a guide of scientists, researchers and specialists in various fields of space science in the Member States to ensure integration and coordination between them and take advantage of this potential and the possibility to its development
- Support the development of national data bases for scientific and technical information and ensure easy access to it and keep it up to date
- Adoption of national programs which promote production, transfer and exchange of information
- Linking Member States' scientific institutions and centers specialized in this area with high-speed information network for the exchange of expertise locally and abroad to enrich scientific research and technological development in the areas of space technology
- Create the necessary mechanisms to ensure data security and protection
- Focusing on development of information technologies which have effective impact on improving the efficiency of information systems and services in the region
- Training of national competencies to support, develop and exchange information in proportion to future challenges

8.6. Find resources of financial support for research and development in the fields of remote sensing technologies, space science applications and other geographical sciences within this regional grouping (Regional Center for Remote Sensing)

- Convince member states' officials and decision makers of the necessity of the existence of this center in the context of international conglomerates and the need for financial, political and moral support to this entity so that it can carry out its tasks and activities

- Promote international cooperation and grant programs to support and implement the various activities of the system
- Collect funds for research and development projects related to advanced space technologies through direct contacts with Arabic, Islamic and international organizations donors and financial institutions
- Stimulate the private sector to invest in space activities and technologies in the region countries

9. Strategy implementing mechanism

i. Strategy setting mechanism

- Send the regional center strategy project, including three-year action plan, to Member States and partners and receive feed-backs and comments made about it
- Organize workshop with the Scientific Council of the regional center and the authors of the draft strategy to reach a final proposal after studying the comments of Member States before submission to the Center competent authorities
- Adoption of the general framework of the Regional Center strategy related to space science and its applications in its final draft, as well as the action plan attached by the Board of Directors. Ensure to the follow-up of operational procedures of the Member States resulting from the action plan

ii. Taking the following necessary considerations

- Considering of national security as a part of this strategy
- Study of legislation, regulations and laws for the use of space technologies in the Member States at scientific, administrative and financial level and modernize it to be a legislative framework for the Regional Center system
- Urging Member States to ensure a continuous spending on space programs and make its financial support a priority
- Cooperate with Member States to ensure a continuous increase in the efficiency and quality of the workforce in this field and developing its ability by providing an appropriate scientific environment
- Adoption of the principle of permanent improvement in the development and networking of centers, bodies and institutions specialized in space science and its applications within the member states
- Assisting States and urging them to fully cooperate to ensure complementarity
- Preparation of standard methodologies for the implementation of specialized projects in the local and Arabic context, especially those related to desertification, drought and natural disasters. Benefit from Arabic and international scientific publications in regards with this matter

- Providing researchers with what they need and building a unified system to select and to measure the quality of their productivity and to protect intellectual property both locally and internationally
- Ensure stability in the administrative institutions of scientific and technical research, particularly specialized in this field within Member States
- Continue to implement the proposed joint projects between Member States in applied space science and urge the specialized institutions in this area to work together and to exchange experiences
- Continue to encourage the Arabic member states in the implementation and development of their space programs, especially related to the launching of small artificial satellite and work on linking them to a unified systems in order to tackle environmental and strategic issues

9.1. Implementation modes

- Setting medium-term practical plans within the strategy axes and the preparation of future studies which take into account the global and regional developments related to the work of the Regional Center
- Create an executive nucleus made of specialists from centers, bodies and institutions of the member countries which works with the Regional Center's Scientific Council to follow up the implementation of programs and projects included in the center planning
- Scheduling specialized workshops and scientific conferences held by the center or of which it will take part and make them available to member states by providing a sufficient time to ensure general benefit
- The formation of executive working committees for research projects adopted by the Centre in the regional framework in favor of the Member States
- Assist Member States by granting international experts to ensure temporary or full time work in the regional center within the framework of implementation of plans and programs approved by the Board of Directors

9.2. Planning, implementation, monitoring and evaluation mechanisms

9.2.1 Planning mechanisms

Planning mechanisms are based on the agreements and programs of implementation at the heart of the priorities discussed by the Board of Directors. The mechanisms are established within the joint work between the regional center and the national bodies on the one hand and between the regional centers and the executive structures on the other hand in addition to international bodies and associations within the framework of a future action plan. Framework Conventions define the general principles for cooperation between the contracting parties and set implementation, monitoring and evaluation mechanisms in particular. These

conventions represent executive programs, projects and field activities in accordance with the directions contained in the Framework Conventions. There should be a precise time schedule for the projects and activities and the ways of their implementation, their funding and mentioning of financial obligations of each party. The executive programs can be annual according to the agreement between the cooperator and the Regional Center.

9.2.2 Implementation, monitoring and evaluation

The implementation of programs, projects and activities covered by the joint cooperation is the responsibility of the centers and the competent bodies of the member states of the Regional Center which will coordinate between them. Then, periodic reports on the progress of implementation are sent to the Director-General of the Regional Center as he represents the coordination supervising authority, who in his turn presents them to the Board of Directors.
The Scientific Council the Centre's ensures the follow-up and evaluation, through periodical meetings to evaluate the course of implementation and its results, to study the difficulties it may face and to propose appropriate solutions to facilitate its path or correct it in the right time.
This evaluation can be conducted in two complementary two ways:

- Progress evaluation is done during the implementation of programs and projects, and it ensures the follow-up of progress through the various stages of implementation so that accurate quantitative and qualitative data about each achieved stage would be available
- A final assessment after the completion of the implementation of all stages which evaluates the achievement of program objectives and verifies the effectiveness of the used means

9.2.3 Funding

Regional Center can opt for three methods in the financing of cooperative work with national institutions, regional and international organizations and associations and other financial institutions

- Co-financing between the regional center and the Member States through specialized institutions which undertake bilateral or multilateral projects included in the Regional Center programs
- Attract additional funding for the Regional Center projects approved in the budget programs, which enables the development of these projects and methods of implementation and expand the circle of beneficiaries
- Realization of projects funded fully by international organizations, bodies and private banks or by development institutions and associations cooperating with the Regional Center

10. Accessible fields from a research point of view

In order for this strategy to become effective, it is required to take advantage of space technology, especially remote sensing by establishing application projects between Member States in accordance with the proposed fields and the states' need.

10.1. Environment

- Establish a project in an Arabic regional framework to study and combat desertification and ensure periodic control
- Projects on the study of eroded land and soil degradation
- Establish a study project on environmental pollution of the coasts of countries in the region
- Implementation of scientific studies and research related to controlling and detecting the shore erosion in the Member States
- Dynamic mapping of the polluting elements affecting the marine environment.

10.2. Natural resources

- Cooperation of countries in the region to prepare land maps and update them periodically using satellite images
- Use of remote sensing techniques for the survey and study of natural resources, jointly between the countries, and optimize benefit from advanced capacities of national specialists in this field
- The creation of joint project in the field of mineral exploration in cooperation with the Arabic and regional organizations and companies specialized in minerals and exploration
- Projects to digitize mineral maps and update them to be provided as a service to the investor in collaboration with specialized organizations
- Setting up a joint study of surface and ground water basins between the countries of the region and the production of maps serving national and regional interests
- The establishment of a joint study for mapping areas affected by the depletion of ground water in some countries of the region.

10.3. Agriculture

- Preparation of uniform regional methodology to classify region soils using remote sensing and preparation of soil maps and productivity capacity appropriate to strategic agricultural crops
- Establishment of a regional system for early detection of plant diseases and epidemics that affect the strategic crops
- Applied projects in the field of preparation of digital mathematical models to

calculate the area of strategic crops in the region in order to achieve complementarity in the field of food security

- The study of vegetation changes, calculate biomass of pasture plants, and control urbanization advance and dynamic changes of the dunes in the countries of the region
- Create a system for controlling and early detection of forest fires, implementation of scientific studies and research in forest protection, and increase its operational area to detect the overall situation and predict fire risk.

10.4. Periodic surveillance and security

- Develop the ability of sensor technology do distinguish contents and to identify the various ground targets using high-resolution satellite images
- Development of software with effective algorithms to detect the dynamic movements of mobile ground targets using successive satellite images
- Regular monitoring of beaches regarding oil tankers and other industrial waste pollution using thermal images and radar waves
- Regular surveillance of the borders using remote sensing and other means
- Study and monitoring of sand and sandstorms movements taking into account security and health aspects
- Implementation of scientific studies and research in determining the possibility of using satellite images in the field of early warning of epidemics and public manifestations.

10.5. Geodesics and space

- Prepare united profile and anthropomorphic Datum to countries of the region
- The digitization and updating of topographic and geological maps to produce a digital map of the Regional Center's States
- Preparation of digital elevation models of the region using integration between topographic and geodesic data, satellite visualizations and radar images.

10.6. Urbanization and population census

- The use of satellite high-definition imagery in the study of cities and communities planning
- The use of satellite images to detect changes in populations
- Implementation of scientific studies and research in order to use satellite images in population census
- The use of remote sensing techniques in the study of the locations of strategic

projects such as dams, power plants and others and presenting them to decision-makers.

10.7. Disaster monitoring

- Creation of a system for the Member States of Regional Center to detect drought and forecast its future effects on the countries in the region
- Establishment of a regional early warning system for natural disasters, such as earthquakes, volcanoes, locusts, and others, and implementation of scientific studies and research in the area of disaster detection and collective management. Connect this system with regional and international observatories in the area
- Create a monitoring system of the Member States to monitor dust storms and detect their sources, and implementation of scientific studies and research with regards to prevention and the forecasts of these storms.

10.8. Space science

- Advanced space research, by the establishment of research groups eligible for the implementation of advanced space research in preparation for aerospace industries and transfer of the technology to the countries of the Regional Center
- The preparation of national competencies and training them. The exchange of scientific expertise between the relevant institutions on the establishment of joint project in the field of satellite industry between the regional Central countries
- Develop a study to produce Arabic navigation systems for tourism and roaming in the cities of the region in cooperation with the competent institutions in those countries.

10.9. Space culture and community awareness

- The adoption of program that aims at spreading space culture and introducing it to the new generation through publications and means of presentation for primary school students and developing them gradually in addition to the focus on astronomical domes established in the Member States
- Create a space cultural programs during the meetings of the youth of the member states
- Focus on Member States' celebration of the World Space Week hosted by the United Nations and the opening of the national centers specialized in space fields to the public, the broadcast of cultural and scientific programs in coordination with the United Nations Office for Outer Space Affairs
- Grant incentive awards for talented and young innovators in these areas and ensure their follow-up in the future

- Taking care of inventors and innovators in this field and encouraging them in order to develop their skills.

10.10. Space legislation

Establish the basis of an organizational structure project for space activities and their legal system through the preparation of draft including provision projects which take into account the international obligations. Member States should strengthen the similarity of their legislative framework in preparation for the establishment of space activity control rules in each country with the aim to achieve a unified legislative framework for all Member States following the example of global conglomerates. Then, there should be attempts to extend its scope to the level of Arabic countries in cooperation with the United Nations organizations working in this framework.