Phụ lục 1

List of the research programs in 2017

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
Agriculture						
1	Collection, evaluation and development of native animal breeds (A-3)	To conserve potentially genetic resources for producing commercial poultry products in the future.	1. To collect and evaluate genetic biodiversity of poultry breeds using morphological and molecular markers. 2. To exploit genetic resources in order to improve productivity, quality and resistance to diseases. 3. To conserve genetic diversity and sustainably use genetic resources. 3. To select 1-2 poultry breeds potentially used for commercialization.	36 months	60,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 5/12 – Number of published books: 1 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 6 – Number of short trainings: 2 – Number of trainees: 50
2	Developing integrated crop management (ICM) for improvement of product quality and adaptation to climate changes (A-5)	To develop sustainable crop production and improve cash crop tolerance to unfavorably environmental conditions such as pests, salinity and submergence stresses etc...	1. To study plant responses and adaptability to the environmental stresses in MDR. 2. To select elite line of cash crop varieties to tolerance stress conditions. 3. To study the effect of micro-element on cash crop tolerance to stress conditions such as selenium, boron,… 4. To study the effect of growth regulators on cash crop tolerance to stress conditions such as brassinolide, abscisic acid etc., 5. To study on application of predators and parasitoids for control of cash crop insect pests. 6. To study soil preparation, fertilizer, water application for cash crop cultivation under stress conditions. 7. To develop the integrated management	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of published books: 3 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of new technologies applied: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 12 – Number of short trainings: 2 – Number of trainees: 100

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			systems to improve productivity and quality of cash crop.			
3	Studies on insect pests and diseases and development of alternative plant protection technologies (A-6)	To enhance the capacity in research and application of environmentally friendly strategies for management of insect pests and plant diseases on rice in the MD of Vietnam, from which provides the best means of sustainable and integrated plant protection strategies, and thus elevates the competitiveness for agricultural products on national and international markets. In addition, to enhance research capacity of staffs in area plant protection such as biology and ecology of pest, on biological control and other friendly environmental methods for controlling pest and diseases on rice in Mekong delta	1. To study biology, ecology and management of panicle rice mite, *Steneotarsonemus spinki Smiley* (Acari: Tarsonemidae) in the Mekong delta. 2. To apply potential biocontrol agents for management of the Rice Leaf Folder, *Cnaphalocrocis medinalis.* 3. To study plant extract in control bacterial leaf blight caused by *Xanthomonas oryzae* pv. *oryae* and blast disease caused by *Pyricularia oryzae* of rice in Mekong delta. 4. To study the combination different biological control agents for management of some important pests and diseases on rice.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of published books: 1 – Number of conferences/workshops: 2 – Number of new technologies: 2 – Number of new technologies applied: 1 – Number of patent applications: 2 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 12 – Number of short trainings: 5 – Number of trainees: 60

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
4	Studies on sustainable soil uses (A-8)	To improve soil fertility and soil quality for crop production on alluvial soils, acid sulphate soils and saline-affected soils toward improving soil constraints and adaptation to climate change in MD.	1. To investigate soil forming processes and enhance soil classification map of MRD. 2. To identify negative impacts of saline intrusion, drought and flooding on soil nutrients, physio-chemical and biological changes, green house emission and crop production. 3. To apply the integrated management for soil nutrients, crops and irrigation water.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of published books: 3 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 3 – Number of graduate students involved in the program: 10 – Number of short trainings: 2 – Number of trainees: 60
5	Molecular studies for detection and identification of animal diseases in MDR (A-10)	To apply molecular techniques for disease control systems involved all types of pathogenic agents including bacteria, viruses, parasites and fungi, for improving animal health.	1. To study at molecular level of virus and bacterial diseases in domestic animals. 2. To develop diagnostic methods and strategies for disease prevention applying molecular techniques for viral, bacterial and parasite disease in domestic animals. 3. To identify source of mycotoxin infection in feed ingredients, farms and animal products in order to control and enhance feed quality and safety for animal and human health. 4. To identify and apply probiotics and bacteriophage for prevention and treatment of diseases in domestic animals.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of published books: 1 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of new technologies applied: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 12 – Number of short trainings: 2 – Number of trainees: 50
6	Microbial and pharmaceutical studies for animal disease treatment (A-11)	To study strategies for prevention of microbial diseases and to develop pharmaceutical sources for animal and poultry treatment.	1. To study epidemiology and immunology of diseases caused by microbial pathogens and assess host-pathogen interactions. 2. To identify sources of pathogenic genes, antibiotic resistant genes transferred from animals to human in order to find control methods, and improve quality of food originated from animals. 3. To select new materials including medical plant and determine antimicrobial	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of published books: 1 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 12

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			effectiveness of those materials for the prevention and treatment of domestic animal diseases.			– Number of short trainings: 2 – Number of trainees: 50
7	Studies and development of post-harvest technologies for rice, plant and crop based-food products in MDR (A-14)	To develop and/or improve post-harvest handling procedures and further processing technology for plant and crop products in MDR.	To develop and/or improve post-harvest handling procedures and further processing technology for mango, sweet potato, violet onion in MDR.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of conferences/workshops: 2 – Number of new technologies: 2 – Number of new technologies applied: 1 – Number of patent applications: 2 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 12 – Number of short trainings: 2 – Number of trainees: 50
8	Development of value added food products from agricultural products and by-products in MDR (A-15)	To develop advanced technologies for enhancing the value of some major agricultural products of the MDR.	1. To study modeling and control the distribution of temperature, humidity … in 3D storage systems of agricultural products (frozen aquatic products, vegetables, etc.). 2. To study the effects of variety and processing methods to physicochemical and functional properties of modified starches from different rice varieties in MDR. 3. To apply biotechnology in evaluation of rice quality served for food processing. 4. To study characteristics and responding ability of specific factors in brewing technology from rice varieties in MDR. 5. To study methods of extraction and assess the value of the functional components of rice bran by-products in MDR. 6. To study pharmaceutically active substances in agricultural by-products in MDR for producing value-added products.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of conferences/workshops: 2 – Number of new technologies: 2 – Number of new technologies applied: 1 – Number of patent applications: 2 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 20 – Number of short trainings: 2 – Number of trainees: 50

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
9	Studies on food pathogens and antibiotics resistant bacteria (A-16)	To identify origin of pathogens and antibiotics resistant bacteria and application of multiple treatments to control their growth in supply chain of catfish (*Pangasius hypophthalmus*).	1. To establish the map of pathogenic microorganisms that contaminate from different stages of production chain by culture -dependent and independent techniques. 2. To apply physical, chemical and biological methods for controlling pathogenic and antibiotic resistant microorganisms. 3. To evaluate safe management methods on pathogenic microorganisms and antibiotic resistant bacteria in a whole food supply chain.	36 months	75,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 6/15 – Number of conferences/workshops: 2 – Number of new technologies: 2 – Number of new technologies applied: 1 – Number of patent applications: 2 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 12 – Number of short trainings: 2 – Number of trainees: 50
Aquaculture and Fisheries						
10	Green technology innovation for aquaculture (F-2)	General objectives are to develop and apply advanced and environmental friendly technologies in aquaculture in order for sustainable development of aquaculture in the Mekong Delta.	**1. Developing and applying recirculating systems in grow-out of some importantly economic species**. The objectives of the study are to develop recirculating systems and suitable culture methods for some important species (focusing on catfish) with high production and economical efficiency, biosecurity, reduction of environmental pollution, and food safety. **2. Developing and applying Biofloc technologies in grow-out of some importantly economic species.** The objectives of the study are to develop technology for culture of some important species (focusing on Vanamei shrimp) applying Bioflocs for high production and economical efficiency, biosecurity, reduction of environmental pollution, and food safety.	36 months	300,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 21/70 – Number of published books: 6 – Number of conferences/workshops: 7 – Number of new technologies: 6 – Number of new technologies applied: 6 – Number of PhD degrees obtained from/involved in the program: 4 – Number of graduate students involved in the program: 16 – Number of short trainings: 2 – Number of trainees: 210

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			3. Developing and applying modern cage culture of marine fish The objectives of the study are to develop technology for modern cage culture of important marine fish (focusing on Snub-nose Pompano) in the Mekong Delta. **4. Developing and applying sustainable integrated aquaculture systems** The objectives of the study are to improve the integrated and poly culture systems (focusing on improved extensive shrimp farming systems, and alternative shrimp – rice + prawn farming systems) for better economical efficiency and sustainable development. **5. Studies on seed production of some important indigenous aquaculture species** The objectives of the study are to develop and improve technology for seed production of important indigenous species in the Mekong Delta (focusing on spotted scat fish and Snub-nose Pompano) for diversification of culture species and improvement of farming efficiency. **6. Genetics management and development of high quality fish broodstocks for seed production in the Mekong Delta** Objectives of the study are to manage effectively gen pool and to apply domestication to improve and develop high quality broodstocks for seed production and supply for aquaculture (focusing on indigenous Clarias catfish).			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
11	Quality improvement of fisheries/aquaculture products (F-4)	The overall objectives of this program include to stand, and to achieve a project of the research content to be highly evaluated in the world. To that end, it will be necessary for findings with the novelty to be provided. Furthermore, the fruitful results should be published in internationally-recognized scientific journals in this area. Following specific research themes are raised this time; (1) to enhance quality and food safety management of fisheries and aquaculture products and (ii) to develop the fisheries products processing technology for high quality and added value products.	**1. Investigation the current status of food safety management system and development the strengthening program for improvement of quality and safety of seafood products of not only for the domestic consumption but also exporting under the Food Hygiene Regulation enforced newly in July in 2016.** Objectives are (i) to investigate the current management and use of drugs and chemicals in aquaculture in the Mekong Delta and (ii) to determine pharmacokinetics of antimicrobials in common fish species aquaculture and (iii) to evaluate the microbiota contamination in shrimp processing plant and management. **2. Improvement of cold storage methodology for fisheries products** Objectives are (i) to investigate the quality of common fish species during cold storage conditions and (ii) to evaluate the application of natural extracted compounds in fish cold storage. **3. Biotechnology application in added value aquatic product processing** Objectives are (i) to apply biotechnology on production of added value products e.g. acid soluble collagen and pepsin soluble collagen from fisheries processing byproducts (skin, scale), glucosamine hydrochloride from shrimp shell; and (ii) to produce high value products by enzymatic application during extraction and purification of processing byproducts (Fish Protein Hydrolysates and mineral powder from fish bone).	36 months	250,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 12/40 – Number of published books: 5 – Number of conferences/workshops: 6 – Number of new technologies: 8 – Number of new technologies applied: 3 – Number of PhD degrees obtained from/involved in the program: 5 – Number of graduate students involved in the program: 12 – Number of short trainings: 4 – Number of trainees: 120 – Others: 04 processing procedures for domestic fish species on producing added valued products

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			4. Development of bone regeneration materials from hydroxyapatite and natural polymer extracted from bone and skin of catfish Objectives are (i)utilization of materials from aquaculture products to produce valuable materials and practical in life in order to increase product value and minimize the environmental impact and (ii) creation of materials from catfish waste products that can be able to use in bone tissue regeneration. **5. Added value product processing from local fisheries raw materials in small-scale application** Objectives are (i) to develop processing technology for added value products from local fisheries raw materials for domestic consumption (ii) to transfer these processing technology to small-scale farms, especially for farmers under climate change impacts.			
12	Biochemistry and pharmaceutical science in aquaculture and fisheries (F-6)	The research aims to develop natural bioactive compounds, in order to: (i) enhance of fish growth and ; (ii) replace antibiotics/chemicals in the prevention and treatment of aquatic animal diseases.	**1. Screening natural bioactive compounds to apply in drug production for the prevention and treatment of aquatic animal diseases.** The objectives of project are (i) identifying of bioactive compounds from medicinal plants collected from different locations of Mekong delta; (ii) determining the chemical structures of pure compounds by physical chemistry methods such as UV, IR, MS, NMR; and (iii) establishing an extraction process of plant extracts containing naturally bioactive compounds.	36 months	120,000	– Number of international peer-reviewed papers/total published paper (30%/100%): 4/12 – Number of published books: 1 – Number of conferences/workshops: 1 – Number of new technologies: 2 – Number of new technologies applied: 2 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 12 – Number of short trainings: 2 – Number of trainees: 60

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			2. Assessing the positive impact of natural bioactive compounds in aquaculture The research has the following objectives(i) determining antibacterial activity and antifungal activity of selective bioactive compounds; (ii) evaluating the ability to enhance growth, immunologicalparameters and inhibit pathogens in aquatic animals; (iii) determining the possibility of replacing antibiotics/chemicals with bioactive compounds groups in the prevention and treatment of aquatic animal diseases; (iv) developing a process to supplement products with bioactive compounds in feed animal diseases; (iv) developing a process to supplement products with bioactive compounds in feed for some of aquatic animals; (v)evaluating the effectiveness of bioactive compound products in farms.			
Environment						
13	Water and land resources monitoring (E-1)	The goal of this research is to develop the integration database system for water and land resources in the Mekong delta of Viet Nam.	**1. Development of Land use/land cover change monitoring system using remote sensing data** This study aims at creating the land cover/land use change monitoring system over the Mekong delta using remotely sensed data over the Mekong delta. This land use / land cover changes database can be used for many other research purposes. **2. Development of a monitoring/detecting system for erosion (coastal, river) in the Lower Mekong River** The purpose of this study is to integrate	36 months	72,000	– Number of international peer-reviewed papers/total published paper: 6/20 – Number of published books: 1 – Number of conferences/workshops: 1 – Number of patent applications: 1 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 6 – Number of short trainings: 5 – Number of trainees: 40

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			satellite imagery (LANDSAT, MODIS, Sentinel, ASTER) for creating the erosion (coastal, river) monitoring database from 1985 to 2015 in order to estimate of erosion damage on agriculture and aquaculture in study site, and development the database and impact estimation for flooding in the Lower Mekong River in order to: - To integrate satellite imagery (LANDSAT, MODIS, Sentinel, ASTER) for flood monitoring . - To develop flood risk database from 2005 to 2015 based on geological environment and meteorological changes. - To assess flood damage impact each year and during study period (from 2005 to 2015) on agriculture and aquaculture in study site. **3. Development of soil degradation monitoring system** The purpose of this project is to develop a database for land degradation in the Mekong delta. Due to many years of agriculture intensification, decline in soil quality caused by its improper use, usually for agricultural, industrial or urban purposes. Soil degradation is a serious global environmental problem and may be exacerbated by climate change. **4. Develop an automatic environmental monitoring system** The purpose of this study is (i) to develop a prototype for an automatic environmental monitoring system and (ii) to build a pilot automatic environmental monitoring network.			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			5. Develop an environmental and climate sensor network to support agriculture and aquaculture development To review the existing water observation network to suggest gaps in water monitoring a coastal zone in the Vietnamese Mekong Delta. To set up a monitoring station for surface water to fill out the gap in the existing monitoring network. To generalize a scientific-standard requirement for water monitoring network in the coastal area of the Vietnamese Mekong Delta. **6. Creating an integrated information system for Environment** This research aims to develop databases for the systems in "Water and Land resources monitoring" program. To develop a standard and central/common database which can be stored/retrieved by other systems in the "Water and Land resources monitoring" program. To develop the standard/schema for inter-connections between databases in the "Water and Land resources monitoring" group. To develop an overall information system, which acts as a gateway, to connect all of the other systems in the "Water and Land resources monitoring" group.			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
14	Analyzing and modelling water and land resources (E-2)	To simulate environmental changes to support for early responses and adaptations.	**1. Modeling land-use change and develop strategies for sustainable land-use management in response to impacts of climate change in the Vietnamese Mekong Delta** The main objective of the study is to develop models simulating land-use change based on farmer's decisions at the time being and the future climate change condition. The specific objectives include: - To analyze land-use change in the VMD during the last 15 years to determine driving factors (including socio-economic and environmental aspects) affecting land use. - To simulate farmer's decision-making in terms of land use change given impacts of socio-economic and environmental factors to deal with climate change. - To study possible impacts of economic policies and governmental plans of infrastructure development on land use change in the area. - To propose strategies for integrated land resources management to deal with development and climate change. **2. The development of numerical models for predicting surface water pollution in the river (city/urban)** The main objective of the study is to develop models for predicting surface water pollution in city river network and to apply WebGIS for visualizing spatial data. The specific objectives include: - To develop a 2D water quality hydraulics	36 months	72,000	– Number of international peer-reviewed papers/total published paper: 6/20 – Number of published books: 1 – Number of conferences/workshops: 1 – Number of new technologies: 1 – Number of new technologies applied: 1 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 6 – Number of short training: 3 – Number of trainees: 40 – Others: NR

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			model to study the hydrodynamics and water quality dynamics at the time being and in the context of city development. - To visualize water quality in the river by WebGIS application. **3. The interaction between coastal mangrove forest, tidal wave and coastal erosion** The main objective of the study is to study on wave energy reduction due to impacts of coastal mangrove ecosystems for sustainable development in the Mekong delta (climate change: sea level rise and socio-economic development). The specific objectives include: - To study wave energy reduced in the coastal mangrove forests in the VMD to reduce wave energy in different structural forests. - To develop 3D models of forest status (including systems of forests and rhizomes - under dynamic wave transfer). - To model wave-energy transfer through monitored results. - To develop math models characterized wave energy transfer in (3.3)To assess associated risk (of natural, agriculture, aquaculture systems in the coastal of the VMD under the changes of wave-tided based patterns of the mangrove forests or dyke embankment or both systems (in relation to climate change scenarios).			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			4. Geomorphology assessments of coastal areas under climate change and sea constructions The main objective of the study is to assess geomorphology changes and simulate hydrological response. The specific objectives include: - To survey the geo-morphological of river mouth and detect changes over a short period observation (a two-year period). - To develop hydrological models for morphological dynamics and saline intrusion in the coastal river mouth. **5. Water quality changes given impacts of intensive farming system** The main objective of the study is to understand the water quality changes due to intensive farming systems in the Vietnamese Mekong Delta. The specific objectives include: - To study exchanged flows (in terms of hydraulics and water quality) between the field and external river network. - To propose changes in farming technologies to minimize the negative impacts of agriculture activities on the external environment. **6. Assessment of sustainable groundwater resources management in urban areas in the Mekong delta under socio-economic development and climate change context** The main objective of the study is to assess groundwater resources exploitation and management in urban areas under socio-			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			economic development and climate change context. The specific objectives include: - To evaluate the current state of GW exploitation, use and GW level. - To build, calibrate and validate the model simulations of groundwater flow (GW level). - To construct the relationship between GW level and land subsidence. - To develop future scenarios taking socio-economic development factors and climate change impact into account. To forecast the dynamics of groundwater resources under developed scenarios of socio-economic development and climate change.			
15	Evaluating changes of the agro-ecological changes under great threats of the in-situ development and climate change (E-3)	The aims of the project are to identify impacts of specific development activities/plans in the Mekong delta and climate change on agro- and aquatic ecosystems (1) in the deep flooding areas and (2) in the coastal complex areas.	**1. Impacts of saline intrusion in the coastal areas on productions systems of forestry-agriculture and agriculture** The aim of the study is to assess saline intrusion in the coastal areas under the present and the future conditions due to climate changes (flowrate of the Mekong river, dynamics of sea levels) and their impacts on productions systems of forestry- agriculture and agriculture. Research methodologies: - The data collection (including flowrate sea levels, saline intrusion data and land use systems) will be collected by surveys and available data form past projects and local government offices. - Analyzing land use changes and saline intrusion over time and defining relation and impacts of saline intrusion on forestry-	36 months	144,000	– Number of international peer-reviewed papers/total published paper: 12/38 – Number of published books: 2 – Number of conferences/workshops: 2 – Number of new technologies: 1 – Number of PhD degrees obtained from/involved in the program: 2 – Number of graduate students involved in the program: 6 – Number of short trainings: 4 – Number of trainees: 40

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			agriculture and agriculture in in the coastal areas by data collected. - Analyzing the trends of flowrate of the Mekong river and defining relation between flowrate and saline intrusion in the coastal zone of Soc Trang province. - Defining dynamics of sea levels and analyzing sea levels variability impacts on saline intrusion and and defining relation between flowrate and saline intrusion in the coastal zone of Soc Trang province. - Simulating dynamics of sea levels, flowrate of the Mekong river and saline intrusion in Soc Trang under future condition scenarios (year 2030 and 2050) due to climate changes and sea level rise by hydrodynamic and hydraulic model. - Defining Agro-ecological dynamics and classification of risk and vulnerable zones in agriculture under impacts of saline intrusion in the coastal areas of Soc Trang in in the context of climate change and sea level rise and defining site-specific adaptation strategies for water Management. **2. Study on the impact of climate change on ecosystem services of intensive brackish shrimp aquaculture in Soc Trang province** The study will seek to quantify, evaluate and map ecosystem services associated with intensive brackish shrimp aquaculture model in Soc Trang province under different climate change scenarios.			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			3. Study on the effects of intensive brackish shrimp aquaculture on water and soil quality in Soc Trang province The study aims at evaluation of soil and water quality in intensive shrimp farming to serve as baseline data for planning and proposing appropriate solutions towards sustainably aquaculture development. **4. Assessment of microbial community structure in the rice-shrimp farming system in Soc Trang province** The aim of the study is to investigate functional diversity and soil microbial community structures in paddy soil in the rice-shrimp rotation system applied for the saline instruction areas in Soc Trang province. **5. To assess effects of using agro-chemical in full dike system on aquatic ecosystems** The aim of the study is to identify impacts of common agro-chemical uses on rice cultivation to common rice aquatic species, including toxicity tolerant capacity, bio-chemical effects and residues of common agro-chemicals and potential risks. **6. Effects of agricultural practices on macrophytes diversity and soil insect in the paddy rice** The study aims at assessment of the effect of intensive triple rice crop on macrophytes diversity and soil insect. **7. Study on the impact of full dike development on sediment deposit** The study aims at assessment of the effect of full dike development on sediment deposit.			

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
16	Analysis of economic efficiency of natural resource uses and problems in natural resource uses and management (E-4)	Natural resources management and environmental protection by using economic tools.	**1. Service evaluation of mangrove ecosystem in the Mekong Delta.** The aims of study are: 1) Identify how local people benefit from mangrove ecosystem goods (litters, crabs, fishes and shrimp) and service (carbon dioxide absorbent, good climate condition), 2) Perform an economic valuation of those goods and services, 3) Create a framework for payment ecosystem services based on the economic value of Cu Lao Dung mangrove ecosystem. **2. Evaluation economic effects and sustainable land use in the Mekong Delta.** The aims of study are: 1) Evaluate economic efficiency on main land use in fresh water area and saltwater area. 2) Detect factors affecting to the economic efficiency on main land use over year in that two sites. 3) recommend the sustainable farming system of main land use in the two sites. **3. Proposing a comprehensive development strategy for protected areas associated conservation of natural resources with exploitation of the economic value.** The aims of study are: 1) Estimate the value of natural resources ((flora and fauna ecosystem) and landscape of pristine Melaleuca forest based on tourists' preferences of protected areas, 2) Determine the value of biodiversity conservation based on the eco-labels of products, 3) Create a comprehensive development strategy linked reserves of natural resource conservation with the exploitation of their economic values (the construction of the sustainable economic development model).	36 months	120,000	– Number of international peer-reviewed papers/total published paper: 10/33 – Number of published books: 2 – Number of conferences/workshops: 1 – Number of PhD degrees obtained from/involved in the program: 1 – Number of graduate students involved in the program: 6 – Number of short trainings: 5 – Number of trainees: 40

No.	Program title (code)	General objective(s)	Specific objectives	Program duration	Maximum budget *(USD)*	Program outputs
			4. Economic efficiency and problem of land use and management in U Minh Hạ forest ecosystems in the Mekong Delta. The aim of study are: 1) Determine the state of land use (in term of technical use, farming area, land use history, farming designing, tool using..) and social – economic of households (in term of household income, household utilities, knowledge level, population & labors…). 2) Determine economic providing of land use types in forest ecosystem including rice cropping systems (in term of yield per crop, income per year, benefice per cost) and forest land systems (in term of yield of wood, income per year, and non- wood including natural fish, honey, and other resources). 3) Determine the problems of land use (as natural destroyed, biodiversity loss, environmental degradation…) and management state (as law and policy of land use and forest protection, ability of forest and land management, law of and 4) To analyse and suggest the best solutions for land use management. **5. Effects of climate change on land use and service values of wetland ecosystem in the Mekong Delta.** The aims of study are: 1) Evaluate impacts of climate change on land use, 2) Evaluate impacts of climate change on wetland ecosystem and their service values, 3) Suggest strategies to mitigate effects of climate change on land use and service values of wetland ecosystem.			