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**President's memorandum**  
**Proposed additional financing**  
**Kingdom of Cambodia**  
**Agriculture Services Programme for an Inclusive  
Rural Economy and Agricultural Trade**

Project ID: 2000003433

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**FOR: APPROVAL**

**Action:** The Executive Board is invited to approve the recommendation for the proposed additional financing contained in paragraph 60.

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- II. Updated summary of the economic and financial analysis

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## Financing summary

<b>Initiating institution:</b>	IFAD
<b>Borrower/recipient:</b>	Kingdom of Cambodia
<b>Executing agency:</b>	Ministry of Agriculture, Forestry and Fisheries
<b>Total programme cost:</b>	US\$216.646 million
<b>Amount of original IFAD loan 1 (performance-based allocation system [PBAS]):</b>	US\$11.2 million
<b>Terms of original IFAD financing 1:</b>	Blend: 25 years, including a grace period of 5 years, with a service charge of 0.75 per cent and an interest rate of 1.25 per cent per annum in SDR (adjustments for single-currency loans)
<b>Amount of original IFAD loan 2 (PBAS):</b>	US\$22.7 million
<b>Terms of original IFAD financing 2:</b>	Highly concessional: 40 years, including a grace period of 10 years, with a service charge of 0.75 per cent per annum in SDR (adjustments for single-currency loans)
<b>Amount of original IFAD loan 3 (Borrowed Resource Access Mechanism [BRAM]):</b>	US\$14 million
<b>Terms of original IFAD financing 3:</b>	Ordinary: 27 years, including a grace period of 8 years, subject to interest at a rate equal to the IFAD Reference Interest Rate including a variable spread
<b>Amount of additional IFAD loan 1:</b>	US\$15.588 million
<b>Terms of additional IFAD financing:</b>	Blend: 25 years, including a grace period of 5 years, with a service charge of 0.75 per cent and an interest rate of 1.25 per cent per annum in SDR (adjustments for single-currency loans).
<b>Amount of additional IFAD loan 2 (BRAM):</b>	US\$7 million
<b>Terms of additional IFAD financing:</b>	Ordinary: 27 years, including a grace period of 8 years, subject to interest at a rate equal to the IFAD Reference Interest Rate including a variable spread
<b>Cofinanciers:</b>	European Union/European Investment Bank (EU/EIB), financial partner institutions, South-South and Triangular Cooperation (SSTC), small and medium-sized enterprises (SMEs)
<b>Amount of cofinancing:</b>	EU/EIB: US\$60.559 million Financial partner institutions: US\$42.93 million SSTC: US\$0.3 million SMEs: US\$2.164 million

<b>Terms of cofinancing:</b>	Loan, grant and in-kind contributions
<b>Contribution of borrower/recipient:</b>	US\$19.152 million
<b>Contribution of programme participants:</b>	US\$1.05 million
<b>Financing gap:</b>	US\$20.0 million
<b>Amount of original IFAD climate finance:<sup>1</sup></b>	US\$14.357 million
<b>Amount of additional IFAD climate finance:<sup>2</sup></b>	US\$13.058 million
<b>Cooperating institution:</b>	Directly supervised by IFAD.

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<sup>1</sup> Adaptation finance (IFAD12).

<sup>2</sup> Adaptation finance (IFAD13 additional financing).

# **I. Background and programme description**

## **A. Background**

1. This memorandum seeks approval for additional financing of US\$22.588 million – comprising US\$15.588 million from the Thirteenth Replenishment of IFAD's Resources (IFAD13) performance-based allocation system (PBAS) allocation and US\$7 million from the Borrowed Resource Access Mechanism (BRAM) – to support the Kingdom of Cambodia in scaling up the Agriculture Services Programme for an Inclusive Rural Economy and Agricultural Trade (ASPIRE-AT). The additional financing will integrate modern agricultural cooperatives (MACs) into the producer organization and agricultural cooperative (PO/AC) exit framework. The borrower's formal request, dated 14 March 2025, is attached.
2. Approved by the IFAD Executive Board in December 2022 and effective in February 2023, ASPIRE-AT promotes inclusive, sustainable agricultural growth and greater capacity to produce for domestic and export markets. The total programme cost of US\$194.1 million is financed through the IFAD loan (US\$47.9 million), the European Investment Bank (EIB) loan and grant (US\$60.55 million), government counterpart funds (US\$19.15 million), partner financial institutions (US\$42.93 million), small and medium-sized enterprises (SMEs) (US\$2.16 million), farmers (US\$1.05 million), a South-South and Triangular Cooperation (SSTC) grant (US\$0.3 million) and government cofinancing (US\$19.152 million), leaving a US\$20 million financing gap. Following a government request, IFAD approved a restructuring in June 2025 introducing EIB-financed bridge infrastructure, repurposing the SME credit line for productive assets, and adding the Ministry of Public Works and Transport as an implementing partner.
3. The additional financing will scale up and consolidate ASPIRE-AT operations through targeted support to 50 MACs (40 non-rice and 10 rice), providing structured access to finance, capacity-building and market infrastructure.

## **B. Original programme description**

4. ASPIRE-AT aims to reduce rural poverty and enhance climate resilience through inclusive and sustainable agricultural growth, focusing on smallholder productivity, competitiveness and market access. The programme targets 100,000 smallholder and 25,000 landless or land-poor households and had reached 79,181 individuals (60.9 per cent of the target) by July 2025, including 952 landless and 2,862 Indigenous Peoples. Women accounted for 66.5 per cent of programme participants, reflecting strong gender inclusion.
5. Partnerships with the Agricultural and Rural Development Bank (ARDB) and the Small and Medium Enterprise Bank of Cambodia (SME Bank) have expanded financial access for rural enterprises and smallholders. By July 2025, 38 rural enterprises had received business development support and 536 producers' organizations (POs) had been strengthened, exceeding the target of 500. These POs are now better equipped to negotiate with agribusinesses and access markets.
6. Investments in climate-smart agriculture have trained 8,700 individuals in improved practices. Overall, the programme has benefited 79,181 people, supported 38 SMEs, and facilitated 35 partnerships between 10 companies and 50 POs worth US\$35.8 million. A durian pest survey led to the approval of new export protocols by the General Directorate of Agriculture, enabling Cambodia's first-ever durian export to China of 17 tons, valued at over US\$50,000.

## II. Rationale for additional financing

### A. Rationale

7. ASPIRE-AT is a well-performing programme. Its PO/AC exit model enables smallholders and POs to progress from support-ready to market-ready and investment-ready cooperatives. The tiered approach builds PO capacity to become commercially viable and self-sustaining. Support-ready POs receive basic capacity-building; market-ready POs strengthen supply chains, buyer trust, and access to block grants and credit; while investment-ready POs qualify for larger loans and advanced financial products.
8. A key gap in this framework is access to larger working capital and investment financing. To address this, the Ministry of Agriculture, Forestry and Fisheries (MAFF) introduced the MAC model, emphasizing market linkages, integrated production and professional management. MACs are designed as commercially viable, inclusive organizations aligned with the Government's cooperative policy.
9. The additional financing introduces large-scale working capital and investment capital through ARDB credit lines and a credit guarantee fund via the Credit Guarantee Corporation of Cambodia (CGCC) to de-risk lending. These instruments support the transition of POs to MACs – apex entities providing collective input supply, aggregation, quality control and marketing. By building credit history, MACs can access larger loans for infrastructure, processing and value addition.
10. The MAC approach includes: (i) professional management, combining external expertise with local leadership; (ii) working capital loans of up to US\$1 million via ARDB backed by the credit guarantee fund; (iii) assured market access and quality improvement through forward contracts and private sector extension; (iv) coordinated input supply, production planning and aggregation; and (v) an exit pathway towards self-sustaining, investment-ready institutions.
11. It will also support policy reforms, including revision of the Law on Agricultural Cooperatives and drafting of a contract farming law, to create an enabling environment for scaling the MAC model. Aligned with government priorities, these reforms will strengthen Cambodia's agricultural legal framework and promote the evolution of MACs and other POs and ACs into sustainable institutions.
12. The additional financing will integrate 50 MACs, benefiting about 15,000 new households. The additional financing maintains the same objectives, components and implementation approach as the original programme, building on existing structures to achieve the intended outcomes.

Table 1

<i>Goal/objective</i>	<i>Indicators</i>	<i>Target</i>
<b>Goal:</b> Rural poverty and vulnerability have decreased and the climate resilience of Cambodian rural households has increased through inclusive and environmentally sustainable growth in the agriculture sector	1. Persons receiving services promoted or supported by the project 2. Declining rural poverty rate 3. Average growth in value added in agriculture sector	1. 145,040 persons (original target: 130,040 persons) 2. 10% 3. 3.1%
<b>Development objective:</b> Inclusive and sustainable agriculture sector growth based on exports and domestic markets has increased incomes of rural producers and workers	1. Number of rural households with household income increased by at least 20% 2. Individuals demonstrating an improvement in empowerment	1. 50,000 households (original target: 50,000 households) 2. 14,504 persons (original target: 13,004 persons)
	Economic internal rate of return	18.1%

### **Special aspects relating to IFAD's corporate mainstreaming priorities**

13. In line with IFAD's mainstreaming commitments, the programme has been validated as:
  - ☒ Including climate finance
  - ☒ Gender-transformative
  - ☒ Including adaptive capacity
14. **Climate finance.** Validated as climate-informed, with at least 40 per cent of resources generating climate co-benefits through investments in climate-smart agriculture, renewable energy and resilient infrastructure. Partner financial institutions will finance POs and SMEs to adopt green technologies.
15. **Gender.** The programme promotes gender equality and women's empowerment, enabling women to participate in and benefit from profitable economic activities as PO members and entrepreneurs. It aims for gender-transformative outcomes, ensuring women benefit equally from all interventions.
16. **Adaptive capacity.** The programme strengthens the ability of communities to cope with climate variability by enhancing access to diverse assets, inclusive institutions, innovation and forward-looking governance.

### **B. Description of geographical area and target groups**

17. ASPIRE-AT is a national programme implemented across 21 provinces in Cambodia. Programme participants are identified through direct and geographic targeting, focusing on two groups: (i) smallholder farmers who are poor or near-poor; and (ii) landless or land-poor households benefiting from agricultural employment. The programme initially aimed to reach 125,000 rural households – 100,000 with land and 25,000 landless or land-poor. Under the additional financing, beyond the 500 ACs already supported, the programme will assist 25 established MACs whose members are not included among ASPIRE-AT ACs. Each MAC will have about 400 members. In addition, 25 investment-ready ACs (tier 2) will be supported to voluntarily transform into MACs, expanding membership from 200 to 400. This scaling up is expected to reach 15,000 additional households, increasing total outreach to 140,000 households.

### **C. Components, outcomes and activities**

18. **Overview and outcomes.** The additional financing strengthens ASPIRE-AT's exit pathway by integrating MACs as the most advanced tier and financing them through: (i) credit lines via ARDB; (ii) a partial credit guarantee through CGCC; (iii) targeted rice market infrastructure; and (iv) structured capacity-building led by the Department of Agricultural Cooperative Promotion (DACP) and service provider 1 (SP1). These interventions support the programme objective of promoting inclusive and sustainable agricultural growth that increases rural incomes in order to achieve the following outcomes: (i) increased smallholder and PO investments in productive assets, enhancing productivity and competitiveness; (ii) stronger PO-agribusiness partnerships and market access; and (iii) better organization of smallholders through cooperatives to meet market standards. Expected results include higher farmer incomes through organized input and output systems, greater private investment in PO, AC and MAC value chains, stronger DACP and MAC governance, and improved sales and market access.
19. Component 1. Productive and resilient assets for producers' organizations.
20. **Subcomponent 1.1. Investment in productive and resilient assets of POs and smallholders (non-rice MACs).** Two new instruments will be introduced with the additional financing: a line of credit to ARDB (US\$18.44 million) for large working-capital loans to 40 non-rice MACs, and a credit guarantee fund via CGCC

- (US\$5.0 million) to de-risk lending and protect ARDB's prudential ratios; non-rice MACs may also access on-demand market infrastructure under subcomponent 1.2.
21. **Subcomponent 1.3. Productive and asset support to rice MACs (new subcomponent).** To comply with EIB stipulations, rice investments are ring-fenced and include market infrastructure (US\$2.75 million) and a line of credit for 10 rice MACs (US\$5.2 million) channelled through the ASPIRE-AT secretariat and ARDB with CGCC support.
  22. **Component 3. Aggregating farmers and integrating them into value chains.**
  23. **Subcomponent 3.1. Structure and capacity of producers' organizations** (non-rice MACs) The additional financing scales up support for 40 MACs (US\$3.53 million) covering formation, strengthening and business development through a MAC specialist, an expanded SP1 team, accounting systems, mentoring, trade promotion, DACP operational support and Cambodian Agricultural Cooperative Alliance-led audit and monitoring.
  24. **Subcomponent 3.3. Structure and capacity of rice MACs (new subcomponent).** To comply with EIB stipulations, rice investments are ring-fenced and include targeted institutional strengthening and business development services for 10 rice MACs (US\$0.418 million).
  25. **Institutional and policy support.** DACP, within MAFF, is the implementing partner for the MAC initiative, with amended terms of reference for SP1-1/2/3 (different service provider teams supporting POs/ACs in different regions) and a MAC specialist embedded for day-to-day coordination. The additional finance also supports legal/policy workstreams informed by MAC field experience.
  26. **Financing logic, phasing and gap.** The liquidity-plus-risk-sharing design of the additional financing is grounded in demonstrated absorption by existing MACs. The credit-guarantee combo enables one-year working capital at entry, progressing to three to five-year loans for infrastructure and value addition. Phasing is as follows: US\$7.5 million in 2026, US\$12.5 million in 2027 and US\$7.5 million in 2028, for a cumulative US\$27.5 million, leaving a US\$3.86 million gap by 2028 that is expected to be met by partner financial institutions already envisaged in the programme.
  27. **Results framework alignment (headline targets).** The additional financing raises total outreach and adjusts the logical framework indicators as follows:

Table 2

<i>Indicator</i>	<i>Old target</i>	<i>New target</i>	<i>Notes/justification</i>
Persons receiving services (CI 1)	130,040	145,040	Expanded outreach by 15,000 households
Households reached	125,000	140,000	Addition of 25 new + 25 upgraded MACs (≈15,000 households)
<b>Estimated corresponding total number of household members</b>	500,000	560,000	Additional 15,000 households X 4 = 60,000 household members
Individuals demonstrating empowerment (IE.2.1)	13,004	14,504	10% of total persons reached
Households reporting influence in decision-making (SF.2.2)	56,250	63,000	45% of households, including 945 Indigenous households and 9,450 women-headed households
Households satisfied with project-supported services (SF.2.1)	70,000	78,400	56% of households, including 11,760 women-headed households
<b>Component 1</b>			
Participating households with increased crop productivity (outcome 1)	Labour productivity 8% per annum	57,500 households (50% of 115,000)	Indicator name revised



<i>Indicator</i>	<i>Old target</i>	<i>New target</i>	<i>Notes/justification</i>
		landholding households)	
Rural POs reporting increased sales (2.2.5)	450 (90% of 500)	315 (60% of 525)	Revised target to make it realistic; includes 189 POs with women in leadership
Households reporting improved physical access to markets, processing and storage facilities	66,400	74,200	53% of 140,000 households
Number of rural producers benefiting from loan-financed investments by PO/AC	22,000	37,000	All the additional 15,000 households would be included in this indicator
Number of members of PO/AC with access to physical infrastructure assets provided by the project	40,000	46,000	40% of 115,000 members
<b>Component 2</b>			
Rural enterprises reporting increased profit (2.2.2)	9 (60% of 15 SMEs)	10 (25% of 40 SMEs)	Expanded to cover all 40 enterprises, % decreased
<b>Component 3</b>			
Supported rural producers' organizations providing new or improved services to their members	535	560	Expanded POs through MAC; gender/youth/Indigenous disaggregation done for PO members
Rural POs engaged in formal partnerships (2.2.3)	375 (75% of 500)	394 (75% of 525)	All 50 MACs included
Households adopting climate-smart practices (3.2.2)	11,400	14,000	10% of 140,000 households

CI = core indicator; IE = impact evaluation; SF = stakeholder feedback.

## D. Costs, benefits and financing

### Programme costs

28. The programme components titled productive and resilient assets for Pos and line of credit to ARDB for non-rice MACs are partially counted as climate finance. As per the multilateral development banks' methodologies for tracking climate change adaptation and mitigation finance, the total amount of IFAD climate finance for this programme is estimated as US\$13.058 million.
29. The total amount of additional IFAD climate finance for the proposed additional financing is estimated as US\$13.058 million.

Table 3  
**Original and additional financing summary**  
(Thousands of United States dollars)

	<i>Original financing</i>	<i>Additional financing</i>	<i>Total</i>
IFAD PBAS	33 900	15.588	49 488
IFAD BRAM	14 000	7.000	21 000
EIB	60 559	-	60 559
Financial partner institutions	42 930	-	42 930
SSTC grant	300	-	300
Individual programme participants	1 050	-	1 050
SMEs	2 164	-	2 164
Borrower/recipient	19 152	-	19 152
Financing gap	20 003	-	20 003
<b>Total</b>	<b>194 058</b>	<b>22 588</b>	<b>216 646</b>

Table 4  
**Additional financing: programme costs by component and financier**  
 (Thousands of United States dollars)

<i>Component</i>	<i>Additional IFAD loan</i>			
	<i>IFAD PBAS</i>	<i>IFAD BRAM</i>	<i>Total</i>	
	<i>Amount</i>	<i>Amount</i>	<i>Amount</i>	<i>%</i>
Component 1. Productive and resilient assets for producers' organizations	11 640	7 000	18 640	100
Component 2. Business partnerships and market access	-	-	-	-
Component 3. Aggregating farmers and integrating them into value chains	3 948	-	3 948	100
Component 4. Management, monitoring and evaluation	-	-	-	-
<b>Total</b>	<b>15 588</b>	<b>7 000</b>	<b>22 588</b>	<b>100</b>

Table 5  
**Additional financing: programme costs by expenditure category and financier**  
 (Thousands of United States dollars)

<i>Expenditure category</i>	<i>Additional IFAD loan</i>					
	<i>IFAD PBAS</i>		<i>IFAD BRAM</i>		<i>Total</i>	
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>
<b>Investment costs</b>						
1. Equipment and materials	1 050	6.7	-		1 050	5
2. Credit and guarantee funds	11 640	74.7	7 000	100	18 640	83
3. Training and capacity-building	753	4.8	-		753	3
4. Consultancies and studies	2 145	13.8	-		2 145	9
<b>Total investment costs</b>	<b>15 588</b>	<b>100</b>	<b>7 000</b>	<b>100</b>	<b>22 588</b>	<b>100</b>
Recurrent costs	-		-		-	-
<b>Total recurrent costs</b>	<b>-</b>		<b>-</b>		<b>-</b>	<b>-</b>
<b>Total</b>	<b>15 588</b>	<b>100</b>	<b>7 000</b>	<b>100</b>	<b>22 588</b>	<b>100</b>

Table 6

**Programme costs by component and year (PY)**

(Thousands of United States dollars)

<i>Component</i>	<i>PY1</i>		<i>PY2</i>		<i>PY3</i>		<i>PY4</i>		<i>PY5</i>		<i>PY6</i>		<i>PY7</i>		<i>Total</i>
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>
Component 1. Productive and resilient assets for producers' organizations	2 383	2	10 140	8	16 154	13	27 988	23	30 392	25	25 361	20	11 497	9	123 915
Component 2. Business partnerships and market access	1 357	2	21 688	39	4 739	9	7 873	14	9 342	17	7 177	13	2 792	5	54 969
Component 3. Aggregating farmers and integrating them into value chains	2 371	9	5 604	20	5 804	21	5 701	21	4 261	16	3 294	12	367	1	27 403
Component 4. Management, monitoring and evaluation	1 351	13	1 221	12	1 443	14	1 495	14	1 579	15	1 606	15	1 664	16	10 359
<b>Total</b>	<b>7 463</b>	<b>3</b>	<b>38 653</b>	<b>18</b>	<b>28 141</b>	<b>13</b>	<b>43 058</b>	<b>20</b>	<b>45 574</b>	<b>21</b>	<b>37 438</b>	<b>17</b>	<b>16 320</b>	<b>8</b>	<b>216 646</b>

### **Financing and cofinancing strategy and plan**

30. The original total programme cost is US\$194.1 million, financed through an IFAD loan (US\$47.9 million), EIB sovereign loan and grant (US\$60 million), government counterpart funds (US\$19.2 million), partner financial institutions (US\$43 million), SMEs (US\$2.16 million), farmers (US\$1 million), and an SSTC grant (US\$0.3 million), leaving a US\$20 million financing gap and government cofinancing of US\$19.15 million. The total programme cost will increase to US\$216.646 million with the proposed additional financing of US\$15.588 million from PBAS and US\$7 million from BRAM.
31. In addition, US\$12.75 million has been proposed for repurposing from the market infrastructure subcomponent (1.2) to finance the line of credit, CGCC guarantee facility and market infrastructure for rice MACs. This adjustment, detailed in the reallocation memo, complements the additional financing and responds to a government request.
32. The additional financing is not intended to fill the original financing gap, and that gap still remains. The MAFF and IFAD teams are in discussions with the China International Development Cooperation Agency to cofinance part of the US\$20 million financing gap under ASPIRE-AT through the proposed Support to the Export-Led Agricultural Sector in Cambodia (SELAS) initiative. Once finalized, SELAS is expected to mobilize additional resources. The financing gap of US\$20 million may be sourced through subsequent PBAS cycles under financing terms to be determined and subject to internal procedures and subsequent Executive Board approval, or by cofinancing identified during implementation.

### **Disbursement**

33. Disbursement arrangements for the additional financing will be similar to those of the ongoing programme. Two designated accounts will be opened, one for each IFAD loan, to which the IFAD funds will be disbursed. Consolidated interim financial reports are to be submitted quarterly by the ASPIRE-AT secretariat within 45 days of the end of the relevant quarter. The ASPIRE-AT secretariat will also be responsible for submitting withdrawal applications for justification and advances each quarter, based on the submitted and validated interim financial reports.

### **Summary of benefits and economic analysis**

34. **Return on investment of the overall programme.** The economic analysis of the ASPIRE programme, including the additional financing, shows strong economic returns at a 10 per cent discount rate over 20 years. The economic internal rate of return is 18.1 per cent. This assumes 75 per cent of targeted farmers in 50 cooperatives adopt improved technologies and practices, affecting production and processing of rice, cashew, pepper and vegetables through concessional credit. The net present value (NPV) is US\$130.2 million, with a benefit-cost ratio of 1.16 based on quantifiable benefits from programme activities. Sensitivity and scenario analyses confirm robustness, showing profitability over a 15-year period. The programme becomes unprofitable only if benefits drop by more than 13.78 per cent or costs rise by more than 15.98 per cent due to shocks during implementation.
35. **Return on investment of the additional finance.** If only the benefits and costs of additional financing projected over 20 years are considered, the programme would also have a promising economic return on investment. The NPV would be US\$31.7 million, the internal rate of return (IRR) would be 21.5 per cent, and the benefit-cost ratio (BCR) would be 1.14. The sensitivity and scenario analysis demonstrates the robustness of these findings. The programme would become unfeasible if the projected benefits were reduced by more than 12.5 per cent or if costs increased by over 14.3 per cent due to adverse factors. The programme would remain viable in evaluation periods of 10 and 15 years.

Table 7

Indicator	Overall programme	Additional financing (MAC)
IRR	18.1 %	21.5 %
BCR (10% discount rate)	1.16	1.14
NPV (10% discount rate)	US\$130.2 million	US\$31.7 million
Switching values	Up to 15.98% increase in costs Up to 13.78% reduction in benefits	Up to 14.26% increase in costs Up to 12.48% reduction in benefits

36. **Sensitivity analysis and risk analysis.** Similarly, the sensitivity analysis conducted to evaluate the potential changes in various variables that can affect the economic profitability of the investment is shown in the following table.

Table 8

Variables	Change (Δ%)	Overall programme		Additional financing		Risk analysis
		IRR (%)	NPV (US\$ million)	IRR (%)	NPV (US\$ million)	
Base scenario 10%, 20 years		18.10%	130.2	21.50%	31.7	
Programme benefits	-10%	12.10%	35.7	12.50%	6.3	Combination of risks affecting output prices, yields and adoption rates
	-20%	(5.10%)	(58.8)	1.10%	(19.1)	
Programme costs	10%	14.10%	62.8	14.10%	11.1	Increase in the prices of agricultural inputs
	20%	9.70%	(4.6)	6.40%	(9.4)	
Combined effect – benefit(-)/cost(+)	10%	7.60%	31.7	4.00%	(14.2)	Low management, negotiating capacity of farmers groups, market price fluctuation, external shocks
Combined effect – benefit(-)/cost(+)	15%	(0.40%)	(112.6)	(9.50%)	(37.2)	
Adoption rate (60%)		17.90%	124.6	19.30%	22.8	Quality of technical assistance and access to technologies
Adoption rate (75%)		18.10%	130.2	21.50%	31.7	
Evaluation period (15 years)		15.10%	59.7	19.90%	21.1	Uncertainty about the programme's short-, medium- and long-term continuity
Evaluation period (10 years)		1.42%	(50.9)	14.50%	6.5	
Social discount rate (5.5%)		n/a	306.9	n/a	64.0	Linked to political and macroeconomic stability

37. **The financial analysis of the additional financing** shows that the activities supported by the programme – primarily the provision of concessional loans to cooperatives to strengthen primary production and processing in selected value chains such as rice, cashew, pepper and vegetables – have the potential to generate positive returns on investment. The following table presents the expected return-on-investment indicators for these value chains.

Table 9

<i>Value chain</i>	<i>Financial indicators</i>	
	<i>IRR (%)</i>	<i>Benefit-cost</i>
Rice	11.7%	0.997
Cashew	20.9%	1.13
Pepper	13.7%	1.02
Vegetable	14.3%	1.06

### **Exit strategy and sustainability**

38. A dedicated team within the DACP has been established and trained to continue supporting MACs and POs beyond programme closure. Sustainability of the exit framework will be supported by the institutional embedding of cooperative promotion functions in DACP and strengthened governance mechanisms within MACs.
39. Critical value chain facilitation will be sustained by fostering durable partnerships between POs, private sector buyers and financial institutions. The introduction of credit lines and guarantees through ARDB and CGCC ensures that MACs will have access to financial services even after programme support ends, while ongoing policy reforms (e.g. Law on Agricultural Cooperatives and drafting of a contract farming law) provide an enabling environment for long-term impact.

## **III. Risk management**

### **A. Risks and mitigation measures**

40. The ASPIRE-AT programme, including the additional financing for MACs, is rated a moderate risk overall, with substantial climate risk due to Cambodia's high exposure to floods, droughts and other natural hazards.
41. Key risks relate to integrating new MAC activities not included in the original design, requiring IFAD's technical and fiduciary review and an amendment to the financing agreement. Weak business-planning capacity among MACs and farmers presents investment risks, mitigated through technical support, service providers, and ARDB's screening criteria. Loan default risks are reduced through the CGCC guarantee covering up to 80 per cent on a declining basis, with safeguards ensuring partner financial institutions retain partial risk, pursue recoveries before claims and make phased claim payments (50 per cent after 360 days), with a capped exposure of US\$20 million and an initial leverage ratio of 1:4.
42. Sustainability risks of market and MAC infrastructure are mitigated through feasibility assessments and institutional plans. Capacity risks within ARDB and project units are managed by the ASPIRE secretariat and specialized service providers. Procurement and financial management risks remain moderate and are mitigated through IFAD's standard systems, anti-corruption controls, capacity-building and close supervision. Environmental and social safeguards include exclusion of protected areas, zero-deforestation commitments, occupational health and safety compliance, and a multi-tier grievance redress mechanism supported by safeguard instruments such as the environmental, social and climate management framework, environmental, social and climate management plan (ESCMP), cultural heritage plan, Indigenous Peoples Plan (IPP) and Free, Prior and Informed Consent (FPIC) plan.
43. The project financial management and project procurement risk are considered moderate.

Table 10  
Overall risk summary

<i>Risk category/subcategory</i>	<i>Inherent risk</i>	<i>Residual risk</i>
Country context	Moderate	Low
Sector strategies and policies	Moderate	Low
Environment and climate context	Moderate	Low
Programme scope	Substantial	Moderate
Institutional capacity for implementation and sustainability	Moderate	Moderate
Programme financial management	Substantial	Moderate
Programme procurement	Moderate	Moderate
Environment, social and climate impact	Moderate	Low
Stakeholders	Moderate	Low
<b>Overall</b>	<b>Moderate</b>	<b>Low</b>

## B. Environment and social category

44. The proposed additional financing is categorized as a moderate risk on environmental and social aspects under IFAD's Social, Environmental and Climate Assessment Procedures (SECAP) screening. To manage these risks, the programme enforces a zero forest encroachment and deforestation policy and will not involve involuntary land acquisition or resettlement. Interventions in protected or community-recognized habitats are excluded. Safeguard documents will be updated, including the ESCMP, cultural heritage plan, IPP and FPIC implementation plan.

## C. Climate risk classification

45. The integration of MACs into ASPIRE-AT is classified as a substantial climate risk under IFAD's SECAP. Cambodia is highly vulnerable to climate and disaster risks; intervention areas face river and urban floods, landslides, cyclones, extreme heat, wildfires and water scarcity. Agricultural systems and rural infrastructure are susceptible to rainfall variability, prolonged droughts, temperature shifts and pest outbreaks. Adaptive capacity is constrained by limited disaster-response mechanisms and inadequate dissemination of climate information to farmers.

# IV. Implementation

## A. Compliance with IFAD policies

46. The integration of MACs within ASPIRE-AT demonstrates compliance with IFAD's policies and operational frameworks, supporting the programme's goal of inclusive and sustainable agricultural growth. The MAC model aligns with the IFAD Strategic Framework 2016–2025 and the Cambodia country strategic opportunities programme 2022–2027 strategic objectives: (SO1) enhancing productive capacity; (SO2) enhancing market participation and income; and (SO3) strengthening environmental sustainability and climate resilience. ASPIRE-AT, including MACs, is validated as gender-transformative, youth-sensitive, Indigenous Peoples-focused and including climate finance, ensuring inclusion of women, youth, landless people and Indigenous Peoples.

## B. Organizational framework Management and coordination

47. The newly established DACP under MAFF will serve as the implementing partner for the MAC component, supported by SP1-1, SP1-2, SP1-3, and the ASPIRE-AT secretariat. The SP1-1 terms of reference will be amended to engage three

full-time specialists in business development, financial analysis and agronomy for two years to provide field-level capacity-building and progression support to MACs, with recruitment approved by DACP. These specialists will support 50 MACs nationwide in coordination with DACP. The terms of reference of all three SP1s will also be updated to include MAC capacity-building support, with an additional budget allocated for the expanded scope. CGCC will manage the guarantee facility under a formal agreement with Ministry of Economy and Finance (MEF) to de-risk MAC lending alongside ARDB.

### **Financial management, procurement and governance**

48. **Amendment of legal document.** The financing agreement will be amended to include the implementation arrangements for MACs, additional activities under relevant components, additional financing instruments, and the corresponding additional financing amount. The financial management and financial control arrangements letter will also be revised to reflect the additional financing.
49. The existing ASPIRE-AT secretariat, serving as the programme management unit (PMU), will manage financial arrangements for the additional financing. The PMU has qualified and experienced staff capable of timely budget preparation, maintaining internal controls and ensuring smooth funds flow. It uses accounting software that supports reliable record-keeping and submission of acceptable interim financial reports to IFAD. The internal control framework follows government standard operating procedures for projects financed by international institutions. The programme implementation manual will be updated as required. The programme also maintains adequate arrangements for timely submission of audit reports under the additional financing.
50. The DACP under MAFF will serve as a new implementing partner to manage MAC-related activities under components 3.1 and 3.3. DACP will oversee internal controls, training, and financial monitoring for MACs, supported by a dedicated finance and accounts officer. DACP will submit all financial records of MAC-related activities to the ASPIRE-AT secretariat for consolidation, preparation of withdrawal applications, interim financial reports and annual statements for submission to IFAD.
51. **Procurement.** Procurement using IFAD financing will follow the standard operating procedures on procurement for all externally financed projects/programmes in Cambodia, to the extent they are consistent with the IFAD Project Procurement Guidelines. The ASPIRE-AT secretariat will be directly responsible for procurement except for procurement activities managed by DACP under subcomponent 3.3 using the additional financing. Procurement activities under subcomponent 1.3 using IFAD financing via ARDB will be the responsibility of the borrowers (POs, ACs, MACs). There will be a subsidiary financing agreement between MEF and ARDB to manage the wholesale lines of credit using IFAD additional financing.

### **C. Monitoring and evaluation, learning, knowledge management and strategic communication**

52. ASPIRE-AT's monitoring and evaluation (M&E) system tracks physical and financial progress and results against objectives, outcomes and outputs. Under the additional financing, the same system will continue, with an updated logical framework reflecting 15,000 additional households reached through MACs. Outreach and output indicators will be revised, and midterm and endline surveys conducted to assess results. Existing M&E staff will continue, with scaling up as needed for additional financing monitoring. Monthly review meetings involving DACP, SP1-1, SP1-2, SP1-3, MAC specialists, consultants and the M&E team will track progress, address bottlenecks and agree on corrective actions. Action points and minutes will be shared with stakeholders, and SP1-1 will submit biannual progress reports on MAC support.



53. The knowledge management team, led by a national specialist, will continue producing and disseminating knowledge products. The knowledge management strategy will be updated to capture additional financing activities, including success stories and lessons from MACs. Existing case studies on ACs, SMEs and farmers will be updated, and new ones developed – such as on MACs engaged in agricultural exports – to document best practices.

#### **D. Proposed amendments to the financing agreement**

54. The financing agreement will be amended to incorporate the additional financing.
55. Two new subcomponents are added: subcomponent 1.3 – productive and asset support to rice MACs; and subcomponent 3.3 – structure and capacity of rice MACs.
56. The total end targets now include the original target and the new additional financing target. The disaggregation proportion is maintained, with revised targets for gender and Indigenous Peoples.

#### **V. Legal instruments and authority**

57. A financing agreement between the Kingdom of Cambodia and IFAD will constitute the legal instrument for extending the proposed financing to the borrower/recipient. The signed financing agreement will be amended following approval of the additional financing.
58. The Kingdom of Cambodia is empowered under its laws to receive financing from IFAD.
59. I am satisfied that the proposed additional financing will comply with the Agreement Establishing IFAD and the Policies and Criteria for IFAD Financing.

#### **VI. Recommendation**

60. I recommend that the Executive Board approve additional financing in terms of the following resolution:

RESOLVED: that the Fund shall provide a loan on blend terms to the Kingdom of Cambodia in an amount of fifteen million five hundred eighty-eight thousand United States dollars (US\$15,588,000) and upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented herein.

RESOLVED FURTHER: that the Fund shall provide a loan on ordinary terms to the Kingdom of Cambodia in an amount of seven million United States dollars (US\$7,000,000) and upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented herein.

Alvaro Lario  
President

## Updated logical framework incorporating the additional financing

Results Hierarchy	Indicator	Original Logical Framework			Revised End Target (Post AF) <sup>3</sup>	Means of Verification			Assumptions
	Name	Base-line	Midline	End-line		Source	Frequency	Responsibility	
Outreach	1. Persons receiving services promoted or supported by the project					Project MIS	Annual	PMU	There are 115,000 smallholder HH in POs and 25,000 landless or land-poor HH benefitting from employment opportunities.
	Males - Males	0	26,008	65,020	72,520				
	Females - Females	0	26,008	65,020	72,520				
	Young - Young people	0	10,403	26,008	29,008				The number of HHs supported by the project has been increased by 15,000 HHs, resulting in a total target of 140,000 HHs. The project will support 25 newly established MACs (≈400 members each) and 25 existing investment-ready POs/ACs that will transition into MACs, increasing their membership from 200 to 400. This scale-up is expected to reach about 15,000 additional households (25×400 + 25×200 = 15,000) within the project period. Additionally, it is assumed that there only one HH member is a part of the PO, and each HH comprises of 4 members.
	Indigenous people - Indigenous people	0	780	1,951	2,176				
	Total number of persons receiving services - Number of people	0	52,016	130,040	145,040				
	1.a. Corresponding number of households reached					Project MIS	Annual	PMU	
	Households - Households	0	50,000	125,000	140,000				
	Corresponding number of households reached					Project MIS	Annual	PMU	
	Landless or land-poor – Households - Number	0	10,000	25,000	25,000				
	1.b. Estimated corresponding total number of households members					Project MIS	Annual	PMU	

<sup>3</sup> This column reflects the incorporation of additional 15,000 households targeted through the establishment of MACs. Adjustments have been made to outreach and output indicators, as well as baseline indicators where necessary.

	Household members - Number of people	0	200,000	500,000	560,000				
<b>Project Goal</b> Rural poverty and vulnerability has decreased and climate resilience of Cambodian rural households has increased through inclusive and environmentally sustainable growth in the agriculture sector.	<b>Declining Rural Poverty Rate</b>					National poverty statistic (%)	Annual	National Institute of Statistics	It is assumed that increased volume and / or value addition will result in increased incomes for smallholders and employment opportunities for the rural poor, therefore contributing to reduced national poverty headcount based on inclusive growth. The baseline of 17.8% is drawn from the 2019–2020 national household survey (conducted every five years). Agriculture value-added growth is reported at 1.098% (World Bank), with mid-term and end targets of 3.1% aligned to the National Agriculture Development Policy 2022–2030.
	Poverty headcount - Percentage (%)	17.8	15	10	10				
	<b>Agriculture value added growth of 3% per annum (ADP Policy Indicator 1)</b>					National poverty statistic (%)	Annual	National Institute of Statistics	
	Average growth of value added in agriculture sector - Percentage (%)	1.098	3.1	3.1	3.1				
<b>Development Objective</b> Inclusive and sustainable agriculture sector growth based on exports and domestic markets has increased incomes of rural producers and workers	<b>Number of rural households with household income increased by at least 20%</b>					Outcome Survey	BL, MT, EL	Service provider	There are market opportunities to increase volumes and / or capture more value-added in pro-poor value chains.  Project interventions, services, and capacity-building activities are relevant, accessible, and effectively taken up by beneficiaries, leading to measurable improvements in individual empowerment.
	Number of households - Number	0	20,000	50,000	50,000				
	Women-headed households - Number	0	3,000	7,500	7,500				
	Total number of household	0	80,000	200,000	200,000				
	<b>IE.2.1 Individuals demonstrating an improvement in empowerment</b>					Outcome Survey		Service provider	
	Total persons - Percentage (%)	0	4	10	10				
	Total persons - Number of people	0	5,202	13,004	14,504				
	Females - Percentage (%)	0	4	10	10				

	Females - Females	0	2,601	6,502	7,252				
	Males - Males	0	4	10	10				
	Percentage (%)								
	Males - Males	0	2,601	6,502	7,252				
<b>Outcome:</b> Stakeholders' Feedback	<b>SF.2.2 Households reporting they can influence decision-making of local authorities and project-supported service providers</b>					Outcome Survey	BL, MT, EL	Service provider	Local authorities and project-supported service providers are open to participatory approaches and willing to incorporate household inputs into decision-making processes.  Services provided are demand-driven, accessible, and of sufficient quality and relevance to meet household needs and expectations.
	Household members - Number of people	0	100,000	225,000	252,000				
	Indigenous households - Households	0	375	844	945				
	Women-headed households - Households	0	3,750	8,440	9,450				
	Households - Percentage (%)	0	20	45	45				
	Households- Households	0	25,000	56,250	63,000				
	<b>SF.2.1 Households satisfied with project-supported services</b>					Outcome Survey	BL, MT, EL	Service provider	
	Household members - Number of people	0	112,000	280,000	313,600				
	Indigenous households - Households	0	469	1,050	1,176				
	Women-headed households - Households	0	4,690	10,500	11,760				
	Households - Percentage (%)	0	25	56	56				
	Households - Households	0	31,250	70,000	78,400				
<b>Outcome 1</b> Smallholders' and PO's Investments in productive assets	<b>Number of beneficiary households with increased crop productivity</b>					Outcome Survey	BL, MT, EL	Service provider	Beneficiary households adopt and effectively apply improved practices and technologies,
	Total number of household	0	80,000	200,000	230,000				

have increased their productivity and competitiveness in domestic and exports-based value chains.	members - Number	-							supported by favorable climatic and market conditions.  50% of HHs with land (115,000 HHs) are expected to experience an increase in crop productivity.
	Number of households - Number	0	20,000	50,000	57,500				
	Women-headed households - Number	0	3,000	7,500	8,625				
	<b>2.2.5. Rural producers' organizations reporting an increase in sales</b>					Project MIS	Annual	PMU	60% of rural producer organizations supported by the project will achieve increased sales. The proportion of POs with women in leadership positions will be 60%, provided that organizational structures remain inclusive and supportive of women's participation.
	Percentage of rural POs - Percentage (%)	0	35	90	60				
	Number of Rural POs - Organizations	0	180	450	315				
	Rural POs with women in leadership position - Organizations	0	180	450	189				
	<b>2.2.6. Households reporting improved physical access to markets, processing and storage facilities</b>					Project MIS	Annual	PMU	Infrastructure investments and services are functional and equitably accessible to beneficiary households.
	Households reporting improved physical access to markets - Percentage (%)	0	21	53	53				
	Size of households - Number of people	0	26,560	66,400	296,800				
	Households reporting improved physical access to markets - Households	0	106,240	265,600	74,200				
Output	<b>Number of rural producers benefiting from loan-financed investments by AC / PO</b>					Project MIS	Annual	PMU	POs are willing to take investment risks when provided

1.1.1 Financial support provided to PO with bankable investment	Rural producers benefiting - Number	0	8,800	22,000	37,000				with appropriate technical and financial support.
	Males - Number	0	4,400	11,000	18,500				The calculation of this indicator is based on 135 POs, revised from the earlier 110 to include an additional 25 MACs supported by the project
	females - Number	0	4,400	11,000	18,500				
	Indigenous People - Number	0	132	330	555				
	Young - Number	0	1,760	4,400	7,400				
<b>Output</b> 1.1.2 Financial support provided to smallholders with bankable investment proposals in productive and resilient assets	<b>1.1.3 Rural producers accessing production inputs and/or technological packages</b>					Project MIS	Annual	PMU	Farmers willing to accept risks of investing if suitable assistance and finance is provided. The outreach target for this indicator remains unchanged, as it is determined by the fixed allocation of the block grant.
	Males - Males	0	170	425	425				
	Females - Females	0	170	425	425				
	Young - Young people	0	68	170	170				
	Indigenous people - Indigenous people	0	5	13	13				
1.2 Enabling market infrastructure for Producer Organisations	<b>Number of members of PO/AC with access to physical infrastructure assets provided by the project.</b>					Project MIS	Annual	PMU	Members of POs/ACs will have equitable access to and make effective use of physical infrastructure assets provided by the project, supported by transparent management and maintenance systems It is assumed that 40% of the total number of members with land have improved access to physical infrastructure assets.
	Total PO/AC members - Number	0	16,000	40,000	46,000				
	Males - Number	0	8,000	20,000	23,000				
	Females - Number	0	8,000	20,000	23,000				
	Indigenous people - Number	0	240	600	690				
	Young - Number	0	1,600	8,000	9,200				
Outcome 2. PO's partnerships with agribusinesses have been enhanced and their market access improved	<b>2.2.2. Supported rural enterprises reporting an increase in profit</b>					Project MIS	Annual	PMU	This indicator accounts for all 40 rural enterprises supported by the project, rather than only the 15 SMEs receiving financial support.
	Number of enterprises - Enterprises	0	4	9	10				
	Percentage of enterprises - Percentage (%)	0	25	60	25				

	<b>2.2.1 Persons with new jobs/employment opportunities</b>								Investments create equivalent of about 10,000 full-time jobs, with most roles being part time / seasonal.
	Males - Males	0	5,000	12,500	12,500	Outcome Survey	BL, MT, EL	Service provider	
	Females - Females	0	5,000	12,500	12,500				
	Indigenous people - Indigenous people	0	150	375	375				
	Young - Young people	0	2,000	5,000	5,000				
	Total number of persons with new jobs/employment opportunities - Number of people	0	10,000	25,000	25,000				
	<b>Policy 3 Existing/new laws, regulations, policies or strategies proposed to policy makers for approval, ratification or amendment</b>					Outcome Survey	BL, MT, EL	Service provider	Policymakers are receptive to evidence-based proposals and institutional processes allow timely review and approval of legal and policy reforms.
	Number - Number	0	1	3	3				
<b>Output</b> 2.1.1. Private investments for agricultural market and trade development promoted and facilitated	<b>2.1.1. Rural enterprises accessing business development services</b>					Project MIS	Annual	PMU	Effective collaboration with existing institutions (e.g., Khmer Enterprise, EuroCham) will facilitate the identification of participating businesses and the provision of complementary support services.
	Rural enterprises - Enterprises	0	6	40	40				
Output 2.1.3 Financial support provided for agribusinesses to invest in increased processing capacity	<b>Number of rural enterprises accessing financial services</b>					Project MIS	Annual	PMU	Retail financial institutions are able to access existing credit guarantee schemes, such as the Co-financing Guarantee Scheme of SME Bank and the Women Entrepreneurs Guarantee Scheme, to expand lending to target beneficiaries
	Enterprises - Number	0	6	15	15				

Output 2.2.1 Strategic infrastructure for agriculture trade facilitation established	<b>Number of facilities completed and operational with sustainable management and financing plans.</b>					Project MIS	Annual	PMU	Sustainable business model for facilities has been identified
	Facilities - Number	0	3	10	10				
Output 2.2.2 Review of policy and regulatory framework supported to strengthen competitiveness	<b>Policy 1 Policy-relevant knowledge products completed</b>					Project MIS	Annual	PMU	The government is willing to engage on policy dialogue.
	Number Knowledge Products	0	1	3	3				
Outcome 3 Smallholders have been organised and coordinated in Agriculture Cooperatives and other Producer Organisations, and have been enabled to produce in response to market requirements for type, volume and quality standards.	<b>2.2.4 Supported rural producers' organizations providing new or improved services to their members</b>					Project MIS	Annual	PMU	Consolidation and formalisation of POs leads to improved services  Farmers understand the potential benefits of forming ACs / POs  Enterprises are willing to enter partnerships with ACs and UACs  Resilient and sustainable production technologies can be market-competitive
	Number of POs - Organizations	0	214	535	560				
	Total number of POs members - Number of people	0	40,000	100,000	115,000				
	Males POs members - Males	0	20,000	50,000	57,500				
	Females POs members - Females	0	20,000	50,000	57,500				
	Young POs members - Young people	0	8,000	20,000	23,000				
	Indigenous POs members - Indigenous people	0	600	1,500	1,725				
	<b>2.2.3. Rural producers' organizations engaged in formal partnerships/agreements or contracts with public or private entities</b>					Project MIS	Annual	PMU	
	Percentage of POs - Percentage (%)	0	30	75	75				
	Number of POs - Organizations	0	150	375	394				



	Women in leadership position - Females	0	90	225	315				
	<b>3.2.2. Households reporting adoption of environmentally sustainable and climate-resilient technologies and practices</b>					Outcome Survey	BL, MT, EL	Service provider	
	Households - Households	0	4,440	11,100	14,000				
	Households - Percentage (%)	0	4	10	10				
	Total number of household members - Number of people	0	20,000	50,000	56,000				
Output 3.1 Producer organisations / Agriculture Cooperatives established and strengthened (AC) and	<b>2.1.3. Rural producers' organizations supported</b>					Project MIS	Annual	PMU	The project will support 560 POs, including 35 UACs, with an estimated 115,000 members (475 POs with an average of 200 members each, 25 POs transformed into MACs with 400 members each, and newly established MACs with 400 members each). It is further assumed that 60% of these POs will have women in leadership positions.
	Total size of POs - Organizations	0	40,000	100,000	115,000				
	Rural POs supported - Organizations	0	214	535	560				
	Males - Males	0	20,000	50,000	57,500				
	Females - Females	0	20,000	50,000	57,500				
	Young - Young people	0	4,000	10,000	23,000				
	Indigenous people - Indigenous people	0	600	1,500	1,725				
	Rural POs supported that are headed by women - Organizations	0	120	300	315				
	<b>2.1.4. Supported rural producers that are members of a rural producers' organization</b>					Project MIS	Annual	PMU	
	Males - Males	0	20,000	50,000	57,500				
	Total number of persons -	0	40,000	100,000	115,000				

	Females - Females	0	20,000	50,000	57,500				
	Indigenous people - Indigenous people	0	600	20,000	1,725				
	Young people - Young people	0	8,000	1,500	23,000				
Output 3.2.1 Centres of excellence and Lead Farmers established and supported for development and dissemination of improved agricultural, post-harvest and processing technologies	<b>1.1.4. Persons trained in production practices and/or technologies</b>					Project MIS	Annual	PMU	Suitable sites and sustainable business models for Centres of Excellence are identified.
	Total number of persons trained by the project - Number of people	0	8,000	20,000	23,000				Trained individuals are able and willing to apply improved production practices and technologies, supported by adequate resources, extension services, and favorable conditions.  It is assumed that 20% of persons belonging to HHs with land are trained in production practices or technologies.
	Men trained in crop - Males	0	4,000	10,000	11,500				
	Women trained in crop - Females	0	4,000	10,000	11,500				
	Young people trained in crop - Young people	0	1,600	4,000	4,600				
	Indigenous people trained in crop - Indigenous people	0	120	300	345				

[1] This column reflects the incorporation of additional 15,000 households targeted through the establishment of MACs. Adjustments have been made to outreach and output indicators, as well as baseline indicators where necessary.

## Updated summary of the economic and financial analysis

### *Methodological approach*

1. The economic rationale of ASPIRE is built on several key strategies: boosting agricultural productivity and minimizing post-harvest losses through the adoption of good agricultural practices, improving productive infrastructure, and strengthening post-harvest management, including enhanced handling and storage. The additional financing (MAC) is particularly aimed at providing concessional loans to support improvements in primary production and processing of key value chains such as rice, cashew, pepper, and vegetables. These interventions are expected to increase crop yields by up to 10% and reduce post-harvest, storage, processing, and transport losses by as much as 100%.
2. A cost-benefit analysis was conducted to determine the economic and financial feasibility of the project. The original analysis was subsequently revised, and a complementary economic-financial assessment was developed for the additional financing to estimate the overall return on investment. The analysis primarily drew on information from previous assessments carried out during the initial project design phase, as well as secondary data collected from various sources and other IFAD-financed projects in Cambodia. This information was further verified through field interviews with selected beneficiaries from the first phase of the project.
3. Financial analyses utilized actual market prices, inclusive of taxes, subsidies, and other market distortions. Conversely, economic analyses employed adjusted economic prices to correct for these distortions, reflecting the broader economic environment in Cambodia. The results from the financial analysis provide insights into the returns for implementing entities, participants, private enterprises, and beneficiaries. Meanwhile, the economic analysis reveals the genuine returns to society, offering valuable insights for policymakers responsible for promoting public investment.
4. The analysis was conducted considering an evaluation period of 20 years as the base scenario, including the execution phase. The estimates were made using a social discount rate and a cost of capital of 10 percent<sup>4</sup>. The internal rate of return (IRR), net present value (NPV), benefit-cost ratio (B/C), and other indicators such as the payback period and switching values were estimated. The analysis considers the total cost of the projects, including contributions from beneficiaries and governmental counterparts. Sensitivity and scenario analyses were conducted to evaluate the potential impact of key variable changes on the project's economic viability due to different factors, such as changes in input and output prices, adoption rates, benefits, costs, social discount rates, and evaluation periods.

### Results

61. **Return on investment of the overall project.** The economic analysis of the entire ASPIRE project, encompassing both original and additional financing, indicates promising economic returns considering a social discount rate of 10% and 20 years of evaluation period. The EIRR is estimated at 18.1 percent. This EIRR estimate assumes that 75% of targeted farmers which are part of 50 Cooperatives will adopt the improved technologies and/or practices promoted by the project, impacting the primary production and processing of agricultural products such as rice, cashew, pepper and vegetable through the benefit of the concessional credits provided by the project. The Net Present Value is projected at USD 130.2 million, with a benefit-cost ratio of 1.16, derived from quantifiable benefits related to the implementation of the project activities. Sensitivity and scenario analyses highlight the robustness of these evaluations, indicating that the project would remain profitable over a 15-year

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<sup>4</sup> Values used in the previous EFA analyses.

evaluation period. Sensitivity analysis shows that the project can become unprofitable if projected benefits decrease by more than 13.78 percent and costs increase by more than 15.98 percent due to any shocks during implementation which considering the local economic context and the macro trends.

62. **Return on investment of the additional finance.** If only the benefits and costs of additional finance projected over 20 years are considered, the project would also have a promising economic return on investment. The NPV would be USD 31.7 million, the IRR would be 21.5 percent, and the B/C ratio would be 1.14. The sensitivity and scenario analysis demonstrates the robustness of these findings. The project would become unfeasible if the projected benefits were reduced by more than 12.5 percent or if costs increased by over 14.3 percent due to any adverse factors. The project would remain viable in evaluation periods of 10 and 15 years.

Indicator	Overall project	Additional finance (MAC)
IRR	18.1 %	21.5 %
BCR (@10% discount rate)	1.16	1.14
NPV (@10% discount rate)	USD 130.2 million	USD 31.7 million
Switching values	Up to 15.98% increase in costs Up to 13.78% reduction in benefits	Up to 14.26% increase in costs Up to 12.48% reduction in benefits

63. **The financial analysis of the additional financing** shows that the activities supported by the project—primarily the provision of concessional loans to cooperatives to strengthen primary production and processing in selected value chains such as rice, cashew, pepper, and vegetables—have the potential to generate positive returns on investment. The following table presents the expected return-on-investment indicators for these value chains.

Value chain	Financial Indicators	
	IRR (%)	B/C
Rice	11.7%	0.997
Cashew	20.9%	1.13
Pepper	13.7%	1.02
Vegetable	14.3%	1.06

### A. Rice

## A.2 Rice processing

Land use dynamics			
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B.2 Cashew - Processing																						
Parameters																						
Parameters	WOP	With Project																				
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	
1. Cashew	Processed ha	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	
Total	Processed ha	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	1350.00	
Financial Budget																						
Items	Unit	Without Project	With Project																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Production value	US\$	1874446	1874446	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	
Cashew	US\$	1874446	2434567	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	2678025	
Cost	US\$	2045677	2320488	2616453	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2623908	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2618199	
1. Cashew	US\$	2045677	2320488	2616453	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2623908	2618199	2618199	2618199	2618199	2618199	2618199	2618199	2618199	
Debt service	US\$	16613	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1. Credit cost - Interest	US\$	16613	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Net Income		-185744	-479042	-206980	48719	59827	59827	59827	59827	59827	59827	59827	59827	54117	59827	59827	59827	59827	59827	59827	59827	
	Incremental benefits	0	558122	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	801579	
	Incremental cost	293298	579359	567117	556009	556009	556009	556009	556009	556009	556009	556009	556009	561118	556009	556009	556009	556009	556009	556009	556009	
Incremental net income		-205096	-212936	234463	245570	245570	245570	245570	245570	245570	245570	245570	245570	239961	245570	245570	245570	245570	245570	245570	245570	
Incremental Cumulative		-205096	-314535	-80123	95456	41006	45638	90220	114770	135351	163857	198489	239653	261454	284104	307663	332275	358177	384534	411466	438986	

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Land use dynamics		With Project																				
Parameters	WOP	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	
1. Pepper	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	
Total	Ha	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	
Harvest	Number	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Cropping intensity (%)		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Financial Budget		With Project																				
Items	Unit	Without Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Production value	US\$	1582308	1582308	1582308	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539
1. Pepper	US\$	1582308	1582308	1582308	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539	1740539
Cost	US\$	68086	102186	114886	134444	134444	162794	134444	134444	134444	134444	162794	134444	232364	240464	246794	162794	134444	134444	134444	134444	134444
1. Pepper	US\$	68086	102186	114886	134444	134444	162794	134444	134444	134444	134444	162794	134444	232364	240464	246794	162794	134444	134444	134444	134444	134444
Deer	US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 Credit cost - Interest	US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income		146713	1444123	1442327	1593362	1600096	1577745	1600096	1600096	1600096	1577745	1600096	1508175	1500075	1475775	1577745	1600096	1600096	1600096	1600096	1600096	1600096
	Incremental benefits		0	0	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231	168231
	Incremental cost		53587	55382	62079	49846	78196	49846	49846	49846	49846	78196	49846	147766	155886	160166	78196	49846	49846	49846	49846	49846
	Incremental net income		-53587	-55382	96152	106385	106385	106385	106385	106385	106385	88000	106385	10465	2365	-21936	80036	106385	106385	106385	106385	106385
	Incremental net income - Cumulative		-53587	-108969	12917	59561	176002	283387	392122	501766	608161	690136	767661	809029	810338	798456	964880	970614	1026559	1031644	1030029	1031643

## C.1. Derivatives

## Land use dynamics

[illegible]

C.2 Pepper - Processing

Parameters		WOP		With Project																			
				Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
1. Pepper		Processed ha	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00
Total		Processed ha	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00	225.00
Financial Budget				With Project																			
		Unit	Without Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Production value		US\$	6469785	6469785	6469785	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764
1. Pepper		US\$	6469785	6469785	6469785	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764	7116764
Cost		US\$	5429468	5429468	5429468	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190
1. Pepper		US\$	5429468	5429468	5429468	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190	5972190
Debt service		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Credit cost - Interest		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income			1023804	1005317	961459	1133466	1144573	1144573	1144573	1144573	1133188	1144573	1121803	1122942	1144573	1143697	1133188	1144573	1144573	1144573	1121803	1144573	1117249
Incremental benefits																							
Incremental cost																							
Incremental net income																							
Incremental net income - Cumulative																							

D. Vegetable

D.1 Vegetable - Primary production

Land use dynamics		WOP		With Project																			
				Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
1. Vegetable		ha	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75
Harvest		Number	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total		Ha	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75
Financial Budget				With Project																			
		Unit	Without Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Production value		US\$	746348	746348	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294
1. Vegetable		US\$	746348	746348	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294	872294
Cost		US\$	186359	190409	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415
1. Vegetable		US\$	186359	190409	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415	261415
Debt service		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Credit cost - Interest		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income			543475	520939	585783	599771	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879	610879
Incremental benefits				0	117364	131351	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459	142459
Incremental cost				22537	33638	61701	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917
Incremental net income				-22537	33726	61701	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917	83917
Incremental net income - Cumulative				-22537	11189	72890	156807	240723	324640	408557	492473	576390	660307	744224	828140	912057	995974	1079891	1163807	1247724	1331641	1415558	1499474

D.2 Vegetable - Processing

Parameters		WOP		With Project																			
				Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20
1. Vegetable		Processed ha	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75
Total		Processed ha	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75	168.75
Financial Budget				With Project																			
		Unit	Without Project	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Production value		US\$	1245817	1245817	1455698	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344
1. Vegetable		US\$	1245817	1245817	1455698	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344	1486344
Cost		US\$	837550	866237	1003718	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303
1. Vegetable		US\$	837550	866237	1003718	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303	1021303
Debt service		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Credit cost - Interest		US\$	16513	35000	25096	11108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Income			391454	344279	426884	453933	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041	465041
Incremental benefits				0	201999	246232	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340	267340
Incremental cost				47174	174750	178348	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240	167240
Incremental net income				-47174	268448	67884	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100	90100
Incremental net income - Cumulative				-47174	-20326	47556	137658	227758	317858	407959	498059	588159	678259	768359	858459	948559	1038659	1128759	1218860	1308960	1399060	1489160	1579260

Table B

<b>A. Beneficiaries</b>							
Cooperatives		50					
Farmers/cooperative		300					
Total farmers		15000					
Land/cooperative (ha)		690					
Land/farmer (ha)		2.3					
<b>B. Cooperatives</b>	%	Beneficiaries (coop)	Farmers/Cooperative	Farmers (#)	Land/farmer (ha)	Total has	% effective beneficiaries (adoption rate)
Rice	40%	20	300	6000	1	6000	75%
Cashew	30%	15	300	4500	0.8	3600	75%
Pepper	20%	10	300	3000	0.2	600	75%
Vegetable	10%	5	300	1500	0.3	450	75%
	100%	50	300	15000		10650	
<b>C. Cooperatives</b>	Primary production	Secondary production	Primary production (Coop)	Secondary production (Coop)			
Rice	50%	50%	10	10			
Cashew	50%	50%	8	8			
Pepper	50%	50%	5	5			
Vegetable	50%	50%	3	3			
			25	25			
<b>C. Credit conditions</b>	Loan	Interest rate	Tenor (years)	Grace period (years)			
Rice	500000	7%	3	0.5			
Cashew	500000	7%	3	0.5			
Pepper	500000	7%	3	0.5			
Vegetable	500000	7%	3	0.5			
<b>D. Credit trend - Primary production</b>	2026	2027	2028	2029			
Rice	2	4	4	0	10		
Cashew	2	3	3	0	8		
Pepper	1	2	2	0	5		
Vegetable	1	1	1	0	3		
%	20%	40%	40%	0%	100%		
<b>E. Credit trend - Processing</b>	2026	2027	2028	2029			
Rice	2	4	4	0	10		
Cashew	2	3	3	0	8		
Pepper	1	2	2	0	5		
Vegetable	1	1	1	0	3		
%	20%	40%	40%	0%	100%		

C.2 Shadow prices

Assumptions:					Economic		ENTER 0 FOR ECONOMIC PRICES
VAT (average) [https://taxsummaries.pwc.com/cambodia/corporate/other-taxes]		10%					Conversion Factors by Good
Custom Duty for Imports		14%					
Standard Conversion Factor (SCF) for imported and exported inputs/goods		1.10			SCF	1.20	Tradable 1.10
Shadow Wage Rate Factor (SWRF)*		0.91			SWRF		Non-tradable (PC) 1.00
Standard Conversion Factor (shadow exchange rate factor) (SER/OER)		1.10			SCF	1.10	Locally traded 1.00
							Non-tradable 0.9091

\*\* Derived and used for the original EFA

Table D. Beneficiary adoption rates and phasing

D.1 Beneficiaries and adoption rate

B. Cooperatives	%	Beneficiaries (coop)	Farmers/Cooperative	Farmers (#)	Land/farmer (ha)	Total has	% effective beneficiaries (adoption rate)
Rice	40%	20	300	6000	1	6000	75%
Cashew	30%	15	300	4500	0.8	3600	75%
Pepper	20%	10	300	3000	0.2	600	75%
Vegetable	10%	5	300	1500	0.3	450	75%
	100%	50	300	15000		10650	

D.2 Phasing

	2026	2027	2028	2029	
Rice	2	4	4	0	10
Cashew	2	3	3	0	8
Pepper	1	2	2	0	5
Vegetable	1	1	1	0	3
%	20%	40%	40%	0%	100%

Table E. Economic cash flow

E.1 Entire project (Original and Additional financing)

		Economic analysis																				Year 30		
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	
Investment benefits		271,110,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Net benefits		271,110,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Investment costs		3,410,000,000	4,450,000,000	3,450,000,000	2,450,000,000	1,450,000,000	850,000,000	450,000,000	250,000,000	150,000,000	100,000,000	70,000,000	50,000,000	40,000,000	30,000,000	20,000,000	10,000,000	5,000,000	2,500,000	1,250,000	625,000	312,500	156,250	
Net investment costs		3,410,000,000	4,450,000,000	3,450,000,000	2,450,000,000	1,450,000,000	850,000,000	450,000,000	250,000,000	150,000,000	100,000,000	70,000,000	50,000,000	40,000,000	30,000,000	20,000,000	10,000,000	5,000,000	2,500,000	1,250,000	625,000	312,500	156,250	
Net benefits (Direct investment)		267,700,000	4,415,550,000	5,202,225,000	10,030,000,000	14,470,000,000	18,110,000,000	21,030,000,000	23,230,000,000	24,850,000,000	26,020,000,000	26,770,000,000	27,210,000,000	27,440,000,000	27,470,000,000	27,400,000,000	27,230,000,000	26,955,000,000	26,575,000,000	26,095,000,000	25,515,000,000	24,825,000,000	24,045,000,000	
Net benefits (Indirect investment)		40,410,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	
Net benefits (Total investment)		308,110,000	4,915,550,000	5,702,225,000	10,530,000,000	15,020,000,000	18,660,000,000	21,580,000,000	23,780,000,000	25,350,000,000	26,520,000,000	27,270,000,000	27,940,000,000	27,970,000,000	27,900,000,000	27,730,000,000	27,455,000,000	27,075,000,000	26,595,000,000	26,015,000,000	25,325,000,000	24,545,000,000	23,760,000,000	
Investment cash flow		267,700,000	4,415,550,000	5,202,225,000	10,030,000,000	14,470,000,000	18,110,000,000	21,030,000,000	23,230,000,000	24,850,000,000	26,020,000,000	26,770,000,000	27,210,000,000	27,440,000,000	27,470,000,000	27,400,000,000	27,230,000,000	26,955,000,000	26,575,000,000	26,095,000,000	25,515,000,000	24,825,000,000	24,045,000,000	
Sensitivity analysis		20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	
Base		15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	
SAC		1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Payback period		5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	
Switching value - benefit		11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	
Switching value - cost		11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	

E.2 Additional financing (MAC)

		Economic analysis																				Year 30		
		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	
Investment benefits		271,110,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Net benefits		271,110,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Investment costs		3,410,000,000	4,450,000,000	3,450,000,000	2,450,000,000	1,450,000,000	850,000,000	450,000,000	250,000,000	150,000,000	100,000,000	70,000,000	50,000,000	40,000,000	30,000,000	20,000,000	10,000,000	5,000,000	2,500,000	1,250,000	625,000	312,500	156,250	
Net investment costs		3,410,000,000	4,450,000,000	3,450,000,000	2,450,000,000	1,450,000,000	850,000,000	450,000,000	250,000,000	150,000,000	100,000,000	70,000,000	50,000,000	40,000,000	30,000,000	20,000,000	10,000,000	5,000,000	2,500,000	1,250,000	625,000	312,500	156,250	
Net benefits (Direct investment)		267,700,000	4,415,550,000	5,202,225,000	10,030,000,000	14,470,000,000	18,110,000,000	21,030,000,000	23,230,000,000	24,850,000,000	26,020,000,000	26,770,000,000	27,210,000,000	27,440,000,000	27,470,000,000	27,400,000,000	27,230,000,000	26,955,000,000	26,575,000,000	26,095,000,000	25,515,000,000	24,825,000,000	24,045,000,000	
Net benefits (Indirect investment)		40,410,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	
Net benefits (Total investment)		308,110,000	4,915,550,000	5,702,225,000	10,530,000,000	15,020,000,000	18,660,000,000	21,580,000,000	23,780,000,000	25,350,000,000	26,520,000,000	27,270,000,000	27,940,000,000	27,970,000,000	27,900,000,000	27,730,000,000	27,455,000,000	27,075,000,000	26,595,000,000	26,015,000,000	25,325,000,000	24,545,000,000	23,760,000,000	
Investment cash flow		267,700,000	4,415,550,000	5,202,225,000	10,030,000,000	14,470,000,000	18,110,000,000	21,030,000,000	23,230,000,000	24,850,000,000	26,020,000,000	26,770,000,000	27,210,000,000	27,440,000,000	27,470,000,000	27,400,000,000	27,230,000,000	26,955,000,000	26,575,000,000	26,095,000,000	25,515,000,000	24,825,000,000	24,045,000,000	
Sensitivity analysis		20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	
Base		15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	
SAC		1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	
Payback period		5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	
Switching value - benefit		11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	
Switching value - cost		11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	

E.2 Additional financing (MAC)

	Economic analysis																				Year 30		
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	
Investment benefits	2,711,100,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Net benefits	2,711,100,000	5,420,000,000	8,652,225,000	12,480,000,000	15,920,000,000	18,960,000,000	21,480,000,000	23,480,000,000	25,000,000,000	26,120,000,000	26,840,000,000	27,260,000,000	27,480,000,000	27,500,000,000	27,420,000,000	27,240,000,000	26,960,000,000	26,580,000,000	26,100,000,000	25,520,000,000	24,840,000,000	24,060,000,000	
Investment costs	958,930,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	
Net investment costs	958,930,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	1,489,512,133	
Net benefits (Direct investment)	1,752,169,867	3,930,487,867	7,162,712,867	10,990,487,867	14,430,487,867	17,470,487,867	19,990,487,867	22,000,487,867	23,510,487,867	24,630,487,867	25,350,487,867	25,770,487,867	25,990,487,867	25,910,487,867	25,930,487,867	25,750,487,867	25,470,487,867	25,090,487,867	24,610,487,867	24,030,487,867	23,350,487,867	22,570,487,867	
Net benefits (Indirect investment)	40,410,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000	50,000,000		
Net benefits (Total)	1,792,579,867	3,980,487,867	7,212,712,867	11,040,487,867	14,480,487,867	17,520,487,867	19,990,487,867	22,050,487,867	23,560,487,867	24,680,487,867	25,400,487,867	25,820,487,867	25,940,487,867	25,960,487,867	25,980,487,867	25,800,487,867	25,520,487,867	25,140,487,867	24,660,487,867	24,080,487,867	23,400,487,867	22,620,487,867	
Investment cash flow	1,792,579,867	3,980,487,867	7,212,712,867	11,040,487,867	14,480,487,867	17,520,487,867	19,990,487,867	22,050,487,867	23,560,487,867	24,680,487,867	25,400,487,867	25,820,487,867	25,940,487,867	25,960,487,867	25,980,487,867	25,800,487,867	25,520,487,867	25,140,487,867	24,660,487,867	24,080,487,867	23,400,487,867	22,620,487,867	
Sensitivity analysis																							
Base	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	20 years	
NPV	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	15.1%	
Payback period	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	5.7%	
Switching value - benefit	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	
Switching value - cost	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%	

Table F. Sensitivity analysis

Variables	Change (Δ%)	Overall project		Additional financing		Risk analysis
		IRR (%)	NPV (USD M)	IRR (%)	NPV (USD M)	
Base scenario @10%, 20 year		18.10%	130.2	21.50%	31.7	
Project benefits	-10%	12.10%	35.7	12.50%	6.3	



Project benefits	-20%	-5.10%	-58.8	1.10%	-19.1	Combination of risks affecting output prices, yields and adoption rates
Project costs	10%	14.10%	62.8	14.10%	11.1	Increase of agricultural inputs
Project costs	20%	9.70%	-4.6	6.40%	-9.4	
Combined effect - benet(-)/cost(+)	10%	7.60%	31.7	4.00%	-14.2	Low management, negotiating capacity of farmers groups, market price fluctuation, external shocks
Combined effect - benet(-)/cost(+)	15%	-0.40%	-112.6	-9.50%	-37.2	
Adoption rate (60%)		17.90%	124.6	19.30%	22.8	Quality of technical assistance and access to technologies
Adoption rate (75%)		18.10%	130.2	21.50%	31.7	
Evaluation period (15 years)		15.10%	59.7	19.90%	21.1	Uncertainty about the continuation of the activities supported by the project in the short, medium and/or long term
Evaluation period (10 years)		1.42%	-50.9	14.50%	6.5	
Social discount rate (5.5 percent)		na	306.9	na	64.0	Linked with political and economic stability and macroeconomic context