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Ultra-concessional loans as sustainable development finance: evidence from Japanese official development assistance to Cambodia

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Abstract. How low-income countries can finance large-scale infrastructure without compromising debt sustainability is a central question in development economics. This paper examines Japanese Official Development Assistance (ODA) to Cambodia as an empirical case of ultra-concessional development lending, against the backdrop of the country's current low risk of debt distress. Drawing on a qualitative case-study design that combines document analysis of official reports from the Cambodia Development Council, the Japan International Cooperation Agency (JICA), and the Ministry of Foreign Affairs of Japan with semi-structured interviews conducted with Cambodian government officials and think-tank analysts in Phnom Penh, the study analyses the financial terms, development outcomes, and fiscal implications of Japanese concessional loans. The flagship National Road No. 5 Improvement Project (JPY 11,136,000,000, approximately USD 75 million) carries an interest rate of 0.01% per annum, a ten-year grace period, and a forty-year amortization period, implying near-negligible debt service and a grant element far above the OECD-DAC concessionality threshold. The evidence indicates that such ultra-concessional terms preserve fiscal space for health, education, and poverty reduction while still financing connectivity infrastructure aligned with SDG 9 and Cambodia's national development strategies. The paper concludes with policy recommendations on concessionality benchmarks, financing diversification, public debt management, and donor-recipient alignment for aid-dependent economies.

Keywords: official development assistance, concessional loans, debt sustainability, infrastructure development, Cambodia

1. Introduction

Financing infrastructure is one of the most persistent constraints on the growth of low-income economies. Roads, ports, and power systems require investments that far exceed domestic revenue capacity, yet the terms on which such investments are financed determine whether they become a springboard for development or a source of fiscal distress. For post-conflict states the dilemma is acute: infrastructure gaps are widest exactly where debt-carrying capacity is weakest. Cambodia illustrates this tension. The country emerged from decades of conflict that destroyed much of its physical and institutional capital, including an education system that was

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dismantled almost entirely. Against this backdrop, Official Development Assistance (ODA) has been a cornerstone of the country's efforts to rebuild its economy, infrastructure, and human resources. Recent joint World Bank-IMF analysis classifies Cambodia at low risk of external and overall debt distress, with external public and publicly guaranteed debt of about USD 11.9 billion, roughly 25.9% of GDP, at the end of 2024[1].

Among Cambodia's development partners, Japan has been a consistent and influential donor since 1992, when assistance resumed following the Paris Peace Agreements and the United Nations transitional administration. Japanese ODA combines grant aid with highly concessional loans channelled mainly through the Japan International Cooperation Agency (JICA), and spans transport infrastructure, education, health, governance, and rural development. Unlike financing packages that carry near-commercial interest rates and short repayment horizons, Japanese yen loans are widely regarded as exceptionally soft; however, systematic, loan-level evidence on how such terms interact with a recipient's debt sustainability and fiscal space remains limited, particularly in the Cambodian context [1].

This paper addresses that gap by examining Japanese concessional loan aid to Cambodia as an empirical case of ultra-concessional development finance. Three research questions guide the analysis: (1) What are the financial terms of Japanese concessional loans to Cambodia, and how concessional are they relative to international benchmarks? (2) Through which channels does this financing affect infrastructure development, regional connectivity, and the attainment of the Sustainable Development Goals (SDGs)? (3) What are the implications of these loan terms for Cambodia's debt sustainability, fiscal space, and development policy?

The study contributes to the literature in two ways. First, it provides a detailed, contract-level account of the financial structure of Japanese loan aid to Cambodia, including an illustrative debt-service computation derived from contractual terms. Second, it links concessionality to fiscal-space and resource-allocation outcomes, thereby extending the aid-effectiveness debate on Japanese ODA into the policy debate over debt distress in aid-dependent economies. The findings are relevant not only for Cambodia but also for other low-income countries seeking to reconcile ambitious infrastructure agendas with prudent debt management.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the methodology. Section 4 presents the results, covering loan terms, infrastructure and connectivity outcomes, SDG alignment and capacity building, and debt sustainability. Section 5 discusses the mechanisms and limitations, and Section 6 concludes with policy recommendations.

2. Literature review

2.1. Official development assistance and concessionality

The concept of ODA emerged from post-Second World War efforts to channel resources from wealthier to less-developed economies, and it was progressively formalized by the Development Assistance Committee (DAC), first within the OEEC and later within the OECD. ODA spans grants, concessional loans, and technical assistance; from the mid-1960s onwards the DAC advocated softer financial terms so that aid would not impose a heavy repayment burden on recipients, a position crystallized in the 1965 Recommendation on Financial Terms and Conditions[2]. The concessionality of a loan is conventionally summarized by its grant

[1] International Monetary Fund. (2025). Cambodia: Staff report for the 2025 Article IV consultation—Debt sustainability analysis. In IMF Staff Country Reports (Vol. 2025, Issue 317). https://doi.org/10.5089/9798229027755.002.A003

[2] OECD. (2013). The evolution of official development assistance: Achievements, criticisms and a way forward. OECD Publishing. https://doi.org/10.1787/5k3v1dv3f024-en

element—the present-value difference between the loan's face value and its future debt service, discounted at a standard rate—and a minimum grant element is required for a flow to qualify as ODA.

For highly indebted or low-income countries, the degree of concessionality is not a technical detail but a first-order policy variable: the higher the grant element, the lower the future debt-service burden, and the greater the recipient's budgetary room for manoeuvre. This insight motivates the present focus on the contractual terms of Japanese yen loans to Cambodia.

2.2. Aid, infrastructure, and economic growth

The aid-growth literature is voluminous and contested [2]. Recent evidence specific to Japanese ODA is comparatively favourable. Assessing the growth impact of Japanese ODA across recipient economies, Momita, Matsumoto and Otsuka find a positive contribution and attribute it partly to the programme's emphasis on economic infrastructure and long-term engagement [3]. Focusing on the ASEAN region, Nguyen Phuc and co-authors likewise report that Japanese ODA has supported economic growth in recipient countries [4]. Transport infrastructure is a plausible transmission channel: better roads reduce travel time, vehicle operating costs, and spoilage of agricultural produce, while improving market access, export competitiveness, and integration into regional production networks.

Cambodia's economy, which relies heavily on agriculture and light manufacturing, is particularly sensitive to transport costs; improved connectivity with Thailand and the wider Greater Mekong Subregion (GMS) should therefore raise the value of Cambodian exports and deepen the country's integration into GMS and ASEAN markets. These mechanisms frame the outcome analysis in Section 4.

2.3. Debt sustainability in aid-dependent economies

Debt sustainability analysis assesses whether a country can service its obligations without exceptional financing or distress. The Asian Development Bank's assessment of Cambodia highlights that the country's external debt position depends crucially on the concessionality of new borrowing and on the growth dividends of the financed projects[3]. Where loans carry low interest rates, long maturities, and grace periods aligned with the gestation of infrastructure returns, debt service remains a small share of revenue; where they do not, debt service can crowd out spending on health, education, and social protection, undermining human-capital formation precisely in the countries that need it most.

The fiscal-space perspective therefore shifts attention from the volume of aid to its terms: identical loan volumes can have opposite effects on a recipient's medium-term expenditure framework depending on interest rates, grace periods, and amortization schedules. This perspective is central to the interpretation of Japanese loan terms developed below.

2.4. Japan's ODA model and the Cambodian case

Japan's aid policy has evolved through successive ODA charters that increasingly emphasize sustainability, human security, and quality infrastructure [5]. Analysts describe the Japanese approach as developmentalist: infrastructure finance is coupled with capacity building and institutional engagement in pursuit of long-term developmental and national interests[4]. In mainland Southeast Asia, and in Cambodia in particular, this approach has combined road and bridge construction with education, health, and governance support since the

[3] Asian Development Bank. (2022). Debt sustainability analysis of Cambodia. Asian Development Bank.

[4] Jain, P. (2014). National interest and Japan's foreign aid policy. The Japan Institute of International Affairs.

post-conflict reconstruction period.

Despite this literature, detailed contract-level evidence on the financial terms of Japanese loans to Cambodia, and on their implications for debt sustainability, remains scarce. The present study fills this gap using official loan documentation and stakeholder interviews.

3. Methodology

3.1. Research design

The study adopts a qualitative, single-country case-study design. Cambodia is an information-rich case for examining ultra-concessional lending: a post-conflict, aid-dependent economy that has received Japanese ODA continuously since 1992 across infrastructure, education, health, and governance. The case-study approach permits an in-depth examination of loan contracts, project documentation, and stakeholder perceptions that aggregate cross-country regressions cannot capture.

3.2. Data collection

Two data sources are combined. First, secondary documentary evidence was collected from official reports of the Cambodia Development Council (CDC), including loan-level information on Japanese ODA. Donor-side policy documents of the Ministry of Foreign Affairs of Japan set out the objectives and priorities of the aid programme[5]. Project-level evidence comes from JICA's survey work, loan agreements, and standard terms documentation for Cambodia, while debt sustainability analyses produced by international financial institutions provide an independent fiscal reference point. Second, primary evidence was gathered through semi-structured interviews conducted in Phnom Penh with Cambodian government officials and analysts from local think tanks, covering loan terms, project implementation, and the perceived fiscal and developmental consequences of Japanese assistance.

3.3. Analytical approach

The documentary and interview material was examined through thematic analysis along three dimensions: (i) the financial structure of concessional loans; (ii) infrastructure, connectivity, and SDG-related outcomes; and (iii) debt sustainability and fiscal-space implications. In addition, an illustrative debt-service profile was computed directly from the contractual terms of the flagship loan (interest rate, grace period, and amortization period) to make the fiscal meaning of the concessionality concrete. Triangulation across government documents, donor publications, international assessments, and interviews strengthens the credibility of the findings.

4. Results

4.1. Financial terms of Japanese concessional loans

Japanese loan aid to Cambodia is characterized by exceptionally soft financial terms. The clearest documented example is the loan for the National Road No. 5 Improvement Project (Battambang to Sri Sophorn, Section II),

[5] Ministry of Foreign Affairs of Japan. (2002). Japan's mid-term policy on official development assistance: Japan's ODA white paper 2002. Ministry of Foreign Affairs of Japan.

summarized in Table 1: JPY 11,136,000,000 (approximately USD 75 million) at an interest rate of 0.01% per annum, with a ten-year grace period and a forty-year amortization period[6]. JICA's loan documentation confirms that this structure runs through the whole National Road No. 5 series: the tranches signed in March 2020, comprising JPY 11,715 million for the Prek Kdam-Thlea Ma'am section and JPY 17,702 million for the Thlea Ma'am-Battambang and Sri Sophorn-Poipet sections, carry the same 0.01% rate, forty-year repayment, ten-year grace, and general untied procurement - terms that Japan reserves for its lowest-income borrowers[7].

Table 1. Financial terms of the Japanese concessional loan for the National Road No. 5 Improvement Project

Category	Details
Project / programme title	National Road No. 5 Improvement Project (Battambang to Sri Sophorn, Section II)
Total financial contribution	JPY 11,136,000,000 (approximately USD 75,000,000)
Loan type	Concessional loan
Interest rate	0.01% per annum
Grace period	10 years
Amortization period	40 years
Sector	Transport - road infrastructure
SDG alignment	SDG 9: Industry, Innovation and Infrastructure (100%)
Target locations	Phnom Penh, Battambang, Banteay Meanchey

Note: Source: Cambodia Development Council (2024).

The fiscal meaning of these terms can be illustrated with a simple computation based on the contractual parameters (Table 2). Annual interest on the outstanding principal is on the order of USD 7,500; even after the grace period expires, annual principal repayment averages roughly USD 2.5 million, so total annual debt service remains around 3.3% of the original loan principal per year, spread over three decades. At standard discount rates used in concessionality measurement, the grant element implied by these terms is far above the minimum threshold required for ODA qualification, placing the loan close to grant-equivalent financing.

Table 2. Illustrative annual debt service implied by the contractual terms of the National Road No. 5 loan

Component	Approximate annual amount (USD)
Interest payment on outstanding principal (0.01% x 75,000,000)	7,500
Principal repayment after the 10-year grace period (75,000,000 / 30)	2,500,000
Total annual debt service in the amortization phase	2,507,500

Note: Source: author's calculation from the contractual terms in Table 1. Figures are indicative and abstract from disbursement profiles and exchange-rate movements.

The ten-year grace period gives Cambodia a window in which the economic returns of the road—higher productivity, lower transport costs, improved connectivity—can materialize before repayment obligations

6 Cambodia Development Council. (2024). ODA loan report. Royal Government of Cambodia.

7 Japan International Cooperation Agency. (2020, March 24). Signing of Japanese ODA loan agreements with Cambodia: Supporting improvements to the Southern Economic Corridor, a major arterial route for the Mekong region. Retrieved October 22, 2026, from https://www2.jica.go.jp/yen_loan/pdf/en/7053/20200324_31_en.pdf

begin, while the forty-year amortization spreads the burden thinly across successive budgets. Interviewed Cambodian officials consistently described Japanese loans as the most manageable component of the country's external obligations, precisely because of these terms.

4.2. Infrastructure development and regional connectivity

Japanese loan aid has financed critical transport infrastructure that enhances both domestic and regional connectivity. National Road No. 5 links Phnom Penh with Battambang and Banteay Meanchey, two of Cambodia's most economically significant provinces, and forms part of the national network connecting urban centres with rural areas and with Thailand[8]. Improving the road reduces travel times, lowers transport costs, and improves road safety; for an economy reliant on agriculture and light manufacturing, these gains are central to competitiveness in regional and global markets. In particular, faster and more reliable transport reduces the wastage and spoilage of agricultural produce shipped from Battambang to Phnom Penh, raising farm-gate value and export potential.

The project also strengthens access to industrial zones and to the Sihanoukville Autonomous Port, Cambodia's primary deep-water seaport, thereby supporting the country's trade and investment strategies. More broadly, Japanese-financed corridors integrate Cambodia into the Greater Mekong Subregion and ASEAN economic space; the loan agreement of July 2024, which provides a further JPY 8,293 million for rehabilitating and widening about 134 kilometres of National Road No. 5 together with new bridges and traffic-safety facilities, illustrates the continuity of this regional-connectivity logic[9]. Evidence from rural road surveys further suggests that improved feeder roads extend the benefits of trunk corridors to rural communities, improving access to markets, healthcare, education, and employment.

4.3. Alignment with the sustainable development goals and capacity building

Japanese loan projects are explicitly mapped onto the SDGs: as Table 1 records, the National Road No. 5 project is classified as contributing 100% to SDG 9 (Industry, Innovation and Infrastructure). Design standards emphasize durability and climate resilience, reducing lifecycle maintenance costs and ensuring that benefits persist over time—an orientation consistent with the broader quality-infrastructure turn in Japan's aid policy.

A second distinctive feature is capacity building. Japanese assistance couples finance with training for Cambodian engineers and government officials in road maintenance, project management, and environmental protection, supporting the country's ability to operate and maintain the assets it borrows to build. This combination of finance and skills transfer reflects the developmentalist philosophy of Japanese aid, and it supports Cambodia's stated ambition to reach middle-income status through sustainable, broad-based growth.

4.4. Debt sustainability and fiscal space

The near-zero interest rate ensures that the cost of borrowing is virtually negligible, allowing Cambodia to invest in long-gestation infrastructure without placing significant strain on public finances. Because debt service on Japanese loans is minimal and deferred, the government retains budgetary room to prioritize health,

[8] Japan International Cooperation Agency. (2023). Data collection survey on rural road connectivity improvement. Japan International Cooperation Agency.

[9] Japan International Cooperation Agency. (2024, July 16). Signing of Japanese ODA loan agreement with Cambodia: Supporting improvements to the Southern Economic Corridor, a major arterial for the Mekong region. Retrieved October 22, 2026, from https://www.jica.go.jp/english/information/press/2024/20240716_21.html

education, and poverty reduction during the early years of each project—the period when social spending needs are most pressing. Interviewed officials and analysts confirmed that Japanese loans are perceived as compatible with the country's debt-management framework, in contrast to less concessional financing, which obliges the budget to absorb sizeable interest outlays from early in the project cycle.

The multiplicative effects of the financed infrastructure reinforce this picture. Roads such as National Road No. 5 generate immediate construction-phase employment and, over the longer term, raise productivity, trade, and investment. Improved connectivity lowers the cost of doing business and strengthens supply chains, expanding the future revenue base from which debt is serviced. The stakes are heightened by the structure of Cambodia's liabilities: roughly 99% of public debt is owed to external creditors, with the total public debt-to-GDP ratio near one quarter of GDP[10]. Where loan terms are soft and projects are economically productive, borrowing can thus be self-stabilizing, because the growth dividend of the financed asset accrues to the same budget that services the loan.

5. Discussion

Three mechanisms emerge from the evidence. First, concessionality as fiscal insurance: with a 0.01% interest rate and a forty-year horizon, debt service is so small relative to the financed asset that the probability of loan-induced fiscal stress is minimal, echoing the longstanding DAC position that softer terms protect borrowers from heavy repayment burdens. The pattern contrasts sharply with financing packages carrying higher interest rates and shorter maturities, which force recipients to divert resources from social sectors towards debt service and can set in motion a cycle of new borrowing to service old obligations. Second, temporal alignment: the ten-year grace period matches the gestation profile of transport infrastructure, so repayment begins only after the asset starts generating economic returns. Third, capacity embedding: by coupling finance with training and maintenance support, Japanese aid raises the probability that assets are maintained and that their economic returns are actually realized.

The findings also speak to the debate on aid and policy autonomy. Japan's approach promotes transparency and governance capacity without imposing explicit political conditionality—a stance that Cambodian interlocutors view as respectful of sovereignty while still encouraging gradual institutional improvement. The interview evidence further suggests that recipients value predictability and concessionality above volume: the credibility of repayment terms shapes fiscal planning more than headline disbursement figures. From the recipient's perspective, a donor that finances durable assets on near-grant terms, trains the officials who will maintain them, and refrains from political conditionality addresses the three anxieties that dominate aid-dependent budgeting—debt distress, asset decay, and policy dependence—within a single financing package.

Nor are today's ultra-concessional terms guaranteed indefinitely; loan agreements signed in mid-2026 already illustrate a gradual hardening as Cambodia's income rises. A JPY 24,237 million package signed in June 2026 carries a floating rate of TORF (Tokyo Term Risk Free Rate, a yen benchmark) plus 35 basis points with a repayment period of 25 years[11]. A JPY 17,776 million package agreed two months later carries

[10] World Bank. (2025). Cambodia economic update: Navigating uncertainty—Strengthening revenues for Cambodia's future. Retrieved October 22, 2026, from https://documents1.worldbank.org/curated/en/099060925065018354/pdf/P506814-501fedcb-5a78-4603-a512-479686a9338a.pdf

[11] Japan International Cooperation Agency. (2026, June 22). Signing of Japanese ODA loan agreement with Cambodia: Contributing to improved agricultural productivity and reduced flood damage through rehabilitating irrigation and drainage facilities. Retrieved October 22, 2026, from https://www.jica.go.jp/english/information/press/2026/20260622_11.html

TORF plus 45 basis points over 30 years[12]. For other aid-dependent economies, the Cambodian experience therefore suggests a general lesson: the developmental quality of external borrowing is determined less by the volume of finance than by its grant element, maturity structure, and alignment with national strategies and the SDGs. Ultra-concessional loans of the Japanese type approach the fiscal properties of grants while retaining the discipline of a repayment obligation, offering a template for sustainable infrastructure finance in low-income settings—one whose most generous windows are worth securing while eligibility lasts.

Several limitations qualify these conclusions. The analysis rests on a single donor-recipient pair and on one fully documented loan contract; disbursement profiles, exchange-rate movements, and project-level rate-of-return data were not publicly available, so the debt-service computation in Table 2 is illustrative rather than exact. Interview access to sensitive loan-negotiation details was limited, and the long-run effects of forty-year loans cannot yet be observed. Future research should assemble loan-level panels across donors and recipients, estimate project-level economic returns, and test whether the mechanisms identified here generalize across the Greater Mekong Subregion and beyond.

6. Conclusion and policy recommendation

This paper has examined Japanese ODA to Cambodia as a case of ultra-concessional development finance. Contract-level evidence on the National Road No. 5 Improvement Project shows that Japanese yen loans carry a 0.01% interest rate, a ten-year grace period, and a forty-year amortization period, implying near-negligible debt service and grant-equivalent concessionality. These terms preserve Cambodia's fiscal space for social spending, while the financed infrastructure advances connectivity and SDG 9. The combination of soft terms, temporal alignment with project returns, and embedded capacity building offers a coherent model of sustainable infrastructure finance for aid-dependent economies.

Four policy recommendations follow. First, recipients should apply explicit concessionality benchmarks—such as minimum grant-element thresholds—when appraising loan offers, publish loan terms to strengthen accountability, and secure the softest available financing while their income classification still permits it. Second, aid-dependent economies should diversify financing sources, combining concessional bilateral loans with grants and multilateral financing from institutions such as the World Bank and the Asian Development Bank, so that no single creditor or financing model dominates the debt portfolio. Third, debt-management capacity should be strengthened so that the fiscal-space benefits of concessional borrowing are monitored and preserved within medium-term expenditure frameworks. Fourth, donors and recipients should align projects with national development strategies and the SDGs and embed capacity building in loan design, so that assets financed today remain productive across their full economic life. For Cambodia, sustaining the concessional character of its external borrowing while broadening its financing partnerships offers the surest path to reconciling ambitious infrastructure development with long-run debt sustainability.

[12] Japan International Cooperation Agency. (2026, August 10). Signing of Japanese ODA loan agreement with Cambodia: Contributing to improved logistics environment through development of a new container terminal. Retrieved October 22, 2026, from https://www.jica.go.jp/english/information/press/2026/20260810_11.html

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