DRAFT STRATEGIC PLAN
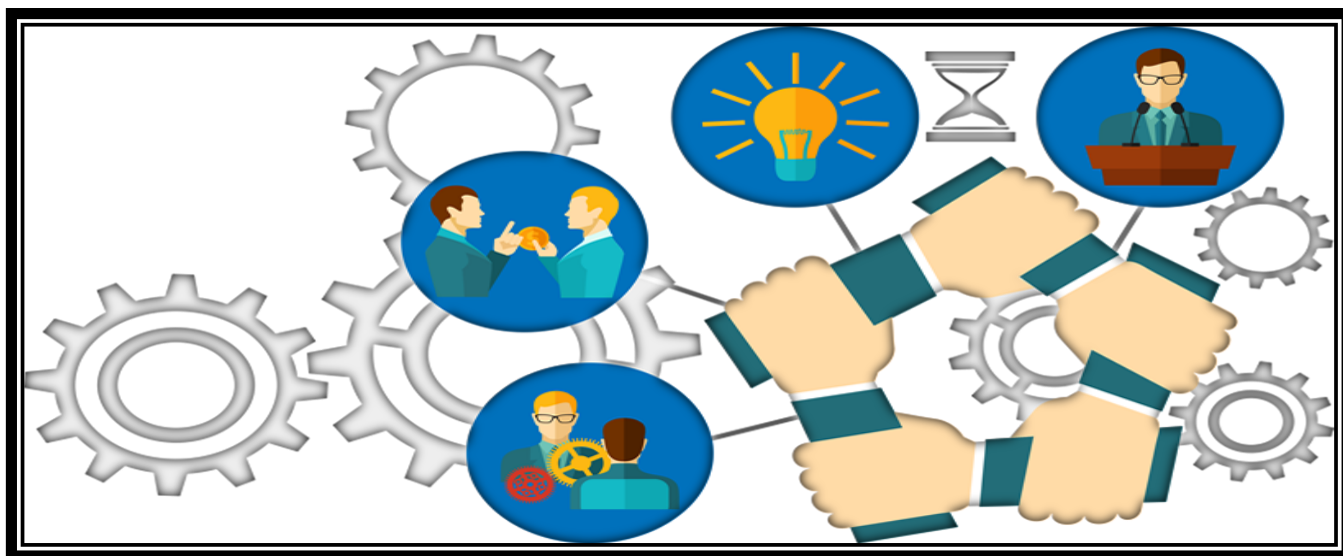
OF

CENTRE ON GEOINFORMATICS APPLICATIONS FOR RURAL DEVELOPMENT-CIRDAP

CIRDAP

Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP)

DRAFT STRATEGIC PLAN OF CGARD

CIRDAP

Centre on Integrated Rural Development for Asia and the Pacific

Dhaka, Bangladesh

The Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) is an Intergovernmental Organization mandated to promote Integrated Rural Development (IRD) in Asia-Pacific through regional cooperation. It has been in existence for the last 41 years since its establishment in 1979. Over these years, CIRDAP has encountered several challenges and opportunities brought about by globalization and free market processes. Its member countries have responded by formulating Legislative and Policy initiatives to address the challenges under the Millennium Development Goals (MDGs) and recently the Sustainable Development Goals (SDGs). Likewise, CIRDAP has also and should continue to reposition itself in terms of its mandated roles by resetting its platform in response to these changes particularly in rural development.

For development activities to be effectively planned, implemented, monitored and evaluated it is necessary to have a strong information base. More so, when the area where these development activities are targeted is remote, backward, poverty stricken, has a rural characteristic and with people whose abilities and experience to utilize and harness the development process is itself low.

GIS is proving as a very powerful spatial technology tool for understanding earth features, planning for resource optimization, generation of decision alternatives, real-time monitoring and a host of related work, which has great potential in effective planning, management, monitoring of development initiatives, and policy support measures across CMCs.

The system has already created an enormous impact virtually on every field of activity that requires management and analysis of spatially distributed data. In particular, it has great potential to be the revolutionary technology to accelerate the sustainable development in the Asia and the Pacific Countries.

Keeping that in view, the Governing Council (GC-19) resolution in 2013 approved the establishment of the CIRDAP information Centre which is known as Centre on Geoinformatics Applications in Rural Development (CGARD) to support the governments of CIRDAP Member countries including to use GIS/MIS as a tool for informed decision making, better planning and management of resources to achieve the CIRDAP's Goals.

This Strategic Plan of CGARD is an important prerequisite to achieve the Strategic Plan of CIRDAP that emphasises on enhancing CIRDAPs visibility and relevance according to

CMCs expectations and needs.

I would like to thank the CGARD, NIRD&PR for their valuable insights and guidance that shaped the CGARD Strategy to great extent. Input and feedback from CIRDAP Secretariat staff from different divisions. Finally, I would like to thank CGARD of CIRDAP for developing this Strategy.

I believe this Strategy will certainly guide CIRDAP in strengthening communication and active partnership among CIRDAP member Countries, Development partners and other stakeholders. I hope CIRDAP, with its renewed commitment towards its member countries, will be able to continue work as a trusted partner in achieving sustainable and inclusive rural development through Geoinformatics application in the Asia and the Pacific region.

CONTENTS

ABBREVIATIONS

ACP	Action Plan
APO	Asian Productivity Organization
CBOs	Community Based Organizations
CCM	CIRDAP Contact Ministry
CGARD	Centre on Geo-informatics Applications in Rural Development
CIRDAP	Centre on Integrated Rural Development for Asia and the Pacific
CLIs	CIRDAP Link Institutions
CMCs	CIRDAP member Countries
CSOs	Civil Society Organizations
DG	Director General
FAO	Food and Agriculture Organization
GC	Governing Council
GIS	Geographical Information System
GT	Geospatial Technology
ICD	Information Communication Division
ICIMOD	International Centre for Integrated Mountain Development
ICT	Information Communication Technology
IRD	integrated rural development
IT	Information Technology
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MIS	Management information system
NGOs	Non-governmental Organizations
NIRD&PR	National Institute of Rural Development and Panchayati Raj
PDF	Portable Document Format
PS	poverty stricken
RD	Rural Development
RS	Remote Sensing
SAARC	South Asian Association for Regional Cooperation
SDGs	Sustainable Development Goals
SP	Strategic Plan
SWOT	Strengths, Weaknesses, Opportunities, and Threats

UN   United Nations
VLC   Virtual Learning Centre

1. INTRODUCTION

For development activities to be effectively planned, implemented, monitored and evaluated it is necessary to have a strong information base. More so, when the area where these development activities are targeted is remote, backward, poverty stricken, has a rural characteristic and with people whose abilities and experience to utilize and harness the development process is itself low.

Geoinformatics application has proved its potential in effective planning, management, monitoring of development initiatives and policy support measures across the world. In the recent past, some CMCs, in which GIS/MIS has emerged as an effective tool in designing rural development programmes, with focus on sustainable poverty reduction and environmental conservation. The importance of the spatial dimension in assessing, monitoring and modelling various issues and problems related to sustainable management of natural resources is recognized all over the world.

Geospatial Technology became very important technology for decision-makers across a wide range of disciplines, industries, commercial sector, environmental agencies, local and national government, research, academia, national survey and mapping organizations, International organizations, United Nations, emergency services, public health and epidemiology, crime mapping, transportation and infrastructure, information technology industries, Information and Communication Technology (ICT) consulting firms, environmental management agencies, tourist industry, utility companies, market analysis and e-commerce, mineral exploration, etc. Many government and non-government agencies started to use spatial data for managing their day-to-day activities.

The underlying spirit behind the establishment of Centre on Geoinformatics application for rural development at Centre on Integrated Rural Development for Asia and Pacific (CIRDAP) plays as a role of the international organization to determine the Actionable Intelligence Policy (AIP) in which was to support the governments of CIRDAP Member countries to use ICT as a tool as the module simulation for informed decision making, better planning, forecast & prediction and management of Natural resources to achieve socio-economic growth, besides engaging in research, designing, modelling and application development of Geospatial Technology Applications, Platform, Big data for the rural development sector.

2. BACKGROUND

CIRDAP is a regional, intergovernmental and autonomous organization, established in July 1979 by the countries of the Asia and Pacific region at the initiative of the Food and Agricultural Organization (FAO) of the United Nations (UN) with financial support from the CIRDAP Member Countries (CMCs) and several other UN bodies and a few donor countries.

CIRDAP membership has expanded to fifteen countries namely Afghanistan, Bangladesh, Fiji, India, Indonesia, Iran, Lao PDR, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam. CIRDAP need to ensure its relevance to member countries, and it needs to distinguish itself amongst its peers as a centre of excellence.

Now a days, in the rural development, the traditional method cannot meet the scientific planning and analysis. In the last two decades, GIS/MIS has been used for infrastructure, resource monitoring and survey, regional planning, surveying and mapping, disaster assessment and prediction, water resources development, agriculture, environmental protection, tourism planning and management and other fields. In the new rural planning, GIS/MIS highlights its advantages in rural planning, with its powerful spatial analysis and efficient data query capabilities.

Keeping that in view, the Governing Council (GC-19) resolution in 2013 approved the establishment of the CIRDAP Information Centre which is known as Centre on Geoinformatics Applications in Rural Development (CGARD). This centre was established in 2017 with generous support from Ministry of Rural Development, Government of India and National Institute of Rural Development and Panchayati Raj (NIRD&PR), India to support the government of CIRDAP Member countries to use GIS as a tool for informed decision making, better planning and management of resources to achieve socio-economic growth, besides engaging in research, designing, modelling and application development of Geospatial Technology Applications for the rural development sector.

The Governing Council (GC-21) in its meeting in Manila, Philippines in 2017 approved the CIRDAP Strategic Plan 2018-2022. One of the three goals of the Plan is 'to Enhance CIRDAPs visibility and relevance according to CMCs expectations. As a strategy to achieve this goal, the clause 3.2.6 of the Action Plan of the Strategic Plan of CIRDAP stipulates "Develop and update informatics applications and establish an interactive spatial database system to connect all CMCs" to achieve the outcome CIRDAP needs to develop a Strategic Plan of CGARD.

3. GEOINFORMATICS APPLICATION IN RURAL DEVELOPMENT

Geoinformatics Applications can be used for Planning, Strategic Mobilization, Monitoring, Assessment and Evaluation of various rural development programmes for learning value in different CIRDAP Member countries in the area of Public Health Statements such as malnutrition, pandemic particularly Covid-19 Drinking Water, Rural Roads, Natural Resource Management, Disaster Management, Forestry, Water Resources, Settlement Planning, Agriculture, Irrigation, etc. Geoinformatics Applications also can provide guidance and support in the preparation of Spatial Action Plan including development Alternatives / Scenarios and Spatial Decision Support System for rural applications in most of the rural development initiatives, preparation of the assets by using Participatory GIS at the all level both in domestic and international organization of CIRDAP Member countries as well as in the areas of monitoring, assessment and evaluation of on-going integrated rural project in developing country.

4. WHAT IS THIS DOCUMENT?

This CGARD Strategic Plan is intended to serve as guidance for moving from initial stage to advance stage. This plan clearly outlines the mission, objectives and goals of this initiative as well as strategies on how it will be achieved. This plan will allow the CIRDAP to better leverage its GIS/MIS investments and ensure that priorities for GIS/MIS technology and related business processes are aligned with CIRDAP's objectives. The scope of this document is targeted primarily at the 2020-2024 calendar years. At the end of this period a comprehensive review will be done to assess progress-to-date and for future direction.

5. ANALYSIS OF CIRDAP'S GIS/MIS SITUATION

An evaluation was made of the Strengths, Weaknesses, Opportunities, and Threats (referred to as "SWOT" analysis) for CMCs geographic information situation by the research "Status and Perspective of GIS/GIM in CIRDAP Member Countries: Policies, Practices and Strategies" conducted in CGARD-CIRDAP. The strengths and weaknesses are identified by an internal environment appraisal. On the other hand, opportunities and threats are identified by an external environment appraisal. SWOT-analysis helps to determine the current situation and to identify major prospects and challenges that could significantly impact GIS/MIS implementation in CMCs.

Strengths
  (i) Publicly Available Geospatial Data from some government and national/International agencies;
  (ii) Academic Advancement of Geospatial Technology in some CMCs;

(iii) Extensive Experience with Collaborative Geospatial Initiatives with CGARD, NIRDPR.
(iv) Connection of an interactive spatial database system among CMC/CIRDAP country members
(v) Big data generated by linkage spatial data of CMCs/CIRDAP would be suitable and sufficient information for more precisely making decision.

Opportunities
(i) Budget constraints: Use geospatial technology more efficiently and apply the technology to perform processes more quickly and cost effectively;
(ii) Climate Change: Use Geospatial technology more effectively to monitor the impact of Climate change;
(iii) Emergency Management: Use Geospatial technology more effectively to mitigate the effects of and recover from natural or manmade disaster.
(iv) At present, diversification of ICT application, technology and service in rural development from CMCs/CIRDAP such as GIS, GPS, Internet of Thing(IOT), Artificial Intelligence(AI), Sensors, Drones, Internet, Cloud, Big data, Mobile Application and Smart Devices.
(v) The dramatically change of natural resources and environment cause to gain the data complexity that need the technology device for data collection to maximize the utilization.
(vi) The CIRDAP's action goals conform to the SDG such as No Poverty, No Hunger, Clean water and Sanitation Cities and Communities, Protect the planet Life on Land.
(vii) Majority of population in rural area of CMCs actually practice in agriculture that enables to provide the information in order to enhance the productivity. Meanwhile to avoid or to decrease the crop damage because of natural disaster would be forecast and to recommend the proper plantation, crop harvesting to farmer.

Weaknesses
(i) Limited Funding/ Resources for Geospatial Initiatives;
(ii) Lack of Awareness of Geospatial Technology;
(iii) Absence of GIS/MIS focal officer in CLIs in some member countries;
(iv) Inadequate funding for programs and limited budgetary allocation;
(v) Limited number of staff and lack of training for capacity building programs for staff;
(vi) Lack of Awareness and Accessibility of Geospatial Data in CLIs.
(vii) Lack of IT officer in Sub-district level
(viii) ICT skill of IT office in CMCs/CIRDAP is not in the experience equal.
(ix) System design and service are not friendly-used and sufficiently compatible.

(x) Insufficient or none of information availability, digital devices and internet access for farmers in rural area.
(xi) Difference languages as barrier
(xii) No Internet Infrastructure cover in some area

Threats
(i) Pace of Changing Technology
(ii) Data Security
(iii) The Covid-19 pandemic

Swot Analysis Outcome:

GIS systems have some recognized strengths. The main strength of a GIS is its ability to integrate spatial data, maps, and data which are publically available from multiple sources, and visualize them in digital maps that can be used by technical and non-technical employees for problem-solving and decision making; thus it improves the employees' productivity, efficiency, and effectiveness and consequently improves the quality of their decisions. Second, GIS is fast becoming a tool used for research and planning in all disciplines of study. Some of the higher education institutions in CMCs recognize the importance of GIS and offer educational opportunities (degree, certificate, courses). CIRDAP CGARD with technical support from the National Institute of Rural Development and Panchayati Raj (NIRD&PR), India, has been offered several Certificate Courses on GIS and its Applications and intensifying its efforts to increase the availability and awareness of GIS courses. Third, GIS can facilitate the coordination of work among CMCs/CLIs because it integrates many aspects of decision analysis such as statistical, spatial, and geographical information already available in the interactive spatial database system. And fourth, GIS has considerable and comprehensive tools in Big data generation, evaluation, and analysis as well as the ability to integrate multi-dimensional attributes to assist in decision making considering a large amount of data available.

GIS is used not only to best utilize money, time, and resources (efficiency) but also to ensure of performing the right decisions and actions (effectiveness). In the era of rapidly-changing technologies, we need to use updated ICT applications, technology, and service for rural development in CMCs such as GIS, GPS, Internet of Thing (IoT), Artificial Intelligence (AI), Sensors, Drones, Internet, Cloud, Big data, Mobile Application and Smart Devices. These rapid development activities are fueling high demand for geospatial information. High-quality geospatial information along with an effective GIS system is able to play a strategic role in a country's sustainable development and address the major challenges facing the world today such as Poverty, environmental conservation, climate change, disaster, and global warming. The majority of the populations in the rural area of CMCs actually practice agriculture which enables to provide the information in order to

enhance productivity. Meanwhile to avoid or to decrease the crop damage because of natural disasters would be forecast and to recommend the proper plantation, crop harvesting to farmers.

Weaknesses in the use of GIS Despite, the importance and popularity of the GIS, there are a number of identified weaknesses associated with its use. The major weakness of the GIS in developing country is inadequate staff and financial resources, and limited budgetary allocation that internally weaken the GIS usage. Even though some CIRDAP Member countries are not capable of supporting in-house GIS capacity. Additional funding is seen as a priority for the development of a Regional GIS framework, however, and should be listed as an objective for the upcoming budget/Strategic Plan of CIRDAP. Another major weakness is the complexity of GIS, which makes it difficult to use by non-trained and unprofessional personnel, and hard to be adopted by decision-makers. In additional, there is a lack of skilled and trained personnel in GIS usage. One more weakness of GIS is the lacking of sufficient resources that would be required to meet the national need in the field of geospatial information. Another weakness of GIS is that it lacks awareness and accessibility of geospatial data at CLIs level.

Threats of Using GIS, there are many external negative issues related to the widespread of using GIS. One of these issues is focuses on national security and privacy; the misuse of the system and its information can lead to a serious national public dilemma. Some examples of threats that cause these misuses are the privacy/intellectual freedom, ownership, the misuse of information, and the cost to publicly-funded institutions. Another major threaten is the pace of changing technology. In order to take full advantage of the technology, significant attention needs to be given to the industry and the technology that is developing, while ensuring best practices are applied. Professional GIS practitioners require continuing education, presenting a challenge for academic institutions and the workplace to maintain a professional pace with rapidly unfolding advancements in the industry. In addition, COVID 19 pandemic is the greatest threat globally. The COVID-19 pandemic will have short- medium- and long-term effects on territorial development and subnational government functioning and finance. The COVID-19 pandemic created havoc in CMCs across the world, forcing them to resort to lockdown. COVID-19 affected the global economy in three main ways: by directly affecting production, by creating a supply chain, and by market disruption.

6. Key Message
CIRDAP Secretariat is not only the Centre of Excellence in servicing institutions in Integrated Rural Development for CMCs but also an Actionable Intelligent platform (AIP) role as a networking agency in the Asia-Pacific region with cross-disciplinary teamwork. In this regard, CIRDAP Secretariat, over the years, has tried to make institutional linkage

and networking in the region which includes strengthening networking with CIRDAP Link Institutions for knowledge generation and establishing linkages with regional organizations such as SAARC ICIMOD and APO etc. However, emphasize should also be given to strengthening networking with other important regional organisations, and national and community level development partners. In addition, CIRDAP must make itself a convergence platform between donors and partners in CMCs for resource mobilisation and collective efforts for IRD in the region.

To strengthen CIRDAP capacity is to develop any relevant application system to meet the need of targeted farmers in the rural areas in order to overcome their actual problems and constraints efficiently by developing ICT as simplified application for all.

7. OBJECTIVES

The objectives of the Strategic Plan are aligned and linked inextricably with CIRDAP's proposed Strategic Plan (2020–2024). The Strategic Plan has 4 key Objectives .Number of sub-objectives under the key Objectives are as follows:
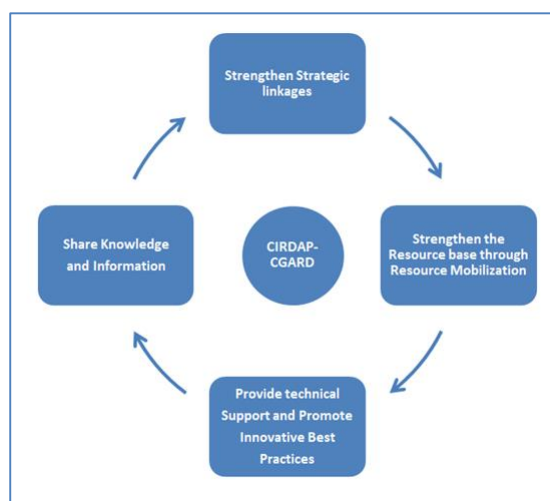

Figure: The theory of Change of Strategic Plan

1. **Strengthen strategic linkages with Global, Regional, National and Community level organizations, link institutes and development partners for collaborative program activities in order to meet the development needs of CMCs**

1.1 Ensure to Establish new partnerships and implement collaborative programs efficiently by strengthening networking;

- *Identify and liaise with potential partners for partnership*
- *Submit to DG for MoU approval*
- *Upon agreement from both parties, formalize through MoU*
- *Collaborative programs*
  - o *Identify areas of common interest for collaboration*
  - o *Table submission (concept paper including budget) to DG for approval*
  - o *Implement collaborative programs*

1.2 Ensure to strengthening the network with Regional organisation like UNSPIDER, UNGGIM etc for becoming a Nodal Centre for Disaster management and alert centre for CMCs;

- *Identify the GIS focal point Officers from National and Regional Organization in CMCs.*
- *Prepare a database of GIS focal point Officers.*
- *Strengthening network with GIS focal point Officers.*
- *Data Exchange from the Organizations*

1.3 Monitor and Report on the status of Programme activities in accordance with Monitoring & Evaluation and Reporting Guideline;

- *Monitor work activities through weekly meetings and monthly Reports*
- *Report on work plans activities as scheduled*
- *Evaluate/assess the process and the effects of the activities*

2. Strengthen the resource base through resource mobilization, expansion of Networking to be membership, engagement with potential donors and partners, and income generation through CIRDAP infrastructure / Identify and secure sustainable funding sources to support geospatial programs.

2.1 To develop product by characterizing in each specific origin to determine those contents in order to formulate the strategic marketing plan and mobilization in local, domestic and nationwide;

- *Develop and implement Branding and Marketing Strategies of Unit products*
- *Find the target audience*
- *Awareness through Website/Training/ Workshops/Forums/Publications Communication with clients regularly.*

2.2 Conduct paid training/workshops/seminars in-country programmes;

- *Develop or revised the Curriculum/material/presentations and consult with subject matter expert*
- *Proposal submission for approval to DG*
- *Circulate the Advertisement/Invitation*
- *Identify and engage the Resource Persons*
- *Conduct the Training Session/Workshops/seminars*
- *Certificate distribution*
- *Evaluation and submission of programe report to DG*

2.3 Secure a sustainable funding source to support the established geospatial framework;

- *Identify potential partners like IFAD, FAO, World Bank, SAC, EU, using standard guidelines provided*
- *Prepare relevant submissions/concept papers/project proposals*
- *Submit DG for approval*
- *Submit project proposal to the funding agencies*
- *Implement approved programme activities*
- *Secure a sustainable funding source to support the established geospatial framework.*
- *Establish formal partnerships for funding of geospatial initiatives.*

3. Providing technical support and promote innovative best practices on ICT for sustainable IRD

3.1 Determine Rural Development challenges in CMCs and develop appropriate measures to address the gaps and pain point either through Training, capacity building, Research or Pilot Projects;

- *Identifies Rural Development challenges or specific community problems*
- *Develop a work plan for addressing problems and attaining the goals.*
- *Describe measurable beneficial impacts to the community that result from the project's implementation.*
- *Determine the level of resources or funding necessary to implement the project.*
- *Prepare and submit project proposal to funding agencies*
- *Implement approved project*
- *Monitor the work activities*
- *Evaluation and submission of project report*

3.2 Documentation of best practices from member countries based on focus areas as benchmarks for CMCs to develop new or strengthen existing models;

- *Collect and compile Good practice*
- *Submit to DG for approval*
- *Disseminate and Promote Good practices through inford.org knowledge, portals, websites and social medias*

3.3 Use of state-of-art information and Communication Technology for optimum and efficient management of rural development initiatives;

- *Generate and compile GIS data related to IRD*
- *Prepare Database*
- *Identify areas and liaise with GIS/MIS and Spatial data where appropriate.*
- *Share tools and data with other divisions and CMCs for potential use in different programme and activities*

3.4 Design the digital solutions to support any digital technology and various ICT in order to build the data linkage such as GIS, GPS, Internet of Things (IOT), Artificial Intelligence, Sensors, Drone, Internet, Cloud, Big data, Mobile Application and Smart Device;
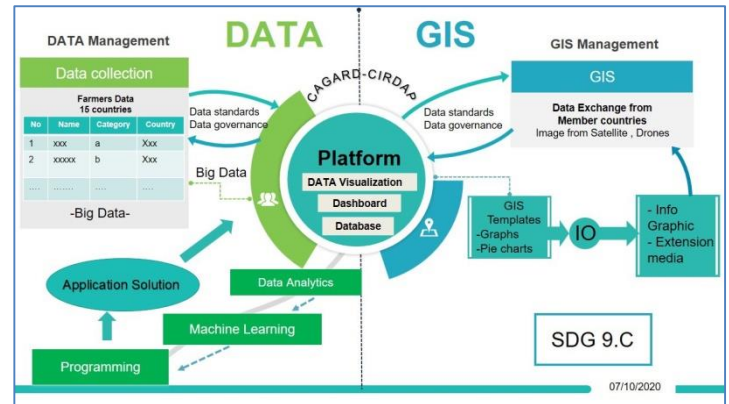
- *Establish standards for framework geospatial data*
- *Adapt or develop best practices for collaborative data collection, management, and distribution.*
- *Establish mechanisms for supporting collaborative data development, coordination, validation, and data dissemination.*
- *Provide a unified clearinghouse for access to geospatial data that leverages existing capabilities.*
- *Facilitate the completion and maintenance of framework geospatial data.*

4. Generate and disseminate new knowledge on IRD in collaboration with CLIs and partner organisations at different levels by developing networking and spatial database systems, e-learning, and other ICT tools and resources to share knowledge and information with CMCs and development partners

4.1 Ensure sound management of ICT Applications and establish an interactive Regional Spatial Database System to generate BIG Data relevant to IRD from CMCs and decision support system through platform which consist of promise database exchange from each CMC probably display through GIS, satellite image and template and graph, monitoring dashboard etc;

- *Consult with Subject matter Expert and technical experts*
- *Design an interactive Regional Spatial Database system*
- *Build the Spatial database system including decision support system and early warning system for flood and draught*
- *Implementation the hardware, software and server*
- *Generate the Big data which lead to development into Artificial Intelligence (AI) through machine learning and algorithms, Performance monitoring and evaluation*
- *Formulate the system programming which generates the solution for all end-user.*
- *Regular maintenance including database backup*

4.2 Develop Virtual Learning Centre (VLC) probably develop through Augmented Reality(AR)Technology for better understanding and learning and offer relevant Programme courses in collaboration with recognized universities/institutions;

- *Setting up online platform*
- *Choose the Course Topic and consult with expert*
- *Develop the e-course curriculum and content*
- *Identify and collaborate with the partners*
- *Submission to DG for approval;*
- *Produce Online e-Course material*
- *Marketing through social media platform*
- *Launch*
- *Evaluate and update regularly*

4.3 Knowledge transfer by providing the ICT-based learning and Advisory Service on the use of program and device including the application of information such as E- learning, Knowledge Management System, Streaming Media/Video-Based Learning (YouTube), Consultancy and Webinar etc;

- *Develop Massive Open Online Course (MOOCS)*
- *Prepare e-materials for E- learning*
- *Plan and shoot relevant video of the programme.*
- *Upload the content on e-platform*
- *Use e-tools for evaluation of programme.*
- *Update database with e- materials*
- *All relevant document, post programme report, etc. submit to CO for updating CIRDAP website and social media;*

4.4 Establish a dashboard platform in order to monitoring the warning and their impact such as Natural and manmade disasters, Pandemic diseases (COVID-19);
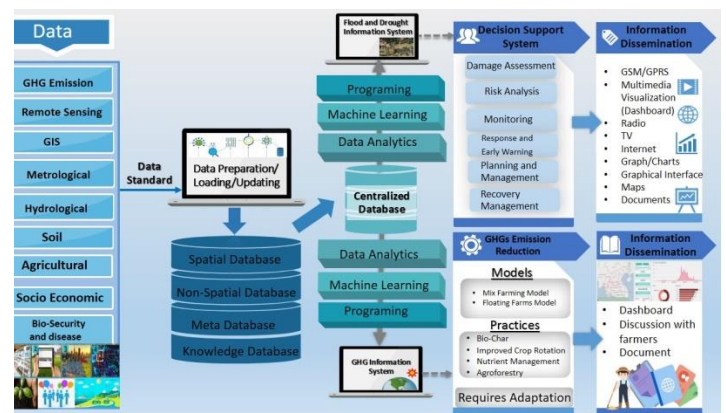
- *Prepare a detailed design of the Monitoring platform in collaboration with the Technical experts*
- *Develop the monitoring platform/portal*
- *Deploy a monitoring system to aggregate, analyze and report on results.*

4.5 The campaign of awareness and motivation on ICT to all level partners and targeted farmers;

- *Coordinate and increase awareness of professional development and training opportunities to empower the use of geospatial technology in a more effective manner.*
- *establish outreach activities, including meetings and media outlets, to formally promote the application and benefits of the technology*
- *Continually evaluate new technologies and make recommendations on how these technologies might be leveraged*
- *Promote and deliver the outcome through the cultural and media network i.e. television, magazines, maps, brochures, and radio.*

8. Requirements:

For achieving the strategic goals outlined, requires a number of organizational changes. CGARD needs to be empowered, a staff position for a Geospatial Information Officer, a programmer and an Assistant of Geospatial Information Officer, best infrastructure, updated software's, and sufficient sustainable funding.

To capacity Building emphasis on strengthening, enhancing and encouraging the collaboration among CMCs into easily data access through agreement on the data governance.

Among CMCs, the best ICT Practice as lesson learnt should be exchanged as probably training course for further collaboration and to develop networking.

Big data in Multi-Level Platform for cooperation in Knowledge Transfer and Capacity Building for precision agriculture and spatial data standardization

9. VALUES

To accomplish this strategic goal of the CGARD, CGARD is linked with these values.

Quality: Enhancing, Encouraging and maintaining expertise in technical skills and providing geospatial technology determination.

Accessibility: Spatial data is available in different formats and different medium.

Affiliation: Preserve and participate the needs and interests of our partners for the lead of our actions.

SECURE: Spatial data is stored in a safe and secure environment and back-up is kept on

a regular basis.

Teamwork: Strive for the involvement and cooperation of our audience towards the most effective and efficient applications of GIS/MIS technology.

Supervision: Securely and responsibly keep and uphold major investment in GIS/MIS resources.

Professionalism: Value the highest ethical standards and professional principles based on the code of ethics of Geographic Information System.

Service: Provide effective support, responsive, and knowledgeable service to meet our audience's needs for geospatial issues and other GIS/MIS applications.

Feedback and Participation: Regular feedback from the stakeholder should be captured and acted upon.

Precision: Spatial Information should be precisely tailored to the audience's interests and "information overload" should be avoided.

10. FOCUS AREAS

Sustainable Development and Efficient use of Natural Resources:
- Land Administration and Management

Livelihoods:
- Poverty reduction

Access to Basic Services:
- Access and use of ICT for IRD

Climate Change and Impacts
- Strengthen resilience and adaptive capacity to climate change
- Mitigation of adverse impact

Governance
- Strengthening local governance and CBO/CSOs

11. AUDIENCE

To achieve the goal, identifying the audiences is one of the key primary steps. Considering the diversity in terms of quality, accessibility, affordability, and preference of different audiences, CGARD should be tailored accordingly and the right mix of data, tools, and platform should also be determined to ensure maximum outreach and impact. The key audiences of CGARD include the following:

1. Audience within CIRDAP Framework
   (i)   Secretariat;
   (ii)   CIRDAP Contact Ministries ;
   (iii)   CIRDAP Link Institutes (CLIs).

2. External Audience
   (i)   Relevant Ministries of CIRDAP Member Countries;
   (ii)   International Donor Agencies;
   (iii)   Regional Development partners;
   (iv)   National level Development Partner Geoinformatics Technology Applications in Rural Development sector and allied areas;
   (v)   Community based organisation;
   (vi)   NGOs and Civil society Organisations;
   (vii)   Academicians;
   (viii) Private Sectors.
   (ix)   Small Scale Farmers (CIRDAP-CGARD have a plan to build up a decision-support platform by initiating a network of information and communication at community levels to apply and to monitor climate-smart farming practices in relation to climate change adaptation and mitigation and to communicate with community network, vulnerable communities, small scale farmers and stakeholders to plan for mitigating the impacts of climate change in terms of preparedness, response, and recovery by integrating scientific information with local knowledge which can be adapted for sustainable management of agriculture farming practices)

12.   CGARD SERVICES ON OFFER

CGARD has developed a range of products and trainings for CMCs in integrated rural development. The Centre offers a wide portfolio of services: data collection – management – visualization (production of static & dynamic maps), remote sensing analysis, Academic and research guidance, conduct research, and organise training and capacity building. **It will need an experimental project to proof effectiveness of CCGARD connectivity and practical means of working**. Therefore, In the duration of this strategic plan, first, CIRDAP-CGARD will conduct a pilot project entitled "Using Satellite Images and Cellphone Data with Machine Learning tools for Predicting Poverty" and Second, CIRDAP-CGARD will establish an interactive Regional Spatial Database System to generate BIG Data relevant to IRD from CMCs and decision support system through a platform which consists of promise database exchange from each CMC probably display through GIS, satellite image and template and graph, monitoring dashboard, etc, and third, CIRDAP-CGARD will continue to conduct the training and

capacity building program.

One-stop-shop data & Information Centre: CGARD is a multi-level Platform in order to exchange, to share and to access the database as Big Data through GIS or MIS technology

Data Collection and standardization: Provide technical support and training by GIS/MIS for geographic data collection using GPS and/or mobile phones, Aerial Imagery acquisition, and analysis (Mainly satellite, and drones, etc.).

Data Management: Responsible for data management of spatial data and is available to support structuration of sector data if requested by sector specialist.

Data Visualization – "mapping": The GIS end product entails data visualization using geography as its organizing principle. Different types of visualizations, ranging from PDF static maps to be printed and used in the field to various other options: dynamic maps, dashboard, etc. exist.

Academic and Research Guidance: The CGARD offers to The Masters' Students to work in CGARD on various Research Themes decided by CIRDAP and may be limited Fellowships by CIRDAP or other CIRDAP Member Countries.

Conduct Research: CGARD conducts research on CIRDAP Focus areas under the Sustainable Development Goal and identifies areas for further research, pilot projects and training.

Training and Tutorials: GIS/MIS courses are designed according to different targeted audience. The CGARD offers basics as well as advanced courses in GIS, Remote Sensing, data management, GPS, etc. All the trainings are conducted by theoretical as well as practical classes.

13.   MONITORING AND EVALUATION

Assessment, Monitoring and Evaluation (M&E) activities as dashboard will be conducted on an on-going basis, based on the objectives, progress on the outputs and compliance to values defined in this Strategic Plan to achieve the expected outcomes. An Annual Work Plan of CGARD will be developed to conduct this Strategic Plan. Annual Plan will be assessed quarterly and an annual review of GIS/MIS activities will be conducted. The continuous feedback and findings will work as a basis for the development of subsequent GIS/MIS plans.

Monitoring and Evaluation tools may include but not limited to the following:
- (i)   Survey with target stakeholders;
- (ii)   Number and volume of contents produced;

(iii)   Data analysis to determine the quality of data and compliance to values and other guidelines set by this Strategic Plan.

CGARD will ensure that monitoring is done to ensure planned activities are done on time and according to set guidelines. In addition, external Expert/Consultant from CGARD NIRDPR can be engaged to review GIS/MIS activities once a year to ensure evaluation free of bias and also to get an outside perspective on CIRDAP brands.

It is expected that the implementation of proper M&E will enhance the effectiveness of GIS/MIS Activities and thus will contribute to the overall objectives of CIRDAP.

14.   EXPERIMENTAL PROJECTS: To validate CCGARD connectivity and practical mean of working.

- **Experimental Project 1:** Conduct a pilot project entitled "Using Satellite Images and Cellphone Data with Machine Learning tools for Predicting Poverty".
- **Experimental Project 2:** Build up a decision-support platform by initiating a network of information and communication at community levels to apply and to monitor climate-smart farming practices in relation to climate change adaptation and mitigation.
- **Experimental Project 3:** Organise in-country and Regional level training, workshop on GIS and Its applications.

15. GIS/MIS USE FOR CLIMATE CHANGE MITIGATION AND ADAPTATION

GIS technology acts as a decision support tool. It may be possible to make a decision from the analysis of the different GIS layers. Presently, GIS, GPS, Internet of Thing (IOT), Artificial Intelligence (AI), Sensors, Drones, Internet, Cloud, Big data, Mobile Application and Smart Devices are useful for managing and planning disasters as well as dealing with critical situations. Geospatial technologies are useful for multiple hazard mapping and risk mapping and mitigation of people can be easily possible by using these maps during emergency situations. Geospatial technologies are very beneficial in mitigation strategies and preparedness plans. Real-time geographic data can improve the allocation of resources for response. GIS technologies are very useful in modeling disaster risks and human adaptation to hazards. It also provides a decision support system in disaster management and communicates

with community networks, vulnerable communities, farmers and stakeholders to plan for mitigating the impacts of disasters in terms of preparedness, response and recovery.
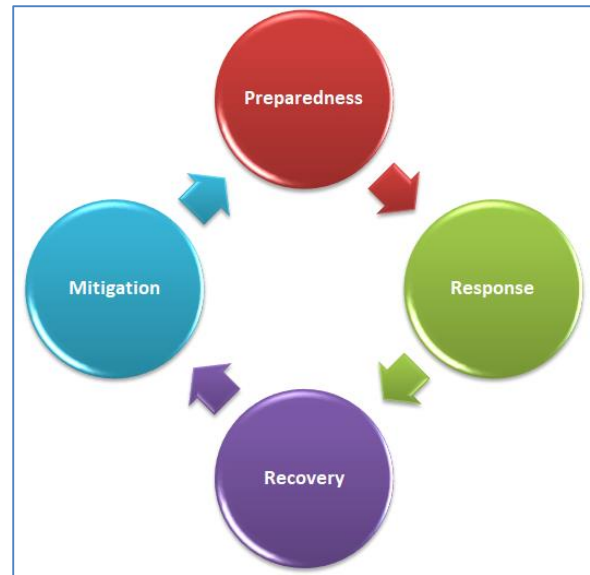
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