Case Studies on Blended Finance and Sustainable Investing in Indonesia

Edited by
Caroline Flammer & Nnamdi Igbokwe

2026

COLUMBIA | SIPA
Sustainable Investing Research Initiative

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Foreword Financing our Shared Future: System Transformation in Indonesia

Caroline Flammer & Nnamdi Igbokwe

Sustainable Investing Research Initiative (SIRI)
Columbia University

SIRI and the Purpose of this Casebook

This casebook has been developed by the Sustainable Investing Research Initiative (SIRI) at Columbia University and released in conjunction with SIRI's high-level roundtable in Indonesia. As a field-building institution where rigorous scholarship meets market-making action, SIRI serves as the intellectual home of blended finance and sustainable investing, where practitioners and policymakers convene and engage in dialogue. SIRI also operates as a research platform dedicated to reshaping global perspectives. This casebook reflects that dual mandate. It is intended for a diverse audience of senior policymakers, investors, development finance institutions, philanthropies, and researchers, and is designed to inform both the roundtable discussion and the broader effort to build an evidence base that can guide action, shape markets, and support the evolution of financial and institutional design in emerging economies.

SIRI's mission is to foster cross-disciplinary scholarship, education, and dialogue on system-level investing, focusing on the interaction between investment practices and complex challenges facing the global system. Academic literature underscores the importance of this interaction and emphasizes design features such as credibility, additionality, and impact measurement to ensure that sustainable finance instruments achieve tangible outcomes.[1,2,3] In practice, fostering deeper dialogue and progress requires moving beyond basic deal descriptions towards more rigorous accounts of the entire investment picture. Case studies are an effective means to achieve these objectives.

Within SIRI's framework, however, the purpose of case studies is equally about building a stronger foundation for informed judgment as it is illustration. Beyond examining deal size, financial instruments, stakeholders, leverage ratios, and measured outcomes, SIRI case studies incorporate connective analysis that addresses questions such as whether catalytic capital is solving genuine market failures, whether public resources are allocated with discipline, and whether institutional conditions for scale are realistically attainable. Specifically, the case studies evaluate the progression of the markets and transactions, beginning with identi-

[1] Flammer, Caroline, "Corporate Green Bonds," Journal of Financial Economics (2021).
[2] Flammer, Caroline, Thomas Giroux, and Geoffrey Heal, "Biodiversity Finance," Journal of Financial Economics (2025).
[3] Flammer, Caroline, Thomas Giroux, and Geoffrey Heal, "Scaling Sustainable Investing in Emerging and Developing Economies: Frictions and Opportunities," NBER Working Paper (2026).

fying binding constraints and catalytic mechanisms implemented to address them, followed by an analysis of how governance and enabling conditions shape implementation, and concluding with insights into the broader trajectory of market development toward scale. These questions and themes structure this casebook.

Case studies are essential for building the evidence base for blended finance and sustainable investing, and the system-level perspective they can provide is a defining feature of the present volume. SIRI holds that additional analytical value is derived from understanding a more inclusive investment story. When a financing structure facilitates the transition of a market from a constrained present state to a more investable future state, the insights gained regarding the necessary conditions for replication and scale become vital and instructive. In that sense, public institutions, regulatory conditions, political economy, implementation capacity, technical assistance, and evidence generation are all equally part of the accounting that is integral to analysis. These factors inform not only the characteristics of the individual deal but also the broader state of the market and its potential trajectory.

This perspective also shapes SIRI's institutional role. SIRI positions blended finance as a foundational element that links rigorous scholarship with market-shaping action. By expanding the evidence base for practitioners and policymakers, convening cross-sector dialogue, disseminating best practices, and helping define improved impact measures, SIRI exemplifies the particularly important role Academia plays in bridging theory and practice. The SIRI Blended Finance Annual Conference and Roundtable Discussions at Columbia University contribute to this dialogue, while the development of case studies and related research underscores the institution's parallel and ongoing commitment to knowledge creation and dissemination.

The primary objective for SIRI is to identify the structures, institutions, and forms of evidence that can effectively guide capital flows toward more resilient, inclusive, and scalable models of sustainable development, particularly in the Global South. This casebook is offered as a research-based, practice-oriented contribution to the study and implementation of market-building through finance, examining how blended finance structures can be deployed as catalysts to address Indonesia's most pressing challenges across various sectors and across the capital stack.

Why Indonesia, Why Now

Indonesia occupies a position of systemic importance in both the global economy and the Earth system. Its development trajectory is system-defining, playing a pivotal role in shaping global pathways toward the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework, and the United Nations Sustainable Development Goals (SDGs).[4] As the world's fourth most populous country, the largest archipelagic state, and a G20 economy endowed with globally significant terrestrial and marine ecosystems, Indonesia sits at a critical nexus of economic development, environmental sustainability, and social inclusion. The country is central to the future of global decarbonization, biodiversity protection, food systems, coastal resilience, and inclusive growth across the Global South. Indonesia is, in this sense, more than a useful national case. It is a high-leverage setting in which broader questions of sustainable development, climate transition, and market formation become unusually visible.

From a systems perspective, Indonesia constitutes a high-leverage node within coupled human-natural systems. The country's ecological endowment, including vast tropical forests, carbon-dense peatlands, and extensive mangrove ecosystems, positions it as a central actor in regulating global carbon cycles and biodiversity dynamics. These ecosystems perform critical functions in carbon sequestration, climate stabilization, and habitat provision. Their degradation generates nonlinear feedback effects that propagate across spatial and temporal scales, amplifying climate risk and accelerating biodiversity loss.[5]

Environmental, economic, and social dimensions are deeply interdependent in Indonesia. They form a complex adaptive system characterized by feedback loops, nonlinearities, and emergent properties, in which interventions in one domain inevitably affect outcomes in others, often in unintended ways. Traditional approaches focused on isolated projects or sectors are insufficient to navigate these dynamics. What is required is a shift toward system-level strategies that explicitly account for interdependencies and aim to shift system equilibria.[6]

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[4] United Nations Development Programme, Human Development Report 2022 (New York: UNDP, 2022).

[5] Intergovernmental Panel on Climate Change, Climate Change 2022: Sixth Assessment Report (Geneva: IPCC, 2022).

[6] Schoenmaker, Dirk, and Willem Schramade, Principles of Sustainable Finance (Oxford: Oxford University Press, 2019).

Indonesia is also at a consequential moment in its financing trajectory. Public ambition is significant, financing needs are large, and the country has become a focal point for experimentation in sustainable finance, catalytic capital, and transition-related investment. Yet the path from ambition to execution remains uneven. Public resources are material but insufficient on their own. Private capital is necessary, but it does not move automatically into sectors and projects marked by policy uncertainty, fragmented pipelines, limited bankability, or weak institutional coordination. That gap makes Indonesia a particularly important setting in which to examine how sustainable finance is being organized, intermediated, and translated into investable activity.

Within this context, SIRI's high-level roundtable in Indonesia serves as a pivotal event in a broader market-building agenda. The roundtable provides a platform for policymakers, researchers, practitioners, development institutions, and private capital providers to engage in a shared discussion on the requirements for transitioning from isolated examples of sustainable finance to more coherent pathways for implementation and scale. The casebook examines critical questions, including how markets become investable, the interaction between catalytic structures and public institutions, and how country level ambition is shaped by the realities of risk, coordination, and execution. While these issues have clear implications beyond Indonesia, Indonesia offers a particularly clear lens through which to examine these dynamics, while the roundtable aims to translate them into actionable strategies. The timing of this casebook is deliberate. Indonesia's sustainable finance agenda has progressed sufficiently to provide meaningful institutional and transaction-level evidence, yet questions of design, coordination, and market formation remain unresolved. Given Indonesia's global significance, the country's capacity to balance economic growth with environmental stewardship, and social inclusion will have far-reaching implications for climate resilience, biodiversity preservation, and inclusive development worldwide.

Indonesia offers more than a contextual backdrop for the profiled cases. It provides a setting in which critical questions can be examined with clarity, including the visible gap between policy ambition and investable activity, the ongoing development of market-building architecture, and the critical choices about risk allocation, institutional design, and concessional capital that will influence outcomes both domestically and throughout the broader trajectory of sustainable finance in the Global South. The next section addresses this landscape directly by outlining the scale of the challenge, the architecture already in place, and the frictions

that continue to shape Indonesia's market-building trajectory.

Indonesia's Sustainable Finance Landscape

Indonesia's sustainable finance landscape is characterized by the interplay of scale, urgency, and institutional complexity. As a nation of continental significance in demographic, ecological, and economic dimensions, Indonesia's development path is shaped by persistent coordination challenges, heterogeneous market depth, and substantial financing requirements across infrastructure, energy, land use, food systems, and human development. Sustainable finance in Indonesia cannot, therefore, be understood as a narrow subset of financial activity. It is better understood as part of the broader architecture through which the country is attempting to reconcile growth, resilience, inclusion, and environmental stewardship over the long term.

Economically, Indonesia is undergoing a profound structural transformation. Rapid urbanization, industrialization, and integration into global value chains are reshaping production, consumption, and investment patterns. Infrastructure development spanning transport, energy, and digital systems has become a central driver of growth. At the same time, rising energy demand and continued reliance on fossil fuels raise the risk of carbon-intensive lock-in, with long-term implications for both economic competitiveness and environmental sustainability.[7] These shifts create major investment opportunities but also raise the stakes for how capital is allocated. The question is whether it will support a sustainable development trajectory compatible with long-run resilience, productivity, and ecological stability.

Indonesia's economic trajectory is marked by increasing integration into global capital markets and supply chains. While this integration creates opportunities for growth and development, it also exposes the economy to external shocks and volatility. It reinforces the importance of aligning domestic development strategies with global sustainability imperatives, particularly in sectors such as palm oil, mining, and fisheries, where Indonesia plays a pivotal role. In practice, the country's investment environment is increasingly shaped by both domestic policy choices and external pressures, including buyer standards, climate-related disclosure expectations, transition risk concerns, and shifting investor preferences regarding long-term risk.

[7] World Bank, Indonesia Country Environmental Analysis (Washington, DC: World Bank, 2021).

The sustainable finance landscape cannot be read through investment opportunities alone. It must also be understood in relation to the country's sustainable development challenge. The scale of climate, environmental, and social need is substantial and deeply intertwined with the structure of the economy itself. As the country-platform discussion later shows, national climate planning is already linked to large projected investment requirements, while public spending, though significant, falls short of the scale of transition and development needs. The central question is whether the institutional, financial, and market conditions exist to move these priorities toward bankability and implementation.

These pressures are intrinsically linked to Indonesia's ecological endowment, which is a core component of the financing landscape. Indonesia's forests rank among the largest remaining tropical forest systems globally, its peatlands store disproportionate amounts of carbon relative to their geographic footprint, and its mangroves provide coastal protection, support fisheries, and act as significant carbon sinks. Yet these systems are increasingly under pressure from agricultural expansion, extractive industries, and infrastructure development, pressures that interact through reinforcing feedback loops and carry consequences far beyond Indonesia itself.[8] Indonesia's environmental dynamics are best conceptualized as part of an integrated system in which land use, ecosystem management, and marine resource stewardship are shaped by broader political-economic structures, including global commodity supply chains, domestic governance arrangements, and financial incentives. These dynamics exhibit path dependence, whereby historical land-use decisions constrain future trajectories, and coordination failures, where individually rational actions produce collectively suboptimal outcomes.[9] Sustainable finance is, in this sense, entering sectors and systems already shaped by inherited institutional arrangements, fragmented value chains, inconsistent enforcement, and deeply embedded political-economic incentives.

The social and development context is equally important. Significant progress has been made in poverty reduction and human development over recent decades, yet disparities persist across regions, income groups, and genders. Financial inclusion remains limited, particularly among rural populations and small and medium-sized enterprises (SMEs). Gender gaps in access to finance, labor market participation, and entrepreneurship continue to constrain inclusive growth.[10] These

[8] Food and Agriculture Organization, Global Forest Resources Assessment 2020 (Rome: FAO, 2020).

[9] Austin, K. G., et al., "What Causes Deforestation in Indonesia?" Environmental Research Letters (2019).

[10] United Nations Development Programme, Human Development Report 2022.

patterns matter because many of the sectors most relevant to inclusive development, including agriculture, smallholder value chains, water, MSME finance, and regional infrastructure, are precisely the sectors in which financing is hardest to organize on standard commercial terms. The development challenge is closely linked to the financing challenge. This relationship broadens the definition of sustainable finance in Indonesia to include considerations of institutional quality, the extent of financial intermediation, and the nation's capacity to channel capital toward long term productive transformation.

The financial landscape reflects these broader pressures. Over the past decade, Indonesia has developed a more prominent sustainable finance agenda, with expanding policy attention to transition finance, climate budgeting, blended finance, and capital mobilization. Yet the landscape remains uneven in implementation. Public institutions are increasingly active, and development finance institutions play an important role, but private capital still encounters familiar frictions: projects are often too early, too fragmented, too weakly prepared, or too exposed to regulatory, currency, or implementation uncertainty to fit standard underwriting templates. In some sectors, the bottleneck lies in project preparation and bankability; in others, it lies in the absence of risk-sharing tools, insufficient data, weak traceability, or poor alignment between public priorities and financing channels. Capital may exist in principle while the pathways for deploying it effectively remain underdeveloped.

Indonesia's sustainable finance landscape is further influenced by a wider enabling environment that extends beyond financial markets. Regulatory consistency, public-sector credibility, bureaucratic coordination, and the predictability of implementation all influence the transition from commitment to execution. These conditions affect everything from project preparation and permitting to procurement, safeguard alignment, reporting standards, and the confidence with which domestic and international actors engage one another. Where those conditions are inconsistent, even well-designed financing structures may encounter delays, increased transaction costs, or difficulty achieving scale.

A macroeconomic perspective alone is insufficient. Sustainable finance initiatives are closely linked to fiscal space, state capacity, institutional continuity, and the overall credibility of development policy. Changes in these conditions can shape the willingness of investors and implementing institutions to commit over extended periods, often as much as the financing structure itself. The Indonesian

sustainable finance landscape is shaped by political and institutional factors as well as financial considerations. Public ambition matters, but so do ministry coordination, state capacity, institutional credibility, legal and reporting frameworks, and the ability of domestic actors to absorb, govern, and sequence catalytic resources. The following country-platform analysis demonstrates that the gap between national targets and actual financing is frequently determined by the design of institutions capable of preparing projects, allocating risk, matching capital to project stage, and managing the interaction among donor requirements, domestic policy, and commercial participation.

Blended finance has become an important financing structure for mobilizing private investment in sustainable development. It is conceptualized as a tool that reconfigures the risk-return profile in the architecture of a capital stack.[11,12] By strategically deploying concessional capital, blended finance can address market failures, mitigate risks, and catalyze private capital investment. However, despite growing momentum, the scale of blended finance remains modest relative to the vast funding needs of sustainable development and climate finance. Recent studies indicate that the blended finance market has mobilized approximately $260 billion cumulatively across roughly 1,478 transactions, with annual climate blended finance flows reaching $15.5 billion in 2024, the second-highest total on record, reflecting sustained momentum and a meaningful increase in average transaction size over the prior decade.[13] This aggregate represents a fraction of what is required. Estimates to close the SDG financing gap in emerging and developing economies require trillions of dollars annually, yet blended finance currently mobilizes only a small share of that need.[14] Geographically, the blended finance market remains concentrated. Sub-Saharan Africa has historically attracted the largest share of activity, while East Asia and the Pacific have seen accelerating flows in recent years. Southeast Asia in particular remains significantly under-penetrated relative to its share of global development needs. A persistent structural constraint across all regions is the limited participation of local and domestic capital, which

[11] OECD, Global Outlook on Financing for Sustainable Development 2021 (Paris: OECD, 2021).
[12] Flammer, Caroline, Thomas Giroux, and Geoffrey Heal, "Blended Finance," NBER Working Paper (2025).
[13] Convergence, State of Climate Blended Finance 2025 (Toronto: Convergence, 2025).
[14] OECD, Global Outlook on Financing for Sustainable Development 2023: No Sustainability Without Finance (Paris: OECD, 2023).

represents less than a fifth of total blended finance flows globally. This gap is especially acute in emerging and developing economies where domestic financial systems are still developing the capacity, regulatory frameworks, and risk appetite to engage at scale.[15]

Indonesia occupies a notable but underserved position within the global blended finance landscape. Historically, the country has accounted for over 40 percent of Southeast Asian blended finance transaction activity by volume and nearly half by value, consistently ranking among the leading global destinations for blended finance. The sectoral concentration of this activity is revealing. Studies show that the largest share of blended finance transactions in Indonesia has been directed toward renewable energy, followed by agroforestry, energy efficiency and emissions reduction, and nature-based solutions.[16] Yet the capital structure supporting this activity reflects a market still in its early stages of development. Public sector investors lead climate blended finance in Indonesia by a wide margin, with development agencies and multilateral donor funds comprising the dominant share of capital commitments. Commercial banks have been considerably less active in blended structures than multilateral and national development finance institutions. Only a small fraction of investments from domestic private sector financial institutions are climate-aligned, and local financial institutions continue to allocate more capital to domestic fossil fuel industries than to climate-related opportunities. Domestic capital mobilization into blended and climate-aligned structures remains one of the most significant and unresolved challenges in Indonesia's sustainable finance path.

The magnitude of the financing challenge underscores why these structural gaps matter. Studies estimate that Indonesia requires tens of billions of dollars annually to meet its 2030 climate targets, yet public resources cover only a fraction of that need, and even the country's landmark transition finance commitment, the largest of its kind among emerging economies at the time of its launch, leaves the majority of the power sector investment requirement unfunded.[17] Against this backdrop, Indonesia has assembled a more deliberate institutional architecture than most peers. A national development finance institution manages the coun-

[15] Convergence, State of Blended Finance 2025 Spring Edition (Toronto: Convergence, 2025).
[16] Convergence, State of Blended Finance 2024: Climate Edition (Toronto: Convergence, 2024).
[17] Convergence, State of Blended Finance 2024: Climate Edition (Toronto: Convergence, 2024); Climate Policy Initiative, Climate-Aligned Investments in Indonesia's Financial Sector (San Francisco: CPI, 2024).

try's integrated blended finance platform and its energy transition country mechanism. The financial regulator has advanced two phases of a sustainable finance roadmap and introduced a national taxonomy for sustainable finance. Indonesia co-launched an international blended finance framework with the OECD in 2018, signaling its intent to deploy blended finance as a structural approach to development finance rather than a project-level instrument.[18] The question this casebook takes up is whether that architecture is sufficient to move capital from commitment to execution at the scale demanded by the country's sustainable development direction.

Indonesia provides a compelling testbed for these approaches. Its priority sectors, including sustainable land use, energy transition, infrastructure, oceans, and human capital, are characterized by both systemic importance and persistent underinvestment. Unlocking capital flows in these sectors requires financial innovation alongside enabling policy environments, institutional capacity, and cross-sector collaboration. For policymakers, this means creating regulatory frameworks that reduce uncertainty, strengthen governance, and deploy public resources strategically to attract private investment. For investors, it requires new approaches to risk assessment and portfolio construction that incorporate system-level considerations and long-term value creation. For researchers, it calls for interdisciplinary work that bridges finance, economics, environmental science, and systems theory. That is the backdrop against which this casebook is organized. The analysis that follows first turns to the country-level financial architecture, examining how Indonesia is attempting to structure coordination, project preparation, and access to finance at scale, before moving to six case studies that examine how different catalytic and blended structures operate within the broader market-building landscape outlined here.

Reading the Chapters That Follow

The subsequent chapters are structured as a sequential progression. Each layer--national financing architecture, institutional bridge, and transaction and firm-level cases—contributes a distinct register of evidence, with the analytical value of each enhanced by the preceding analysis. The opening chapter examines Indonesia's country-level financing architecture through SDG Indonesia One and

[18] Convergence, "Indonesia — A Hub for Blended Finance in the Asia-Pacific" (Toronto: Convergence, 2020); OECD, Blended Finance and the Tri Hita Karana Roadmap (Paris: OECD, 2018).

JETP. Its purpose is to clarify the organization of catalytic and blended finance at the national level, the curation and preparation of project pipelines, and the distribution of risk-sharing and coordination functions among public institutions, development partners, and external financiers. This discussion establishes the institutional bridge into the transactions profiled in the subsequent case studies.

The six cases that follow are organized by the specific market-building challenge they address and the role of catalytic capital in each context. The sequence traces a progression from the most legible institutional form of risk sharing, characterized by public frameworks and state-backed instruments, to more complex, frontier, and data-dependent approaches to creating investability. Each case introduces analytical tools and conceptual distinctions that inform the analysis of the subsequent cases. The observation that emerges is that blended finance comprises a set of functions whose design, sequencing, and institutional context determine whether capital moves markets or merely moves through them.

The first case examines blended finance in urban water infrastructure, a sector where public service obligations, politically constrained tariffs, and limited utility balance sheets have historically impeded private capital entry. The West Semarang example demonstrates how state-backed guarantees, viability gap support, and project preparation can together create a bankable segment within an otherwise non-commercial service system. This case reveals the conditions under which Indonesia's fiscal instruments and PPP framework can operate effectively and in tandem.

Following the discussion of infrastructure bankability, the casebook addresses lender-channel formation. FP196 uses a Green Climate Fund-supported partial credit guarantee to address a persistent demand-side problem where lenders treat energy efficiency financing as unfamiliar territory, despite the economic viability of the underlying measures. The case examines whether a guarantee mechanism, paired with technical assistance, can establish the underwriting practices and documentation standards needed for replication, thereby shifting the focus from whether a deal closes to whether a market learns.

The subsequent case compares two blended finance architectures that address the persistent mispricing of credit for women-led micro, small, and medium enterprises (MSMEs), demonstrating that they perform fundamentally different market functions. One approach employs catalytic capital to render underserved interme-

diaries investable for the first time, while the other leverages layered risk to attract institutional investors to an existing market at scale. This comparison clarifies a central distinction throughout the casebook: the function of concessional capital and its appropriate stage within market development.

The next case examines a 2018 sustainability bond for rubber concessions and a 2023 private credit fund targeting the financing gap among climate-smart land-use enterprises, presenting them as successive stages in an evolving financing strategy. The comparison reveals that blended finance architecture must adapt when frontier transactions face persistent challenges in borrower readiness, verification, and governance. It also demonstrates that the transition from demonstration to scale is neither automatic nor linear.

The following case examines the compound investment challenges in the coconut sugar sector. Issues like fragmented sourcing, inconsistent quality, inadequate traceability, and restricted access to patient capital collectively prevent robust export demand from translating into an investable business model. Layered risk capital and technical assistance are directed toward a company already working to internalize certification and supply-chain discipline across a widely dispersed smallholder network. The case investigates the conditions under which blended finance can enhance investability in nature-based agriculture and identifies the evidentiary limitations that constrain definitive conclusions.

The final case examines a sector where biological risk, fragmented farm-level data, and weak traceability have made commercial underwriting persistently difficult. JALA, a technology-enabled aquaculture platform, employs data infrastructure, including farm monitoring, disease diagnostics, and traceability systems, to perform much of the analytical work typically undertaken by concessional capital. This approach reduces underwriting uncertainty and broadens the range of financeable opportunities. The case raises an open question about the frontier of market-building, asking how far data systems, platform models, and catalytic capital can together shift the conditions for investability on a structural rather than transactional basis.

The cases do not resolve the market-building question; they define it more precisely. Each case reveals a different constraint, a different function for catalytic capital, and a different threshold of evidence. What they share is a common inquiry: under what conditions does structured finance shift the trajectory of a market, and what

remains unresolved even where financing is mobilized? The cases are intended for comparative analysis, emphasizing the quality of evidence, the specificity of the constraint being addressed, the role of public and concessional resources, and the extent to which each structure supports broader market scaling.

The casebook concludes with recommendations and revisits these cross-cutting questions, drawing insights across the cases for policymakers, practitioners, and researchers concerned with how sustainable finance can support implementation, institutional development, and market formation in Indonesia and beyond. The overarching objective is to foster a more rigorous and practically grounded discourse on financial and institutional designs that can shift sustainable finance from isolated transactions to more durable market formation.

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Indonesia's Market-Building Financial Architecture: SDG Indonesia One and JETP

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Abstract

This chapter examines Indonesia's efforts to operationalize blended finance at the national level through two distinct institutional arrangements: SDG Indonesia One (SIO), considered here as a country platform, and the Just Energy Transition Partnership (JETP), regarded as a financing facility. The analysis prioritizes institutional design and implementation over headline commitments, focusing on how projects are prepared, how risk is allocated, how public and concessional resources are coordinated, and where decision-making authority sits across domestic and international stakeholders.

SIO is analyzed as a nationally anchored platform under PT Sarana Multi Infrastruktur that integrates project preparation, de-risking, financing, and capital coordination within a standardized framework. In contrast, JETP Indonesia is characterized as a facility focused more on pathway coordination, pipeline development, and aligning projects with potential financiers within a fragmented international financing landscape, rather than on direct transaction structuring. Indonesia's experience reveals both the potential and the limitations of country-level blended-finance architecture. Institutional anchoring, pipeline discipline, and public-sector coordination can facilitate the transition from policy ambition to implementation. However, donor fragmentation, inconsistent reporting standards, implementation challenges, and unclear distinctions between catalytic and commercial finance remain significant constraints. As a bridge to the six transaction-level case studies that follow, the chapter clarifies the national institutional environment within which different catalytic structures and market-building functions subsequently operate.

Background and Framing

SDG Indonesia One is considered a country platform because it combines project preparation and multiple financing windows within a repeatable structure anchored in PT SMI, a national development-finance institution. This characterization is consistent with public descriptions of SIO as an integrated blended-finance platform spanning project development, de-risking, commercial financing, and equity participation. In contrast, JETP Indonesia is more accurately described as a financing facility. It aligns an international financing ecosystem with Indonesian power-sector priorities and helps curate and channel a project pipeline, but it does not operate as a pooled domestic investment platform with centralized deal-structuring authority. This distinction is significant because the two arrangements perform different institutional functions, and comparing them clarifies the specific operational roles each arrangement performs in practice.

A second distinction is important for the framing of this chapter. In more conventional usage, blended finance usually refers to a capital structure in which concessional or catalytic resources are combined with commercial capital to reshape risk-return conditions for a specific deal or portfolio. While program-level arrangements may still intersect with blended finance, they do not function in the same manner. For example, some projects under a JETP model may be financed entirely on commercial terms, while concessional resources are reserved for areas that remain difficult to finance or for other transition bottlenecks. JETP therefore should be understood as a country-level coordination and financing framework that may enable or channel blended finance in certain areas, rather than as blended finance in the transaction-level sense described in many of the subsequent case studies.
The chapter draws on public documentation, platform materials, and semi-structured interviews with actors involved in the design and implementation of both arrangements. Its focus is not headline commitments alone, but institutional mechanics: how projects are identified and prepared, how risks are allocated and mitigated, how public and concessional resources are deployed, and how coordination across ministries, development partners, and private financiers is structured. Reading SIO and JETP side by side clarifies the trade-offs between a nationally anchored platform with greater capacity to shape transactions directly and a more externally coordinated facility geared toward planning, prioritization, and access to finance. Neither resolves the financing challenge on its own, and neither should be treated as evidence of market-building success simply because it operates at national scale.

Indonesia's experience is analytically significant as it demonstrates how national level architecture can either facilitate or constrain the progression from policy ambition to implementation. This context also establishes the institutional foundation for subsequent transaction level cases, which analyze the operation of various catalytic structures across sectors and instruments within an environment influenced by public coordination, pipeline quality, de-risking tools, and state capacity.

SDG Indonesia One as a Country Platform

Origin and institutional anchoring

SDG Indonesia One (SIO) was launched by PT Sarana Multi Infrastruktur (PT SMI) in 2018 under a mandate from the Ministry of Finance. Its viability rests on two foundational features. First, it is anchored in PT SMI, a national development finance institution with established project-finance and implementation capacity. Second, it benefits from the Ministry of Finance's role as institutional anchor, which appears to have strengthened partner confidence and broadened participation. Notably, the platform emerged before the term "country platform" became common in Indonesia's policy landscape. Its original conceptual basis was rooted in blended-finance principles, including mobilizing catalytic capital to reduce risks, enhance feasibility and bankability, and accelerate private-sector participation. Public descriptions of SIO broadly support that framing, presenting it as an integrated platform that combines project development, de-risking, commercial finance, and equity participation across sustainable infrastructure sectors.

Interview evidence places SIO within a broader Indonesian pattern of learning-by-doing across three governance models, each shaped by how public resources enter the system. In the SIO model itself, PT SMI manages a platform with limited direct state-budget exposure. Donor contributions carry supervisory and reporting obligations, but donors do not participate in project selection or investment decision-making, which remain within PT SMI's authority. Grant resources used for de-risking are treated differently from repayable state capital because they are intended to absorb losses or mitigation costs in support of feasibility and bankability.

A second model appears in geothermal exploration support, where APBN-backed resources are administered through committee-based decision-making. In that arrangement, the Ministry of Finance and the Ministry of Energy and Mineral

Resources jointly select eligible projects, with approximately IDR 3 trillion administered by PT SMI as a dedicated geothermal fund. A third model appears in the Energy Transition Mechanism (ETM), where PT SMI acts under ministerial assignment and governance varies by activity: early retirement decisions require steering-committee involvement, while some renewable-energy support measures may move through lighter reporting channels. The three models suggest a governance spectrum. Where APBN resources are directly involved, procedural layers increase and risk-taking becomes more constrained. Where catalytic capital is donor-heavy, execution appears faster, while donors remain in supervisory rather than project-selection roles.

How the Platform Works

SIO is organized around a sequence that links project preparation, de-risking, financing, and eventual equity participation under a single institutional anchor. Public materials describe four main components: Development Facilities, De-Risking Facilities, Financing Facilities, and an Equity Fund. Different capital types are matched to different stages of the project cycle, with donors and impact-oriented actors providing grants and technical assistance, development banks and climate funds supplying concessional loans and grants, commercial financiers providing debt and capital-market instruments, and developers contributing equity.
Pipeline formation appears to draw on two channels. One is bottom-up, through PT SMI's engagement with private developers and sectoral stakeholders. The other is top-down, through projects aligned with national strategic priorities and then screened by sponsor type. The platform's internal discipline is described through a three-gate sequence covering feasibility, bankability, and impact or externality management. At the feasibility stage, catalytic grants or technical assistance can be used to close documentation and readiness gaps. At the bankability stage, PT SMI models project viability, including around DSCR and cost of capital, and may deploy concessional support where commercial finance would not proceed on its own. At the third gate, grants may be used to address local externalities or unresolved social and environmental risks that threaten project continuity.

The three-gate structure offers the chapter's most precise working definition of additionality at the platform level. SIO is characterized as an institutional arrangement intended to allocate catalytic support selectively, thereby maintaining commercial discipline while enabling a broader range of projects to approach financial close. Publicly available evidence provides greater insight into the platform's intervention design than into the consistent realization of commercial disci-

pline across the portfolio.

Illustrative Deployment and Risk Management

As of December 2025, SIO reports total "commitment" of USD 3.19 billion, "agreement" of USD 821 million, and "realization" of USD 431 million, alongside 39 partners and 118 projects. It also reports a 5.9x "multiplier effect" from every USD 1 of SIO funding toward total project cost. These figures are more useful as platform-reported activity and leverage indicators than as stand-alone proof of realized additionality.

Two project illustrations help clarify how the platform appears to intervene. In the Titab Minihydro Power Plant, a blended structure combining a 65% loan share, 20% sponsor equity, and a 15% investment grant was used to finance a small renewable-energy project with total cost of IDR 24.68 billion. The grant appears to have functioned as a temporary equity substitute, reimbursing pre-construction expenditures such as feasibility studies, environmental approvals, and land preparation that would otherwise have pushed sponsor-equity requirements beyond feasible thresholds. In the Gresik Drinking Water System, syndicated loans combined with donor-financed technical assistance supported a much larger IDR 600 billion project. Read together, the examples suggest that SIO is not confined to one sector or one instrument. More importantly, they show how platform-level capital can be used to address either bankability gaps or upstream preparation constraints.

Risk management in the platform is not limited to financial structuring. The chapter materials describe environmental and social safeguards as part of project-finance risk management, with due diligence, site visits, assessment reports, and structured mitigation planning playing a role similar to that used in multilateral development-bank practice. The examples are analytically useful. In Bengkulu, biodiversity risk mattered because the presence of critically endangered Sumatran tigers near a mini-hydro site could trigger delays, regulatory intervention, safety concerns, and operational disruption. In geothermal projects, unresolved community resistance could interrupt timelines, raise costs, and undermine long-term viability. In both cases, the analytic point is the same: environmental and social risks are treated as part of the project's financing problem, not as a separate compliance afterthought.

Constraints and Institutional Evolution

Operational constraints in SIO become most evident when donor resources transition from design to execution. Heterogeneous reporting requirements among partners increase administrative burden and limit scalability, particularly when indicators, disclosure requirements, and verification standards are not harmonized. Additional tension arises when donor safeguards surpass national regulatory requirements. For example, in the Sumbawa solar project, a corrective action plan may enable compliance with Indonesian environmental standards, yet still fail to meet more stringent donor thresholds. This discrepancy can affect project eligibility, delay financing, or restrict the pool of potential capital partners. While selective partner matching has been reported as a response, the broader issue is structural. The effectiveness of country platforms depends not only on access to catalytic capital, but also on the ability to deploy that capital under reporting and safeguard conditions that do not introduce new bottlenecks.

The chapter materials indicate that SIO may transition toward a trust-fund structure under Indonesia's UU P2SK framework. This potential shift is driven by institutional considerations, including tax leakage when grants remain on PT SMI's balance sheet, balance-sheet sensitivity arising from de-risking funds that generate non-performing-loan exposure before donor capital is recognized as loss-absorbing, and ongoing reporting fragmentation among partners. Consequently, the trust-fund concept should be viewed as a response to operational frictions already evident within the platform, rather than as a definitive endpoint. This perspective underscores the chapter's broader point, that scaling country-level blended-finance architecture relies as much on legal, accounting, and reporting frameworks as on the availability of catalytic capital.

JETP Indonesia as a Financing Facility

Mandates, Targets, and Facility Logic

JETP Indonesia was launched on 16 November 2022 through the G20 Joint Statement in Bali, with an initial commitment of USD 20 billion, split between USD 10 billion in IPG funding and USD 10 billion in expected private financing from the GFANZ working group. The Joint Statement set conditional targets for 2030 power-sector emissions, renewable generation, and net-zero power by 2050. The CIPP later introduced an important qualification: its technical modeling suggested that those conditional targets could be difficult to achieve under existing captive-coal plans and therefore proposed a different on-grid pathway, with a 2030 emissions target of

no more than 250 Mt CO_2 and a renewable share of 44%. That divergence matters because it shows that JETP is doing more than announcing finance. It is also functioning as a planning and coordination process that translates political ambition into more specific pathways, assumptions, and investment priorities.

The governing documents further emphasize that the plan is a strategic framework rather than a legally binding instrument. That point is central to the chapter's classification. JETP derives authority primarily from coordination, planning, and alignment rather than from statutory control, pooled domestic capital, or a centralized investment mandate. On that basis, it is better understood here as a financing facility, or coordinated financing framework, than as a country platform in the SIO sense.

The scale of the transition need reinforces that designation. Achieving the on-grid pathway across the five designated Investment Focus Areas (IFAs) is projected to require at least USD 97.1 billion between 2023 and 2030 and USD 580.3 billion through 2050, excluding the full cost of just-transition assessments and interventions. On its own terms, the initial USD 20 billion commitment covers only a portion of projected 2030 needs and is best read as catalytic support rather than full financing. The pipeline data point in the same direction. From roughly 1,000 project proposals mapped across the IFAs, more than 400 were designated priority initiatives, and a subset of nearly 50 was identified as top priority. What those figures show most clearly is curation and sequencing, not financing at equivalent scale.

JETP acts more as a matchmaker than a structurer. Recognition and funding are separate processes. The facility tracks both the recognized portfolio and the subset advancing to financier approvals, while financing terms are negotiated bilaterally and remain outside the Secretariat's control. Direct private funding goes to developers, while indirect public flows typically flow through DFIs, MDBs, PT SMI, or selected international organizations. This separation between recognition and financing is one of the clearest reasons to view JETP as a facility rather than a platform: it can assemble, rank, and present opportunities, but it does not negotiate terms. The structure also creates an expectation-management problem, since large headline figures can imply a degree of pooling or funding certainty that the underlying architecture does not necessarily provide.

These limitations are not incidental. External assessments place JETPs between transaction-level blended finance and broader forms of political and financial coordination. In practice, some JETP projects proceed on commercial terms, while concessional support focuses on parts of the transition that remain difficult to finance, such as coal retirement, grid expansion, and other system needs. Several recurring frictions prove directly relevant: donor mandates and conditions often remain misaligned, the terms and location of concessional resources are difficult to trace, headline pledges are not fully pooled or fungible, and the project pipeline is thinner than the stated ambition. However, these features do not reduce JETP's analytical significance. Much of its value lies in political signaling and agenda coordination. Even with a fragmented financing structure, JETP's can shape transition priorities, highlight pipeline needs, and encourage institutional alignment that isolated transactions would not achieve. Overall, JETP's main strengths are in coordination, prioritization, and pathway management, rather than serving as a traditional blended-finance vehicle at the transaction level.

Governance Evolution and Domestic Embedding

JETP's governance arrangements also evolved as Indonesia's domestic institutional landscape changed. It was initially meant to coordinate with the National Energy Transition Task Force under the Coordinating Ministry of Maritime & Investment Affairs, a setup that gave the initiative high-level political visibility and ministerial backing. After the 2024 change of administration, however, that ministry was dissolved and its functions redistributed. For a period, JETP lacked a clear domestic host. The subsequent establishment of the Satgas Transisi Energi dan Ekonomi Hijau (TEH), led by the Coordinating Ministry of Economic Affairs, reintroduced a domestic coordinating structure and appears to have shifted the Secretariat toward a more implementation-oriented support role.

The establishment of the Indonesia Energy Transition Implementation Joint Office (IET) in 2024 pushed that evolution further. The Joint Office functions as a domestic coordination hub responsible for policy analysis, action planning, project identification, and alignment across ministries and state-owned enterprises. The analytic significance is straightforward: some of the coordination burden appears to be moving from a largely external or facilitative architecture into domestic bureaucratic structures where cross-ministerial bottlenecks can be negotiated more directly.

MRV and the Institutional Limits

Unlike SDG Indonesia One, whose monitoring burden is shaped by partner-specific reporting and transaction-level due diligence, JETP documentation describes a system-level M&E architecture. The updated 2025 framework is intended to align with national monitoring systems, including an SDG dashboard and an electricity-sector platform, while also tracking technical, financial, policy, and just-transition indicators through the JETP monitoring platform.

Available evidence suggests that a monitoring framework is in place, but it remains under construction in practice, and commercial confidentiality limits the disclosure of pricing and business-model details even where aggregate funding can be reported. JETP's MRV ambition is therefore real, but the current depth of project-level transparency, comparability, and independent verification remains limited.

Comparative Insights: Platform vs Facility

Additionality: transaction-level engineering versus portfolio-level catalysis

SDG Indonesia One's country platform design enables transaction-level engineering of additionality. The Titab mini-hydro example shows the logic clearly: a grant fills an equity gap in a small renewable project and is linked to bankability thresholds such as DSCR. In the SIO setting, additionality is most legible at project level, where catalytic support is used to move a specific project from technical viability toward financial viability.

JETP, by contrast, presents additionality at a broader pathway scale. The initial USD 20 billion commitment is framed as catalytic support relative to a much larger transition requirement, while the facility's core role is to coordinate priorities, signal pipeline needs, and improve alignment between projects and potential financiers. It is less about transaction-specific financial engineering and more about whether a coordinated framework can help direct capital toward a defined transition pathway. That broader framing also places limits on what can be considered as additionality. In JETP's case, the clearest evidence is on coordination, planning discipline, and priority-setting, rather than attributable blended-finance mobilization in the transaction-level sense. External critiques are more cautious still. It remains difficult to determine whether JETPs, as presently structured, mobilize public and private capital more effectively than other forms of country-level coordination, especially where donor mandates diverge and some commercially viable projects may have proceeded without concessional support.

Inclusion: multi-sector SDGs and smaller projects versus power-sector scale

SDG Indonesia One is explicitly multi-sector in both the OECD summary and the platform profile, spanning renewable energy, clean water and sanitation, and other SDG-linked infrastructure. That breadth allows the platform to accommodate projects and sectors that fall outside a narrow power-transition frame, including smaller or more mixed-use infrastructure needs.

JETP, conversely, is designed around the power sector pathway and its interdependencies. Even as the facility expands IFAs, including, energy efficiency and electrification, supply chain, and repurposing, it remains structured around energy transition priorities and large investment needs, as evidenced by the pipeline composition of the JETP's CIPP & Progress Report documents. Its inclusion logic is therefore narrower and more strategic. The relevant question is whether projects fit within the power-sector transition pathway and its attached priorities. That focus gives JETP greater strategic concentration, though it can also narrow the range of projects and actors that fall within scope.

MRV: donor-driven reporting complexity versus integrated meta-monitoring ambition

SDG Indonesia One's MRV is shaped by multiple donors and partners, a structure that can increase both credibility and transaction costs. JETP's desk sources document an explicit meta-monitoring architecture intended to integrate technical, financial, policy, and just transition indicators with national systems. The contrast is less about differences in strength than about where the friction sits. In SIO, the burden comes from donor-by-donor reporting and verification demands. In JETP, the ambition lies in system-level integration, with public comparability and depth of disclosure continuing to evolve. The presence of a monitoring framework on paper does not automatically yield transparent, project-level evidence in practice.

Conclusion

The comparison between SDG Indonesia One and JETP helps clarify how Indonesia is trying to operationalize country-level financing architecture for climate and development. The comparison highlights that alongside the volume of capital pledged, institutional form plays an important role in shaping project preparation, risk allocation, coordination, and the kinds of financing challenges that can

effectively be addressed.

The analysis suggests that country platforms and financing facilities serve different institutional functions. SDG Indonesia One intervenes more directly in project formation and bankability constraints, integrating project preparation, de-risking, concessional finance, and equity participation within a single institutional anchor. Its three-gate assessment system, spanning feasibility, bankability, and impact, provides a clear example of transaction-level additionality as an institutional discipline rather than a proven causal outcome. JETP, by contrast, operates at a broader systemic level. Its value lies less in direct transaction structuring than in coordination, prioritization, and pathway alignment, with recent governance changes indicating that some of those functions are becoming more embedded in domestic bureaucratic structures. The comparison therefore shows that institutional design shapes which market failures can be addressed, at what scale, and with what degree of direct control over project outcomes. SIO is more effective in addressing project-cycle frictions, whereas the JETP model is better suited to pathway coordination and large-scale transition planning. However, neither model is sufficient independently; each should be evaluated against the specific institutional function it is designed to perform. Their value depends on whether institutional form matches the financing and coordination problem at hand.

Collectively, the two structures also illuminate different points in Indonesia's market-building trajectory. SIO shows how a domestic platform can intervene upstream through project preparation, selective de-risking, and the conversion of policy priorities into more financeable propositions. JETP shows how coordination at country level can help organize transition priorities, curate pipeline, and signal where larger pools of capital may be needed, even when financing terms, donor conditions, and execution pathways remain fragmented. At the transaction level, structures exist in an environment where the upstream institutional architecture is becoming more deliberate, while many of the frictions that shape actual deal execution remain unresolved.

The six subsequent case studies should therefore be read as transaction-level expressions of the institutional picture outlined here. Some show what becomes possible when upstream project preparation, selective de-risking, and public coordination are sufficiently developed to move projects toward financeability. Others show where transaction structures still have to compensate for unresolved bottlenecks, including fragmented pipeline, uneven risk allocation, reporting burdens,

and limited financing coherence across actors. Viewed in that way, the cases do more than illustrate sectoral variety. They test how far Indonesia's broader market-building architecture is translating into executable blended-finance structures on the ground.

Indonesia's experience offers key lessons for emerging economies seeking to scale blended finance. Strong credible domestic institutions are essential, as they manage donor resources, safeguards, and coordination more effectively than less structured approaches. Persistent challenges include harmonizing reporting and safeguards, particularly when donor requirements complicate implementation. Managing expectations matters as well, since international commitments can be misread as full financing rather than catalytic support. The chapter further highlights that iterative institutional learning, evident in Indonesia's experimentation across governance models, is a central part of long-term system performance.

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Blended Finance and Public-Private Partnerships in Indonesia's Urban Water Sector

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Abstract

This case examines the West Semarang Water Supply System as a blended finance model implemented through a public-private partnership in Indonesia's urban water sector. The project addressed challenges such as limited local utility financing, politically restricted tariffs, rising demand for piped water, and growing environmental pressures from groundwater extraction, land subsidence, and flood risk. The analysis shows the project achieved financial viability by creating a bankable bulk-water segment within the public service system and combining private participation with multiple forms of public support, including Viability Gap Fund assistance, upstream public works, land acquisition, project preparation, and a sovereign-backed guarantee.

The analysis identifies stronger evidence of financial and institutional additionality than of fully demonstrated long-term development outcomes. Reported financial indicators show a return profile consistent with the project's revised structure. However, issues such as groundwater substitution, subsidence reduction, and resilience remain only partially verified within the current monitoring framework. West Semarang thus serves as a disciplined prototype, illustrating the conditions under which Indonesia's fiscal instruments, PPP framework, and local utility institutions can be integrated to mobilize private capital into climate-relevant urban water infrastructure.

Case Summary

	West Semarang Summary (Indonesia Urban Water PPP)
1. Case Theme	Blended finance for climate-relevant urban water infrastructure through a bulk-water PPP in Indonesia
2. Blended Finance Archetype	Availability-based bulk-water PPP with layered public fiscal support, public works co-financing, and sovereign-backed risk mitigation
3. Primary Catalytic Instrument	Viability Gap Fund support combined with upstream public capex, project-preparation support, and an infrastructure guarantee
4. Capital Channel and Users	Public support and private capital → project company → bulk-water production and transmission assets → PDAM off-take → households, commercial users, and industrial growth areas
5. Primary Market Function	Utility-linked infrastructure bankability through risk reallocation, affordability support, and segmentation of a financeable bulk-water component
6. Evidence Status	Stronger public evidence on structure, public support architecture, and reported financial performance; weaker evidence on fully verified long-term environmental and distributional outcomes
7. Replicability Vector	Conditional replication where utility health, local political commitment, project-preparation capacity, and layered public support are sufficient to close the viability gap without eroding affordability
8. Capital Scale and Structure	Approximately USD 75 million in total project capex across public and private components; PPP-specific financing closed at approximately USD 29 million after public works and fiscal contributions reduced the private capital requirement
9. Locus of Catalytic Intervention	Project-level and public-risk-allocation layer, with fiscal support and guarantees wrapped around the concession to improve bankability and revenue security.

The Investment Problem and Chapter Thesis

Indonesia's urban water sector is characterized by intersecting climate risks, service gaps, and weak local finance. Water-related disasters such as fluvial and pluvial flooding and coastal inundation are estimated to cause annual economic losses of around USD 2–3 billion, while losses associated with water risks and related health impacts represent roughly 2–3 percent of national GDP.[1] In rapidly urbanizing cities, chronic over-extraction of groundwater is a principal driver of land subsidence, which subsequently amplifies both pluvial and coastal flood risk in densely populated areas.[2] Under Indonesia's decentralization framework, local governments and their water utilities (PDAMs) are primarily responsible for service provision. However, BPPSPAM classifies approximately 41 percent of PDAMs as "unhealthy" or "sick," which limits their capacity to expand production or undertake capital-intensive projects.[3] As a result, reliance on private wells, boreholes, and small-scale vendors is a rational short-term response, but this approach is environmentally unsustainable and undermines the financial viability of utilities that are intended to provide piped water. Consequently, many cities face an expansion challenge that is both capital-intensive and difficult to finance solely through local public budgets or utility balance-sheet borrowing.

Semarang, the capital and largest city of Central Java Province, illustrates these dynamics. As a major port and industrial center on Indonesia's north coast, its population reached approximately 1.6 million by 2023[4] , with rapid urbanization particularly evident in western and coastal districts. The expansion of safe piped-water services has not matched this growth. Household surveys report

[1] OECD, Water Financing and Disaster Risk Reduction in Indonesia: Highlights of a National Dialogue on Water (Paris: OECD Publishing, 2023), https://doi.org/10.1787/3205b20a-en.

[2] Hasanuddin Z. Abidin, Heri Andreas, Irwan Gumilar, Teguh P. Sidiq, and Muhammad Gamal, "Environmental Impacts of Land Subsidence in Urban Areas of Indonesia," paper presented at FIG Working Week 2015, Sofia, Bulgaria, May 17–21, 2015, https://www.fig.net/resources/proceedings/fig_proceedings/fig2015/papers/ts04i/TS04I_abidin_andreas_et_al_7568.pdf.

[3] World Bank, Compendium for Public Private Partnership in Water Supply Sector Development in Indonesia (Washington, DC: World Bank, 2023), https://documents1.worldbank.org/curated/en/099052124180526341/pdf/P1754291572a2400101b5e2167c7dc3080ae.pdf.

[4] BPS-Statistics Indonesia, Semarang Municipality, "Population, Population Growth Rate, Percentage Distribution of Population, Population Density, and Population Sex Ratio by District in Semarang Municipality, 2023," accessed April 9, 2026, https://semarangkota.bps.go.id/en/statistics-table/3/VlZSbFRUY3lTbFpEYTNsVWNGcDZjek53YkhsNFFUMDkjMw==/population--population-growth-rate--percentage-distribution-of-population--population-density--and-population-sex-ratio-by-district-in-semarang-municipality--2023.html?year=2023.

that approximately 85 percent of residents express interest in connecting to PDAM services, yet PDAM Tirta Moedal's production could not be significantly increased under previous SPAM facilities due to limited fiscal resources, technical constraints, and historical underinvestment. This has resulted in a persistent gap between water demand and supply.[5] Consequently, households and firms have relied extensively on shallow and deep groundwater wells, which has contributed to significant land subsidence and increased vulnerability to both tidal and pluvial flooding.[6] Empirical studies and government assessments reveal that excessive groundwater extraction, combined with heavy built-up loads on soft alluvial soils, has caused subsidence in coastal and low-lying areas of Semarang at rates of around 8–10 cm per year.[7] Figure 1 shows that the northern and eastern parts of the city have already experienced accelerating land subsidence, and the city government now seeks to prevent similar patterns from emerging in western districts. The central challenge remains expanding water supply through institutions whose fiscal and operational capacities are still constrained.

Semarang's water system is characterized by a complex risk profile, including insufficient piped-water coverage, increasing reliance on over-exploited aquifers, and heightened vulnerability of coastal communities and infrastructure to both pluvial and coastal flooding. The city's water crisis is not only an infrastructure deficit, but a governance challenge in aligning local service provision, environmental protection, and climate resilience. Within this landscape, PDAM Tirta Moedal is the key institutional actor. In 2018, it served approximately 167,979 customers, or about 1,010,806 residents or 62.02 percent of the city's population, despite survey evidence that roughly 85 percent of residents wished to connect, revealing substantial unmet demand constrained by limited production capacity . To narrow this access gap and move toward the jointly articulated 90 percent service-level target, the Semarang City Government and PDAM Tirta Moedal launched the West Semarang Water Supply System (SPAM Semarang Barat) as a strategic

[5] Republic of Indonesia, Ministry of National Development Planning/Bappenas, Public-Private Partnership Book 2018 (Jakarta: Bappenas, 2018), https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Panduan_Perencanaan/PPP%20Book%202018%20FINAL.pdf.

[6] Hasanuddin Z. Abidin, Heri Andreas, Irwan Gumilar, Teguh P. Sidiq, and Yoshihisa Fukuda, "Land Subsidence in Coastal City of Semarang (Indonesia): Characteristics, Impacts and Causes," Geomatics, Natural Hazards and Risk 4, no. 3 (2013): 226–40, https://doi.org/10.1080/19475705.2012.692336.

[7] Republic of Indonesia, Ministry of National Development Planning/Bappenas, Public-Private Partnership Book 2018, https://perpustakaan.bappenas.go.id/e-library/file_upload/koleksi/migrasi-data-publikasi/file/Panduan_Perencanaan/PPP%20Book%202018%20FINAL.pdf.

[8] Ibid.

bulk-water scheme designed to unlock additional production capacity and gradually displace groundwater-based self-provision in critical districts.[9]

At its core, the Semarang case speaks directly to SDG 6 (Clean Water and Sanitation) by addressing access, quality, and reliability of potable water for urban households. By targeting areas highly exposed to flooding and land subsidence, the project also contributes to SDG 11 (Sustainable Cities and Communities) through more resilient urban development and reduced disaster risk for vulnerable communities. The shift away from groundwater abstraction toward surface water from Jatibarang Dam is also relevant to SDG 13 (Climate Action), particularly in relation to adaptation in coastal cities. These downstream environmental and resilience effects, however, should be understood at this stage as intended or hypothesized benefits rather than fully demonstrated project outcomes. Finally, the use of a Public–Private Partnership (PPP) structure and the layering of fiscal support instruments and guarantees situate the project within SDG 9 (Industry, Innovation and Infrastructure), illustrating how innovative financing and institutional arrangements can underpin sustainable infrastructure delivery. Although SPAM Semarang Barat is geographically confined to selected districts in West Semarang, it addresses a systemic problem facing many Indonesian cities, where groundwater over-extraction, inadequate drainage, and coastal exposure combine to erode physical infrastructure and social resilience. The West Semarang case thus raises a central question for Indonesia's sustainable development agenda: can this PPP-based bulk-water model be replicated in other municipalities facing similar constraints, and if so, under what regulatory, financial, and governance conditions?[10]

The case now turns from the underlying investment problem to the project's service model, physical scope, and operating structure.

[9] Ibid.

[10] Author's note: This analysis is based on publicly available PT SMI and Bappenas documentation and interviews with PT SMI officials. As parts of the program, including project-level due diligence materials and some contractual terms, are not publicly disclosed, the discussion relies on available evidence and may not capture all internal implementation details.

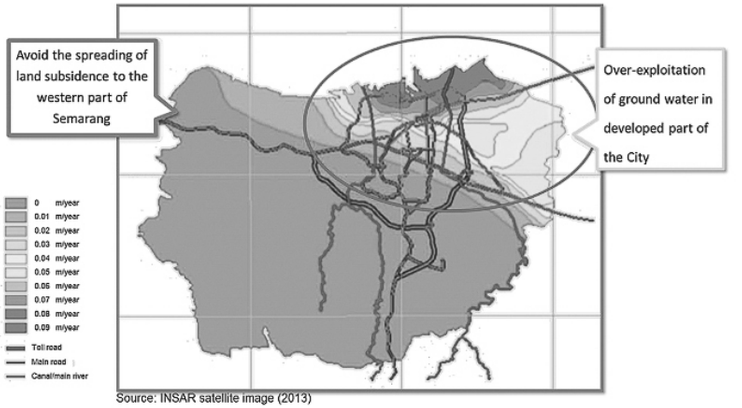

FIGURE 1: Land Subsidence in West Semarang
SOURCE: PT SMI

Mechanism Overview

Business Model

The West Semarang Water Supply System is a public private partnership in which a public water utility called PDAM Tirta Moedal works with a private consortium under a build–operate–transfer (BOT) scheme. The project focuses on bulk water, where treated water is produced in large volumes and sold by the private consortium to PDAM at a few delivery points, rather than directly to households. Raw water will be sourced from Jatibarang Dam, flowing through the Kreo River, and will first enter the 1,000 L/s water treatment plant at Jatibarang Intake. Then water will be stored in the main reservoir, and from there it flows through large transmission pipes to three downstream distribution reservoirs that supply PDAM's network. These facilities are operated for a 25-year concession period plus 2 years for construction, after which the assets are transferred back to PDAM Tirta Moedal. The cooperation agreement between PDAM Tirta Moedal (as Government Contracting Agency) and the project company was signed in November 2018, followed by construction in 2019–2021 and the start of commercial operation in 2021. By the time of writing, the project had entered commercial operations.

The system supplies the districts of Tugu, Ngaliyan, and West Semarang, divided into five PDAM service zones that include greenfield, semi-greenfield, and brownfield areas. The private company is responsible only for producing and delivering treated bulk water to the outlet reservoirs, while PDAM and government agencies

build and operate the primary, secondary, and tertiary networks and household connections. Demand is expected to ramp up over about 10 years to full consumption, with an average of around 7,900 new customer connections per year. The project is classified as a National Strategic Project and National Priority Project facilitated by KPPIP, which is relevant because it helped position the project for the public support discussed later, including implementation as a PPP with BOT and Viability Gap Fund (VGF) support, alongside additional construction support from the Ministry of Public Works and Public Housing. The estimated PPP capital cost was around IDR 450 billion.

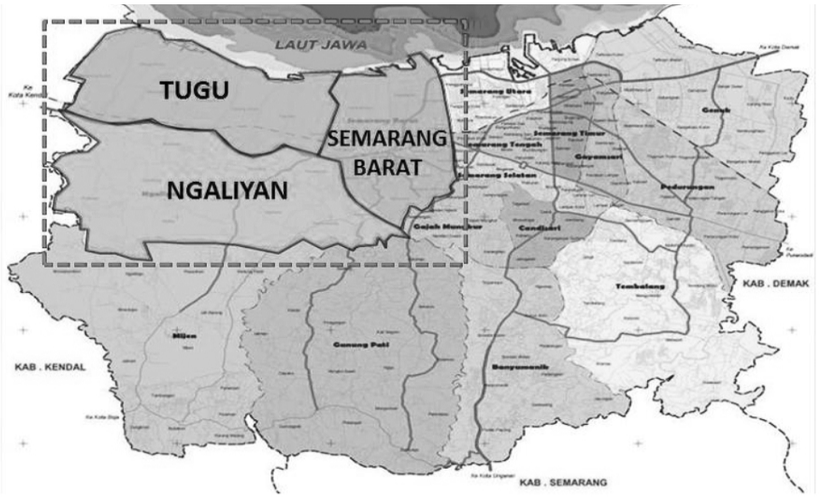

FIGURE 2: Project Location
SOURCE: PT SMI

Service Coverage

The project's business strategy targets a mixed portfolio of service zones. The project's spatial targeting is illustrated in Figure 3, which maps five service zones in West Semarang and shows that groundwater-dependent households are concentrated in the greenfield and semi-greenfield areas that constitute the primary focus of the intervention.

In Zone 1 (Tugu), a greenfield area where residents currently rely predominantly on groundwater, the priority is to open new service areas and rapidly connect households that have expressed high latent demand for piped water. Zones 2 and 3 (Ngaliyan), classified as semi-greenfield, are expected to absorb a combination of new connections and upgrades from informal or intermittent supply, while

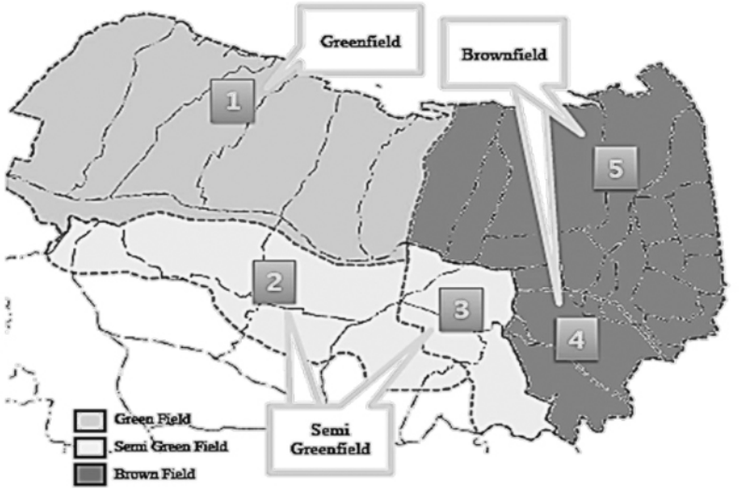

FIGURE 3: Service Coverage
SOURCE: PT SMI

Zones 4 and 5 (West Semarang) consolidate service in dense brownfield neighborhoods where PDAM already serves nearly all residents. This spatial strategy allows the project company and PDAM to balance early revenue from existing brownfield demand with progressive expansion into currently unserved greenfield communities. The use of a large dam-based raw water source and modern treatment facilities is also intended to improve water quality and operational efficiency, which in turn supports the project's longer-term service and financial model.

Bulk Water Build-Operate-Transfer

The physical scope of the PPP can be understood as a bulk-water "spine" that links the Jatibarang Dam to PDAM's existing and planned distribution system. Raw water is abstracted from the Kreo River at Jatibarang, where the intake works are financed and constructed by the Ministry of Public Works and Public Housing as part of the government scope. From this intake, water is conveyed to the Jatibarang Water Treatment Plant (WTP), which the project company designs, finances, builds, and operates with an installed capacity of 1,000 L/s. The PPP company also develops the main reservoir at Bambankerep (3,500 m^3 at 97 mdpl), from which treated water is transmitted through dedicated mains to three distribution reservoirs: Desel (new), Manyaran 1 (existing), and Manyaran 2 (new).

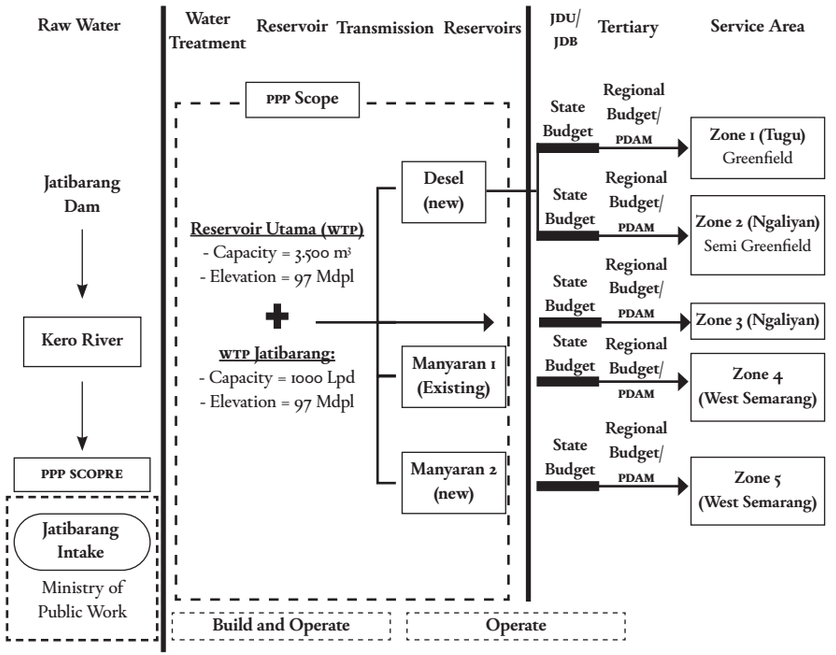

FIGURE 4: Bulk Water Scope

SOURCE: PT SMI

Downstream of these reservoirs, responsibility shifts back to the public sector. Primary distribution pipelines from the bulk-water outlets are funded through the central government budget (APBN), while secondary and tertiary networks and household connections are financed by the local budget (APBD) and PDAM Tirta Moedal. In operational terms, the PPP company is accountable for meeting performance standards at the bulk-supply delivery points, whereas PDAM manages distribution, billing, and customer relations in the five service zones (Zone 1 Tugu, Zones 2–3 Ngaliyan, Zones 4–5 West Semarang). This division of responsibilities gives the private partner a focused bulk-water role while leaving network expansion, tariff policy, and retail service delivery with public actors.

Dimension	Key Features
Project	West Semarang Water Supply System (bulk-water PPP)
Capacity & scope	1,000 L/s WTP + main reservoir + transmission to 3 distribution reservoirs
Service area	3 subdistricts (Tugu, Ngaliyan, West Semarang), 5 PDAM service zones
Contract type	PPP – Build–Operate–Transfer (BOT)
Agreement signing	November 2018
Construction period	2019–2021
Operation start	2019–2021
Concession length	27 years (including 2 years construction)
Cost at tender (2019)	~USD 34 million; IRR ~16%; NPV ~USD 1.8 million; ROI via availability-based bulk-water payments from PDAM
Cost at close (2020)	~USD 28.97 million; IRR ~9.07%; NPV ~USD 16 million; ROI availability-based bulk-water payments from PDAM
Equity investors	PT Air Semarang Barat; PT Aetra Air Jakarta; PT Medco Gas Indonesia
Lenders	Bank Central Asia (long-term loan facility)
Public fiscal support	VGF (up to 49% of construction costs); Project Development Facility (MoF/ PT SMI)
Public capex in assets	Intake, raw-water transmission, primary distribution (MoPWH); land (City Government)
Guarantee	Infrastructure guarantee from IIGF/PT PII
Key public stakeholders	PDAM Tirta Moedal (GCA/off-taker); Semarang City Government; MoPWH; MoF; IIGF/PT PII; KPPIP
Revenue mechanism	Availability-based bulk-water payments from PDAM

TABLE 1: Project Features

Risk Allocation and Stakeholder Economics

Blended Structure

The West Semarang project uses a blended structure embedded within its BOT model, combining public finance, public guarantees, and private capital to make the project viable. Public contributors include the Ministry of Finance, which provides a Viability Gap Fund (VGF) covering up to 49% of construction costs and a Project Development Facility (PDF) managed through PT SMI to cover project preparation and advisory work. The Ministry of Public Works and Public Housing (MoPWH) finances and builds the raw-water intake, raw-water transmission, and primary distribution pipelines, while the Semarang City Government funds land acquisition and supports local regulations to strengthen PDAM Tirta Moedal's financial position. In addition to this public support, the project company, owned by sponsors and financed by commercial lenders, provides equity and debt to design, build, finance, and operate the bulk-water assets under a 25-year BOT concession. These elements lower upfront capital pressure, shift selected project risks away from the private side, and help make the bulk-water segment financeable. The governance structure of this model is presented in Figure 5.

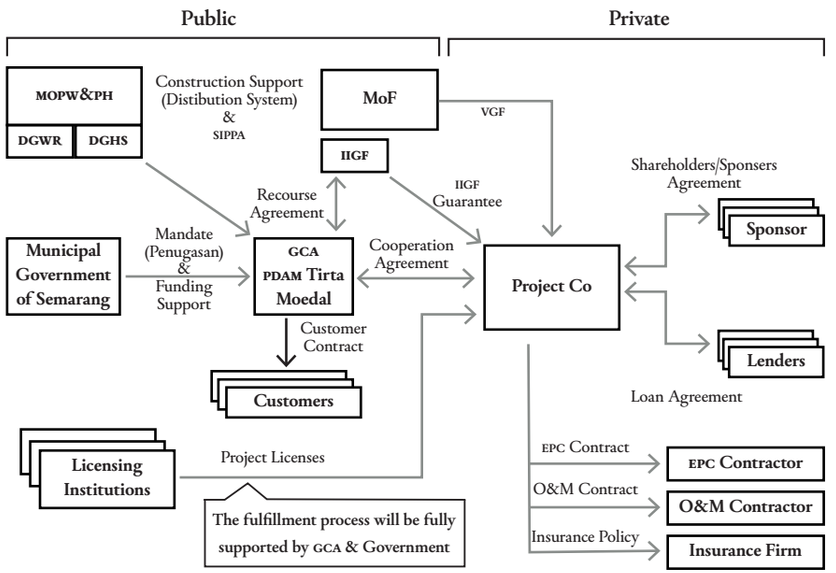

FIGURE 5: Public-Private Partnership Scheme.
SOURCE: PT SMI

Within this structure, PDAM Tirta Moedal acts as the Government Contracting Agency (GCA) and bulk-water off-taker. PDAM signs a cooperation agreement with Project Co and commits to pay availability-based charges, while it keeps direct customer contracts with households and businesses. The Ministry of Finance, through IIGF/PT PII, issues an infrastructure guarantee that covers key government-related risks, with a recourse agreement back to the Ministry. The Semarang City Government and MoPWH provide in-kind support via land and distribution-system construction, and licensing institutions issue the necessary permits. On the private side, sponsors sign a shareholders' agreement to capitalize Project Co, lenders provide long-term loans under a loan agreement, and Project Co contracts separate EPC, O&M, and insurance firms to build and run the facilities. Altogether, this structure shows how public actors take on part of the cost and risk so that private capital can participate in a project whose commercial profile would otherwise have been difficult to finance on private terms alone.

PDAM Eligibility and Offtaker Credibility

The government's decision to appoint PDAM Tirta Moedal as the Government Contracting Agency (GCA) reflected the need for a financially credible offtaker able to sustain long-term payment obligations under the PPP. In practice, drinking-water PPPs are generally screened so that the PJPK/offtaker (often the PDAM/Perumda) is financially capable, commonly evidenced by BPPSPAM 'healthy' performance status, because the project requires reliable long-term payment obligations. In 2018, PDAM Tirta Moedal met all key financial indicators for this status.

A study on the West Semarang PPP by Adiyanti and Fathurrahman (2021) finds that PDAM Tirta Moedal applies a full cost recovery (FCR) tariff,[11] indicating that its tariff structure is sufficient to cover operating costs and debt service, so purchasing bulk water under the PPP should not push the utility into deficit. The study notes that PDAM's average tariff of Rp 3,870/m³ exceeds the minimum benchmark of Rp 3,000/m³, while non-revenue water (NRW) stands at 38.73 percent—just under the 40 percent ceiling used for PPP eligibility, suggesting that losses remain significant but within the acceptable range for a bulk-water off-taker. From a capital-structure perspective, the same study reports a Debt–Equity Ratio (DER) of 0.111, far below the maximum threshold of 0.433, yielding an overall performance score of

[11] World Bank, Compendium for Public Private Partnership in Water Supply Sector Development in Indonesia (Washington, DC: World Bank, 2023), https://documents1.worldbank.org/curated/en/099052124180526341/pdf/P1754291572a2400101b5e2167c7dc3080ae.pdf.

3.57 out of 5 and placing PDAM Tirta Moedal in the "healthy" category. The utility also committed around Rp 297 billion of its own resources to co-finance shared distribution networks, signaling tangible commitment and strengthening confidence in its capacity to serve as GCA over the life of the concession.[12]

Public Supports and Risk Allocation

PDAM Tirta Moedal is considered a "healthy" utility. It has full-cost-recovery tariffs, relatively low non-revenue water, and a low debt-equity ratio. However, its balance sheet remains far too small to finance a 1,000 L/s water-treatment plant and transmission system on its own. Meanwhile, tariff adjustments are politically sensitive, making it infeasible for the city to raise tariffs to a level that would support full commercial returns. As a result, public co-financing from the Ministry of Public Works and Public Housing's capital expenditures, municipal distribution funding, and VGF, was needed to close the viability gap so the project could remain affordable for consumers while still presenting a bankable, availability-payment structure to private investors. Investors also perceive significant institutional risks, particularly related to inter-agency coordination, permitting delays, and regulatory changes, which made the guarantee mechanism and joint-office function important tools for risk mitigation and project bankability.

The rationale for this support becomes clearer when considered in relation to the project's underlying risk structure. Since a drinking-water PPP involves politically sensitive tariffs, municipal service obligations, and long-term utility commitments, both national and local governments are required to intervene to address risks that private sponsors cannot reasonably assume. Indonesia's PPP framework is defined by Perpres 38/2015 and further shaped by PUPR and MoF regulations. This framework assigns government entities specific responsibilities and support instruments. These range from VGF and capex contributions to guarantees, land acquisition, and technical assistance. Mapping these against standard PPP risk categories identifies that most key risks in water supply, including revenue, affordability, land, raw water, and political and regulatory risks, remain with the public sector. Construction and O&M risks are instead assigned to the private partner. The table below illustrates the emergence of primary risk categories in a PDAM-led water public-private partnership (PPP) and outlines the structuring of public interventions to mitigate these risks. The effectiveness of these public supports

[12] Nabila Puspa Adiyanti Wicaksono and Reza Fathurrahman, "Assessing Critical Success Factors for PPP Water Project in Indonesia: Lessons from West Semarang," Policy & Governance Review 5, no. 2 (2021): 164–81, https://doi.org/10.30589/pgr.v5i2.372.

and risk allocations is realized through the payment structure, which determines project company compensation and the manner in which PDAM manages downstream demand risk.

Type of Risk	Description	Mitigation
Credit Risk	PDAM could not ramp up connections or could not or would not pay the bulk-water availability charges over 25 years (tariff politics, NRW, billing/collection).	• PDAM provides equity funding in networks → demonstrating financial commitment to the wider system. • Municipal Government of Semarang City provides fiscal and non-fiscal support for PDAM such as capital injection, recourse guarantee commitment to the IIGF, and tariff policies. • MoF's VGF reduces the level of revenue needed from tariffs. • IIGF guarantee backstops PDAM/government payment obligations, improving bankability for lenders.
Affordability and Viability-Gap Risk	If full costs were passed to users, tariffs would be politically unacceptable or unaffordable; if tariffs are kept low, the project might not be financially viable.	Private credit fund
Land acquisition and social risk	Delays or disputes over land acquisition can halt construction and scare investors.	• Semarang City Government finances and leads land acquisition consistent with regulatory provisions that place land-acquisition responsibility on local government.
Construction and operational risk	Delays in building the WTP/transmission, technical issues (e.g., crossing toll roads), or poor O&M performance.	• These risks are largely placed on Project Co and its EPC/O&M contractors, but public funding by MoPWPH for the intake and some primary mains reduces technical complexity and interface risk for the private party. • Technical assistance (PDF) via PT SMI/PT SMEC improves project design and preparation, reducing the risk that the PPP is based on weak technical studies
Raw-water, environmental, and climate-related risk	Quantity/quality of raw water from Jatibarang Dam and Kreo River; hydrological variability; environmental flow requirements.	• MoPWPH, as dam and raw-water asset owner, assumes responsibility for constructing and managing the intake and raw-water transmission system, so the private partner is not directly exposed to hydrological infrastructure risk. • Residual raw-water risk, including drought-

Type of Risk	Description	Mitigation
		related risk, remains largely on the public side and is addressed through contract allocation and guarantee structures.
Political, regulatory, and contractual risk	Changes in law, tariff policy, or contract terms; delays in permits; shifting political priorities.	• IIGF/PT PII guarantee protects investors against defined government default/ changes. • KPPIP (Committee for Acceleration of Priority Infrastructure Delivery) and the PPP Joint Office play a coordination and problem-solving role, signaling sustained national-level political support.
Capacity and preparation risk	Delays or disputes over land acquisition can halt construction and scare investors.	• Australian Government through KIAT program has also supported this project in the form of high-level business case study before MoF PDF facilities mobilized. • MoF's Project Development Facility, implemented by PT SMI and supported by private consultants provides financial, legal, and technical advisory services.

TABLE 2: Public Support: Risk vs. Mitigation

Monetization Mechanism

Monetization is structured through an availability-based bulk-water offtake agreement between PDAM and the project company. Figure 6 present the monetization structure received by the private company. PDAM makes monthly payments in local currency comprising (i) fixed charges, namely a Fixed Capital Charge to recover capital cost, debt service, profit, taxes and levies; a Fixed Operation and Maintenance Charge to cover base O&M; and a Fixed Energy Charge for baseline electricity consumption and (ii) output-linked variable charges covering variable O&M and electricity costs as production increases. A Supplemental Charge reflects raw-water intake fees, indexed to actual output. This payment mechanism largely shields the project company from direct household-level demand risk, which remains with PDAM and the public sector, while still linking part of its revenue to actual production and performance. On PDAM's side, wholesale bulk-water costs are recovered through retail tariffs, cross-subsidies, and fiscal support including Viability Gap Fund support and infrastructure investments from the central government. This structure allows the PPP to generate a contracted revenue stream for the private partner while leaving end-user affordability and retail service obligations on the public side.

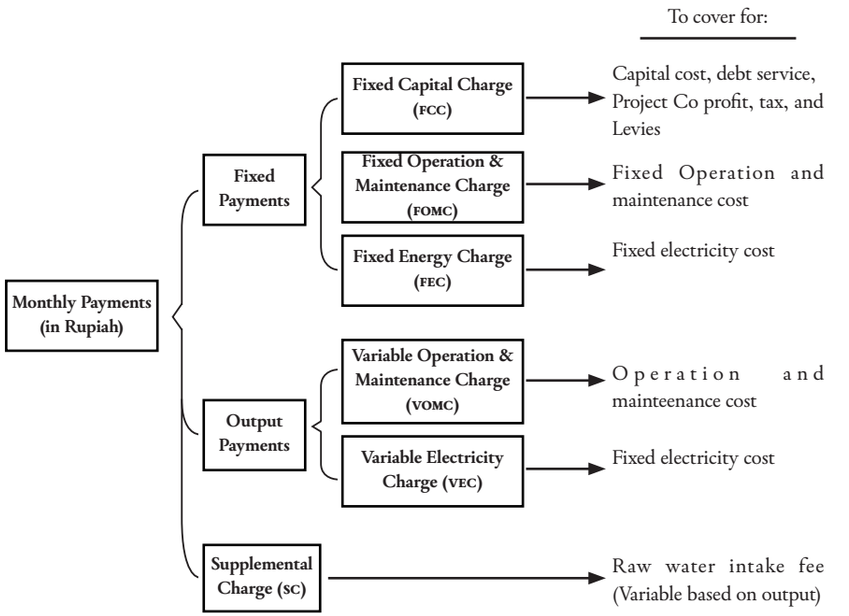

FIGURE 6: Monetization Structure by the Private Company
SOURCE: PT SMI

Stakeholder Economics

For private sponsors and lenders, the project offers a contracted bulk-water revenue stream supported by an availability-based payment structure and a broader package of public risk mitigation. For PDAM, the arrangement shifts the challenge from financing major upfront infrastructure to managing long-term offtake obligations within a regulated tariff system. For government, the project requires substantial upfront fiscal support and continued risk absorption, but does so in pursuit of broader access, environmental, and resilience benefits. For households and firms, the economic proposition lies in more reliable piped-water service without the full cost of the system being passed directly through retail tariffs.

Public Economics Perspective

From a public economics perspective, the Economic Internal Rate of Return (EIRR) of 13.1 percent is substantially higher than the Financial Internal Rate of Return

(FIRR). This suggests that when broader social and environmental benefits are considered, such as improved access to safe water, reduced reliance on groundwater, and enhanced flood and subsidence resilience, the project generates value that extends well beyond the private cash flows realized by sponsors and lenders. In simple terms, the government accepts upfront fiscal costs (VGF, upstream works, land, and guarantees) and some residual policy and hydrological risk in return for a stream of non-market benefits that accrue to households, firms, and the city as a whole. Households and businesses pay tariffs that cover PDAM's costs, resulting in more reliable service and reduced groundwater-related risks. The positive NPV, a FIRR of approximately 9 percent, and an EIRR above 13 percent indicate that the West Semarang PPP is financially sustainable for private and utility stakeholders and economically justified for the public sector. However, clearer differentiation between reported financial performance and broader downstream outcomes would provide valuable insight, as this information is currently only partly available.

Value Creation and Additionality

This paper follows the OECD (2018) and Attridge and Engen (2019) in defining financial additionality as the mobilization of private capital that would not have been invested, or not on comparable terms, in the absence of concessional public support, and impact additionality as the generation of development benefits that go beyond what would have occurred under a business-as-usual scenario.

Development Impact Thesis

According to the project rationale, expanding bulk-water capacity is expected to reduce reliance on self-provisioning in areas where groundwater use is prevalent. Replacing groundwater abstraction with surface water from the Jatibarang Dam in greenfield and semi-greenfield zones is expected to further reduce reliance on private wells. Over time, this shift should contribute to lower groundwater extraction and, consequently, to reduced subsidence pressure and flood vulnerability in West Semarang. From a development perspective, the impact thesis centers on three outcomes: (i) expanded and more reliable access to potable water for low- and middle-income urban households; (ii) environmental benefits through reduced over-extraction of aquifers and enhanced resilience of subsidence-prone coastal districts; and (iii) clearer functional separation between bulk-water production and distribution, which is expected to strengthen PDAM Tirta Moedal's operational performance.

Financial Thesis

Figure 7 shows that the five project zones coincide with Semarang's designated new industrial and economic growth center, encompassing industrial and garment clusters, airport expansion and associated hotel development, as well as new upper- and middle-income housing estates. As service coverage in these zones increases, PDAM is expected to benefit from a growing and diversified customer base that includes both households and higher-consumption commercial and industrial users, which was expected to strengthen its revenue base and support its capacity to meet bulk-water offtake payments under the PPP. The financial thesis of the project is clear: initial investment in reliable bulk-water capacity, combined with increasing demand in strategic growth areas and the use of targeted fiscal instruments, is expected to generate stable cash flow for PDAM. This approach is designed to provide a bankable return for the private partner while maintaining tariffs within socially acceptable limits. The project further assumes that early public support and a phased increase in demand will enable viable private participation without raising tariffs to politically or socially unsustainable levels.

Financial Additionality

From a financing perspective, the West Semarang PPP exhibits clear financial additionality. PDAM Tirta Moedal's balance sheet, while relatively healthy, would not have allowed it to finance a 1,000 L/s bulk-water system and associated transmission infrastructure on its own without either (i) pushing tariffs to politically unaccept-

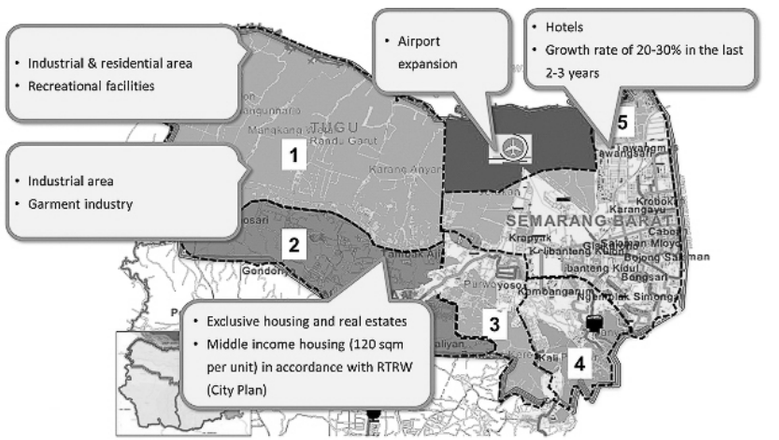

FIGURE 7: Semarang City Plan
SOURCE: PT SMI

able levels or (ii) delaying the investment and relying on slower, fully public funding. The layered structure of the deal, combining Viability Gap Funding, central and local government capex for intake and networks, a sovereign guarantee, and project-preparation support, reduces both the size and the risk of the cash flows that private sponsors and lenders must recover. As a result, the transaction crowds in private equity and commercial debt that would not otherwise have flowed into a PDAM-offtaker project under standard market conditions, which aligns with the way blended finance additionality is defined in the literature as mobilizing capital "that would not have been invested, or not in the same volume or at the same terms, without concessional support."[13]

Impact Additionality

In terms of sustainable development impact, the additionality of the deal is also significant. At the institutional level, the project creates market and governance additionality: it strengthens PDAM's capacity to operate under an availability-based PPP contract, provides a concrete demonstration of how Viability Gap Funding and guarantees can be combined in the water sector, and offers a template that other cities and PDAMs can adapt. If this demonstration effect materializes, the impact return of the West Semarang deal will extend beyond local service improvements to include a scalable model for mobilizing private capital into climate-relevant urban water infrastructure in Indonesia.[14] In that sense, the project's development additionality lies not only in its intended local service and resilience effects, but also in its potential to expand the institutional toolkit available for financing urban water infrastructure in comparable Indonesian cities.

Governance and Accountability

Institutional Accountability

In governance terms, the West Semarang PPP is embedded in Indonesia's standard public infrastructure and utility framework rather than in a dedicated "fund" structure. Accountability is ensured mainly through regulation, contracts, and hierarchical public oversight. PDAM Tirta Moedal acts as the Government Contracting Agency under a BOT agreement with the project company, while

[13] OECD, Making Blended Finance Work for the Sustainable Development Goals (Paris: OECD Publishing, 2018), https://doi.org/10.1787/9789264288768-en.

[14] Samantha Attridge and Lars Engen, Blended Finance in the Poorest Countries: The Need for a Better Approach (London: Overseas Development Institute, 2019), https://odi.org/en/publications/blended-finance-in-the-poorest-countries-the-need-for-a-better-approach/.

the Semarang City Government provides political oversight and land acquisition. The Ministry of Public Works and Public Housing and the Ministry of Finance supervise, respectively, the delivery of upstream assets and the use of fiscal support and guarantees, and BPPSPAM periodically assesses PDAM's financial and technical performance. This configuration anchors the project in existing institutional mandates, creates several lines of control over PDAM and the local government, and links utility performance to a formal rating system that can affect its future access to national support.

Monitoring Architecture

With respect to environmental and social impact, the project does not operate under a bespoke E&S or SDG impact framework. Instead, it relies on Indonesia's statutory National Environmental Impact Assessment (AMDAL) process to identify, mitigate, and monitor environmental and social risks at the project level, complemented by PDAM's annual reports, municipal publications, and BPPSPAM's periodic assessments of service coverage and financial health. The advantage of this approach is that it is legally grounded, familiar to domestic stakeholders, and consistent with national sector practice.

Enabling Environment

Public–private partnerships in Indonesia have evolved significantly since the introduction of a formal PPP framework in 2005, but progress was slow in the first decade. Between 2005 and 2015, only around 2% of PPP projects successfully reached financial close and entered construction, reflecting persistent issues such as weak regulations, unbalanced risk allocation, and political or administrative uncertainty. Drinking-water PPPs were elevated as both national strategic projects (PSN) and critical tools for achieving universal access, yet major pipeline projects like Jatiluhur and Bandar Lampung experienced prolonged delays. Within this context, the West Semarang project was treated as a priority PPP in a politically sensitive sector. This helped create the conditions for a more extensive package of fiscal support, guarantees, and coordination than would likely have accompanied a less strategically prioritized project.

Under Indonesia's PPP regulations for drinking water such as Perpres 38/2015 and the implementing rules issued by PUPR and the Ministry of Finance, central and local governments are required to provide substantial support when a PDAM serves as the Government Contracting Agency (GCA), including land, viability-gap funding (VGF), raw-water assets, distribution networks, and institutional capacity building.

These provisions matter because they show that the West Semarang structure did not emerge outside the formal policy framework. It was built through a regulatory architecture that already anticipated significant public support for water PPPs where local utilities could not carry the investment burden alone.

The Semarang City Government played a central enabling role by actively planning the service area as part of a wider growth corridor that included industrial zones, airport expansion, and new housing development. It also backed the PPP through land acquisition, local regulation, and sustained political sponsorship. This local commitment made it easier for central agencies, including the Ministry of Finance, the Ministry of Public Works and Public Housing, and KPPIP, to prioritize the project and deploy Viability Gap Fund support, guarantees, and upstream public works. Here, local leadership was not just supportive of implementation. It was one of the conditions that made private participation possible.
West Semarang also benefited from an unusually extensive package of public support, including Viability Gap Fund support, local government fiscal and non-fiscal support, government-funded intake and primary networks, land acquisition, a sovereign guarantee, and project-preparation support. This layered package helped mobilize private equity and bank lending that would not have entered on a purely commercial basis, while also keeping tariffs within politically acceptable bounds. At the same time, the model is fiscally demanding and may not be replicable everywhere on the same terms. Its broader use will depend on whether lighter support structures can be developed for cities with weaker balance sheets or lower strategic priority, so the sector is not defined only by highly subsidized transactions.

Performance Evidence

Because long-run realized performance remains only partially observable in the public record, this section begins with the project's ex ante deal economics and financing terms as the baseline against which later reported financial performance can be assessed. It then turns to the operating and financial signals that have become visible during implementation.

Ex Ante Deal Economics

Building on the institutional set-up described above, the West Semarang Water Supply System is structured as a public-private partnership in which equity is provided by a consortium comprising PT Air Semarang Barat, PT Aetra Air Jakarta,

and PT Medco Gas Indonesia, complemented by a long-term loan facility from Bank Central Asia. At tender in 2019, the project was appraised on the basis of an estimated capital cost of about USD 34 million, with an IRR of around 16 percent and an NPV of about USD 1.8 million, recovered through availability-based bulk-water payments by PDAM. By financial close in 2020, after the blended-finance package (public works, VGF, and guarantee) had been fully defined, the estimated project cost was revised down to approximately USD 29 million, with a lower but still attractive IRR of about 9.1 percent and a much higher NPV of around USD 16 million. This suggests that private sponsors accepted a lower expected return in exchange for a de-risked cash-flow profile, while the public sector contributed capital and guarantees to make the project bankable at a tariff level acceptable to users. In this allocation, construction and operational risks are largely borne by the project company and its lenders, while demand and tariff risks sit mainly with PDAM and the city (backed by VGF and the central guarantee), and policy and hydrological risks are retained by the state. The structure was therefore designed to place each major risk with the actor most able to absorb or manage it.

Reported Financial Performance

As reported by Bappenas in 2025, the project's realized financial performance is reported as consistent with the close-stage return profile. The Financial Internal Rate of Return (FIRR) is 9.07 percent, essentially equal to the IRR estimated at close, indicating that actual cash flows to sponsors and lenders have so far evolved close to the revised financial model. With a concession period of 27 years (including two years of construction) and a total capital expenditure (capex) of around USD 75 million, the PPP generates a positive NPV of about USD 14.89 million, confirming that, at the chosen discount rate, the present value of revenues exceeds the present value of costs. Operating expenditure (Opex) of roughly USD 1.13 million per year, relative to the scale of the asset base, supports the overall financial viability of the bulk-water scheme. These later figures should, however, be read with some caution alongside the earlier tender and close estimates, as the draft does not yet clarify whether they are based on exactly the same project-cost boundary. Until that scope difference is clarified, the later capex figure is best read as a reported reference point rather than as a directly comparable restatement of the earlier tender and close estimates.[15] For private investors and the lending bank, this outcome appears consistent with the risk–return trade-off implicit in the PPP contract; for PDAM, it

[15] A fuller reconciliation of these figures would require confirmation that the tender, close, and later reported capex values refer to the same project boundary and cost components.

means that long-term availability payments can remain manageable within a full cost recovery tariff structure. Because the project company is largely shielded from direct end-user demand volatility through availability-based payments, while PDAM has regulatory tools and tariff reviews to adjust over time, residual revenue risk is spread in a way that was intended to support political and financial stability so long as the broader policy framework remains intact. Financial performance, however, captures only part of the project's significance. The broader development case depends on what can be said, and what cannot yet be said, about service expansion, environmental effects, and longer-term urban resilience outcomes.

Beyond the reported financial metrics, the project also appears to have performed relatively well on transaction and implementation timelines. A study by Adityanti et al. (2021) of the West Semarang PPP identifies the project as the fastest-moving priority water-supply PPP among the comparable Indonesian cases it reviews, reaching financial close in May 2019 after completing the final business case in 2017. The same study reports that by 7 July 2020, construction progress had reached 42 percent against an actual target of 22 percent, and that the project remained on schedule despite the Covid-19 period. These indicators do not substitute for return metrics, but they do provide useful execution-performance signals consistent with a project that moved from structuring to implementation more smoothly than several peer water PPPs.[16]

Outcome Evidence

Observed and Reported Outcome Signals

The project is designed to reach full utilization over a ten-year ramp-up, with installed capacity of 1,000 L/s enabling roughly 7,900 new connections per year and ultimately providing safe drinking water to about 60,000 currently unserved residents in the service area. In the short term, the project is intended to enable PDAM to connect around 60,000 residents who previously lacked access to piped water, many of whom depended on self-supplied groundwater of variable quality, while also supporting planned industrial, airport, hotel, and residential developments in West Semarang without further stressing local aquifers. At this stage, the available public evidence is strongest on intended service expansion and project design signals, rather than on independently verified long-term outcome data.

[16] Wicaksono and Fathurrahman, "Assessing Critical Success Factors for PPP Water Project in Indonesia," https://doi.org/10.30589/pgr.v5i2.372.

One project-summary source also reports the system as operational from 2021 and states that treated water from Jatibarang Dam supplies more than 60,000 households with clean water, although this figure is not directly comparable to the chapter's resident-based service estimates and should therefore be treated cautiously. [17] These reported signals are useful, but they should still be read as service-delivery and project-summary indicators rather than as conclusive evidence of longer-term environmental or resilience outcomes.

Expected but Not Yet Fully Verified Outcomes

Over the longer term, the shift from deep groundwater abstraction to surface water from Jatibarang Dam is expected to moderate land subsidence and reduce flood and saline intrusion risks in subsidence-prone districts, generating resilience benefits for households, firms, and public infrastructure that would not be achieved by incremental, small-scale investments alone. These development effects should, however, be distinguished carefully between those that are already observable in project design and implementation, those that are expected over time, and those that remain contingent on wider replication. At this stage, these should be understood as intended project effects rather than fully demonstrated outcomes.

Limits of Current Outcome Tracking

Its main limitation is that it does not systematically track a broader set of outcome indicators, such as groundwater substitution, changes in land-subsidence risk, or distributional effects across different user groups, and does not incorporate an explicit results framework for long-term social and environmental benefits. As a result, governance and monitoring are adequate for regulatory compliance and basic performance oversight, but provide only a partial picture of the project's wider sustainability outcomes.

Lessons and Implications

This case study of the West Semarang Water Supply PPP offers a number of interlinked lessons on how Indonesia can use public–private partnerships and fiscal tools to address urban water and climate risks. It shows how a clear impact and mone-

[17] C40 Cities, "How Cities Can Work with Businesses to Achieve Climate Goals," C40 Knowledge Hub, accessed April 20, 2026, https://www.c40knowledgehub.org/s/article/How-cities-can-work-with-businesses-to-achieve-climate-goals?language=en_US; author's note: the source describes the West Semarang Water Supply Project as operational in 2021 and serving "more than 60,000 households," but this figure is presented as a project-summary statement and is not used here as a directly reconciled chapter metric.

tization thesis, a financially healthy and committed PDAM, and strong local political leadership can be combined with layered public support to mobilize private capital for a complex bulk-water project. At the same time, it exposes important constraints, including the fiscal intensity of the public support package, uneven utility performance across cities, and the limitations of existing governance and monitoring arrangements for managing long-term social and environmental outcomes. The discussion below draws these themes together and identifies what they imply for future practice and policy in Indonesia's urban water and PPP agenda.

Conditions for Replication

For future projects, West Semarang suggests three practical conditions for replication. First, the model is more likely to work in cities where PDAMs already meet minimum financial-health criteria and where groundwater and flood risks are sufficiently acute to justify substantial intervention. Second, elements of the blended package, including Viability Gap Fund design, guarantee templates, and PPP documentation, would need to be standardized to reduce transaction costs. Third, simple utility-owned SDG and impact scorecards should be strengthened so that access, groundwater use, subsidence and flood risk, and the inclusion of poorer neighborhoods can be tracked more consistently over time. Under these conditions, West Semarang can be understood as a potentially useful prototype for how Indonesia's fiscal instruments, PPP framework, and local planning can be combined to mobilize additional finance for climate-relevant urban water infrastructure.

Conclusion

The West Semarang Water Supply System illustrates how blended finance can be institutionalized through a public-private partnership in a sector where infrastructure need is clear, but conventional financing channels remain weak. The case is not simply about attracting private capital into urban water. It shows how a bankable bulk-water segment can be carved out within a wider public service system in which downstream distribution, tariff politics, and social obligations remain firmly public. In West Semarang, that segmentation was made workable through a layered package of public support: Viability Gap Fund support, upstream public works, land acquisition, project-preparation funding, and a sovereign-backed guarantee. These instruments did not eliminate risk but rather redistributed it to enable private sector participation while preserving affordability and public oversight of

Topic	Lessons Learned
Eligibility as GCA for Public Support	The case shows that PDAM Tirta Moedal's financial health, including full cost recovery tariff, acceptable NRW, low DER, and healthy rating was essential for it to be accepted as GCA and sign a long-term bulk-water offtake contract. Its willingness to commit around Rp 297 billion to co-finance distribution networks sends a strong signal of financial commitment to central government and private investors. PDAM-led PPPs will only be credible where utilities meet minimum financial and operational thresholds; otherwise, even generous public support may not be sufficient to mobilize private finance.
Clear Impact Thesis and Monetization Logic Reduce Ambiguity	The project articulates a relatively clean impact thesis: connect ~60,000 unserved residents, support planned economic growth, and reduce groundwater extraction and subsidence by shifting to surface water from Jatibarang Dam. At the same time, the monetization mechanism is straightforward: availability-based bulk-water payments from PDAM, backed by cost-reflective tariffs and public co-financing. This clarity on both why the project matters and how cash flows will be generated helps make the return pathway more legible for sponsors and lenders. PPP financing is generally easier to finance when impact and revenue stories are tightly aligned and expressed in simple, operational terms.
Limited SDG Impact Governance and Monitoring	On governance, the project is embedded in Indonesia's standard architecture: PDAM as GCA, city government, MoF, MoPWH, IIGF, and BPPSPAM. This ensures multiple lines of oversight and ties PDAM performance to a formal rating system. On the other hand, responsibilities are fragmented, and there is no single body mandated to track financial, social, and environmental outcomes in an integrated way. Impact assessment relies on AMDAL, annual reporting, and BPPSPAM ratings, which are suitable for regulatory compliance but leave room for improvement in the systematic measurement to capture SDG-relevant outcomes such as the degree of groundwater substitution, changes in subsidence risk, or equity of access. The lesson is that governance and E&S monitoring are sufficient for PPP operation but not yet optimized for SDG impact management.

TABLE 3: Lessons Learned

retail service delivery. The primary lesson is that the relevant policy question is not whether private finance can enter urban water in the abstract, but under which institutional, fiscal, and regulatory conditions such participation can occur without compromising the public nature of service delivery.

This case also demonstrates the importance of utility quality. PDAM Tirta Moedal's relative financial health, willingness to co-finance network expansion, and capacity to serve as the Government Contracting Agency were core preconditions for bankability rather than peripheral features. The West Semarang project should not

be read as evidence that any municipality can replicate this model merely by adopting a PPP structure. The project achieved financial viability due to the presence of a credible off-taker, strong local political sponsorship, active central-government coordination, and a support package substantial enough to close the viability gap while managing investor concerns related to payment, coordination, and regulatory risk. This case provides a useful conditional frame: when a utility meets minimum financial and operational thresholds, local leadership aligns land, planning, and service expansion strategies, and the state is prepared to absorb selected risks and costs, a bulk-water PPP can provide a plausible pathway for expanding urban water supply in climate-vulnerable settings.

However, the chapter does not present an unqualified success narrative. The financial and economic indicators reported in the case indicate that the project achieved a return profile broadly consistent with its close-stage design, and the structure may be economically justified when wider public benefits are considered. Nevertheless, the chapter identifies the need for improved systematic tracking of broader downstream outcomes, particularly groundwater substitution, changes in subsidence pressure, flood-risk moderation, and distributional effects across user groups.

West Semarang should be viewed as a disciplined prototype, not a universally applicable template. It demonstrates how Indonesia's fiscal tools, PPP framework, and local utility institutions can be combined to attract private investment in climate-relevant urban water infrastructure. However, replication is challenging where PDAM balance sheets are weak, tariff politics are contentious, project preparation capacity is limited, or comparable fiscal support is unavailable. The case reveals that blended finance for urban water is most credible when it is embedded in institutional reform, utility discipline, and explicit public-risk absorption, rather than as a stand-alone financing solution. For Indonesia's urban water agenda, the key lesson is that the model is promising only under clearly defined enabling conditions. Future projects will require stronger outcome measurement if claims of climate resilience and scalable impact are to move from plausible thesis to demonstrated result.

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Delano Dalo, Division Head of Public Finance 2 at PT Sarana Multi Infrastruktur (Persero)

Catalytic Guarantees for Industrial Energy Efficiency Finance in Indonesia

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Abstract

FP196 is a Green Climate Fund-supported program that seeks to scale industrial energy-efficiency (EE) investment in Indonesia by combining a partial credit guarantee with market-building support. The case addresses a persistent demand-side financing problem: although many EE measures are technically viable and economically attractive, lenders often treat EE lending as unfamiliar due to performance-linked cash flows, limited standardization of measurement and verification, and high transaction costs across fragmented projects. FP196 intervenes through an intermediated guarantee structure in which the Korea Development Bank provides partial guarantees to participating Indonesian financial institutions for eligible "FI own loans," complemented by de-risking mechanisms and technical assistance intended to strengthen project readiness, monitoring routines, and enabling-environment coordination. Because implementation began recently, available evidence should be interpreted as an early snapshot rather than proof of long-run portfolio performance or verified impact at scale. The analytical focus is therefore on whether the mechanism establishes credible conditions for replication, including disciplined underwriting incentives, repeatable eligibility and documentation standards, and the accumulation of comparable evidence on repayment performance and verified energy savings.

Case Summary

	FP196 Summary (Indonesia EE Guarantee)
1. Case Theme	Industrial decarbonization; demand-side energy efficiency finance
2. Blended Finance Archetype	Intermediated partial credit guarantee paired with grant-funded technical assis-tance and market readiness
3. Primary Catalytic Instrument	Partial credit guarantee (with look-forward prefunding for eligible claims)
4. Capital Channel and Users	GCF → KDB (guarantee cover) → Indonesian LFIs (partial guarantees) → SMEs/mid-caps and ESCOs (EE capex loans)
5. Primary Risk Addressed	Perceived credit risk linked to performance verification and implementation uncertainty; weak repeatable appraisal routines
6. Evidence Status	Early implementation snapshot; design well documented; limited disclosed data on defaults/claims/recoveries and verified savings
7. Replicability Vector	Transferable rulebook (eligibility/coverage), templates (monitoring/claims), and TA toolkits (M&V/ESCO/ESI concepts) intended for ASEAN replication
8. Capital Scale and Structure	USD 105 million package comprising a USD 100 million guarantee facility and USD 5 million grant, designed to mobilize additional LFI lending and borrower equity.
9. Locus of Catalytic Intervention	Lender-portfolio and market-readiness level, with catalytic support sitting behind LFI-originated loans rather than in direct project equity or pooled transaction finance.

The Investment Problem and Chapter Thesis

Indonesia's energy transition is often framed as a supply-side task, namely building renewables, upgrading grids, and retiring coal. However, the demand side is of equal importance. If industrial energy use continues to rise quickly, the system must build additional capacity simply to keep pace, making the transition harder and more expensive. Energy efficiency (EE) is therefore a core element of the pathway. WRI's net-zero analysis underscores that Indonesia's transition requires much larger investment not only in renewables but also in EE, alongside shifts in finance and policy.[1] Yet industrial EE remains under-deployed, not because opportunities are missing, but because the financing system struggles to convert them into replicable investments. This case examines FP196, a Green Climate Fund (GCF) guarantee program implemented by the Korea Development Bank (KDB) as the accredited entity in Indonesia, designed to address financial, capacity, and enabling-environment barriers to industrial EE investment.

One root problem in industrial EE finance is the way performance-linked risk is understood and managed. Many EE projects look attractive on paper, but cashflows depend on delivery: correct installation, operational behavior, and sustained savings over time.[2] For lenders, that is a different repayment story than working-capital loans or expansion capex, because value comes from verified savings, not a new revenue line.[3] As a result, banks often treat EE as generic SME risk, requiring hard collateral, pricing conservatively, or rationing credit, particularly where measurement and verification (M&V) practices are not standardized and performance data are scarce. The problem can become self-reinforcing: fewer projects are financed, less comparable performance evidence accumulates, and EE remains "unfamiliar".[4]

[1] Leonardo Garrido, Egi Suarga, Arief Wijaya, Arya Harsono, and Yelena Akopian, "Zeroing In on Zero Emissions: Increasing Climate Ambition for Indonesia," World Resources Institute, October 15, 2021, https://www.wri.org/insights/zero-emissions-increasing-climate-ambition-indonesia.

[2] Rois Langner, Bob Hendron, and Eric Bonnema, Reducing Transaction Costs for Energy Efficiency Investments and Analysis of Economic Risk Associated With Building Performance Uncertainties: Small Buildings and Small Portfolios Program, Technical Report NREL/TP-5500-60976 (Golden, CO: National Renewable Energy Laboratory, August 2014), https://docs.nrel.gov/docs/fy14osti/60976.pdf.

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[4] Energy Efficiency Finance for Commercial Buildings: Insights from Lenders, Institute for Market Transformation, https://imt.org/resources/energy-efficiency-finance-for-commercial-buildings-insights-from-lenders/.

A second constraint relates to scale and transaction structure. Even when EE is cost-effective at the system level, it is often fragmented into many smaller retrofits, with higher transaction costs per dollar invested. In periods when transition finance is tight, capital tends to flow toward large, visible supply-side projects and away from transaction-heavy demand-side investments. To compete for capital, EE needs stronger market infrastructure, including clear eligibility standards, credible M&V, and repeatable appraisal methods, so lenders can process projects efficiently and build confidence through portfolio experience.

A third constraint sits in enabling conditions. EE investment responds to policy signals, incentives, and institutional capability including the consistency of policy incentives, the presence of standardized M&V expectations, and the institutional routines that allow banks and firms to originate, assess, and implement EE projects repeatedly. Where policies are unclear or coordination is weak, EE can remain stuck in a "pilot zone": workshops happen and awareness improves, but the routines and incentives needed for consistent lending and implementation do not take hold. WRI's work highlights that Indonesia's transition requires re-alignment of finance flows and policy measures over time. Without sustained policy consistency, demand-side investment is harder to mainstream.

These challenges are not unique to Indonesia. Across Southeast Asia, industrial demand is growing, EE markets vary widely in maturity, and similar barriers repeat: banks lack standardized tools to assess EE risk, project developers struggle to produce bankable pipelines, and data systems for savings and emissions are uneven.[5] The recurring constraint is therefore not simply insufficient capital, but the absence of mechanisms that make EE finance replicable, including risk-sharing arrangements, verification practices, and market coordination that enable learning-by-doing.

This case study examines why a guarantee, combined with market-building support, is a plausible lever in this system. A well-designed guarantee can reduce banks' perceived downside enough to enter EE lending, while partial coverage preserves credit discipline by keeping lenders exposed to some risk. Market-building measures, including technical assistance for project readiness, standardized approaches for assessment and monitoring, and policy engagement, aim to

[5] Green Climate Fund, FP196: Supporting Innovative Mechanisms for Industrial Energy Efficiency Financing in Indonesia with Lessons for Replication in Other ASEAN Member States (2022), https://www.greenclimate.fund/sites/default/files/document/funding-proposal-fp196.pdf.

address the non-financial frictions that guarantees alone cannot solve. The analysis is based on publicly available Green Climate Fund documentation and a limited set of interviews; where program implementation details are not disclosed, the discussion distinguishes proposal-stated design from what can be evidenced in disclosed reporting.

Mechanism Overview

FP196 is designed as a two-step guarantee intermediation model that uses KDB as an accredited entity and transmission channel for GCF support into Indonesia's domestic banking system. In practice, GCF provides guarantee cover to KDB through a Guarantee Cover Agreement, including a "look-forward" pre-funding arrangement[6] intended so KDB can reliably meet eligible claim payments when local banks call the guarantee.[7] In addition, to address market barriers, including low awareness and limited capacity in the sector and within the regulatory environment, the program includes a de-risking and technical assistance package. FP196 is operationalized through three components that combine risk-sharing with market-building support: (1) Energy Efficiency Financial Guarantee, (2) De-risking Mechanisms, and (3) Technical Assistance for Market Readiness. The remainder of this section summarizes the mechanism and capital mobilization logic; subsequent sections describe each component in detail.

FP196 is a blended finance mechanism that combines concessional and catalytic public climate finance with commercial capital from local lenders and borrowers to address barriers that the market does not resolve on its own. Unlike a conventional sustainable finance transaction in which Indonesian banks would lend within prevailing credit appetite and apply sustainability primarily as an eligibility screen, FP196 adds catalytic features that change the risk-return conditions for local banks: it provides a GCF guarantee totaling USD 100 million through Component 1.

[6] Author's note: Under the Guarantee Cover Agreement, GCF pre-funds KDB on a forward-looking basis. Upon KDB's disbursement request and satisfaction of conditions precedent, GCF pays KDB the amount of eligible guarantee claims reasonably expected within the next six months. An LFI can trigger such a claim only if a borrower misses a scheduled principal or covered-interest payment that remains unpaid for 25 business days, after which the LFI must submit a demand notice within 30 days for KDB to pay, in USD and within coverage limits.

[7] Green Climate Fund, FP196: Supporting Innovative Mechanisms for Industrial Energy Efficiency Financing in Indonesia with Lessons for Replication in Other ASEAN Member States (2022), https://www.greenclimate.fund/sites/default/files/document/funding-proposal-fp196.pdf.

It also provides a grant totaling USD 5 million through Component 2 and Component 3 to support the mechanism and technical assistance. The actual lending to end-borrowers comes from co-financing, and it is expected to mobilize up to USD 133.33 million, notably in the form of senior loans from participating local financial institutions, and up to USD 9 million in the form of equity from the borrowers.[8] Put differently, the "blended" element enters upstream through public risk-sharing and grant-funded market-building, enabling downstream local banks to extend their own loans to eligible EE investments at greater scale than they would without that support.

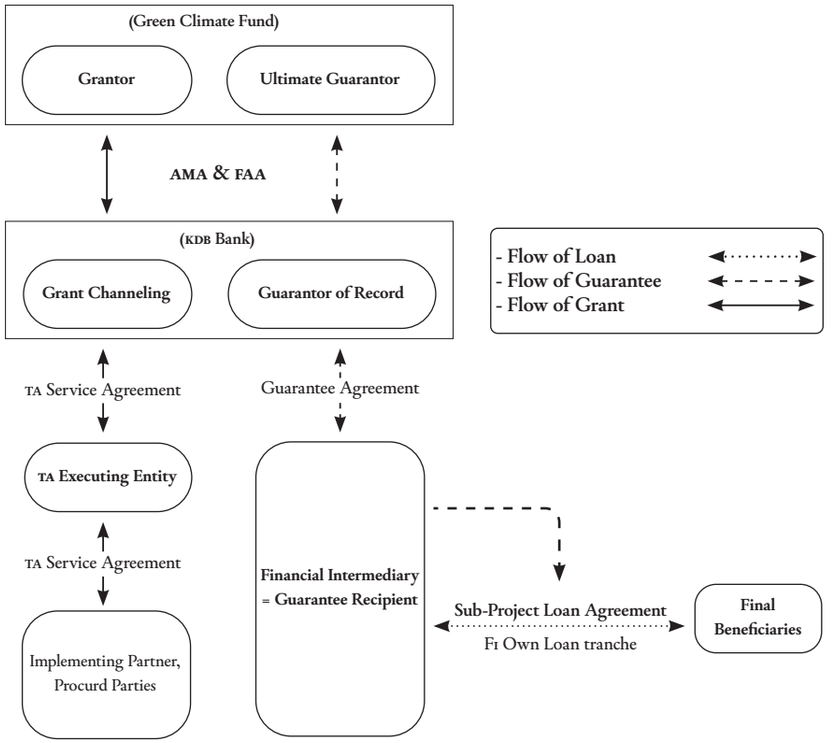


FIGURE 1: Structure Overview of FP196

[8] Green Climate Fund, "FP196: Supporting Innovative Mechanisms for Industrial Energy Efficiency Financing in Indonesia with Lessons for Replication in Other ASEAN Member States," https://www.greenclimate.fund/project/fp196.

Component 1. Energy Efficiency Finance Guarantee

This component is the program's main financing channel to encourage Indonesian local financial institutions (LFIs) to lend to industrial EE investments that they might otherwise avoid. As set out in the funding proposal, the channel operates thought a GCF-supported credit guarantee: GCF provides a prefunded guarantee line to KDB, and KDB issues partial credit guarantees to participating LFIs to cover a share of the credit risk on the LFIs' own loans to eligible EE borrowers, including small and medium enterprises (SMEs) and energy service companies (ESCOs). Coverage is calibrated by borrower segment and ranges broadly from around 50% to 95%, so the LFI always retains an unguaranteed portion. This retained exposure is the central discipline mechanism: because the bank continues to bear residual-risk, it remains responsible for origination, underwriting, pricing, monitoring, and recovery, rather than treating the guarantee as a substitute for credit assessment. In practice, even with guarantee coverage, LFIs may still seek additional credit support such as collateral or third-party guarantees, to manage the portion of the loan that remains uncovered.

Interview-based inputs from KDB emphasize a practical lender and investor rationale : Indonesian banks have been reluctant to finance EE due to limited awareness of the underlying business model and a perception that EE projects and SME borrowers present elevated risk, with credit risk identified as the core concern. To manage this risk-sharing in a disciplined way, KDB screens each guarantee request against eligibility criteria prior to issuance, including borrower size thresholds, Environmental and Social risk category, and a minimum EE improvement threshold; guarantee exposure is capped at USD 20 million per company.

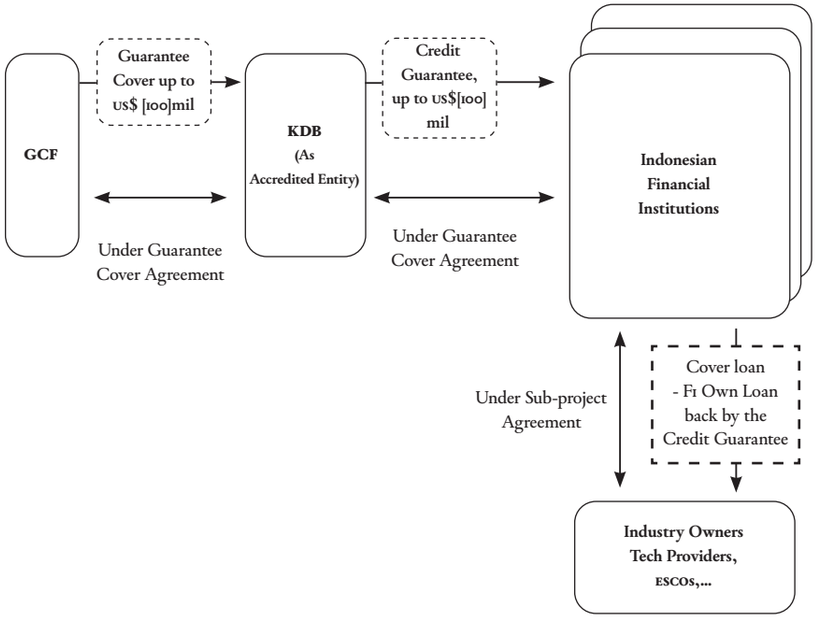


FIGURE 2: Implementation of Component 1

Component 2. De-risking Mechanisms

Under this component, the ASEAN Centre for Energy (ACE) and its technical partners work on designing a locally suitable Energy Savings Insurance (ESI) model, including practical elements such as standardized contracts and M&V approaches that can help validate whether energy savings are being delivered. In parallel, the component develops an ESCO financing structure, alongside related guidance drawing on lessons from more mature ESCO markets, so that local banks and insurers have clearer reference points for assessing, contracting, and financing ESCO-led EE projects. This mechanism is designed to support industrial EE financing beyond the credit guarantee. The intent is to strengthen industrial EE financing beyond the credit guarantee by improving standardization and confidence in performance-related claims. Implemented by ACE using Technical Assistance grant resources, this component responds directly to what KDB described as the broader constraint in the market: "low awareness and limited capacity among market players, including companies, ESCOs, financial institutions, and regulators with respect to industrial EE."

Component 3. Market Readiness

This pillar is also implemented by ACE through Technical Assistance (TA) grant resources under the program. The remaining challenges in EE are not purely financial, but also demand-side and regulatory, and are again linked to low awareness and limited capacity across both private and public stakeholders. Activities therefore focus on strengthening the ability of local financial institutions to build and manage an EE pipeline, including support for project identification and monitoring and evaluation, while also supporting industry actors on technology selection, installation, operation, and M&V. Component 3 also engages regulators through workshops and structured consultations to inform improvements in the industrial EE regulatory framework, and it includes regional knowledge sharing across ASEAN to support replication. In KDB's wording, Components 2 and 3 are "designed to address these barriers by developing local de-risking mechanisms and building market readiness."

Value Creation and Additionality

Value Creation

By combining a credit guarantee with de-risking tools and market-readiness support, the program is designed to address three linked barriers, namely financial, demand-side, and regulatory barriers, that constrain industrial EE invest-

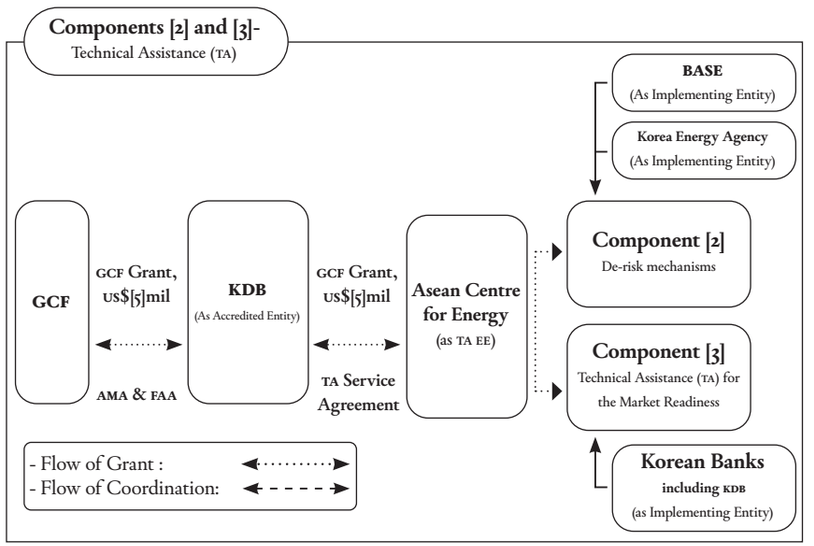


FIGURE 3: Implementation of Component 2 and 3

ment. Component 1 targets the financial barrier directly by providing partial credit risk coverage on eligible FI own loans, which can make local banks more willing to originate and maintain EE lending. Importantly, the guarantee is structured to preserve credit discipline because LFIs retain an unguaranteed portion, they continue to carry residual exposure and therefore retain incentives for underwriting, monitoring, and recovery. In this way, the guarantee translates concessional risk protection into bankable loan transactions while still building durable lending capability within domestic financial institutions.

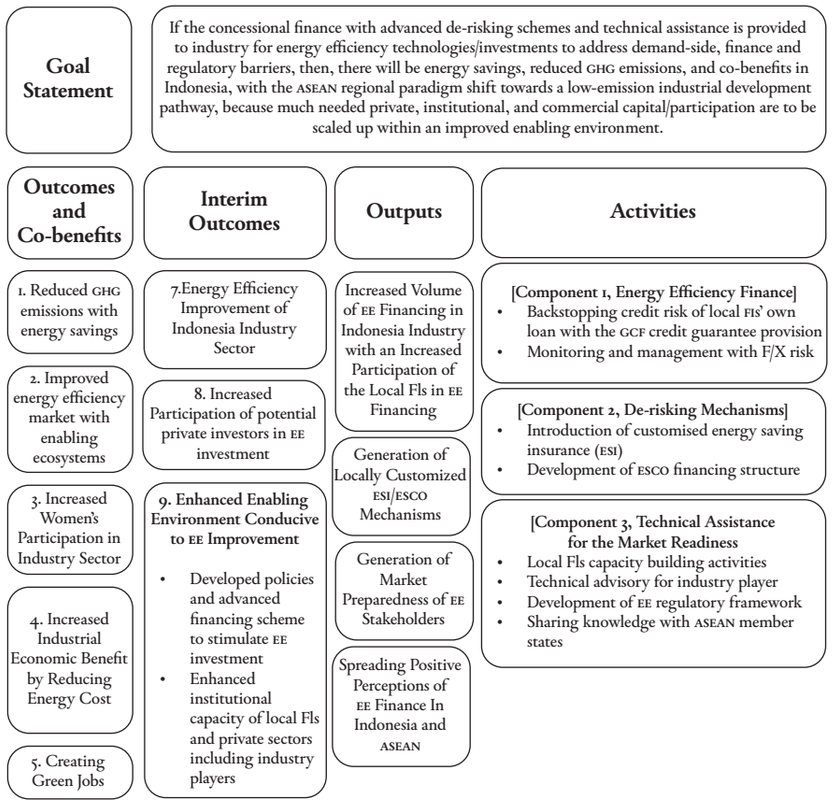
Components 2 and 3 address the demand-side and regulatory barriers that credit risk coverage alone cannot solve. Component 2 adds value by developing locally tailored de-risking mechanisms, most notably the design of Energy Savings Insurance (ESI) and associated standardized contracting and M&V approaches, as well as an ESCO financing structure, intended to improve confidence in performance-related claims and make EE projects easier to assess and finance. Component 3 complements this by building market readiness across banks, industry players, and regulators: it supports pipeline development and strengthens technical capacity for project identification, implementation, and monitoring, while also engaging policymakers to improve the enabling framework and facilitate replication across ASEAN. Together, these components are expected to create a bundled value proposition: reduced perceived downside for lenders (financial barrier), improved standardization and readiness for EE project development (demand-side barrier), and stronger coordination and policy learning to support scale and replication (regulatory barrier).

Theory of Change

FP196's impact thesis (as shown in the Theory of Change diagram in Figure 4) is that industrial EE in Indonesia can scale if three barriers are tackled together, namely finance, capacity, and enabling-environment barriers. The program starts from the premise that local banks have limited appetite and tools to lend for EE, industry players have limited information and capacity to develop EE projects, and the policy environment does not yet fully support EE investment. It then applies three linked interventions: Component 1 provides credit guarantees (and related monitoring, including FX risk follow-up) to encourage local financial institutions to increase EE lending; Component 2 develops local de-risking tools such as energy savings insurance and ESCO financing structures; and Component 3 provides technical assistance to build market readiness, strengthen lender and industry capacity, and support improvements in the EE regulatory framework and knowledge

sharing across ASEAN.

The program is expected to deliver near-term outputs, including higher volumes of EE financing, locally tailored de-risking mechanisms, and better-prepared EE stakeholders. Over time, those outputs should lead to interim outcomes including improved EE performance in industry, greater participation of private investors, and a more enabling environment for EE. The intended end-results are energy savings and reduced GHG emissions, stronger EE markets and ecosystems (in Indonesia and potentially across ASEAN), and co-benefits such as industrial cost savings, green jobs, and an increase of women's participation in the industry sector.



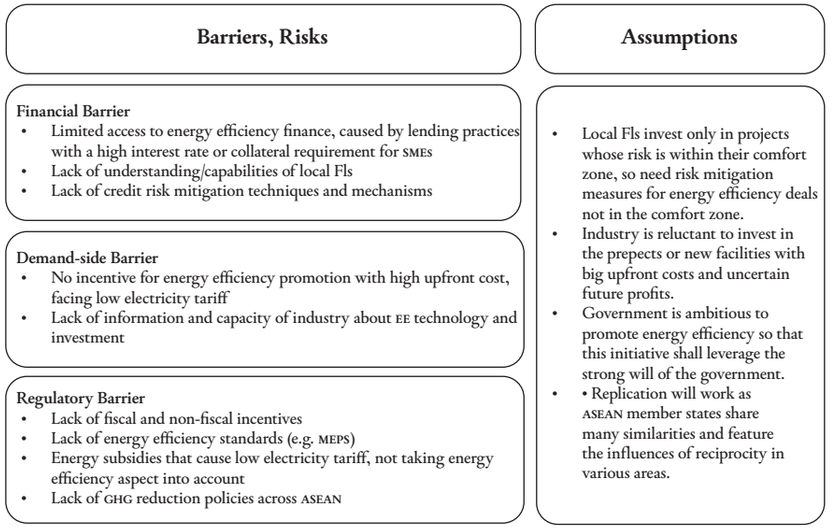


FIGURE 4: Theory of Change. Source: GCF

Additionality

FP196 frames "additionality" in two linked ways. First, it argues that a guarantee-backed structure can deliver financial additionality by changing the risk–return profile of industrial EE lending for local banks, so capital is mobilized into transactions that would otherwise be delayed, downsized, or priced out. Second, it positions the program to generate impact additionality by moving EE from isolated upgrades into a more replicable investment pipeline, supported by technical assistance and new market practices that strengthen implementation and monitoring. Importantly, this demand-side focus also aligns with Indonesia's broader energy-transition agenda: the proposal treats EE as a practical way to advance transition outcomes not only through changes in energy supply, but also through reducing energy intensity and emissions on the consumption side, especially in industry.

Financial Additionality

In FP196, the main financial additionality is framed as the use of a GCF-backed guarantee to mobilize domestic bank balance sheets into a segment that banks consider unfamiliar and risky. The proposal is explicit that liquidity is not the binding constraint; rather, it is perceived risk around EE projects and technologies, and SME-type borrowers, that keeps banks from lending on workable terms. By providing a USD 100 million guarantee facility, the program aims to mobilize co-financing from local financial institutions and borrowers (USD 133.33 million

in LFI senior loans plus USD 9 million in borrower equity), implying an indicative guarantee-to-co-financing ratio of 1.0 : 1.43.

The proposal also frames pricing and terms as part of the additionality: it notes that existing EE deals can price in the high teens or above 20%, while the program targets covered loans around ~10%, and argues that a single-digit to low-teen interest range is needed to induce both financiers and industries to participate.[9] On tenor, FP196 includes longer tenors than typical short-term corporate lending assumptions in this market framing: the co-financing table indicates 10-year senior loans (with a 3-year grace period), and the guarantee terms set a maximum tenor up to 10 years (or shorter depending on completion). This matters because many industrial EE investments require upfront capital expenditure while savings accrue over time, so longer tenors (and grace periods where relevant) can better align debt service with the project's cash-flow profile and reduce repayment pressure in the early implementation period. Finally, the program treats "new borrower segment" additionality as central: it is designed to pass through concessionality to end-beneficiaries (notably SMEs) and keep banks engaged in origination and monitoring so that the market can build confidence and repeat lending after the program.

Impact Additionality

FP196 aims to move EE from "hard to finance pilots" into replicable industrial investments, by combining risk-sharing (Component 1) with technical assistance and new de-risking tools (Components 2–3). The proposal links the guarantee to increased deployment of EE technologies and then to measurable outcomes through program-level reporting, including energy savings and emissions reductions, with indicative targets such as energy savings (for example, 10,065 GWh) and mitigation outcomes (for example, total expected mitigation outcome around 3.139 MtCO2eq) over the program and technology lifetimes.

It also argues that the intervention should change market practice, not just fund isolated upgrades, by (i) improving banks' ability to assess and manage EE credit risk over a real lending cycle, and (ii) developing locally customized mechanisms like energy savings insurance and ESCO-related financing approaches so that the EE market can function with less reliance on external support over time. Eligibility criteria is used to ensure that the borrowers and its investment meets GCF's requirements, including but not limited to minimum Energy Efficiency improvement and E&S risk category.

[9] Author's note: These pricing ranges are presented as proposal framing and should be treated as indicative unless separately evidenced.

Risk Allocation and Stakeholder Economics

Eligibility and Screening

Once a potential energy-efficiency investment enters the program pipeline, the next step is to determine whether it qualifies for guarantee support under Component 1. The following section therefore focuses on the eligibility filters and screening criteria, including borrower thresholds, minimum expected efficiency gains, and environmental and social risk classification, that define which projects can proceed under FP196 and how risk is managed at entry.

Guarantee Eligibility Criteria

FP196 supports industrial EE projects in five priority subsectors: food & beverage; textiles & apparel; pulp/paper/wood; chemicals & petrochemicals; and non-metallic minerals (including cement). Eligible investments focus on major energy-using systems, especially motor systems, boiler/steam systems, and process cooling (plus cement-specific systems) and on standard, scalable EE technologies such as efficient pumps, fans, compressors, motors, variable frequency drives (VFD/VSD), steam boilers and economizers, chillers, and waste heat recovery (WHR) for cement. This targeting is intended to concentrate support on high-energy-use applications where savings potential is material and performance can be assessed more consistently.

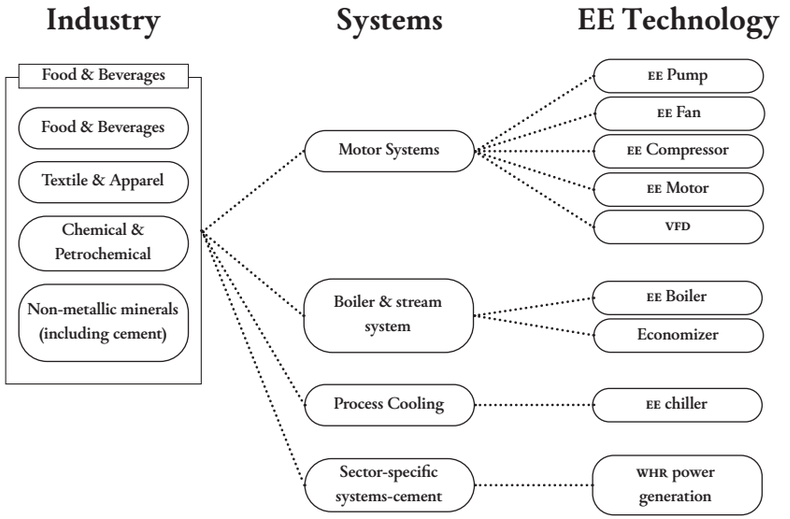


FIGURE 5: Eligible Energy Efficiency Technology.
SOURCE: GCF

Projects must also pass a set of entry filters. Borrowers must have annual sales below USD 200 million; projects must show an expected ≥20% efficiency improvement (with specified exceptions for best-in-class equipment where relevant); and only E&S Category B or C projects are eligible (Category A excluded). Guarantee coverage is then linked to borrower size: less than USD 35 million in annual sales (Class A) can receive up to 95% coverage, and USD 35 million to 200 million in annual sales (Class B) up to 50%, with a USD20 million cap per company, while there are no annual sales for the ESCOs. Together, these filters and technology focus are designed to reduce credit and implementation risk at entry and strengthen the credibility of expected energy-savings outcomes.

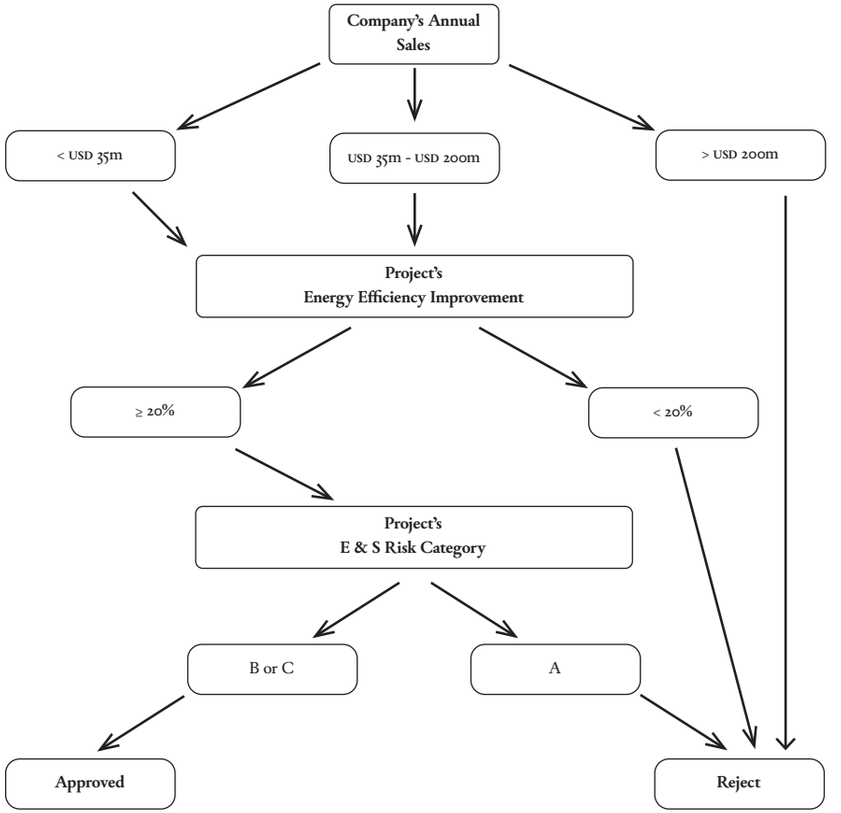


FIGURE 6: Project's Entry Filter (no limit for ESCOs).
SOURCE: KDB

Guarantee Terms and Process

This subsection summarizes the standardized implementation terms through which KDB operationalizes the credit guarantee, translating GCF support into bankable lending by Indonesian LFIs. In practice, these terms define how the guarantee is issued, how risk is shared, and how performance is managed across the full cycle, from loan origination and eligibility checks, to guarantee coverage and pricing, to default triggers, claim submission, payment, and recovery.

KDB clarifies the responsibilities of each party: LFIs remain the originating lenders and loan managers for the underlying "FI own loans," while KDB acts as the guarantor of record and program supervisor, applying agreed eligibility criteria and

monitoring requirements to ensure that the guarantee is used consistently and in line with the funding proposal. The terms below summarize the key operational conditions that KDB implements within the guarantee mechanism described in the previous section.

Terms	Description
Structure overview	GCF → KDB → Local Financial Institutions (LFIs) → Borrowers. GCF provides a prefunded guarantee facility to KDB; KDB issues guarantees to participating Indonesian LFIs; LFIs originate and manage their own loans to eligible industrial EE borrowers.
Instrument	Credit guarantee backing a portion of each eligible FI own loan (not direct lending by the program).
Guarantor (of record)	KDB (pays eligible claims to LFIs under Guarantee Agreements, using the GCF-backed prefunding mechanism).
Guarantee benefi-ciaries	Participating Indonesian LFIs extending eligible loans.
End-borrowers	Industry owners, enterprises, technology providers, ESCOs, or project developers.
GCF **funding package**	USD105 million total: USD100 million guarantee + USD5 million grant (grants support TA/market readiness components and program M&E).
Expected co-financing	Up to USD 133.33m senior loans from participating LFIs + up to USD 9m borrower equity (plus smaller in-kind contributions shown in the financing tables).
Tenor	Up to 10 years (maximum tenor is the shorter of 10 years and the remaining period until completion date, per the program terms).
Currency	USD (guarantee is denominated in USD; claim payments are made in USD).
Coverage ratio (by beneficiary class)	Class A / ESCOs (annual sales < USD 35m): up to 95% of eligible loan amount. Class B (USD 35m–USD 200m): up to 50% of eligible loan amount.
Single borrower cap	Maximum guarantee exposure per company: USD 20m (applies to both Class A and Class B).
Risk retention	LFIs retain the unguaranteed tranche (skin-in-the-game). In practice, LFIs may still request collateral for their retained exposure, but there should be no other guarantees in favour of the Lender other than under the Master Guarantee Agreement, entered between KDB and the Lender.
Borrower equity requirement	Class A / ESCOs: min 5% of total investment cost. Class B: min 10% of total investment cost.
Eligible investment cost (definition)	Total Eligible Investment Cost = Total Cost – Borrower Equity Injection. (Total cost = cost of purchasing EE technologies/equipment; equity injection = portion paid by borrower.)

Loan pricing caps (borrower-facing)	Interest Rate may not exceed 8% for USD Loan and 12% for IDR Loan (Interest Rate 8%/12%)
Guarantee premium	0.75% per annum (paid for the guarantee cover).
Ranking	Each FI own loan ranks pari passu with other senior loans of the borrower.
Guaranteed risk (trigger)	Guaranteed risk (trigger): Eligible Borrower fails to pay any Scheduled Payment when due in accordance with the terms of the Eligible Facility Agreement and such payment remains unpaid 180 days after the original due date
Covered amount	Scheduled payment includes principal and covered interest due under the payment schedule; excludes break/unwinding costs on prepayment, default interest, penalties/fees, and gross-up amounts not expressly covered.
Claim submission (timing)	LFI can file a payment demand within 30 days after the guaranteed risk occurs, confirming the overdue amount has not been recovered since the demand date.
Claim payment	KDB pays the guaranteed amount in USD as specified in the demand notice; payments are limited to the amount that GCF has paid to KDB under the guarantee cover arrangement.
Subrogation & recoveries	After payout, KDB is subrogated to LFI rights/remedies against the borrower to the extent of the guarantee payment. LFIs must continue collection efforts; recoveries are passed to the guarantor up to the amount paid, within the specified timeframe.
LFI **obligations (high-level)**	LFIs must manage loans in good faith and with the same care as other non-guaranteed assets, notify KDB of defaults/material events in line with the terms, continue collection even after payout, and comply with monitoring/ reporting requirements.
Monitoring support	Program includes professional monitoring support (for example, Guarantee Advisor) to track performance and manage risks including currency risk monitoring referenced in the program design.

TABLE 1: Guarantee Term
SOURCE: KDB

Risk Allocation and Mitigants

To clarify the main risks that directly affect credit outcomes, and how those risks are mitigated through the program, the table below summarizes key risk factors, associated mitigants, and the actors that bear and manage each risk.

Terms	Description	Mitigation
Technical and Operational Risk	End-beneficiaries may lack the skills to operate and maintain new EE equipment, reducing realized savings and affecting repayment capacity.	LFIs require technical assessment and an O&M plan in the loan and guarantee application; KDB enforces these eligibility conditions through guarantee screening; ACE supports borrower readiness and O&M capability through Component 3 TA (on request).
Governance Risk	Principal–agent risk because LFIs control sub-project selection and loan management, while KDB oversees borrowers indirectly through LFIs, creating potential misalignment with program criteria (including E&S and gender).	KDB vets and selects partner LFIs and sets obligations via the Master/Guarantee Agreements; GCF/KDB require partial (not 100%) coverage so LFIs retain "skin-in-the-game"; LFIs, KDB and Guarantee Advisor take parts in sub-project monitoring.
Credit Risk	The guarantee facility is exposed to borrower defaults up to the coverage ratio, and information asymmetry can weaken screening and underwriting quality.	KDB shortlists LFIs based on creditworthiness/reputation; LFIs retain residual exposure under partial guarantees and conduct underwriting/monitoring; borrowers provide mandatory equity injection; There is no limitation regarding the borrower's credit rating, as this programme aims to back-stop credit risk of local SMEs.
Currency Risk	Currency risk is limited under the current design because the guarantee, claim payments, and underlying loans are denominated in USD; however, mismatch risk could arise if participating LFIs originate sub-project loans in IDR while guarantee claims are paid in USD, particularly if IDR appreciates against USD.	KDB oversees monitoring and hires a Guarantee Advisor to track and manage currency-risk developments. Programme participants decided not to use the FX risk management mechanism introduced in the Funding Proposal, due to its complexity. Therefore, GCF doesn't absorb any FX risks. The risk is borne by the lenders and the borrowers.
Legal Risk	Multi-party contracts may face enforceability or misalignment issues across jurisdictions.	KDB standardizes key program agreements under English law with SIAC arbitration (FAA/Guarantee/TA agreements); LFIs use standard Indonesian-law sub-project loan agreements within their core business practice; KDB/LFIs/ACE use independent legal counsel to reduce drafting, alignment, and enforceability risks.

Regulatory Risk	Long-term EE incentives and reforms may progress slowly due to cross-ministry coordination needs and competing economic priorities.	ACE (Component 3, incl. Activity 3.3) supports policy engagement and stakeholder coordination; KDB maintains program operation through the guarantee framework even if reforms are slow; demonstration of economic benefits from implemented EE projects is expected to strengthen policymakers' willingness to improve the EE framework over time.

TABLE 2: Risk Matrix
SOURCE: GCF

From KDB's standpoint, the risks discussed above relate mainly to the use of GCF concessional funding and the performance of the guarantee portfolio, but the program also explicitly targets risks faced by local financial institutions. From the LFIs' perspective, the central concern is credit risk, whether SME and ESCO borrowers will be able to repay their loans, which is why the guarantee is framed as backstopping credit risk for smaller companies that typically face tight collateral requirements. Participating banks retain at least 5 percent of the loan exposure and often still request additional collateral, so the guarantee reduces but does not eliminate their risk.

In FP196, GCF could absorb foreign exchange risk. However the stakeholders decided not to use the FX risk mitigation mechanism. Therefore, GCF doesn't absorbs FX risk.

Environmental and social risks are managed through E&S standards and due diligence requirements based on GCF and IFC type frameworks, providing an additional layer of risk management for participating banks.

The incentives embedded in the structure become clearer when viewed through stakeholder economics, namely what each actor earns, what risks each retains, and how those choices shape underwriting discipline and implementation behavior.

Stakeholder Economics

GCF

GCF's financial return is not framed as yield maximization; it mainly seeks to preserve its guarantee resources through agreed eligibility rules, safeguards, monitoring, and recovery/subrogation arrangements, while receiving a guarantee cover

fee funded out of the guarantee premium stream. In exchange, GCF accepts contingent credit-loss exposure (via guarantee cover to KDB) and, per the program design, absorbs part of the currency-risk burden where relevant. GCF's primary "return" is impact: mobilizing commercial lending into industrial energy efficiency that would otherwise be constrained, with emissions reductions and energy savings to be quantified under the agreed methodology and verified through the program's verification plan, and with an explicit intent to generate transferable learning for replication across ASEAN.

KDB

KDB operationalizes the guarantee and earns an implementation-related return through fees/premiums collected from participating LFIs, remitting an agreed portion to GCF as the cover fee and retaining the remainder to cover administration and monitoring costs (including the Guarantee Advisor funded via the AE fee). KDB makes its best efforts to monitor the programme, with support from an independent Guarantee Advisor and Executing Entity (ACE) conducting due diligence. KDB implements various mitigation measures to ensure that there will be no full execution risk and to keep the mechanism credible for both GCF (standards and reporting) and local banks (workable documentation and processes).

LFIs

LFIs earn standard banking returns from interest income (within program caps of 8% for USD loans and 12% for IDR loans) plus any normal lending fees, while gaining risk protection through partial guarantee coverage (up to 95% for Class A/ ESCOs and up to 50% for Class B). In return, LFIs accept and retain residual credit exposure on the unguaranteed portion, and maintain full responsibility for origination, underwriting, monitoring, and recoveries. Longer tenors (up to 10 years, with co-financing assumptions including a 3-year grace period) help align repayment with EE cashflow profiles.

Non-financial value comes from ACE-led capacity building and standardized tools that strengthen EE project appraisal, monitoring, and data practices, as well as a more consistent E&S process aligned with IFC-type standards. Over time, the combination of partial risk coverage and learning-by-doing is intended to help LFIs treat EE lending as a more routine asset class.

Borrowers

Borrowers receive improved access to credit for EE capital expenditure under capped interest rates and longer tenors, enabling upgrades that reduce operating costs. In exchange, they must provide equity injection (typically 5% for Class A/ ESCOs and 10% for Class B), meet eligibility thresholds (e.g., expected ≥20% efficiency improvement and E&S category limits), and comply with monitoring/data requirements through the LFI relationship. The guarantee reduces the collateral hurdle, as KDB covers a large share of the loan exposure, although LFIs still often seek some additional collateral to cover their residual risk. Because the final beneficiaries are industry players, the borrowers usually pay the premium.

Beyond cheaper or more available finance, design features such as the minimum 20 percent efficiency improvement criterion, ACE's technical due diligence, and energy use monitoring are intended to improve the reliability of expected savings / support more reliable savings. Over time, this can translate into higher margins and competitiveness for firms, as well as a track record that may lower their financing costs even outside the program.

These incentive structures are reinforced by de-risking and technical-support functions that operate beyond the guarantee itself, shaping how projects are appraised, how savings are verified, and how EE finance may become repeatable across the wider market.

Governance and Accountability

Governance and Accountability Chain

LFIs retain decision rights over credit origination and loan management for FI own loans, while KDB controls access to guarantee coverage by applying eligibility rules through its guarantee agreements. Interview inputs indicate that ACE provides technical due diligence support (including E&S categorization) and reports findings to KDB, which uses these inputs and lender-submitted information to decide whether to issue a guarantee for a given sub-project.

Accountability follows a layered reporting chain: LFIs collect borrower-level information through the lending relationship and report it to KDB via program templates and periodic reporting routines; KDB consolidates portfolio information for program oversight and onward reporting to GCF through program reporting cycles (for example, APRs).

The proposal indicates KDB plans to hire an independent Guarantee Advisor to support monitoring of sub-project performance and changes in credit risk, including review of key contracts, with findings reported to KDB and shared with LFIs where needed. For results credibility, the interview notes that an external auditor is expected to verify GHG emission reductions mid-program. For safeguards transparency, E&S Category B sub-projects require public disclosure of ESIA/ESMP (English and Bahasa Indonesia) prior to loan approval, with ongoing monitoring reflected in program reporting.

FP196 acknowledges a principal–agent risk because LFIs control loan decisions and borrower management, while KDB's oversight is indirect. Partial guarantee coverage keeps LFIs exposed to residual credit risk, reinforced by eligibility screening, E&S and gender obligations, and reporting requirements.

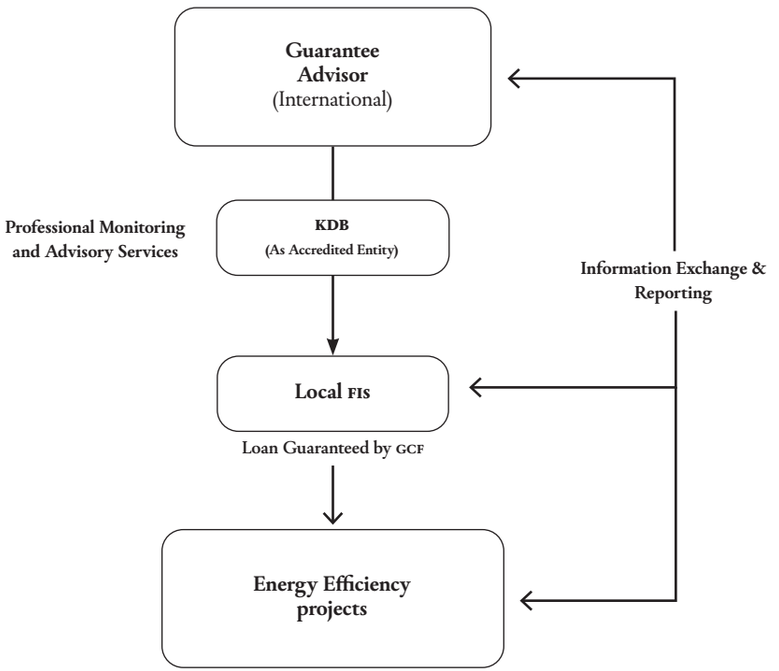


Figure 7: Monitoring and Reporting.
SOURCE: GCF

Performance Evidence

As FP196 only began signing and disbursing in August 2024, the available realized results should be read as an early implementation snapshot rather than a mature performance track record. Disclosed reporting to date mainly captures initial guaranteed lending volumes, while portfolio credit outcomes such as defaults, guarantee claims, recoveries, and portfolio yield are still expected to emerge as projects are implemented and repayment data accumulate. With KDB's guarantee support, IBK Indonesia is the first LFI that executed a loan with a portfolio totaling USD 27,685,853. At this early stage, the disclosed information does not yet provide figures on defaults, guarantee claims, recoveries, or portfolio yield, which is consistent with a new guarantee program where repayment performance and loss experience typically require more seasoning time and where EE projects may have a lag between financing, installation, and stabilized operational savings.[11]

To judge whether FP196 is delivering catalytic effect beyond early system set-up, disclosed reporting would need to provide, at minimum, portfolio performance indicators including defaults, guarantee claims, recoveries, and net portfolio yield, as well as evidence of repeat origination by participating LFIs, including whether pricing and tenor terms for EE lending shift over successive lending cycles. These are the core indicators needed to evaluate whether the guarantee is generating disciplined portfolio behavior beyond initial deployment.

Outcome Evidence

FP196 uses the GCF Integrated Results Management Framework (IRMF) as the main impact -assessment structure. The program is classified as mitigation-focused, and it frames "impact" at two linked levels: (i) paradigm shift potential, assessed through scale, replicability, and sustainability, and (ii) results indicators that track emissions, energy savings, and enabling conditions for a durable EE market.
At the outcome/results level, the proposal selects IRMF indicators and specifies how they will be evidenced. For mitigation, it includes Core Indicator 1 (GHG emissions reduced/avoided) and Supplementary Indicator 1.1 (annual energy savings), with measurement relying on (a) program GHG/energy saving reports verified by an independent verifier, and (b) annual performance reports that compile data "from end borrowers and FIs." It also includes Core Indicator 3 (value of physical assets made more resilient / able to reduce GHG emissions), evidenced through project financial reporting on total cost and asset value sourced from end borrowers and FIs.

Operationally, LFIs translate this framework into project-level requirements by embedding eligibility and reporting obligations into the FI own-loan process and compiling the information needed for IRMF indicators, including energy use, savings, and basic project financial data. KDB then acts as the central aggregator and reporter, organizing this information into annual program reporting and supporting the planned independent verification step referenced in the logical framework to strengthen the credibility of reported GHG and energy-saving outcomes.

At this stage, disclosed project-level outcome signals remain limited but are directionally consistent with the program's intended impact logic. The reporting document notes that each financed sub-project is expected to deliver more than 20% energy-efficiency improvement, and that the sub-projects financed so far are classified as E&S Category C. These early disclosures are informative about expected technical and safeguards characteristics, but they do not yet constitute independently verified evidence of realized energy savings or emissions reductions.

To assess realized outcomes beyond the current design stage, disclosed reporting would need to provide independently verified energy savings and associated emissions reductions, with clear attribution and time basis. Until that evidence is available, the chapter is stronger on outcome architecture and intended measurement logic than on demonstrated results.

Enabling Environment

Market Readiness and Regulatory Conditions

Beyond the guarantee itself, FPI96 also depends on enabling conditions that support repeatable EE lending across the wider market. The program's technical-assistance and de-risking components are designed to strengthen more than individual transactions: they aim to improve project readiness, shared technical understanding, and the regulatory and institutional routines needed for EE finance to become repeatable. In this respect, Component 2 develops locally tailored de-risking tools such as Energy Savings Insurance and ESCO-related financing structures, while Component 3 builds market readiness by strengthening lender and industry capacity, supporting project identification, monitoring and evaluation, and engaging regulators and regional stakeholders around improvements in the EE framework.

Early implementation disclosures already point to this wider market-building function. ACE convened with OECD, OJK, and BASE to discuss implementation plans for a customized Energy Saving Insurance approach, and conducted a Market Assessment Study to identify priority EE technologies to be de-risked; ACE delivered the Market Assessment Report to KDB in January 2025, with KDB indicating it will share the report in the next APR. The same disclosure highlights that many financing institutions and industry players still have limited capacity to understand EE projects, and that ACE supported this gap by conducting due diligence for E&S categorization to assist LFIs and relevant industry players in assessing EE sub-projects. In parallel, ACE engaged the Ministry of Industry through consecutive meetings to map existing policies and identify areas needing an EE framework, indicating that the disclosed activities are consistent with an early focus on strengthening the conditions for a scalable pipeline.

At this point, disclosed results lean more toward set-up, capacity building, and market-conditioning efforts than toward fully quantified impact and portfolio credit statistics. This reflects the program's short operating history since first disbursement, the practical time needed for EE measures to be installed and monitored, and the acknowledged capacity constraints in the local market that the TA components are intended to address.

To judge whether FPI96 is generating catalytic effect beyond early system set-up, disclosed reporting would also need to show progress on market-building outputs, including adoption of standardized assessment and M&V routines, uptake of de-risking tools such as Energy Savings Insurance and ESCO financing approaches, and documented improvements in the enabling framework where relevant. These indicators matter because the guarantee is intended not only to support early lending, but also to make EE finance more legible and repeatable across institutions over time.

In this sense, the enabling environment for FPI96 is not a passive backdrop to the guarantee, but part of the intervention logic itself: it shapes whether early guaranteed transactions can mature into repeatable lending practice and broader market confidence.

Post-program Sustainability

After the exit of GCF and KDB, the funding proposal states that the program should not leave Indonesia's EE market dependent on external concessional support. Instead, it aims to help create the "enabling circumstances" needed for EE to continue as a functioning market activity once guarantee support ends. In this framing, the guarantee is treated as a temporary catalyst to unlock early lending and learning-by-doing, while the longer-term goal is to normalize EE project development and financing within domestic institutions.

The proposal links the exit strategy to the program's market-building components, especially Component 3 (market readiness), which it describes as an important factor for reducing reliance on concessional financiers and donors. It also highlights the importance of integration into government planning and recovery measures, for example through ongoing engagement with relevant ministries to map existing policies, identify gaps in the industrial EE framework, and align EE financing and implementation practices with national planning processes. Alongside this, the development of locally adapted de-risking mechanisms and the program's replication intent are positioned as ways to sustain activity in the EE ecosystem beyond the life of the GCF-supported facility.

Lessons and Implications

Given how new the program is, early results are best understood as signals of system formation rather than proof of long-term performance. Initial lending supported by the guarantee and early TA activities (market assessments, policy engagement, and technical support for project screening), suggest that implementation is focused on building the conditions for scale. The broader lesson for blended finance is that closing the EE financing gap requires more than credit enhancement: it requires a risk-sharing design that preserves lender discipline, a clear split of roles across actors, and supporting tools that turn isolated upgrades into a pipeline that can be financed repeatedly. The proposal's exit logic follows the same systems view: success is defined by whether domestic institutions and market practices become strong enough that EE lending can continue with less reliance on external guarantees over time. Based on the discussion above, sets of lessons learned are summarized in the table below:

Terms	Description	Mitigation
Guarantee Mechanism	Guarantees work best as a risk-sharing design that preserves credit discipline.	In FP196, LFIs retain an unguaranteed share (e.g., at least 5% for high-coverage borrowers, and materially more for other segments), which keeps them financially exposed and therefore incentivized to underwrite, monitor, and pursue recoveries as they would for non-guaranteed loans. This matters for energy efficiency because repayment capacity is linked to real-world implementation and operating performance, so maintaining lender discipline helps protect both portfolio quality and the credibility of expected energy saving outcomes.
Guarantee Eligibility	Eligibility design can function as a market-building tool	Guarantee is limited to defined industrial subsectors and standard EE systems/technologies, and each sub-project must pass clear filters, borrower size (< USD 200m sales), expected EE improvement (≥20%), and E&S category (B/C only; A excluded), with coverage tiers linked to borrower class and a USD 20m cap per company. These rules help create a more consistent deal template for banks and reduce uncertainty about what qualifies and how savings claims are assessed. In practice, LFIs apply the criteria in origination and documentation, ACE supports technical checks (including due diligence/E&S categorization), and KDB enforces the gate by issuing guarantees only when eligibility conditions are met.
Technical Assistance	Technical assistance as part of the risk management / risk sharing strategy.	EE capacity-building in Indonesia often remained short trainings and did not translate into sustained implementation, so Components 2 and 3 are structured to support execution alongside lending. In practice, ACE focuses on improving project readiness and shared technical understanding (including guidance relevant to implementation and monitoring), LFIs build capability through "learning-by-doing" as they develop pipelines and manage EE loans, and policymakers are engaged through Component 3 activities to reduce coordination and framework gaps. This division of roles supports the guarantee by making EE projects more consistently assessable and monitorable, which is a precondition for banks to lend.
Replicability	Modeling a replicable structure into transferable standards and routines	FP196 is explicitly designed for replication in other ASEAN Member States and includes ASEAN knowledge sharing under its market-readiness work. In practice, KDB provides the repeatable backbone (standard eligibility rules, monitoring templates, and guarantee operations), ACE develops market-readiness and de-risking tools and disseminates learning, and LFIs generate evidence through repeated origination and reporting, together creating a package that can be adapted to other ASEAN contexts. In practical terms, the transferable package consists of (i) a defined eligibility and coverage rulebook, (ii) standardized documentation and claims and recovery procedures, (iii) portfolio monitoring templates and reporting routines, and (iv) replicable market-building toolkits (M&V guidance and de-risking instruments) that reduce appraisal friction for subsequent lenders and borrowers.

Exit logic	Blended finance should be designed with a testable exit logic even if it does not claim an early exit.	The goal of this program is not to keep guarantees forever, but to use them as a temporary bridge while the ecosystem learns. If the program succeeds, banks should become comfortable with EE underwriting; project developers and ESCOs should be able to prepare bankable proposals; and policymakers should have clearer signals and coordination on EE frameworks. At that point, the guarantee can become more targeted (for example, focused only on smaller borrowers or riskier technologies) or gradually reduced, because the underlying market has become more capable. That is what it means to shift EE from isolated upgrades into a replicable pipeline: not that risk disappears, but that risk becomes understood, priced, and managed locally without depending indefinitely on external credit enhancement.

Table 3: Lessons Learned

Conclusion

This case study examines FP196 as an example of a guarantee-led, domestically intermediated approach to scaling industrial energy-efficiency finance in Indonesia. The program design reflects a systems diagnosis: energy-efficiency opportunities remain under-deployed not only because of capital scarcity, but because risk perception, transaction fragmentation, and enabling-environment frictions inhibit repeatable lending and implementation. In that context, the guarantee is designed to reduce perceived downside while preserving credit discipline through residual lender exposure, and the associated de-risking and technical-assistance components are designed to address the non-financial constraints that would otherwise prevent performance-linked investments from becoming routine.

Given the program's early stage, the appropriate standard for assessment is not mature realized performance, but whether the mechanism is establishing credible conditions for replication: consistent eligibility and screening, disciplined origination and monitoring by local financial institutions, a functioning governance and reporting chain, and the accumulation of comparable evidence on repayment performance and verified energy savings. Over time, FP196's practical relevance will depend on whether these design features translate into a durable shift in local market behavior, such that energy-efficiency lending can be repeated with progressively less reliance on external credit enhancement and stronger domestic capacity to sustain the market beyond the program period.

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Market Creation and Market Scaling in Gender Finance: Comparing Blended Finance Architectures for Women's MSME Credit in Indonesia

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Abstract

This case compares two blended-finance architectures addressing a common investment problem: the persistent mispricing of women-led and women-serving MSME finance in Indonesia and the wider ASEAN region. Rather than treating gender-lens blended finance as a single model, it argues that distinct structures perform distinct market functions within the same ecosystem. Women's World Banking Capital Partners II (WWB CP II) is examined as a market-creation mechanism that combines catalytic, risk-bearing capital with technical assistance to make women-serving financial intermediaries more investable where institutional, governance, and data constraints deter conventional capital. The Japan ASEAN Women Empowerment Fund (JAWEF), by contrast, is examined as a market-scaling mechanism. Through a layered structure of junior, mezzanine, and senior capital, it reallocates risk in ways intended to mobilize institutional investors into women-focused microfinance portfolios across ASEAN and South Asia.

The comparison shows that the relevant design question in blended finance is what function concessional capital performs and at what stage of market development. The two cases also generate different kinds of evidence: WWB CP II offers a clearer Indonesia-linked pathway through investee-level signals associated with Amartha, whereas JAWEF offers stronger public evidence on regional fund-level mobilization, outreach, and investor participation, but more limited Indonesia-specific disclosure. Together, the case suggests that scaling gender-lens finance will require a shift from deal-level optimization to system-level design, including closer alignment between concessional capital and clearly defined market functions, stronger shared data and MSME financial infrastructure, and reduced dependence on repeated public risk absorption over time.

Case Summary

	WWB–JAWEF Summary (Indonesia Gender Finance)
1. Case Theme	Comparative gender-lens blended finance for women's MSME credit in Indonesia and ASEAN
2. Blended Finance Archetype	Catalytic growth capital with TA (WWB CP II) and blended private debt fund with tranche-based sub-ordination
3. Primary Catalytic Instrument	WWB CP II: first-loss/risk-bearing capital plus TA; JAWEF: junior and mezzanine protection for senior investors
4. Capital Channel and Users	WWB CP II: LPs → fund → women-serving intermediaries/fintechs; JAWEF: public/catalytic/institutional investors → fund → MFIs → women borrowers
5. Primary Market Function	WWB CP II: investability creation; JAWEF: scaled capital mobilization
6. Evidence Status	WWB CP II: stronger Indonesia-linked investee evidence; JAWEF: stronger regional fund-level evidence, weaker Indonesia-specific disclosure
7. Replicability Vector	Paired design logic: market creation where investability is weak, market scaling where intermediaries are mature but scale capital is constrained
8. Capital Scale and Structure	WWB CP II reached a USD 103 million final close; JAWEF expanded to USD 241 million through a layered debt structure with subordinated protection for senior investors
9. Locus of Catalytic Intervention	WWB CP II: fund and investee-transformation level through risk-bearing capital and TA; JAWEF: fund capital-stack level through junior and mezzanine risk transfer

This chapter compares two blended-finance architectures deployed against a common investment problem: the persistent mispricing of women-led and women-serving MSME finance in Indonesia and the wider ASEAN region. Despite policy commitments to financial inclusion and a large base of women-led enterprise activity, access to formal finance remains uneven, shaped not only by borrower characteristics but by underwriting norms, data asymmetries, and institutional risk perceptions that often render women-focused enterprises less legible as investable opportunities.[1] These constraints reflect structural features of financial intermediation rather than any simple absence of demand.[2] The chapter therefore adopts a functional comparative frame, asking how different capital-stack designs intervene at different stages of market development that coexist within the same ecosystem.

Women's World Banking Capital Partners II (WWB CP II) is examined as a market-creation mechanism. By combining risk-bearing capital with technical assistance and gender-focused institutional support, it seeks to make women-serving financial intermediaries more investable upstream, particularly where operational, governance, or data constraints deter conventional capital.[3] In the materials reviewed for this chapter, WWB CP II offers the clearer Indonesia-linked pathway, most visibly through its investment in Amartha and through associated evidence on institutional practice, outreach, and company-level performance. Even here, however, the chapter distinguishes carefully between fund-level facts, investee-level evidence, and broader ecosystem inference.[4]

The Japan ASEAN Women Empowerment Fund (JAWEF), by contrast, is examined as a market-scaling mechanism. Through a layered structure of junior, mezzanine, and senior capital, it reallocates risk in ways intended to mobilize institutional

[1] Microsave, Policy note on Women Financial Inclusion in Indonesia, https://www.microsave.net/wp-content/uploads/2025/10/Final_PolicyNote_G20_v2-1.pdf

[2] "International Finance Corporation. 2016. Women-Owned SMEs in Indonesia: A Golden Opportunity for Local Financial Institutions. © World Bank. http://hdl.handle.net/10986/25403 License: CC BY-NC-ND 3.0 IGO." https://openknowledge.worldbank.org/server/api/core/bitstreams/doda5857-f69d-5c12-9e60-56e287230b24/content

[3] Women's World Banking. 2022 Impact Report (p 24-29).
https://www.womensworldbanking.org/wp-content/uploads/2023/06/WWB-2022-Impact-Report.pdf

[4] Government of Indonesia (DNKI). SNKI official site https://snki.go.id/, National Stratgey on Indonesian Financial Literacy 2021-25, https://snki.go.id/wp-content/uploads/2023/02/Laporan-SNKI-2020-v8.pdf, https://ojk.go.id/en/berita-dan-kegiatan/publikasi/Documents/Pages/National-Strategy-on-Indonesian-Financial-Literacy-(SNLKI)-2021---2025/National%20Strategy%20on%20Indonesian%20Financial%20Literacy%20(SNLKI)%202021%20%E2%80%93%202025.pdf

investors into women-focused microfinance portfolios across ASEAN. The public evidence reviewed here is stronger on JAWEF's regional mobilization, portfolio construction, and outreach than on Indonesia-specific deployment or outcomes.[5] This structure suggests how calibrated concessionality can shift risk-return profiles in ways that help to crowd in fiduciary capital at scale.

Taken together, the two cases suggest that gender-lens blended finance performs different functions depending on where catalytic capital enters the intermediation chain: upstream, by reshaping institutional norms, data practices, and investable conditions at the market-creation stage; and downstream, by mobilizing larger pools of institutional capital at the market-scaling stage. The chapter's contribution is to show how different blended-finance structures address different constraints within women's access to finance, and how those constraints shift across stages of market development.

The case study also identifies persistent constraints including regulatory ambiguity around gender metrics, data fragmentation, and pipeline limitations that continue to constrain scale in Indonesia, and distills evidence-anchored lessons for the design of future blended-finance instruments seeking both financial performance and structural gender inclusion.[6]

The Investment Problem and Comparative Thesis

Indonesia's MSME finance landscape is often described through the language of scale: a large entrepreneurial base, high employment intensity, rapid digitization, and an explicit national commitment to financial inclusion. Women are central to this picture, not only as micro and small business owners, but as economic actors operating across household enterprises, informal supply chains, and increasingly formalized MSME segments. Yet despite sustained economic growth and policy intent, access to formal finance remains uneven. Women-owned and women-

[5] BlueOrchard. "Expansion of prestigious women empowerment fund" (press release, Sept 5, 2019). https://www.blueorchard.com/wp-content/uploads/190905_BlueOrchard-News-Release_JAWEF-Expansion-1.pdf; JBIC. "Additional Investment in Fund Investing in Microfinance Institutions" (Sept 6, 2019). https://www.jbic.go.jp/en/information/press/press-2019/0906-012506.html

[6] World Bank. The State of Blended Finance 2024. https://ppp.worldbank.org/sites/default/files/2025-06/State%20of%20Blended%20Global%20Finance%202024_0.pdf

led MSMEs continue to face persistent constraints in accessing credit on viable terms, reflected in lower approval rates, smaller ticket sizes, and limited access to growth-oriented financial products.[7]

This gap is frequently framed as a problem of informality or insufficient financial literacy. Such explanations are incomplete. The evidence points instead to a structural investment problem rooted in how risk is perceived, priced, and allocated within Indonesia's financial system. Many women-led enterprises operate without fixed collateral, rely on mixed household–business cash flows, and lack the standardized financial histories that conventional underwriting models privilege.[8] These characteristics do not make such enterprises unviable; they make them less legible within prevailing risk assessment frameworks. Gendered norms and institutional heuristics further shape these frameworks, reinforcing a cycle in which women-focused enterprises are systematically mispriced, not because they are inherently riskier, but because the tools used to evaluate risk are poorly aligned with their operating realities.[9]

The result is a persistent financing paradox: capital, entrepreneurial demand, and policy commitment exist, yet capital does not flow at scale to women-led MSMEs on sustainable terms.[10] Commercial lenders face information asymmetries and downside risks they are unwilling or unable to absorb.[11] Early-stage financial institutions and fintech platforms that serve women entrepreneurs often lack the balance sheets, data infrastructure, or regulatory space to experiment with alternative underwriting approaches.[12] At the other end of the spectrum, institutional investors require standardized risk–return profiles, portfolio scale, and governance assurances that

[7] World Bank (2021). Country Partnership Framework for the Republic of Indonesia, FY21–FY25, https://openknowledge.worldbank.org/server/api/core/bitstreams/b459c991-a781-5603-b3ca-47a7d784f87b/content

[8] IFC (2017). MSME Finance Gap: Assessment of the Shortfalls and Opportunities. https://documents1.worldbank.org/curated/en/653831510568517947/pdf/121264-WP-PUBLIC-MSMEReportFINAL.pdf

[9] ILO (2018/2024). Women and Men in the Informal Economy: A Statistical Picture. https://www.ilo.org/sites/default/files/2024-04/Women_men_informal_economy_statistical_picture.pdf

[10] https://documents1.worldbank.org/curated/en/691661477568338609/pdf/109534-WP-ENGLISH-SME-Indonesia-Final-Eng-PUBLIC.pdf

[11] World Bank. Serving the needs of Indonesian SMEs: Main Findings. Washington, DC: World Bank Group, 2017. https://documents1.worldbank.org/curated/en/556861495102658074/pdf/115101-WP-ID-SME-Banking-Study-Main-Findings-PUBLIC.pdf

[12] Credit Bureau of Indonesia, "Access of capital is not about the size: Why many MSMEs still struggle" 2026, https://www.cbi.id/articles/struggling-to-secure-capital-heres-why-many-msmes-fail-to-qualify-for-financing/

most women-focused intermediaries cannot meet without prior market conditioning. The problem, then, is not the absence of capital, but a misalignment between the structure of available capital and the structure of risk in the underlying market.[13]

This case takes that misalignment as its starting point. Rather than asking whether gender-lens blended finance "works" in the abstract, it asks a more specific and operational question: what function does a given blended-finance structure perform, at what stage of market development, and with what observable effects on risk allocation, performance, and outcomes? To answer this, the case adopts a functional lifecycle framing that recognizes uneven market maturity within Indonesia's gender-lens finance ecosystem. Market-building and market-scaling needs coexist, often within the same sector and geography, requiring different uses of concessional capital at the same time.[14]

Within this framing, the case compares two distinct blended-finance architectures deployed to address the same binding investment problem: gender-based credit mispricing in Indonesia's MSME finance ecosystem. Women's World Banking Capital Partners II (WWB CP II) is analyzed as a market-creation mechanism. By combining first-loss capital with a dedicated technical assistance facility, it is intended to intervene upstream, by absorbing uncertainty and supporting changes in underwriting logic, governance practices, and gender-disaggregated data systems among early-stage financial institutions, fintechs, and MSME platforms. Its function within this chapter is therefore understood less as rapid capital deployment than as the attempted creation of investable conditions where few previously existed.[15]

The Japan ASEAN Women Empowerment Fund (JAWEF) is analyzed as a market-scal-

[13] International Finance Corporation. 2016. Women-Owned SMEs in Indonesia: A Golden Opportunity for Local Financial Institutions. © World Bank. http://hdl.handle.net/10986/25403 License: CC BY-NC-ND 3.0 IGO.

[14] Convergence (2024). State of Blended Finance.
https://www.convergence.finance/api/file/1e0168ef575ad7e421038ed0d6c5ba07:1e5ca10b9d-09807f50454ab410ef57229dfb5c462fe8748ceeed86a79674ce2ee43277ef93144696 1ade7925dfcc18963e9f13b8a79-43946683a6be068051c1a8da5bd610407d717db13bf8cf63d3785f8e2bdd48998222 12c5b8412dd2315deaf55a0e-1172a9c60c2ab969bocc29cd70f5fd112b717c93c0ad8f683961 2f55f1e0fb9cb648193303a255cbfb135d1fc

[15] Women's World Banking. 2022 Impact Report (p 24-29).
https://www.womensworldbanking.org/wp-content/uploads/2023/06/WWB-2022-Impact-Report.pdf

ing mechanism. Through a capital stack that layers minimal first-loss capital with calibrated risk-bearing mezzanine tranches, it is designed to mobilize institutional investors into the senior tranche while providing debt financing to established microfinance institutions serving predominantly women clients. Here, concessionality is used not to test new institutional models, but to standardize risk sufficiently to enable larger-scale participation by fiduciary capital while maintaining portfolio discipline and impact governance.[16]

These architectures are not substitutes, nor do they represent a linear progression from one to the other. They intervene at different functional stages of market development that coexist within Indonesia's financial ecosystem. The case uses evidence from both architectures to examine what changes when concessional capital is used to absorb first loss versus when it is used to de-risk senior capital, and what these choices imply for future investment design, policy reform, and the scaling of inclusive finance. At the same time, the comparison does not assume identical levels of visibility across the two cases; rather, it uses the available evidence to clarify how different blended-finance structures are intended to work, what can be observed about their performance and outcomes, and where material proof gaps remain.

Mechanism Overview: The Two Interventions

This case analyzes two blended-finance interventions that treat gender-lens MSME finance not as a niche product line, but as a market-building and market-scaling challenge inside Indonesia's broader financial inclusion agenda. Indonesia's policy environment has increasingly recognized women's financial inclusion as a national priority (including a dedicated national women's financial inclusion strategy) at the same time that persistent data, collateral, and underwriting frictions continue to constrain women-owned MSMEs' access to formal credit on viable terms.[17]

In parallel, estimates of Indonesia's women MSME financing gap and constraints (e.g., heavy microenterprise concentration, limited collateral legibility, uneven access

[16] Convergence. 2020. JAWEF Case Study

[17] Expertise Agency of the House of Representatives of the Republic of Indonesia (DPR RI), Info Singkat: National Financial Inclusion Strategy for Women's Economic Empowerment, Vol. XVI, No. 5/I/Pusaka, March 2024, Sali Susiana (Jakarta: Expertise Agency, March 2024), https://berkas.dpr.go.id/pusaka/files/info_singkat/Info%20Singkat-xvi-5-I-P3di-Maret-2024-177-en.pdf

to tailored products) have sharpened the rationale for interventions that do more than expand credit volume, namely, interventions that change how risk is assessed and priced for women entrepreneurs and the intermediaries that serve them.[18]

This section introduces the two interventions, explains how each transaction pipeline works, and compares how structure, underwriting logic, and risk allocation differ across market creation and market scaling in women's MSME finance.

WWB CP II: Market Creation Mechanism

Business Model and Impact Thesis:

Women's World Banking Capital Partners II (WWB CP II) is structured as a layered gender-lens investment vehicle designed to expand the investable frontier for women-focused financial services providers particularly those that are early-stage, innovation-oriented, or operationally constrained from financing gender-intentional product innovation at scale. The fund's core business model is to deploy risk-bearing capital into inclusive finance institutions and fintechs while pairing investments with a dedicated technical assistance (TA) facility that supports gender-responsive transformation inside investee institutions. WWB CP II combines (i) catalytic, risk-absorbing capital (including first-loss features) with (ii) a TA grant facility intended to shift the underlying "credit production function": governance incentives, product design, underwriting practices, and the collection and use of gender-disaggregated data.[19]

The fund positions "sustainability" - here meaning structural gender inclusion in access to finance - as a financially viable strategy by making the business case that gender-intentional product redesign and institutional practices can expand market share and improve portfolio quality, conditional on investees' ability to adopt fit-for-purpose metrics and operational capabilities.[20] WWB CP II's impact thesis aligns directly with the SDG challenge around women's economic participation and inclusive growth, most visibly SDG 5 (gender equality) and SDG 8 (decent work and economic growth), with spillovers to SDG 10 (reduced inequali-

[18] Indonesia women MSME financing gap estimates and constraints (including the commonly cited ~$6B gap estimate and microenterprise concentration). Asian Development Bank, Leveraging Fintech for Women Entrepreneurs in Indonesia, the Philippines, and Vietnam (Manila: Asian Development Bank, July 2024), https://www.adb.org/sites/default/files/publication/985141/leveraging-fintech-women-entrepreneurs.pdf

[19] Convergence, WWBCPII, https://www.convergence.finance/resource/women's-world-banking-capital-partners-ii-(wwb-cpii)-case-study/view

[20] WWB press release, 2022, https://www.womensworldbanking.org/insights/womens-world-banking-asset-management-closes-second-fund-for-financial-inclusion-at-103m/

ties) through improved access to formal financial services for underserved women entrepreneurs. The "why now" logic for WWB CP II in Indonesia is that gender-lens market creation requires institutional change capacity at the same moment that policymakers and regulators are attempting to strengthen women's inclusion strategies and data foundations, creating a window for catalytic capital and technical assistance to shift norms before scaling capital can credibly price the risk.[21]

JAWEF: Market Scaling Mechanism

Business Model and Impact Thesis:

The Japan ASEAN Women Empowerment Fund (JAWEF) is structured as a blended-finance private debt vehicle designed to mobilize senior, institutional capital into lending to established microfinance institutions (MFIs) serving predominantly women microentrepreneurs across ASEAN, with Indonesia included in that regional scope. JAWEF's business model is portfolio-based, financing a diversified set of MFIs through debt (including senior and subordinated instruments), while using a multi-layer capital stack to reallocate risk in a way that can meet institutional investors' risk-return requirements.[22] Unlike a market-creation approach centered on experimentation and investee transformation, JAWEF is built to scale what is already operationally investible: mature financial intermediaries with track records and the capacity to absorb larger volumes of debt, but where the senior capital base still requires risk calibration and credible impact governance.

JAWEF involves a junior/first-loss layer and a mezzanine layer that together provide credit risk coverage for senior investors; public actors have played a prominent role in the mezzanine tranche, while institutional investors have participated in the fund's broader investor base.[23] This "calibrated concessionality" logic aligns with the SDG challenge through SDG 5 and SDG 8 in a scaling frame: expanding women's access to finance via intermediaries at meaningful portfolio scale, rather than piloting new underwriting models.

How Concessionality is Used

[21] Indonesia's National Financial Inclusion Strategy

[22] Blueorchard brief, JAWEF, https://www.blueorchard.com/wp-content/uploads/20210218_SFDR-sustainability-related-product-disclosure_JAWEF_final.pdf

[23] Convergence Case Study, JAWEF, https://www.convergence.finance/resource/japan-asean-women-empowerment-fund-case-study/view

Both interventions are blended finance, but they deploy concessionality differently and therefore are associated with different types of additionality.

- WWB CP II's additionality is primarily market-creating and capability-building. First-loss/risk-bearing features and TA grants are used to finance the cost of institutional change: the "unpriced" work of building gender-responsive governance, data systems, and underwriting approaches that standard capital would not finance (or would price prohibitively).[24]
- JAWEF's additionality is primarily mobilization at scale: limited junior/mezzanine risk protection is used to make the senior tranche investible for institutional investors, thereby expanding the pool of available capital for women-focused microenterprise finance through intermediaries.[25]

Together, these structures are best read as complementary responses to a single binding market problem: persistent gender-based credit mispricing in Indonesia's MSME finance ecosystem. WWB CP II is designed to change the market's risk-production machinery - norms, data, underwriting, and governance - where investability is weak. JAWEF is designed to standardize and finance intermediaries where investability is already present but senior capital remains constrained.[26] Read comparatively, the distinction is between two uses of catalytic capital: one oriented toward creating investable conditions upstream, and the other toward mobilizing larger volumes of capital once investability is already more established.

Transaction Pipelines

The two interventions analyzed in this case deploy blended finance at different points in the financial intermediation chain. Both seek to expand credit access for women entrepreneurs, but they do so by intervening in different parts of the investment pipeline: one strengthens the conditions under which financial institutions become investable, while the other mobilizes institutional capital once

[24] The financial additionality claim to test in the case is whether this structure enables investments in earlier-stage institutions and women-focused business lines that would otherwise remain below investability thresholds, and whether TA measurably shifts investee practices in ways that later reduce perceived risk and expand the pipeline.

[25] Here, the financial additionality claim to test is whether the risk-return profile (and governance assurances) created by the layered stack is sufficient to crowd in institutional capital that otherwise would not enter this asset class at comparable scale and terms.

[26] That functional distinction (market creation versus market scaling) will govern how this case evaluates performance evidence, outcomes evidence, and the enabling conditions required for replication and scale

investability conditions are established. Understanding how capital flows through these structures clarifies the distinct roles that catalytic capital can play in gender-lens financial markets and the different stages at which blended finance can intervene to expand inclusive financial systems.[27]

WWB CP II Transaction Pipeline:
Women's World Banking Capital Partners II (WWB CP II) operates through a two-track intervention combining risk-bearing investment capital with institutional capability-building support. The objective is to expand the investable universe of financial intermediaries capable of serving women entrepreneurs in emerging markets while testing and supporting the commercial viability of gender-responsive financial products.[28]

The mechanism begins with capital commitments from impact investors and catalytic capital providers, which are pooled into the WWB CP II fund. Within the capital stack, catalytic investors provide first-loss protection, absorbing a portion of downside risk and improving the risk profile for other investors. This structure is designed to enable the fund manager to invest in earlier-stage or operationally evolving financial institutions that conventional capital markets may perceive as too risky due to limited track records, data gaps, or product innovation risk. Once capital is raised, the fund manager conducts investment selection and due diligence focused on financial institutions and fintech platforms with strong potential to expand services to women clients. Investment decisions incorporate both traditional financial performance metrics and gender-lens investment criteria, including product suitability for women entrepreneurs, institutional governance commitments to gender inclusion, and the capacity to collect and utilize gender-disaggregated data.[29]

Following investment, a technical assistance (TA) facility operates alongside the capital deployment process. The TA facility provides grant-funded support to investee institutions to strengthen internal systems and operational practices that

[27] Convergence, State of Blended Finance 2024, https://www.convergence.finance/resource/state-of-blended-finance-2024/view

[28] WWB, Unlocking the power of Gender Lens Investing: Gender Performance Checklist, 2024 https://www.womensworldbanking.org/insights/unlocking-the-power-of-gender-lens-investing-the-gender-performance-checklist/

[29] Women's World Banking, "Asset Management," Women's World Banking, accessed March 2026 https://www.womensworldbanking.org/asset-management/

enable effective service to women clients. Activities typically include redesigning loan products tailored to women entrepreneurs, developing sex-disaggregated data systems, adjusting underwriting models to incorporate alternative credit signals, and strengthening governance structures that embed gender inclusion into institutional strategy.[30]

Through this mechanism, WWB CP II seeks to generate two outcomes simultaneously: financial returns from investments in financial intermediaries and institutional transformation that improves the investability of women-focused financial markets. By strengthening the operational capabilities of financial institutions serving women entrepreneurs, WWB also aims to show the commercial viability of gender-lens financial inclusion and attract additional private capital into the sector.

JAWEF Transaction Pipeline:
The Japan ASEAN Women Empowerment Fund (JAWEF) employs a different pipeline designed to mobilize institutional capital at scale once financial intermediaries have demonstrated operational maturity and established lending portfolios targeting women borrowers. The mechanism begins with a layered capital stack combining public capital and private institutional investment. In this structure, the junior tranche was provided by BlueOrchard Finance and public actors provided mezzanine tranches that absorbed initial portfolio losses and provided partial risk protection for senior investors.[31]

This layered capital structure improves the risk-return profile of the vehicle, enabling institutional investors, a foundation, an insurance company, and a pension fund, to participate in the senior tranche while maintaining fiduciary investment standards. By reducing perceived portfolio risk through credit enhancement mechanisms, the structure helps mobilize private capital into sectors that might otherwise remain underfinanced.[32]

Once the fund is capitalized, the fund manager allocates debt financing to estab-

[30] Convergence, Women's World Banking Capital Partners II (WWB CP II) (Convergence Blended Global Finance Case Study, May 2021), https://www.convergence.finance/resource/women's-world-banking-capital-partners-ii-(wwbcpii)-case-study/view

[31] Convergence, Japan ASEAN Women Empowerment Fund (JAWEF) (Convergence Blended Global Finance Case Study, March 2020), https://www.convergence.finance/resource/japan-asean-women-empowerment-fund-case-study/view

[32] BlueOrchard Impact Report, https://www.blueorchard.com/wp-content/uploads/Publications/BlueOrchard-Impact_Report_2019-2020.pdf and https://blueorchard.com/impactreport/

lished microfinance institutions (MFIs) and other financial intermediaries across ASEAN. These institutions already serve large numbers of women borrowers but require larger volumes of wholesale capital to scale their lending portfolios and expand outreach to underserved micro- and small enterprises.

The MFIs then deploy this capital to lend directly to women microentrepreneurs, typically through microcredit or MSME loan products. Repayments from borrowers flow back to the MFIs, which in turn service their debt obligations to the fund. Cash flows from these loan repayments return to the JAWEF vehicle allocated according to the priority structure of the capital stack, while a portion may also be reinvested into new loans. This reinvestment feature allows the fund to extend its outreach beyond its initial committed size over time.

Through this mechanism, catalytic capital plays a narrower but critical role: it absorbs credit risk that would otherwise deter institutional investors and enables the participation of private capital providers that require risk-adjusted returns consistent with fiduciary investment mandates. Within the terms of this chapter, JAWEF is therefore treated as a market-scaling structure whose primary function is not to build new institutional models, but to make established intermediaries more financeable at larger scale through structured risk allocation.

Structure and Capital Design

This section explains each structure by component and mitigation tool, with attention to how capital is layered, where risk is absorbed, and where the principal decision points occur.

WWB CP II Structure and Capital Design:

WWB Capital Partners II (WWBCP II) uses catalytic capital and grant-funded technical assistance to make earlier-stage or institutionally evolving financial intermediaries investable. JAWEF uses a layered capital stack to improve the risk-return profile of a debt vehicle so that institutional investors can participate once investee institutions are already operationally mature enough to absorb wholesale capital.[34] In comparative terms, WWBCP II is structured to manage institutional transformation risk upstream, whereas JAWEF is structured to manage portfolio and investor-risk exposure downstream.

[33] In doing so, the structure indicates how blended finance can support scaled access to capital for women entrepreneurs by mobilizing institutional investment into inclusive financial intermediaries.

[34] Women's World Banking, "Women's World Banking Asset Management Closes Second Fund for Financial Inclusion at $103M," Women's World Banking, March 2022, https://www.womensworldbanking.org/insights/womens-world-banking-asset-management-closes-second-fund-for-financial-inclusion-at-103m/

Capital formation: pooling commercial and catalytic capital

WWBCP II reached a final close of $103 million in March 2022. The fund includes a blended finance structure designed to enhance risk-adjusted returns for private and institutional investors, alongside a dedicated grant-funded technical assistance facility. The European Union and BMZ, facilitated by KfW, provided critical funding for both the first-loss tranche and the technical assistance facility. Public and impact-oriented investors in the broader fund included, among others, DFC, EIB, JICA, KfW, Soros Economic Development Fund, Sasakawa Peace Foundation, MEDA, Dreilinden, Ceniarth, and USAID, as well as other impact investors, family offices, and high-net-worth individuals.[35]

The catalytic layer sits at the fund level and is designed to improve downside protection for other investors. The first-loss tranche is there so that some portion of early losses is absorbed before losses reach more senior or less risk-tolerant capital. That reallocates the risk and allows the manager to pursue investees whose value proposition may be commercially promising but not yet fully legible to conventional capital markets.

Instrument choice: risk-bearing capital into inclusive financial intermediaries

Women's World Banking describes the strategy of WWBCP II as investing in innovative inclusive financial service providers in emerging markets that prioritize attracting and serving a gender-diverse customer base and expanding gender diversity within their workforces. The fund is a gender-lens private equity/growth capital strategy, not a pure wholesale debt vehicle.[36]

Equity-style capital bears more business-model risk and is therefore better suited to institutions that may need time, governance support, and operating adaptation before they become scalable lenders to underserved women customers. Because the fund is taking balance-sheet and execution risk at the intermediary level, the key risks are not only credit losses in an end-borrower portfolio. They include governance risk, product-market fit risk, management execution risk, data-system weakness, and strategic drift inside the investee institution. This matters because

[35] Women's World Banking, Impact Report 2024 (New York: Women's World Banking, 2025), https://www.womensworldbanking.org/wp-content/uploads/2025/09/WWB-2024-Impact-Report.pdf

[36] Stakeholder interveiw

the dominant risk in WWBCP II is not only borrower repayment risk, but whether the intermediary itself can evolve into a commercially viable and women-responsive platform.

Selection and due diligence: the major decision point

The first major decision point in WWBCP II is investee selection. The fund invests in inclusive finance companies and uses a gender-lens strategy aimed at both customer outreach and internal workforce inclusion. Its technical assistance process begins with data-driven market and organizational gender analysis for each portfolio company, which then feeds into a Gender Action Plan. In practice, this implies that the manager is not screening only for present financial performance, but also for institutional willingness and capability to implement gender-responsive growth strategies.[37]

The fund is not just selecting institutions that already perform well on gender metrics. It is selecting institutions where catalytic capital plus technical support can plausibly change the institution's operating model or market reach. That means the underwriting logic necessarily includes a forward-looking judgment about whether institutional transformation is achievable. That forward-looking element is one reason WWBCP II carries a different risk profile as it is underwriting both current fundamentals and the possibility of future institutional change.

Technical assistance as an explicit risk mitigant, not an add-on

WWBCP II's technical assistance facility is not incidental to the structure. The facility supports portfolio companies through market and organizational gender analysis, the development of Gender Action Plans, and gender-disaggregated reporting against inclusion targets.[38]

[37] Stakeholder inteveiw

[38] Women's World Banking Asset Management has provided technical assistance to portfolio companies to help them understand and capture the underserved women's market, Women's World Banking, Impact Reports 2022 and 2024

Reduces			
Information risk	Product design risk	Execution risk	Monitoring risk
By			
Improving the collection and use of gender-disaggregated data	Helping intermediaries adapt products and channels to women customers	Translating gender intent into concrete institutional action plans	Creating reporting expectations that make progress legible to investors

Figure 1: TA Facility as a Mitigating Tool,
SOURCE: SIRI Authors (2026)

Loss allocation and residual risk: The fund uses a first-loss tranche supported by anchor catalytic funders and the structure was explicitly designed to improve risk-adjusted returns for other investors. The residual risks that remain, even after catalytic protection and TA, are largely those of institutional underperformance, strategic failure, and slower-than-expected translation of gender inclusion into profitable growth. Those risks are partially absorbed and actively managed. In other words, catalytic protection and TA do not eliminate institutional transformation risk; they make it more financeable and more manageable within the fund structure.

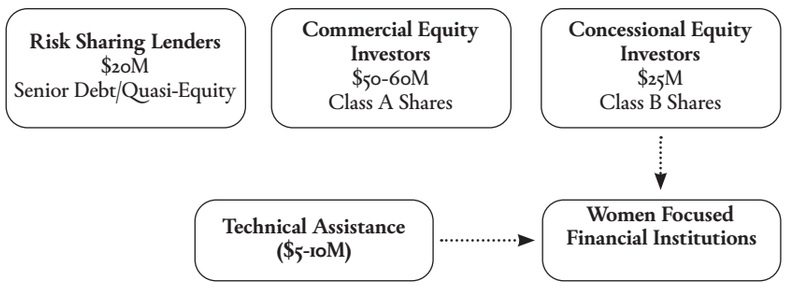

Figure 2: WWBCPII Structure and Risk Allocation
SOURCE: 2021 Convergence case study

JAWEF Structure and Capital Design

Vehicle design: a three-tier private debt fund

JAWEF is a closed-end private debt blended finance fund, launched in 2016, domiciled in Luxembourg as a SICAV-SIF, and managed by BlueOrchard. JAWEF provides loans to microfinance institutions helping female entrepreneurs in ASEAN and its blended finance structure uses first-loss and mezzanine tranches to minimize risk and encourage institutional investors.[39]

This structure makes the risk allocation more visible than in WWBCP II. Instead of one catalytic layer plus TA supporting equity-style investments, JAWEF uses subordination across tranches to create a risk ladder for investors with different return expectations and risk tolerances. The relevant comparison is therefore transparent tranche-based risk reallocation versus institution-level capability support.

Tranche Roles: who absorbs what

BlueOrchard's public materials and blended finance report indicate the following architecture:

- Senior tranche: occupied by private / institutional investors;
- Mezzanine tranches: funded by public and DFI investors;
- Junior tranche: funded by private investors and the fund manager

The junior tranche is first to absorb losses, followed by the mezzanine layer, thereby protecting the senior tranche. This is the core mechanism by which concessional or catalytic capital changes the risk-return profile for institutional investors. The structure is not primarily designed to change investee institutions internally; it is designed to change the investor proposition at the fund level. That distinction is central to the chapter's comparative logic: JAWEF addresses whether large pools of capital can finance already-established intermediaries, not whether those intermediaries must first be transformed into investable institutions.

Investee Profile: mature intermediaries rather than early-stage platforms

JAWEF does not target early-stage experimentation in the same way as WWBCP II. The fund provides loans to microfinance institutions that help female entrepreneurs, and JAWEF finances, through senior and subordinated loans, financial intermediaries that target female entrepreneurs and have specialized lending products and services for them. This implies an investee universe of already-operating institutions with lending systems, borrower bases, and sufficient operational maturity to absorb wholesale debt.

Risk allocation implication: the dominant risk is portfolio credit risk, intermediary creditworthiness risk, country risk, and regional market risk across a pool of lenders. That is why subordination at the fund level is the key mitigant.

Due diligence and portfolio construction: the major decision point

The due diligence includes the assessment of the investee's policies, procedures, processes, and practices, including interviews with senior management and directors, loan file reviews, and broader review of credit underwriting and risk management tools and processes.[40] This is a materially different decision point from WWBCP II. The question here is less "can this institution be transformed into a gender-responsive growth platform?" and more "is this institution already a sufficiently robust credit counterparty and women-focused intermediary to justify scaled debt exposure?"

Cash-flow mechanics: from investors to fund to MFIs to women borrowers and back

The cash-flow logic of JAWEF is more linear:

1. Investors subscribe capital into different tranches of the fund;
2. The fund extends debt financing to selected MFIs/financial intermediaries;
3. Those intermediaries on-lend to women microentrepreneurs and MSMEs;
4. Borrower repayments flow back to the MFI;
5. The MFI services its debt to the fund; and
6. The fund allocates those cash flows according to its reinvestment and distribution rules, including the potential recycling of repayments into new lending during the fund life and distribution to investors according to tranche seniority at maturity or through defined interim distributions.

[39] JAWEF as a multi-layered fund with senior, mezzanine, and junior tranches, BlueOrchard Finance Ltd., Blended Finance 2.0 (BlueOrchard, 2018), https://www.blueorchard.com/wp-content/uploads/181016_BlueOrchard_Blended_Finance-2.0.pdf

[40] BlueOrchard Finance Ltd., Sustainability-Related Product Disclosure: Japan ASEAN Women Empowerment Fund (JAWEF) (BlueOrchard, March 2021) https://www.blueorchard.com/wp-content/uploads/20210218_SFDR-sustainability-related-product-disclosure_JAWEF_final.pdf

This sequencing shows where losses are expected to appear first: typically at the borrower level, then at the intermediary balance sheet, and only then at the fund level. The tranche structure determines how much of that fund-level impairment is borne by junior and mezzanine investors before senior investors are affected. The mechanism is therefore comparatively narrower than WWBCP II's: it does not attempt to redesign intermediary operating models, but to make portfolio risk acceptable to more risk-sensitive investors.

Why the structure mobilizes institutional investors:
JAWEF's first-loss and mezzanine tranches are intended to absorb risk and encourage institutional investor participation. Japanese institutional investors are in the senior tranche. The structure's financial additionality lies in mobilization through subordination: risks that might otherwise keep institutional investors out of the vehicle are partly absorbed by more junior or public capital.[41]

The relevant additionality claim here is therefore not institution-building but mobilization through structured risk-sharing.

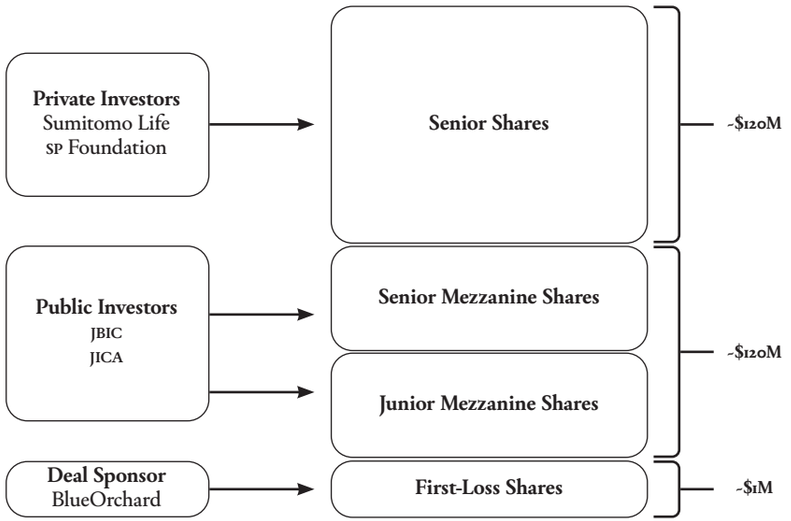

Figure 3: JAWEF Structure and Risk Allocation
SOURCE: 2020 Convergence case study

[41] This is the central contrast with WWBCP II. JAWEF's catalytic role is not primarily to create investability within the intermediary through capability building; it is to create investability of the fund for institutional capital.

Information risk	WWB Capital Partners II (Market Creation)	JAWEF (Market Scaling)
Target investees	Early-stage or evolving inclusive financial institutions, fintech platforms, and MSME finance providers	Translating gender intent into concrete institutional action plans
Institutional maturity required	Moderate; institutions may still be developing gender-responsive strategies or operational systems	High; institutions must demonstrate operational stability and established lending performance
Primary underwriting question	Can catalytic capital and technical assistance transform the institution into a scalable provider of women-focused financial services?	Is the intermediary financially robust enough to absorb wholesale debt financing and expand lending portfolios?

Figure 1: Eligibility and underwriting logic
SOURCE: SIRI Analysis

The comparison makes clear that the two structures differ in instrument form, in the maturity of institutions they are designed to support, and in the underwriting logic each model requires.

Risk Allocation and Stakeholder Economics

This section identifies the binding risks in each structure and maps them to the documented mitigation tools using a cautious interpretive approach.

Dimension	WWB Capital Partners II (Market Creation)	JAWEF (Market Scaling)
Key risk assessed	Institutional transformation risk (governance, product design, execution capacity, data systems)	Translating gender intent into concrete institutional action plans.
Gender-lens screening logic	Commitment to gender inclusion, potential to expand services to women clients, capacity to implement gender-disaggregated data systems.	Existing outreach to women borrowers and demonstrated ability to scale lending to women entrepreneurs.
Role of catalytic capital	Absorbs early institutional risk and supports capability-building through technical assistance.	Improves risk–return profile of the fund through tranche subordination to mobilize institutional investors.

Figure 1: Eligibility and underwriting logic
SOURCE: SIRI Analysis

The two structures address different categories of risk within the women's MSME finance ecosystem. WWB Capital Partners II uses mitigation mechanisms designed to support institutional development among inclusive financial intermediaries, while JAWEF uses a layered capital stack to manage investor exposure to portfolio losses.

Risk Category	Where Risk Appears	Fund	Risk Intensity	Mitigation Tool
Institutional capability risk (governance, operational systems, product development)	Financial intermediaries receiving investment capital	WWB CP II	High	Grant-funded Technical Assistance Facility supporting institutional capacity and gender strategy implementation
		JAWEF	Low	Screened and monitored at investee level; not the fund's primary mitigation architecture.
Gender strategy implementation risk	Investee institutions expanding services to women clients	WWB CP II	High	Gender Action Plans and institutional diagnostics implemented through the Technical Assistance Facility
		JAWEF	Low	Screened and monitored through investee selection and oversight; secondary to portfolio-level risk allocation.
Investor downside risk at the fund level	Exposure of investors to portfolio losses	WWB CP II	Moderate	First-loss capital layer absorbing initial portfolio losses
		JAWEF	Low for senior investors	Junior tranche absorbing first losses
Portfolio credit risk	Loan portfolios of microfinance institutions and MSME borrowers	WWB CP II	Low–Moderate	Not applicable
		JAWEF	Moderate High	Portfolio diversification across multiple MFIs and credit due diligence by the fund manager
Senior investor risk exposure	Institutional investors participating in the fund	WWB CP II	Moderate	First-loss capital improving downside protection for investors
		JAWEF	Low	Mezzanine tranche providing additional loss absorption before senior investors

Table 3: Binding risks and documented mitigation tools, SIRI Analysis (risk grading refers to the centrality of portfolio credit risk within structure, not to an assessment that portfolio quality)
SOURCE: SIRI Analysis

In **WWBCP II**, the principal mitigation tools are first-loss capital and a grant-funded technical assistance facility. The first-loss layer protects the capital structure; the TA facility reduces information, design, and execution risks inside the investee institution. The structure is therefore suited to market creation, where the core problem is not only investor downside but the absence of institution-level systems that make a women-focused strategy commercially legible.	In **JAWEF**, the principal mitigation tool is subordination through junior and mezzanine tranches. The key objective is not to rebuild the investee institution's operating model but to make a pooled debt fund acceptable to private institutional investors. The structure is therefore suited to market scaling, where the core problem is not whether women-focused intermediaries can exist, but whether large volumes of private capital will finance them on scalable terms.

Figure 4: Comparative structure logic: what each mitigation tool does
SOURCE: SSIRI Authors (2026)

The two blended-finance structures rely on distinct stakeholder configurations with differentiated incentives, return expectations, and risk exposures.

WWB CP II aligns catalytic investors, impact LPs, the fund manager, and investee financial institutions around a transformation agenda. Catalytic investors absorb first-loss risk and accept a more concessional or risk-tolerant position to expand women-focused financial intermediation. The fund manager balances financial performance with gender outcomes, selecting institutions willing to adopt gender-responsive practices. Investees access capital and technical assistance but face higher short-term operational costs. Residual risk is concentrated upstream among catalytic investors, while execution risk sits with investees. Stability depends on sustained catalytic capital willing to underwrite long-horizon institutional change.

JAWEF brings together concessional capital providers, private institutional investors, the fund manager, and downstream MFIs. Public investors absorb higher risk through junior tranches to crowd in private capital, while senior investors gain exposure to diversified microfinance portfolios aligned with fiduciary constraints. The fund manager ensures credit discipline and cash flow reliability. MFIs access scale capital but retain borrower-level credit risk. Residual risk is borne first by subordinated investors at the fund level, while credit exposure remains embedded in the underlying intermediary and borrower portfolios. Stability depends on continued concessional capital and sustained repayment performance across the underlying lending chain.

WWB CP II reflects the use of catalytic capital to support institutional change where women-focused intermediation is not yet fully investable, while JAWEF reflects tranche-based risk reallocation designed to mobilize larger-scale capital once investee institutions are already more established. In both cases, risk is reallocated, but in different ways: upstream in WWB CP II, and through the capital stack and underlying portfolio chain in JAWEF.[42]

Performance Evidence

WWB CP II: Indonesia Linked Performance Signals

At the fund level, Women's World Banking CP II reached a final close of $103 million in March 2022, after a first close of $75 million in March 2020.[43] At the manager/platform level, Women's World Banking reported in its 2022 impact report that across Funds I and II combined, WAM had made 20 investments (plus one additional agreement signed), totaling nearly $100 million in companies serving 8.5 million women, and both funds "demonstrate that social returns need not come at the expense of financial returns." The interpretive value of these platform-level signals is material, as they help situate WWB CP II within a broader manager track record linking gender outreach and financial performance. At the same time, they are best read as platform-level signals rather than as standalone Indonesia-specific evidence for WWB CP II, which in this case is more concretely reflected in the Amartha transaction and in later investee-level indicators associated with that investment.

In May 2021 Amartha secured a $28 million funding round led by WWB Capital Partners II and MDI Ventures, which Amartha described as WWB's first investment in Southeast Asia. This indicates that WWB CP II was willing to commit substantial capital to an Indonesian women-focused fintech lender at a growth stage. As a transaction-level signal, this is important because it anchors WWB CP II's Indonesia relevance in a concrete deployment decision. Its evidentiary value, however, lies more in confirming Indonesia-linked investment activity than in demonstrating subsequent fund-attributed performance effects.

At the investee/company level, later third-party and company-linked materials indicate that Amartha's operating performance remained strong after the WWB

[42] The durability of each model depends on whether these allocations remain acceptable to stakeholders over time.

[43] Women's World Banking, "Women's World Banking Asset Management Closes Second Fund for Financial Inclusion at $103M," Women's World Banking, March 2022, https://www.womensworldbanking.org/insights/womens-world-banking-asset-management-closes-second-fund-for-financial-inclusion-at-103m/

investment. A 2024 case study by the Centre for Impact Investing and Practices, drawing on Amartha materials, reports a loan repayment rate (TKB90) of 98.24%, 37.76% growth in borrowers' annual revenue during pandemic recovery, and more than 1 million borrowers served, with more than IDR 6 trillion disbursed to 1.3 million customers. By September 2023, Amartha reported having disbursed more than IDR 12 trillion in working capital to over 1.6 million women-led SMEs across 55,000 villages in Indonesia. These metrics illuminate the subsequent operating trajectory, scale, and borrower reach of a WWB-backed Indonesian platform. At the same time, they are most directly understood as investee-level performance and outreach signals rather than as direct evidence that WWB CP II alone produced those outcomes.

JAWEF: Regional Fund-level Performance Signals With Indonesia Relevance

By 2018, BlueOrchard reported that JAWEF had disbursed 34 loans totaling $110 million to 19 financial intermediaries in 7 countries, with 46% of fund loans denominated in local currency (hedged or unhedged). According to BlueOrchard, as of Q_3 2025, JAWEF had 46 loans to 26 Financial Institutions, predominantly Tier-1 institutions, estimating to be reaching more than 500,000 microentrepreneurs (about 93% women, 74% rural) and indirectly nearly 13 million micro, small and medium enterprises (MSMEs) via investee portfolios. These disclosures illustrate scale, portfolio composition, and regional deployment at the fund level. Their evidentiary weight differs, however, from Indonesia-attributed results, which are not as clearly isolated in the reviewed source set.

By September 2019, BlueOrchard announced that, following the fund's initial performance, JAWEF would be expanded to $241 million and that more than 50% of total fund assets came from private investors. These figures are most informative about continued fundraising, deployment, and private-capital mobilization at the regional fund level. They are therefore more informative about the fund's scaling function than about Indonesia-specific performance.

BlueOrchard has long-standing partnerships with Indonesian women-focused MFIs and Indonesian partner institutions more broadly, but the sources reviewed do not clearly attribute those Indonesia exposures to JAWEF specifically. This distinction matters for interpretation: JAWEF contributes meaningful regional fund-level evidence that is relevant to Indonesia as part of the broader ASEAN market.

Outcome Evidence

WWB CP II has a visible Indonesia pathway through Amartha, which allows some country-level outcome reporting at the investee level. JAWEF provides stronger regional fund-level outcome reporting, while public disclosure remains more limited at the Indonesia-specific level.

WWB CP II: Indonesia-linked Outcomes Evidence

The clearest Indonesia-linked outcome pathway for WWB CP II runs through Amartha, the Indonesian fintech lender in which WWB CP II invested in 2021. Amartha is a lender focused on women-led ultra-micro and microenterprises in rural Indonesia. A 2024 CIIP case study reports that Amartha's borrowers are 100% women, that it had reached more than 35,000 villages in Java, Sumatra, and Sulawesi, that over 130,000 borrowers started their first business with Amartha's loan, that over 89,000 microenterprises grew into small enterprises, that over 65,000 borrowers hired their first employee, and that more than 270,000 jobs had been created.[44]

While these are the clearest publicly available Indonesia-linked outcome signals in the chapter, they remain investee-level outcomes associated with Amartha rather than fund-attributed outcome measures for WWB CP II itself.

A more conservative and recent company-level operating outcome is provided by IFC: by September 2023, Amartha had disbursed more than IDR 12 trillion to over 1.6 million women-led SMEs in 55,000 villages in Indonesia.[45] This provides a more bounded operating and outreach indicator, and is especially useful because it confirms sustained scale at the company level after WWB CP II's entry.
At the organizational level, Women's World Banking's 2022 impact report states that Amartha was identified as a portfolio company showing leadership in gender-inclusive business practices, and that a Gender Action Plan with concrete actions, KPIs, and social milestones was being built in partnership with Women's World Banking.[46]

[44] Catalytic Initiative for Private Sector Engagement in Indonesia (CIIP), Case Study: Amartha (Singapore: CIIP, April 2024), https://ciip.com.sg/docs/default-source/default-document-library/ciip_case-study_amartha

[45] International Finance Corporation, "IFC and Amartha Partner to Support Women-owned Microenterprises in Indonesia,"Press Release, September 2023 https://www.ifc.org/en/pressroom/2023/27743

[46] Women's World Banking, 2022 Impact Report (p 24-29) (New York: Women's World Banking, 2023), https://www.womensworldbanking.org/wp-content/uploads/2023/06/WWB-2022-Impact-Report.pdf

This institutional-change layer is important to the outcome picture because it points not only to borrower outreach, but also to evidence of gender-responsive organizational practice within the investee itself.

Publicly available evidence on WWB CP II in Indonesia is strongest at the investee level, particularly through Amartha's borrower reach, enterprise growth, employment, and operating scale. Cleaner fund-attributed outcome measures remain limited in the public domain, including borrower growth net of other investors, realized exit outcomes from the Amartha investment, or a causal estimate linking WWB's technical assistance to subsequent changes in portfolio quality. The result is an outcome picture that is informative and material, but still stronger on investee trajectory than on fund-attributed causality.

JAWEF: Regional Fund-level Outcomes Evidence

JAWEF's public outcomes evidence is stronger at the regional fund level than at the Indonesia-specific level. BlueOrchard reported in 2018 that JAWEF investees reached 4.8 million micro-entrepreneurs, that all investees had at least 60% female clients with an average of 92%, and that 71% of investees' clients were rural. These are stronger regional outreach and gender-concentration signals than Indonesia-specific outcome measures.[47] Even though this evidence does not isolate country level outcomes for Indonesia directly, the disclosures remain important as they indicate the gender composition and outreach profile of the fund's intermediary portfolio across ASEAN.

By 2019, BlueOrchard stated that JAWEF had reached approximately 230,000 female micro-entrepreneurs through financing 21 microfinance institutions across 7 countries, and projected that the expanded fund would increase outreach to 700,000 women in need.[48] Here, the evidentiary distinction is important: the first figure is reported outreach, while the second is a forward-looking projection tied to the expanded vehicle. By the end of 2022, JAWEF had supported approximately 500,000 micro-entrepreneurs across 8 countries, and customers of JAWEF-funded MFIs were 91% women. BlueOrchard stated that, as of Q_3 2025, JAWEF had 46 loans to 26 Financial Institutions, predominantly Tier-1 institutions, estimating to be

[47] BlueOrchard Finance Ltd., Blended Finance 2.0 (BlueOrchard, 2018), https://www.blueorchard.com/wp-content/uploads/181016_BlueOrchard_Blended_Finance-2.0.pdf

[48] BlueOrchard Finance Ltd., "Expansion of prestigious women empowerment fund," News Release, September 2019, https://www.blueorchard.com/wp-content/uploads/190905_BlueOrchard-News-Release_JAWEF-Expansion-1.pdf

reaching more than 500,000 microentrepreneurs (about 93% women, 74% rural) and indirectly nearly 13 million micro, small and medium enterprises (MSMEs) via investee portfolios.

These disclosures show meaningful fund-level regional outcomes in terms of outreach and women-client concentration. What remains limited is clean Indonesia-specific outcome evidence attributable to JAWEF's deployment within the country.

Value Creation and Additionality

This section assesses the counterfactual case for blended finance by linking structure to three questions: what type of additionality each vehicle is designed to generate, what performance signals support that claim, and what outcomes are observable within the limits of the available evidence. In these cases, additionality lies in how catalytic capital changes investability conditions and reallocates risk within the financial intermediation chain. WWB CP II does so by supporting earlier-stage institutional transformation, while JAWEF does so by improving the risk-return profile of a pooled debt vehicle in ways that mobilize larger-scale private capital.

Taken together, the two structures illustrate different forms of blended-finance additionality. WWB Capital Partners II demonstrates institutional additionality: the use of catalytic capital and technical assistance to make gender-focused financial intermediaries investable. JAWEF demonstrates mobilization additionality: the use of subordinated capital to enable institutional investors to participate in lending to women-focused microfinance institutions. The two mechanisms address different constraints within the financial ecosystem. Where investee institutions require operational transformation and capability building, catalytic equity capital and technical assistance can help create investable opportunities. Where mature intermediaries already exist but institutional capital remains hesitant, tranche subordination can enable larger pools of private capital to enter the sector.

WWB Capital Partners II: Institutional and Capability Additionality

The primary additionality of WWB Capital Partners II lies at the institutional formation stage. The fund's structure combines a first-loss capital layer with a grant-funded technical assistance facility, enabling the manager to invest in financial intermediaries that may not yet meet conventional investment thresholds due

to operational, data, or governance constraints. Without this structure, many early-stage or innovation-oriented inclusive finance providers would face difficulty attracting growth capital because their business models involve experimentation with new products, borrower segments, and data systems.

The 2021 investment in Amartha, an Indonesian fintech lender serving women microentrepreneurs, illustrates this dynamic. Amartha secured a $28 million funding round led by WWB Capital Partners II and MDI Ventures, which the company described as Women's World Banking's first investment in Southeast Asia. The willingness of the fund to invest in a rapidly scaling but still operationally evolving digital microfinance platform reflects the role of catalytic capital in absorbing institutional and execution risks that conventional private equity investors may perceive as excessive.

Evidence from Amartha's subsequent operational performance suggests that the institution continued to scale its lending activities after the investment. By September 2023, Amartha reported that it had disbursed more than IDR 12 trillion in working capital to over 1.6 million women-led SMEs across 55,000 villages in Indonesia. While these outcomes cannot be attributed solely to WWB CP II's investment, they are consistent with the fund's theory of change: catalytic capital combined with institutional support can help accelerate the growth of women-focused financial intermediaries that would otherwise struggle to attract commercial capital at comparable scale.

By absorbing early losses and financing institutional capability-building through technical assistance, WWB CP II attempts to shift the underlying risk-production mechanisms, such as underwriting practices and gender-disaggregated data systems that shape how financial institutions evaluate women entrepreneurs as borrowers.

JAWEF: Capital Mobilization Additionality

The additionality of the Japan ASEAN Women Empowerment Fund operates at a different stage of the investment chain. Rather than transforming early-stage institutions, JAWEF uses a layered capital structure with junior and mezzanine tranches to reduce the risk exposure of senior investors. This structure enables institutional investors, including Japanese institutional capital providers, to participate in a portfolio of loans to microfinance institutions that serve women entrepreneurs across ASEAN.

The mobilization effect of this structure is reflected in the composition of the fund's investor base. BlueOrchard reported that slightly more than 50% of the fund's equity were provided by private investors, with public actors occupying subordinated positions in the capital stack. This distribution of capital suggests that the blended finance structure succeeded in attracting institutional participation that might otherwise have remained limited in a purely commercial microfinance debt fund. The relevant additionality claim here is therefore fund-level mobilization through risk-sharing, rather than institution-level transformation within investees.

Portfolio deployment data further supports the mobilization argument. By 2018, JAWEF had extended 34 loans totaling approximately $110 million to 19 financial intermediaries across seven countries, reaching an estimated 4.8 million micro-entrepreneurs through those institutions. While these outcomes are reported at the regional level and are not disaggregated specifically for Indonesia, they demonstrate the scale of capital flows that the structure was able to mobilize into women-focused microfinance portfolios. Their interpretive value lies less in country-specific attribution than in showing that tranche-based subordination helped support scaled regional deployment through established intermediaries.

Across the two cases, blended finance matters because it changes the terms on which risk can be carried at different points in the intermediation chain. In WWB CP II, that means making institution-building risk more financeable through catalytic capital and technical assistance. In JAWEF, it means making portfolio risk more acceptable to senior investors through subordination. The practical counterfactual is a narrower set of investable institutions in the first case and weaker private-capital participation in the second.

Additionality Type	WWB CP II	JAWEF
Financial additionality	Enables equity investment into early-stage financial intermediaries that may not meet conventional investment thresholds	Mobilizes institutional capital into microfinance debt portfolios through tranche subordination
Institutional additionality	Technical assistance supports governance reforms, gender data systems, and product redesign	Limited institutional transformation; focuses on scaling existing intermediaries
Mobilization additionality	Primarily catalytic and impact investors	Slightly more than 50% of fund assets from private investors
Market additionality	Expands pipeline of investable women-focused financial institutions	Expands supply of wholesale capital to MFIs serving women borrowers

Figure 5: Illustrative additionality channels across the two structures
SOURCE: SIRI Authors (2026)

Enabling Environment

The performance and limitations of both WWB Capital Partners II and the Japan ASEAN Women Empowerment Fund (JAWEF) are shaped by the broader financial, regulatory, and data environment in which they operate. In Indonesia, this environment is characterized by strong policy commitment to financial inclusion and rapid growth in digital financial services which coexist with structural constraints in credit allocation, data systems, and capital markets. These conditions both enable and limit the effectiveness of gender-lens blended finance.

Policy commitment without operational standardization
Indonesia has made explicit commitments to financial inclusion through national strategies such as the Strategi Nasional Keuangan Inklusif (SNKI), supported by regulatory bodies including Otoritas Jasa Keuangan (OJK) and Bank Indonesia. These frameworks have contributed to increased financial access, including the expansion of microfinance and digital lending platforms.[49]

[49] Otoritas Jasa Keuangan (OJK), National Strategy on Indonesian Financial Literacy (SNLKI) 2021–2025 (Jakarta: Otoritas Jasa Keuangan, 2021)

However, gender inclusion within these frameworks remains largely normative. While women are recognized as a priority segment, there are limited regulatory requirements for financial institutions to collect, report, or act upon gender-disaggregated financial data.[50] The absence of standardized gender metrics constrains both underwriting innovation and impact measurement, reinforcing the perception of women-led MSMEs as higher-risk due to lack of formal data visibility. This gap helps explain the role of WWB CP II's technical assistance facility, which focuses on building internal data systems and gender-responsive governance within investee institutions.[51]

Financial sector segmentation and the "missing middle"

Indonesia's financial system is dominated by commercial banks, with state-owned institutions such as Bank Rakyat Indonesia (BRI) playing a central role in microfinance. At the same time, a large number of microfinance institutions and fintech platforms serve smaller and more informal borrowers. Between these segments is a "missing middle": small and growing enterprises that are too large for traditional microcredit but too informal or data-constrained for commercial bank lending. Women-led enterprises are disproportionately represented in this segment due to structural factors including asset ownership patterns, sectoral concentration, and reliance on informal cash flows. This segmentation creates two distinct but interrelated financing constraints. First, early-stage financial intermediaries that serve women entrepreneurs face difficulties scaling due to limited access to equity capital and weak institutional capacity. Second, more established intermediaries face constraints in accessing large volumes of wholesale capital required to expand lending portfolios. The coexistence of these constraints explains why both WWB CP II and JAWEF operate within the same market but address different stages of the financing chain. The former responds to institutional fragility and pipeline formation, while the latter responds to capital scaling constraints among already mature intermediaries.

Data asymmetries and risk perception

A central constraint across both structures is the lack of robust, standardized data on women borrowers and MSME performance. Many women-led enterprises operate with mixed household-business finances, limited formal documentation, and irregular cash flow patterns. These characteristics reduce their visibility within traditional credit scoring systems and contribute to persistent risk mispricing. While fintech models have introduced alternative data sources and digital transaction histories, these innovations remain unevenly distributed and are not yet fully integrated into formal financial sector risk frameworks.[52] WWB CP II's emphasis on gender-disaggregated data systems and alternative underwriting approaches reflects an attempt to address this constraint at the institutional level. However, the absence of shared data infrastructure or industry-wide standards limits the scalability of these efforts. Without broader system-level adoption, such innovations remain localized rather than transformative.

Capital market constraints and risk appetite

Indonesia's capital markets remain relatively shallow in relation to the financing needs of MSMEs. Institutional investors, including pension funds and insurance companies, face regulatory and fiduciary constraints that limit their exposure to higher-risk asset classes such as microfinance or SME lending. Currency risk, portfolio fragmentation, and limited track records further constrain investor participation. In this context, blended finance structures such as JAWEF play a critical role in reallocating risk through subordinated capital layers. By absorbing initial losses, junior and mezzanine tranches enable senior investors to participate in asset classes that would otherwise fall outside their risk tolerance. However, the continued reliance on catalytic capital to achieve this risk adjustment raises an important question about the terms on which scale is reached and sustained. Persistent risk sharing may remain necessary to attract private investors. However, if institutional participation depends on persistent risk subsidies, the long-term sustainability of such structures remains uncertain. The case therefore suggests that market-scaling vehicles can expand capital access under present conditions, but that deeper capital-market development remains necessary if such participation is to become less subsidy-dependent over time.

What would unlock scale

The evidence from both structures suggests that scaling gender-lens finance in Indonesia requires shifts beyond individual fund design. Four system-level changes emerge as particularly relevant:

[50] Otoritas Jasa Keuangan (OJK), The Indonesian Financial Services Sector Master Plan 2021–2025 (Jakarta: OJK, 2021), https://ojk.go.id/id/berita-dan-kegiatan/publikasi/Documents/Pages/Master-Plan-Sektor-Jasa-Keuangan-Indonesia-2021-2025

[51] In effect, the fund is compensating for a public data infrastructure gap that would otherwise be expected to be addressed through regulation or industry standards.

[52] As a result, financial institutions continue to rely on conservative underwriting practices that systematically disadvantage women-led enterprises.

- Standardization of gender-disaggregated financial data: Regulatory or industry-led requirements for collecting and reporting gender-disaggregated data would reduce information asymmetries and enable more accurate risk pricing.[53]
- Strengthening of MSME financial infrastructure: Improvements in credit registries, digital financial records, and formalization pathways for MSMEs would increase the visibility of women-led enterprises within financial systems, expanding the investable universe.
- Development of local currency investment vehicles: Reducing currency risk through local currency financing mechanisms would make SME and microfinance assets more attractive to domestic institutional investors, reducing reliance on external concessional capital.
- Regulatory incentives for institutional participation: Targeted regulatory adjustments such as revised capital adequacy treatment or impact-linked investment frameworks could encourage institutional investors to allocate capital to inclusive finance without requiring extensive risk layering.

The comparison suggests that scale will depend on a specific set of system conditions: better gender-data visibility and stronger MSME financial infrastructure would improve the conditions for market creation, while deeper local-currency capital markets and more enabling institutional-investor rules would improve the conditions for market scaling. Under current conditions, blended finance in Indonesia functions as a bridge mechanism, compensating for gaps in data systems, institutional capacity, and capital market development. WWB CP II and JAWEF show that well-designed structures can help bridge these constraints, while durable scale will depend on shifts in the underlying system conditions that make such structures necessary in the first place.

[53] This would lower the need for fund-level technical assistance to build basic data infrastructure.

Lessons and Implications

This case shows that gender-lens blended finance operates through distinct financial interventions performing different functions within the same market. The comparison between Women's World Banking Capital Partners II (WWB CP II) and the Japan ASEAN Women Empowerment Fund (JAWEF) suggests that effectiveness turns on how precisely concessional capital is matched to the binding constraint it is meant to address. WWB CP II is strongest where investability must first be built through institutional adaptation, product redesign, and better gender data systems. JAWEF is strongest where investable intermediaries already exist but larger-scale capital still requires structured risk-sharing and a portfolio format acceptable to institutional investors. The lessons that follow therefore focus on functional fit, evidence boundaries, and the system conditions required for scale.[54]

Blended finance works best when it is function-specific

A central lesson from the case is that blended finance works best when it is designed around a clearly specified market function. WWB CP II shows the value of pairing first-loss capital with technical assistance when the binding constraint lies in institutional fragility, weak data systems, and limited investability. JAWEF shows the value of tranche-based subordination when the binding constraint lies in mobilizing institutional investors into portfolios of already established intermediaries. These structures serve different purposes inside the same ecosystem, and each is more effective when matched to the stage of market development it is intended to support. Functional diagnosis therefore matters as much as instrument choice: where investability is weak, capability-building and institutional transformation matter most; where intermediaries are already mature, the task shifts toward portfolio design, risk calibration, and capital mobilization at scale.

Technical assistance is core infrastructure in early-stage markets

The WWB CP II model underscores that, in contexts characterized by weak data systems and misaligned underwriting practices, technical assistance is not a supplementary feature but a core component of the investment model. TA functions such as building gender-disaggregated data systems, redesigning products, and strengthening governance directly affect how institutions evaluate borrowers and

[54] Across both structures, the evidence indicates that blended finance is not neutral: it shapes how risk is defined, allocated, and absorbed across actors in the financial system.

allocate credit. In this sense, TA operates as a form of risk production infrastructure, shaping how future capital will perceive and price women-focused financial intermediaries. At the same time, the case highlights an important limitation: TA-driven improvements remain largely institution-specific. Without broader standardization or regulatory adoption, these gains may not translate into system-wide shifts in risk perception. As a result, TA can enable investability at the firm level without necessarily transforming the broader market conditions that produced the constraint. For catalytic funders and fund managers, the implication is that TA should be treated as part of core deal architecture in early-stage markets, not as a peripheral grant add-on.

Mobilization depends on credible risk transfer, not impact intent alone

JAWEF illustrates that institutional investors can be mobilized into gender-lens finance when risk is structured in a way that aligns with fiduciary constraints. The presence of junior and mezzanine tranches enables senior investors to participate without altering required risk-return thresholds. This suggests that impact intent alone is insufficient to mobilize capital at scale. What matters is whether risk is redistributed in a manner that is legible and acceptable to institutional investors. However, while this enables capital inflows, it does not necessarily alter the underlying conditions under which women borrowers are assessed or priced. Mobilization can scale capital through existing intermediation channels without fundamentally changing how inclusion is operationalized at the last mile. The reliance on concessional capital to achieve this redistribution also raises questions about durability: if participation depends on sustained subordination, the scalability of such models may remain contingent on continued public or philanthropic support. For institutional investors, fund managers, public anchor investors, and other structuring partners, the implication is that mobilization at scale depends on credible, legible risk transfer, not on thematic alignment alone.

Pipeline and capital constraints coexist and require parallel solutions

A key finding from the case is that pipeline creation and capital mobilization are not sequential stages, but concurrent needs within the same market. Indonesia's MSME finance ecosystem exhibits both underdeveloped intermediaries and mature institutions facing capital constraints. This challenges linear models of market development that assume progression from "creation" to "scaling." Instead, different segments of the market require different forms of intervention simultaneously. Blended finance must be deployed as a portfolio of complementary structures, each aligned to a specific constraint. Without this alignment, there is a risk that

capital is either under-deployed (in the absence of a pipeline) or insufficiently transformative (where scaling occurs without underlying institutional change). For fund designers, fund managers, catalytic funders, and policymakers, the implication is that market-development strategies should not assume a single blended-finance instrument can solve pipeline formation and capital mobilization at the same time.

Data infrastructure is a binding constraint on both performance and scale

Across both structures, the absence of robust, standardized data emerges as a critical limitation. For WWB CP II, it constrains underwriting innovation and necessitates institution-level investment in gender-disaggregated data systems. For JAWEF, it limits the ability to demonstrate risk-adjusted performance at scale to institutional investors. Without improvements in shared data infrastructure, particularly around gender-disaggregated financial performance, blended finance will continue to operate under conditions of partial visibility, constraining both capital allocation and impact verification. This reinforces the point that risk is not simply a function of borrower characteristics, but of the information systems through which those characteristics are interpreted. Investments in shared data infrastructure may therefore generate higher systemic returns than repeated investments in fund-level technical assistance. For regulators, market-builders, and data intermediaries, this suggests that shared data architecture may be one of the highest-leverage interventions for improving both allocative efficiency and evidence quality.

Blended finance currently compensates for system gaps rather than resolving them

The analysis suggests that blended finance, as currently deployed, functions primarily as a compensatory mechanism. WWB CP II compensates for gaps in institutional capacity and data systems, while JAWEF compensates for limited risk appetite among institutional investors.

While these structures enable capital flows that would not otherwise occur, they do not fully resolve the underlying constraints that necessitate their existence. As a result, their continued effectiveness may depend on parallel progress in regulatory frameworks, data systems, and capital market development. This raises a broader question for future design: whether blended finance can evolve from compensating for system failures toward reducing the need for repeated concessional support, or whether its future role will remain structurally tied to persistent market and institutional gaps.

Conclusion

This case has argued that gender-lens blended finance does not operate as a single model, but as a set of distinct financial architectures that intervene at different points in the same market failure. The comparison between WWB Capital Partners II and the Japan ASEAN Women Empowerment Fund shows that the central design question is not whether concessional capital is present, but what function it is performing. In one case, catalytic capital and technical assistance are used to make women-focused financial intermediaries more investable by addressing institutional fragility, weak data systems, and misaligned underwriting practices. In the other, subordinated capital is used to reallocate portfolio risk in ways that make larger-scale institutional participation possible once investee intermediaries are already more operationally mature.

The comparison also clarifies an important evidentiary point. The two structures do not generate the same kind of proof. WWB CP II offers a clearer Indonesia-linked pathway through Amartha, with visible investee-level performance and outcome signals, but more limited public evidence on fund-attributed causality. JAWEF offers stronger public evidence on regional fund-level mobilization, outreach, and investor participation, but weaker Indonesia-specific disclosure. This asymmetry does not weaken the comparison. Rather, it helps show that different blended-finance architectures should be judged against different functional expectations and evidence standards.

The broader implication is that the next generation of gender-lens blended finance will require a shift from deal-level optimization to system-level design. That means aligning concessional capital with clearly defined market functions, investing in shared infrastructure such as gender-disaggregated data systems and MSME financial visibility, and designing mechanisms that can reduce dependence on repeated public risk absorption over time. For policymakers, investors, catalytic funders, and fund designers, the task is therefore not simply to replicate existing structures, but to diagnose how risk, data, incentives, and institutional maturity are configured within a given market and to design interventions accordingly. Scaling gender-lens finance will depend not only on building better funds, but on changing the system conditions that determine what becomes investable, what becomes scalable, and what kinds of evidence can ultimately prove that progress.

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Frontier Experiments to Climate-Smart Credit: ADM Capital's Evolving Blended-Finance Model for Sustainable Land Use in Indonesia

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Abstract

This case examines the evolution of ADM Capital's blended-finance model for sustainable land use in Indonesia through two related but distinct vehicles: the Tropical Landscapes Finance Facility (TLFF), a 2018 multi-tranche sustainability bond financing PT Royal Lestari Utama's rubber concessions, and the Asia Climate-Smart Landscape Fund (ACLF), a private credit fund launched in 2023 to lend to mid-sized enterprises in climate-smart land-use value chains. The chapter reads the structures as successive stages in an evolving financing approach. TLFF is analyzed as a frontier transaction that used tranche structuring, guarantee support, and embedded safeguards to make a long-tenor land-use asset investable in capital-markets form. ACLF is examined as a more operationally intensive successor model that combines a 50 percent DFC guarantee, technical assistance, and fund-level governance to support portfolio-based lending into a "missing middle" of commercially viable but underfinanced enterprises. The case shows that blended finance can help mobilize capital into land-use sectors that conventional finance often struggles to serve by redistributing risk rather than eliminating it. It also highlights a deeper institutional shift: from trustee-led, transaction-bound governance toward manager-led portfolio governance. The chapter's contribution lies in showing how blended-finance architecture changes when early demonstration projects encounter persistent constraints in borrower readiness, verification, technical-assistance delivery, and post-exit durability.

Case Summary

	ADM Capital Summary (Indonesia Sustainable Land Use Finance)
1. Case Theme	Blended finance for sustainable land use, climate-smart credit, and land-use risk intermediation in Indonesia
2. Blended Finance Archetype	Structured sustainability bond with tranche-based risk transfer (TLFF) and guarantee-backed private credit with technical assistance (ACLF)
3. Primary Catalytic Instrument	TLFF: partial credit guarantee, reserve support, and differentiated note tranching; ACLF: 50% DFC guarantee plus catalytic technical-assistance support
4. Capital Channel and Users	TLFF: capital-markets investors → SPV → RLU entities; ACLF: LPs and DFC-supported fund → mid-sized enterprises in sustainable land-use value chains
5. Primary Market Function	TLFF: frontier demonstration of land-use investability; ACLF: repeatable credit deployment into the underfinanced middle market
6. Evidence Status	TLFF: stronger public evidence on structure, pricing, and repayment; ACLF: stronger design and governance evidence, weaker realized portfolio-level outcome disclosure
7. Replicability Vector	Sequential design logic: bespoke structuring to open the market, followed by portfolio-based credit to deepen and extend it
8. Capital Scale and Structure	TLFF centered on a USD 95 million multi-tranche sustainability bond; ACLF deploys guarantee-backed private credit, typically in roughly USD 3–7 million borrower tickets
9. Locus of Catalytic Intervention	TLFF: transaction-level structuring around a single borrower; ACLF: fund-portfolio level through partial guarantee support, manager-led governance, and technical assistance

The Investment Problem and Chapter Thesis

This case follows the evolution of ADM Capital's blended-finance strategy for sustainable land use in Indonesia, from the Tropical Landscapes Finance Facility (TLFF), a large-scale multi-tranche sustainability bond issued in 2018, to the Asia Climate-Smart Landscape Fund (ACLF), a private credit vehicle launched in 2023 to finance mid-sized enterprises in climate-smart land-use value chains across Asia.

In sequence, the two transactions trace an evolution in ADM Capital's approach to land-use finance: from a flagship, single-borrower structure designed to mobilize large-scale capital into sustainable landscapes, toward a portfolio-based credit model aimed at smaller, more operationally legible firms. The chapter argues that TLFF exposed important design, pipeline, and underwriting limits that helped shape ACLF's more targeted lending model, even as core constraints in land-use finance remained.

TLFF's USD 95 million, multi-tranche sustainable land use bond (maturities to 2033) channeled capital to a Michelin-Barito joint venture managing approximately 90,000 hectares of rubber concessions. The tiered blended-finance structure combined a USAID-backed, AAA-rated Class A tranche for institutional investors with higher-risk Class B tranches purchased by impact-oriented investors, including the Fund, while UNEP, BNP Paribas, ADM Capital, and IDH supported origination, structuring, and implementation.

In a context of land and social conflict, deforestation, overlapping concessions and community encroachment, TLFF was an early attempt to use blended finance to underwrite Indonesian land-use risk at scale. The bond was repaid at par in 2022 after Michelin's buyout, but interviews and case materials suggest that TLFF also functioned as a learning platform, revealing thin project pipelines, weak mid-market borrowers, long gestation periods, and the limits of a large, single-borrower structure.

The transaction also exposed broader structural frictions in Indonesian land-use finance, including the difficulty of verifying environmental and social performance in remote landscapes, the uneven quality of project pipelines, the long timelines required for landscape restoration, and the shortage of mid-sized borrowers able to absorb commercial debt on viable terms.

Stakeholder interviews suggest that ACLF was shaped in part by lessons drawn from TLFF, including the need for stronger local intermediation, deeper on-the-ground partnerships, and blended structures that price risk more realistically while supporting externalities such as community engagement, biodiversity monitoring, and regenerative agriculture extension. ACLF targets USD 3-7 Mn loans to mid-sized enterprises with clearer governance, stronger supply-chain linkages, and some demonstrated capacity to generate climate, biodiversity, and livelihood co-benefits. The fund benefits from a 50% asset-level guarantee from the U.S. International Development Finance Corporation (DFC) alongside catalytic grant funding supported by the ADM Capital Foundation. Unlike TLFF's single large-borrower structure, ACLF pursues a diversified portfolio and places weight on supply-chain integration, traceability, and technical assistance intended to help firms absorb environmental and social upgrading costs that they might not otherwise finance.

Rather than financing a single flagship asset, ACLF provides USD 3-7 millionloans to medium-sized companies with sufficient revenue scale, margins, and cash flow to service debt priced above typical bank credit. The portfolio is concentrated in midstream and upstream-plus-processing segments of agriculture, with a strong bias toward export-oriented, B2B supply chains that offer natural FX hedges. ADM Capital applies standard private-credit rigor through collateral requirements, sponsor assessment, and regular debt-service discipline, while using blended finance to layer in technical assistance and public-good externalities that companies cannot fund alone.

Backed by a 50% DFC guarantee at the asset level and catalytic grants supported through ADM Capital Foundation, ACLF bundles capital with hands-on support: structuring partnerships with smallholders; introducing technologies; and supporting certification (regenerative organic, organic, fair trade) aligned with emerging regulations such as the EU Deforestation Regulation. The fund's impact framework is organized around four target areas: sustainable land use, emissions, gender, and livelihoods. The fund is further supported by an MRV approach informed by the IFC Operating Principles for Impact Management and the IFC Performance Standards, with data collection designed to align, where possible, with company reporting processes. These target areas should be understood here as part of ACLF's intended outcomes architecture, not as a claim that portfolio-level results are yet publicly established across the fund.

Together, TLFF and ACLF do not simply represent two transactions, but rather two stages in an evolving blended-finance approach to sustainable land use. TLFF demonstrated that large-scale capital could be mobilized into an Indonesian landscape transaction under substantial credit enhancement, but it also exposed constraints in pipeline quality, borrower readiness, verification, and post-transaction durability. Interview evidence suggests that these lessons informed later market development, including more strategic donor behavior and the design of successor vehicles such as ACLF. ACLF appears to incorporate several of those lessons through a smaller-ticket, portfolio-based model oriented toward companies with clearer operating capacity, stronger market linkages, and more continuous technical support. For Indonesia, where smallholder agriculture, deforestation pressures, and rural livelihoods remain tightly intertwined, this case shows that blended finance for sustainable land use in Indonesia has undergone a measurable institutional shift from bespoke, capital-markets-based risk redistribution toward portfolio-based, operationally intensive private credit, and that this shift was shaped not by the failure of early-stage transactions but by the constraints those transactions exposed. TLFF demonstrated that a long-tenor land-use asset could be made investable through layered credit enhancement, tranche engineering, and contractually embedded sustainability safeguards. But it also surfaced the limits of a single-borrower structure: thin mid-market pipelines, uneven borrower readiness, the difficulty of verifying environmental and social performance in remote landscapes, and the time-bound character of sustainability leverage in a capital-markets instrument. ACLF reflects a design response to those limits. Rather than relying on a flagship asset and capital-markets engineering, it deploys a 50 percent DFC guarantee and technical assistance across a diversified portfolio of mid-sized enterprises whose commercial viability is treated as a lending precondition rather than an aspiration.[1]

The chapter's central claim is therefore not that blended finance solved land-use investment in Indonesia, but that the progression from TLFF to ACLF illustrates a practical logic of institutional learning: what can be demonstrated at the frontier of an investable market differs from what can be replicated at scale, and the distance between the two is precisely where governance, technical assistance, and borrower-readiness constraints accumulate. That observation is not unique to Indonesia, but the case makes it specific and evidence-anchored in ways that generic blended finance commentary does not.

[1] SIRI–ADM interview (Nov 19, 2025)

Mechanism Overview: From Structured Land-Use Bond to Climate-Smart Private Credit

TLFF: Single-asset land-use finance through structured capital-markets debt

TLFF's inaugural transaction financed PT Royal Lestari Utama (RLU), an Indonesian natural rubber company structured as a joint venture between Michelin and Barito Pacific Group, via a USD 95 Mn multi-tranche, long-dated sustainability bond arranged by BNP Paribas and issued by TLFF I Pte. Ltd.[2,3] The bond proceeds funded RLU's operations to develop "climate-smart, wildlife-friendly, socially inclusive" natural rubber production across landscapes in Jambi (Sumatra) and East Kalimantan, explicitly framed as production on heavily degraded land with embedded environmental and social safeguards.[4] In operating terms, the model centered on a large concession-based, vertically integrated natural-rubber enterprise, with sustainability objectives embedded in land-use management, plantation expansion, and safeguard compliance.

ACLF: portfolio-based private credit for climate-smart land use enterprises

ACLF is structured as a regional Asia private credit fund providing medium-term senior secured lending to eligible SMEs in Indonesia across sectors including sustainable agriculture, agroforestry, and aquaculture.[5] The fund is supported by an unfunded 50% partial-credit guarantee from the U.S. DFC to enable on-lending of medium- to long-term loans to eligbile enterprises.[6] In fund manager framing, ACLF targets a "missing middle" where ticket sizes of roughly USD 3-7m and the complexity of transition finance make commercial bank lending misperceived as risky.[7]

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Dimension	TLFF (2018) - First-feneration model	ACLF (2022) – Second-generation model
Unit of analysis	Single flagship asset (PT Royal Lestari Utama – natural rubber)	Portfolio of climate-smart SMEs
Financing logic	Capital markets sustainability bond	Private credit fund
Typical deal size	USD 95m (single issuer)	USD 3-7 Mn per borrower
Role of sustainability	Safeguards and Compliance to deliver AFLOU transition with better practice	Credit-relevant risk reduction and operational value creation
Risk mitigation approach	ESAPs, tranches, concessional guarantees, Annual ESG/KPI, TA for community & biodiversity	TA, operational involvement, asset-level guarantees
Target enterprises	Large, vertically integrated operator	Export-oriented, B2B SMEs
Scalability constraint	One asset at sufficient scale	High (guarantees + TA facility)
Dependence on concessional capital	High (bond-level derisking)	High (guarantees + TA facility)

TABLE 1: Evolution in ADM Capital's land-use financing model (Information SOURCE: UNEP (2018); ADM Capital (2022, 2023); DFC Public Information Summary; SIRI–ADM interview (Nov 19, 2025))

TLFF: Sustainability as Bankability Engineering

The sustainability logic was designed to reduce land-use and social conflict risks that can impair plantation performance and long-tenor debt service. TLFF's public framing explicitly links the bond to sustainable development and job creation, positioning the structure as a way to "unlock private finance" while fighting deforestation and generating green jobs. ADM Capital states that an Environmental and Social Action Plan (ESAP) was enshrined in transaction documents, indicating sustainability performance requirements were integrated into the financing contract rather than treated as voluntary reporting.[8] This suggests a model in which sustainability functioned less as a downstream reporting layer than as a form of bankability engineering: stronger environmental and social safeguards were expected to reduce operational disruption, social conflict, and reputational risk in ways that supported long-tenor debt service.

ACLF: Sustainability as credit-relevant risk reduction and value creation

ACLF's underwriting proposition is that sustainability is not only "impact," but also credit-relevant risk management. The fund's framing suggests how export orientation can provide a "natural hedge," while stronger supply-chain resilience and farmer relationships may reduce operational and sourcing risks that threaten repayment. The fund pairs lending with technical assistance (TA) and operational involvement (e.g., support for ESG/financial management capacity, standards and traceability), framed internally as "impact as de-risking."[9] This is directionally consistent with the fund's stated objective of financing enterprises engaged in land regeneration and forest protection, where transition costs are often upfront, payback periods are longer, and conventional lending may not be available.

TLFF: Sustainable land use framed for institutional capital mobilization

The stated impact thesis was to mobilize private capital to finance deforestation-avoiding land use and biodiversity-sensitive commodity production, while creating jobs and supporting livelihoods in rural landscapes. The transaction was intended to test whether capital-markets financing could be used to support sustainable commodity production at landscape scale while embedding environmental safeguards and livelihood-related objectives.[10] The transaction aims at (i) protecting forests and biodiversity through land-use choices and buffer-zone logic, and (ii) social inclusion and job creation via "fair-wage jobs" and community safeguards. In SDG terms, this maps most directly to SDG 15 (Life on Land), SDG 13 (Climate Action), and SDG 8 (Decent Work).

ADM Capital's TLFF I is described as Southeast Asia's first corporate sustainability bond designed to support sustainable rubber production "according to clear environmental and social safeguards," across ~88,000 hectares.[11]

[9] SIRI–ADM interview (November 19, 2025)

[10] United Nations Environment Programme (UNEP), "How Innovative Finance Is Helping to Protect Indonesia's Forests," UNEP, September 26, 2022, https://www.unep.org/news-and-stories/story/how-innovative-finance-helping-protect-indonesias-forests

[11] ADM capital report

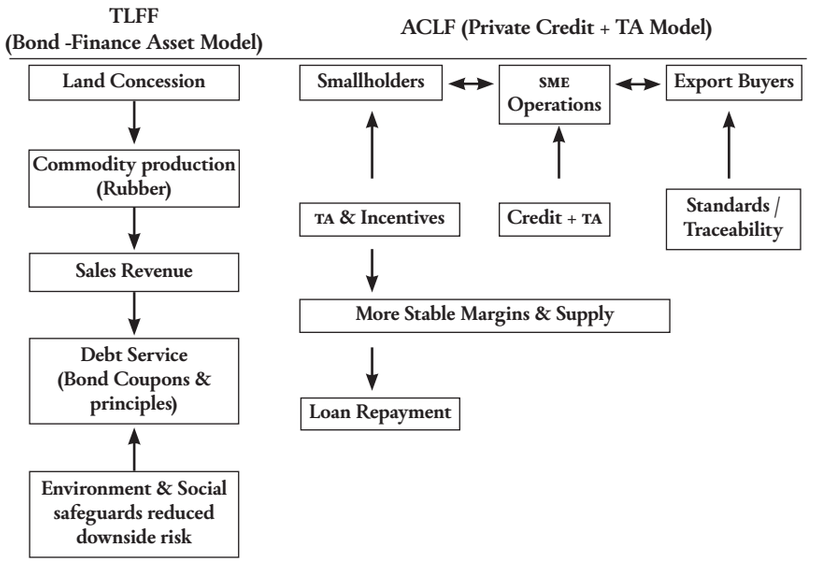

FIGURE 1: Sustainability embedded in cashflow logic
SOURCE: Prepare by Authors (2026)

ACLF: Addressing the Missing-Middle Transition-finance Gap

ACLF's impact thesis is to address a financing gap for enterprises whose business models may support land regeneration, forest protection, livelihood improvement, and lower emissions from land-use change. The DFC Public Information Summary states the project supports eligible enterprise through a partial-credit guarantee to enable medium- to long-term lending.[12] ADM Capital frames ACLF as addressing a "significant funding gap" for mid-sized enterprises engaged in sustainable sectors through senior secured lending.[13] External partner and investor descriptions highlight focus areas such as land regeneration and forest protection, while also situating land-use change as a major emissions driver in Indonesia and the wider region.[14] According to stakeholder interviews, ACLF organizes its intended impact architecture around four top-level target areas: sustainable land use, emissions, gender, and livelihoods, with sub-targets and quarterly tracking.[15]

[12] DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

[13] ADM Capital, "ADM Capital Launches First Impact Fund: The Asia Climate-Smart Landscape Fund (ACLF)," press release, Hong Kong, December 5, 2023, https://www.admcapital.com/adm-capital-launches-first-impact-fund/

[14] Calvert Impact, "ADM Asia Climate-Smart Landscape Fund", Portfolio Partner Profile, https://calvertimpact.org/investing/partner/adm-asia-climate-smart-landscape-fund

[15] SIRI–ADM interview, Nov 19, 2025

TLFF / RLU: Commodity Cash Flows and Bond Repayment

At the operating company level, RLU monetize through the production and sale of natural rubber (a commercial commodity business), financed with long-tenor debt. The TLFF vehicle monetizes through bond cashflows, and the bond was repaid repaid at par in August 2022, linked to Michelin's acquisition of full ownership of RLU. This early repayment underscores that investor monetization depended not only on plantation operating performance, but also on corporate ownership decisions and refinancing/prepayment dynamics.

ACLF: Interest Income on Enterprise Loans and Impact-linked Carry

ACLF's core monetization is via interest and fees on senior secured loans to SMEs. ADM Capital also states that 50% of carried interest is linked to achieving impact, "verified annually". At the borrower level, ACLF targets companies with sufficient revenue and margins to service quarterly interest. These are midstream/upstream businesses with processing/value add rather than thin-margin commodity trading. That underwriting logic makes monetization dependent on operational improvements such as productivity gains, certification, and buyer access and resilience investments supported via TA.[16]

Across the two transactions, a clear evolution emerges in how sustainability is positioned within the economic logic of land-use finance. The movement progresses from a model in which sustainability helped make a large asset financeable to one in which sustainability is more explicitly tied to portfolio construction, borrower selection, and risk-adjusted credit performance. This shift has important implications for instrument choice, risk-sharing design, and the role of public and philanthropic capital. To understand how that shift operates in practice, it is necessary to look more closely at how each vehicle allocated risk, priced exposure, and used catalytic support.

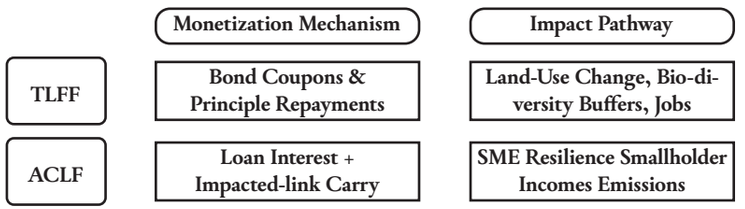

FIGURE 2: Impact thesis and Monetization Mechanism for TLFF & ACLF
SOURCE: Prepare by Authors (2026)

[16] SIRI–ADM interview, Nov 19, 2025

Risk Allocation and Stakeholder Economics

TLFF: Note structure, guarantee support, and tranche-based risk distribution

TLFF was structured as a US$95 million multi-tranche secured fixed-rate note issuance by TLFF I Pte. Ltd., a special purpose vehicle that on-lent proceeds to the RLU operating entities. The structure is best understood as blended finance rather than simply sustainable finance because it combined commercial capital-markets debt with explicit risk-bearing and credit-enhancement features designed to make a long-tenor land-use transaction investable. In substance, the vehicle functioned as a form of securitized project lending: investors purchased notes issued by the SPV, the proceeds funded the operating company, and repayment depended on a combination of borrower performance, reserve protections, contractual enforcement, and guarantee support.[17]

Class	Principal	Expected Maturity	Legal Maturity	Coupon/Interest Rate
Class A	$30,000,000	23 Feb 2033	23 Feb 2034	4.136 % p.a.
Class B1a	$20,000,000	23 Feb 2033	23 Feb 2034	9.0% p.a.
Class B1b	$15,000,000	23 Feb 2023	23 Feb 2034	8.375% p.a.
Class B1c	$15,000,000	23 Feb 2025	23 Feb 2034	8.875% p.a.
Class B2	$15,000,000	23 Feb 2033	23 Feb 2034	2.0% p.a.

TABLE 2: Source: TLFF I Notes; tranche sheet
SOURCE: Page ii, Tropical Landscapes Finance Facility (TLFF) I Pte. Ltd., Offering Circular dated 7 March 2018, Singapore Exchange (SGX), March 7, 2018

The note structure made risk distribution visible. Class A carried the lowest coupon at 4.136% and received a Moody's Aaa rating, consistent with a senior position supported by substantial structural protection. The B tranches carried materially higher coupons, ranging from 8.375% to 9.0%, indicating that investors in those notes accepted higher risk in exchange for higher expected return. Class B2 complicates any simple senior-junior reading because it carried a 2.0% coupon despite sitting within the broader Class B stack; it should therefore be interpreted carefully rather than treated as straightforward proof of a linear w ladder. The notes were constituted under a trust deed, with Citicorp International

[17] Tropical Landscapes Finance Facility (TLFF) I Pte. Ltd., Offering Circular dated 7 March 2018, Singapore Exchange (SGX), March 7, 2018, https://links.sgx.com/FileOpen/TLFF_Offering%20Circular%20dated%207%20March%202018%20%283%29.ashx?App=Prospectus&FileID=33812

Limited acting as trustee for noteholders, and they were limited-recourse obligations of the issuer, an important feature for investor risk framing. That matters because investor recovery depended on the performance and enforceability of the structure itself rather than on an unrestricted claim beyond it. The quarterly interest-payment schedule is also significant, since it imposed recurring cash-flow discipline on the borrower over a long tenor. The financing architecture becomes clear when read alongside the risks it was designed to absorb. At the core of the structure was a partial-credit guarantee covering up to 50% of net principal losses after recoveries and application of the first-loss reserve, capped at US$33.25 million. That guarantee was central, but it did not eliminate risk. Losses beyond the capped amount remained with the structure and its noteholders, and the guarantee itself was procedurally conditional. Public documentation indicates that claim payment could take substantial time, with one source describing a possible minimum timeline of roughly 225 days before payment. The guarantee also required "Reasonable Collection Efforts" and other criteria, meaning that recovery depended not only on the existence of the guarantee but on successful enforcement and compliance with process. In that sense, the structure redistributed risk but did not erase it; it converted part of the exposure into a form more acceptable to investors while leaving timing risk, residual loss risk, and enforcement risk materially in place.

The transaction was also exposed to underlying operating and contextual risks in Indonesian land use. &Green's reporting points to land-return frameworks, stakeholder engagement, and community partnership programs as core implementation constraints requiring dedicated systems and credible partners.[18] The offering circular separately identifies natural hazards and climate-related disruption as material risk factors. Indonesian legal, regulatory, and enforcement conditions were therefore not background context but part of the transaction's credit reality, because recoveries depended in part on the ability to enforce claims and realize security in a difficult operating environment.[19]

The de-risking package extended beyond the guarantee itself. The offering circular describes a Reserve Account sized to cover approximately 10.53 months of scheduled interest, fees, and expenses, thereby providing an important liquidity buffer. It

[18] ADM Capital, "&Green Fund Makes Catalytic Investment in Natural Rubber Company in Indonesia through TLFF" press release, March 7, 2019, https://www.admcapital.com/green-fund-makes-catalytic-investment-in-natural-rubber-company-in-indonesia-through-tlff/

[19] Offering Circular dated 7 March 2018, Singapore Exchange (SGX)

also refers to a pre-funded interest mechanism available around utilization.[20] More broadly, the transaction relied not only on financial engineering, but on the expectation that environmental and social discipline could reduce operational disruption, conflict, and reputational impairment over the life of a long-tenor asset.

Public disclosures also suggest that implementation support formed an important complement to the formal credit-enhancement package. &Green's disclosures frame TLFF as a platform involving UNEP, BNP Paribas, CIFOR-ICRAF, and ADM Capital, with wider ecosystem support also tied to implementation partners such as IDH and FCDO Partnerships for Forests. These actors were not a substitute for guarantee protection, but they helped supply the institutional and operational infrastructure required to make the deal function.[21]

[20] &Green Portfolio, PT Royal Lestari Utama (RLU), accessed December 25, 2025 https://www.andgreen.fund/portfolio/pt-royal-lestari-utama-rlu/, IDH – The Sustainable Trade Initiative, "Indonesia: andgreen.fund Invests USD 23.5 Million for Sustainable, Deforestation-Free Rubber," IDH, March 26, 2019, https://idh.org/news/indonesia-andgreen-fund-invests-usd-23-5-million-for-sustainable-deforestation-free-rubber

[21] This is materially important because it shows how the TLFF structure actually allocated risk-bearing capital: impact/catalytic investors (e.g., &Green) participated through TLFF notes rather than via direct project equity, &Green Fund, "Royal Lestari Utama (RLU)," &Green Annual Report, https://annual-report.andgreen.fund/portfolio/rlu/

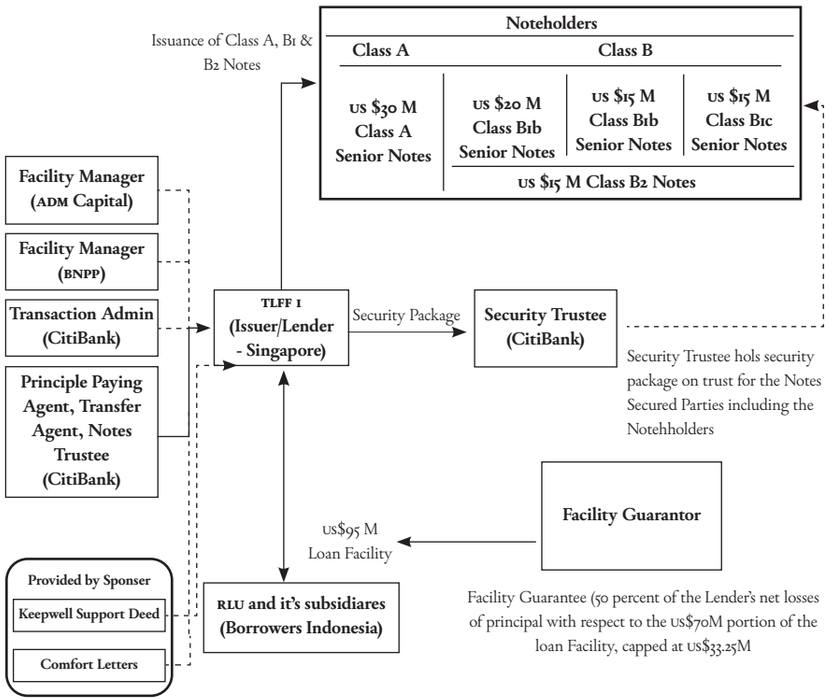

FIGURE 3: TLFF Transaction Summary
SOURCE: Page 1, Tropical Landscapes Finance Facility (TLFF) I Pte. Ltd., Offering Circular dated 7 March 2018, Singapore Exchange (SGX), March 7, 2018)

On financial additionality, the structure enabled capital to enter a land-use transaction on terms that would likely have been difficult to achieve without layered de-risking. The guarantee and reserve mechanisms helped make the senior paper legible to investors seeking stronger credit protection, while the differentiated coupons across the B tranches indicate a structure designed to allocate higher exposure to investors prepared to accept higher exposure in exchange for higher expected return. &Green's disclosed US$23.75 million participation in TLFF notes provides concrete evidence that mission-oriented capital entered the structure, even if public materials do not fully establish the counterfactual composition of investors absent the guarantee, reserve mechanisms, and tranche design.

On impact additionality, the evidence supports a narrower but still meaningful conclusion. Environmental and social objectives were embedded in governance through ESG standards and ESAP-style monitoring rather than treated solely as

marketing language or generic use-of-proceeds labeling. That is analytically significant. At the same time, public documentation does not fully establish whether those safeguard mechanisms translated into verified long-term social, biodiversity, or post-repayment land-use outcomes. The available evidence therefore supports a distinction between structurally embedded sustainability requirements and demonstrated impact performance.

The exchange relationships underlying this structure are worth stating plainly. USAID accepted contingent fiscal exposure capped at USD 33.25 million in exchange for a mobilization signal: evidence that public credit enhancement could bring institutional capital into a land-use transaction it would not otherwise have entered. Class A noteholders accepted a 4.136% coupon and limited-recourse obligations in exchange for AAA-rated structural protection, Reserve Account liquidity coverage, and priority claim over the guarantee. Class B1 noteholders accepted subordinated payment position and materially higher loss exposure in exchange for coupons ranging from 8.375% to 9.0%, consistent with a more catalytic investor profile. &Green's USD 23.75 million participation in Class B notes is the most concrete public evidence of that exchange: a mission-aligned investor accepting first-loss-adjacent risk in exchange for alignment with its deforestation mandate. RLU accepted ESAP obligations, ESAB oversight, and quarterly cash-flow discipline over a fifteen-year asset horizon in exchange for long-tenor USD financing at a scale and structure that domestic markets were unlikely to support on comparable terms. The stability of that allocation held through the financing period. Its leverage was strongest during the life of the instrument, with durability beyond repayment shifting to the corporate acquirer. Once the bond was repaid, USAID's contingent exposure ended, noteholder leverage ended, and accountability for land-use outcomes passed to the corporate acquirer. The structure was stable for the life of the instrument. It was not designed to be stable beyond it. Anticipated risk was shaped not only by subordination but by the conditional, time-lagged, and capped character of the guarantee. Seniority therefore mattered, but so did the procedural reality that guarantee support could be delayed and would not absorb all losses. The structure did not remove risk. It reordered and distributed it.

ACLF: Guarantee-backed portfolio lending and borrower-level risk discipline

ACLF uses a different financing architecture and is best evaluated as a portfolio-based private-credit model rather than as a scaled-down version of TLFF. ACLF is presented as a private credit fund making medium-term senior secured loans to eligible enterprises, including Indonesia SMEs, operating in sustainable agriculture,

aquaculture, agroforestry, land regeneration, and forest-protection value chains, supported by an unfunded 50% partial-credit guarantee from the U.S. International Development Finance Corporation. The central blended element is therefore an asset-level public risk-sharing mechanism rather than a visible multi-tranche public note issuance. The mechanism is intended to support lending into firms that fall

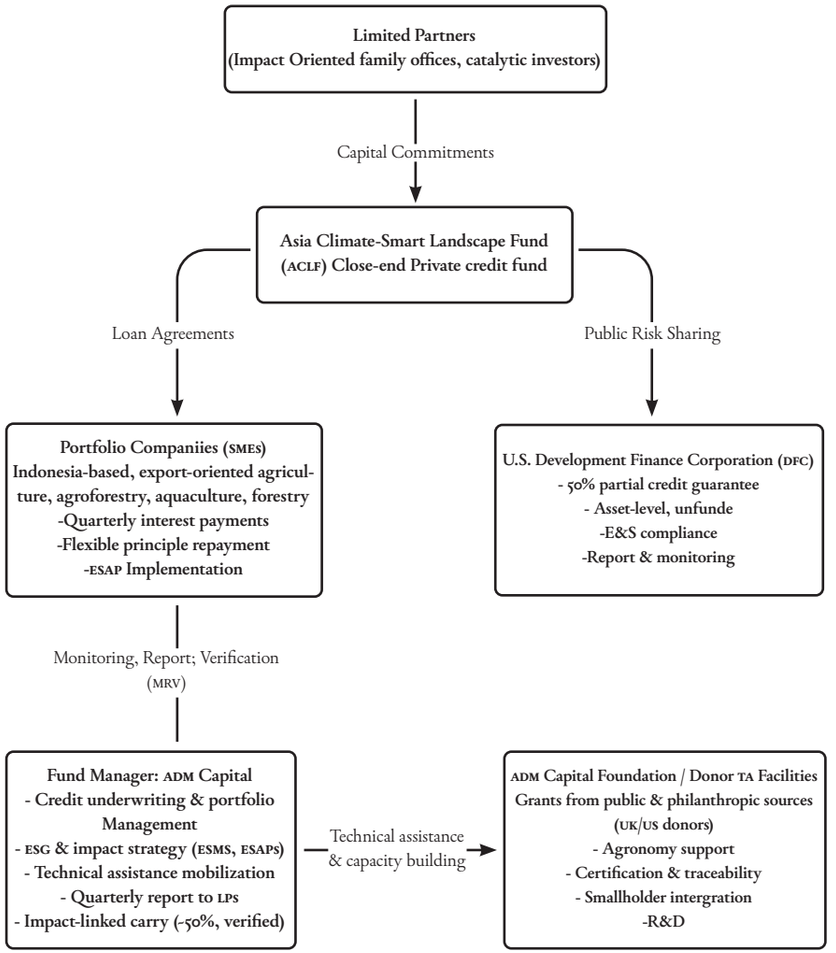

FIGURE 4: ACLF Transaction Flow
SOURCE: Prepared by Authors (2026)

into a missing middle, where conventional local-bank credit is limited and financing needs are more complex than standard working-capital loans.[22] [23]

Unlike TLFF's publicly legible tranche-by-tranche risk disclosure, ACLF's structure is readable through a different set of features: guarantee coverage, borrower pricing, technical-assistance functions, and environmental and social governance requirements. The missing-middle financing gap this addresses, mid-market enterprises too complex for standard bank credit, too small for most DFI direct lending, is established in the mechanism overview; the relevant question here is how the fund's architecture redistributes risk within that setting.[24]

The principal risks in ACLF appear to be borrower credit risk, sector and commodity volatility, and climate-related production risk. ADM Capital states that borrowers must service interest quarterly and that the fund avoids thin-margin commodity-trading profiles, suggesting that business-model selection is itself a form of risk management. Climate-production risk remains only partly solved. Interviews indicate that the team has explored rainfall and soil-moisture insurance, but that cost and product-fit challenges remain significant; the proposed approach is for companies rather than farmers to bear premium costs, with monitoring intended to prevent cost pass-through. DFC's own framing reinforces that these borrowers operate in sectors exposed to land-use governance, commodity, and climate risks, even where those risks are not disaggregated publicly in the same way as in TLFF.[25]

The de-risking architecture in ACLF appears to rest on three linked elements. First is the 50% DFC guarantee, which functions as the primary formal risk-sharing device. Second is technical assistance funded through sources organized by the fund, which interviews and public summaries describe as supporting smallholder partnerships, certification, traceability, agronomy, operational capacity, and other

[22] DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

[23] U.S. International Development Finance Corporation, "DFC Approves 11 Values-Based Investments Totaling Nearly $364 Million to Address Climate Change, Promote Gender Equity, and Improve Healthcare throughout the Developing World," DFC, March 9, 2022 https://www.dfc.gov/media/press-releases/dfc-approves-11-values-based-investments-totaling-nearly-364-million-address

[24] DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

[25] SIRI- ADM Capital Interview (November 19, 2025)

forms of borrower strengthening. Third is environmental and social risk management, including compliance with applicable law, IFC Performance Standards, ESMS and ESAP requirements, KPI tracking, and annual reporting to DFC. The fund manager also describes hands-on operational involvement, including support for ESG and financial management compliance.[26]

ACLF's exchange relationships are organized around a different set of positions. DFC accepts contingent fiscal exposure of up to USD 70 million on a 50 percent asset-level basis in exchange for developmental outcomes aligned with its mandate: expanded SME credit access, sustainable land use, emissions reduction, and livelihood improvement. Its return is not financial; its exposure is triggered by individual borrower defaults rather than aggregate portfolio loss, which keeps its contingent liability disaggregated and preserves its oversight role through annual reporting requirements. LP investors accept illiquidity and transition-sector risk in exchange for target net returns in the high single digits to low teens and impact exposure aligned with their mandates (Grade B: CPI NBS Toolbox, 2024; Calvert Impact partner profile). The LP base is weighted toward impact-orienimpact-oriented family offices, and foundations consistent with investors who prioritize impact alignment alongside financial return. ADM Capital accepts the operational burden of hands-on portfolio management, ESMS administration, and TA mobilization in exchange for management fees and carried interest, with 50 percent of that carry contingent on annually verified impact performance, a direct economic link between manager compensation and the sustainability outcomes the fund targets (Grade B: Calvert Impact). Portfolio SMEs accept quarterly interest service, ESAP compliance obligations, and data reporting requirements in exchange for medium-term financing at ticket sizes and tenors unavailable through local commercial banks, combined with technical assistance that may reduce transition costs and improve buyer access over time. "The structure's stability rests on two conditions not yet fully tested at portfolio scale: continued TA funding availability in partnership with ADM Capital Foundation, and sufficient portfolio credit quality. Both are plausible given the underwriting approach and the DFC backstop. Neither is yet demonstrated."[27]

[26] SIRI- ADM Capital Interview (November 19, 2025)

[27] SIRI- ADM Capital Interview (November 19, 2025), substantiated by DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

Return expectations and risk-sharing logic

Return expectations should nevertheless be kept analytically separate from additionality claims. Interview evidence places borrower pricing in the low- to mid-teens, up to roughly 13%, reflecting higher risk than bank lending and the fund's hands-on operational model. Public secondary reporting is somewhat narrower: CPI reports investor-return targets of roughly 8-10% and notes that the loans are export-oriented and denominated in U.S. dollars, which may reduce currency risk.[28]

Unlike TLFF, ACLF is not publicly presented through a multi-tranche capital stack with tranche-specific coupon disclosure. The evidence instead points to a simpler public risk-sharing logic: private lenders and LPs benefit from the presence of the DFC guarantee, while residual loss beyond the guaranteed portion remains with the fund and its investors and is managed through underwriting discipline, technical assistance, and environmental and social risk management. The structure therefore does not expose senior-versus-junior risk allocation in the same way as TLFF, but it still reveals how public support is used to reshape the distribution of credit risk within a portfolio-lending model.

What the two structures reveal about risk allocation

When contrasted, the financing contrast between the two structures is analytically significant. TLFF relied on tranche engineering, reserve protection, and guarantee support to make a large, long-tenor landscape transaction investable in capital-markets form. ACLF relies on asset-level guarantee support, more selective borrower underwriting, and operationally intensive technical assistance to extend credit into a mid-market segment that is harder to serve through either commercial banks or large one-off structures. The shift is not simply from one instrument to another. It is a shift in how blended finance distributes risk, what kind of borrower it can support, and where public and philanthropic capital enter the financing chain.

In effect, ACLF distributes risk and expected return through a different architecture than TLFF. Whereas TLFF disclosed risk allocation through multiple note

[28] Climate Policy Initiative, "Toolbox on Financing Nature-Based Solutions," Climate Policy Initiative, September 2024, https://www.climatepolicyinitiative.org/wp-content/uploads/2024/09/Report-Toolbox-on-Financing-Nature-Based-Solutions.pdf

tranches with differentiated coupons, ACLF's publicly visible risk-sharing mechanism is primarily the 50% DFC guarantee layered onto a portfolio-lending model. Further, the guarantee supports a total US$200 million funding envelope, with up to US$100 million in DFC coverage for medium- and long-term on-lending to enterprises in sustainable agriculture, aquaculture, land regeneration, and forest protection.[29] Descriptions of the structure emphasize guarantee support, technical assistance, and environmental and social governance requirements rather than a tranche-by-tranche investor stack.

Within that framework, expected return is most clearly signaled at two levels. At the borrower level, interview evidence suggests pricing in the low- to mid-teens, up to roughly 13%, reflecting both higher perceived risk than local bank credit and the operational intensity of the fund's approach. At the investor level, public and interview-based reporting places LP return expectations in the high single digits to low teens, with a predominantly impact-oriented, family-office-heavy investor base. The structure's risk discipline is therefore expressed less through visible subordination and more through the interaction of guarantee coverage, underwriting selectivity, technical assistance, and standards alignment. ACLF's governance architecture also includes ESMS and ESAP requirements, KPI monitoring, annual reporting, and application of application of IFC Performance Standards under DFC oversight.[30] These structural differences matter not only for risk allocation, but also for how each vehicle's additionality can be understood and assessed.

Value Creation and Additionality

ACLF: Financial additionality and structural gap-filling

The clearest financial-additionality claim rests on the market-failure framing established by the fund's public risk-sharing partners. DFC explicitly identifies low local bank credit availability in Indonesia as the structural condition the guarantee is designed to address, and Calvert confirms that medium-term financing demand among these enterprises is largely unmet (Grade B: DFC PIS; Calvert Impact partner profile). Together these constitute credible third-party corroboration that ACLF

[29] SIRI- ADM Capital Interview (November 19, 2025), and DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

[30] SIRI- ADM Interview (November 19, 2025), IFC performance standards in DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

is filling a structural gap rather than substituting for readily available commercial credit.

ACLF: Impact pathway and evidence limits

The impact-additionality case is framed more in terms of intended pathway than demonstrated outcomes.[31] Expected impact can be described through reduced greenhouse-gas emissions, improved livelihoods, and gender equity. DFC further states that technical assistance is expected to reach value-chain SMEs, mostly farmers, and that portfolio companies will be monitored through KPIs within an ESMS/ESAP framework. Interviews add more operational specificity to this pathway, pointing to smallholder incentives, certification and traceability support, agronomy and training, and exploration of rainfall and soil-moisture insurance as mechanisms through which environmental and livelihood outcomes might be strengthened. These details make the pathway more concrete, but they should more accurately be regarded as intended channels of impact rather than verified portfolio-level results.

DFC's stated developmental objectives link the fund to improved sustainability of land use, procurement from value-chain SMEs, mostly farmers, and the delivery of technical-assistance benefits to projects and beneficiaries. Calvert adds a more explicit theory-of-change framing, describing the fund as enabling enterprises to expand in a more sustainable way while targeting greenhouse-gas reduction, improved livelihoods, stronger land-use management, and gender equity.

Governance and Accountability

Governance architecture and accountability mechanisms

The differences between TLFF and ACLF extend beyond finance into governance, accountability, and the durability of sustainability leverage. They also lie in how authority is structured, how compliance is maintained, and how long sustainability leverage lasts. Both vehicles aim to mobilize private capital toward sustainable land-use outcomes, but they do so through distinct governance architectures that reflect different assumptions about enforcement, incentives, and post-invest-

[31] ACLF's design addresses a specific market failure: limited availability of bank credit for SMEs, especially for medium/long-term capital in sustainable land-use value chains. DFC explicitly frames the guaranty as enabling origination of private (non-bank) credit in that context. ADM similarly positions ACLF as filling an SME funding gap and crowding in catalytic and impact LP commitments up to a $200m target.

ment accountability.

TLFF: Trustee-led governance with time-bound sustainability leverage

TLFF employed a capital-markets governance architecture designed to meet the expectations of institutional debt investors. Notes were issued by a Singapore SPV (TLFF I Pte. Ltd.) and constituted under a trust deed, with Citicorp International Limited acting as Notes Trustee. This structure created formal fiduciary oversight, enforceable security, and a legally binding priority of payments, thereby supporting accountability for financial performance over the life of the bond (Figure 5)

Sustainability accountability was embedded contractually through Environmental and Social Action Plans (ESAPs) and a Landscape Protection Plan (LPP) incorporated into the loan documentation with PT Royal Lestari Utama (RLU). These instruments required reporting on agreed environmental and social KPIs, including land-use management, biodiversity buffers, and community engagement. Oversight was reinforced by an Environmental & Social Advisory Board (ESAB) comprising

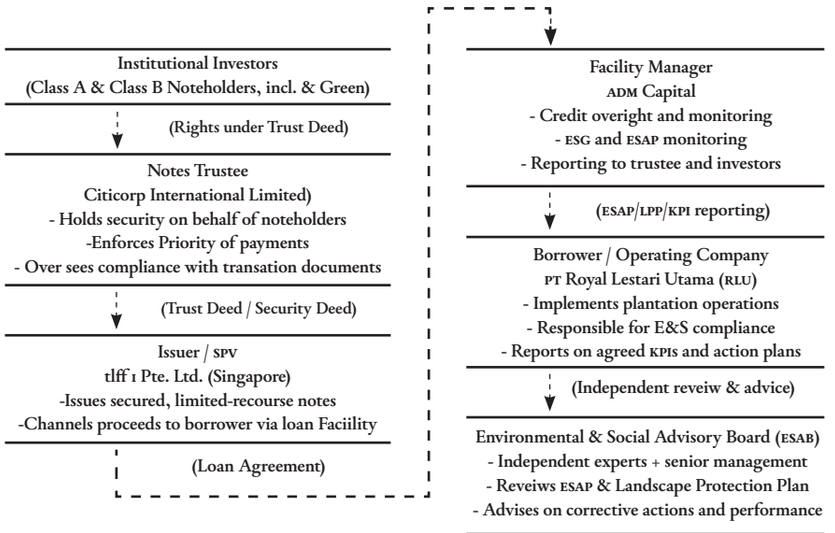

FIGURE 5: Governance - TLFF,
SOURCE: Prepared by Authors (2026)

independent experts and senior management, which reviewed implementation progress and advised on corrective actions.[32]

This produced a dual governance system: financial obligations were backed by hard legal enforcement, while sustainability commitments were governed through formalized but comparatively softer monitoring and advisory mechanisms. During the financing period, that arrangement likely reduced information asymmetry and helped support investor confidence in a long-tenor structure. Its leverage, however, appears to have been strongest while the financing remained live. Once the bond was repaid and investor leverage ended, accountability for sustainability outcomes appears to have shifted primarily to the corporate owner. TLFF therefore illustrates a broader limitation of project-based blended finance: sustainability oversight may be strongest during the financing period and significantly weaker after exit, even where safeguards are robust at origination (Figure 6).

ACLF: Manager-led governance with public oversight and incentive alignment

ACLF represents a second-generation governance model centered on fund-level accountability and operational control, rather than trustee enforcement. Governance authority is primarily exercised by the fund manager, ADM Capital, with upward accountability to limited partners (LPs) and public oversight by the U.S. Development Finance Corporation (DFC). (Figure 7).

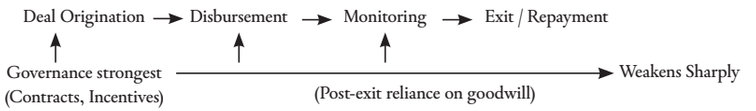

FIGURE 6: Governance over the investment lifecycle and the post-exit weakening of leverage,
SOURCE: Prepared by Authors (2026)

[32] &Green Portfolio, PT Royal Lestari Utama (RLU), accessed December 25, 2025 https://www.andgreen.fund/portfolio/pt-royal-lestari-utama-rlu/

As a DFC-supported financial intermediary, ACLF is required to operate a formal Environmental and Social Management System (ESMS), implement Environmental and Social Action Plans (ESAPs) at the portfolio company level, and report annually on compliance and KPIs. Applicable standards include compliance with local law

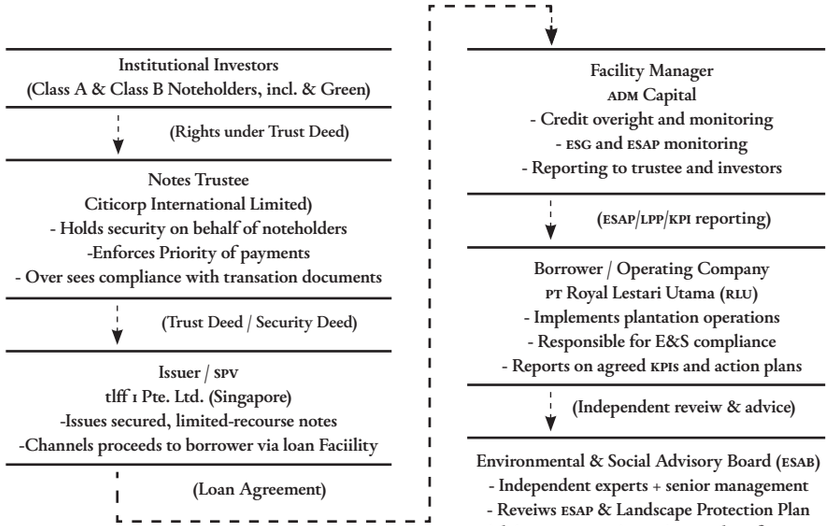

FIGURE 7: Governance Structure: ACLF,
SOURCE: Prepared by Authors (2026)

and IFC Performance Standards (PS 1 and 2). These requirements create a formal accountability framework linking portfolio companies, the fund manager, and the public guarantor.[33] Unlike TLFF, ACLF embeds governance more directly in loan agreements with portfolio companies rather than through an SPV-based note structure. ESAPs, KPI definitions, and monitoring protocols are agreed prior to disbursement and are designed, according to stakeholder accounts, to align with borrower business processes in order to reduce compliance burden while maintaining oversight. Reporting is conducted quarterly through a data platform.[34]

A distinctive feature of ACLF's governance is economic incentive alignment: ADM Capital has disclosed that 50% of carried interest is linked to achieving impact

[33] DFC, "Public Information Summary ADM Capital Asia Climate-Smart Landscape Fund LP", https://www.dfc.gov/sites/default/files/media/documents/9000104718_0.pdf

[34] SIRI- ADM Interview (November 19, 2025)

targets, verified annually. This links part of fund manager compensation to impact performance and adds an incentive-based accountability mechanism beyond reputational commitment alone.[35]

The contrast here is instructive. TLFF relied on externally formalized transaction governance, with strong legal discipline over financial obligations and time-bound leverage over sustainability commitments. ACLF relies more on manager-led portfolio governance under public oversight, with accountability embedded in loan documentation, monitoring systems, and incentive design. The two models therefore differ not only in structure, but in where authority sits, how compliance is maintained, and how long sustainability leverage is likely to endure. Those governance arrangements also shaped what each vehicle was designed to measure, monitor, and claim in impact terms.

Performance Evidence

TLFF: Repayment and Pricing Visibility

Financially, TLFF achieved a full repayment of principal, following Michelin's acquisition of Barito's stake in RLU. ADM Capital and &Green confirm that the bond/loan was repaid in full on 18 August 2022. At issuance, expected returns were clearly disclosed by tranche, with Class A at 4.136%, the main Class B tranches at 8.375-9.0%, and Class B2 at 2.0%. Public sources do not, however, provide audited net realized IRRs.

ACLF: Target Returns and Pricing Signals

CPI reports a target investor return of 8-10%, while interview evidence suggests borrower pricing in the low-to-mid teens, up to roughly 13%, reflecting higher perceived risk and hands-on involvement. Neither DFC nor Calvert publicly disclose audited realized net returns or portfolio-level default or recovery statistics at this stage.[36]

The two vehicles present a study in contrasting evidence availability as much as

[35] Calvert Impact, "ADM Asia Climate-Smart Landscape Fund", Portfolio Partner Profile, https://calvertimpact.org/investing/partner/adm-asia-climate-smart-landscape-fund

[36] Neither DFC nor Calvert publicly disclose audited realized net returns or portfolio-level default/recovery statistics at this stage.

contrasting performance. TLFF's financial record is the more legible: principal was repaid in full, coupon rates were publicly disclosed at issuance, and the structure performed through a long-tenor operating environment in a difficult market. ACLF presents a different evidentiary profile. Public materials indicate target investor returns and borrower pricing signals, but not yet audited realized net returns or portfolio-level default and recovery data. The contrast therefore lies both in the structures themselves and in their different stages of financial disclosure maturity.

Outcome Evidence

TLFF: Safeguards architecture and time-bound outcome evidence

TLFF's impact framework was primarily safeguards-driven, a design consistent with its capital-markets structure and emphasis on risk mitigation. ESAPs and the LPP translated sustainability objectives into actionable requirements during the loan period, supported by KPI reporting and ESAB oversight. UNEP and ADM also framed TLFF in terms of SDG-aligned objectives, including deforestation avoidance, biodiversity protection, and fair employment within sustainable rubber production.[37]

On impact, interim evidence reported during the financing period includes plantation development, conservation buffers adjacent to Bukit Tigapuluh National Park, community partnership programs, and employment generation. However, & Green explicitly notes that following early repayment, investors no longer retain direct leverage over sustainability commitments. This underscores the limits of impact durability once the financial instrument matures, even where interim safeguards and reporting systems were in place.After repayment, ADM reported that Michelin would continue compliance with IFC Performance Standards and independent reporting. Those commitments, however, sat outside TLFF's formal governance perimeter. In that sense, TLFF's framework prioritized compliance and risk containment during the financing period more than long-term outcome measurement or post-exit accountability within the transaction itself.

TLFF therefore illustrates a model in which interim project-period outcomes are more visible than their post-exit durability. ACLF presents a different evidentiary

[37] United Nations Environment Programme (UNEP), "Financing Natural Rubber Plantation in Indonesia: Promoting Sustainable Development," UNEP, February 26, 2018, https://www.unep.org/news-and-stories/press-release/financing-natural-rubber-plantation-indonesia-promoting-sustainable

configuration: a more formalized outcome architecture, but less realized public evidence so far.

ACLF: Outcome architecture and early evidence limits

ACLF employs a dual-layer impact framework. First, it uses a safeguards-based architecture, including ESMS, ESAPs, and alignment with IFC Performance Standards, to manage environmental and social risks at the portfolio-company level. Second, it articulates outcome-oriented impact targets across sustainable land use, greenhouse gas emissions, livelihoods, and gender, as reflected in ADM and DFC disclosures.

Impact measurement is further reinforced by impact-linked carry, with annual verification, linking part of fund manager remuneration to reported impact performance. Interview evidence also indicates that MRV systems are intended to integrate with operational data already collected by portfolio companies, such as farmer onboarding, certification processes, and training delivery, rather than impose parallel reporting structures.[38]

While impact targets and governance systems are clearly articulated, verified portfolio-level impact outcomes, such as emissions reductions or income changes, have not yet been publicly aggregated. For ACLF, public disclosures remain focused primarily on targets rather than realized performance, making the case stronger on ex ante design than on demonstrated portfolio-level outcomes so far.

Lessons and Implications

The progression from the Tropical Landscapes Finance Facility (TLFF) to the Asia Climate-Smart Landscape Fund (ACLF) provides a useful longitudinal view of how blended finance for sustainable land use has adapted in response to market realities, implementation frictions, and unresolved systemic risks. The evidence points to two models with different strengths, constraints, and stages of institutional maturity, rather than a simple linear progression. Rather, the two vehicles reveal different strengths and different limits: TLFF provides clearer evidence on structure, pricing, and repayment, but weaker assurance on long-term outcome durability after exit, while ACLF offers a more formalized governance and impact architecture but, at this stage, less realized public evidence on portfolio-level performance and outcomes. The lessons that follow are therefore less about identifying a single

[38] SIRI- ADM Capital Interview (November 19, 2025)

"best" instrument than about understanding the conditions under which different forms of blended finance can support more durable climate- and nature-aligned investment in emerging markets.

Risk reallocation, not risk elimination

TLFF showed that private capital can be mobilized for sustainable land-use finance when risk is explicitly redistributed across public, philanthropic, and private actors. The combination of a protected senior tranche and more risk-bearing impact-oriented capital helped make the structure legible to institutional investors in an asset class that public materials and stakeholder accounts describe as difficult to finance at scale.

At the same time, TLFF also exposed the limits of one-off, highly structured transactions. Risk was redistributed, but not fundamentally resolved: exposure to commodity prices, climate variability, implementation capacity, and social conflict remained embedded in the underlying asset. ACLF reflects a different response to that lesson. It moves away from capital-markets engineering toward portfolio diversification, tighter credit selection, and more operational engagement, accepting higher pricing and more intensive management in exchange for the possibility of greater repeatability.

The broader implication is that blended finance works best not as a substitute for risk, but as a temporary scaffold that allows markets, business models, and institutions to mature until risk becomes more measurable, more governable, and more priceable.

Governance durability and incentive design

TLFF's trustee-led governance provided strong investor protection and clarity of enforcement, but its sustainability accountability was time-bound to the life of the instrument.[39] Once the bond was repaid, leverage over land-use outcomes appears to have diminished substantially. ACLF responds with a different governance model, embedding accountability more directly at the fund and borrower level and linking impact delivery to fund-manager incentives and DFI oversight. The contrast suggests that capital structure alone is not enough: the durability of blended-finance outcomes depends heavily on where governance authority sits,

[39] TLFF had trustee-led governance for investor protection and cash-flow enforcement. It did not have trustee-led governance for sustainability, operations, or strategy.

how monitoring is maintained, and whether incentives remain active beyond initial disbursement.

Mid-market investability and the role of technical assistance

Both cases point to a critical market insight: mid-sized, often export-oriented agribusinesses represent a potentially investable but fragile segment. These firms are generally too large for grants or microfinance, yet often remain too risky, operationally complex, or transition-intensive for conventional commercial-bank lending, particularly when they operate through fragmented smallholder supply chains.

The ACLF model suggests that lending to this segment requires more than credit alone. It depends on hands-on involvement that, in practice, can resemble a lower-cost substitute for equity support, as well as technical assistance for supply-chain integration, certification, traceability, and operational upgrading. It also requires investors willing to accept the higher cost and complexity of deploying capital into businesses whose resilience and impact potential are linked to operational change rather than short-cycle financial optimization.

Scaling sustainable land-use finance may therefore depend less on the sheer volume of available capital than on the institutional capacity to work effectively with complex mid-market firms.

What worked in structuring and implementation

In TLFF, three features stand out. First, the transaction had a meaningful demonstration effect: it showed that sustainable land-use assets could, under substantial structuring and credit support, be financed through capital-markets channels, and it appears to have informed later thinking around funds such as &Green and subsequent private-credit approaches. Second, risk stratification mattered. Tranching enabled institutional investors to participate without assuming the full risk profile of the underlying project. Third, the governance package at origination, including trustee structures and ESAP-linked oversight, appears to have reduced investor uncertainty during the financing period.

In ACLF, the strengths lie elsewhere. The fund-based private-credit model allows capital to be deployed across multiple borrowers and sectors rather than tied to a single flagship asset. Close engagement with borrowers can strengthen supply-chain resilience, operational discipline, and credit quality. In addition, impact-linked carry creates an internal incentive structure that goes beyond

external reporting alone by linking part of manager compensation to measured impact performance.

What still needs to improve

Neither vehicle fully resolves the problem of long-term land stewardship beyond the financing horizon. TLFF's sustainability leverage appears to have weakened materially after repayment, and ACLF's governance leverage is likely to remain strongest while loans remain outstanding. This points to a need for mechanisms that link finance more credibly to long-term land-use commitments, including covenants tied to land rights, off-take agreements with sustainability conditions, or stronger alignment with regulatory frameworks such as the EU Deforestation Regulation.

A second weakness is the cost and fragmentation of technical assistance. TA is central to both models, yet it remains donor-dependent, administratively costly, and unevenly integrated with investment pipelines. The retrenchment of agencies such as USAID has further exposed the vulnerability of these support systems. A more durable model would involve pooled, multi-donor TA facilities that are aligned with fund pipelines and that distinguish more clearly between TA serving public-good outcomes and TA that directly enhances borrower profitability or repayment capacity.

A third weakness is the limited development of climate-risk transfer. Despite clear recognition of climate exposure, insurance and hedging solutions remain thin because of cost, product mismatch, and limited underwriting appetite for SME agriculture. Public support for early-stage climate-risk products, such as rainfall or soil-moisture indices, may therefore be necessary, especially where risk-sharing mechanisms can be designed to avoid cost pass-through to farmers.

Drivers, hurdles, and the mechanism mix needed for scale

Several factors appear likely to support additional capital mobilization. Regulatory pressure on supply chains, including through measures such as the EUDR, can increase demand for compliant producers and more traceable value chains. Export-oriented business models may offer natural foreign-exchange hedges. DFI guarantees and anchor commitments can reduce downside risk for private LPs. Demonstrated track records, including TLFF's repayment, also matter because they make subsequent structures easier to underwrite and explain.

At the same time, several persistent hurdles remain. Transaction costs are high relative to ticket size. Political risk and land-tenure uncertainty continue to weigh on investor perception. Exit options remain limited, often relying on refinancing or strategic acquisition rather than deep secondary markets. And many structures still depend on concessional capital to absorb early losses and support technical assistance.

Drawing on both cases, scaling sustainable land-use finance is therefore likely to require a portfolio of complementary mechanisms rather than a single preferred instrument. These mechanisms are likely to include partial-credit guarantees that crowd in private LPs, TA facilities aligned with borrower needs and fund pipelines, first-loss capital targeted at early portfolio construction rather than permanent subsidy, climate-risk-sharing instruments supported by public capital to reduce cost, and policy-aligned incentives linking finance to trade, procurement, and environmental regulation. Crucially, such mechanisms should be designed to phase down over time as markets mature and risk becomes more measurable and priceable.

A directional signal of where this institutional evolution may lead comes from regional platforms such as Pentagreen Capital's Green Investments Partnership, which aggregates risk across multiple Asian markets and uses catalytic capital to support commercially oriented debt deployment at a scale that single-country funds cannot achieve. The model is not directly comparable to TLFF or ACLF in sector focus, risk-sharing design, or public disclosure depth, and should not be read as a benchmark for either. Its relevance here is institutional rather than structural: it points toward a possible next phase in which blended finance moves beyond bespoke project vehicles and first-generation fund experiments toward repeatable, regionally scaled platforms that crowd in private investors through portfolio diversification. Whether that trajectory is achievable in sustainable land-use finance specifically will depend on whether the pipeline, borrower-readiness, and verification constraints that TLFF and ACLF both encountered can be resolved at a level of consistency that regional aggregation requires.

A complementary direction for blended-finance design is emerging in parallel through smallholder-focused credit models that operate below the mid-market segment. For example, a pilot supported by Temasek Foundation in Indonesia combines a partial philanthropic guarantee with insurance provided by Tokio Marine Insurance and value-chain integration through an aggregator platform

to extend formal credit to smallholder rice farmers. Early evidence suggests that such structures can reduce seasonal lending rates from levels exceeding 20–50% in informal markets to approximately 7–10%, while generating repayment data intended to crowd in financial institutions over time.

Unlike ACLF, which assumes a baseline level of borrower readiness and deploys capital into firms already legible to credit markets, these models attempt to construct creditworthiness ex ante through tighter coordination of inputs, offtake, insurance, and risk-sharing. This suggests that the frontier of blended finance is not only moving "upward" toward more investable enterprises, but also "downward" into smallholder systems, where financial viability must be engineered through ecosystem design rather than assumed at entry.

Conclusion

TLFF and ACLF do more than mark a shift in instrument choice, they reveal a deeper evolution in how blended finance has been used to confront the persistent constraints of sustainable land-use investment in Indonesia. TLFF was important because it showed that, under sufficiently strong structuring, guarantee support, and governance discipline, a large-scale land-use transaction could be made legible to institutional capital. But it also exposed the limits of frontier demonstration. The transaction depended on substantial risk redistribution, intensive structuring, and time-bound sustainability leverage, while leaving unresolved the harder questions of post-exit durability, borrower depth, and whether safeguards embedded during the life of an instrument can secure long-run land-use outcomes once financial leverage falls away.

ACLF reflects a more operational response to those limits. Rather than relying on a single flagship asset and capital-markets engineering, it moves toward portfolio-based private credit, mid-market borrower selection, technical assistance, and manager-led governance under public oversight. In that sense, ACLF should not be read simply as a "scaled-up" successor to TLFF. It represents a different theory of investability: one that accepts that sustainable land-use finance in emerging markets may require less emphasis on one-off demonstration and more emphasis on building repeatable credit processes around firms that are commercially viable but institutionally hard to finance. That shift is significant because it places

sustainability closer to the core of underwriting, operational support, and incentive design, rather than treating it mainly as a safeguard condition attached to an otherwise conventional financial structure.

Even so, the chapter suggests that this evolution remains incomplete. Neither model fully resolves the structural frictions that continue to define climate-smart land-use finance: fragmented supply chains, uneven borrower readiness, costly and donor-dependent technical assistance, weak climate-risk transfer markets, and the persistent challenge of sustaining accountability beyond the financing horizon. What changes across the two cases is not the disappearance of those frictions, but the way they are managed. TLFF handled them through bespoke structuring and explicit tranche-based risk redistribution. ACLF handles them through portfolio diversification, guarantee-backed lending, and more intensive managerial intermediation. Both approaches expand the frontier of what can be financed, but both also underscore that blended finance still relies on public, philanthropic, or concessional support to make difficult risks governable.

For Indonesia, and for broader efforts to finance sustainable land use in emerging markets, the central lesson is therefore more demanding than the familiar claim that blended finance can mobilize capital. The more important question is whether these structures can help build markets that become progressively less exceptional over time: markets in which sustainability is integrated into credit discipline, where technical assistance is better institutionalized, where risk is more transparently measured and priced, and where public support acts as a catalyst rather than a permanent substitute for market development. The central challenge is therefore not simply whether blended finance can work under specially designed conditions, but how to design it so that, over time, fewer extraordinary interventions are required.

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From Smallholders to Global Markets: De-risking the Coconut Sugar Value Chain

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Abstract

This case examines the role of blended finance in enhancing the financeability of a fragmented, smallholder-linked coconut sugar value chain in Indonesia. It centers on Mirova Sustainable Land Fund 2's investment in Big Tree Farms (BTF), a company that combines export-market access, certification, and internal supply-chain coordination across a widely dispersed network of coconut producers. The analysis highlights a compound investment challenge: fragmented sourcing, inconsistent farm gate quality, vulnerability to climate variability in rainfed production systems, and restricted access to patient capital collectively hinder the transformation of robust export demand into an investable and scalable business model. The transaction was enabled by the combination of layered risk-bearing capital and technical assistance, which was directed toward a company already working to internalize certification, supplier coordination, and quality control throughout its value chain.

The analysis indicates both structural and financial additionality, although long-term development outcomes have yet to be demonstrated. The deal structure includes subordinated public and philanthropic capital that protects senior investors at the fund level, mezzanine financing that provides the company with longer-tenor and more flexible capital at the transaction level, and technical assistance that translates climate and ESG concerns into more specific workstreams for implementation and monitoring. However, evidence regarding realized financial performance and verified outcome depth remains limited. Public disclosure on transaction-level returns is still scarce, and several key outcomes of the case, including resilience gains, livelihood improvements, and longer-term carbon and biodiversity effects, are better characterized as monitored pathways or expected outcomes rather than as fully verified results. BTF therefore serves as a conditional demonstration of how blended finance can expand investability in nature-based agriculture when company capability, certification systems, supply-chain discipline, and catalytic support are aligned, while also clarifying the limitations of replication in the absence of these conditions.

Case Summary

	BTF Summary (Indonesia Coconut Sugar Value Chain)
1. Case Theme	Blended finance for a smallholder-linked coconut sugar value chain in Indonesia
2. Blended Finance Archetype	Layered fund structure with mezzanine debt and donor-funded technical assistance
3. Primary Catalytic Instrument	Junior / first-loss capital at fund level and a USD 10 million mezzanine loan at company level, complemented by TAF support
4. Capital Channel and Users	Public, philanthropic, and private investors → MSLF2 → Big Tree Farms → smallholder-linked coconut sugar sourcing, processing, and export-market expansion
5. Primary Market Function	Investability enhancement through risk-bearing capital, technical assistance, traceability, and internal supply-chain coordination
6. Evidence Status	Stronger on structure, governance, and operating logic; weaker on realized financial performance and fully verified long-run outcomes
7. Replicability Vector	Conditional replication where company capability, certification systems, buyer demand, and catalytic support are sufficiently aligned
8. Capital Scale and Structure	MSLF2 is targeting EUR 350 million and had raised roughly EUR 165 million in equity and grants; within that structure, BTF received a USD 10 million mezzanine loan.
9. Locus of Catalytic Intervention	Fund-level through junior / first-loss capital and TAF support, and company-level through subordinated mezzanine finance tied to operating and ESG strengthening.

The Investment Problem and Thesis

Indonesia is the world's largest coconut sugar exporter, with an estimated 5.8 million households cultivating 3.7–3.8 million hectares[1] and generating around USD 2.06 billion in annual coconut-related exports.[2] Yet most smallholders sell through multiple layers of brokers and middlemen who capture a disproportionate share of value. Within this fragmented structure, performance standards are poorly defined, and implementation costs are high. As a result, farmers possess limited incentives and capacity to invest in quality, productivity, and sustainability-related upgrading.[3]

This structural weakness is exacerbated by an accelerating climate threat. According to a private insurance company's climate due diligence, Java's dry season is projected to extend by about a month by 2050, accompanied by an average temperature increase of 1.3°C. Sumatra and Kalimantan face even greater risks. In Dumai, projections indicated that by 2050, every month will experience more than 10 days with temperatures exceeding 33°C, a threshold that threatens coconut nectar production.[4] In the relevant production systems, productivity already declines toward the end of the dry season as water becomes increasingly scarce. Extended droughts are likely to intensify this vulnerability. These farms are rainfed and lack systematic irrigation, water management infrastructure, and large-scale climate adaptation training.[5] Research on tropical rainfed smallholder systems shows that without targeted interventions, including soil and water conservation, climate information services, and conservation agriculture, farmers frequently rely on reactive coping strategies that undermine long-term productivity.[6] Within this value chain, climate should be understood as an increasing constraint on supply reliability, farm productivity, and the quality of future investment.

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[5] Ibid.

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On the demand side, the global coconut sugar industry is valued at about USD 1.33 billion and growing at roughly 8% per year, driven by consumer shifts toward natural, low-glycemic sweeteners.[7] Coconut sugar aligns with three prevailing trends: consumer demand for natural and low-GI products, preferences for organic and fair-trade sourcing, and interest in minimally processed, nutrient-rich foods. However, Indonesian producers often face challenges in meeting the minimum quality and volume standards required by international buyers.[8] Consequently, strong market growth does not necessarily result in improved profit margins or more reliable market access for these fragmented producers.

These pressures, farmer marginalization, climate vulnerability, and the gap between export demand and investable supply, define the investment problem examined in this case. The central constraint is the absence of financing and operational arrangements that can strengthen internal sourcing, improve traceability and quality control, support climate and ESG upgrading, and reduce dependence on fragmented intermediary channels. This case therefore evaluates whether blended finance enhances the financial viability of a smallholder-linked coconut sugar business by combining patient capital with technical support and value-chain integration. The analysis draws upon available evidence regarding structure, operating discipline, and the limited public record on performance and outcomes.

Mechanism Overview

Mirova Sustainable Land Fund 2 (MSLF2)[9] is a blended finance vehicle that channels capital from public, philanthropic and private investors into sustainable land-use companies in emerging markets. Public and philanthropic investors provide concessional capital in the form of junior, first-loss equity and grants. In doing so, they absorb more downside risk at the fund level and help mobilize senior

[7] F. Sarpong, D. Anning, and C. Oduro-Yeboah, "Trends in Coconut Brown Sugar Production – A Review of Health and Future Prospect in the Industry," Turkish Journal of Agriculture - Food Science and Technology 12, special issue 2 (2024): 2407–14, https://doi.org/10.24925/turjaf.v12is2.2407-2414.6907

[8] Indrayanto et al., "Organic Coconut Sugar Factory: Feasibility Study Indonesia Case," International Journal of Research - GRANTHAALAYAH 10, no.11(2022): 140-52, https://doi.org/10.29121/granthaalayah.v10.i11.2022.4887

[9] Caroline Flammer and Frederic de Mariz, eds., Case Studies on Blended Finance and Sustainable Investing in Brazil (New York: Sustainable Investing Research Initiative at Columbia SIPA, 2025), https://siri.sipa.columbia.edu/sites/siri.sipa.columbia.edu/files/content/SIR|%20Blended%20Finance_Case%20Studies%20Brazil_2025_0.pdf

commercial investors. Alongside the fund sits a Technical Assistance Facility (TAF), managed by an independent non-profit, that uses donor grants to strengthen investees' operations, ESG systems and ability to meet international sustainability standards. MSLF2 builds on the earlier Land Degradation Neutrality (LDN)[10] fund11, but in this case the focus is on how the structure operates in the BTF transaction rather than on the broader evolution of the fund strategy.

Once capital is pooled, the fund identifies eligible companies like Big Tree Farms (BTF) in Indonesia. Because BTF works with more than 17,000 smallholder farmers in a complex regenerative coconut sugar supply chain, the company can be difficult for conventional lenders to underwrite on standard terms. MSLF2 addresses that financing constraint by providing a USD 10 million mezzanine loan positioned below existing senior lenders and structured with a longer tenor, while the TAF finances specialized support such as climate-risk assessments, ESMS upgrades and certification processes.

BTF uses this financing to expand its processing capacity and internal farmer network, with the aim of reducing reliance on intermediary channels, strengthening traceability, and improving operating performance over time. As the company sells certified organic products into global markets, it generates the cashflows needed to service and repay the mezzanine loan. These repayments flow back into the fund's cashflow waterfall, first remunerating senior commercial investors and then junior investors. At the mechanism level, this case demonstrates how layered capital and TA can be combined to ensure that public and philanthropic investors absorb greater downside risk at the fund level.This structure allows commercial investors to occupy a more protected position, while investees benefit from longer-tenor, more flexible financing and targeted operational support that is typically unavailable under standard market terms. Following sections unpack how this mechanism distributes risk, structures incentives, and connects fund-level design to company-level implementation.

[10] Convergence datasheet, investors list of Mirova Sustainable Land Fund 2 (in USD, converted to EUR. 1 EUR = USD 1.06)

Risk Allocation and Stakeholder Economics

Fund Structure

MSLF2 aims to secure EUR 350 million in total commitments and has currently raised approximately EUR 165 million in equity (senior, junior, first-loss) and grants for technical assistance. The concessional layer comprises about EUR 5 million in TA grant, USD 12 million in first-loss equity and EUR 70 million in junior equity,[11] in addition to more than USD 90 million in senior commercial capital. According to the fund design, each euro of junior capital is expected to mobilize approximately four euros of senior capital.[12] At present, this ratio represents a design expectation rather than an achieved outcome for the entire vehicle.

The fund pools concessional capital in a junior tranche and commercial capital in a senior tranche. Public investors occupy the junior layer and absorb first losses, thereby reducing downside risk for the senior tranche. This structure increases the vehicle's appeal to risk-averse institutions that are cautious about investing in emerging markets and nature-based projects. Because natural capital is still perceived as high-risk, MSLF2 deliberately uses concessional capital to protect senior investors rather than to lift returns above market levels; even with the Green Climate Fund (GCF). The economic trade-off is clear: public and philanthropic investors accept a subordinated risk position enabling senior investors to participate with greater protection in an asset class often considered too risky for conventional capital. As the fund advances toward its EUR 350 million target, the manager's stated objective is to use this junior-senior structure to attract additional private capital on commercial terms (see Figure 1). As Antoine Raes, Investment Director at Mirova, describes, "The first-loss tranche provided by junior investors offers downside protection to senior capital providers and is intended to make participation more feasible for commercial investors."

At the same time, the fund is structured around the concept that agriculture and forestry investments in emerging markets may require less concessional support

[11] Green Climate Fund, FP263: Mirova Sustainable Land Fund 2 (2025), https://www.greenclimate.fund/sites/default/files/document/fp263-mirova-multi-countries-fp-public_0.pdf

[12] Ibid.

[13] Ibid.

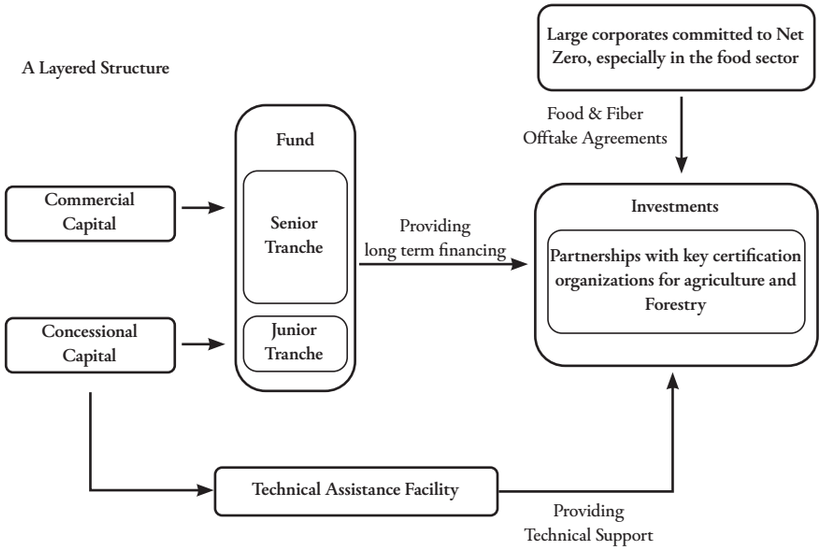

FIGURE 1: Targeted Layered Structure of MSLF 2
SOURCE: Mirova

as the asset class matures. The exact split between junior and senior equity within GCF's commitment will be at the fund's final close and kept at an "optimal" level (subject to a cap in the Term Sheet) to maximize co-investment.[14] For any successor vehicle, the manager's stated goal is to lower the share of junior capital further, reflecting an anticipated move toward more fully commercial financing.

Revenue Mechanism

While detailed information on MSLF2's revenue and cashflow waterfall is currently unavailable, the fund explicitly builds on the model and lessons learned from the LDN fund, where risk mitigation occurs through a cashflow waterfall organized by tranche seniority.[15] Project cashflows are used first to repay senior investors, who receive their initial capital plus a preferred return. After that, junior investors are

[14] Flammer and de Mariz, eds., Case Studies on Blended Finance and Sustainable Investing in Brazil, https://siri.sipa.columbia.edu/sites/siri.sipa.columbia.edu/files/content/SIRI%20Blended%20Finance_Case%20Studies%20Brazil_2025_0.pdf

[15] Ibid.

repaid and receive a preferred return. Any remaining surplus is then shared pro rata between Limited Partners (LPs). In this case, that predecessor structure provides contextual guidance for how MSLF2's economics are expected to operate; it is not direct evidence of realized cashflow performance under MSLF2.[16]

Financing Structure

Big Tree Farms is experiencing rising demand for its products and increasing expectations around quality, traceability, and impact, which place pressure on its current operating capacity. To sustain growth within a regenerative, smallholder-based model, the company seeks investment to strengthen its farmer network reduce reliance on less traceable intermediary channels, and expand processing and storage facilities. Plans include adding new production lines, enlarging warehouse space, and repurposing a neighboring factory to handle larger volumes without compromising quality or farmer relationships.

The financing supports BTF's growth through a combination of subordinated capital and parallel technical support. It comprises a USD 10 million mezzanine debt investment from MSLF2, complemented by access to a donor-funded Technical Assistance Facility (TAF). The TAF supports upgrades in ESG systems, farmer engagement, and operational efficiency as the business scales. The mezzanine loan covers long-term capital expenditure and working capital, while the TAF supports risk management and implementation capacity associated with expansion.[17] Mirova noted that a mezzanine structure was strategic, preserving senior lenders' priority rights and offering flexibility to align investor and issuer objectives within the capital stack. In effect, the mezzanine layer allows MSLF2 to support expansion without displacing existing senior lenders, while the TA facility addresses implementation frictions that capital alone would not resolve.

From this blended pool, MSLF2 provides long-tenor, often subordinated financing with grace periods to certified agriculture and forestry companies, on terms that are often difficult to obtain from local banks. These instruments play a quasi-equity role: by sitting low in the capital stack and avoiding heavy early-year repayments, they give companies time to invest in assets and systems, grow cash flows, and improve leverage ratios. The intended transition logic is that, over time, companies supported on these terms may become better positioned to approach

[16] TAF update materials, Mirova Sustainable Land Fund 2.

[17] TAF update materials by Mirova Sustainable Land Fund 2

local banks or DFIs with stronger reporting systems, clearer operating track records, and a more resilient capital structure. A dedicated investment team, working with conservation and certification partners, originates, structures, and monitors these transactions, while a separate Technical Assistance Facility (TAF), managed by the Catalytic Finance Foundation, helps portfolio companies improve practices, gain certifications, and strengthen the operational and ESG foundations needed for broader access to commercial capital.

This deal introduces new capital to Big Tree Farms. MSLF2's blended fund structure, combining public junior and private senior capital, provides a USD 10 million mezzanine loan plus TA to an Indonesian SME that may be difficult for local banks to finance on comparable terms due to long supply chains, smallholder reliance, climate exposure, and limited collateral. The mezzanine instrument offers long-term, flexible financing aligned with BTF's growth needs, sitting alongside existing senior lenders. The TA facility is intended to strengthen operating systems and improve the company's ability to absorb and use capital effectively. At this stage, additionality could be seen in package combining mezzanine finance, longer tenor, and associated TA may not otherwise be readily available to a regenerative, smallholder-linked agribusiness on standard market terms in Indonesia.

As the transaction recently closed, detailed financial return information has not yet been made public. This limits what can be concluded at this stage about realized financial performance beyond the transaction's structure and stated operating rationale.

Risk Analysis

This section provides a transparent overview of the risk profile associated with the BTF transaction by summarizing examples of risks and mitigants identified, climate due diligence, and ESG assessment. The table starts with financial and market risks, then moves through climate/physical risks, and finally ESG and social risks. It focuses on how these risks are being managed or partially mitigated through the fund structure, covenants, technical assistance, and BTF's own operational and certification systems, while still highlighting where residual exposure remains. Some responses described below are current management tools, while others are planned or prospective measures. Accordingly, the table should be interpreted as a risk-management framework rather than definitive evidence that each risk has been fully mitigated.

Risk Category	Where Risk Appears	Description	Mitigation Tool
Financial / market	Niche segment & competition	Coconut sweeteners and aminos are still niche segments with rising competition from regional producers that may undercut on price.	High differentiation ofBTF proructsthrough certifications, traceability, quality, and brand positioning, with less reliance on pure price competition.
Financial / liquidity	Working-capital and cash-flow strain	Fast growth of operations pushes capex and working-capital requirements and must be accompanied with an attention to quality checks.	Long debt tenor to match capital requirements; TA and ESAP actions are intended to strengthen quality systems and reduce rejection rates and quality control.
Country / macro	Regulatory & macro uncertainty (Indonesia)	Exposure to changes in agriculture, export, certification and labor regulations; infrastructure and climate-adaptation gaps.	Engagement with local partners, alignment with sustainable-agriculture and value-addition priorities, and use of international standards and lender covenants to anchor practices.
Climate / physical – farms	Heat stress	Projected temperature rise (~+1.6°C in Java; more hot days >33°C) affects flowering and sap yields, especially in some prospective northern areas.	Prioritizing sourcing regions with lower heat risk, using agronomic practices that reduce heat stress (shade, mixed crops), and avoiding over-reliance on the highest-risk expansion zones.
Climate / physical – farms	Longer dry seasons / drought	Dry season in Java lengthens by ~1 month; by 2050, all current sourcing is at least "medium" dry-spell risk, 3% in "extreme" risk.	Regenerative practices (mulching, compost, cover crops) to improve soil moisture and resilience, geographic diversification, and monitoring of yield trends in high-risk areas.
Climate / physical – farms	Water-stress context	High WRI water-stress scores at landscape level; though coconuts are rainfed, broader scarcity can affect communities and competing uses.	Focus on low-input, rainfed agroforestry systems with a lower water footprint than cane sugar, alongside engagement with local stakeholders on water issues.
Climate / physical – factory	Extreme heat at plant	Very high heat-wave risk at factory → building degradation, equipment overheating, worker health/ safety, productivity loss.	Cooling and ventilation upgrades, heat-safety protocols, and maintenance planning may be required; climate-resilience capex could be integrated into the ESAP/ TA pipeline.
Climate / physical – factory	Fluvial flood risk	1-in-100-year flood could inundate entire site (~1.2m depth) under defended scenario; material operational disruption risk.	Site-level flood preparedness (drainage, storage elevation, business continuity plans), insurance, and, if risk worsens, longer-term site options.
ESG / supply chain	Inconsistent regenerative practices among external suppliers	While 100% of supply is organic, external suppliers may not fully match internal regenerative standards.	Gradual shift toward internal supply via IDS, targeted TA and ESAP measures, tighter audits and conditions for external suppliers.
ESG / labor & livelihoods	Living income, labor conditions, gender risks	Indonesian agriculture context includes risks on wages, labor rights and gender inequality across >17,000 farmers.	Use of Fair for Life and ROC standards (living income, labor safeguards); monitoring via IDS and certification audits, and TA to strengthen farmer organizations and systems.
ESG / labor & livelihoods	Deforestation & biodiversity pressure	Indonesia's high deforestation risk means expansion could encroach on sensitive areas if not controlled.	Zero-deforestation cut-off dates, farm mapping, certification requirements, ESAP actions, and regenerative agroforestry instead of monoculture expansion.

Table 1: Risk Identification and Mitigation

De-risking Tools and Output

As part of the broader blended structure, MSLF2's TAF supports portfolio companies in pursuing impact KPIs and strengthening the social and environmental performance of fund-backed investments. TAF is set up as a separate pool of donor money that sits alongside the fund and draws on contributions from third-party contributors such as the GCF, the UK Department for Environment, Food & Rural Affairs (DEFRA), Global Affairs Canada (GAC) and other potential donors. This separation means all TA cashflows are independent from the fund's financial returns. That institutional separation matters because it allows TA to function as a de-risking and capability-building tool without altering the return mechanics of the investment vehicle itself.

In the BTF transaction, the TAF functions as a practical de-risking mechanism that helps convert broad climate and ESG concerns into specific workstreams,

action plans, and monitoring processes. At the fund level, the TAF is intended to support the agroecological transition of food and fiber value chains by helping portfolio companies strengthen climate, biodiversity, livelihood, and gender-related performance channels.[18] Within MSLF2, this support is organized around two broad functions: (i) impact enhancement and (ii) impact monitoring and capacity development.

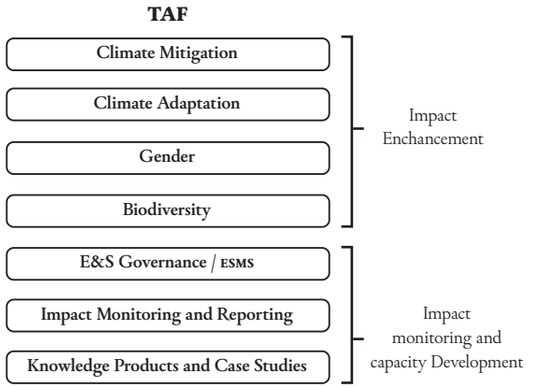

FIGURE 2: MSLF 2 TAF Scope
SOURCE: Mirova

According to Mirova, BTF has utilized TAF in three primary ways. First, it funded a Climate Due Diligence and an Environmental and Social Action Plan (ESAP). The climate study assessed risks related to heat, drought, and flooding for the farms and factory, while the ESAP translated these findings into specific actions by identifying responsibilities and deadlines to strengthen safety, resilience, farmer conditions, and environmental practices. In practical terms, this converts broad climate and ESG concerns into a more structured risk-management agenda with named actions and implementation responsibilities.

Second, TAF resources supported a lifecycle carbon analysis across BTF's entire value chain, highlighting major emission sources: i) downstream logistics to North America and Europe; ii) processing energy (electricity, LPG, diesel); iii) firewood use in sugar processing; and iv) smaller contributions from raw material transport

[18] Green Climate Fund, FP263: Mirova Sustainable Land Fund 2, https://www.greenclimate.fund/sites/default/files/document/fp263-mirova-multi-countries-fp-public_0.pdf

and waste. The assessment also confirmed that coconut plantations hold significant carbon stocks, though annual sequestration in mature stands is limited. These findings provide a more concrete basis for decarbonization planning, including possible shifts away from firewood, efficiency improvements in furnaces, cleaner or renewable energy options, better transport optimization, and greater use of by-products and waste streams such as biomass for energy or water reuse.

Overall, TAF is intended to reduce risk over time by improving how material climate and ESG issues are identified, prioritized, and managed. Energy-efficiency measures may lower operating costs and future carbon exposure. Improved planning for flood and heat risk may strengthen factory resilience. Better farmer-practice and waste-management systems may also support supply-chain credibility with buyers. At this stage, the more precise conclusion is that TAF provides BTF with a stronger foundation for pursuing improvements that might not have been financed or organized as rapidly without external support. Simultaneously TAF offers MSLF2 a more structured framework for monitoring climate and ESG risks alongside the mezzanine investment. Thus, TAF complements financial risk-taking by enhancing the visibility, governance, and actionability of non-financial risks.

Value Creation and Additionality

Business Model

BTF is a company founded in 2003 that produces coconut flower nectar (Nira) sourced from smallholder farmers across Java and Eastern Sumatra, Indonesia. It operates through a supply chain that reportedly covers close to 10,000 hectares managed under regenerative agriculture principles.Raw materials are procured from both internal and external smallholder networks certified under Organic, Regenerative Organic Certified® and Fair for Life standards, which are intended to support good agricultural and labor practices.

The company's production model draws on traditional Indonesian backyard gardens, where coconut palms offer shade, structure, and water management for diverse understory crops. BTF's coconut sugar value chain centers on three key farmer roles: growers, tappers, and cookers. Through farmer associations and cooperatives, BTF organizes sourcing, certification, and market access for products positioned as regenerative and smallholder-linked. Its main commercial offerings, including Coconut Aminos, Coconut Nectar (including a vacuum-evaporated version), and Granulated Sugar, are sold in bulk to U.S. brands and retail markets

as marinades, sweeteners, and Bali BBQ sauce.

BTF's internal supply is sourced directly from smallholder groups or cooperatives through exclusive partnerships, with BTF covering certification costs and overseeing the internal control system, inspections, audits, and data management. External supply involves third-party intermediaries operating as producer-group managers, responsible for certification and data handling, from whom BTF purchases certified products. Rapid growth has led BTF to rely more on external suppliers, creating challenges related to cost, quality, and reliability. To address this, BTF established an Internal Development System (IDS) team to strengthen its internal smallholder network and gradually shift toward more internally managed sourcing, aiming to improve product quality, traceability, and support sustainable farming practices. In commercial terms, the IDS is important because it links sourcing strategy to greater control over quality, traceability, and supplier relationships. In this case BTF functions not only as a processor and exporter, but as a coordinating platform that seeks to internalize certification, traceability, and quality control across a fragmented smallholder supply base.

Monetization Mechanism

BTF monetizes its business model through sales of certified coconut-nectar products in both B2B and B2C channels. On the B2B side, it sells bulk coconut sugar, nectar and aminos as ingredients to food manufacturers and brands seeking organic, fair and regenerative inputs for use in branded products and sustainability-oriented sourcing narratives. On the B2C side, it earns revenue from finished, branded condiments and sweeteners such as coconut aminos, marinades, BBQ sauces and granulated sugar, sold mainly into the US natural/organic market and other export channels.

Sustainability as Business Strategy

Coconut Nira comes from trees that are long-lived, drought-resistant and productive all year, which can lower replanting and input costs and reduce exposure to climate and seasonal shocks. In the company's operating logic, that ecological profile can support a more stable raw-material base and reduce exposure to some forms of supply volatility over time.

On the sourcing side, the smallholder model is designed to be both inclusive and commercially functional. By paying for farmers' organic and fair-trade certification, training and internal inspections, BTF secures loyal, often exclusive suppliers

and tighter control over quality. The model is intended to reduce dependence on intermediary channels while giving the company greater influence over sourcing conditions and product consistency. The shift toward internally managed supply supported by the IDS, prioritizes channels that are more traceable and potentially more resilient than external broker-based sourcing, while also offering a clearer basis for quality control.

Certifications and product positioning form part of the company's market strategy. Organic and Fair for Life labels, along with batch-level traceability, are intended to support access to premium, fast-growing market segments and strengthen brand narratives around health and ethics. Coconut sugar's nutritional benefits and coconut aminos' "better-for-you" image help the company compete in export markets where product differentiation depends not only on price, but also on traceability, origin, and production method. For the investment case, the key point is that sustainability is presented here as part of the operating model rather than as a parallel CSR function. The strength of that claim, however, depends on later evidence on operating performance, sourcing stability, and outcome measurement.

In this case, additionality turns on two narrower questions: whether MSLF2 provides financing and support on terms that BTF would have struggled to secure through standard market channels, and whether the structure creates a credible pathway for stronger environmental, operational, and smallholder-related outcomes than a purely commercial transaction would likely support. The discussion below distinguishes between those two dimensions and, where necessary, between demonstrated evidence and intended effect.

Financial Additionality

MSLF2 was created to fill a financing gap for sustainable land management projects that are largely overlooked by both local banks and international investors. Traditional lenders tend to avoid these opportunities because of perceived high risks in the AFOLU sector, limited collateral, small ticket sizes and unfamiliar business models. By leveraging GCF's junior equity, other concessional capital and a TA grant within a stated principle of minimum concessionality, the fund can offer long-tenor, flexible instruments that support nature-based projects that may otherwise struggle to attract financing on comparable terms.[19]

[19] Ibid.

Beyond providing capital, MSLF2 appears to strengthen financeability at the deal level. Investments are systematically paired with Technical Assistance to strengthen ESMS, governance, business planning and impact systems, so that SLM companies become better positioned for future engagement with commercial co-investors and lenders. At the same time, the program tackles information and knowledge barriers by building a pipeline of transactions, sharing lessons, and supporting communities of practice in sustainable agrifood and land-use models. At this stage, the primary additionality claim is that the fund combines subordinated catalytic capital, flexible financing terms, and operational support to enhance transparency of companies such as BTF for investors, beyond what standard lending conditions typically provide. In the BTF case, this claim is most evident in the provision of mezzanine financing with longer tenor and accompanying TA support, rather than in evidence that the broader market for sustainable land-use finance has already undergone transformation.

Impact Additionality

MSLF2's impact additionality thesis is that capital and TA can move agrifood and fiber companies in the AFOLU sector onto stronger environmental and social pathways than business-as-usual financing would be likely to support on its own. In this case, the claim rests on the idea that the fund's capital and support can help sustain higher-impact pathways where purely commercial financing is often reluctant to absorb implementation risk or longer time horizons. The fund focuses on businesses that can expand regenerative land use, improve smallholder livelihoods, and strengthen climate resilience, and then uses its TA facility to support these pathways through better ESMS, certifications, and targeted climate and gender action plans. In this case, the strongest interpretation is that the structure is intended to improve the conditions under which such outcomes may be pursued and monitored. Whether those outcomes are ultimately realized, and at what scale, remains a question for the later evidence sections rather than something this subsection can establish on its own.[20]

Impact Thesis

The impact thesis of MSLF2's investment in Big Tree Farms is to scale a vertically integrated, 100% organic coconut-nectar value chain that uses regenerative agroforestry with more than 17,000 smallholders on roughly 10,000 hectares to deliver three things: better farmer livelihoods, greater climate resilience and mitigation, and biodiversity protection, while supplying high-value export markets. According to the fund's investment thesis, impact is expected to come from shifting more sourcing toward internal supply under the IDS, expanding coverage of Regenerative Organic Certified® and Fair for Life standards, and using certification-linked premiums and market access to support not only revenue, but also more stable and sustainable income for rural producers.

This thesis is explicitly framed in relation to the broader SDG challenges identified in the internal investment document. On the environmental side, regenerative coconut agroforestry and zero-deforestation requirements are presented as responses to land degradation, biodiversity loss, and water stress in Central Java and Lampung, contributing to SDG 12 and SDG 15, and, according to internal assessment, are expected to sequester at least 530,000 tCO_2 over 20 years, aligning with SDG 13. Socio-economically, stable offtake, living-income standards, and value addition in the coconut sector are intended to address rural poverty and precarious incomes, supporting SDG 1, SDG 2, and SDG 8. Finally, with around 45% women in the farmer base, a stated target of 50%, and 2X-aligned leadership, the model is intended to address gender gaps and unequal opportunities in rural economies, linking to SDG 5 and SDG 10. In Mirova's internal assessment, these features support a "High" positive impact rating, especially under the pillars of Sustainable Land Use, Climate & Economic Adaptation, and Biodiversity. At this stage, that rating should be read as an internal investment assessment rather than as independent proof that the full range of projected outcomes has already been achieved.

Governance and Accountability

Big Tree Farms has a layered governance structure. Day-to-day operations are handled by the management team, overseen by a board where investors are represented and hold key approval rights on strategy, major capex, use of debt and ESG commitments. Internal controls and regular financial and operational reporting flow from management to the Board, while independent external auditors review the annual accounts, giving investors assurance that financial information is accurate and that management can be held to account. From a fund level perspective, MSLF2 generally seeks representation on the governance bodies of investees. That representation is intended to improve access to information and support more hands-on engagement between investor and investee. In a case like BTF, where execution depends on supply-chain coordination, certification integrity, and operational scaling, that governance access also matters because it reduces information

[20] Interview with Antoine Raes, Investment Director at Mirova.

asymmetry around how commercial and ESG risks are being managed.

Monitoring and Verification

On the sustainability side, independent third-party certifiers (organic, Fair for Life, Regenerative Organic Certified®) verify farming practices, labor conditions and traceability. The IDS team works directly with farmer groups to provide training, check compliance and monitor quality, feeding structured field data back to management and the Board. These arrangements create multiple channels of monitoring and verification, ranging from field-level oversight through the IDS to external review by auditors and certifiers. They strengthen the credibility of company reporting, even if they do not eliminate all questions of attribution or ensure that every reported outcome has been independently verified to the same degree.

TAF Governance

For MSLF2, Mirova has designated a third-party nonprofit organization to oversee the Technical Assistance Facility (TAF). The TAF's governance includes a TA Committee, which features members from both Mirova and the TAF Manager. Mirova is responsible for approving the TAF's annual budget, while the TA Committee authorizes how this budget is allocated and sets the Terms of Reference for specific TA projects involving portfolio companies. The TA Manager selects specialized consultants to carry out TA activities in partnership with the portfolio companies and monitors performance and reports results to Mirova and TA donors. All MSLF2 portfolio companies can access TA support, but the findings from the E&S due diligence process will determine the type of assistance provided.

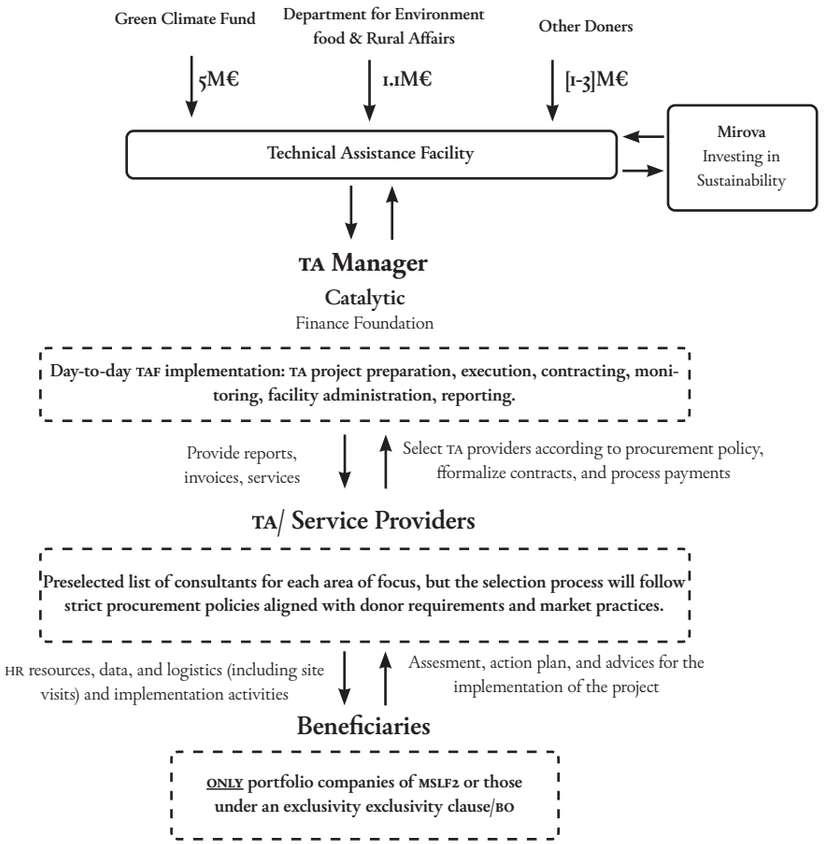

FIGURE 3: Fundraising and Management of TAF
SOURCE: Mirova

Management of the facility is delegated to an independent TA manager, Catalytic Finance Foundation, which operates in coordination with Mirova. Catalytic Finance is responsible for the day-to-day work: designing TA projects, selecting and contracting consultants, supervising delivery, handling procurement and compliance with donor rules, and reporting back to both donors and Mirova. Specialist E&S and technical consultants then carry out the actual assignments with the companies such as climate assessments, ESMS upgrades, gender plans or impact monitoring systems.

Only MSLF2 portfolio companies (or those under exclusivity) can benefit from this

support, which keeps the facility tightly focused on de-risking and deepening the impact of the fund's own investments. In practice, this arrangement reflects a more specific operational reality: TA is difficult to raise, govern, and administer from within a commercial asset-management platform alone. Using a dedicated non-profit TA manager allows Mirova to access donor funding while maintaining procurement discipline, implementation oversight, and separate reporting lines.

Impact Assessment Framework

MSLF2 evaluates BTF through its impact pillars and ratings: Sustainable Land Use, Climate & Economic Adaptation, Biodiversity, Social/Employment, and Gender. Each is rated (e.g., High / Moderate) and linked to relevant SDG themes such as environment, climate, biodiversity, poverty, decent work, and gender equality. These pillars are supported by quantitative indicators like hectares under organic/regenerative management, the proportion of women farmers, CO_2 outcomes from life-cycle analyses, and adherence to zero-deforestation and labor standards. Fund-level metrics and third-party standards provide a structured framework for assessing environmental and social performance, while also clarifying which claims are being tracked through internal monitoring, third-party certification, or modeled estimates.

At the reporting level, the framework links company operations to a farmer base of more than 17,000 producers, of whom about 45% are women, with a stated target of 50% by 2026. Internal farmers under direct contracting model manage an average of about 0.3 to 0.5 hectares with roughly 20 to 30 trees each. Those figures are useful for understanding scale and inclusion, though they do not on their own establish improved livelihoods or broader developmental change.

Under Regenerative Organic Certified® and Fair for Life standards, the model is intended to support living income, better labor conditions, and reduced chemical exposure. It extends regenerative coconut agroforestry land area, supports zero-deforestation commitments, and is associated in the internal materials with projected carbon benefits measured in the hundreds of thousands of tCO_2 over 20 years. Those elements are best understood here as part of the model's monitored and expected impact pathways, not as a fully verified summary of realized outcomes. From a market perspective, the framework aims to assess whether a smallholder-focused, regenerative coconut value chain can facilitate a commercially credible transition from raw commodity production to certified ingredients and branded products. Current evidence shows that governance, monitoring, and certification systems enhance transparency for buyers and investors, helping to de-risk the sector and support ongoing progress toward broader transformation and long-term financial viability.

Enabling Environment

Market and Supply-Chain Conditions

The coconut sugar sector in Indonesia is characterized by a structural mismatch between export opportunities and the organization of the supply chain. Smallholders frequently sell their products through several layers of brokers and intermediaries. Additionally, quality standards, traceability systems, and implementation capacity are inconsistently maintained throughout the supply chain. That fragmentation is a critical factor as international buyers are not purchasing volume alone. They are also purchasing consistency, certification credibility, and dependable product quality. While demand exists, a company such as BTF is attractive because it attempts to internalize supplier coordination, certification, and quality control across a dispersed smallholder base.

Climate and Institutional Constraints

The case also sits within a climate and finance constrained production environment. Coconut production in the relevant sourcing regions remains largely rainfed, with limited irrigation, uneven adaptation infrastructure, and growing exposure to drought and heat stress. These pressures affect farm productivity and the reliability of future supply. At the same time, conventional financing channels remain difficult to access on comparable terms, particularly for agribusinesses with long supply chains, limited collateral, climate exposure, and operating models that do not fit standard underwriting templates. The enabling challenge, therefore, is both ecological and institutional whereby the business must manage physical climate risk while also becoming legible to investors and lenders.

What Still Binds Scale

Several constraints still limit the scale and replicability of this model. The business depends on company-level capability to manage internal systems, certification, supplier relationships, and traceability at meaningful depth. It also depends on buyer demand for sustainability-linked products and on the continued availability of concessional capital and donor-backed technical assistance. Public evidence on realized financial performance remains limited, which makes it harder to assess how far the model can travel without similar support. For that reason, the enabling environment for replication depends on more than product demand; it

also requires operational discipline, credible monitoring systems, and financing structures willing to absorb risk that conventional capital may still treat cautiously.

Performance Evidence

The most robust performance-related evidence available in this case consists of a focused set of commercial and operational signals, rather than transaction-level return data. These indicators include clearly defined B2B and B2C revenue streams, established positioning in export markets, and an operating model that integrates sourcing control, certification, and traceability to achieve product differentiation. The company is also increasing its processing and storage capacity to meet growing demand and heightened expectations for quality and consistency. While these characteristics do not confirm realized financial performance, they demonstrate that the investment case is grounded in a structured commercial model rather than a solely conceptual sustainability proposition.

At the same time, the public record on realized financial performance remains limited. As the transaction recently closed, detailed transaction-level return information has not yet been made public. Nor does the case provide public evidence on repayment performance, loan servicing, realized margin expansion, or post-investment operating results. Hence, while the current record shows evidence of sound business-model logic, structure, and implementation readiness, the financial performance outcomes remain associated to the future developments of BTF.

Outcome Evidence

Observed and Reported Outcome Signals

The case provides several reported signals relevant to social and environmental outcomes. BTF monetizes its business model through sales of certified coconut-nectar products in both B2B and B2C channels. The company also reports certification-linked practices connected to living-income thresholds, labor conditions, and reduced chemical exposure under Fair for Life and Regenerative Organic Certified® standards. Training in regenerative and organic farming practices, along with the Internal Development System, forms part of the current farmer-support and monitoring model. These elements are meaningful as reported operating and monitoring signals, even if they do not yet establish outcome depth on their own.

According to Mirova, BTF does not lock farmers into long-term contracts because although these can offer the security of offtake to farmers, they can also reduce the ability of farmers to respond to opportunities for better prices. Instead, BTF relies on its ability to establish good relationships with farmers and to offer higher prices and rapid payment. The model also provides additional benefits to farmers and cookers, such as upgrades to their cooking facilities and equipment. The company has also stated that the unit price paid for sugar is intended to meet at least a "living income" threshold, as required by Fair for Life certification. In terms of climate smart practices, the company provides training to farmers on regenerative and organic farming practices, and a significant proportion of the company's farmers are within the scope of the Regenerative Organic Certified (ROC) certification. More cautiously, the company's farmer-support model is intended to strengthen resilience through training, certification, and farm-practice upgrading. Whether those efforts produce measurable climate-resilience gains at the supply-chain level is a question that requires separate evidence.

Expected but Not Yet Fully Verified Outcomes

Several of the case's most important outcome claims remain better understood as expected pathways than as fully verified results. These include stronger climate resilience at the supply-chain level, wider livelihood gains, biodiversity protection, and projected carbon benefits associated with regenerative coconut agroforestry and zero-deforestation requirements. The internal materials also associate the model with carbon benefits measured in the hundreds of thousands of tCO_2 over a 20-year horizon. Those projections are analytically relevant, but they should be treated as modeled or expected outcomes rather than as independently verified evidence that the full range of benefits has already been achieved.

Limits of Current Outcome Tracking

The current monitoring architecture strengthens the credibility of outcome tracking, but it does not eliminate all evidentiary limits. Governance structures, certification systems, IDS-based field monitoring, and internal impact assessment all provide a more structured basis for oversight. Even so, questions of attribution, durability, and long-run causal impact remain open. Scale indicators, certification coverage, and internal ratings should therefore be read as part of a credible reporting framework, not as conclusive proof that the full developmental or environmental thesis has already been realized.

Lessons and Implications

This case provides practical insights for investors and practitioners engaged in nature-based, smallholder-linked enterprises. The table below summarizes what the BTF–MSLF2 transaction indicates most clearly at this stage across fund design, business model, farm practices, impact logic, de-risking tools, and replication conditions. Because several elements of the transaction are still recent and some outcome data remain limited, these lessons are best read as evidence-anchored implications rather than as universal prescriptions.

Topic	Description and Evidence	Next Steps
Fund Structure & Capital Layering	MSLF2 uses a two layer capital stack (junior/senior) rather than a guarantee model. Junior investors take a first-loss position, creating a visible equity cushion for senior investors. In this case, the clearest lesson is that subordinated public or philanthropic capital can make participation more feasible for commercial investors where perceived risk remains high and expected returns are modest.	For public investors and DFIs, the main implication is that first-loss capital may be most useful where commercial participation depends on visible downside protection. Its relevance is likely greatest in sectors where risk is hard to price and where conventional capital would otherwise remain cautious.
Specialized Technical Assistance (TA)	The TAF is a separate pool of donor capital (UK DEFRA, GCF) managed by an independent non-profit (Catalytic Finance Foundation). This separation keeps fund economics clean for commercial investors while ensuring portfolio companies like BTF receive expert support for ESMS and climate audits.	For fund managers, the implication is that third-party TA management may strengthen implementation discipline where donor-funded support is important but difficult to administer within a commercial investment platform
Operationalizing Sustainability	The model uses a "food-forest" agroforestry system codified by Regenerative Organic Certified® standards. It combines certification, traceability, and internal supply-chain management through the Internal Development System (IDS) across more than 10,000 hectares of smallholder production. In this case, sustainability is operationalized through standards backed by systems that make compliance and product tracking more manageable.	For smallholder-led agribusinesses, the implication is that internationally recognized standards may become more useful when paired with internal systems for data, compliance, and supplier coordination. Certification alone is unlikely to be sufficient without operational infrastructure behind it.
Strategic De-risking Tools	TA was deployed specifically for a Climate Due Diligence and an Environmental and Social Action Plan (ESAP). This converted abstract risks (heatwaves, logistics emissions) into a binding to-do list for BTF, including energy switching and waste valorization.	Fund Managers could embed ESAP requirements as legal covenants in the loan agreement. This turns de-risking into a contractual milestone linked to capital deployment, rather than leaving it as a non-binding expectation.
Economic-Impact Alignment	BTF's business strategy is its sustainability. Vertical integration and 100% organic/regenerative sourcing from 17,000 smallholders function as drivers of higher margins, quality control, and premium export pricing rather than as peripheral CSR activity.	Investment Officers must distinguish between impact features that are central to the operating model and those that sit at the margins. Where sustainability practices are integral to sourcing, pricing, and execution, the commercial rationale is likely to be more durable than in cases where impact remains peripheral to the business model
Scale-up & Replicability	BTF's growth is focused on system depth (strengthening the internal network and warehouse capacity) rather than just volume. The fund targets companies with a high impact rating where TA can push them to the next level of maturity. This suggests that scaling in such cases may depend as much on deepening internal systems and supply-chain control as on increasing throughput.	LPs and Policy Makers could use this "Growth + TA" blueprint as a conditional replication logic: blended capital appears most relevant where SMEs already have a meaningful sustainability commitment, but still need support on internal systems, traceability, and risk management before they can access more conventional finance on better terms.

TABLE 2: Lessons Learned

Conclusion

BTF and MSLF2 demonstrate that blended finance can enhance the financeability of fragmented, smallholder-linked agricultural value chains. The investment challenge extended beyond insufficient demand. Issues such as fragmented sourcing, inconsistent quality control, inadequate traceability, climate vulnerability, and restricted access to patient capital hindered the transformation of export-market opportunities into investable and scalable business models. Financing became feasible when the fund combined subordinated risk-bearing capital with targeted technical assistance, applying this approach to a company already working to internalize certification, traceability, and supplier coordination across a dispersed smallholder network. Thus, this case illustrates blended finance as a mechanism for value-chain organization and risk management, rather than solely as a growth subsidy.

The case is most useful in illustrating how concessionality, governance, and technical support can operate across different levels. At the fund level, public and philanthropic capital absorbs more downside risk so that senior capital can participate on a more protected basis. At the company level, mezzanine financing provides longer-tenor, more flexible capital alongside existing senior lenders to support expansion of sourcing, processing, and storage capacity. The Technical Assistance Facility complements that financing by translating broad climate and ESG concerns into specific workstreams, including climate due diligence, environmental and social action planning, carbon analysis, and operational upgrades. The case thus substantiates a significant claim of structural and financial additionality. This combined package provides capital and implementation support which would unlikely be obtained on comparable terms through conventional lending channels.

At the same time, a more nuanced interpretation of the case is warranted. The strongest evidence pertains to structure, governance, risk allocation, and the operational logic linking internal sourcing, certification, and market access. In contrast, evidence concerning realized financial performance and long-term outcomes remains limited. Detailed transaction-level return data are not yet publicly available. Many development and climate-related claims, including livelihood improvement, resilience gains, long-term carbon benefits, and broader sectoral effects, are more accurately described as intended pathways or monitored hypotheses rather

than fully demonstrated outcomes. Although governance, auditing, certification, and internal monitoring strengthen the reporting framework, these mechanisms do not fully resolve questions of attribution, durability, or long-term causal impact.

BTF serves as a conditional demonstration of how blended finance can enable a transition from fragmented commodity sourcing to a more coordinated, traceable, and sustainability-linked agribusiness model. This case study identifies key conditions that increase the plausibility of such a transition: credible export demand, company capacity to develop internal supply-chain systems, recognized certification standards, investor willingness to accept layered risk allocation, and technical assistance that directly supports implementation. The analysis also outlines the limitations of replicating this model. Replication is more challenging in contexts where companies lack operational discipline, traceability and certification systems are insufficient, buyer demand for sustainability-linked products is low, or concessional and donor-backed support cannot be mobilized at a similar scale. The case provides evidence that blended finance in nature-based agriculture can address specific coordination, financing, and monitoring challenges at the value-chain level. Under these conditions, blended finance can improve the investability of smallholder-linked businesses. The establishment of a strong foundational partnership between BTF and MSLF2 will remain an important tool to support consistent financial performance and fully verified development outcomes.

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Antoine Raes, Investment Director at Mirova – Natixis IM Singapore

Data, Capital, and Shrimp: Could Blended Finance Scale Sustainable Aquaculture?

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Abstract

This case examines how blended finance can expand investability in Indonesian shrimp aquaculture, a sector shaped by biological risk, fragmented farm-level data, weak traceability, and persistent environmental pressures. The focus is the Sustainable Ocean Fund's investment in JALA, a technology-enabled aquaculture platform company that integrates the shrimp value-chain from farm to market, combining operations, financing, and supply-chain management. Fund-level risk sharing, staged company-level financing, and post-investment technical assistance are employed to address a market where commercial capital has historically encountered difficulty underwriting operational and environmental risks.

JALA has demonstrated significant commercial progress, as evidenced by strong revenue growth, low leverage, and sustained investor confidence. The company also reports environmental and social indicators associated with sustainable farm management and increased service adoption. However, the strength of supporting evidence differs by analytical level. Company-level performance metrics offer the most robust support, whereas broader claims regarding avoided mangrove conversion, enhanced livelihood resilience, and system-level risk mitigation are more inferential. JALA illustrates how catalytic capital, data infrastructure, and governance discipline can expand the pool of financeable opportunities.

Case Summary

	JALA–SOF Summary (Indonesia Sustainable Aquaculture)
Case Theme	Blended finance for a technology-enabled sustainable aquaculture platform in Indonesia
Blended Finance Archetype	Fund-level risk sharing and technical assistance paired with staged company-level growth capital
Primary Catalytic Instrument	Portfolio-level guarantee plus grant-funded technical assistance, deployed alongside preferred equity and convertible instruments
Capital Channel and Users	Private and development-finance investors (pari passu equity) plus guarantee and technical assistance → Sustainable Ocean Fund → JALA → shrimp farmers and value-chain participants through farm management, diagnostics, trading, traceability, and financing facilitation
Primary Market Function	Investability expansion in a sector constrained by weak data visibility, uneven farm practices, biological risk, and limited traceability
Evidence Status	Stronger company-level performance and operating-model evidence; weaker public disclosure on quantified fund-level returns and on longer-term causal environmental and livelihood outcomes
Replicability Vector	Data-enabled aquaculture platforms paired with catalytic risk sharing and governance support in markets where productivity upgrading is needed but underwriting remains difficult
8. Capital Scale and Structure	SOF reached approximately USD 132 million in commitments and combines pari passu investor capital with a USD 50 million portfolio-level guarantee; SOF's exposure to JALA totaled roughly USD 5.5 million
9. Locus of Catalytic Intervention	Fund level through guarantee-backed risk capacity and company level through post-investment TA, ESG-linked monitoring, and staged financing support

The Investment Problem and Chapter Thesis

Aquaculture has become central to global food security. As pressure on wild fish stocks has increased, aquaculture has come to play a larger role in meeting global seafood demand. Since 2013, aquaculture production has exceeded that of wild fisheries, making it the fastest growing sector in agriculture.[1] The sector is also highly diverse across species, feeds, production systems, and business structures. It continues to evolve through technological innovation intended to improve productivity and strengthen environmental performance.[2] Despite its scale and growth, the sector faces structural constraints. Production remains concentrated in only a few improved species,[3] creating vulnerability in supply chains. Aquaculture remains labor-intensive, with core tasks described as laborious and costly, and water monitoring critical for productivity is often neglected due to operational complexity.[4] Disease outbreaks generate significant economic losses estimated at USD 6 billion annually,[5] while environmental pollution and ecosystem degradation remain ongoing risks.

Indonesia illustrates these pressures clearly. As the world's fourth-largest shrimp producer, with an estimated 11 percent global market share in 2019, the country operates in a highly competitive export market while facing persistent productivity constraints. Producers must improve disease resilience, meet rising buyer requirements on traceability and sustainability, and raise farmer profitability through higher productivity and stronger access to markets, technical support, and finance. Low-productivity production also carries environmental costs. Mangrove conversion remains a major concern where output growth depends on expanding pond

[1] Kangning Yue and Yubang Shen, "An Overview of Disruptive Technologies for Aquaculture," Aquaculture and Fisheries 7, no. 2 (2022): 111–20, https://doi.org/10.1016/j.aaf.2021.04.009.

[2] OECD and Eurostat, Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition, The Measurement of Scientific, Technological and Innovation Activities (OECD Publishing, 2018), https://doi.org/10.1787/9789264304604-en.

[3] Yue and Shen, "An Overview of Disruptive Technologies for Aquaculture."

[4] Yue and Shen, "An Overview of Disruptive Technologies for Aquaculture"; Charlotte Dupont et al., "IoT for Aquaculture 4.0 Smart and Easy-to-Deploy Real-Time Water Monitoring with IoT," 2018 Global Internet of Things Summit (GIOTS), June 2018, 1–5, https://doi.org/10.1109/GIOTS.2018.8534581

[5] Yue and Shen, "An Overview of Disruptive Technologies for Aquaculture."

area rather than improving yields. One estimate suggests that, if current productivity constraints remain unresolved, meeting future shrimp demand could place roughly 600,000 additional hectares of mangroves at risk over the coming decades.[6] Water pollution from farm effluents is another material environmental risk, contributing to the degradation of groundwater resources, coral reefs, and mangrove and marine ecosystems. Climate change adds further pressure,[7] while limited product traceability continues to constrain market confidence and access to premium segments.[8] In this setting, higher-productivity production systems require substantial capital investment, alongside better access to technical advice and suitable financing for farmers. [10]

The Sustainable Ocean Fund's investment in JALA is evaluated to assess whether risk-sharing mechanisms and technical assistance can support commercially structured growth capital in a sector where limited operational visibility, uneven farm practices, and environmental risk have historically constrained investor confidence. This raises both investability and sustainability questions. Can better data, stronger traceability, and targeted catalytic support help more aquaculture businesses become financeable to institutional investors?

[6] https://www.sciencedirect.com/science/article/abs/pii/S0264837716302009

[7] OECD and Eurostat, Oslo Manual 2018.

[8] Yue and Shen, "An Overview of Disruptive Technologies for Aquaculture."

[9] Intensification in shrimp aquaculture means producing more shrimp from the same pond area instead of expanding to new land. This is achieved by improving farm management, such as better water quality monitoring, disease control, feeding practices, and technical oversight, resulting ponds can support higher shrimp densities and more predictable yields. When done properly, intensification can reduce pressure to clear new mangroves, but it also requires stronger management to avoid risks like water pollution and disease outbreaks.

[10] Deal summary, Mirova's internal document

Mechanism Overview[11]

At its core, the case links a blended fund structure to a technology-enabled aquaculture platform. SOF is structured as a closed-end[12] investment vehicle in which private investors and development finance institutions commit capital on a pari passu basis. In addition to strengthening the fund, a DFC portfolio-level guarantee covers up to 50% of principal losses on eligible debt investments in portfolio companies, triggered only in cases of deal-by-deal default. This guarantee does not alter investor seniority but reduces potential downside exposure at the portfolio level.

Once capital is committed, SOF conducts financial and ESG due diligence on potential investees. ESG assessments are anchored in the IFC Performance Standards and operationalized through an Environmental and Social Action Plan (ESAP). Identified gaps are translated into time-bound commitments embedded in legal documentation. For JALA, SOF structured its investment through preferred equity followed by convertible loan instruments with warrants that have since been converted. Instrument selection was based on company maturity, risk profile, and growth stage.

Financially, the DFC guarantee reduces potential principal loss on eligible debt investments, increasing the fund's overall risk capacity without creating preferential investor classes. ESG-related risks are managed through ESAP implementation. Progress is monitored through regular reporting, site visits, and annual impact reviews, with escalation mechanisms available if milestones are not met.

At the investee level, JALA implements an integrated aquaculture platform that combines farm monitoring devices, farm-management software, laboratory disease diagnostics, marketplace access, and financing facilitation. The model emphasizes productivity improvements on existing ponds rather than spatial

[11] This case study is based on the author's independent analysis, semi-structured interviews with stakeholders, and review of unpublished internal documents, including investment memoranda. All interpretations reflect the author's analysis. Certain details have been anonymized or adapted to protect confidentiality

[12] Closed-end impact investment fund is a long-term, fixed-capital vehicle that deploys patient capital into illiquid investments with the explicit goal of generating measurable social and environmental impact alongside financial returns. SOF legally established as a Luxembourg investment company with variable capital (SICAV) under the Specialized Investment Fund (SIF) regime. Commonly used for institutional impact and private equity funds, as it offers regulatory oversight while maintaining flexibility in investment strategy and asset classes.

expansion, aligning commercial growth with sustainable intensification. By linking production data to trading and financing functions, JALA reduces information asymmetries across the value chain.

JALA generates revenue through multiple channels, including data monetization, trading commissions, farming (climate-adaptive smart shrimp farms), and local/export sales. This mix gives the company several income streams, including recurring revenue sources tied to platform use and service delivery.

Monitoring and accountability connect fund-level oversight with company-level execution. SOF tracks financial performance, ESG risk ratings, and impact indicators, while JALA reports operational, environmental, and social metrics such as land under sustainable management and beneficiary reach.

In operational terms, the pipeline is straightforward. Investors commit capital to SOF; the fund's blended structure expands risk capacity through a portfolio-level guarantee; SOF selects and structures investments through financial and ESG due diligence; capital is deployed through instruments tailored to investee needs; and the portfolio company generates revenue through integrated services while ongoing monitoring links financial oversight with environmental and social performance.

Risk Allocation and Stakeholder Economics

SOF's risk-allocation logic responds to a persistent financing mismatch in the blue economy. Marine and coastal sectors often require long-term, capital-intensive investment while exposing investors to several risks that are difficult to underwrite through conventional finance alone, including biological, operational, and environmental risks. In aquaculture, these constraints are especially visible where fragmented production systems, weak traceability, and uneven farm-level data, which limit investor confidence and raise the perceived cost of capital.

SOF was established in this context to channel institutional capital into ocean-related sectors through a structure that preserves investor alignment while expanding risk capacity. The fund's strategy rests on the view that commercial performance and improved stewardship of marine and coastal resources can be mutually reinforced when paired with appropriate risk-sharing and post-investment discipline.

SOF has reached final commitments of USD 132 million. Launched in 2018, SOF provides equity, quasi-equity, and debt financing to portfolio companies across the blue economy.[13] Managed by Mirova in its capacity as the Alternative Investment Fund Manager (AIFM),[14] the Fund includes multiple institutional and development finance investors as limited partners. By the end of 2023, SOF had deployed more than USD 105 million across 16 investments in 12 countries across Asia, Africa and Latin America, including Indonesia.[15]

SOF's investors consist of commercial capital from private investors and development finance institutions (DFIs), together with concessional support instruments. At the fund level, all investors participate through equity and hold the same class of shares on a pari passu basis, with no seniority, tranche differentiation, or fund-level leverage.

In addition to investor capital, the fund benefits from a concessional instrument: a USD 50 million portfolio-level guarantee from DFC covers up to 50% of principal losses on eligible debt investments, applied on a deal-by-deal and last-resort basis (following default and liquidation).

Once capital is pooled, SOF deploys it flexibly through equity, quasi-equity, and debt instruments, allowing the financing structure to be tailored to the maturity, risk profile, and capital needs of each investee. This design preserves a simple fund structure while reducing investment risk and maintaining alignment among investors. Figure 1 illustrates the overall structure of the fund.[17]

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[13] Mirova, Sustainable Ocean Fund (SOF): 2023 Impact Report, 2024, https://www.mirova.com/sites/default/files/2024-07/sustainable-ocean-fund-sof-2023-impact-report.pdf

[14] Mirova, "Sustainable Ocean Fund," https://www.mirova.com/en/funds/unlisted/3766/sustainable-ocean-fund

[15] Mirova, Sustainable Ocean Fund (SOF): 2023 Impact Report.

[16] Green Finance Institute, "Althelia Sustainable Ocean Fund," https://www.greenfinanceinstitute.com/casestudies/althelia-sustainable-ocean-fund/

[17] This figure is based on the authors' interpretation of publicly available information, including fund disclosures and investor information published on the Convergence platform. Detailed fund-level structuring parameters were not publicly disclosed by the fund manager.

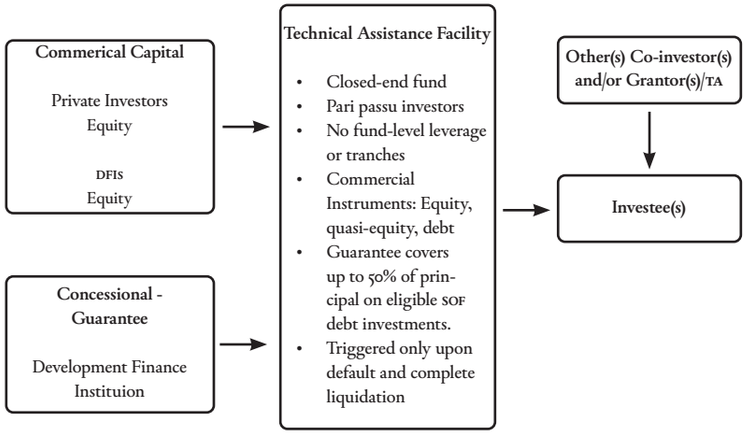

FIGURE 1: Fund Structure

The guarantee serves as a portfolio-level risk-sharing mechanism, increasing SOF's risk capacity by limiting potential losses on eligible debt investments. By reducing downside exposure, the fund can construct a more diversified portfolio and deploy capital more flexibly while maintaining a risk profile acceptable to investors. This mechanism was particularly important at the fund's launch, when institutional investors remained cautious following previous losses in aquaculture investments. The presence of cornerstone investors, including the European Investment Bank, FMO, AXA Investment Managers, and the Inter-American Development Bank, further reinforced investor confidence.[18] Because the guarantee is triggered only after default and liquidation, it preserves commercial discipline by encouraging rigorous due diligence and active portfolio monitoring.

Technical assistance complements this financial risk-sharing by strengthening environmental and social risk management and operational performance in portfolio companies. Alongside the guarantee, technical assistance supports post-investment improvements in governance, environmental and social management, and reporting systems. In design terms, this combination is intended to strengthen both impact integrity and operational resilience without changing the pari passu structure among investors. Within this structure, ESG management functions as part of the fund's broader risk-management approach and as a means of protecting

[18] Green Finance Institute, "Althelia Sustainable Ocean Fund," https://www.greenfinanceinstitute.com/hive/revenues-for-nature/case-studies/althelia-sustainable-ocean-fund/

asset value. At the level of stakeholder economics, the structure allocates roles in a legible way. Private and development finance investors provide capital on a pari passu basis; the DFC guarantee absorbs part of the downside risk on eligible debt exposure; grant-funded technical assistance supports governance, environmental and social management, and reporting improvements; and portfolio companies receive capital and post-investment support within a structure designed to preserve commercial discipline while expanding the fund's risk capacity.

SOF investment was made in 2021 and resulted into a USD 5.5 million equity exposure in the company as of today, post converting two of its loans. The use of convertible instruments reflected the company's growth stage at the time of investment. Although JALA was already operating at a certain scale with sizable revenue operations, a large straight equity investment would have resulted in significant founder dilution and valuation uncertainty.[19] Convertible loans provided a staged financing structure: initially ranking senior to equity and accruing interest that supported working capital, while allowing conversion into equity at a later financing round once valuation risk had been reduced and a clearer market price had emerged. Investor protections accompanied with set valuation principles further aligned incentives between founders and investors during the company's scaling phase.

The debt-linked structure also targeted a return profile consistent with early-stage growth credit, while SOF's eligible debt exposure benefited from the DFC portfolio-level risk-sharing guarantee at the fund level. This arrangement helped limit downside exposure at the fund level while preserving commercial discipline at the company level. As a stage-specific financing solution, the instrument was designed to support JALA's growth until conversion into equity rather than to serve as a permanent financing layer.

Beyond the financing instruments themselves, SOF used technical assistance and ESG-linked post-investment monitoring as company-level de-risking tools. These measures were part of the investment logic rather than peripheral add-ons. Their purpose was to reduce downside risk, strengthen operational resilience, and improve the long-term investability of the platform in ways that aligned with the fund's impact thesis.

These interventions were embedded in the Environmental and Social Action Plan

[19] Interview with Antoine Raes, Mirova

(ESAP), which was intended to reduce operational, environmental, and compliance risks that could otherwise affect financial performance. Technical assistance played a central role in translating ESAP commitments into concrete management actions over the life of the investment. Progress on both ESAP implementation and technical-assistance delivery was monitored through regular engagement, site visits, and annual impact reporting, with escalation mechanisms ranging from revised timelines and additional audits to contractual remedies if progress stalled.

At the company level, this structure extended the fund's risk-allocation logic into the financing of JALA itself. Preferred equity and convertible instruments matched the company's growth stage, reduced immediate valuation and dilution frictions, and gave SOF a staged way to support expansion while preserving downside protections associated with growth credit. Technical assistance and ESAP-linked monitoring then added a second layer of discipline by connecting post-investment support to governance, operational resilience, and risk management.

Value Creation and Additionality

Here, additionality must be assessed at two levels. The first concerns whether SOF's blended structure increased the availability or improved the terms of capital for a company such as JALA. The second considers whether financing, combined with technical support and oversight, facilitated environmental or social benefits that would have been less likely under conventional financing alone. The following discussion differentiates between these two questions and clearly separates demonstrated effects from intended pathways.

Financial Additionality

SOF's claim to financial additionality is based on its capacity to deploy capital into sectors and business models that have historically experienced limited access to conventional investment. As outlined in the fund structure above, the combination of a portfolio-level guarantee and flexible investment instruments enables SOF to provide capital under conditions typically unavailable from commercial lenders or traditional venture investors. This structure permits the deployment of longer-tenor financing, hybrid instruments, and growth capital tailored to early-stage enterprises, while maintaining a risk profile acceptable to institutional investors. The guarantee and instrument flexibility function not only as structuring features, but also as mechanisms designed to broaden investor participation in a sector often perceived as too risky, operationally complex, or difficult to underwrite through

standard products. SOF's approximately USD 132 million in commitments aligns with this proposition; however, the evidence presented supports a plausible catalytic role more clearly than a fully demonstrated counterfactual. Analytically, this structure demonstrated financial additionality by providing capital at a scale, tenor, and risk profile that conventional financing channels may have been less willing to offer at that stage of the company's development.

Impact Additionality

SOF's claim to impact additionality is tied primarily to the technical-assistance facility and to the post-investment environmental and social management requirements applied to portfolio companies. Grant-funded support provided by Conservation International and the Environmental Defense Fund strengthens environmental and social management systems within portfolio companies. This support is intended to improve operational practices, strengthen sustainability management, and support alignment with international ESG frameworks. In principle, these are outcomes that may be less likely under commercial financing alone, especially in early-stage companies where governance, reporting, and environmental management systems remain underdeveloped. At this stage of the analysis, however, the case study shows that technical assistance created a structured pathway for stronger impact management, rather than independently proving realized impact gains.

Value-Creation Pathway

Within SOF's sustainable seafood allocation, JALA is a portfolio company operating in Indonesian shrimp aquaculture. According to investor materials, JALA is a technology and services platform that integrates farm monitoring hardware, management software, farming and processing operations, and financing facilitation. The company focuses on semi-intensive and intensive farms and seeks to scale by improving productivity and management on existing ponds rather than by enabling new pond development. This operating model is relevant to the additionality question because it addresses several constraints at once: weak farm-level data, inconsistent operating practices, limited traceability, and restricted access to markets and finance.

At the farm level, JALA provides water-quality monitoring devices (Baruni) and a farm-management application. These tools support operational decision-making on feeding, biosecurity, and production planning. Beyond production support, JALA also operates a trading platform (Jala Harvest) linking farmers to processors and exporters, while facilitating digital traceability and invoice financing through

partner institutions. Through its Jala Supply model, the company further integrates technical assistance, inputs, financing access, insurance, and market linkage feed sales business with selected farms. JALA also operates its own climate-adaptive smart farms as Jala Farm business, its ASC certified farms and combined with mangrove restoration. For downstream business, JALA does local and export shrimp sales from its rented processing facilities.

By combining technology, farming market access, and financing services, JALA's platform is designed to address multiple constraints in shrimp aquaculture. Farm-level data can support better productivity management, stronger biosecurity, and more consistent operating decisions. At the value-chain level, digital trading and traceability can improve transaction visibility and payment efficiency, while financing facilitation may widen access to working capital after harvest. These features define the company's theory of change. They do not, on their own, establish that the resulting environmental or social gains have been fully demonstrated in this case.

Commercial Model and Investability

JALA generates revenue across several layers of its platform ecosystem. Income streams include margins from hardware sales, subscription fees from its SaaS-based farm management platform, and fees from invoice financing facilitated through its trading solutions. Under the Jala Farm model, JALA also earns higher from farms that adopt its integrated production and management services. By combining these activities around a shared data infrastructure, the platform creates a business model with several potential revenue channels and a clearer path to recurring income than a single-product aquaculture service business. That matters for the additionality analysis because diversified and partially recurring revenues can make an early-stage company more legible to investors. At the same time, commercial logic should not be confused with proof of additionality. The relevant question is whether SOF's structure allowed capital to reach a company with this profile on terms that would otherwise have been harder to obtain. That distinction matters because the company's revenue model helps explain why investors may find the platform legible, whereas wider environmental and social impact requires a separate evidentiary standard. Figure 2 shows JALA's ecosystem, which integrates farm management, trading, financing, and data services.

Impact Pathway and Evidentiary Limits

SOF's investment in JALA appears to rest on the proposition that sustainable inten-

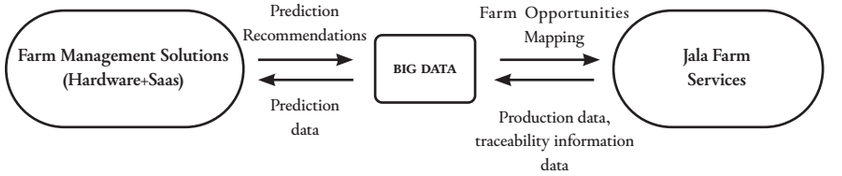

FIGURE 1: Fund Structure

sification can raise productivity in shrimp aquaculture without relying on spatial expansion. In that logic, higher yields and lower mortality on existing ponds could reduce pressure to expand production through additional coastal land conversion, including mangrove clearance. This is a plausible impact pathway and is central to the case's environmental relevance. In the evidence currently presented, however, it should be treated as an inferred mechanism rather than a directly demonstrated outcome.

At the operational level, JALA's activities create several channels through which impact may occur. Real-time water-quality monitoring, disease detection, and technical support can improve farm management and may reduce input waste, mortality, and other inefficiencies. Digital traceability from pond to processor can support compliance with buyer requirements and strengthen access to higher-value markets. Facilitation of financing and insurance may also expand service access for small and medium scale farmers. These channels are analytically important, but they should be described with care. This section, shows that that JALA's model creates a credible pathway toward better environmental management, stronger traceability, and broader service access. Which of those effects have been observed, and at what scale, should be specified in the performance and outcomes sections rather than assumed here.

Governance and Accountability

At the fund level, governance is structured to ensure that environmental and social considerations are embedded directly into investment decision-making and ongoing portfolio management. The IFC Performance Standards provide the baseline

framework for identifying, assessing, and managing ESG risks across the portfolio. ESAP commitments are embedded in legal investment documentation and set out time-bound actions, responsibilities, and monitoring requirements. This provides investors with clear rights to monitor progress and, where relevant, condition disbursements or require corrective measures. Fund-level governance therefore functions as a mechanism for aligning impact objectives with risk management and capital protection.

SOF assessed these issues using the IFC Performance Standards (PS1-PS8) as its primary reference framework, complemented by the fund's internal impact taxonomy and a structured Environmental and Social Management System (ESMS) and Environmental and Social Action Plan (ESAP) process. This combined framework allowed the fund to evaluate downside ESG risks and potential impact channels in a way that was intended to remain relevant to investment decision-making. At the time of investment, portfolio companies were assessed against the IFC standards to identify material gaps, establish a baseline ESG risk rating, and define a pathway toward improved performance.

In practice, the IFC Performance Standards served as the baseline for ESG due diligence, ESAP design, and ongoing monitoring. Identified gaps informed time-bound ESAP actions, supported by technical assistance, with the objective of improving ESG performance and, over time, reducing the company's risk profile. In JALA's case, SOF assessed the baseline ESG risk as Medium and anticipated that successful ESAP implementation could shift that rating toward Low over the investment lifecycle.

As described by SOF's investment team, the process began with pre-investment screening and a red-flag analysis of material ESG risks. Based on that assessment, a time-bound ESAP was designed, assigning responsibilities, milestones, and monitoring indicators. ESAP commitments were embedded in the legal investment documentation, and in some cases capital disbursements could be made conditional on satisfactory progress. ESG risk was therefore treated as dynamic rather than fixed.

At the investee level, governance focuses on strengthening management capacity, transparency, and accountability as the business scales. JALA's governance structure includes a formal management team, board oversight, and regular reporting to investors, including ESG and impact reporting aligned with SOF's requirements and monitoring expectations. Where gaps are identified, governance improvements form part of the ESAP and are supported through targeted technical assistance,

such as strengthening internal policies, improving data and reporting systems, or appointing independent board members. This approach reflects the view that effective company-level governance is necessary for sustaining operational performance and for supporting credible environmental and social management as the business grows.

Monitoring and accountability mechanisms link fund-level oversight with company-level execution. ESAP implementation is supported by regular engagement, site visits, and annual impact reporting. ESG risks are monitored dynamically through ESAP implementation, with the expectation that stronger environmental and social management will improve the company's risk profile over time. Technical assistance plays a complementary role by supporting continuous improvement and addressing unforeseen challenges, such as disease outbreaks or operational disruptions. Together, these governance and monitoring arrangements are intended to strengthen operational discipline, improve transparency, and support the implementation of impact commitments over time. This architecture gives investors oversight rights, gives the fund manager a structured basis for escalation, and gives company-level governance improvements a direct connection to both operational performance and impact credibility.

Enabling Environment

The JALA case operates within an enabling environment that, while present, remains inconsistent. Indonesia possesses the necessary market scale, production base, and commercial relevance to support innovation in shrimp aquaculture. However, prevailing surrounding conditions continue to hinder financing sustainable upgrading and implementing at scale. Producers face pressure to meet stricter traceability and sustainability requirements, improve resilience to disease, and raise productivity without relying on environmentally damaging expansion. At the same time, many farms continue to operate with fragmented data, variable management practices, and limited access to the technical support and financing needed to shift toward more productive and environmentally disciplined systems. Consequently, the primary challenge extends beyond the introduction of improved tools or additional capital; it involves establishing the broader conditions that enable these tools and resources to consistently support commercially viable and environmentally sustainable growth.

At the market level, the case also reflects a broader infrastructure problem. Shrimp

aquaculture remains difficult to finance where farm-level data is weak, operating practices are inconsistent, traceability is limited, and access to markets and finance is uneven. Under those conditions, investors and commercial partners face high information costs and limited confidence in underwriting production risk, environmental performance, and supply-chain reliability. JALA's model is designed address those conditions, but the case also suggests that broader market development will depend on stronger traceability systems, more consistent operational standards, and higher-quality data across the value chain.

Biological and environmental risks further shape the enabling environment for investment. Disease outbreaks, water-quality deterioration, effluent management failures, and variable smallholder production practices all create uncertainty around production stability and cash flow. These risks are not unique to JALA. They are part of the broader context that makes aquaculture difficult to underwrite using conventional financing channels. In that setting, technical assistance, monitoring capacity, and stronger environmental and social management systems become more than project-level enhancements. They become part of the wider institutional conditions needed to make sustainable aquaculture more investable.

The broader implication is that replication will depend on more than the availability of catalytic capital. It also depends on whether the surrounding market environment can support businesses that rely on data visibility, traceability, disciplined farm management, and credible reporting. Therefore, the enabling environment in this context includes not only financing conditions but also the technical, informational, and governance infrastructure necessary to make companies such as JALA more legible to investors and commercial counterparties over time.

Performance Evidence

Financial Performance and Return Signals

JALA reports strong top-line revenue growth, with total revenues of IDR 456.4 billion, indicating significant market traction and operational scale. At the same time, the company recorded a net loss of IDR 25.1 billion, reflecting its continued investment in growth. Although the company remained loss-making in 2023, the loss appears relatively contained in relation to revenue, which may indicate improving operating efficiency as the business scales. This pattern is consistent with platform businesses in which fixed costs are spread across a growing revenue base, creating the potential for margin improvement over time.

JALA's balance sheet reflects a strong equity base, with total assets of IDR 225.0 billion, equity of IDR 207.5 billion, and liabilities of IDR 17.5 billion. This results in a Debt-to-Equity Ratio (DER) of approximately 0.08 and a Debt-to-Assets Ratio (DAR) of 7.8%, indicating very low leverage. Such a capital structure reduces financial risk, improves solvency, and enhances the company's capacity to absorb operational shocks during its scaling phase.

This equity-heavy structure is consistent with the role of catalytic and impact-oriented capital in absorbing early-stage risk in sectors where commercial financing may initially be limited. The successful completion of JALA's Series A fundraising in 2023 (USD 13.1 million) also signals continued investor confidence and the possibility of an upward valuation trajectory. Stakeholder interview evidence provides a

Indicator	Unit	Indicator
Revenue	IDR	456,425,539,855
Loss for the year	IDR	(25,135,200,019)
Total Assets	IDR	225,005,301,831
Total Equity	IDR	207,485,416,700
Total Liabilities	IDR	17,519,885,131

FIGURE 1: JALA Financial Performance.
SOURCE: JALA Sustainability Report 2023

more direct, though still non-quantified, link to fund-level performance. Antoine Raes, Investment Director at Mirova stated, "Our investment in JALA is contributing positively to the Fund's performance and remains aligned with market-level returns, notwithstanding its blended structure." While stopping short of disclosing a quantified realized return, this statement connects JALA's company-level performance more directly to the fund's experience.

Revenue Model and Future Return Potential

The revenue model diversification reflects a deliberate strategy to build recurring and service-based revenues, which can improve predictability and resilience relative to purely transactional models. From an investor perspective, these recurring revenue components are particularly relevant for supporting higher valuations in future fundraising or exit scenarios. These indicators point to commercial traction, low leverage, and a maturing revenue model, while still stopping short of establishing quantified realized fund-level financial returns.

Outcome Evidence

Environmental Outcome Signals

The clearest reported environmental indicators relate to farm-level management practices in shrimp aquaculture. According to reported impact indicators, JALA-supported practices cover approximately 190 hectares of land under sustainable management, reflecting the scale at which improved water quality monitoring, feed optimization, and disease surveillance are being implemented.[20] The deployment of real-time monitoring devices and data-driven farm-management tools is intended to support more efficient input use, stronger disease management, and improved water-management practices. These operational changes may also be consistent with lower pollution intensity per unit of production, although that effect is not directly quantified in the evidence presented here.

Importantly, JALA's emphasis on improving productivity on existing ponds, rather than enabling spatial expansion, supports sustainable intensification in a sector historically associated with mangrove conversion. While avoided deforestation is not directly quantified, a model centered on raising productivity on existing ponds may reduce pressure for expansion into new coastal land and is therefore consistent with lower long-term pressure on mangrove and coastal ecosystems, particularly in regions where land-use change remains a material environmental risk.

Social and Livelihood Outcome Signals

JALA's reported social indicators point primarily to expanded access to technology, information, and services for shrimp farmers, including small- and medium-scale operators. As of the reporting period, 1,468 beneficiaries are directly linked to JALA-supported activities, reflecting uptake of its digital tools, laboratory services, and market access solutions. These services can improve farmers' visibility over production performance, costs, and cash flows, and they may support more informed decision-making. The evidence presented here, however, is stronger on service uptake than on realized income effects.

Workforce composition provides a second reported social indicator, with 39.01% of jobs held by women. This suggests substantial female participation in a sector often characterized by male-dominated employment patterns. Faster post-harvest payments facilitated through digital invoicing and financing solutions may also improve liquidity for farmers. In the current evidence base, however, these services can ease transaction frictions, while broader effects on income volatility and household resilience would require more direct measurement.

20 JALA, Sustainability Report 2023, https://22234259.fs1.hubspotusercontent-na2.net/hubfs/22234259/Sustainability%20Report/SUSTAINABILITY%20REPORT%20JALA.pdf

Market and System-Level Relevance

Beyond farm-level outcomes, JALA's model may also carry wider system relevance by addressing information asymmetries that constrain sustainable aquaculture financing. Its data infrastructure can improve visibility around production, disease risks, and harvest projections for downstream actors, including processors, insurers, and fintech partners. This potential is analytically important, with the evidence presented here offering a valuable foundation for an understanding to a more possible system-level change. Across these domains, the evidence is strongest where the chapter can point to reported indicators and operational uptake, and more limited where broader environmental, livelihood, or system-level effects would require longer-term or more causal verification.

Lessons and Implications

The table below summarizes key lessons and implications from SOF's investment in JALA. It synthesizes insights from the fund's structure, the investee's business model, revenue diversification, risk management approach, and scaling potential, and translates them into case-based implications for investors and practitioners designing blended finance solutions in emerging markets.

21 JALA, Sustainability Report 2023.

Topic	Description	Lessons Learned
Simple Fund Structure	SOF maintained a pari passu structure with no fund-level tranching and applied guarantees at the transaction level. This reduced structural complexity while preserving investor alignment.	This case suggests that blended funds can benefit from transparent, non-layered capital structures that lower due-diligence burden and preserve investor alignment. Fund managers can aim to prioritize structural clarity where the strategy does not require more complex layering.
Portfolio-level Risk Sharing	A partial portfolio guarantee on eligible debt investments was used rather than a first-loss tranche with investor seniority. Investors remained pari passu, while the guarantee provided contingent coverage to the fund following a defined default and liquidation event.	This case indicates that partial guarantees can be effective when risks are identifiable and credit-related, and when the goal is to preserve commercial incentives while extending risk capacity. They may also be capital-efficient for concessional providers because resources are not fully deployed upfront. By contrast, first-loss structures may be more appropriate in settings where risks are highly uncertain, or markets are especially nascent and investors require a clearer upfront loss cushion to participate.
Flexible Funding Instruments	SOF deployed equity, convertible debt, and technical assistance depending on JALA's maturity and risk profile.	The case supports building flexibility into fund mandates so financing structures can be tailored to investee maturity and risk profile. Fund managers and limited partners should consider authorizing multi-instrument strategies when sector conditions and company-stage needs vary significantly.
Investee Model Alignment	JALA's core operations, including productivity tools, traceability, and financing access, directly addressed sustainable aquaculture and transparency objectives, with impact channels embedded in the business model itself.	The case points to the value of investing where impact is embedded in the revenue model rather than in peripheral activities. Impact investors and investment committees should test alignment between the impact thesis and the business model during diligence
Replicability and Governance	JALA scales through services and data rather than asset-heavy farming, with strong governance emphasized following sector credibility concerns.	This case highlights the importance of governance systems, transparency, and supply-chain integration in supporting replication potential and investor confidence, particularly in sectors where credibility concerns have shaped risk perception. Investors and company leadership should strengthen reporting systems and board oversight early in the company's growth cycle.

These lessons are most useful when read as evidence-informed design implications from this case rather than as universal rules for blended finance in sustainable aquaculture or the blue economy more broadly.

Conclusion

This case demonstrates how blended finance can enhance investability in a sector where environmental risks, operational opacity, and fragmented production systems have historically constrained commercial capital flows. In Indonesia's shrimp aquaculture sector, the primary challenge extends beyond the need for additional financing to the difficulty of directing growth capital into business models that must concurrently improve productivity, strengthen traceability, manage biological and environmental risks, and maintain commercial viability for investors. The SOF investment in JALA is analytically significant because it addresses this challenge through a combination of fund-level risk sharing, flexible company-level financing, and post-investment technical and governance support. Accordingly, the case illustrates a specific function of blended finance: not the elimination of risk, but its selective redistribution and management to make an otherwise difficult sector more financeable. This approach is evident in the fund's pari passu structure, its portfolio-level guarantee, the use of tailored instruments for JALA's growth stage, and the reliance on ESAP-linked technical assistance to strengthen governance as well as environmental and social management. Collectively, these elements clarify how catalytic capital expanded the conditions under which investment could occur in a technology-enabled aquaculture platform.

At the same time, the case points to important evidentiary limits. The strongest publicly available signals are at the company and operating-model level: revenue growth, a low-leverage balance sheet, successful follow-on fundraising, reported land under sustainable management, beneficiary reach, and a business model built around data, traceability, and service integration. Those indicators support the view that JALA has achieved commercial traction and has built a platform with plausible environmental and social relevance. They provide meaningful evidence on sustainable intensification in shrimp aquaculture, while leaving room for further research to more fully establish fund-level financial returns and the broader impact outcomes associated with it.

The broader implication is that the advancement of sustainable aquaculture finance is unlikely to result from capital deployment alone. Progress will depend on whether blended finance structures can foster the market conditions necessary to

make catalytic support less exceptional over time. These conditions include more reliable farm-level data, enhanced traceability infrastructure, standardized risk assessment, improved company level governance, and clearer outcome measurement across environmental and social dimensions. For investors, fund managers, catalytic funders, and policymakers, the lesson extends beyond the familiar assertion that blended finance can mobilize capital into challenging sectors. The more critical question is whether these structures can transform how risk, performance, and sustainability are observed and governed, so that aquaculture businesses with credible productivity and environmental-management models become easier to finance on increasingly conventional terms. In this context, the JALA case should be interpreted not as definitive proof that blended finance has resolved the investment challenge in sustainable aquaculture, but rather as evidence that catalytic capital, data infrastructure, and governance discipline can begin to expand the frontier of what is considered financeable.

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Antoine Raes, Investment Director at Mirova – Natixis IM Singapore

List of Interviews

Antoine Raes, Investment Director at Mirova – Natixis IM Singapore

Recommendations: A Look at Market-building in Indonesia

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The following recommendations draw on the full body of case evidence assembled in this casebook. Rather than presenting a conventional list of policy actions organized by stakeholder or sector, they are structured as a unified practice framework. The seven recommendations share a central premise: the most consequential decisions regarding whether blended finance builds markets or merely completes transactions are made before capital is committed, not after. Each recommendation is empirically grounded in the Indonesia cases and formulated with a view to external validity, such that it may be applied—subject to appropriate contextual adaptation—to other settings in which blended finance is deployed to support the development of sustainable investment ecosystems.

The Design Stage Is the Market-Building Stage

The insights suggest that blended finance is frequently evaluated at suboptimal moments. Programs are assessed when capital is deployed, when transactions close, when funds reach final size, or when projects report their first outcomes. While these can be reasonable measurement points, the critical decisions that determine whether a blended finance program builds a market or simply completes a transaction are almost never made at these stages. Instead, they are made earlier during the design stage, before the term sheet is signed and capital is dispersed.

The Indonesia casebook makes this visible in a way that individual case studies rarely can. Across all of the transactions examined, a consistent pattern emerges. The cases that demonstrate the clearest market-building effect, where financing became more accessible and where a subsequent transaction became easier than the preceding, all share the common characteristic of critical market-building questions that were posed and planned for during the initial design. Contrastingly, the cases where evidence is thinner, replication is harder, and market development is less visible, share the opposite characteristic. Here, critical market-building questions for implementation, reporting, and evaluation, for example, were deferred. Consequently, by the time structure was set and capital was deployed, the decisions that would have mattered most had already been made by default.

This observation is not meant as a critique of the practitioners involved. Rather, it highlights a pervasive tendency within the field to treat design as merely the phase for selecting instruments and structuring capital, while learning gets relegated to a subsequent stage. The Indonesian experience, across initiatives such as the energy efficiency guarantee, land-use bond, urban water public-private part-

nership, gender finance funds, nature-based agriculture investment, and aquaculture platform, demonstrates that this sequencing is misguided. The design stage is not preliminary to market-building; it is itself market-building. The choice of instrument for the right market stage, the assessment of whether counterparties can absorb capital productively, the hypothesis about when public support can narrow, the template that makes the next transaction cheaper, the outcome indicator that proves the investment worked, the precise claim about what public capital is doing that private capital cannot, and the pathway for domestic institutions to participate are not reporting outputs. They are design inputs. And once capital moves without them, they can seldom be recovered.

The following seven recommendations reflect this insight. Each highlights a discipline essential at the design stage, before capital is committed, and illustrates the outcome in the Indonesian cases when that discipline is applied or omitted. Collectively, these recommendations form a pre-capital practice framework. They are not a checklist, but a set of questions to address before advancing any blended finance program from concept to commitment.

Recommendation 1:
Before allocating public funds, determine whether the intervention will alter market capabilities or merely fund a single transaction

The most important distinction in blended finance is also the most often overlooked. A guarantee that accelerates a deal that would have occurred regardless is fundamentally different from a guarantee that enables a lender to underwrite a new asset class. Similarly, a large international financing pledge that draws attention to a country's energy transition differs from a platform that transforms non-bankable projects into financeable opportunities. Closing a fund and deploying capital is not equivalent to establishing a market where such transactions can recur at lower cost and with reduced public support.

The Indonesian cases illustrate both sides of this distinction. The energy efficiency guarantee highlights that the main barrier in Indonesia's industrial energy efficiency market is not capital scarcity, but lenders' difficulty in assessing risk. Guarantees that target the wrong constraint may reduce capital costs without improving lending outcomes. In contrast, guarantees that address the real constraint can significantly change lenders' willingness and ability to provide credit. The JETP commitment is a clear example of a misunderstanding in the

opposite direction. The USD 20 billion pledge was widely seen as direct financing, but it was actually a coordination mechanism to align priorities and develop a project pipeline, not to structure or fund individual transactions. This misinterpretation created expectations the program could not meet, leading to a credibility gap between commitment and implementation.

The TLFF sustainability bond illustrates this distinction from another perspective. Although the bond was repaid at par, indicating financial success, the subsequent shift to a portfolio-based private credit vehicle instead of issuing a second bond suggests that the capital markets pathway for land-use finance in Indonesia did not evolve as expected. While the transaction was completed, it did not catalyze broader market development. ACLF, the successor vehicle, embodies ADM Capital's assessment of this gap: the issue was not the failure of TLFF, but rather its inability to establish the institutional infrastructure necessary to facilitate subsequent transactions.

The recommendation is to include one question as a formal part of the design and approval process for any program deploying catalytic or public capital: Does this change what the market can do? To answer this, two steps are essential. First, clearly state the specific change being claimed before committing capital. For example, is the program aiming to build new lender capabilities, attract private investors to previously avoided markets, or deliver outcomes for communities that would not occur under business-as-usual conditions. Each claim requires distinct evidence, and combining them makes it difficult to determine which, if any, actually occurred. Second, define the evidence for each claim in advance. If the claim is a new lender capability, the program should track underwriting behavior before and after. If the claim is private capital mobilization, the program should define what genuine mobilization looks like versus co-investment that would have happened regardless. If the claim is market impact, the program should identify what a changed market looks like and how it would be observed.

This is a discipline, not a bureaucratic requirement. It does not require a new institution or standards body. Instead, it calls for funders, fund designers, DFIs, and policymakers to be precise about the intended change, honest about what was achieved, and clear when outcomes do not align with intentions. This casebook is one of the more rigorous efforts to apply that discipline to real transactions and reveals how rarely this discipline was used during the initial design. Altering this habit at the design stage, before funds are allocated, is essential for

the blended finance field to achieve greater productivity, build the market, and scale transactions.

Recommendation 2:
Align financial instruments to the stage of market development

Blended finance program underperformance is often attributed to excessive sector risk, market immaturity, or poor timing. However, evidence from Indonesia indicates that, in several cases, the primary issue is a mismatch between the financial instrument and the specific market challenge. The problem is therefore, the use of an inappropriate tool for the market's actual stage of development. The gender finance cases illustrate this point clearly. Women's World Banking Capital Partners II (WWB CP II) and JAWEF both operate within the same sector, target the same beneficiaries, and aim to expand financial access for women entrepreneurs in Indonesia and the broader region. Despite these similarities, their structures differ significantly, as is appropriate. WWB CP II employs catalytic equity and grant-funded technical assistance to address institutional barriers, since financial intermediaries serving women-led businesses are not yet investable on standard terms. The objective is to enhance investability. In contrast, JAWEF utilizes tranche subordination to address mobilization challenges; while intermediaries are operational and creditworthy, institutional investors require a risk cushion before participating. Here, the focus is on risk redistribution rather than institutional capacity building. Applying JAWEF's structure to WWB CP II's context, or vice versa, would not only be inefficient but would also fail to address the actual constraint.

The ADM Capital cases make the same argument across time. TLFF used bespoke capital markets structuring in 2018 because the land-use bond market in Indonesia did not exist, and the asset class needed a proof of concept. ACLF used portfolio-based private credit in 2023 because the problem had shifted: the asset class had been demonstrated, and the constraint was now borrower readiness and pipeline depth at smaller ticket sizes. The right instrument changed because the market stage changed. Using a TLFF-style bespoke bond structure for ACLF's problem would have been misaligned, not because bespoke structuring is inferior, but because the market no longer needed a proof of concept. It needed a repeatable lending mechanism.

A recommended practical approach is to conduct a diagnostic assessment before selecting financial instruments: determine the market's current state before deciding on the appropriate capital deployment. If investable assets have not yet been developed, the capital should focus on creation through first-loss positions, equity, and technical assistance that absorb institutional risk during the market's development. If investable assets exist but institutional capital remains hesitant, the priority becomes mobilization, utilizing subordination, guarantees, and blended structures to render existing opportunities accessible to risk-constrained investors. If the primary challenge is coordination, such as misaligned actors, fragmented pipelines, or unclear priorities, the focus should shift to facilitation, which may not require a financial instrument at all. Getting this diagnosis right before committing capital is not a theoretical exercise. It is the design decision that determines whether the program addresses the actual constraint, or funds around it.

Recommendation 3:
Assess absorptive capacity before deploying capital and treat it as a binding constraint, not a downstream implementation detail

Challenges in blended finance are often addressed predominantly on the supply side, focusing on capital mobilization, attracting investors, and risk-sharing design. However, evidence from Indonesian cases highlights an equally significant constraint on the demand side. The question is not only whether capital can be raised. It is whether the institutions, systems, and processes on the receiving end can deploy it effectively, govern it responsibly, and account for it credibly. When absorptive capacity is insufficient, capital does not vanish; instead, it stalls, accumulates during preparatory phases, causes implementation delays, or results in disbursements that cannot be linked to measurable outcomes. Frequently, the gap between commitment and realization reflects a deficiency in absorptive capacity rather than a lack of financing.

The JETP experience in Indonesia illustrates this dynamic. The program reported a total commitment of USD 20 billion and identified a pipeline of over 400 priority projects from approximately 1,000 proposals. The gap between this project pipeline and actual large-scale financing is attributable to several factors, including donor fragmentation, misaligned mandates, and coordination costs. But this gap also reflects the system's absorptive capacity as many projects required preparatory work, institutional coordination across ministries, procurement processes, alignment with safeguards, and implementation capacity that the financing facility was not designed to support and that domestic institutions were not fully prepared to deliver. Increasing capital commitments under these constraints does

not accelerate implementation; rather, it widens the gap between headline figures and realized outcomes.

ADM Capital's pivot from TLFF to ACLF reveals a similar lesson at the borrower level. The TLFF structure exposed that the mid-market borrower pipeline for sustainable land-use finance in Indonesia was thinner than anticipated. Not because companies did not exist, but because most of them lacked the governance systems, supply chain discipline, verification capacity, and debt service track record to absorb commercial credit on viable terms. ACLF was designed in response and included smaller ticket sizes, intensive technical assistance, and a selection process that treats commercial viability as a precondition rather than an aspiration. The fund's absorptive capacity analysis occurs before capital is deployed, not after.

In West Semarang, PDAM Tirta Moedal is required to meet minimum financial health thresholds to qualify as the government contracting agency, consistent with standards applied to other public utilities. The project's success was attributable to the off-taker's capacity to absorb the associated obligations. The West Semarang case demonstrates that this model is viable only when the utility satisfies minimum financial and operational criteria. However, most local water utilities in Indonesia do not currently meet these thresholds. Consequently, a significant barrier to replication occurs not at the project level, but is instead a sector-wide issue that must be addressed before additional capital can be mobilized.

A key practical response is to formally integrate absorptive capacity assessment into the pre-capital design process. Absorptive capacity should be used as a design input to guide instrument selection, capital allocation, technical assistance, and disbursement sequencing, rather than simply being treated as a risk factor. For country platforms, this means evaluating whether the project owner has sufficient procurement, safeguard, and reporting capacity before committing capital. Fund managers should rigorously assess borrower governance and operational readiness in addition to financial projections. Development partners should treat capacity-building programs as a fundamental precondition for effective financing, not as ancillary support.

Recommendation 4:
Define success criteria prior to disbursing funds and establish measurement parameters

Each case in this casebook demonstrates a consistent pattern regarding evidence. While the financial structures are well-documented and the mechanisms are clearly explained, evidence concerning whether the investments achieved their intended outcomes such as cleaner water, lower emissions, better livelihoods, avoided deforestation, is either absent, incomplete, or described as expected rather than observed.

This issue does not reflect a lack of effort but rather a design flaw. In most cases examined, the approach to measuring outcomes was considered only after finalizing the investment structure. Consequently, baseline data were not collected, measurement methodologies were undefined, and resources for ongoing monitoring were not allocated. As a result, outcomes are often described with confidence at the time of deal closure but are difficult or impossible to verify at the conclusion of the program.

The West Semarang water project sought to reduce groundwater extraction and mitigate land subsidence in coastal neighborhoods; however, the monitoring framework was not structured to track these specific outcomes. While the project may have achieved its objectives, systematic evidence was lacking because an integrated measurement plan was not in place from the beginning. Similarly, the energy efficiency guarantee lacked verified energy savings at the time of reporting. In the case of the coconut sugar investment, long-term carbon and livelihood outcomes are described as monitored pathways rather than as demonstrated results.

In contrast, the cases that perform better on this dimension share a common design feature: the measurement architecture was established before capital deployment. For example, JALA's farm monitoring devices, disease diagnostics, and traceability systems were integral to the business model from the outset, rather than being retrofitted to meet reporting requirements. Similarly, FPI96's measurement and verification (M&V) framework for energy savings was incorporated as a core program component, rather than as a reporting afterthought, even though its full implementation was pending. Additionally, BTF's Environmental and Social Action Plan, supported by the Technical Assistance Facility, translated broad ESG commitments into specific, time-bound, and named actions as an essential part of the investment process, rather than as a post-disbursement reporting obligation.

The recommendation is clear: prior to the commitment of catalytic or public capital to any blended finance transaction, three conditions must be satisfied. First, the intended investment outcomes must be clearly defined as observable changes with a specified baseline, rather than general aspirations. Second, the methodology for measuring these outcomes should be established in advance, specifying data collection, timing, and reference points. Third, key outcomes should be independently reviewed by an assessor whose evaluation is not influenced by the investment's commercial performance.

This approach does not seek to impose additional reporting burdens on an already complex process. Rather, it emphasizes the importance of making substantiated claims and facilitating organizational learning. The field cannot improve what is not measured, nor can it measure what is not defined and planned from the outset.

Recommendation 5:
Design every transaction with the expectation that it will serve as a precedent for future deals

In nearly every case in this casebook, the distance between a successful individual deal and a functioning market came down to one question: did the structure leave anything behind that made the next deal easier?

In most cases, the outcome was not positive. The TLFF sustainability bond demonstrated that a long-tenor land-use bond could be issued in Indonesia. While it was a significant market milestone, upon closure, the market for such bonds remained unchanged as the structure had not yielded many reusable components such as standardized eligibility criteria, underwriting templates, or a shared verification process. There were lessons learned and incorporated within ADM Capital that influenced the shape of ACLF. But they were not converted into publicly transferable templates, frameworks, or standards that another investor or borrower could utilize independently of ADM Capital. This represents the gap between organizational learning and the development of broader market infrastructure.

In contrast, the energy efficiency guarantee program, FPI96, was intentionally designed to facilitate transferability from its inception. Its eligibility rulebook, coverage tiers, monitoring templates, and technical assistance toolkits were developed for adoption by other lenders and markets throughout the region. The guarantee mechanism aims to equip lenders with the capacity to assess energy efficiency

risk, rather than merely providing risk coverage. Whether a lender applied the program's underwriting criteria to a subsequent loan without needing the guarantee was the real success indicator. PT SMI's three-gate platform at SDG Indonesia One operates similarly: by applying a consistent screen for feasibility, bankability, environmental and social readiness to every project in its pipeline, the platform accumulates institutional knowledge with every transaction. Each deal teaches the next one.

This analysis does not claim that portfolio logic is universally superior to project-specific structuring. When risks are genuinely asset-specific, such as those linked to a single utility, concession, or company's operating model, project-level engineering remains both necessary and appropriate. For example, the West Semarang water public-private partnership required bespoke structuring because PDAM Tirta Moedal's financial profile, the city's specific growth corridor, and the political economy of tariff-setting in Semarang posed unique challenges that a standard template could not address. The recommendation is therefore not to prioritize portfolio approaches over individual projects. Rather, regardless of the chosen structure, it is essential to incorporate mechanisms that ensure lessons learned persist beyond the immediate transaction.

It is recommended that every blended finance transaction be evaluated not only on whether it closes, but on what it leaves behind. Does it produce a reusable underwriting template? Does it generate comparable data that can inform the next deal? Does it create a pipeline or just a project? These questions should be asked and answered before the structure is finalized, not at evaluation time. Where bespoke structuring is genuinely necessary for a new asset class or nascent sector, the deal should include an explicit plan for converting what is learned into replicable infrastructure. Without that plan, blended finance will produce transactions for case studies. With it, blended finance produces markets for scale.

Recommendation 6:
Incorporate a testable exit hypothesis into every concessional structure, not as a commitment of early withdrawal, but as a discipline for knowing when public support has done its job

Blended finance programs that employ concessional capital implicitly suggest that public funding is presently necessary but will eventually become unnecessary. However, this assumption is seldom explicitly stated or systematically evaluated. As a result, concessional support, including first-loss positions, guarantees, or subsidized technical assistance, may continue indefinitely, not due to persistent market need, but because mechanisms for assessing ongoing necessity are frequently absent.

FPI96 represents the most definitive counterexample in the casebook. The program explicitly states that guarantees serve as a temporary mechanism while the ecosystem develops. Its primary objective is to enable Indonesian banks to independently underwrite energy-efficiency loans, facilitate project developers in preparing bankable proposals without external assistance, and provide policymakers with robust evidence for regulatory design. Once these conditions are met, the guarantee can be either more narrowly targeted or gradually withdrawn as the market demonstrates increased capability. That is a testable hypothesis, not a vague aspiration. It names what change would look like, and it implies what evidence would confirm the change had occurred: repeat origination by participating lenders without guarantee coverage, adoption of M&V standards by lenders who were not part of the program, a measurable reduction in perceived risk pricing for energy efficiency transactions.

MSLF2 makes a similar argument at the fund level. The manager states an explicit objective of reducing the junior tranche in successor vehicles as the sustainable land use asset class matures, reflecting the expectation that investors will require less concessional protection as evidence accumulates and familiarity with the asset class increases. However, this is not a guarantee, it is more a hypothesis regarding market development that the fund's performance will either validate or refute.

In contrast, most other cases in this casebook do not demonstrate this level of clarity. JAWEF's subordinated structure lacks a stated hypothesis regarding when senior investors might participate without mezzanine protection. West Semarang's Viability Gap Funding (VGF) was designed for a single transaction, without an

articulated rationale for how future water public-private partnerships (PPPs) might require less fiscal support as the model matures and PDAMs strengthen. Similarly, ACLF's Development Finance Corporation guarantee does not include a published reduction pathway. While these are not design failures in isolation, collectively they indicate a broader tendency within the field to treat concessionality as a permanent structural feature rather than a transitional tool.

The recommendation does not require early exits or the setup of arbitrary timelines for removing public support. Markets develop at different speeds, and some sectors will require sustained public risk-sharing for prolonged periods. What is required is a hypothesis: if this program works as intended, what would the market look like in five years that it does not look like today? What would that change allow the program to do differently, such as narrower coverage, smaller first-loss layer, lighter technical assistance, broader eligibility for commercial terms? Addressing these questions during the design phase does not restrict the program. Instead, it provides strategic direction and measurable indicators of progress.

Recommendation 7:
Integrate domestic financial institution participation into blended finance structures from the outset, establishing it as a current design requirement rather than a future aspiration

The blended finance transactions in this casebook draw capital from a wide range of sources. In most cases, the primary catalytic and structural capital comes from international development finance institutions, multilateral bodies, and offshore impact funds. Domestic participation does occur — Bank Central Asia's long-term lending role in West Semarang is a genuine example of domestic commercial bank engagement in a blended PPP structure — but often results from other conditions, not from the initial design. Indonesian pension funds, local insurance companies, and most regional financial institutions remain largely absent from the capital stacks across the cases examined here. It is, in large part, a reflection of how these deals were designed, with domestic participation treated as a goal to be achieved over time rather than a structural requirement to be solved at inception.

The distinction is significant because domestic financial institution participation generates outcomes that international capital alone cannot achieve. When a domestic bank underwrites an energy efficiency loan, it develops the internal knowledge, the credit templates, and the institutional memory to do it again. When a domes-

tic pension fund participates in a blended infrastructure vehicle, it creates the precedent and the regulatory comfort for the next allocation. When a local-currency instrument is designed into a blended structure from the start, it reduces FX risk for borrowers, expands the pool of domestic investors, and lowers the long-term cost of capital for the sector. These effects do not accumulate automatically over time. Rather, they require deliberate design choices made before the structure is finalized.

Before finalizing the capital stack, assess whether domestic financial institutions can participate. If they cannot, identify the conditions required for their involvement. Clearly document any regulatory constraints as system-level gaps that need policy intervention. If limited risk appetite is the main barrier, adjust the blended structure to offer a more accessible entry point, such as a smaller co-investment tranche, a local currency instrument, or a guarantee that reduces perceived downside risk to an acceptable level. If institutional capacity is lacking, include a targeted capability-building component in the financing program, as demonstrated by FPI96's work with Indonesian banks. These adjustments do not guarantee domestic participation. But designing without them guarantees the outcome the field consistently produces: international capital moves, domestic market depth stays flat, and the blended structure has to be rebuilt from scratch the next time because no local institution learned how to do it.

Domestic capital mobilization remains a persistent challenge in blended finance across emerging markets. While Indonesia has not fully addressed this issue, its experience highlights one key lesson: programs that achieved even partial domestic participation, such as BCA in West Semarang, Indonesian LFIs in FPI96, and PT SMI in SIO, succeeded because participation pathways were integrated into the initial design rather than added later. This design discipline should be adopted more widely in the field.

Conclusion

The central implication across all seven recommendations is that scale should not be understood solely by an increased number of transactions or a higher headline volume of mobilized capital. Instead, it should be understood as a shift in market function. Scale is achieved when more projects become independently bankable, when more institutions, including domestic banks, local intermediaries, and national development platforms can intermediate capital effectively without requiring bespoke public support each time. And when absorptive capacity has expanded to where capital can be deployed at speed without accumulating preparatory backlogs. Furthermore, scale is evident when reporting and verification have become sufficiently standardized that investors can compare opportunities and allocate with confidence. It is also demonstrated when financial instruments that once required significant concessionality can operate with reduced support, when exit strategies established during the design stage have been tested and validated, and when domestic financial institutions are integrated not because they were invited at the last stage, but because they were designed in from the first.

Under these conditions, catalytic capital remains present, but its role evolves. It becomes less a permanent substitute for underperforming markets and more a targeted instrument for accelerating market maturation. This approach focuses on the frontier of what is not yet investable, rather than dispersing resources across already investable opportunities. The primary objective is not merely to finance additional projects, but to establish market conditions that make financing routine, credible, domestic, and scalable over time. Each recommendation in this section argues that building these conditions must begin at the design stage, before capital deployment, transaction structuring, or the emergence of critical questions. The Indonesian cases illustrate this principle: FPI96 implements most recommendations concurrently, while several other cases apply some in isolation. The primary challenge is not solely a lack of knowledge, but inconsistency. These practices are adopted when exceptional practitioners make them a priority, not because the field expects them as a condition of program design. This standard must shift, and such practices should be foundational, not exceptional.

Climate change, biodiversity loss, and inequality are interconnected challenges, yet the financial systems designed to address them remain fragmented and insufficient. Despite growing commitments, a significant financing gap persists—particularly in emerging and developing economies—limiting the scale and speed of sustainable development. Blended finance has emerged as a critical instrument to help bridge this gap. By combining public and philanthropic capital with private investment, these structures aim to mobilize additional funding while redistributing risk. However, their effectiveness depends not just on intent, but on design: how risk is allocated, how incentives are aligned, and whether underlying business models are viable. This casebook moves beyond high-level narratives to examine how blended finance works in practice. Through a set of real-world cases across sectors such as sustainable land use, renewable energy, and inclusive finance, it identifies what drives success, where constraints persist, and what is required to scale. As Indonesia navigates its role in the global climate and development landscape, the country presents a unique opportunity to advance next-generation blended finance. Unlocking this potential will require not only more capital, but better-designed structures, stronger institutions, and a clearer alignment between financial returns and long-term impact.

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