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I. Rationale

SSCT aims to fully comply with the expectations of its clients and stakeholders as a functional University. CHED Order No. 46, S. 2012 stipulates that Universities perform the primordial role of generating new knowledge, hence, research is a central function of all universities in general, and of SSCT in particular. This Research Agenda provides the talking points and “doable” undertakings in research for the institution, in part, focusing the application of government resources to high- impact academic undertakings.

The Research Agenda is anchored on: (a) the available research resources of the Institution, (b) the National High Education Research Agenda NHERA: 2009- 2018, (c) the Regional Development Plan (RDP), and (d) the Philippine Medium Term Development Plan. Taking account of all these, the Research Agenda synthesizes the major areas of concern and systematically responds to these concerns.

Vision

An excellence- driven institution of higher learning committed to produce holistic and globally competitive individuals.

Mission

To provide relevant, high quality and sustainable instruction, research, production and extension programs and services within a culture of credible and responsive institutional governance.

Goals

The overarching goal of the Institutional Research and Development System is to establish a culture of excellence in research and development relevant to the development thrusts and priorities of Surigao Del Norte, the whole of Caraga Region, and beyond.

Objectives

The R and D System endeavors to pursue the following objectives:

1. Develop research capacity and enhance research productivity among the faculty of the College.
2. Produce relevant and quality research and development outputs.
3. Disseminate relevant research outputs through public presentations in local, national and international fora and publication in accredited refereed journals.
4. Establish mechanisms to ensure that research outcomes benefit the target clients.
5. Transfer appropriate technology to empower communities, businesses, and industries.

II. Research Framework

While the general purpose of research in the academic is to push the frontiers of knowledge forward, research in SSCT shall be focused on advancing knowledge in various disciplines to support.

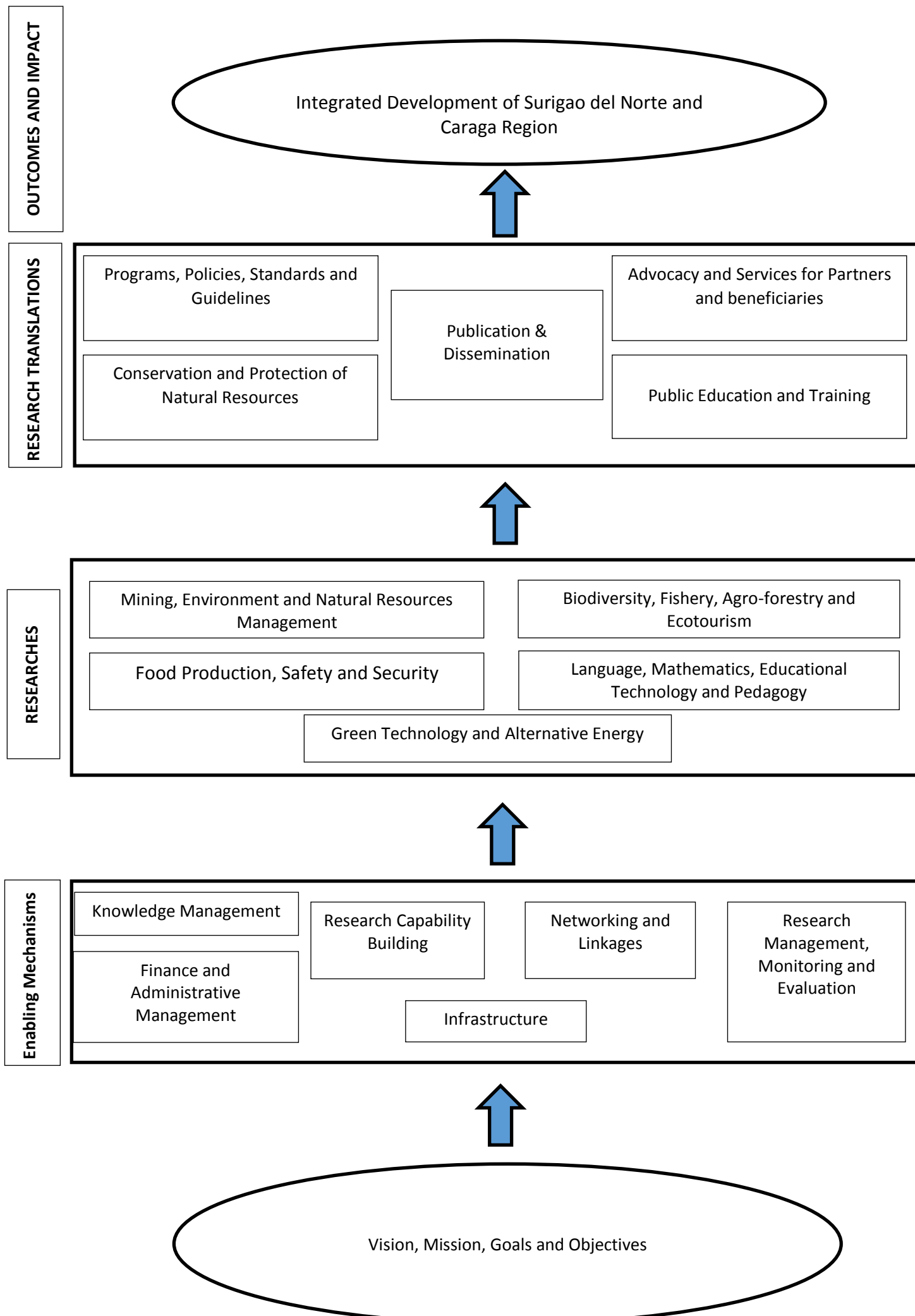


Figure 1. Framework for Research and Development

The individual disciplines in Science, Technology, Social Sciences, Education and the Languages synergistically interact through inter- disciplinary or multidisciplinary researches that address concerns in Ecotourism, Fisheries and Agriculture.

III. Identification of the Agenda

Guided by this research framework and thorough analysis of the strengths, weaknesses, opportunities and threats to the institution, the following concerns/ issues emerged.

1. Faculty Capability. Only a few faculty members have had experience in publishing their research outputs in recognized indexed journals. The greater majority have no experience in research publication. In terms of educational qualifications, the few faculty with advanced degrees are not vertically-articulated, hence, unable to produce expert- level research outputs.
2. Research Outputs. While the institution has a category B journal, the sustainability of the journal is threatened by the low research production from the faculty members. The ideal 1: 1 faculty to research ratio is yet to be attained based on the current ratio of 6: 1 (six faculty to each research).
3. Research Culture. The institution is still locked on the traditional “teaching” role of the academe. Research remains a function that is largely neglected at SSCT.
4. Minimal External Linkages in Research. The institution operates like an island with minimal external contacts. This environment does not nurture a culture of research in the academe.
5. International Perspectives. Quite clearly, the views of most of the faculty have remained parochial and riveted to the confines of the institution.

IV. Research Agenda: 2011- 2016

Given all these concerns, the Research Agenda of SSCT covering the period 2011-2016 is hereby presented:

Agendum 1. Enhancing Faculty Research Productivity

Agendum 2. Research Capability Building for the Faculty

Agendum 3. Building the Culture of Research

Agendum 4. Strengthening External Research Linkages

Agendum 5. Internationalizing SSCT Research

V. Agenda Discussions

Agendum 1. Enhancing Faculty Research Productivity

The challenge of enhancing faculty research productivity has to address the following concerns:

- a) Faculty members are “burned out” due to the number of teaching loads and prefer to have an extra load than doing research.

- b) Small amount of faculty members are vertically articulated in their degree from baccalaureate to masters or doctorate.
- c) Some faculty members have the ability to research and publish but, for various reasons, did not want to make an expanded contribution because they felt institutional betrayal, low trust, fatigue, and increased social isolation.
- d) Some faculty has low motivation and low ability. They are characterized by older faculty who were approaching retirement and few younger faculty members with no research or publishing education or experience and did not have terminal degrees and, therefore, no education or experience in the research and publishing that most of them comes with doctoral programs.

Thus the following activities shall be conducted:

I. Policy formulation rationalizing research extension and instruction load.

This activity will develop rules converting teaching load into research and extension load. A series of consultative meetings with the Civil Service commission, COA representative, deans, research, extension and program coordinators will be conducted. The focus of this activity will be on how the 40 hours of mandated services rendered by the permanent faculty member be divided into research, extension and instruction. Anything in excess of the mandated hours is considered overload.

II. Faculty development plan formulation

Quality of research depends largely on the qualification and competencies of the faculty as mandated in CHED Memorandum Order (CMO) No. 40, s. 2008. The faculty development program is a crucial factor towards building a strong foundation of an educational system to ensure quality education. Hence, there is need to encourage and provide assistance to faculty to enable them to meet the desired ratio of 1:1(faculty per research).

This activity will focus on developing plan for providing variety of training opportunities that are premised on minimizing inbreeding and empowering individuals for the benefit of the institution as a whole. A series of workshops and consultative meetings with the planning officer, Human Resource Development Officer, deans and program heads will be conducted. This activity will include development of incentive scheme for publication in high-impact journals, support for paper presentations in high-impact conferences, support for publication, support for advanced and short term studies in top-rate local and foreign universities, support for sandwich program abroad, support for post-doctoral fellowship abroad, and support for faculty research leave.

Agendum 2. Research Capability Building for the Faculty

Capability building is an enhancement of the abilities of individuals, organisations and systems to undertake and disseminate high quality research efficiently and effectively. In order to capacitate the faculty of SSCT in the conduct of research, series of training and faculty research enhancement shall be conducted. Its fundamental goal is to enhance the ability to evaluate and address the crucial questions related to the development and conduct of research. It will also facilitate individual and organisational learning which builds social capital and trust, develops knowledge, skills and attitudes to

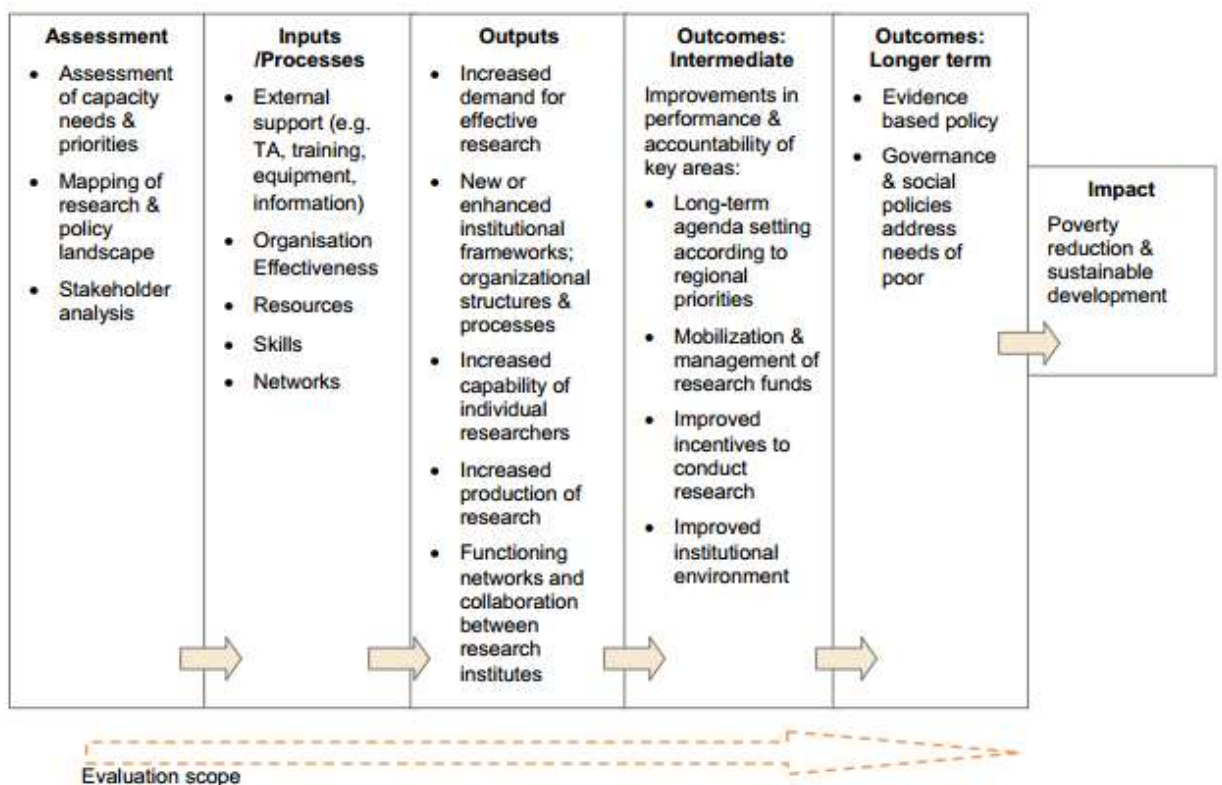
successfully create an organisational culture and a set of capabilities which enables organisations to set objectives, achieve results, solve problems, and create adaptive procedures which enable them to survive and sustain in the long run. It will enhance the abilities of individuals, organisations and systems to undertake and disseminate high quality research efficiently and effectively. It focuses on a series of actions directed at helping participants in the development process to increase their knowledge, skills and understandings, and develop the attitudes needed to bring about the desired development change. This means improving researchers' skills, as well their access to research information and resources and supporting researchers in playing a more regular and effective role in policy-making. It also means paying special attention where there are skills gaps.

Hence the following modules are presented as initial step, but this is not an end in developing faculty research capacity:

- Module 1. How to write a publishable paper.
- Module 2. Statistical Analyses using software (e.g. Minitab, SPSS, MatLab)
- Module 3. Data Mining 1
- Module 4. Data Mining 2
- Module 5. Modelling and Simulations
- Module 6. Fractal Analyses 1
- Module 7. Fractal Analyses 2
- Module 8. Series of Writeshops

To fully fulfil the desired outcomes from the program, the table below showed the plan for capacity building for research structure around the research system.

Capacity Building Chain



Agendum 3. Building the culture of Research

To ensure a culture of research, the school administrators should allocate funds for faculty development especially in honing their research skills by immersing them to research-related seminars, trainings, and workshops called by various research organizations. This strategy should be reinforced by mentoring and coaching by the research team. The faculty researchers must be informed of their reach functions accompanied by a well-defined research plan, setting of research goals and setting a clear cut incentive scheme as a form of motivation to encourage more faculty to engage in research. Student involvement should also be promoted both in the undergraduate and graduate school.

A strong research culture also be established by all members of the academe by establishing policies relating to research and enforced with regularity over time since it can raise institutional reputation and promotes faculty advancement. The R and D shall also recommend worthwhile researchers for publication in high-impact research journals and other publication especially in the CHED-JAS.

Thus, the following influential factors are to be considered for building a strong culture of research:

- a. Faculty training and Support programs
- b. Recognition of research production
- c. Encouragement of research collaboration
- d. Balanced teaching and research responsibilities
- e. Pay that is commensurate with expectations

Agendum 4. Strengthening External Research Linkages

In order to strengthen external research linkage, the RDO shall establish research linkages with the other colleges and universities and with other public and private domestic and foreign agencies and organizations, linkages and networking with other stakeholder. This is to source out funds from funding agencies apart from the institutions funding grant.

Agendum 5. Internationalizing SSCT Research

Research as one of the functions of higher education institutions and the pursuit of knowledge has no boundaries. Thus, it is often stated that research is by its very nature, internationalized. Partnership with international institutes may be in the form of joint research projects, the sharing of facilities and major infrastructure, allowing sharing of research data and discoveries and the linking of research centres and virtual networks.

This can play role in gaining another perspective access to complementary expertise unavailable domestically, to obtain additional funds and overcome the high cost of research through sharing of resources or infrastructure, and increasingly in order to tackle global issues and challenges.

R & D PROGRAMS (2011-2016)

Mining, Environment and Natural Resource Management Program

- a) The Arts and Sciences Division (ASD) shall be the lead convener.

- b) Collaborators shall be the faculty-researchers from the:
 1. Environmental Science Department, Natural Sciences Department, Information Technology Division of the City Campus
 2. Graduate School particularly the MAED major in General Science
 3. Fisheries and Marine-Biology Department of the Malimono Campus and Del Carmen Campus
 4. Agro-Forestry Department of the Mainit Campus
 5. Teacher Education Division of the City Campus and the Malimono Campus

- c) The R & D program shall include:
 - a. Ridge to Reef Management
 - b. Responsible Mining
 - c. Climate Change Adaptation and Mitigation
 - d. Conservation, Protection and Rehabilitation of Environment and Natural Resources
 - e. Air and Quality Management
 - f. Toxic, Hazardous, and Solid Waste Management
 - g. Eco-system based studies
 - h. Environmental Effects of Mining Industry
 - i. Disaster Risk Reduction Management

Agro-forestry, Fisheries, Food Production, Safety and Security

- a) The BS Fisheries and BS Agro-forestry Malimono, Mainit and Del Carmen Campuses will be the lead convener.
- b) Collaborators will be the faculty-researchers from the:
 1. Natural Sciences Department, Mathematics and Languages Departments of the four campuses.
 2. Information Technology and Engineering Departments of the city campus
 3. Teacher Education from the four campuses.
- c) The RDE program shall include:
 - a. Socio-cultural aspects of agriculture and fisheries
 - b. Agricultural and fishery production technology
 - c. Basic aspects of agriculture and fisheries
 - d. Post Harvest Technology
 - e. Value added Food Processing
 - f. Food Handling Technology

Biodiversity and Ecotourism

- a) The Faculty of the BS Marine Biology in Malimono Campus and BS HRM in the City Campus and Del Carmen Campus will be the lead convener.
- b) Collaborators will be the faculty-researchers from the:
 1. BS Environmental Science of the City Campus;
 2. BSE major in Biological Science and MAEd-Gen Science in the City Campus;
 3. BS Agriculture in Del Carmen and Mainit Campus; and
 4. BS Fisheries in Malimono and Del Carmen Campus
 5. BS Information Technology and Engineering Division in the City and Del Carmen Campus.

- c) The R and D program shall include:
 - a. socio-cultural aspects of biodiversity and ecotourism
 - b. assessments on biodiversity areas
 - c. environmental issues on ecotourism
 - d. demographic profile of the communities within or near tourism sites
 - e. basic literacy of the communities within ecotourism
 - f. science and mathematics education for would-be ecotourism workers

Language, Mathematics, Educational Technology and Pedagogy Program

- a) The faculty of Master of Arts in Mathematics Education, Master of Arts in Education and Master in Information Technology shall be the lead conveners.
- b) Collaborators shall be the faculty-researchers from the:
 - 1. Faculty and students of Arts and Sciences Division
 - 2. Faculty and students of Teacher Education Division
 - 3. Faculty and students of Information Technology Division
- c) The R & D program shall include:
 - a. Instructional Materials
 - b. Appreciation of Academic Disciplines
 - c. Medium of Instruction
 - d. Teaching Strategies
 - e. Assessment Practices
 - f. Curriculum Monitoring and Evaluation
 - g. Theory Formulation

Green Technology and Alternative Energy

- a) The Engineering, Industrial Technology and Information Technology Divisions shall be the lead convener.
- b) Collaborators shall be the Industrial Technology faculty-researchers from the Del Carmen Campus.
- c) The RDE program shall include:
 - a. development of clean technology
 - b. exploration of alternative energy sources
 - c. innovate energy conservation gadgets

Proposed Activities:

- a. Assessment of cleaner production technology
- b. Utilization of corncobs as thermal insulator
- c. Conversion of food scraps to biodegradable equipment/materials
- d. Implementation of paperless office in SSCT
- e. Characterization of e-wastes in SSCT
- f. Implementation of a telework program in SSCT

Key Area 1: Mining, Environment and Resource Management Program in Surigao del Norte, Surigao River

Specific Action Plan:

Completed and On-going Activities (2011-2015)

1. Evaluation of Mining Station in Surigao del Norte
2. Social Acceptability of Mining Operations in Surigao del Norte and Surigao del Sur
3. Landslide Hazard GIS-Based Mapping using Fuzzy Logic Approach
4. Assessment of Mangrove Ecosystems in Del Carmen
5. Waste Management in Mining Areas of Caraga Region
6. Mining Operations Awareness Program
7. Disaster and Risk Management in Key Mining Areas in Surigao del Sur and Surigao del Norte
8. Siltation

Strategies:

1. Training Need Analysis
2. Faculty members leading the research activities
3. Selected groups of students to conduct studies
4. Partnership with the LGUs in Surigao del Norte, Surigao del Sur and municipalities
5. Partnership with NGO's e.g. HIPADA
6. Source out fishing from the college, LGU partners, private companies.

Expected Output:

1. Publications in ISI Journals
2. Information System (complete with data bases, online information).

Key Area 2: Agro-forestry, Fisheries, Food Production, Safety and Security

Goal: To provide safe food which sustain the needs for each family for a healthy life.

Specific Action Plan:

Completed Researches(2011-2015)

Agriculture

1. Improving Rice Production in Water Scarce Areas of Surigao del Norte Using Aerobic Rice
2. Growth Yield Performance of Hog Fatteners Homemade Feeds Adopting Natural Farming
3. Field Evaluation of Natural Pesticides against Major Pests of Eggplant
4. Comparative Study of Farmers' Practice and Package of Technology for Cardaba Banana as Undercrop-based Farms of Surigao del Norte
5. Common Indigenous Botanicals as Insect Repellent in Paddy Storage
6. Optimal Rice Varieties under Magpayang Condition: Experimental Trial Under Climate Change

Fisheries

1. Benthic Life Forms, Relative Fish Abundance and Composition of Karihatag Fish Sanctuary.
2. Ichthyoplankton in the Coastal Waters of Malimono, Surigao del Norte

4. Abundance and Size Composition of Oilfish, *Ruvettus pretiosus*
5. Catch Trend of Bigeye Scad, *Selar crumenophthalmus*
6. Light Production for Squid Fishing
7. Determining Lead Concentration of Fish Samples in Surigao Rivers
8. Body and Gonad Length-Weight Harvested in Rainfed Pond Relationship of Aquatic Species
9. Growth, Survival Rate and Length Weight Relationship of Tilapia (*Oreochromis niloticus*) Fed With Aquatic Plants in Canvass Tank
10. Length-Weight Relationship of Aquatic Species Harvested in Freshwater Impoundment
11. Mercury in Bottom Sediments of Surigao Rivers, Philippines
12. Cleaner Production: The Key to Waste Water and Energy Reduction
13. Assessment of Mercury (Hg) Contamination in Sediments and Common Carp (*Cyprinus carpio*) in Selected River Mouths of Lake Mainit
14. Heavy Metal Analysis of Water Sediment and Fish in Surigao Rivers, Philippines
15. Mercury in Bottom Sediments of Surigao Rivers, Philippines
16. Morphometric Analysis of Seagrass Species in Surigao City

On-going Researchs(2011-2015)

1. Assessment of Indigenous Terrestrial Plant Species of CBFM Area within Mainit-Malimono Ridge
2. Survey of Agro-forestry Farmer's Conservation Practices
3. Impact Assessment in Aquasilviculture Areas in Surigao del Norte
4. Polyculture in Aquasilviculture Areas
5. Euchuema crackers

Proposed Activities:

1. Squid, *Photololigo duvacelli* Dried in an Enclosed Space using Different heating Fuels
2. Squid Fisheries in Hipada Waters
3. Survey of Agro-forestry Farmer's Conservation Practices
4. Survival and Growth of *Tridacna gigas* in MPAs in Malimono
5. Ulangan sa Palayan
6. Growth and Survival of Abalone *Haliotis sp.* in Wooden Tanks
7. Aquaphonics
8. Advocacy of the National Greening Program
9. Squid Kroepeck with Malunggay
10. Shelf life of Pickled Fish

Strategies:

1. Faculty members leading the research activities
2. Selected groups of students to conduct theses
3. Partnership with LGUs
4. Partnership with NGOs (local and foreign)

Expected Outputs:

1. Publication in refereed journals
2. Information System (complete with databases, on-line information)
3. Communication, Education & Public Awareness (CEPA) materials
4. Income generation

**Key Area 3. Biodiversity Assessment and Eco-tourism Development in
Malimono, Del Carmen, Mainit and Surigao City**

Goal: Conserve biodiversity areas and promote ecotourism for sustainable development and economic stability.

Specific Action Plan:

Completed Researches/Projects

1. Community-based Coastal Resource Management Project in Malimono, Surigao del Norte
2. Hinatuan Passage Development Area Integrated Coastal Resource Management Project: A Solution for a sustainable Coastal Resource Management
3. Community-based cooperative approach in managing a Community-based Coastal Resource
4. Establishment of Marine Protected Areas(MPAs) in Malimono
5. Fungi on mangrove wood from Siargao Island
6. PLUP-SPEM in Malimono, Surigao del Norte
7. Mangrove Rehabilitation in Selected Areas of Surigao del Norte

Proposed Activities

1. The physical and chemical characterization of the HIPADA coastal waters
2. Assessment of Marine Protected Areas (MPAs) in Malimono
3. Environmental Education for the Various Sectors of the Communities towards the Marine Protected Areas (MPAs) of Surigao del Norte
4. Carbon Sequestration Capacity of the Parangparang Watershed Areas and Siargao Biodiversity Areas
5. Assessment of the Proposed Ecotourism Sites in Malimono, Del Carmen, Mainit and Surigao City
6. Plankton in Freshwater Bodies in Malimono, Del Carmen, Mainit and Surigao City
7. Establishment of Fishing Folk Museum in Malimono Campus
8. Establishment of Pasalubong Center in Malimono, Del Carmen and Mainit

Strategies:

1. Faculty members leading the research activities
2. Selected groups of students to conduct theses
3. Partnership with LGUs of Malimono, Del Carmen, Mainit and Surigao City
4. Partnership with NGOs (local and foreign)
5. Source our funding from College IGP, Foreign Donors, LGU Partners, Private Companies

Expected Outputs:

1. Publication in refereed journals
2. Information System (complete with databases, on-line information)
3. Communication, Education & Public Awareness (CEPA) materials
4. Income generation

Key Area 4: Language, Mathematics, Educational Technology and Pedagogy Concerns among schools in Surigao del Norte

Goal: Improving instruction through utilization of educational technology and verification of existing theories and formulation of new concepts in language, mathematics and other disciplines.

Specific Action Plan:

Completed and On-going Researches (2011-2015)

1. The Communication Skills Deficiencies of the College Students of Three Campuses of the Surigao State College of Technology: Implication to Language Teaching Development and Training
2. Diskors Analisis: Lingua Franca, Konsepto at Istabilidad ng Wikang Surigaonon sa Hilagang Syudad ng Surigao
3. Virtual Learning Environment (VLE) in Teaching Biology
4. Language Learning Strategies of Freshmen College Students of Surigao State College of Technology
5. A q-Analogue of the Non-Central Stirling Numbers of the First Kinds and Some of its Combination Properties
6. An exposition of the Value of Filipinos
7. Teaching Preparedness Level of Mathematics Student-Teachers in Surigao City: Basis for an Intervention Program
8. Massed and Distributed Teaching Programs in Algebra
9. Development of Contextual Learning Materials in Algebra
10. Speaking Performance using Video Technology
11. The Perception of Students in Teacher Education Institutions (TEIS) on Literature as a Subject
12. Student Attitude towards Physics and its Implication to Academic Achievement
13. Antolohiyang Surigaonon: Kagamitan sa Mabisang Pagtuturo at Pagpapahalaga ng Katutubong Panitikan
14. Assessment of Competencies: Skills and Interrelatedness of Skills
15. Metacognitive Strategies in Achieving Comprehension in Biology
16. Saloobin sa Paggamit ng Filipino Bilang Wikang Pantulong sa K-12 Program
17. Graduate Tracer Study of Teacher Education of Surigao State College of Technology
18. Teenage Problems Met and Academic Performance of Students in Surigao State College of Technology
19. Metacognitive Reading Strategies of Freshmen Students in SSCT-Malimono
20. Improving Mathematical Performance of College Freshmen Students in SSCT-Malimono campus using Discovery Method
21. The Culture of Mathematics Education
22. Effectiveness of Singaporean Model Method Approach in Solving Word Problems
23. Cronbach's Alpha and Factor Analysis: A Juxtaposition

24. An Application of Students Self-Assessment and Newman Error Analysis in Solving Math Problems
25. Literary Competence via L2 with L1

Proposed Activities

1. Inventory of Improvised Science Laboratory Apparatus among Public Schools in Surigao del Norte
2. Development of Computer Mathematical Animations for Elementary Pupils
3. Automated Randomized Multiple-Choice Test Construction
4. Development of Contextualized Mathematics Textbooks for Elementary Pupils in Surigao del Norte
5. Performance-based Assessment Practices of Teachers in Surigao del Norte
6. Assessment on the Gap between Mathematics Education and Reality among Schools in Surigao del Norte
7. L2 vs. L2 with L1 in Mathematics Classroom
8. Assessment on the Effectiveness of Mother-tongue Instruction from Grade 1 to Grade 3
9. Triangulation in Teaching Solution of Triangles via L2 with L1
10. Knowledge Management at School Level in Surigao State College of Technology

Strategies:

1. Training Need Analysis
2. Faculty members leading the research activities
3. Selected groups of students to conduct studies
4. Partnership with the Department of Education – Surigao del Norte

Expected Output:

1. Publications in ISI Journals
2. Information System (complete with data bases, online information).
3. Policies Formulation
4. Extension Activities