

ANNEX I
RESEARCH LINES AND RESEARCH PROPOSALS INCT
2023

Instituto Nacional de Ciências e Tecnologia
Timor-Leste



ANNEX I

RESEARCH LINES AND RESEARCH
PROPOSALS INCT 2023

January 2023

RESEARCH LINES AND RESEARCH PROPOSALS INCT 2023

To develop and stimulate scientific research in Timor-Leste, a total of five (5) major thematic areas were created, with (10) ten research lines and twenty-five (25) study/research proposals that the INCT considers as priorities for the development of Timor-Leste. The focus of scientific research for the year 2023 falls on the areas of technology, the 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.....	4
2. EDUCATION, HUMAN DEVELOPMENT AND SOCIAL INCLUSION.....	7
3. HEALTH AND WELL-BEING.....	9
4. ECONOMY, AGRICULTURE, TOURISM, TRADE AND INDUSTRY.....	11
5. ENVIRONMENT, BIODIVERSITY AND CLIMATE CHANGE.....	13

Inclusion of New Studies for 2023

Education

1. Study on basic education curriculum development; challenges and solutions;
2. Urban Violence in Dili - case study.
3. Language studies - study on Portuguese language proficiency in basic education; students and teachers.

Health

4. The Social Impact of Neglected Tropical Diseases in East Timor. Challenges and Solutions.
5. Study on Food Habits and Nutrition. Challenges and Solutions.
6. Study on Non-Communicable Chronic Diseases (NCDs) (Cardiovascular Diseases; cancer; diabetes; chronic respiratory diseases).
7. One Health Studies.

Economics

8. Inflation Study in East Timor. Main Challenges and Solutions.

Environment

9. Study on Illegal Hunting and Trafficking of Endangered Animal and Plant Species in Timor-Leste.
10. Study on the Protection and Conservation of the Environmental Ecosystem with the Participation of Local Communities. Case Study.
11. Study on the Management of Hospital Waste.

1. INNOVATION, TECHNOLOGY AND INFRASTRUCTURE

Research Line 1:

Development of renewable and non-renewable energies in Timor-Leste

1. Study Proposal I (Reference:inov.2023.lp1-I): *Feasibility Study on the Implementation of Alternative and Renewable Energy in Timor-Leste: Photovoltaic Panels as an Alternative Energy Source for Public Lighting in Timor-Leste.* The Environment Framework Law (Law No. 26, 2012, art. 46) refers to the importance of renewable energy, and should promote "investment in the development and use of alternative clean technologies and energy from renewable sources". This study should preferably target the locality of Dili, but the project may target any municipality, as long as it is duly substantiated and justified. It is important to establish creative solutions and ways of implementing and maintaining systems.

(Interdisciplinary Study: Innovation and Technology, Environment, Economy, Health and Welfare).

Research Line 2:

Development and Access to Information and Communication Technologies (ICT) in Timor-Leste.

1. Study Proposal I (Reference:inov.2023.lp2-I): *Study on Internet Accessibility in Timor-Leste for Timorese Youth* (this study takes into consideration the recent study entitled "Speed Matters"). Firstly, this study is intended to determine the percentage of the young population who have access to the internet and who do 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 in

6

question. Creative technological and infrastructural solutions are intended to promote Internet access to the young population (WiFi hotspots), especially to develop school and academic research (physical spaces).

2. (Interdisciplinary Study: Innovation and Technology, Environment, Economy, Health and Well-being: Innovation and Technology, Economy and Social Inclusion).

Research Line 3:

Innovation and Modernization of Fundamental Infrastructure in Timor-Leste and Urban Mobility.

1. **Study Proposal I (Reference:inov.2023.lp3-I): *Feasibility Study on the Construction of Dams for the Development of Productive Sectors in Timor-Leste*** (possibility of water storage, human consumption and irrigation, energy production to supply the electricity 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 consideration 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.

(Interdisciplinary Study: Innovation, Technology and Infrastructures; Environment; Economics).

2. **Study Proposal II (Reference:inov.2023.lp3-II): Study on The Significant Changes in Road Traffic in Dili, Timor-Leste - Identification of Problems and Solutions for Road Traffic in the Capital of Timor-Leste.** In recent years, the capital of Timor-Leste has experienced serious changes concerning 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 increase in population density in Dili, the structural problems at the road level and other infrastructures, among other factors, have had a considerable impact on road circulation in the capital of Timor-Leste (traffic), especially in a period of full economic recovery. The aim is to develop a study to diagnose the major problems in road circulation in Dili, the economic and environmental impacts and the consequences for the quality of life of citizens. Concerning road circulation, we intend to survey the driving licenses of the various types of vehicles; the problems with 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); displacements 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.

(Interdisciplinary Study: Innovation, Technology and Infrastructure, Environment, Human Development).

3. Study Proposal III (Reference:inov.lp3-III): *Study on Drainage System in Dili. How to Manage Rainwater and Prevent Landslides and Floods - Problems and Solutions in Land Use Planning.* In the fundamentals of the Timor-Leste National Action Plan for Adaptation to Climate Change (PANA), the concern around "natural disasters (mainly floods and landslides)" is highlighted, which "already constitute a potential risk to development, which is becoming more frequent, intense and disseminated throughout the country, and may cause increased destruction of properties and livelihoods, as well as the loss of human lives" (n°33, 2011). In this sense, the document highlights concerns about "changes in rainfall and temperature patterns and their effects on drought, floods and landslides" (No. 33, 2011). Further, the "specific difficulties raised during the national and district consultations include the potential increase in injuries and deaths resulting from episodes of extreme rainfall, the impacts on physical infrastructure caused by landslides reducing access to essential services (energy, health, water and transport) and the increase in forest fires causing loss of property and lives" (2011). For this study, it is intended that you identify the region or regions in Timor-Leste where you should specify the disaster risk or risks; then you should identify the main challenges from a land-use planning perspective, traditional disaster risk management responses, as well as point out innovative solutions to manage and prevent disaster risks.

(Interdisciplinary Study: Environment, Climate Action, Innovation and Technology).



2. EDUCATION, HUMAN DEVELOPMENT AND SOCIAL INCLUSION

Research Line 1:

Development of Programmes and Strategies for the Implementation of ICT (Information and Communication Technologies) in Schools and Development of ICT Capacity Building Programmes

1. Study Proposal I (Reference:educ.lp1-I): Study on Teachers' and Students' Digital Literacy in Secondary Education. Main Problems and Solutions for the Implementation of Lifelong Learning.

According to the National Policy for Information and Communication Technology (ICT) (2017 to 2019), when establishing the promotion of digital literacy in the country, in 2017, "individuals aged 15 and over in Timor-Leste with advanced digital literacy represent about 2% of the population, 10% with intermediate digital literacy, and about 10% those with basic digital literacy (involving minimal use of social networks) about double this number" (No. 9, 2017). This document promotes a digitally literate society.

It is in this framework that we intend to ascertain the current state of play regarding the level of digital literacy of teachers and students in secondary education, as well as the state of play of lifelong learning in this field. The solutions to be presented should take into consideration the implementation of a lifelong learning programme.

(Interdisciplinary Study: Education, Humanities and Social Inclusion, Innovation and Technology).

Research Line 2:

Human Development and Social Inclusion

1. Study Proposal I (Reference: educ.lp2-I): Study on Curriculum Development for Basic Education. Challenges and Solutions. The Basic Law of Education appeared in 2008, and it establishes the objectives of Pre-School education, the objectives of



Basic Education, the objectives of Secondary Education, as well as Higher Education. The Curricular Plan for the 3rd cycle of basic education appeared in 2011, with the Government Resolution no. 24/2011 of 10 August and the 2nd National Curriculum for the 1st and 2nd cycles of basic education, with the Decree-Law no. 4/2015 of 14 January. It is intended to develop a study which points out possible gaps in the current curricular structure of EB and how to promote curricular harmony.

- 2. Study Proposal II (Reference:educ.lp2-II): *Study on Portuguese Language Proficiency in Basic Education - Students and Teachers.*** Main Challenges and Solutions. Resolution No. 3/2017, which Approves the National Education Policy, points out that concerning national language proficiency, "The proficiency of teachers and agents will be taken by the Ministry as an important criterion in recruitment, promotion and career plan processes. It is intended to determine if the Portuguese language is spoken and written in the various study cycles of basic education in Timor-Leste and what is the level of Portuguese language proficiency of school administrators, teachers and students. It is necessary to determine the main causes and consequences, according to the results of the study, as well as the main challenges and solutions.

(Interdisciplinary Study: Human Development and Social Inclusion).

- 3. Study Proposal III (Reference:educ.lp2-III): *Case Study on Urban Violence in Dili.*** The rates of crime and violence in Dili have increased dramatically in recent years. Compounded by social and economic instability, clashes between rival martial arts groups, which have been going on for years, are on the rise, as an increase in carjackings, robberies and murders. The aim is to develop a study pointing out the causes of the sharp increase in violence in the capital and a set of contextualised solutions.

- 4. Study Proposal IV (Reference:educ.lp2-IV): *Illegal Immigration at Land and Sea Borders in Timor-Leste. Main Problems and Proposed Solutions.*** It is intended to identify the main trends of illegal immigration at the land and sea borders in Timor-Leste in recent years and to present technological solutions and proposals for integrated border monitoring, information and control systems.

(Interdisciplinary Study: Economics, Human Sciences and Social Inclusion).



3. HEALTH AND WELL-BEING

Research Line 1:

Public Health Care and Management

1. Study Proposal I (Reference: Saúde.lp1-I): *Development of Timor-Leste Traditional Medicine Study*. 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 the flora and plant and mineral products/materials used for therapeutic purposes; c) posology and forms of administration and application of treatment. Theoretical explanation of traditional medicine practices. The treatments and practices should be accompanied by photographs and/or illustrative drawings and detailed descriptions.

(Interdisciplinary Study: Health, Education).

Research Line 2:

Human Health

1. Study Proposal I (Reference: Saúde.lp2-I): *The Social Impact of Neglected Tropical Diseases in Timor-Leste. Challenges and Solutions.* According to the World Health Organization (WHO), "Neglected tropical diseases (NTDs) are a diverse group of 20 conditions that are primarily prevalent in tropical areas, where they primarily affect impoverished communities and disproportionately affect women and children. These diseases cause devastating health, social and economic consequences for more than 1 billion people" (2023). It is intended that a study be developed to identify the main foci of neglected tropical diseases in Timor-Leste and to determine the social impact of these diseases, what the various organisations have done in this area and what can be done to reduce the risk to health, to the most vulnerable social groups and society in general.



(Interdisciplinary Study: Health, Education, Social Inclusion).

Research Line 3:

Animal Health

1. Study Proposal I (Reference: Health.lp3-I): *One Health Studies*.

One Health is a multidisciplinary approach aimed at addressing animal health, human health and the environment (World Health Organization). The study may take into consideration the following factors: a) Quality and Environmental Health Control in the context of One Health; b) Prevention, Diagnosis and Control of zoonoses (infectious diseases between animals and people) and enzootic diseases (a disease that frequently affects animals living in certain regions); c) Animal Health Care and Welfare; d) Veterinary Medicine; e) Quality of Food Products of Animal Origin; f) Technologies applied to Animal Health; g) Animal and Environmental Protection; h) Animal Ethics; among other areas. For this study, you must specify the scientific area, as well as a title that delimits the focus of the work One Health and the research area.

(Interdisciplinary Study: Health, Environment).

6

4. ECONOMY, AGRICULTURE, TOURISM, TRADE AND INDUSTRY

Research Line 1:

Technological Development and Innovation in Business, Agriculture, Tourism, Trade and Industry

- 1. Study Proposal I (Reference:econ.lp1-I): *Study for the Development of E-Commerce for Small and Medium Enterprises in Timor-Leste.*** This research 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 presence, online marketing, online payment systems, carriers and associated logistics. Determine impacts on the economy, environment, job creation and growth of the regions in Timor-Leste. (Interdisciplinary Study: Health, Education, Social Inclusion, Economy, Innovation and Technology).

Research Line 2:

Development of New Economic Models in Timor-Leste: Agriculture, Tourism, Commerce and Industry.

- 1. Study Proposal I (Reference: Econ.2023.lp2-I): *Design of New Integrated Economic Models in the Southern Zone of Timor-Leste.*** Through this study, it is intended to come up with new business models from the confection of products to food distribution and sales. Examples: development of economic production plan: confection, agribusiness, production, processing, conservation and food distribution. Establishment of agricultural business partnerships (agricultural co-operatives, business and industrial co-operation in the agriculture and livestock sector/other). (Interdisciplinary Study: Social Inclusion, Economics, Infrastructures).
- 2. Study Proposal II (Reference: Econ.2023.lp2-II): *Study on Inflation in Timor-Leste. Main Challenges and Solutions.*** Taking into consideration that the

6

consequences of the Covid-19 Pandemic and the current war between Russia and Ukraine, among other factors, have led to an inflation rate in Timor-Leste in 2022, it is very likely that this scenario will continue or even worsen in 2023 and 2024 (World Food Programme). In effect, those most affected by the sudden increase in the price of food products and goods are the "urban and rural poor" who "depend on the market to access food" (WFP, 2022).

The intention is to develop a study to analyse the sharp increase in the price of food products and goods in Timor-Leste, the scarcity of local products and the purchasing power of the various social strata of the population. In light of the collected data, it is intended to determine compliance with the Legal Regulations of International Trade, listing the main challenges and possible political, social and economic solutions to face inflation in the country.

- 3. Study Proposal III (Reference:econ.2023.lp2-III). *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. It is intended to develop a business model, determining its agents, the percentage of employment generation, impacts on the environment and the social and economic impact in the proposed region.

(Interdisciplinary Study: Health, Economy, Innovation, Technology and Infrastructures, Environment).

- 4. Study Proposal III (Reference:econ.2023.lp2-III): *How to Reduce National Imports and Increase Productivity and Supply of Goods and Products in Timor-Leste - Exploring New Business Models.*** Through this study, it is intended to develop, on one hand, a program to reduce national imports, indicating, on the other hand, the means of national production necessary to have access to new products, goods and services in Timor-Leste. This study should point out, in the first phase, which are the main goods and products that are imported to Timor-Leste, exploring, in this way, the gaps in internal production. 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 offer of goods, products and services in the national territory, through new economic export models.

(Interdisciplinary Study: Economy, Environment, Infrastructures).

5. ENVIRONMENT, BIODIVERSITY AND CLIMATE CHANGE

Research Line 1:

Environmental Protection, Biodiversity, Natural Resources and Sustainable Development

1. Study Proposal I (Reference:ambiente.2023.lp1-I): *Feasibility Study on the Construction of a Botanical Park in Timor-Leste for the Protection and Preservation of the Flora of the Country.* It is recommended that the study takes 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 and fundamentation; 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 undertaking; tourist attraction, and projection of the number of annual visitors, among other aspects.

(Interdisciplinary Study: Health, Biodiversity, Environment, Infrastructure, Economy and Education).

2. Study Proposal III (Reference:ambiente.2023.lp1-II): *Study on Illegal Hunting and Trafficking of Endangered Animal and Plant Species in Timor-Leste.*

The National Plan and Strategies for the Forestry Sector recognizes "the importance of forests for their biological diversity and that forest conservation is a priority task in forest development planning" (nº9, 2007). Similarly, Decree Law nº6/2020 of 6 February, the Legal Framework for Biodiversity Protection and Conservation highlight that Timor-Leste "is a nation endowed with vast biodiversity, hosting a series of ecosystems of global importance and endemic species" (Law nº6, 2020). It is intended, through this study, to develop a historical analysis to date on poaching and trafficking of endangered animal and plant species in the country and; secondly, to determine which are the most sought-after animal and plant species (and a diagnosis of threatened and endangered species), as well as, if possible, the various modus operandi of poaching and animal and plant trafficking. Finally, it is intended

to determine solutions to eradicate poaching and trafficking of animal and plant species.

(Interdisciplinary Study: Environment, Biodiversity, Economy, Animal Health).

- 3. Study Proposal (Reference:environment.2023.lp1-III): *Study of Environmental Ecosystem Protection and Conservation with the Participation of Local Communities*.** Case Study. The environment and biodiversity are a common heritage. As such, the conservation of the environmental ecosystem belongs to all inhabitants. According to Article 6 of the Constitution of the Democratic Republic of Timor-Leste, one of the fundamental objectives of the State is the protection of the environment and the preservation of natural resources. Similarly, the Environment Framework Law (Decree-Law No. 26/2012) recognises the importance and participation of communities in protecting the environment, encouraging them to participate in the "definition, implementation and monitoring of environmental policy and environmental decision-making processes" (Law No. 26, 2012, art.12). It is intended to diagnose, in a first moment, the main ecological vulnerabilities (motivated by global warming, loss of diversity, natural phenomena, etc.) in one or more regions in the country (whether through the soil, subsoil, water, sea and air) how to involve local communities in specific situations of monitoring, protection and conservation of these specific environmental ecosystems.

(Interdisciplinary Study: Environment, Biodiversity, Economy, Social Inclusion).

Research Line 2:

Climate Change and Environmental Impact

- 1. Study Proposal I (Reference:ambiente.2023.lp2-I): *The Management of Municipal Waste (rubbish) and Development of Recycling Models in Dili. Main Challenges and Solutions*.**

The Decree-Law No. 2/2017, of March 22, which Approves the Urban Solid Waste Management System, points out that Waste Management consists of "all procedures aimed at ensuring an environmentally safe, sustainable and rational management of waste, taking into account the need for its reduction, recycling and reuse, including the separation, collection, handling, transport, storage and/or disposal of waste as well as the subsequent protection and maintenance of disposal sites, to protect human health and the environment against the harmful effects that may arise from them" (art.8).

This study is intended to identify the treatment of municipal waste (rubbish) produced and how municipal waste can be recycled in Dili. 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, and 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 model support and implement eco-points and recycling systems, as well as national awareness programmes for the introduction of new ecological habits among citizens.

(Interdisciplinary Study: Health, Innovation Technology and Infrastructures, Education).

2. **Study Proposal II (Reference:ambiente.2023.lp2-II): *Study on Hospital Waste Management***. The Decree-Law No. 2/2017, of March 22, which Approves the Municipal Solid Waste Management System, determines that Hospital Waste is the "waste from hospitals, health centres, laboratories, veterinary clinics or other similar establishments and that may be contaminated by any biological, physical or chemical products, which constitute a risk to human health or danger to the environment" (art.6).

Indeed, the sharp demographic and economic growth in Timor-Leste in recent years and the increasing population density in urban centres have led to greater demand and an increase in the costs of health services, a situation that has led to an increase in hospital waste.

This study aims to identify: 1) the various types of treatment given to hospital waste; 2) the impact on public and environmental health; 3) the main flaws and costs in hospital waste management processes; 4) how hospital waste can be treated more efficiently and how the production of waste and pollutants can be reduced.

(Interdisciplinary Study: Health, Innovation, Technology and Infrastructure, Education).

Dili, National Institute of Science and Technology, 9 February 2023



The President of the Executive Council of INCT
Dr. José Cornélio Guterres

