SKALA
Sinergi dan Kolaborasi untuk Akselerasi Layanan Dasar Kemitraan Australia – Indonesia

KEMENTERIAN KEUANGAN REPUBLIK INDONESIA

KEMENTERIAN DALAM NEGERI REPUBLIK INDONESIA

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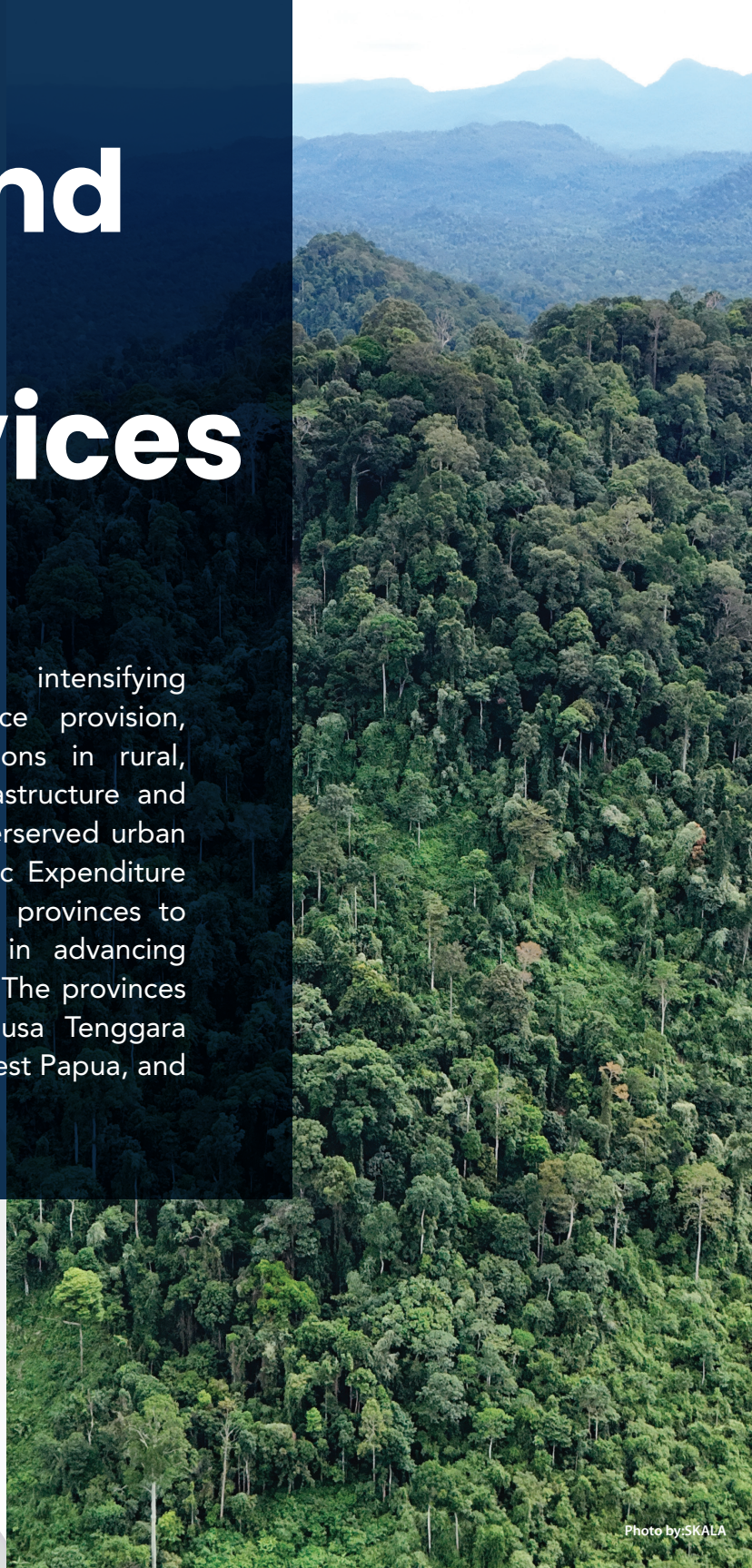
Australian Government

RESEARCH BRIEF

Climate Change and Impact on Basic Services

September 2025

Indonesia's climate vulnerabilities are intensifying long-standing disparities in basic service provision, especially affecting marginalised populations in rural, coastal, and remote areas with weak infrastructure and limited adaptive capacity, as well as in underserved urban settings. This brief draws on SKALA's Public Expenditure and Revenue Analysis (PERA) across eight provinces to support national and provincial partners in advancing climate-resilient and inclusive development. The provinces include Aceh, Gorontalo, Maluku, East Nusa Tenggara (NTT), West Nusa Tenggara (NTB), Papua, West Papua, and North Kalimantan.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Evidence from these provinces reveals three key insights that demand urgent attention:

- **Service access gaps are widest in climate-vulnerable districts.**

Regions exposed to recurrent floods, droughts, and coastal erosion, such as Papua, NTT and Aceh, report the lowest access to clean water, sanitation, health services, and transport infrastructure. Poor connectivity and limited local capacity further constrain service delivery, particularly for rural and remote populations.

- **Local economies remain dangerously exposed to environmental shocks.**

Most provinces continue to rely on agriculture, forestry, and fisheries, sectors highly sensitive to climate variability. Limited irrigation coverage, inadequate infrastructure, and slow adoption of practices leave these economies vulnerable and unprepared for future climate risks.

- **Climate risk is rarely integrated into local planning and budgeting.**

Although environmental challenges are often acknowledged in provincial strategies, few regions incorporate climate data into concrete investment decisions. Weak institutional mandates, fragmented information systems, and limited technical capacity hinder the use of climate analysis in service delivery and economic planning.

These findings point to the need for more practical, climate-aware local governance. Provincial and district governments need support to use climate and vulnerability data when planning services, guide local economic development in ways that can cope with future risks, and ensure that gender, disability, and social inclusion (GEDSI) are part of everyday decision-making.

To support this shift, SKALA recommends three strategic priorities:

1. Invest in climate-resilient basic services: prioritise underserved districts and integrate GEDSI needs into infrastructure and outreach systems.
This responds to the deep service access gaps in climate-vulnerable areas like Papua, NTT, and Gorontalo, where rural and coastal populations, especially women and people with disabilities, face persistent barriers to clean water, sanitation, health, and education.

2. Support local green economic transitions: embed sustainability into regional development strategies with policy and fiscal incentives.
To reduce dependence on climate-sensitive sectors such as agriculture and fisheries, provinces must promote diversification through coordinated planning, improved irrigation, and strategic initiatives like Maluku's National Fish Barn (LIN).

3. Mainstream climate and vulnerability data: institutionalise planning tools that incorporate risk, exposure, and GEDSI-disaggregated service data.
Climate risk is rarely integrated into planning or budgeting. Strengthening data systems and building local capacity will enable subnational governments to make more informed, inclusive, and adaptive investment decisions.

Why this matters now

As climate risks intensify across Indonesia, subnational governments are on the front line of protecting communities from widening service inequality and economic disruption. Rising temperatures, erratic rainfall, floods, drou ghts, and coastal erosion are already compounding existing disparities. This is particularly evident in remote, rural, and coastal areas where infrastructure is weak and populations are highly vulnerable. SKALA's collaboration with governments, communities, and non-governmental organisations reveals that environmental stressors are placing critical pressure on water access, sanitation, healthcare, education, and food systems. These stressors are also undermining local economies that remain heavily reliant on sectors highly exposed to environmental risks, such as rain-fed agriculture, fisheries, and natural resource extraction.

The role of local governments is pivotal. It is at the subnational level where services are planned, budgets are allocated, and community responses are delivered. Yet most districts lack the systems, data, and institutional capacity to assess climate risk, adapt service delivery, or guide structural economic change. Irrigation coverage remains limited, particularly in agriculture-dependent provinces, and adaptive farming systems are not yet widespread. Local plans rarely mention climate finance, and access to it remains very limited. Economic diversification is still modest, with limited movement away from climate-sensitive sectors. In Maluku, the National Fish Barn (LIN) illustrates early potential for marine-based

transformation. At the same time, in West Papua, manufacturing accounts for 39% of Gross Regional Domestic Product (GRDP), the highest among the eight provinces, suggesting an initial shift from extractive dependency. However, these transitions remain fragmented and underfunded.

Without deliberate, coordinated action, climate vulnerability will deepen exclusion, particularly for women, people with disabilities, and the rural poor, and jeopardise Indonesia's broader development goals. To build resilience, governments will need to use risk data in planning, make roles and responsibilities clearer, improve coordination across sectors, and provide practical support to encourage action. The provinces in this brief show some early progress, but they need more investment, better planning, and stronger skills to help services and local economies cope with climate change.

Climate risks deepen service inequality

Climate change is intensifying existing service gaps, especially in remote, disaster-prone, and underserved areas. Floods, droughts, erosion, and extreme weather are not only degrading the environment, but they are also undermining access to clean water, sanitation, healthcare, and education for Indonesia's most vulnerable groups. Women, people with disabilities, and under-resourced rural communities are hardest hit, especially in districts with weak infrastructure and low human capacity to adapt.


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Water and Sanitation

Access to sanitation remains lowest in areas under the greatest environmental pressure. In Papua, just 43% of households have access to sanitation, well below the national average of 90%. Access to clean drinking water is also uneven. While overall household access to improved water sources in North Kalimantan has reached 90.19%, and almost 100% in urban areas like Tarakan, it remains much lower in rural centres such as Malinau at only 73.54%. In coastal districts such as Aceh Barat and Aceh Singkil, flood and erosion damage water and sanitation facilities, exacerbating service disparities. These gaps heighten the risk of disease outbreaks, particularly in communities vulnerable to seasonal flooding and coastal erosion.

Health and Nutrition

Degraded environments are contributing to poor maternal and child health outcomes. In drought-prone NTT, stunting affects 38% of children under five, one of the highest rates in the country. Maternal mortality in Papua is deeply concerning, with 565 deaths per 100,000 live births, driven in part by inaccessible health posts and flood-damaged roads. The links between climate hazards and health vulnerabilities are increasingly evident, as food insecurity, displacement, and unsafe living conditions compound the risks to women and children.

Access and Connectivity

Poor infrastructure continues to isolate vulnerable communities from basic services. In Gorontalo, less than 50% of roads are in good condition, leaving rural areas difficult to access, especially during the rainy season. In NTB, inadequate digital infrastructure and poor road conditions, particularly in rural and island communities, hinder economic integration and productivity growth. These challenges inflate logistics costs, reduce competitiveness, and restrict access to markets, education, and health services, especially for women caregivers and children with disabilities.

Local economies need resilient transitions

Across the eight provinces where SKALA has collaborated, local economies remain heavily dependent on industries susceptible to climate impact, including agriculture, fisheries, and natural resource extraction. This dependence is increasingly unsustainable. Drought, floods, coastal erosion, and land degradation are already disrupting food systems, damaging infrastructure, and undermining rural incomes. Without structural economic transformation, provinces risk deepening vulnerability and missing opportunities for inclusive, sustainable growth

Agriculture Remains Exposed and Under-adapted

In Aceh, over one-third of households depend on agriculture, yet irrigation systems remain inadequate, with only 21% of farmland irrigated. Farming methods remain largely traditional, and recurring floods in Aceh Barat and Aceh Singkil routinely disrupt planting seasons. Agriculture, forestry, and fisheries contribute 27.7% to NTT's economy, with a significant portion of the workforce likely engaged in rain-fed agriculture and livestock. However, only 34% of villages have access to irrigation, leaving farming systems highly vulnerable to prolonged drought and shifting rainfall patterns. Similarly, in NTB, agriculture underpins livelihoods but faces mounting risks from drought and land degradation, with irrigation still underdeveloped and minimal uptake of climate-resilient techniques.

Emerging Transitions Are Still Limited in Scope

Several SKALA provinces have begun to test new economic zones, but progress remains limited and under-resourced. In NTB, the Mandalika Special Economic Zone (SEZ) is intended to anchor a tourism-driven diversification strategy, yet its

footprint is still modest relative to the province's agriculture- and mining-heavy economy. Aceh is banking on the Arun Lhokseumawe SEZ to attract downstream petrochemical and halal-processing investment, but take-up is slow and hampered by logistics bottlenecks. North Kalimantan is promoting the 30,000-hectare Indonesian Green Industrial Zone (KIHI) as a pathway beyond raw-mineral exports, though the initiative is still at a preparatory stage and faces sizeable infrastructure and financing gaps. Outside these areas, the reports show that most provincial economies still rely on commodities, with little evidence of regular climate risk screening or plans to support greener industries. The evidence thus points to early but fragmented diversification efforts that will require stronger coordination, financing, and resilience safeguards to gain real traction.

Access to climate finance remains limited across the eight provinces. Tools like the Fiscal Incentive Fund (DIF – Dana Insentif Fiskal) have been introduced, for example, in Aceh and West Papua, but these are often used in isolation and are not yet integrated into broader budget planning or structural reform.

Provincial Planning Must Now Shift to Long-term Resilience

To safeguard their economic base, subnational governments must address long-term adaptation in their planning. This means using climate and hazard data to guide investments, coordinating across sectors, and providing fiscal and regulatory incentives that support green innovation. Long-term economic change is important not only for environmental sustainability but also for reducing poverty, improving food and water security, and building resilient local economies that can withstand growing climate shocks.

Climate data still not integrated into planning

Subnational governments in Indonesia increasingly recognise the threat of climate change, but their planning systems remain poorly equipped to respond effectively. Across Aceh, NTT, and North Kalimantan, regional development plans acknowledge environmental hazards such as flooding, erosion, and drought. However, this awareness seldom translates into concrete adaptation strategies or prioritised investments. In many cases, climate considerations appear in vision statements or environmental annexes but fail to shape project selection, spatial targeting, or budget allocations. This lack of integration limits the ability of provincial governments to reduce climate risk or ensure that services reach the communities most exposed to environmental shocks.

Effective climate-informed governance depends on three key enablers: institutional mandates that require the use of climate data in decision-making, interoperable data systems that combine vulnerability and infrastructure information, and technical capacity to conduct and apply climate risk analysis. In the provinces reviewed, these enablers remain largely absent or fragmented. In Aceh, for instance, despite acknowledging escalating environmental degradation and climate vulnerabilities, the province faces a lack of a strong environmental governance framework and limited investment in renewable energy and ecosystem restoration, hindering concrete climate adaptation and disaster risk management in development planning. Similarly, in NTT, the province's high climate vulnerability, including its short four-month wet season, illustrates the urgent need for adaptive strategies. However, planning remains constrained by the absence of an integrated, real-time system that provides relevant data.

The problem is systemic. Provincial Mid-Term Development Plans and Regional Government Work Plans still fall short of ensuring climate logic, particularly the use of hazard maps, exposure models, and impact projections, is included in policy and budgeting processes. As SKALA's analysis indicates, climate budget tagging often reveals a disconnect between planned spending and real-world adaptation needs. In North Kalimantan, for instance, while planners understand the province's exposure to erosion and flooding, particularly in coastal and border areas, the absence of interoperable systems means data on infrastructure, population, and hazards are not used together to inform investment decisions. This disconnect not only undermines the impact of public spending but also widens service disparities in remote and climate-vulnerable communities. Provinces must treat climate data as a routine planning input backed by clearer roles, connected data systems, and technical support, avoiding repetition already made in the recommendation.


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Recommendations

Based on findings from the eight SKALA-supported PERA reports, the following recommendations are grounded in empirical evidence and reflect the urgent need for climate-responsive governance at the subnational level.

1. Invest in climate-resilient basic services: prioritise underserved districts and integrate GEDSI needs into infrastructure and outreach systems.
Across districts in provinces such as Papua, Gorontalo, NTT and NTB, access to clean water, sanitation, and health services remains challenging, particularly in remote and coastal districts. For example, in Papua, only 66.5% of households have access to safe drinking water and just 43% to sanitation services, with people with disabilities in rural areas averaging just 2.85 years of schooling. Floods, erosion, and geographic isolation further constrain access to services, especially for women and marginalised groups. Infrastructure planning and delivery must integrate climate adaptation and GEDSI considerations from the outset.

2. Support local green economic transitions: embed sustainability into regional development strategies with policy and fiscal incentives.
All eight provinces remain dependent on sectors vulnerable to climate change impacts, such as agriculture, fisheries, and forestry. In NTT, for example, only 33.8% of villages have access to irrigation infrastructure . Some provinces, such as Maluku, have introduced initiatives like the National Fish Barn (LIN) to diversify their economies, but these remain limited in scale and integration. Transition efforts require stronger alignment across planning, budgeting, and sectoral coordination.

3. Mainstream climate and vulnerability data: institutionalise planning tools that incorporate risk, exposure, and GEDSI-disaggregated service data.
SKALA's collaboration with governments, communities and NGOs across all eight provinces shows ongoing data fragmentation and limited coordination across sectors. Even when climate and disaster risk data exist, they are rarely used in Regional Apparatus Organisation Strategic Plans (Renstra OPD) or budget decisions. To address this, subnational governments need practical planning tools that integrate vulnerability data and track who is being reached. This includes building shared data systems that connect information across sectors and providing ongoing technical support so that local teams can use this information effectively.

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