

Climate Change Impacts on **Agriculture** and on **Social** **Problems.**

Summary

**Impaktu Mudansa Klimátika ba Setór Agrikultura
no Problema Sosiál.**

Rezumu Ezekutivu



LA'O HAMUTUK



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La'o Hamutuk, 2026

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CLIMATE CHANGE IMPACTS ON AGRICULTURE AND ON SOCIAL PROBLEMS Summary¹

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The climate crisis is a global challenge that affects our environment, food security, clean water, public health and community life. It is characterized by increased temperatures, changes in rainfall patterns and extreme weather events. The United Nations Framework Convention on Climate Change (2016) explains that climate change causes economic losses (such as agriculture production and infrastructure damage) and non-economic losses (such as loss of life, health, culture, local wisdom). The main causes are human activities, including extractive industries, transportation, intensive agriculture and urbanisation. Timor-Leste also contributes by extracting and exporting oil and gas, and as an importer and consumer.

Climate justice is necessary to address the climate crisis, whereby industrialised countries that contribute the most emissions should take responsibility for mitigation, phase out polluting activities, and compensate smaller countries which experience disproportionate impacts of climate change. The truth is that poor populations, farmers, fishers, women and indigenous people are among the most vulnerable, although they cause less greenhouse gas emissions.

To combat the crisis, the United Nations Framework Convention on Climate Change (1992) was established with goals of mitigation and adaptation. Timor-Leste ratified the Convention in 2006 and the Paris Agreement; the National Strategic Development Plan (PEDN 2011–2030) also recognizes climate change concerns. Currently, Timor-Leste is the site of international adaptation projects, but these do not address major problems, as industrialised countries continue to emit greenhouse gases, limiting the effectiveness of adaptation projects.

The aims of this research are:

1. To find out the impact of climate change on the agricultural sector and how it affects women and children.
2. To analyse the political challenges related to climate change.
3. To understand the role of the Government, organisational interventions and society's ability to address climate change.

This research was conducted in close collaboration with farmers, local authorities, civil society organisations and state entities. The methodology used is qualitative and includes interviews, group discussions, direct field observation and a literature review. The information in this report represents the views of the community and the entities involved in the interviews.

This report presents the research findings in hopes that:

- Recommendations will support the State of Timor-Leste in formulating more effective policies and programmes.
- Policies and programmes should consider the principles of climate justice as an essential topic.
- We can build a Timor-Leste that is resilient to climate change and equitable for all people, especially the most vulnerable groups.

This report will first provide background information to facilitate understanding of climate change and its impacts, followed by an analysis of the research findings. Finally, conclusions and recommendations will be provided.

¹ The complete Tetum report can be downloaded from https://www.laohamutuk.org/Env/Climate/2605LHImpaktuMKAgriTe_Optimized.pdf

IMPAKTU MUDANSA KLIMÁTICA BA SETÓR AGRIKULTURA NO PROBLEMA SOCIAL

Rezumu Ezekutivu

La'ó Hamutuk, Abril 2026

Krize klimátika mak dezafiu globál ida ne'ebé afeta ambiente, seguransa ai-han, bee moos, saúde, no moris komunidadade nian. Karakteriza ho temperatura aumenta, mudansa padraun udan, no eventu estremu sira. UNFCCC (2016) define katak mudansa klimátika kauza lakon ekonómiku (produsaun agrikultura, infraestrutura) no lakon la'ós-ekonómiku (vida, saúde, kultura, matenek lokál). Kauza prinsipál mak atividade umanu nian, inklui indústría extrativa, transporte, agrikultura intensivu no urbanizasaun. Timor-Leste mós kontribui liu husi esportasaun mina/gás no nu'udar end user importasaun.

Rezolve krize klimátika presiza justisa klimátika: nasaun industrializadu ne'ebé kontribui boot liu tenke asumi responsabilidade ba mitigasaun, hapara sira-nia aktu poluente, no kompensa nasaun ki'ik ne'ebé sofre impaktu boot. Realidade hatudu kataku populasaun kiak, agrikultór, peskadór, feto no indíjena mak vulnerável liu, maski sira kontribui ki'ik (La'ó Hamutuk, 2020).

Atu kombatate krize ne'e, UNFCCC (1992) estabesele ho objetivu mitigasaun no adaptasaun. Timor-Leste ratifika konvensaun (2006) no Akordu Paris, no PEDN 2011-2030 mós rekoñese preokupasaun ba mudansa klimátika. Daudaun, TL sai alvu ba projetu adaptasaun internasionál, maibé ne'e la resolve problema boot tanba nasaun industrializadu kontinua emite gases estufa, halo adaptasaun fó benefísiu limitadu de'it.

Objetivu Peskiza mak;

1. Atu hatene impaktu husi mudansa klimátika ba setór agrikultura no oinsá mudansa klimátika afeta feto no labarik
2. Atu analiza dezafiu politika sira ne'ebé asosiadu ho mudansa klimátika
3. Atu hatene papél Governu, intervensaun organizasaun sira no sosiedade nia abilidade hodi rezolve mudansa klimátika

Peskiza ne'e envolve direta ho agrikultór sira, autoridade lokál, organizasaun sosiedade sivil, no entidade Governu nian. Metodolojia uza mak kualitativu ho entrevista, diskusaun grupu, observaun direta iha terrenu, no revizaun literatura. Informasaun sira ne'ebé hakerek iha relatóriu ida ne'e representa hanoin sira husi komundadade no entidade sira ne'ebé hola parte iha entrevista.

Relatóriu ida ne'e apresenta rezultadu husi peskiza ho esperansa katak:

- Rekomendasaun sira bele apoiu Estado Timor-Leste atu halo formulasaun politika no programa ne'ebé efetivu liu tan
- Polítika no programa konsidera prinsipiu justisa klimátika nu'udar fundamentu importante
- Ita bele harii Timor-Leste ne'ebé resiliente hasoru mudansa klimátika ne'ebé justu ba ema hotu, liuliu sira ne'ebé vulnerável liu

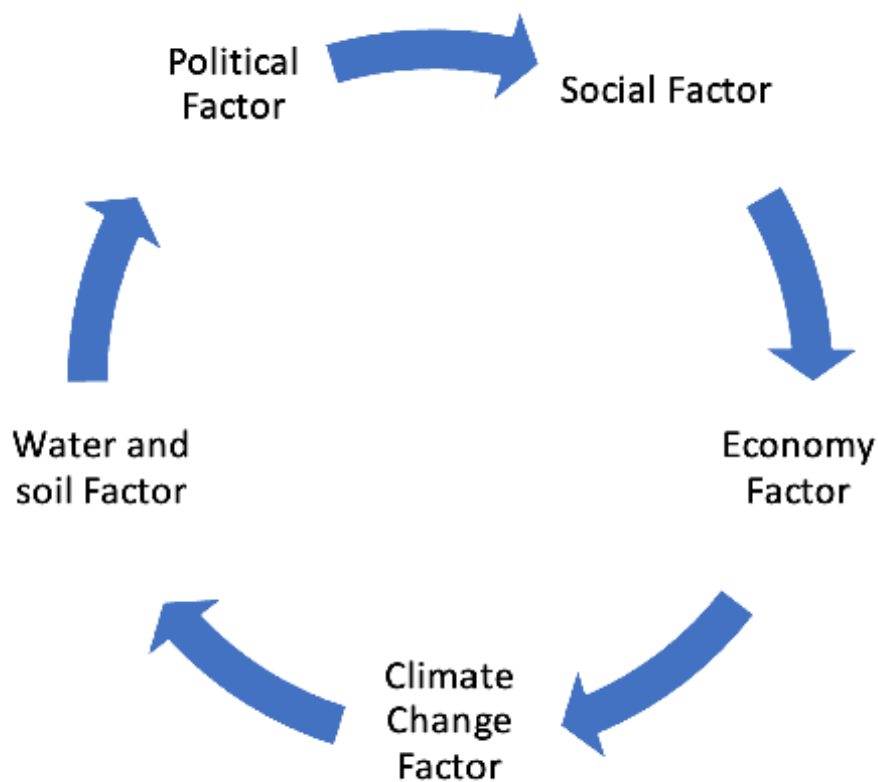
Rezumu Relatóriu ne'e, sei fahe analiza rezultadu xave husi peskiza ida ne'e no oferese konkluzau no rekomendasaun.

KEY FINDINGS

Impacts on Agricultural Production

- Climate change creates uncertainty in traditional agricultural calendars, as rainfall becomes unpredictable, dry seasons become longer and rainy seasons become shorter.
- Farmers said that in the past, rain usually started in November or December, but now it starts only in January or February.
- Production of corn and rice has decreased significantly due to crop pests, droughts and heavy rains that damage farms.
- Many potential areas are not in use. In Viqueque, there are 12,000 hectares of corn, but only 2,015 hectares are harvested.

Factors that impact Agricultural Production



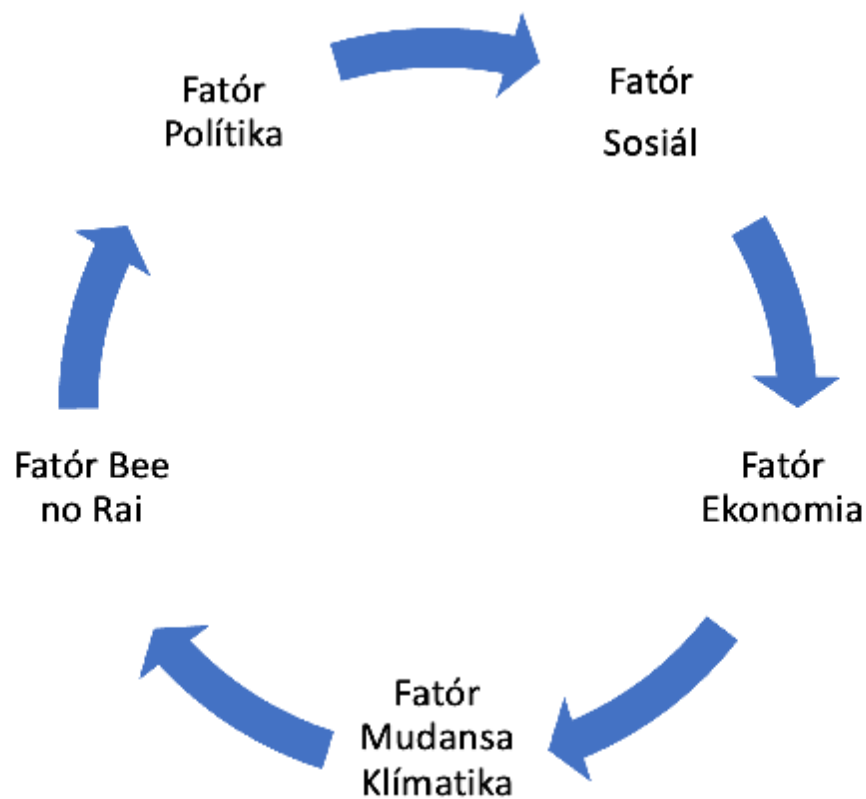
The above cycle shows that the factors influencing agricultural production are not only climate change but also political, social, economic, water and soil factors. Climate change exacerbates existing structural challenges such as poverty, malnutrition, food insecurity, lack of water and degraded soil productivity.

REZULTADU XAVE

Impaktu ba Produsaun Agrikultura

- Mudansa klimátika halo kalendáriu agrikultura tradisionál sai la klaru liu tan – udan la mai tuir tempu, bailoron naruk liu, no tempu udan menus.
- Agrikultór sira hateten katak uluk udan hahu iha Novembru/Dezemburu, maibé agora dala ruma to'o Janeiru/Fevereiru mak foin udan.
- Produsaun batar no hare menus signifkativamente tanba peste (knakok, kamero/moras mean), rai maran, no udan boot ne'ebé estraga toos.
- Área potenciál barak la uza: iha Viqueque, husi 12.500 ha ba batar, de'it 2.015 ha ne'ebé kolleita.

Fatór Ne'ebé Infleunsia Produsaun Agríkola



Husi siklu iha leten hatudu katak fatór ne'ebé influencia produsaun agrikula laos mudansa klímatika deit maibé tanba fatór sira seluk hanesan fatór polítika , sosiál, ekonomia, bee, rai nsst. Mudansa klimátika fatór multiplikadór ne'ebé halo dezafiu estruturál ezistente ona hanesan kiak, malnutrisaun, inseguransa ai-han, bee menus, produtividade rai tun sai boot liu tan.

Impacts on Women and Children

According to the Notre Dame Global Adaptation Initiative (2024) vulnerability index, a global measure of a country's vulnerability to climate-related disturbances, Timor-Leste ranked 134th among 187 countries, with a score of 42.3. This indicates that the country is very vulnerable to climate-related risks; however, it is not prepared to respond. The index shows that Timor-Leste is highly vulnerable across multiple sectors, including water, agriculture, health, infrastructure, food and ecosystems. The report further indicates that Timor-Leste is not well-prepared to face the impacts of climate change affecting both urban and rural populations, with women and children being particularly affected, as they are often responsible for seed preparation, planting and domestic work.

Research shows that the majority of communities consider climate change to have a significant impact on women and children.

- Women and children are the most vulnerable to the climate crisis. They often have to walk long distances to fetch water during the dry season.
- In Oe-Cusse in 2020, all spring water sources dried up, and women had to leave at dawn to wait at wells in order to obtain water for cooking and daily use.
- Children are unable to attend school due to lack of water or damaged roads; they also suffer from malnutrition and preventable diseases.
- Gender-based violence increases during climate crises, and women are burdened with double responsibilities, including domestic work and agricultural labour.

Farmers' Adaptation to the Climate Crisis

Adaptation: Actions taken to address the effects of climate change (such as heavy rain and droughts) in order to reduce damage. *Resilience:* The ability of a system or community to resist, adapt, and maintain proper functioning in the face of hazards.

Communities in Viqueque, Manufahi and Oe-Cusse face significant impacts of climate change, including prolonged dry seasons, rising land temperatures, unpredictable rainfall patterns, drying springs and strong winds. This situation forces farmers to adapt within their existing capacities.

- Use of local wisdom: Farmers change to crop varieties that are more tolerant of changing climate conditions.
- Diversification of activities: Some communities abandon agriculture and seek alternative livelihoods such as carpentry, land excavation and selling clean water.
- Collective farming: In Dotic, Caicassa and Uma Berloik, communities engage in collective farming in *Rai Matak*² (forest areas) using pond water and clearing forested land.
- Livestock sales: When farming adaptation is unsuccessful, communities sell chickens, roosters, buffaloes and pigs to generate income.
- Depends on support: Communities attempt to submit proposals to the government through *Programa Nasional Dezenvolvimentu Suku* (PNDS) to access water, seeds and other support, however, assistance is often delayed.

² *Rai matak* is at Dolok, referred to a forest that is on top of the mountain and far from the community, communities have not done any farming, fertile soil and a water pond is there.

Impaktu Ba Feto No Labarik

Tuir índise vulnerabilidade ND-GAIN (2024) nian, medida global ida kona-ba vulnerabilidade nasaun ida-ne'e nian ba perturbasaun klimatika, Timor-Leste okupa número 134 ho skor 42.3 husi nasaun 187, ne'ebé signífika katak ita-nia vulnerabilidade ba endémiku klimatika aas, maibé ita-nia prontidaun atu responde sei ki'ik tebes. Ne'e hatudu katak Timor-Leste nudár nasaun ne'ebé vulneravel liu ba dala 30 ba pontuasaun sira vulnerabilidade iha setór Bee, Agrikultura, Saúde, Infraestrutura, Ai-han, Ekosistema sira. Relatóriu ne'e hatudu Timor-Leste seidauk iha preparasaun adekuaudu atu hasoru impaktu husi mudansa klimatika ne'ebé afeta populasaun sira iha área urbana no rural, barak liu afeta ba feto no labarik sira, tanba dala barak sira mak responsavel ba halo servisu sira prepara fini, kuda ai-han no halo servisu doméstiku.

Peskiza hatudu katak maioria comunidade sira konsidera katak mudansa klimatika fó impaktu boot ba feto no labarik.

- Feto no labarik mak grupo ne'ebé vulnerável liu ba krize klímátika. Sira tenke la'o dook (kilómetru resin) atu kuru bee bainhira bailoron naruk.
- Iha Oe-cusse tinan 2020, bee matan sira maran hotu, feto sira tenke la'ó ba hein bee matan madrugada, hodi nune'e bele hetan bee moos hodi tein.
- Labarik sira labele ba eskola tanba bee laiha ka estrada kotu; sira mós sofre husi malnutrisaun no moras ne'ebé bele prevene.
- Violénsia ne'ebé bazeia ba jéneru aumenta iha tempu krize klímátika no feto sira hetan dupla responsabilidade (servisu doméstiku no toos).

Adaptasaun Agrikultór Sira Nian ba Krize Klímátika

Adaptasaun: Asaun atu responde ba efeitu mudansa klimatika (hanesan udan boot, rai maran) hodi hamenus estragu. Reziliénsia: Kapasidade sistema/komunidade atu reziste, adapta, no mantein funsionamentu di'ak hasoru perigu.

Komunidade sira iha Viqueque, Manufahi, no Oe-cusse enfrenta impaktu boot husi mudansa klimatika, inklui bailoron naruk, rai manas, udan la tuir tempu, bee matan maran, no anin boot. Situasaun ne'e halo agrikultór sira tenke adapta ho kapasidade ne'ebé sira iha, hanesan:

- Uza matenek lokál: Troka kuda produktu agríkola ba variedade ne'ebé tolerante liu ba klima foun.
- Diversifikasaun atividade: comunidade balun, sai husi servisu setór agrikultura nian no buka servisu seluk hanesan badaen, kee rai no fa'an bee moos.
- Toos koleтиву: Iha Dotik, Caicassa no Uma Berloik, comunidade halo toos hamutuk iha rai matak (dolok/ai-laran) ho lere ai-horis no uza bee debu.
- Fa'an animál: Bainhira adaptasaun agrikultura la susesu, comunidade fa'an manu, karau, no fahi atu hetan rendimentu.
- Dependé ba apoiu: Komunidade tenta hato'o proposta ba Governu liu husi PNDS ba bee, fini, no asisténsia, maibé implementasaun dala barak tarde.

The community can adapt in the short term, but it is limited due to a lack of water, poor infrastructure, delayed technical assistance and unfavourable market conditions. Coordinated interventions are needed to transform temporary adaptation into long-term resilience.

Adaptation Policies and Programmes

- *Water management for agriculture:* Construction of mini-dams, rehabilitation of water canals and irrigation for paddy fields using drip irrigation to regulate water use and to conserve spring water (e.g., digging ponds, terracing and water filtration). For example, in Viqueque, water canal rehabilitation supported 9.5 hectares of paddy fields in Suku Bahalarawin.
- *Agricultural Conservation:* Training for farmers on conservation and adaptation techniques, the use of mulch during prolonged dry seasons, planting trees to protect water sources and developing a standardised training manual.
- *Ecosystem and forest rehabilitation:* Establish village-level forest management committees, promote agroforestry in Viqueque and Baucau (12 sukus, 73,000 seedlings) and strengthen early warning systems for strong winds that can damage houses.
- *Emergency response:* Emergency reporting for communities affected by floods and landslides, and emergency support for basic needs.
- *Ecological studies:* Mapping oceans and natural resources and projecting agricultural production for the next 50 years.

Although the Government and development partners have well-designed programmes, implementation is not yet effective in helping farmers break the cycle of problems. Most programmes provide only short-term support. They help communities adapt to current conditions but do not strengthen long-term resilience. Political leaders in Timor-Leste have not prioritised agriculture as a strategic sector for the country's future, often creating national plans without conducting detailed feasibility studies before designing interventions. This contributes to maladaptation (interventions that increase vulnerability in practice).

Minimizing Maladaptation and Climate Justice

The objective of climate adaptation is to prepare communities to face the impacts of climate change. However, international evidence shows that adaptation which does not integrate a climate justice perspective may be counterproductive, including maladaptation—interventions that aim to reduce vulnerability but actually increase it, create new inequalities and cause unexpected ecological and social problems.

The principle of climate justice emphasizes that countries and actors with greater historical responsibility for greenhouse gas emissions should take greater responsibility for mitigation, adaptation and addressing loss and damage. This is especially important for countries like Timor-Leste, which have contributed less to the global crisis but have suffered disproportionate impacts of climate change.

In Timor-Leste, the vulnerability of communities is not caused only by climate change; it is the result of the interaction between climate impacts and long-standing structural conditions such as poverty, malnutrition, food insecurity, limitations in basic services and a slowdown in the agricultural sector. These conditions make communities more vulnerable to climate shocks such as prolonged dry seasons, droughts, drying springs, floods and changes in rainfall patterns.

Komunidade iha kapasidade adaptaun ba tempu badak, maibé limitadu tanba falta bee, infraestrutura fraku, assisténsia técnica tarde, no valór merkadu ne'ebé la favoravel. Presiza intervensaun koordinadu atu transforma adaptaun temporáriu ba reziliénsia iha tempu naruk.

Polítika No Programa Sira Kona-ba Adaptaun

- Jestaun bee ba agrikultura; halo konstrusaun mini dam, normalizasaun bee dalan, kanaliza ba natar. Uza drip irrigasaun hodi sukat bee no konsersasaun bee matan (kee debu, halo teras, filtrasaun bee), Ezemplu: Viqueque – normalizasaun bee ba natar 9,5 hektar iha Suku Bahalarawain.
- Konsersasaun agrikultura; Formasaun ba agrikultór kona-ba técnica konsersasaun no adaptaun, uza mulsa durante bailoron naruk, kuda ai-horis ne'ebé proteje bee no prodús manual padronizadu ba treinamentu
- Reabilitasaun ekosistema no Floresta; Harii komisaun jestaun floresta iha nível suku, agrofloresta iha Viqueque no Baucau (suku 12, ai-oan 73.000) no early warning ba anin boot no estragu uma.
- Resposta emerjénsia; Emergency report ba komunidade ne'ebé hetan impaktu inundasaun/rai halai no ajuda emerjénsia ba nesesidade báziku
- Estudu ekolójiku; Mapamentu tasi no rekursu no analiza produsaun agrikola ba futuro (50 tinan)

Maski Governu no parseiru dezenvolvimentu iha programa ne'ebé hakerek ho di'ak, implementasaun seidak efetivu atu ajuda agrikultór sira sai husi sirkulu problema. Programa barak liu fó ajuda ba tempu badak de'it. Ajuda komunidade atu adapta ba situasaun atuál, maibé la fó kapasidade ba reziliénsia iha tempu naruk. Líder polítiku sira iha Timor-Leste seidak tau prioridade ba setór agrikultura nudár setór estratéjiku ba futuro nasaun ida ne'e halo planu nasionál sira la halo estudu viabilidade detalladu molok dezeña intervensaun. Ne'e kontribui ba maladaptaun (intervensaun ne'ebé aumenta vulnerabilidade iha realidade).

Minimiza Maladaptaun no Justisa Klimátika

Objetivu husi adaptaun klimátika mak atu prepara komunidade sira hodi enfrenta impaktu mudansa klimátika. Maibé, evidénsia internasionál hatudu katak adaptaun ne'ebé la integra perspetiva justisa klimátika iha risku sei prodús rezultadu kontraproduktivu, inklui maladaptaun —intervensaun ne'ebé hakarak hamenus vulnerabilidade maibé realidade aumenta vulnerabilidade, kria desigualdade foun no hamosu problema ekolójiku no sosial ne'ebé la espera.

Prinsípiu justisa klimátika subliña katak nasaun no atór sira ne'ebé iha responsabilidade histórika boot liu ba emisaun gás estufa tenke suporta responsabilidade boot liu ba mitigasaun, adaptaun no resposta ba lakon no estragu (loss and damage). Ida ne'e, importante liu ba nasaun sira hanesan Timor-Leste, ne'ebé menus kontribuisaun ba krize globál maibé sofre impaktu disproporsional husi mudansa klimátika.

Iha Timor-Leste, komunidade sira nian vulnerabilidade la mosu de'it tanba mudansa klimátika, rezultadu husi interasaun entre impaktu klimátiku ho kondisaun estruktural ne'ebé eziste kle'ur ona, hanesan kiak, malnutrisaun, inseguransa aihan, limitasaun iha servisu báziku no estagnasaun iha setór agrikultura. Kondisaun sira ne'e halo komunidade sira sai vulnerável liu tan ba xoke klimátiku, hanesan bainloron naruk, rai maran, bee maran, inundasaun no mudansa iha padraun tempu.

Timor-Leste already has important policy instruments on climate change, including the National Adaptation Programme of Action (NAPA), the National Adaptation Plan (NAP), the Nationally Determined Contribution (NDC) and the National Climate Policy. These documents show the State's commitment to integrating adaptation into various sectors. However, the main challenges are not only to formulate policies, but to implement and monitor them effectively, coordinate among sectors, and ensure that decision-making and resource allocation reflect local priorities.

In practice, adaptation often depends on short-term and limited funding projects, which are usually inadequate because climate impacts occur over long periods. These issues include a lack of clear strategies for sustainability and capacity transfer, and the fact that communities often are unable to continue activities after projects end. Therefore, strategies should not only meet immediate needs but also ensure long-term resilience.

Another important aspect is the need for planning based on evidence and feasibility assessments. Interventions that ignore the local context can lead to maladaptation, which does not reduce risks but increases vulnerability and creates new problems. Therefore, planning should integrate risk assessment, community consultation and impact analysis prior to implementation.

Local community participation is crucial for effective and equitable adaptation. However, communities often have little influence on decisions. Adaptation that does not meaningfully involve communities may fail to reflect local realities and to meet actual needs.

At the same time, attention must be paid to distributive justice in the allocation of adaptation resources. Transparency and equity in project distribution and funding are important in order to avoid territorial and social inequalities. Adaptation policy should ensure that the most vulnerable groups, including women, children, persons with disabilities and rural communities, are prioritised in planning and implementation.

Thus, the climate crisis is not only an environmental issue but also a justice issue. Timor-Leste, as a country that contributes little to global emissions but suffers significantly from climate impacts, has moral and political grounds to demand fair international support, including adequate funding, technology transfer and effective mechanisms for addressing loss and damage, as well as a serious discussion of development models that may increase environmental and social vulnerability.

We must recognise that without climate justice, adaptation will remain weak, temporary and insufficient to achieve long-term resilience. Therefore, climate justice should be the foundation of all climate change policies and actions in Timor-Leste.

Adaptation alone is insufficient without justice.

CONCLUSION

The research conducted by La'o Hamutuk in Viqueque, Manufahi and Oecussi shows that climate change is not the only cause of agricultural and social production problems. Other important factors include long-standing structural problems such as food insecurity, malnutrition, poverty, unemployment, high dependency on imported food, lack of water, degraded land productivity and limited human capacity. Climate change exacerbates these existing problems, directly affecting household economies and significantly impacting the lives of women and children.

Timor-Leste iha ona instrumentu polítiku importante sira kona-ba mudansa Klimatika, inklui National Adaptation Programme of Action (NAPA), National Adaptation Plan (NAP), Nationally Determined Contribution (NDC) no National Climate Change Policy. Dokumentu sira ne'e hatudu komitmentu Estadu nian atu integra adaptasaun iha setór oin-oin. Maibé, dezafiu prinsipal la'ós de'it iha elaborasaun polítika, maibé iha implementasaun efetiva, koordinasaun intersetoriál, monitorizasaun no garantia katak prioridade lokal sira refleta iha desizaun no alokasaun rekursu.

Iha prátika, adaptasaun dala barak depende ba projetu ho durasaun badak no finansiamentu limitadu, ne'ebé dala barak la adekuaudu ho natureza tempu naruk husi impaktu klimátiku. Falta iha estratéjia klaru ba sustentabilidade no transferénsia kapasidade, comunidade sira dala barak falta iha kondisaun atu kontinua atividade sira hafoin projetu remata. Tanba ne'e, prezisa estratejia ne'ebé la'ós de'it responde ba nesesidade imediata, maibé mós garante reziliénsia iha tempu naruk.

Aspeitu importante seluk mak nesesidade ba planeamentu ne'ebé bazeia ba evidénsia no avaliasaun viabilidade. Intervensaun ne'ebé la konsidera kontektu lokal bele hamosu maladaptasaun, ne'ebé, la'ós hamenus risku maibé aumenta vulnerabilidade no kria problema foun. Tanba ne'e, prosesu planeamentu tenke integra avaliasaun risku, konsultasaun comunidade no análise impaktu antes implementasaun.

Partisipasaun comunidade lokál fundamentál tebes ba adaptasaun ne'ebé efetivu no justu. Maibé, . partisipasaun comunidade lokál dala barak seidauk atinji nivel ne'ebé comunidade iha influénsia real ba desizaun. Adaptasaun ne'ebé la involve comunidade ho forma signifkativa iha risku atu la reflete realidade lokal no la responde ba nesesidade real sira

Iha tempu hanesan, prezisa tau atensaun ba justisa distributiva iha alokasaun rekursu adaptasaun. Transparénsia no ekidade iha distribuissau projetu no finansiamentu importante atu evita desigualdade teritorial no sosial. Polítika adaptasaun tenke asegura katak grupu sira ne'ebé vulnerável liu, inklui fetu, labarik, ema ho defisiénsia no comunidade rurál hetan prioridade iha planeamentu no implementasaun.

Nune'e, krize klimátika la'ós de'it asuntu ambientál, maibé mós asuntu justisa. Timor-Leste, nu'udar nasaun ne'ebé kontribui mós ba emisaun globál, maibe ita mós sofre ba krize klimatika tanba ne'e ita iha baze morál no polítika forte atu ezije apoiu internasionál ne'ebé justu, inklui finansiamentu adekuaudu, transferénsia teknolojia no mekanizmu efetivu ba resposta ba lakon no estragu inklui diskute ho seriedade modelu dezenvolvimentu ne'ebé bele aumenta vulnerabilidade ambientál no sosial.

Ita tenke rekoñese katak, se la iha justisa klimátika, adaptasaun sei fraku, temporáriu no la bele atinji reziliénsia iha tempu naruk. Tanba ne'e, justisa klimátika tenke sai fundamentu ba polítika no asaun hotu-hotu kona-ba mudansa klimátika iha Timor-Leste.

Adaptasaun sei la Suficiente, se la iha justisa.

KONKLUZAUN

Peskiza ne'ebé La'o Hamutuk halo iha Munisipiu Viqueque, Manufahi no RAEOA hatudu katak Mudansa Klimátika la'ós fatór úniku ne'ebé kauza ba problema produsaun agrikola no sosiál iha rejiaun sira-ne'e. Iha fatór seluk ne'ebé mós importante tebes, inklui problema estrutural ne'ebé existe antes ona, hanesan inseguransa ai-han, malnutrisaun, kiak, dezempregu, dependesia ass ba importaun ai-han, bee menus, produtividade rai tun no kapasidade umanu ne'ebé limitadu. Fenomena Mudansa Klimátika sai nudár fatór ida ne'ebé halo dezafiu ne'ebé existe ona sai boot liu tan no implika direktamente ba ekonomia família no fó impaktu boot ba moris fetu no labarik sira.

Although many Government and development partner programmes are well-designed, implementation has not yet been effective in helping farmers break the cycle of problems facing them. Most programmes provide only temporary assistance, which helps communities adapt to current conditions but does not include a path to long-term resilience. This situation occurs because national plans do not include detailed feasibility studies before designing interventions, and political leaders in Timor-Leste have not yet prioritised agriculture as strategic for the country's future.

Therefore, it is necessary to adopt more effective strategies to address these problems, such as increased investment in the agricultural sector, in-depth studies before implementing programmes and focusing on resilience rather than temporary adaptation.

RECOMMENDATIONS

Based on the results of the study, La'o Hamutuk proposes recommendations for three groups—the Government, development partners and families—as part of efforts to develop the agricultural sector in Timor-Leste and build a climate-resilient society.

A. Government of Timor-Leste:

1. The Government should design policies and programmes that address the real problems farmers face by increasing the overall budget allocation for essential programmes and improving implementation capacity to ensure timely delivery.
2. The Government needs to conduct feasibility studies before implementing major projects, such as *Centro Desenvolvimento Treinamentu Pecuaría* (CDTP) in the municipalities, as well as irrigation infrastructure. It is also important to allocate funds for operation and maintenance of each project to ensure sustainability.
3. The Government should preserve local seed varieties that are resilient to Timor-Leste's climate.
4. The Government should allocate workers to areas which need labour, especially in agriculture, CDTPs, animal health services, extension services and technical expert support.
5. The Government should also ensure that interventions carried out by development partners are aligned with national programmes.
6. The Government should integrate climate considerations into all sectors. Climate adaptation should not be treated as a separate project; it should be central to agriculture, health, infrastructure and economic planning, so that these sectors are strengthened across the board.
7. Develop a people-centred early warning system: ensure that weather forecasts and disaster alerts (for floods, landslides and tropical cyclones) are communicated in local languages (Tetum and others) through appropriate channels such as community radio, SMS and church networks. Priority should also be given to women, children and youth in climate response centres.
8. The Government should ensure a sustainable water supply in rural and urban areas to meet household demand appropriately.
9. The Government, through the Ministries of Health and Agriculture and relevant agencies, should promote diversification of food production as well as the consumption of diverse, nutritious and balanced foods.

Maski iha programa barak husi Governu no parseiru dezenvolvimentu ne'ebé hakerek ho di'ak, implementasaun programa sira-ne'e seidak konsege ajuda agrikultór sira atu sai husi sirkulu problema ne'ebé sira hasoru. Programa barak liu fó assisténsia temporária de'it, ne'ebé ajuda comunidade atu adapta ba situasaun atuál, maibé la fó dalan ba comunidade atu harii reziliénsia ba tempu naruk. Situasaun ida ne'e akontese tanba Planu nasionál sira la halo estudu viabilidade detalladu antes dezeña intervensaun, no Lider polítiku sira iha Timor-Leste seidak tau prioridade ba setór agrikultura nudár setór estratéjiku ba futuru nasaun ida ne'e.

Tanba ne'e, presiza mudansa estratejia ida diak liu ba rezolve problema sira ne'e, hanesan aumenta investimentu iha setór agrikultura, halo estudu ne'ebé kle'an molok halo programa, no foka ba reziliénsia, la'os de'it ba adaptaun temporária.

REKOMENDASAUN

Rezultadu estudu sira, La'ó Hamutuk rekomenda ba parte tolu: Governu, Parseiru Dezenvolvimentu inklui Fasmilia nudár alternativa ba dezenvolvimentu setór grikultura iha Timor-Leste no harii sosiedade ne'ebe reziliénsia ba mudansa klimatika.

A. Governu:

1. Governu Nesesita atu dezeña polítika no programa sira ne'ebé bele hatan ba problema real ne'ebé mak agrikultór sira hasoru liu-husi hasae alokasaun orsamentu jeral ba progarama esensial sira no hadiak kapasidade implementasaun tuir tempu.
2. Governu nesesita halo estudu viabilidade sira antes atu hala'o projetu boot sira, inklui halo estudu viabilidade atu hari "Centro Desenvolvimento Treinamento Pecuaria" CDTP sira iha Munisipiu inklui konstrusaun irrigasaun sira. Importante mos atu aloka kustu opersaun no manutensaun ba kada projetu hodi asegu nia sustentabilidade.
3. Governu nian nesesita atu konserva fini lokál ne'ebé mak resiliente ba klima TL nian.
4. Governu nesesita atu halo balansu ka tau forsa traballu iha area ne'ebé presiza forsa traballu bo'ot liu-liu servisu ho agrikultór sira iha baze, CDTP, saúde animal, extensionista no especialista sira iha baze
5. Governu presiza iha lei ba kontola utilizaun pestisida no herbisida sira iha TL
6. Governu tenke integra klima iha setór hotu-hotu: Adaptaun ba Klima labele sai projetu mesak ida; ida-ne'e tenke sai prinsipál ba agrikultura, saúde, infraestrutura, no planeamentu ekonómika atu bele reforsa liu iha markadór sira.
7. Dezenvolve Sistema Alerta Antesipada Sentradu ba Povu: Asegura previzaun tempu no alerta dezastre (ba inundasaun, rai-monu, siklone tropikál) komunika iha lian lokál (Tetum no seluk tan) liuhusi kanál apropriadu (rádiu comunidade, SMS, rede igreja). No fó prioridade ba feto, labarik no adolosente sira iha sentru klima resposta sira.
8. Governu presiza asegu fornimentu bee iha área rural no urbana sira hodi responde ba demanda uma kain sira ho adekua no sustentavel.
9. Governu Timor-Leste presiza hadi'a seguransa ai-han no reziliénsia ba Mudansa Klimatika.

10. The Ministry of Health needs to strengthen public health surveillance, monitoring and preparing for climate-sensitive diseases such as dengue fever, malaria and diarrhoea, which can increase after floods or during heat waves. This includes ensuring climate-resilient water and sanitation systems, protecting spring water from contamination during floods, and promoting hygiene practices to prevent waterborne diseases.
11. The school curriculum should introduce psychology subjects as a way to help children deal with trauma caused by climate change.
12. The Ministry of Agriculture, the Ministry of Industry and Commerce, the Ministry of Finance, and the Central Bank should develop and implement the National Policy for Agricultural Import Substitution (PNIA) using an integrated approach, in order to reduce food imports and strengthen fiscal resilience.

B. Development Partners

1. Development partner programmes and projects should help communities become climate-resilient without creating dependency.
2. Promote climate-resilient crops: Farmers should cultivate locally adapted and climate-resilient crops, including flood-tolerant and salt-tolerant varieties such as maize, rice, vegetables and beans.
3. Reduce agriculture that depends on rainwater by promoting aquaculture and small-scale livestock (such as pigs, chickens, cattle, buffalo and sheep) to provide alternative income when crops fail.
4. Invest in small-scale water infrastructure: build and rehabilitate community-level water collection systems, maintain small irrigation canals and install household rainwater tanks to capture water during the rainy season for use in the dry season. Local skills can also be utilised, such as terracing to retain and filter water and establishing community-led water distribution systems to ensure equitable and sustainable access to water.
5. Agricultural activities carried out by the community should be directed towards diversification of production in order to increase the consumption of a variety of household products and ensure better nutrition.
6. The community plays a key role in addressing specific problems, especially those affecting women and children. Therefore, solutions must be designed collaboratively, respecting traditional knowledge related to land and households, and addressing the specific vulnerabilities faced by women and children in the community.

C. Families

1. Practice family farming aimed at improving household consumption patterns through a diverse, nutritious and balanced diet; don't focus only on rice dependence.
2. Farmers need to preserve existing local knowledge and adopt environmentally friendly practices.
3. Farmers need training in the proper use of pesticides and fertilizers, including correct application rates, crop rotation, integrated pest management and organic fertilizer use.
4. Farmers should preserve their own seeds, including purified seed varieties, so that they do not depend on imported seeds sold in stores.

10. Governu liu husi Ministeriu Saude, Agrikultura no parte relevánsia sira presiza halo kampaña ba diversifikasaun produsaun ai-han no mós konsumu ai-han ne'ebé variedade, nutritivu no balansu.
11. Kurikullu Eskola tenke introdús matéria psikolojia, meius ba ajuda labarik sira bainhira hasoru trauma ne'ebé kauza husi mudansa klimátika.
12. Ministériu Agrikultura, Ministériu Indústria no Komérsiu, Ministériu Finansas, no Banku Sentrá, tenke dezenvolve no implementa Polítika Nasionál Substituisaun Importasaun Agrikultura (PNIA) ho abordajen integradu. Nudár dalan ba hamenus importasaun ai-han no haforsa reziliénsia ba rai-naruk fiskál.

B. Parseiru Dezenvolvimentu

1. Parseiru dezenvolvimentu sira nian programa no projeitu sira tenke tulun atu korre comunidade atu bele reziliente ba mudansa klimátika maibé la'os kria dependensia
2. Promove Ai-horis ne'ebé Reziliente ba Klima; agrikultór sira hakiak variedade ai-horis prinsipál sira ne'ebé resistente ba rai-laran, tolerante ba inundasaun, no tolerante ba masin (ezemplu, batar, hare, modo tahan, no fore sira)
3. Hamenus dependénsia ba agrikultura ne'ebé uza udan been, liuhusi promove akuakultura, pekuária ho eskala ki'ik (hakiak fahi, manu, karau, bibi nsst), hodi bele fornese rendimentu alternativu bainhira ai-horis sira falla.
4. Investe iha infraestrutura bee ho eskala ki'ik: harii no rehabilita sistema sira kolleta bee nian iha nivel comunidade nian, verifika barrajen sira, barrajen ki'ik sira, no tanke udan-been uma-kain nian hodi kaptura udan been durante tempu udan nian hodi uza iha tempu maran. Bele uza mós matenek lokál sira hanesan terras serin sira hodi trava no halo filtrasaun ba bee, inklui asegura sistema fahe ne'ebé jere husi comunidade hodi garante distribuisaun bee ne'ebé ekitavel no sustentavel.
5. Atividade agrikultura ne'ebé comunidade halo tenke orienta ba diversifikasaun produsaun; atu nune'e hasa'e produktu konsumu uma kain nian ho variedade hodi asegura nutrisaun.
6. Komunitade mak lidera hodi responde ba problema sira ho spesífiku, liuliu ba feto no labarik sira, nune'e solusaun sira tenke dezeña hamutuk, hodi respeita koñesimentu tradisionál (rai no uma kain) no rezolve vulnerabilidade spesífiku ne'ebé feto no labarik hasoru iha comunidade.

C. Familia

1. Pratika agrikultura familiár ne'ebé orienta ba hadi'a estilu konsumu uma kain nian liu husi iha balansu ba konsumu ai-han variedade, nutritivu no balansu, labele orienta ba dependénsia foos de'it.
2. Agikultór sira presiza preserva matenek lokál sira ne'ebe iha, no amigavel ba ambiente
3. Agrikulór sira nesseita iha treinamentu ba utilizasaun Pesticida, adubu sira tuir ninia porsaun ne'ebé lo'os, inklui rotasaun ai-horis, jestaun integradu ba peste, no halo adubu orgániku
4. Agrikulór sira presiza reserva rasik sira nian fini, halo purifikasaun fini, nune'e labele depende deit ba fini iha loja sira.

5. The family is the starting point for promoting gender equality by addressing patriarchal norms and building a more just and inclusive society. All family members should share responsibility for household chores, not only wives and girls. Women should also have an important role in decision-making within the household and society.
6. Invest in small-scale water infrastructure: build and rehabilitate community-level water collection systems, maintain small irrigation canals and install household rainwater tanks to capture rainwater during the rainy season for use in the dry season. Local skills can also be utilised, such as terracing to retain and filter water and establishing community-led water distribution systems to ensure equitable and sustainable access to water.



5. Familia hanesan fatin inísiu atu promove igualdade jéneru, liuhusi halakon sistema patriarkál hodi bele hare sosiedade foun ne'ebé justu. Asegura katak servisu doméstika ne'ebé responsavel membru família hotu, la'ós feen ho labarik feto de'it. No feto mós iha papél importante atu foti desizaun iha uma laran no sosiedade.
6. Investe iha infraestrutura bee ho eskala ki'ik: harii no rehabilita sistema sira kolleta bee nian iha nivel comunidade nian, verifika barrajen sira, barrajen ki'ik sira, no tanke udan-been uma-kain nian hodi kaptura udan been durante tempu udan nian hodi uza iha tempu maran. Bele uza mós matenek lokál sira hanesan terras serin sira hodi trava no halo filtraun ba bee, inklui asegura sistema fahe ne'ebé jere husi comunidade hodi garante distribuisaun bee ne'ebé ekitavel no sustentavel.





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