

ANNEX I
RESEARCH LINES AND RESEARCH PROPOSALS INCT
2022

Instituto Nacional de Ciências e Tecnologia
Timor-Leste



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With the objective of developing and stimulating scientific research in Timor-Leste, five (5) major thematic areas were created, with ten (10) research lines and twenty-three (23) study/research proposals that the INCT considers as priorities for the development of Timor-Leste. The focus of scientific research for the year 2022 falls on the areas of technology, infrastructural development of the country, human development and social inclusion, health management, development of the economy, agriculture, tourism, industry and protection of the environment and biodiversity. The thematic/knowledge areas are:

- 1. INNOVATION, TECHNOLOGY AND INFRASTRUCTURE**
- 2. EDUCATION, HUMAN DEVELOPMENT AND SOCIAL INCLUSION**
- 3. HEALTH AND WELL-BEING**
- 4. ECONOMY, AGRICULTURE, TOURISM AND INDUSTRY**
- 5. ENVIRONMENT, BIODIVERSITY AND CLIMATE CHANGE**





INCT RESEARCH LINES AND RESEARCH PROPOSALS

1. INNOVATION, TECHNOLOGY AND INFRASTRUCTURE

2.

Research line 1: Development of renewable energies in Timor-Leste (electric energy, solar energy, wind energy, hydrogen and others).

1. Study Proposal I (Reference:inov.2022.lp1-I): (4 Research Lines: Innovation and Technology, Environment, Economy, Health and Welfare) *Feasibility Study about the implementation of alternative and renewable energies in Timor-Leste: the photovoltaic panels as a source of alternative energy for public lighting in Timor-Leste.* This study must have Dili as preference, but other municipalities can be addressed as long as it is duly substantiated and justified.

Research Line 2: Development and Access to Information and Communication Technologies (ICT) in Timor-Leste.

1. Study Proposal I (Reference:inov.2022.lp2-I): (3 Research Lines: Innovation and technology, Economy and Social Inclusion) *The Accessibility of Internet in Timor-Leste for the Timorese Youth* (this study takes into consideration the recent study entitled "Speed Matters"). Firstly, through this study, it is intended to determine the percentage of the young population that has access to the Internet and who does not (including secondary and higher education students). Secondly, it is intended to identify the technological equipment used for Internet access and the frequency habits of Internet access, and what kind of digital contents are explored; finally, it is intended to determine the study habits using the Internet of the target audience. Creative technological and infrastructural solutions are sought to promote Internet access among young people (WiFi hotspots), especially to develop school and academic research (physical spaces).

2. Study Proposal II (Reference:inov.2022.lp2-II): (3 Research lines: Innovation, Technology and Economy) *Technological modernization of the Public Sector in Timor-Leste: E-government.* Development of innovative technological solutions to improve service delivery and human resources qualification in the Timor-Leste civil service.





Research Line 3: Innovation and Modernization of Fundamental Infrastructure in East Timor and Urban Mobility.

- 1. Study Proposal I (Reference:inov.2022.lp3-I):** (3 Research Lines: Innovation, Technology and Infrastructures; Environment; Economy) ***Feasibility study of dam construction for the development of productive sectors in Timor-Leste*** (the possibility of water storage, human consumption and irrigation, energy production to supply the electrical network, industrial enterprises). It is suggested the choice of a strategic region of the country, with a pilot hydrographic basin. Technical solutions are required, taking into account the issue of water infiltration, stabilization of the foundation, structural solutions, land use and management, basin plans - study and integrated analysis of solutions to control the amount of water (flow), sediments and runoff energy; control of sediment production and soil subsidence, land expropriation and population resettlement. Technical, socio-cultural, economic and environmental aspects.
- 2. Study Proposal II (Reference:inov.2022.lp3-II):** (3 Research lines: Innovation, Technology and Infrastructures, Environment, Human Sciences) ***The significant changes of the road traffic in Díli, Timor-Leste in the last years - Identification of Problems and Solutions for the road traffic in the capital of Timor-Leste***. In the last few years, the capital of Timor-Leste has experienced serious transformations in relation to road circulation. The increase in the purchasing power of Timorese citizens, the growing car sales (renewal of the car fleet), the search for better living conditions in the capital of Timor-Leste (internal and not always seasonal migration), the possible increase in population density in Díli, the structural problems at the road level and other infrastructures, among other factors, have had a considerable impact on road circulation (traffic), especially in a period of full economic recovery. It is intended that a study be developed to diagnose the major problems in road circulation in Díli, the economic and environmental impacts and the consequences for the quality of life of citizens. In relation to road circulation, we intend to survey the driving licenses of the various types of vehicles; the problems in parking; the conditions of the roads and other infrastructures and the difficulties diagnosed in road circulation; the main problems in public transport and passenger collection points (microlets, taxis, Angunas); the displacement by motorbikes and limitations to the transport of goods; limitations of traffic signals, traffic lights, roundabouts, among others; the safety of pedestrians; road accidents; among others.
- 3. Study Proposal III (Reference:inov. lp3-III):** (2 Research lines: Environment and Climate Action and Innovation, Technology and Infrastructures) ***Causes that cause Floods in Díli - Challenges and Solutions to prevent floods, devastation***





of public spaces, flooding and destruction of roads, residences and other assets (factors that contribute to floods in Díli: take into account spatial planning, population density, pollution, drainage system and water runoff in various parts of the region, among others). This study should consider the floods in Díli that occurred in March 2020 and April 2021 and measures that can be taken to predict and prevent new floods.

- 4. Study Proposal IV (Reference:inov.lp3-IV):** (2 Research lines: Environment and Climate Action and Innovation and Technology) *Study on Drainage system in Díli. How to manage rainwater and prevent landslides and floods - Problems and Solutions in Land Use Planning.*

2. EDUCATION, HUMAN DEVELOPMENT AND SOCIAL INCLUSION

Research Line 1: Development of programme and strategies for implementation of ICT (Information and Communication Technologies) in schools and development of social plan for ICT capacity building.

- 1. Study Proposal I (Reference:educ.lp1-I):** (3 Research Lines: Economics, Education, Human Sciences and Social Inclusion, Innovation and Technology). *The Development of quality undergraduate and postgraduate courses in Higher Education using E-Education.* Proposals for technological solutions, digital innovation, curricular improvement and development of human resources. How can undergraduate and postgraduate courses be improved and complemented using E-learning and digital platforms? How can services and work dynamics be improved?
- 2. Study Proposal II (Reference:educ.lp1-II):** (3 Research lines: Education, Human Sciences and Social Inclusion, Innovation and Technology). *The Lifelong Learning of secondary school teachers in Timor-Leste, with special focus on the level of Digital Literacy and Linguistic Proficiency* (especially in relation to the official languages of Timor-Leste) of teachers. Main Problems and Solutions. It is intended to ascertain the level of digital literacy of secondary level teachers and the language proficiency of teachers in relation to the official languages of Timor-Leste, as well as the state of play of lifelong learning. The solutions to be presented must take into consideration the philosophy of lifelong learning.





Research Line 2: Human Development and Social Inclusion

- 1. Study Proposal I (Reference:educ.lp2-I):** (Research line: Education and Social Inclusion): *The Current State of Technical-Vocational Secondary Education in Timor-Leste.* It is known that technical-vocational courses, besides conferring a faster integration in training courses and in the labour market, have a great acceptance and professional recognition. The aim is, firstly, to determine the percentage of acceptance of technical-vocational courses in the labour market, i.e. the degree of employability of certain courses (as many technical and professional areas as possible); secondly, to determine the major challenges of technical-vocational courses in Timor-Leste; thirdly, to determine whether there is a need to create more technical-vocational courses to fill gaps in specific areas in Timorese society.
- 2. Study Proposal II (Reference:educ.lp2-II):** (2 Research Streams: Economics, Humanities and Social Inclusion). *Contemporary Trends of Youth Emigration in Timor-Leste. Destination, Causes and Social and Economic Impacts on Timorese Society.*
- 3. Study Proposal III (Reference:educ.lp2-III):** (2 Research Streams: Economics, Human Sciences and Social Inclusion). *Illegal Immigration through Land and Sea Borders in Timor-Leste. Main problems and proposed solutions.* It is intended to identify the main trends of illegal immigration on land and sea borders in Timor-Leste in the last years and to present technological solutions and proposals for integrated systems of monitoring, information and border control.
- 4. Study Proposal IV (Reference:educ.lp2-IV):** (2 Research Lines: Education, Human Sciences and Social Inclusion). *Studies on School Bullying in Adolescence.* This study aims to determine school bullying in adolescence in schools in Timor-Leste, especially in an age group that ranges from 10 to 19 years old (the adolescent age group according to WHO). It is intended to determine the percentage of adolescents who are victims of verbal harassment, physical harassment and intimidation, sexual harassment, social bullying, and bystander effect in schools in Timor-Leste. The research is expected to deliver a national program to combat bullying practices in schools and the development of institutional and inter-institutional prevention and protection mechanisms for victims.





3. HEALTH AND WELFARE

Research Line 1: Development of programme and strategies for implementation of ICT (Information and Communication Technologies) in schools and development of social plan for ICT capacity building

- 1. Study Proposal I (Reference: Saúde.lp1-I):** (3 Research lines: Health, Innovation Technology and Infrastructures, Education) *Analysis of the quality of laboratories in the areas of medicine and education in higher education in Timor-Leste. Problems and Solutions.* In this study, it is intended to: a) analyze the quality of facilities/infrastructure and logistic conditions for medical/clinical analysis professionals and education professionals. b) identify and analyze the reagents, materials and consumables in the indicated areas. c) present the main vulnerabilities in human resources regarding access and handling of equipment, materials and reagents, as well as possibilities of frameworks for the development of human resources qualifications. Challenges and Solutions.
- 2. Study Proposal II (Reference: Saúde.lp1-II):** (2 Research lines: Health, Education) *Development of a Handbook of Traditional Medicine of Timor-Leste.* In this study, it is intended to present the set of medicinal treatments, therapies, practices, resources and forms of administration used for the practice of traditional medicine in Timor-Leste. Thus, it is intended to present an investigation of: a) the treatments of traditional medicine; b) identification and cataloguing of flora and plant and mineral products/materials used for therapeutic purposes; c) posology and forms of administration and application of treatment. Theoretical explanation of the traditional medicine practices. The treatments and practices must be accompanied by photographs and/or illustrative drawings and detailed descriptions.



4. ECONOMY, AGRICULTURE, TOURISM AND INDUSTRY

Research Line 1: Technological development and innovation in business, agriculture, tourism and industry;

1. Study Proposal I (Reference:econ.lp1-I): (2 Research lines: Economy, Innovation and Technology) *The Impact of the implementation and development of electronic commerce (E-Commerce) for small and medium enterprises in Timor-Leste.* In this research, it is intended to present innovative solutions for the development of E-Commerce for small and medium enterprises in Timor-Leste. It is intended to determine how to boost small and medium businesses' online sales and online presence of small and medium businesses, online marketing, online payment systems, carriers and associated logistics. Determine impacts in the economy, environment, and job creation and growth of the regions in Timor-Leste.

Research Line 2: Development of new economic models in Timor-Leste: agriculture, tourism and industry.

1. Study Proposal I (Reference: Econ.2022.lp2-I) : (2 lines of Research: Economy, infrastructures) *Design of new integrated economic models in the Southern Zone of Timor-Leste: Covalima, Manufahi, Viqueque, among other regions.* Examples: development of economic production plan: agribusiness, food production, processing, conservation and distribution. Partnerships of agricultural enterprises (agricultural cooperatives, business and industrial cooperation in the agriculture and livestock sector/others) and development of infrastructure for their realisation. Programmes for the development of small and medium enterprises in diversified areas: agribusiness, mineral exploration, biofuel development, industry development and job creation.

2. Study Proposal II (Reference:econ.2022.lp2-II) : (3 Research lines: Economy, Innovation, Technology and Infrastructures, Environment) *Development of Economic Model Design for Biofuel Exploitation in Timor-Leste.* Design of an economic model for the exploitation of non-fossil fuels in Timor-Leste. Develop a business model, determine its agents, determine the percentage of employment generation, impacts on the environment and the social impact in the proposed region.

3. Study Proposal III (Reference:econ.2022.lp2-III): (3 Research lines: Economy, Environment, Infrastructure) *How to reduce national imports and increase productivity and the supply of goods and products in Timor-Leste - exploration*



of new business models. Through this study, it is intended to develop, on one hand, a program to reduce national imports, pointing, on the other hand, the necessary national production means to have access to new products, goods and services in Timor-Leste. This study should point out, in a first phase, which are the main goods and products that are imported to Timor-Leste, exploring, in this way, the production gaps in the country. In a second phase, it is intended to highlight the goods and products that can be produced in Timor-Leste to reduce imports and increase the supply of goods, products and services in the national territory and, if possible, with the development of new economic models for exports.

- 4. Study Proposal IV (Reference:econ.2022.lp2-IV):** (3 Research lines: Economy, Environment, Infrastructure) *Design of Economic Model for Valorization and Export of Value-added Tourist Products in Timor-Leste* (Coffee, Tais, Atauro Dolls, among Others). Development programme for the national valorisation of Timor-Leste's main brands and the creation of new economic models for the export of innovative and value-added products characteristic of Timor-Leste.

5. ENVIRONMENT, BIODIVERSITY AND CLIMATE CHANGE

Research Line 1: Environmental Protection, Biodiversity, Natural Resources and Sustainable Development

- 1. Study Proposal I (Reference:ambiente.2022.lp1-I):** (4 Research lines: Health, Innovation Technology and Infrastructures, Biodiversity, Education) *Feasibility study on the construction of a zoological park in a region in Timor-Leste for the protection and preservation of fauna.* The study will have to take into consideration the following basic elements, among others the importance of zoological parks; elementary conditions for the conservation and safety of the animals (environmental and animal protection); organization of the animal areas and respective zoological divisions; functioning of the administrative organization of the zoological park; logistics of the park at the level of nutrition and feeding of the animals, veterinary services, cleaning services, gardening services and maintenance of the spaces; legal framework; proposal of the region and geographical location with scientific justification and rationale; physical description of the enterprise; physical description of the technical parts that





compose the zoological park; stages of the physical implementation of the park; estimated budget. Presentation of images and sketches, environmental impact. It may also consider the economic viability of the enterprise; tourist attraction, projection of the number of annual visitors, among other aspects.

- 2. Study Proposal II (Reference:ambiente.2022.lp1-II):** (Research lines: Health, Biodiversity, Infrastructure and Education) *Feasibility Study on the construction of a botanical park in Timor-Leste for the protection and preservation of the country's flora.* The study must take into consideration the following basic elements, among others: the importance of botanical parks; elementary conditions for the conservation and safety of the flora (environmental protection); legal framework; proposal of the region and geographical location with scientific justification; physical description of the enterprise; physical description of the technical parts that compose the botanical park; stages of the physical implementation of the park; estimated budget. Presentation of images and sketches. Environmental impact. It may also consider the economic viability of the enterprise; tourist attraction, projection of the number of annual visitors, among other aspects.

Research Group 2: Climate Change and Environmental Impact

- 1. Study Proposal I (Reference:ambiente.2022.lp2-I):** (3 Research lines: Health, Innovation Technology and Infrastructures, Education) *The Management of Municipal Waste (rubbish) and Development of Recycling Models in Díli. Main Challenges and Solutions.* This study aims to identify the treatment of municipal waste (rubbish) produced and the ways in which municipal waste can be recycled in Díli. It is intended to identify gaps in the current recycling processes and to identify how to promote new models of urban recycling, reuse of materials, reducing consumption and environmental impact, thus promoting the development of the economy through the recycling business (stimulating new business and social cultures) and reuse of urban waste. Preference is given to proposals that also suggest a support model and implementation of ecopoints and recycling systems, as well as national awareness programmes for the introduction of new ecological habits among citizens.