

**Executive Board** 

# President's memorandum Proposed additional financing to Kingdom of Cambodia Accelerating Inclusive Markets for Smallholders Project

Project ID: 2000001268

Document: EB 2024/LOT/P.29

Date: 5 December 2024

Distribution: Public

Original: English

FOR: APPROVAL

**Action**: The Executive Board is invited to approve the recommendation for the proposed additional financing contained in paragraph 44.

Technical questions:

Reehana Raza Regional Director Asia and the Pacific Division e-mail: r.raza@ifad.org Frew Behabtu Country Director Asia and the Pacific Division e-mail: f.behabtu@ifad.org

For more information on the ongoing AIMS project, visit <u>https://www.ifad.org/en/web/operations/-/project/2000001268</u>

International Fund for Agricultural Development – <u>www.ifad.org</u>

## Contents

Fina	ncing	summary	ii
Ι.	Back	ground and project description	1
	Α.	Background	1
	В.	Original project description	1
II.	Ratio	onale for additional financing	1
	A. B. C. D.	Rationale Description of geographical area and target groups Components, outcomes and activities Costs, benefits and financing	1 3 3 5
III.	Risk	management	8
	А. В. С.	Risks and mitigation measures Environment and social category Climate risk classification	8 9 9
IV.	Impl	ementation	9
	А. В. С.	Compliance with IFAD policies Organizational framework Monitoring and evaluation, learning, knowledge management and	9 10
	-	strategic communication	11
	D.	Proposed amendments to the financing agreement	11
V.	Lega	l instruments and authority	11
VI.	Reco	ommendation	12

## Appendices

- Updated logical framework incorporating the additional financing Updated summary of the economic and financial analysis I.
- II.

Project delivery team					
Regional Director:	Reehana Raza				
Country Director:	Frew Behabtu				
Technical Lead:	Ayurzana Puntsagdavaa				
Finance Officer:	Norpulat Daniyarov				
Climate and Environment Specialist:	Daniela Morra				
Legal Officer:	Itziar Miren Garcia Villanueva				

# Financing summary

Initiating institution:	IFAD
Borrower:	Kingdom of Cambodia
Executing agency:	Ministry of Commerce
Total project cost:	US\$90.7 million
Amount of original IFAD loan:	US\$36.3 million
Terms of original IFAD loan: Amount of first additional IFAD loan	Highly concessional US\$5 million
Terms of first additional IFAD loan	US\$1.65 million highly concessional and US\$3.35 million blend
Amount of second additional IFAD loan:	US\$15.0 million
Amount of second additional IFAD loan A:	US\$4.95 million
Terms of second additional IFAD loan A:	Highly concessional: interest-free but with a fixed service charge; the loan will have a maturity period of 40 years, including a grace period of 10 years
Amount of second additional IFAD loan B:	US\$10.05 million
Amount of second additional IFAD loan B: Terms of second additional IFAD loan B:	US\$10.05 million Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years
	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25
Terms of second additional IFAD loan B:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years
Terms of second additional IFAD loan B: Cofinancier:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years Private sector
Terms of second additional IFAD loan B: Cofinancier: Original amount of cofinancing:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the Ioan will have a maturity period of 25 years, including a grace period of 5 years Private sector US\$8.6 million
Terms of second additional IFAD Ioan B: Cofinancier: Original amount of cofinancing: Additional amount of cofinancing:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the Ioan will have a maturity period of 25 years, including a grace period of 5 years Private sector US\$8.6 million US\$1.4 million
Terms of second additional IFAD Ioan B: Cofinancier: Original amount of cofinancing: Additional amount of cofinancing: Original contribution of borrower:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years Private sector US\$8.6 million US\$1.4 million
Terms of second additional IFAD loan B: Cofinancier: Original amount of cofinancing: Additional amount of cofinancing: Original contribution of borrower: Additional contribution of borrower:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years Private sector US\$8.6 million US\$1.4 million US\$8.6 million
Terms of second additional IFAD loan B: Cofinancier: Original amount of cofinancing: Additional amount of cofinancing: Original contribution of borrower: Additional contribution of borrower: Original contribution of beneficiaries:	Blend: subject to interest on the principal amount outstanding and a service charge to be determined by the Fund; the loan will have a maturity period of 25 years, including a grace period of 5 years Private sector US\$8.6 million US\$1.4 million US\$8.6 million US\$4.8 million

# I. Background and project description

## A. Background

- 1. This memorandum seeks approval from the IFAD Executive Board for additional financing of US\$15 million to be provided to the Kingdom of Cambodia for the Accelerating Inclusive Markets for Smallholders Project (AIMS). The objective of the proposed additional financing is to scale up and consolidate AIMS operations.
- 2. AIMS was approved by the Executive Board in December 2016. The financing agreement entered into force on 28 February 2017. The implementation of AIMS was extended by 18 months to 30 September 2024, with financial closure to take place by 31 March 2025. The original total project cost was US\$61.613 million and was financed by an IFAD loan (US\$36.3 million), the Government (US\$8.654 million), beneficiaries (US\$8.116 million) and the private sector (US\$8.586 million). Additional financing of US\$5 million was approved on 11 September 2024, and the completion and closing dates were extended to 30 September 2027 and 31 March 2028, respectively. As at 23 October 2024, 100 per cent of the original IFAD loan had been disbursed. To date, there have been no disbursements under the additional loan of US\$5 million.

## B. Original project description

- 3. **Goal and development objective.** The AIMS project goal is to enhance the prosperity of Cambodian smallholder farmers through increasingly profitable links to agribusinesses and markets. The project development objective is to increase returns from farming for smallholders, including poorer farmers, through efficient public sector investment. The project has two interrelated components: (i) value chain development; and (ii) value chain financing.
- 4. The project has exceeded its key output targets. Through technical service providers, AIMS has reached 61,106 households (exceeding the target of 60,000), training them in improved production techniques. The project has provided business literacy training to 51,878 households, organized 3,163 multi-stakeholder platform (MSP) events, held 75 trader-to-trader (T2T) network meetings and organized 901 weekend floating markets. With the Agricultural and Rural Development Bank (ARDB) as fund manager, AIMS has funded 3,883 value chain innovation fund (VCIF) proposals, with disbursements totalling US\$4.248 million. As at 31 March 2024, ARDB had disbursed US\$7.489 million from the US\$5 million credit line to finance 881 investments. AIMS has assisted in the installation of 333 pumping wells and the completion of 153 common market infrastructure works under the sector development facility, and 89 infrastructure investments are in progress.
- 5. **The project intervention outcomes have also been achieved.** A total of 42,148 households spread over 1,462 producers' organizations (POs) benefited from sales contracts in 2023. AIMS cumulatively brokered 811,300 tons of target commodity production, valued at US\$162.47 million. The project has achieved an 84 per cent rate of adoption by farmers of production and post-harvest technology, exceeding its target of 75 per cent. The cumulative smallholder investment in targeted value chains and production clusters amounts to US\$5.3 million.

## II. Rationale for additional financing

## A. Rationale

6. AIMS is a well-performing project and has gained a wealth of experience in market facilitation and brokering between value chain drivers and smallholder farmers. Through initiatives focused on market access, better production techniques and sustainable practices, AIMS has not only increased the economic viability of the four targeted commodity value chains but empowered farming communities, especially women, and bolstered their resilience to climate change.

- 7. The purpose of the additional financing is to scale up the successful AIMS interventions and further consolidate the gains achieved. With the additional financing in phase 2, AIMS will employ a twin strategy that consists of: (i) scaling up premium product production and marketing; and (ii) developing a consolidation strategy for strengthening the market facilitation initiatives of the four value chain commodities.
- 8. The scaling-up strategy involves: (i) facilitating the production of premium commodities, namely Khmer chicken, safe vegetables, safe spices and fragrant rice, by some 40,500 farmers. These commodities were selected because of their higher income potential, current market demand, the interest expressed by traders and agribusinesses in sourcing locally and farmers' willingness to invest; and (ii) forming PO clusters to crowd in more domestic and regional buyers and mobilizing additional smallholder farmers into clusters so that they can benefit from better market terms. The cluster approach will also generate demand for appropriate value chain infrastructure.
- 9. Under the consolidation strategy, AIMS will continue to act as a broker between traders and some 47,700 producers already mobilized around four commodities (chicken, rice, cassava and vegetables) to deepen the trust among them and strengthen the business relationships already built, thus increasing the volume and value of commodities sold through larger contracts.
- 10. With the additional financing, AIMS will increase investments in both private and public infrastructure aimed at building the resilience of smallholder farmers to climate and market risks and increasing their climate resilience and incomes.
- 11. AIMS's objectives will remain the same, and the proposed activities to be undertaken with the additional financing will be consistent with the original AIMS design. The implementation approaches will be similar, and the project components will remain the same. With the investments made under phase 1 of AIMS and those to be made in phase 2 with the proposed additional financing, the goals, objectives and targets below are expected to be met.

Goal/objective	Indicators	Target
Goal Enhance the prosperity of Cambodian smallholder farmers through increasingly profitable links to agribusinesses and markets	80 per cent of the total of 88,200 direct beneficiaries have increased their real net farming income by >30 per cent (Unit = No. of households)	70,560 households
<b>Development objective</b> Increase the returns from farming for smallholders, including poorer farmers, through efficient public	Number of beneficiaries who have increased the return on labour in farming by 40 per cent (Unit = No. of households)	47,000 households
sector investment	Economic internal rate of return	20 per cent

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

- 12. In line with IFAD's mainstreaming commitments, the project has been validated as:
  - Including climate finance. About US\$6.942 million of the IFAD loan for the additional financing will be utilized for building climate resilience.
  - ☑ **Including adaptive capacity.** With a view to increasing adaptive capacity, the project will further promote and scale up the adoption of climate-resilient technologies, such as solar pumps, drip irrigation, net houses, solar dryers, cooling storage facilities and innovative finance solutions, with adaptation benefits for smallholder farmers, agricultural cooperatives (ACs), POs and agricultural micro, small and medium-sized enterprises (MSMEs).

## B. Description of geographical area and target groups

13. AIMS is a nationwide project being implemented in 18 provinces, 129 districts, 707 communes and 3,020 villages, thus covering 86 per cent of districts, 56 per cent of communes and 26 per cent of villages in the country. A total of 78,280 households have been mobilized (exceeding the target of 75,000 households) in the four priority commodity value chains, with households identified under the national Identification of Poor Households Programme (IDPoor) constituting 17 per cent, near-poor households 77 per cent and better-off households 6 per cent. With the additional financing, AIMS will incorporate some 13,200 additional households into existing POs in the currently targeted villages and communes,<sup>1</sup> with a focus on IDPoor households and women, and will have a target outreach of 88,200 households by 2027. The composition of the target groups will be the same as in the original AIMS, with preference given to women farmers when mobilizing new households. Overall, 50 per cent of the total outreach beneficiaries will be women.

## C. Components, outcomes and activities

- 14. The two interlinked components of AIMS will remain unchanged:
  - (i) **Component 1: Value chain development** is the lead component, and value chain brokering and facilitation in selected clusters is the core approach, along with capacity-building and the strengthening of market infrastructure.
  - (ii) **Component 2: Value chain financing** will stimulate increased private investment in priority value chains by farmers, MSMEs, ACs and agribusinesses through investment support and the existing line of credit under AIMS.
- 15. The outcomes to be achieved will also remain the same, with revised targets for the additional financing: (i) profits to farmers and businesses increased through participation in inclusive value chains; (ii) private investment in priority value chains by smallholders and agribusinesses increased; (iii) the capacity of national and subnational institutions to design and deliver inclusive agriculture market development initiatives substantially increased; and (iv) sales by POs increased.

16.	The subcomponents and key activities for scaling-up and consolidation strategies	5
	are presented below:	

Subcomponent	Scaling up: Premium commodity value chains	Consolidation strategy: Commodity value chains
Subcomponent 1.1: Value chain	40,500 households producing Khmer chicken, safe vegetables, safe spices and fragrant rice	47,700 households producing vegetables, chicken, rice and
facilitation and brokering	Key activities: public-private-producer partnerships (4Ps); dialogues; T2T networking; cluster formation; provincial and	cassava will receive tapering support
	cluster MSPs; cluster business plan preparation	Key activities: T2T networking; capacity-building for local traders; sales contract facilitation
Subcomponent 1.2: Market- oriented smallholder farmer mobilization	40,500 households Key activities: skills training; demonstrations; farmer field schools promoting climate-resilient practices; value chain study; collective brand registration	None
Subcomponent 1.3: Sector development facility (based on cluster demand and the	50 per cent of investments Key activities: at least 50 per cent water-related infrastructure and the rest market-related infrastructure	50 per cent of investments Key activities: up to 50 per cent water-related infrastructure and the rest market-related infrastructure

<sup>&</sup>lt;sup>1</sup> Producers in adjacent communes, especially members of IDPoor households and women, will also be incorporated if they wish to join.

construction of infrastructure as a public good)		
Subcomponent	70 per cent of the fund	30 per cent of the fund
2.1: Value chain investment support	Window 1: Improved technologies, such as net houses for growing safe vegetables and spices; modern farm irrigation; improved housing and a full package of improved practices for Khmer chicken and rice seed production; at least 50 per cent of VCIF to be used for climate risk management interventions, such as net houses and modern irrigation	Window 1: Improved technologies for vegetable and chicken production; at least 50 per cent of VCIF will be used for climate risk management interventions, such as net houses and modern irrigation
	Window 2: MSMEs, agribusinesses and ACs that are prepared to in value chains to address identified bottlenecks through new technolo or services; priorities to be determined by the value chain actors the dialogue processes	ogies, business models, products
Subcomponent 2.2: Credit line (already disbursed under phase 1 and to be rotated by ARDB)	Eligible households and MSMEs	Eligible households and MSMEs

# 17. The key outcome and output targets under the original project and the additional financing are presented below:

Key indicators	Key outcome/output targets in the original design	Key outcome/output targets after additional financing		
Outreach	75,000 households	88,200 households		
Subcomponent 1.1 – Value chain facilitation and brok	ering			
MSPs that are active	90 per cent	No change		
Number of POs reporting increases in sales	1 628	1 865		
Public-private partnerships with large and small agribusinesses	250	450		
Number of partnerships with domestic buyers (new output indicator)	N/A	12		
Subcomponent 1.2 - Market-oriented smallholder fam	ner mobilization			
Production and post-harvest technology adoption rate	75 per cent of farmers	No change		
Number of farmers trained in improved production technologies (IFAD core indicator)	60 000	73 200		
Number of households producing premium products with production plans to meet market demand (new output indicator)	N/A	30 000		
Collective brand registration	N/A	4		
Subcomponent 1.3 – Sector development facility				
Percentage of facility devoted to water-related investments		50 per cent		
Subcomponent 2.1 – Value chain investment support				
Number of households accessing VCIF (new output indicator)	N/A	3 553		
Number of MSMEs accessing VCIF (new output indicator)	N/A	20		
Percentage of fund devoted to climate risk management		60 per cent		
Subcomponent 2.2 – Credit line				
Number of partner financial institutions	2	3		
Number of households accessing credit	881	1 421		

## D. Costs, benefits and financing

#### Project costs

18. Both AIMS components are partially counted as climate finance. The amount of climate finance for AIMS in phase 2 is US\$6.942 million.<sup>2</sup>

#### Financing and cofinancing strategy and plan

19. The total budget for phase 2 of AIMS with the additional financing is US\$29.103 million over a period of three years. The budget includes an IFAD loan of US\$15 million in addition to the US\$5 million approved on 11 September 2024. The additional financing of US\$15 million will be financed from the additional performance-based allocation system allocations under the Twelfth Replenishment of IFAD's Resources (IFAD12). The second additional allocation will bring the total IFAD contribution under the additional financing to US\$20 million, equivalent to 69 per cent of the total additional financing. Government contributions are estimated at US\$4.792 million (16 per cent), covering duties, taxes and goods. Beneficiary and private sector contributions amount to US\$2.88 million (10 per cent) and US\$1.42 million (5 per cent), respectively.

#### Table 1

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

Original financing First additional financing Second additional financing Total IFAD loan 36 300 5 000 15 000 56 300 Private sector 8 586 1 428 10 015 **Beneficiaries** 8 1 1 6 2 883 10 999 Borrower/recipient 8 6 5 4 4 792 13 446 Financing gap 15 000  $(15\ 000)$ Total 61 656 29 103 \_ 90 759

<sup>&</sup>lt;sup>2</sup> Climate finance has been calculated using the methodologies adopted by the multilateral development banks for tracking climate change adaptation and mitigation finance.

#### Table 2 Additional financing: project costs by component, subcomponent and financier (Thousands of United States dollars)

	IFAD se additional		Total	
Component/subcomponent	Amount	%	Amount	%
1. Value chain development			-	
1.1. Value chain facilitation brokering and sector development facility	2 998	100	2 998	20
1.2. Market-oriented social mobilizers	786	100	786	5
1.3. Sector investment facility	6 676	100	6 676	45
Subtotal	10 460	100	10 460	70
2. Value chain financing				
2.1. Value chain investment support	2 400	100	2 400	16
2.2. Financial service provider partnerships	-	-	-	-
Subtotal	2 400	100	2 400	16
3. Project management				
3.1. Project coordination	1 543	100	1 543	10
3.2. Knowledge management and planning, monitoring and evaluation	597	100	597	4
Subtotal	2 140	100	2 140	14
Total	15 000	100	15 000	100

#### Table 3

Additional financing: project costs by expenditure category and financier (Thousands of United States dollars)

	IFAD se additiona	Total		
Expenditure category	Amount	%	Amount	%
Investment costs				
I. Consultancies	1 557	100	1 557	10
II. Training	1 613	100	1 613	11
III. Credit	-	-	-	-
IV. Grants	9 076	100	9 076	61
Total investment costs	12 247	100	12 247	82
Recurrent costs				
V. Operating costs	2 753	100	2 753	18
Total recurrent costs	2 753	100	2 753	18
Total	15 000	100	15 000	100

#### Table 4 **Project costs by component and project year (PY)** (Thousands of United States dollars)

	PY1		PY2		PY3		Tota	1
Component/subcomponent	Amount	%	Amount	%	Amount	%	Amount	%
1. Value chain development								
1.1. Value chain facilitation brokering and sector development facility	2 788	33	2 871	34	2 720	32	8 379	29
1.2. Market-oriented social mobilizers	645	49	665	51	-	-	1 310	5
1.3. Sector investment facility	4 663	50	4 707	50	-	-	9 370	32
Subtotal	8 096	42	8 244	43	2 720	14	19 060	65
2. Value chain financing								
2.1. Value chain investment support	2 034	30	3 390	50	1 356	20	6 781	23
2.2. Financial service provider partnerships	-	-	-	-	-	-	-	-
Subtotal	2 034	30	3 390	50	1 356	20	6 781	23
3. Project management								
3.1. Project coordination	988	40	743	30	736	30	2 467	8
3.2. Knowledge management and planning, monitoring and evaluation	262	33	295	37	239	30	795	3
Subtotal	1 <b>2</b> 52	38	1 038	32	<b>975</b>	<b>30</b>	3 262	11
Total	11 380	39	12 672	44	5 051	17	29 103	100

#### Disbursement

20. Disbursement arrangements for the additional financing in phase 2 of the project will be similar to those for phase 1. There will be one designated account for the Ministry of Commerce, to which the IFAD funds for the Ministry components will be disbursed. ARDB will not receive funds from IFAD under the additional financing. The Ministry of Commerce project management office (PMO) is to submit consolidated interim financial reports on a quarterly basis within 45 days of the end of the relevant quarter. The PMO 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

- 21. A cost-benefit analysis was performed to assess the economic and financial feasibility of AIMS during the design phase; the analysis was updated at the midterm review of phase 1 and was further revised, taking the additional financing in phase 2 into account. This revised analysis estimated the returns on the entire investment, relying primarily on the data previously used and supplemented with information from field interviews of some AIMS participants. The analysis covers a 20-year period, including an execution phase, with estimates made using a social discount rate and a 10 per cent cost of capital.
- 22. **Return on investment of the overall project.** The analysis shows promising economic returns. The economic internal rate of return (EIRR) is estimated at 29.1 per cent, exceeding the 20 per cent threshold set in the development goal. This EIRR assumes that 70 per cent of targeted farmers and 95 per cent of traders will adopt the improved technologies and practices promoted by the project in the rice, vegetable, spice, cassava and chicken value chains in both rainfed and irrigated systems. The net present value (NPV) is projected at US\$341.1 million, with a benefit-cost ratio of 1.45, based on quantifiable post-project benefits. Sensitivity and scenario analyses indicate that, with the additional financing, AIMS will remain profitable over a 15-year evaluation period but could become unprofitable if projected benefits decrease by more than 31 per cent or costs increase by more than 45 per cent due to shocks during implementation; this is unlikely, given the favourable local economic context and macro trends.

- 23. **Return on investment of the additional financing.** Economic analysis of the additional financing alone also points to a promising economic return on investment over 20 years. The NPV would be US\$297.8 million, with an EIRR of 28.8 per cent and a benefit-cost ratio of 1.67. Sensitivity and scenario analyses confirm the robustness of these projections. The project would become unfeasible if the projected benefits were reduced by more than 40 per cent or costs increased by over 67 per cent as a result of adverse factors; this is unlikely, given the economic context. The project remains viable even with evaluation periods of 10 and 15 years.
- 24. The financial analysis shows that most of the activities supported by the project will yield positive financial returns over a 10-year evaluation period, primarily benefiting participating farmers and traders.

#### Exit strategy and sustainability

- 25. The implementation of AIMS has enabled a range of different farmers' groups, agribusinesses and other enterprises to operate successfully in each value chain and meet their own requirements for future growth. POs are self-sustaining, both institutionally and financially. Through collaboration with the IFAD-funded Agriculture Services Programme for an Inclusive Rural Economy and Agricultural Trade (ASPIRE-AT), there is potential for graduating promising business clusters to agriculture cooperatives. A self-sustaining network of grassroots institutions, including POs and ACs, financial institutions and private enterprises, are expected to sustain the project's benefits.
- 26. Provincial departments of commerce (PDOCs) are performing the project's essential brokering functions at the subnational level. Business cluster facilitators are the connection between POs/clusters, buyers and PDOCs, and at project closure their costs are expected to be borne by the marketing companies, which will utilize their services to maintain their business relations with farmers. Thus, PDOCs, business cluster facilitators and buyers and traders are expected to perpetuate the market linkages of smallholder farmers well beyond project closure.

## III. Risk management

## A. Risks and mitigation measures

27. AIMS is considered a project with moderate risk. Some substantial risks have been identified, related primarily to institutional implementation capacity, sustainability and climate risks in Cambodia, such as flooding, drought and heat waves. Most of the risks are mitigated by well-articulated design features: increasing the competitiveness of smallholders in markets; designing financing instruments to support farmers, farmers' organizations and agribusinesses; and making sector development investments to promote climate-resilient practices, viability and sustainability in project interventions. The financial management and procurement risks for AIMS in phase 2 are considered moderate and will be mitigated by further enhancing financial management procedures and capacity.

#### **Overall risk summary**

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

## B. Environment and social category

28. The environmental and social category risk for phase 2 of the project is considered moderate, as determined by the screening tool of the 2021 Social, Environmental and Climate Assessment Procedures (SECAP). The SECAP review note for AIMS has been updated to include the additional financing interventions. An Environmental, Social and Climate Management Plan has been prepared to ensure the systematic identification, assessment and management of applicable risks at the subproject level, in keeping with domestic legislation and IFAD's SECAP requirements. AIMS has a grievance redress mechanism and stakeholder engagement plan in place, albeit with some gaps that have been identified and will be addressed during the early implementation phase of AIMS phase 2 – in particular, to ensure consistent recording and reporting of grievances. During the early implementation phase, an Indigenous Peoples planning framework will be developed to ensure that planned project activities where Indigenous populations reside will comply with domestic legislation and IFAD's SECAP requirements. These documents will be included as an annex to the project implementation manual. SECAP-related activities and costs have been included and will be reflected in annual workplans and budgets.

## C. Climate risk classification

29. The climate risk is considered substantial. Project households depend largely on rainfall for major crops and household ponds or wells for vegetable production, raising animals and domestic use. With the additional financing, AIMS will continue promoting climate-resilient technologies and climate-smart agricultural practices. The screening checklist will guide the project to include adequate adaptation and mitigation measures. Regenerative farming practices will be promoted in rice production.

## **IV. Implementation**

## A. Compliance with IFAD policies

30. AIMS is well-aligned with IFAD's Strategic Framework 2016–2025, given its overarching goal of enabling poor rural people to overcome poverty and achieve food security through remunerative, sustainable and resilient livelihoods and its three interlinked strategic objectives (SOs): SO1 – increase poor rural people's productive capacities; SO2 – increase poor rural people's benefits from market participation; and SO3 – strengthen the environmental sustainability and climate resilience of poor rural people's economic activities. AIMS adheres to IFAD policies and strategies on gender mainstreaming, environment and natural resource management, climate change, safeguards and scaling up.

## **B.** Organizational framework

## Management and coordination

- 31. The Ministry of Commerce will remain the AIMS project executing agency and continue hosting the PMO headed by the AIMS project director. The PMO is responsible for overall project operation, including administrative activities, financial management, procurement, monitoring and evaluation (M&E) and reporting. Project implementation at the subnational level is led by 18 PDOCs. Four PDOC staff in each province have specific roles in AIMS and are assigned to specific clusters. Value chain technical consultants will support the PMO and PDOCs in their performance of market development functions. The project will engage business-class facilitators to interface between PDOCs and clusters and value chain actors.
- 32. ARDB will be the fund administrator for the VCIF under component 2.1. ARDB will continue to disburse loans from the existing credit line and report to PMO. The project will engage technical service providers to increase producers' capacity to meet market requirements in the priority commodities. The Ministry of Economy and Finance will chair the country project steering committee.

#### Financial management, procurement and governance

- Financial management. The existing Ministry of Commerce PMO and ARDB 33. project coordination unit will be responsible for the financial management arrangements for the additional financing. Both implementing agencies have qualified staff with relevant experience and expertise for the timely preparation and submission of project budgets, who can ensure adequate internal controls and fund flow arrangements under the additional financing. Both implementing agencies have accounting software to keep reliable accounting records and submit acceptable interim financial reports to IFAD. The project's internal control framework includes the standard operating procedures developed by the Government to manage projects funded by international financial institutions. Furthermore, the AIMS project implementation manual will be revised and approved, as needed, to include any additional policies and procedures required for the additional financing. The project has adequate arrangements for the timely submission of project audit reports for the additional financing. Although there were significant delays in submitting audit reports for the ARDB component in previous years, IFAD and the borrower have agreed on measures to address the delays and prevent their recurrence.
- 34. **Procurement.** The PMO will be directly responsible for project procurement activities. It will have a procurement team that includes a procurement chief, a procurement officer, a procurement specialist and a procurement assistant (project-contracted staff). Procurement with IFAD funds under the additional financing will follow the standard operating procedures on procurement for all externally financed projects in Cambodia insofar as they are consistent with the IFAD Project Procurement Guidelines. A detailed project procurement arrangement letter will spell out the detailed procurement requirements and thresholds for procurement methods and IFAD's prior review. The PMO will prepare annual procurement plans in alignment with the annual workplans and budgets and submit them for IFAD's no objection before proceeding with procurement activities. IFAD's Online Project Procurement End-to-End System (OPEN) will be used for preparation and monitoring of the implementation of project procurement plans. Requests for IFAD's prior review and no objection will be routed through OPEN. Data on all contracts and related payments will be recorded and updated regularly in the contract monitoring tool of the IFAD Client Portal.
- 35. Procurement risk assessment for the project conducted as stipulated in the IFAD Project Procurement Manual shows that the overall inherent procurement risk is moderate.

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

- 36. The AIMS M&E system is a comprehensive platform consisting of a database, a dashboard and documents. Under the additional financing, the M&E system will continue to keep track of qualitative and quantitative data and information on project implementation. The findings will be shared with project management during monthly coordination meetings. This information will serve as the basis for the preparation of periodic progress reports and the reporting of M&E data to IFAD. Since the data will come from various actors with different capacities, greater effort will be made under the additional financing to enhance capacity and coordination to improve data quality and increase efficiency in data collection and transfer from the field to the PMO level. An annual outcome survey for phase 2 will be conducted in 2026. Other relevant thematic studies will also be conducted during phase 2.
- 37. **Knowledge management.** The M&E, knowledge management and value chain teams will continue pursuing current collaborative efforts to generate knowledge products and public materials. A knowledge management specialist is responsible at the national level and coordinates at the field level. In phase 2, AIMS will prioritize the dissemination of lessons learned. Two policy briefs will also be prepared. Annual reports, documentaries and various communication supports will be produced. Peer communication, thematic exchange groups, learning visits and workshops will take place, as will communication through community channels and social media.

## D. Proposed amendments to the financing agreement

- 38. The financing agreement will be amended to incorporate the additional financing and private sector contributions.
- 39. Under the additional financing, an update of the logical framework is being proposed to better align it with the additional financing. The original outreach objectives, project goal, development objective and outcome indicators will be retained. The proposed changes are:
  - Output 3.1 will become output 1.1.
  - New outputs 1.2, 2.1, 3.1, 4.1, 4.2 and 4.3 will be added. Some have already been tracked in the management information system and some capture the new activities of the additional financing phase.
- 40. The total end targets include both the original target and the new additional financing target. Some indicators have no targets but will be tracked and achievements reported. Disaggregation of the data by gender will continue.

## V. Legal instruments and authority

- 41. A financing agreement between the Kingdom of Cambodia and IFAD will constitute the legal instrument for extending the proposed additional financing to the borrower/recipient. The signed financing agreement will be amended following approval of the additional financing.
- 42. The Kingdom of Cambodia is empowered under its laws to receive financing from IFAD.
- 43. 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

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

RESOLVED: that the Fund shall provide a loan on highly concessional terms to the Kingdom of Cambodia in an amount of four million nine hundred fifty thousand United States dollars (US\$4,950,000) 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 blend terms to the Kingdom of Cambodia in an amount of ten million fifty thousand United States dollars (US\$10,050,000) 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	Indicators	Original log frame			Total end target (Original	Means of Verification	Assumptions		
	Name	Baseline	Mid- Term	End Target	target + AF target)	Source	Frequency	Responsibility	
Outreach	1 Persons receiving supported by the pro-		omoted o	or		Total HH registered in MIS+ number people	Annual		
	Males - Males	ľ		75000	88200	attended technical			
	Females - Females			75000	88200	training by (Technical service providers)			
	Youth - Young males				2250				
	Youth – Young females				2250	]			
	Indigenous people – Male Indigenous people				9000				
	Indigenous people – Female Indigenous people				9000				
	Total number of persons receiving services - Number of people		75000	150000	176400				
	1.a Corresponding r reached	number of h	ousehold	S		MIS - Farmer Diary, MIS	Annual	PMO	
	reached Women-headed households - Households		18750	37500	44100				
۲ ۲ ۲ ۲ ۲ ۲ ۲	Non-women-headed households - Households		18750	37500	44100				
	Households - Households		37500	75000	88200				
	1.b Estimated corres		tal numbe	er of		HHs have on an average 4 members	Annual	PMO	
	Household members - Number of people		150000	300000	352800				

Project Goal Enhance prosperity	80% of total of 88,20 increased real net fa					End line and evaluation survey	Baseline; Mid-term;	PMO	Assumes continued social, political and
of Cambodian smallholder farmers through increasingly profitable links to agri-businesses and markets	Households - Number	0	20000	60000	70560		End line		economic stability in the country and neighbouring ASEAN region
Development	Number of beneficia		sed returi	n on		End line and	Baseline;	PMO	There are no
Objective	labour in farming by		1	1		evaluation survey	Mid-term;		prolonged fall in
To increase returns	Households -	0	13500	40000	47000		End line		export/local demand
from agriculture value chains for	Number Public return on inve	octmont (D				End line and	End of	PMO	or prices for agricultural
smallholders,		•		20 20		evaluation survey	project	FIVIO	products.
including poorer farmers and youth, through efficient public sector investment	(%)					evaluation survey	project		
Outcome 1 Profits to farmers	Adoption rate of pro technologies of part			vest		Technical service providers report and	Baseline; Mid-term;	PMO	There are no prolonged fall in
and businesses from Inclusive value chains increased for	Adoption rate - Percentage (%)			75	75	verification/check by M&E-PMO	End line		export/local demand or prices for agricultural
multiple higher	Aggregate value of	products so	old			Formal & informal	Annual	PMO	products.
value products.	Aggregate value - Money (USD' 000)			19500	contract/agreement			For AIMS value chains substantial improvements in	
Output 1.1 Farmers trained on improved technologies for	1.1.4 Persons traine and/or technologies		tion pract	tices		SM Report/Hub report/MIS	Annual	PMO	production and post- harvest are necessary and feasible as
production or post- harvest practices	Total number of persons trained by the project - Number of people		45000	60000	73200				foundations of growth.
	Men trained in crop - Males			21000	25620				
	Women trained in crop - Females			21000	25620				
	Men trained in livestock - Males			9000	10980				
	Women trained in livestock - Females			9000	10980				

	Total persons trained in crop - Number of people		42000	51240				
	Total persons trained in livestock - Number of people		18000	21960				
	1.1.7 Persons in rural areas					and service		
	Males - Males	17500	25000	29400	SM Report/Hub	Annual	PMO	
	Females - Females	17500	25000	29400	report/MIS			
	Persons in rural areas trained in FL and/or use of Financial Products and Services (total) - Number of people	35000 50		58800				
Output 1.2	Number of buy and sale co (formal and informal)	ntracts / agre	ements		MIS	Annual	PMO	
	Number			8000				
Outcome 2 Private investment	Agri-business investment i and production clusters	n priority valu	le chains		Value of private sector investment (VCIF-W2)		PMO	Sufficient numbers of banks and MFIs
increased in priority value chains from smallholders and	USD - Money (USD' 000)			5312				continue to show commercial interest and commitment to
agribusinesses	Smallholder investment in and production clusters	priority value	chains		Value of Smallholder investment (VCIF-W1)	Annual	PMO	expanding agricultural lending
	USD - Money (USD' 000)			10,999				portfolio to smallholder and agribusiness sectors
	Participating smallholder fa financial literacy	irmers with ir	creased		BLT Pre &Post test result	Annual	PMO	Participating smallholders have
	Smallholder farmers – Female Percentage (%)	1		25				sufficient interest to improve their financial literacy.
	Smallholder farmers 1 – Male Percentage (%)		25				Positive framework conditions for investment into	
	Total Smallholder     1     50     50       farmers -     Percentage (%)     50     50							agriculture
	Partner Financial Institution financing VCs	ns (PFIs) cont	inue		PFI signed MOU with AIMS (entry in MIS)	Annual	PMO	

	PFIs - Number		2	2	3				
Output 2.1	Number of HH acces	sing to loa	n / LOC	•	•	MIS	Annual	PMO	
Access to finance	HH- Number			881*	1421	_			
	Number of HH acces Near Poor) (VCIF W1		ints (Poor	and	0004	MIS	Annual	РМО	
	HH- Number				3334				
	Number of agribusin (VCIF W2)	ess access	sing to gra	ants		MIS	Annual	PMO	
	Agribusiness owned/managed by women - Number				8				
	Agribusiness owned/managed by men - Number				12	_			
	Total Agribusiness – Number				20				
Outcome 3	MSPs that are active	, well atten	ded			MIS	Annual	PMO	External socio-
Substantially increased capacity of national and sub- national institutions to design and deliver inclusive agriculture market development initiatives	MSPs - Percentage (%)	1	90	90				political factors do not disrupt MSPs. Sufficient interest from Private sector in MSPs across all priority VCs of AIMS. Assumes 80% of	
Output 3.1 KM/M&E and VC	Number of policy-rel completed	evant knov	vledge pr	oducts	2	Project report	Annual	PMO	total direct project beneficiaries.
products	Number								
	Number of 4Ps organ	nized at na	tional leve	el		Project report	Annual	PMO	
	Number				12	_			
Outcome 4 Increased sales by	2.2.5 Rural producer increase in sales	s' organiza	tions rep	_		PO's annual sale report/cluster tracking	Base; mid-PMO king term; end		
POs	Number of Rural POs - Organizations		1628		1865		line; annual		

	Rural POs with women in				1865			]
	leadership position - Organizations							
	2.2.3 Rural producer formal partnerships/ with public or private	/agreement	ations enç is or cont	aged in racts		Buy and sell contract	Base; mid- term; end line; annual	PMO
	Number of POs - Organizations				1746			
	Women in leadership position - Females				1746			
	PPPs or similar part agri-businesses and							
	Partnerships - Number		100	250	450			
	Partner supported agri-businesses - Number				1000			
	Numbers of MSP org	ganized						
	MSP - Number		927	1853	3553	7		
	2.1.3 Rural producer	s' organiza	tions sup	oported		MIS	Annual	PMO
	Rural POs supported - Organizations		812	1628	1865			
Output 4.1	Number of national I	buyer with	contract			MIS	Annual	PMO
Engagement with private sectors	Number				12			
Output 4.2 PO access to	Number of SDF com sustainable manage			nal with		MIS	Annual	PMO
Market facilities	Number				1000			
Output 4.3 Increase PO	Number of HHs proc clear production pla		nium proo	duct with		Cluster report	Annual	PMO
capacity in sale	Number				30000			

# Updated summary of the economic and financial analysis

### Methodological approach

1. The economic rationale behind AIMS is built on several key strategies: boosting agricultural productivity and minimizing post-harvest losses through the adoption of good agricultural and post harvesting practices such as intercropping, seed production, enhanced post-harvest handling and storage, crop rotation, and composting. Additionally, the program focuses on increasing cropping intensity and transitioning to high-value crop and livestock varieties, which includes utilizing drip irrigation to extend production during the dry season. These measures are anticipated to potentially raise crops yields and animal production by up to 100% and reduce post-harvest, storage, processing, and transport losses by up to 100%.

2. A cost-benefit analysis was performed to determine the economic and financial feasibility of the project. The original cost-benefit analysis, updated during the midterm review, was further revised, and a complementary economic-financial analysis was developed for the additional financing. This was done to estimate the return on the entire investment. The analysis primarily drew on information from previous assessments during the initial project design phase and the midterm review. Data was further verified through field interviews with some beneficiaries from the first phase of the project.

3. The analysis is based on data collected for various productive systems in rotational or associated systems. For the initial phase of the project, priority was given to crops such as cassava, cashew, pepper, rice, longan, various types of vegetables, and broiler chickens. In the additional financing, priority is given to rice and vegetable crops, spices, and broiler chickens. Additionally, the analysis considered data from traders of vegetables, rice, and chicken meat production.

4. 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.

5. 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 percent3. 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

6. **Return on investment of the overall project.** The economic analysis of the AIMS project, encompassing both original and additional financing, indicates promising economic returns. The EIRR is estimated at 29.1 percent, exceeding the threshold set in the development goal at 20 percent. This EIRR estimate assumes that 70% of targeted farmers and and 95% of traders will adopt the improved technologies and/or practices promoted by the project, impacting crops and animal production such as rice, vegetables, spices, cassava, and chicken in both rainfed and irrigated systems. The Net Present Value is projected at USD 341.1 million, with a benefit-cost ratio of 1.45, derived from quantifiable

<sup>&</sup>lt;sup>3</sup> Values used in the previous EFA analyses.

benefits related to post-project activities. Sensitivity and scenario analyses highlight the robustness of these evaluations, indicating that the project would remain profitable over a 15-year evaluation period. Sensitivity analysis shows that the project can become unprofitable if projected benefits decrease by more than 31 percent and costs increase by more than 45 percent due to any shocks during implementation which considering the local economic context and the macro trends is unlikely.

7. **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 297.8 million, the IRR would be 28.8 percent, and the B/C ratio would be 1.67. 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 40 percent or if costs increased by over 67 percent due to any adverse factors which is unlikely considering the economic context. The project would remain viable in evaluation periods of 10 and 15 years.

Indicator	Overall project	Additional finance						
IRR	29.1 %	28.8 %						
BCR (@10% discount rate)	1.45	1.67						
NPV (@10% discount rate)	USD 341.1 million	USD 297.8 million						
Switching values	Up to 45% increase in costs Up to 31% reduction in benefits	Up to 67% increase in costs Up to 40% reduction in benefits						

8. 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.

		Overal	l project		litional ancing	
Variables	Δ%	IRR (%)	NPV (USD M)	IRR (%)	NPV (USD M)	Link with the risk matrix
Base scenario		29.1%	341.1	28.8%	297.8	
Project benefits	-10%	23.7%	230.9	24.9%	223.8	Combination of risks affecting
Project benefits	-20%	17.7%	120.7	20.7%	149.9	output prices, yields and adoption rates
Project costs	10%	24.7%	269.9	25.6%	256.0	Increase of construction
Project costs	20%	20.5%	198.7	22.7%	214.2	material prices
Output prices	-10%	28.8%	335.7	28.74%	296.5	Low management, negotiating
Output prices	-20%	28.4%	330.3	28.66%	295.1	capacity of farmers groups, market price fluctuation, external shocks
Input prices	10%	26.1%	298.0	26.4%	270.3	Market price fluctuations and
Input prices	20%	23.3%	254.9	24.2%	242.8	external shocks
Adoption rate (60°	%)	28.2%	285.5	28.2%	252.8	
Adoption rate (75°	%)	29.5%	368.8	29.1%	320.3	Quality of technical assistance and access to technologies
Adoption rates	-20%	27.7%	263.0	27.9%	233.5	
Evaluation period (15 years)		24.8%	155.2	27.5%	211.8	Uncertainty about the continuation of the activities
Evaluation period (10 years)		-1.1%	-35.0	20.6%	73.4	supported by the project in the short, medium and/or long term

Social discount rate (9 percent)	na	399.6	na	341.5	Linked with political and economic stability and macroeconomic context
----------------------------------	----	-------	----	-------	--

9. The following table shows a comparison of the estimated economic rates of return during the project design phase, the update during the midterm review (considering the original project and additional financing), and the estimated results for the additional financing only, considering a social discount rate of 10 percent and an evaluation period of 20 years.

Indicator	Project design – Overall project	design – Overall Overall project	Overall project – OF plus AF	Additional financing
EIRR	31%	35%	29.1 %	28.8 %

10. The various estimates of the economic internal rate of return shown in the previous table consistently demonstrate the project's economic viability. The estimated internal rate of return during the design of the original project is higher than the estimates in the updated analysis of the entire project and the projections for the additional financing. This difference could be explained by the fact that, during the design phase of the project and the update of the analysis in the midterm review, a broader list of higher-priced products, such as pepper, longan, and cashew, was considered as part of the farm models. Additionally, more optimistic assumptions were made in the project design regarding production parameters, without considering the negative effects of the pandemic on production dynamics and the increase in the cost of agricultural inputs. The updated estimate of the EFA indicators for the overall project and additional project would present a more realistic scenario, as the main beneficiaries are small farmers and SME traders, who are characterized by lower productive efficiencies, limited production factors, greater vulnerability to external shocks, and, as a result, lower returns on investments.

11. The financial analysis reveals that most activities supported by the project, primarily focusing on farmers and traders, yield positive returns. Notably, traders of chicken, vegetables and rice, along with primary producers of pepper and chicken, are projected to achieve the highest returns on investment, with Internal Rates of Return (IRR) of 34 percent, 34 percent, 28 percent, 23 percent and 20 percent respectively. This underscores the potential of these initiatives to significantly increase household incomes and enhance the revenues of traders involved in the various value chains supported by the project.

#### Table A Financial cash flow models A.1 Original financing – farm/trader models

					Producers	i				Trad	lers					
			Far	m models'ı	net increm	ental ben	nefits			Enterprise and marketing models'net						
Year					(in \$US)					incremental benefits (in \$US)						
	Farm 1	Farm 2	Farm 2 Farm 3		Cashew	Pepper	Rice	Longan	Vegetables	Chicken	Beef fattening					
PY1	-5454	-5621	-3308	-371	-1144	-18175	-77	-8108	-4915	-230	-138					
PY2	-1398	-1737	-239	-64	-194	-15516	-68	441	-934	-144	-138					
PY3	-619	-1019	-9	109	-229	-13526	23	-322	-66	91	-248					
PY4	965	1066	669	101	-220	3093	33	1512	804	91	-248					
PY5	1945	2237	1127	101	153	11289	43	3423	1494	7	-358					
PY6	2766	3145	1472	101	356	16689	43	3557	2184	112	-358					
PY7	3357	3909	1874	101	558	22089	43	5243	2184	112	245					
PY8	4491	5075	2281	101	963	28257	43	5422	3564	112	245					
PY9	5069	5965	2283	101	1065	39313	43	5422	3564	112	245					
PY10	4933 5865 195			101	1099	41607	43	4545	3564	7	245					
NPV (USD)	4,719	5,745	2,525	62	386	36,266	41	7,189	3,091	32	-581					
FIRR (@10%)	20%	21%	21%	13%	14%	23%	17%	23%	18%	12%	N/A					

## A.2 Additional financing - farm/trader models

				Produ	icers						Traders		
				Farm models	'net incrementa	al benefits				Enterprise a	and marketing	models'net in	ncremental
Year		-			(in \$US)						benefits	(in \$US)	
	Farm 1 - AF	Farm 2 - AF	Farm 3 - AF	Farm 5 - AF -	Farm 6 - AF -	Pepper	Rice	Vegetables	Chicken	Chicken	Vegetable	Rice	Beef
	Tarini 1 - Ar	Tann 2 - Ai	Tarin 3 - Ar	Chicken	spicy	i oppei i ilite		vegetables	CHICKEN	Chicken	vegetable	Nice	beer
PY1	-3404	-3655	-2683	-29	-7537	-18175	-77	-4915	-158	-2821	-3138	-3410	-232
PY2	-1276	-1687	-1733	-73	-4231	-15516	-68	-934	-71	507	332	80	-232
PY3	-695	-1102	-1250	61	-3241	-13526	23	-66	69	793	707	423	-100
PY4	615	615	803	70	2790	3093	33	804	113	1107	1101	855	-165
PY5	1421	1579	1896	-90	4116	11289	43	1494	-47	1462	1380	1,143	32
PY6	2044	2315	2668	54	4116	16689	43	2184	90	1462	1659	1,431	32
PY7	2319	2747	3264	54	5449	22089	43	2184	106	1534	2496	2,873	153
PY8	2589	3848	3858	54	6884	28257	43	3564	114	1534	2496	2,873	153
PY9	2589	4732	3858	54	8217	39313	43	3564	114	1606	2496	2,873	153
PY10	2697	4916	4096	-74	8217	41607	43	3564	-14	1606	2496	2,873	153
NPV (USD)	2,319	4,270	5,110	29	6,662	36,266	41	3,091	99	3,742	4,966	4,525	-279
FIRR (@10%)	18%	21%	25%	21%	19%	23%	17%	18%	20%	34%	34%	28%	-1%

## A.3 Overall farm/trader models

							Р	roducers										Traders		
Years							Farm mod	dels'net increr (in \$US)		nefits							Enterprise and marketing models'net incremental benefits (in \$USD)			
16013	Farm 1 - OF	Farm 1 - AF	Farm 2	Farm 2 - AF	Farm 3	Farm 3 - AF	Farm 4 - AF - rice seed production	Farm 5 - AF - Chicken	Farm 6 - AF - spicy	Cassav a	Cashew	Pepper	Rice	Longan	Vegetables	Chicken		Vegetabl e	Rice	Beef
PY1	-5454	-3404	-5621	-3655	-3308	-2683	-203	-29	-7537	-371	-1144	-18175	-77	-8108	-4915	-158	-2821	-3138	-3410	-232
PY2	-1398	-1276	-1737	-1687	-239	-1733	-121	-73	-4231	-64	-194	-15516	-68	441	-934	-71	507	332	80	-232
PY3	-619	-695	-1019	-1102	-9	-1250	-40	61	-3241	109	-229	-13526	23	-322	-66	69	793	707	423	-100
PY4	965	615	1066	615	669	803	41	70	2790	101	-220	3093	33	1512	804	113	1107	1101	855	-165
PY5	1945	1421	2237	1579	1127	1896	123	-90	4116	101	153	11289	43	3423	1494	-47	1462	1380	1,143	32
PY6	2766	2044	3145	2315	1472	2668	123	54	4116	101	356	16689	43	3557	2184	90	1462	1659	1,431	32
PY7	3357	2319	3909	2747	1874	3264	204	54	5449	101	558	22089	43	5243	2184	106	1534	2496	2,873	153
PY8	4491	2589	5075	3848	2281	3858	204	54	6884	101	963	28257	43	5422	3564	114	1534	2496	2,873	153
PY9	5069	2589	5965	4732	2283	3858	204	54	8217	101	1065	39313	43	5422	3564	114	1606	2496	2,873	153
PY10	4933	2697	5865	4916	1959	4096	204	-74	8217	101	1099	41607	43	4545	3564	-14	1606	2496	2,873	153
NPV (USD)	4,719	2,319	5,745	4,270	2,525	5,110	225	29	6,662	62	386	36,266	41	7,189	3,091	99	3,742	4,966	4,525	-279
FIRR (@10%)	20%	18%	21%	21%	21%	25%	21%	21%	19%	13%	14%	23%	17%	23%	18%	20%	34%	34%	28%	-1%

## Table 2 Project costs and logframe targets Project/programme costs

Component/ou/boomponent	Additional	IFAD loan	Beneficiaries			Private business (SMEs)			Borrow	er/recipient	Total		
Component/subcomponent	Amount	%	Cash	In-kind	%	Cash	In-kind	%	Cash	In-kind	%	Amount	%
A. Value chain development	13,947	73%	0	469	2%	0	262	1%	-	4,382	23%	19,060	65%
1. Value Chain Facilitation Brokering and Sector Development Facility	3,997	48%			0%			0%		4,382	52%	8,379	29%
2. Market-oriented social mobilizers	1,048	80%			0%		262	20%			0%	1,310	5%
3. Sector Investment Facility	8,902	95%		469	5%			0%			0%	9,370	32%
B. Value Chain Financing	3,200	47%	2,414	0	36%	1,167	0	17%	0	0	0%	6,781	23%
1. Value Chain Innovation Fund	3,200	47%	2,414		36%	1,167		17%			0%	6,781	23%
2. Financial Services Partnership	-	0%			0%			0%			0%	0	0%
C. Project Management	2,853	87%	0	0	0%	0	0	0%	0	410	13%	3,262	11%
1. Project coordination	2,057	83%			0%			0%		410	17%	2,467	8%
<ol> <li>Knowledge management and planning, monitoring and evaluation</li> </ol>	795	100%			0%			0%	0		0%	795	3%
Total	20,000	69%	2,414	469	10%	1,167	262	5%	0	4,792	16%	29,103	100%

#### Logframe targets

PROJECT COSTS AND	INDICATORS	FOR LOGFRAME	
Total Project Costs (in million USD)	29.103	Project management including M&E and KM	3.262
Beneficiaries	88,000 Households		
Cost per beneficiary (USD)	330	Adoption rates	75%
Components and Cost (USD million)		Outcomes	Indicators
Value chain Development	19.06	a) increased Profits to farmers and businesses for higher value products from Inclusive value chains,	<ol> <li>Adoption rate of production and postharvest technologies of 73,200 participating farmers increased</li> <li>Aggregate value of products sold increased</li> </ol>
		b) Increased sales by POs.	<ul> <li>3) 1,865 Rural producers' organizations reporting an increase in sales</li> <li>4) Partnerships with450 large and small agri-</li> </ul>
			businesses and service enterprises and rural producers' organsations
Value chain financing	6.781	<ul> <li>c) Private investment increased in priority value chains from smallholders and agribusinesses</li> </ul>	5) Agri business investments and small holder investments in priority value chains increased
Project management	3.262	d) substantially increased capacity of national and sub-national institutions to design and deliver inclusive agriculture market development initiatives	6) 90% of Multi Stakeholder Platforms are active, well attended

## Table C

#### Main assumptions and shadow prices

#### i) General investment assumptions

- The ex-ante incremental cost-benefit analysis aimed to assess key project valuation metrics, such as Net Present Value (NPV) at both private and social prices over a 20-year period, along with Financial and Economic Internal Rates of Return (FIRR and EIRR), the Benefit/Cost ratio (B/C), payback period and switching values. These metrics were calculated for the overall project, additional financing and distinct types of farm/trader models. Additionally, sensitivity analyses were conducted to examine the potential effects of changes in critical variables like benefits, costs, implementation delays, evaluation periods, and discount rates. The estimate of the entire project economic and financial indicators considered the all-project costs including the beneficiary counterparts, private sector contributions and government contributions.

- The conversion rate from DKH to US dollars was based on the exchange rate during the design of the additional financing (1 USD = 4066 DKH). For the baseline scenarios, a 10% discount rate was applied for both financial and economic analyses over a standard 20-year evaluation period, consistent with the parameters set in the preliminary economic and financial analysis. To adjust private prices to social shadow) prices for various goods and services, It was used conversion factors calculated for considering the following formula.

Category	Value (Riel trillion)
Exports of goods and services, 2021 (current LCU) (Average 10 years)	48.74
Imports of goods and services, 2021 (current LCU) (Average 10 years)	50.55
Taxes on international trade, 2021 (current LCU)* (Average 10 years)	1.95
Customs and other import duties, 2021 (current LCU) (Average 10 years)	1.77
Taxes on exports, 2021 (current LCU) (Average 10 years)	0.18
Cambodia does not provide any export or import subsidies (https://www.w	rto.org/english/tratop_e/tpr_e/s364_e.pdf)
SERF = ((M + Tm - Sm) + ( X - Tx + Sx)) / (M + X)	
M = imports	51
Tm = taxes on imports	2
Sm = subsidies on imports	0
X = exports	49
Tx = taxes on exports	0.18
Sx = subsidies on exports	0
M + Tm - Sm	52
X - tx + Sx	49
SERF	1.02
SCF = 1/SERF	0.9842

#### Table 2. Derivation of conversion factors

Source: Estimates based on the data provided by the World Bank (2021)

- The international numeraire pricing system was employed to convert private prices to economic prices for tradable and non-tradable goods and services. Adjustments were made using a Standard Conversion Factor (SCF) of 0.98 and a Shadow Wage Rate Factor (SWRF) of 0.75 for unskilled labor and 0.90 for skilled labor, further adjusted for the SCF.
- The analysis did not account for positive externalities such as technology spillovers and environmental and social benefits, due to challenges in accurately quantifying these effects and a scarcity of pertinent data.

## C.2 Specific assumptions

- The analysis evaluates the projected incremental costs and benefits of activities designed for implementation across various intervention areas of the project. These activities aim to support farmers and traders within selected value chains. The table below details the farm models and trader models used for this analysis and includes specific assumptions for each model under different scenarios: the situation without the project (WOP), the situation at the mid-term review with the project (WP at MTR), and the projected situation with additional financing (WP at AF).

I. Producers							
CROPPING PATTERNS		WOP		WP at MTR		WP at AF	
Name of AEZ	%	ha	%	ha	%	ha	%
Plateau and mountainous zone							
FARM 1		2.50		2.50		1.05	
Cassava	28%	0.700	42%	1.05	0%	0.000	0%
Cashew	25%	0.625	10%	0.25	0%	0.000	0%
Pepper	0%	0.000	2%	0.05	2%	0.050	5%
Rice	25%	0.625	20%	0.50	20%	0.500	48%
Fruit tree	5%	0.125	6%	0.15	0%	0.000	0%
Vegetables	17%	0.425	20%	0.50	20%	0.500	48%
Total	100%	2.50	100%	2.50	42%	1.05	100%
Tonle sap zone	10070	2.00	10070	2.00	1270	1.00	10070
FARM 2		2.00		2.00		1.00	
Cassava	30%	0.60	38%	0.76	0%	0.00	0%
					0%		0%
Cashew	1%	0.02	3%	0.06		0.00	
Pepper	0%	0.00	4%	0.08	4%	0.08	8%
Rice	25%	0.50	24%	0.48	24%	0.48	48%
Fruit tree	35%	0.70	9%	0.18	0%	0.00	0%
Vegetables	9%	0.18	22%	0.44	22%	0.44	44%
Total	100%	2.00	100%	2.00		1.00	1.00
Plain Mekong zone							
FARM 3		0.90		0.90		0.56	
Cassava	5%	0.05	10%	0.09	0%	0.00	0%
Cashew	0%	0.00	3%	0.03	0%	0.00	0%
Pepper	0%	0.00	0%	0.00	3%	0.03	5%
Rice	50%	0.45	34%	0.31	31%	0.28	50%
Fruit tree	30%	0.27	25%	0.23	0%	0.00	0%
Vegetables	15%	0.14	28%	0.25	28%	0.25	45%
Total	100%	0.90	100%	0.90	62%	0.56	100%
Seed production	10070	0.00	10070	0.00	0270	0.00	10070
FARM 4				1			
Rice	0%	0.00	0%	0.00	100%	3.00	100%
Total	0%	0.00	0%	0.00	100%	3.00	100%
Total	0%	0.00	0%	0.00	100%	3.00	100%
Animal products		WOP		WP at MTR		WP at AF	
Animai products	%	Heads		Heads		Heads	
5404 F	%		%		%		%
FARM 5		100.00		300.00		300.00	
Chicken meat	100%	100.000	100%	300.00	100%	300.00	100%
Total	100%	100.00	100%	300.00	100%	300.00	100%
II. Traders							
Vegetables		WOP		WP at MTR		WP at AF	-
	%	Capacity (kg/year)	%	Capacity (kg/year)	%	Capacity (kg/year)	
Vegetables: Post-harvest facilities/technologies		4,800.00		0.00		8,640.00	
Vegetables	0%	4,800.000	0%	0.00	100%	8,640.000	100%
Total	0%	4,800.00	0%	0.00	100%	8,640.00	100%
Chicken		WOP		WP at MTR		WP at AF	
	%	Capacity (kg/year)	%	Capacity (kg/year)	%	Capacity (kg/year)	
Chicken: Slaughter and cold chain trucks		4,435.20		0.00		4,435	
Chicken carcass	0%	4,435.200	0%	0.00	100%	4,435	100%
Total	0%	4,435.200	0%	0.00	100%	4,435	100%
i Oldi	0%	4,435.20	0%	0.00	100%	4,430.20	100%
Rice		WOP				WP at AF	_
KICE				WP at MTR			
	%	Capacity (kg/year)	%	Capacity (kg/year)	%	Capacity (kg/year)	
Rice: Post-harvest equipment		5,000.00		0.00		9,000.00	
Rice	0%	5,000.000	0%	0.00	100%	9,000.000	100%
Total	0%	5,000.00	0%	0.00	100%	9,000.00	100%

## Table 3. Farm and trader models

- The following table shows the financial and economic prices of outputs and inputs used to project the benefits and costs for each farm and trader model presented in the table above.

## Table 4. Financial and economic prices of outputs and inputs

			Financial Prices @ Design	Financial Prices @ MTR	Financial Prices @ AF	E con omic Prices
Outputs	Description Crops	Unit	2016	2021	2024	\$U SI
- utputs	Cassava wet	t	70	100.0	79.0	77.
	Cassava dry	t	150	175.0		116.
	Rice (wet season) dried	Kg	0.28	0.3		
	Rice (dry season) dried	Kg	0.225	0.3		
	Rice AQIP wet paddy (no aromatic)	Kg Kg	0.315	0.9		
	Chicken (farmyard)	Kg	3.5	4.0		
	Longan 0.28	Kg	1.25	4.0		
	Mango	Kg	0.37	0.3		
	Vegetables (av. leafy veg.)	Kg	0.79	1.3		
	Long bean	kg	0.62	0.8	0.8	
	Pepper White	Kg	15	20.0	20.0	19.
	Cashew Raw	Kg	1.1	1.3	1.6	1.
	Cabbage	Kg	0.49	0.8	0.2	0.
	Chinese Kale	Kg	1	1.5		
	Masta Green	Kg	0.99	1.3		
	Lettuce	Kg	0.58	0.8		
	Cattle (chest 160cm)	cow	750	750.0		
	Black pepper	Kg			20.0	
	Chili	Kg			0.7	
	Cucumber	Kg			0.3	
Inputs	Eggplant Seed	Kg			0.5	0.
inputs	Seed Cassava cutting	bundle	2.50	3.3	3.5	3.
	Rice seed	kg	2.50	0.7		
	Rice seed (AQIP)	kg	0.95	0.9		
	Maize	kg	4.06	3.5		
	Long bean (80 seed)	pack	0.80	1.0	1.1	1.
	Chinese Kale (10gr)	pack	0.77	1.0		1.
	Watermelon	kg	53.91	53.0		
	Pepper tree	tree	5.00	4.4		
	Longan tree Cashew tree/seedling	tree	1.00	1.0		
	Cashew tree/seedling Fertilzer / chemicals	tree	0.75	0.4	0.4	
	Farmyard manure/compost	cart	17	20.0		
	Fertilizer UREA	bag	32	33.8		
	Fertilizer DAP	bag	26	35.0		
	Fertilizer NPK (20:20:15)	bag	29	34.0	36.3	32.
	Mulch & compost for treecrop	tree	0.5	0.5		
	Insecticide	I	40	55.0		
	Herbicide	I	20	29.0		
	Other		35	40.0	0.0	
	Chicken pen (approx 100 chicken) Chicks	pen chick	0.25	40.0		
	Chicks (vaccinated)	chick	1.25	1.4		
	Commercial feed	kg	0.6	0.6		
	Local feed	kg	0.15	0.3		
	Cattle (chest 120cm)	cow	550	550.0	581.4	572.
	Beef feed & treatment	cow	70	70.0	74.0	72.
	Fuel gasoline	1	0.9	1.0	1.1	1.
	Fuel diesel	1	0.8	0.9		
	Poles	pole	4.5	4.5		
	Iron wire	kg	1.1	1.1		
	Pole protection (banana leaf) Pump machine	leaf unit	0.15	0.2 250.0		
	Irrigation system (2850\$/0.1ha)	unit	2650	2850.0		
	Sprinklers	unit	1.9	0.4		
Services					0.0	
	Transportation	t	5.5	7.0	7.5	6.
	Motor bike rent	day	50	65.0		
	Land preparation (tractor)	day	61	75.0		
	Land preparation (animal)	ha	77	77.0		
	Land preparation ridging (tractor) Land clearing	day ha	15	37.5		
	Land clearing Harvesting bulk (cassava)	na t	37	42.0		
	Harvesting tree crop	kg	0.88	0.2		
	Combine harvester	ha	96	87.5		
	Bags	bag	0.15	0.2		
Labour					0.0	
	Family labour	person-day	6	7.5		
	Hired labour Skilled (spraying, fertilizer)	person-day	7	10.0		
Part harves (Parassi	Hired labour Unskilled (land preparation & ha	person-day	6	7.5	8.0	5.
Post-harvest/Processing Outputs						
Vegetable	Raw material	kg	0.5	0.8	0.5	0.
Vegetable	Vegetables processed	kg	0.8	1.3		
Chicken	Livew eight	kg	2.5	3.0		
Chicken	Carcass	kg	3.5	4.0	4.0	3.
Rice	Processed rice	kg	0.28	0.3	1.2	1.
Inputs		_				
Bags/trays for packing	Bas for packing	Bag	0.15	0.2		
Water for cleaning	Water for cleaning vegetable	m3	0.1	0.1		
Vlaterials Electricity	1 kit of knife, scissors,etc Electricity for processing vegetables	unit Kw/h	4	4.0		
=lectricity Other services for commer	Electricity for processing vegetables	m onth	3.00	0.1		
Fransport			5.00	5.0	0.0	
Transport from field		Travel	5.00	5.0		
Fransport to the market		Travel	5.00	5.0		
Labour						
Fransport from field		pers-day	6.0	7.5	8.0	5.
Fransport to the market		pers-day	6.0	7.5	8.0	5.
Shelling/cleaning/Packing		pers-day	7.0	10.0		
Total Labour skilled		pers-day	7.0	10.0		
Total Labour unskilled		pers-day	6.0	7.5	8.0	5.
Investment (maintenance	)					
Equipments Tools						

## Table D. Beneficiary adoption rates and phasing

No. of FFI-OP         19686         0        0	Table D. Beneficially a	aoptio														
OFPARAPartPar	Items	Target HH					MTR									
Adependentation         Trook         open         Adependentation         Space         Spa	OF FARM 1 Plateau & Mountains Zono	15007	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027			
No. of 191-O" APARI P I Parasa A Acousting Xao M PARAM P I Para Parata19900			0%	0%	40%	40%	10%	5%	5%	0%	0%	0%	0%			
AF PARA PlaysesAllowAll													0			
No. of HH1-OF         4400         1         0		1	Ű	0	1202	1202	1001	020	020	0			0			
Tanal         P1011         O         O         Apple         Apple </td <td>Adoption rate</td> <td>70%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>0%</td> <td>40%</td> <td>50%</td> <td>10%</td>	Adoption rate	70%	0%	0%	0%	0%	0%	0%	0%	0%	40%	50%	10%			
Accountainty199100 <td>No. of HH - OF</td> <td>8405</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>3362</td> <td>4203</td> <td>841</td>	No. of HH - OF	8405	0	0	0	0	0	0	0	0	3362	4203	841			
FARM 2 Toris Sign Zone         1514         0         0         0         00 </td <td></td> <td></td> <td></td> <td></td> <td>4202</td> <td>4202</td> <td>1051</td> <td>525</td> <td>525</td> <td>0</td> <td>3362</td> <td>4203</td> <td>841</td>					4202	4202	1051	525	525	0	3362	4203	841			
Alappen rateYP6ONONAP0OP0 <td>Accumulative</td> <td>18911</td> <td>0</td> <td>0</td> <td>4202</td> <td>8404</td> <td>9455</td> <td>9980</td> <td>10505</td> <td>10505</td> <td>13867</td> <td>18070</td> <td>18911</td>	Accumulative	18911	0	0	4202	8404	9455	9980	10505	10505	13867	18070	18911			
Alappen rateYP6ONONAP0OP0 <td></td>																
No. of Harto Of         9460         770         770         700																
Air PARA 2 Toole Bag Zoom1907(D)(D													0%			
Akapan name         79%         0%     <			0	0	3784	3784	946	473	473	0	0	0	0			
No. of Her-OF111761300	-	1					00/	00/		00/	100/	500/	100/			
TealAssumptionState <td></td> <td>10%</td>													10%			
Accumulative         P1142         0         0         37.86         98.11         98.17         94.60         94.60         14.129         190.00         91.11           OF. FARM 3 Plain Zone         197.7         0         0.05								-					1167			
CF. FARM 3 Plain Zone         19179         0         0         400         407         407         408         408         407         407         408         408         407         408         408         407         403         408         408         407         403         408         408         402         403         408         407         408		-														
Acception rate         Tots	Accumulative	21134	0	0	3764	7500	6514	0907	9460	9460	14129	19900	21134			
Acception rate         Tots	OF. FARM 3 Plain Zone	19179														
No. of H41-OF         1342         0         0         27.8         378.0         64.6         47.2         0         0         0           Adeption rate         70%         0%			0%	0%	40%	40%	10%	5%	5%	0%	0%	0%	0%			
Air, F.Azhl Jehin Zone         Association         Total         Image: Application of the section of the		1											0			
No. of HI+ OF         3776         0		-		-						-						
No. of HI+ OF         3776         0			0%	0%	0%	0%	0%	0%	0%	0%	40%	50%	10%			
Total         Part         Total         Total         Total         Part         Total         Part         Total         Part         Total         Part					0								1167			
CF: FAMS 4 Rice ased production         0 <t< td=""><td></td><td></td><td>0</td><td>0</td><td>3784</td><td>3784</td><td>946</td><td>473</td><td>473</td><td>0</td><td></td><td></td><td>1167</td></t<>			0	0	3784	3784	946	473	473	0			1167			
Adoption rate         70%         0%	Accumulative	17201	0	0	3784	7568	8514	8987	9460	9460	14129	19966	21134			
Adoption rate         70%         0%																
No. of HH - OF         0         0         0         0         0         0         0         0         0         0         0           Adoption rate         70%         0%																
Ar. F.ARM A Rice seed production         1294         C <thc< th=""> <thc< th="">         C</thc<></thc<>													0%			
Adoption rate         70%         0%			0	0	0	0	0	0	0	0	0	0	0			
No. of HH - OF         990         O																
Tetal         1284         0<													10%			
Accumulative         999         0													90			
OF, FARM 5 Chicken production         0		1											90			
Adoption rate         70%         0%	Accumulative	699	0	0	0	0	0	0	0	0	360	809	899			
Adoption rate         70%         0%	OF FARM 5 Chicken production	0														
No. of HH - OF         0	-		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
AF, FARM 4 Chicken production       3883       Image: style													0			
Adoption rate         79%         0%			Ŭ	0			0		0				0			
No. of HH - OF         2897         0	-		0%	0%	0%	0%	0%	0%	0%	0%	40%	50%	10%			
Accumulative         2997         0         0         0         0         0         0         1079         2427         26           OF, FARM 5 Spley         0         70%         0%	No. of HH - OF	2697											270			
OF.         FARM 5 Spicy         O         Image: Constraint of the spice of the spic	Total	3853	0	0	0	0	0	0	0	0	1079	1348	270			
Adoption rate         70%         0%	Accumulative	2697	0	0	0	0	0	0	0	0	1079	2427	2697			
Adoption rate         70%         0%																
No. of HH - OF         0         0         0         0         0         0         0         0         0         0         0           AF, FARM 4 Spley         1284         0         0%<																
AF. FARM 4 Spicy       1284       0       0       0%<			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
Adoption rate         70%         0%		-	0	0	0	0	0	0	0	0	0	0	0			
No. of HH - OF         899         0																
Total         1284         0<													10%			
Accumulative         899         0													128			
B. Beneficiaries - Traders         O </td <td></td> <td>128</td>													128			
OF. Vegetable         0         0         0%	Accumulative	899	0	0	0	0	0	0	0	0	514	1156	1284			
OF. Vegetable         0         0         0%	P. Popoficiarios - Tradors															
Adoption rate       95%       0% <td></td> <td>0</td> <td></td>		0														
No. of HH - OF         0			0%	0%	0%	0%	∩%	0%	0%	0%	0%	0%	0%			
AF. Vegetable       147       ///>       //>												0.0	0			
Adoption rate       95%       0% <td></td> <td></td> <td>0</td> <td>5</td> <td></td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>0</td> <td></td> <td>0</td>			0	5		5	5	5	5	5	0		0			
No. of HH - OF       140       0			0%	0%	0%	0%	0%	0%	0%	0%	40%	50%	10%			
Total         147         0 </td <td></td> <td>14</td>													14			
B. Beneficiaries - Traders         0 </td <td></td> <td></td> <td>0</td> <td></td> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td>14</td>			0			0	0	0	0				14			
OF. Chicken         0 <th< td=""><td>Accumulative</td><td>140</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>56</td><td>126</td><td>140</td></th<>	Accumulative	140	0	0	0	0	0	0	0	0	56	126	140			
OF. Chicken         0 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>																
Adoption rate         95%         0%		-														
No. of HH - OF         0																
AF. Chicken       162       0       <													0%			
Adoption rate         95%         0%			0	0	0	0	0	0	0	0	0	0	0			
No. of HH - OF         154         0			001			00/			00/	001	1001	E001	1001			
Total         162         0 </td <td></td> <td>10%</td>													10%			
Accumulative         154         0         0         0         0         0         0         0         0         61         138         1           B. Beneficiaries - Traders         0         0         0         0         0         0         0         0         138         1           B. Beneficiaries - Traders         0         0         0         0         0         0         0         0         138         1           B. Beneficiaries - Traders         0													15 15			
B. Beneficiaries - Traders         0 </td <td></td> <td>15</td>													15			
OF. Rice         0<			0	0	0	0	J	0	0	U	01	136	154			
OF. Rice         0<	B. Beneficiaries - Traders															
Adoption rate         95%         0%		0														
No. of HH - OF         0			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
AF. Rice       141       // <th <="" th=""> <th <="" th=""> <th <="" th="">       //</th></th></th>	<th <="" th=""> <th <="" th="">       //</th></th>	<th <="" th="">       //</th>	//													0
Adoption rate         95%         0%		141					Ĩ			-						
No. of HH - OF         134         0         0         0         0         0         0         0         61         77           Total         141         0         0         0         0         0         0         0         0         61         77           Accumulative         134         0         0         0         0         0         0         0         0         61         77           Accumulative         134         0         0         0         0         0         0         0         0         61         138         1           Total original financing         47700                       Total additional financing         40500 <th<< td=""><td></td><td></td><td>0%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td><td>40%</td><td>50%</td><td>10%</td></th<<>			0%	0%	0%	0%	0%	0%	0%	0%	40%	50%	10%			
Total         141         0         0         0         0         0         0         0         61         77           Accumulative         134         0		134											15			
Accumulative         134         0	Total	141	0										15			
Total original financing         47700         Image: Constraint of the state of	Accumulative	134											154			
Total 88200																
Traders 450 450 450 450 450 450 450 450 450 450			ļ		ļ			ļ,								
	Traders	450		I												

Table E

#### E. 1 Economic cash flow – Overall project

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Year 20	Year 15	Year 10
Incremental benefits	-	-	- 6,260,772	14,063,287	50,885,785	80,119,120	110,939,033	139,213,598	161,081,596	193,566,706	233,540,093	266,207,784	293,485,097	318,101,422	336,256,768	352,672,567	368,676,606	381,211,025	387,917,945	389,023,143	1,102,000,907	762,490,731	346,538,928
2017		-														-		-					
2018	- 3		-	-				-		-	-	-		-	-	-	-	-	-				
2019	- (	-	- 6,260,772	20,324,059	32,126,918	43,693,783	57,455,610	64,278,170	72,776,736	83,774,612	90,002,985	93,194,983	93,200,353	93,205,723	93,211,093	93,216,463	93,221,833	93,227,203	93,232,573	93,237,943			
2020	- (			- 6,260,772	20,324,059	32,126,918	43,693,783	57,455,610	64,278,170	72,776,736	83,774,612	90,002,985	93,194,983	93,200,353	93,205,723	93,211,093	93,216,463	93,221,833	93,227,203	93,232,573			
2021	- 1				1,565,193	5,081,015	8,031,730	10,923,446	14,363,902	16,069,543	18,194,184	20,943,653	22,500,746	23,298,746	23,300,088	23,301,431	23,302,773	23,304,116	23,305,458	23,306,801			
2022	- 2			-	-	- 782,597	2,540,507	4,015,865	5,461,723	7,181,951	8,034,771	9,097,092	10,471,826	11,250,373	11,649,373	11,650,044	11,650,715	11,651,387	11,652,058	11,652,729			
2023	- 3				-		- 782,597	2,540,507	4,015,865	5,461,723	7,181,951	8,034,771	9,097,092	10,471,826	11,250,373	11,649,373	11,650,044	11,650,715	11,651,387	11,652,058			
2024		-	-	-			-	-	-	-	-	-	-	-	-	-		-		-			
2025	- 5	-		-	-	-	-	-	185,200	8,084,444	16,237,532	22,654,072	32,654,590	40,199,015	45,240,442	53,045,131	58,010,609	62,372,309	62,372,309	62,372,309			
2026	- i		-		-		-	-	-	217,697	10,070,518	20,266,125	28,312,281	40,812,929	50,237,090	56,551,614	66,313,846	72,520,693	77,972,818	77,974,167			
2027				-				-		-	43,539	2,014,104	4,053,225	5,662,456	8,162,586	10,047,418	11,310,323	13,262,769	14,504,139	15,594,564			
Incremental cost	-	-	28,501,366	55,458,084	66,196,031	73,389,380	82,272,928	87,721,157	120,725,613	150,764,896	150,737,967	150,470,005	150,919,381	155,315,119	159,660,396	163,526,134	165,884,064	170,216,220	174,656,435	175,532,891	711,574,084	557,902,304	334,288,462
2017		-						-										-					
2018	- 3		-		-		-	-	-	-				-			-	-		-			
2019			28,501,366	26,956,718	32.113.971	30,973,559	36.338.616	36,255,315	39.352.230	41.268.474	41.716.312	45.698.773	45,704,143	45,709,513	45,714,883	45,720,253	45,725,623	45,730,993	45,736,362	45.741.732			
2020	- 1	-	-	28,501,366	26,956,718	32,113,971	30,973,559	36,338,616	36,255,315	39,352,230	41,268,474	41,716,312	45,698,773	45,704,143	45,709,513	45,714,883	45,720,253	45,725,623	45,730,993	45,736,362			
2021	-		-	-	7,125,342	6,739,180	8,028,493	7,743,390	9.084.654	9.063.829	9.838.058	10.317.119	10,429,078	11,424,693	11.426.036	11,427,378	11,428,721	11,430,063	11,431,406	11.432.748			
2022			-		-	3,562,671	3,369,590	4,014,246	3.871.695	4,542,327	4,531,914	4,919,029	5,158,559	5,214,539	5,712,347	5,713,018	5,713,689	5,714,360	5,715,032	5,715,703			
2023				-		-	3,562,671	3,369,590	4,014,246	3,871,695	4,542,327	4,531,914	4,919,029	5,158,559	5,214,539	5,712,347	5,713,018	5,713,689	5,714,360	5,715,032			
2024	-	-		-			-	-	.,	-				-	-	-	-	-	-	-			
2025	-							-	28,147,473	17,482,000	19,951,513	13,976,967	16,550,712	17,921,040	19,344,102	20,577,869	21,024,400	24,476,525	24,476,525	24,476,525			
2026								-	-	35,184,341	21,852,500	24,939,391	17,471,209	20,688,391	22,401,300	24,180,128	25,722,336	26,280,500	30,595,657	30,595,657			
2027											7.036.868	4,370,500	4,987,878	3,494,242	4,137,678	4,480,260	4,836,026	5,144,467	5,256,100	6,119,131			
Investment	-	-	6,003,442	12,006,883	18,010,325	12,006,883	6,003,442	6,003,442	7,548,316	12,580,526	5,032,210	-	-	-	.,	.,,	.,,	-	-	-	46,368,589	46,368,589	44,604,830
2017			0,000,442	-	10,010,515	12,000,000	0,000,442	0,000,442	7,540,510	12,500,520	5,052,210										40,500,505	40,500,505	44,004,000
2018								-				-											
2019			6,003,442																				
2020			-	12,006,883				-				-											
2021				-	18,010,325			-				-				-							
2022					10,010,525	12,006,883		-										-					
2022						-	6,003,442																
2023							0,003,442	6,003,442															
2024								-	7,548,316														
2025					-			-	7,546,516	12,580,526				-			-	-					
2020		-	-		-		-			12,300,320	5,032,210												
Operation cost	136,075	136,075	272,149	544,298	680,373	544,298	272,149	136,075	1,132,992	1,100,621	1,003,507	-				-		-			3,001,789	3,001,789	2,650,066
2017			272,149	544,290	000,373	544,298	272,149	130,075	1,132,992	1,100,621	1,003,507	-		-	-	-		-		-	3,001,789	3,001,789	2,050,000
2017		136,075			-				-					-		-	-	-		-			
2010		130,075	272,149		-													-		-			
			272,149																				
2020				544,298	-		-	-		-		-		-		-	-	-		-			
2021				-	680,373	-		-				-		-				-					
2022					-	544,298	-	-															
2023		-	-	-	-		272,149	-		-		-		-		-	-	-		-			
2024				-				136,075	-			-				-		-		-			
2025			-	-	-			-	1,132,992	-	-	-			-	-	-	-					
2026								-		1,100,621	-	-				-	-	-					
2027				-	-	-	-			-	1,003,507			-			-			-			
Incremental cash flow	- 136,075				34,000,944	- 5,821,442	22,390,514	45,352,925	31,674,675	29,120,663	76,766,408	115,737,779	142,565,716	162,786,303	176,596,372	189,146,433	202,792,542	210,994,805	213,261,510	213,490,252	341,056,445	155,218,050	- 35,004,430
Aggregated cash flow	- 136,075	- 272,149	- 41,309,878	- 95,255,857 -	129,256,801	- 135,078,243	- 112,687,729	- 67,334,804 -	35,660,129	- 6,539,466	70,226,942	185,964,721	328,530,437	491,316,740	667,913,112	857,059,545	1,059,852,088	1,270,846,893	1,484,108,403	1,697,598,655			
			10 years	Benefit	0%																		
	20 years	15 years																					
NPV	\$341,056,444.67	\$155,218,049.61	(\$35,004,429.84)	Cost	0%																		
NPV FIRR	\$341,056,444.67 29.132%	\$155,218,049.61 6 24.840%	(\$35,004,429.84) -1.10%	Cost	0%																		
NPV FIRR B/C	\$341,056,444.67	\$155,218,049.61 6 24.840%	(\$35,004,429.84)	Cost	0% <b>0%</b>																		
NPV FIRR B/C Payback period	\$341,056,444.67 29.132%	\$155,218,049.61 6 24.840% 6 \$1.26	(\$35,004,429.84) -1.10% \$0.91	Cost	0% <b>0%</b>																		
NPV FIRR B/C Payback period FNPV/Beneficiary	\$341,056,444.67 29.132% \$1.45	\$155,218,049.61 5 24.840% 5 \$1.26 8 10.38	(\$35,004,429.84) -1.10% \$0.91	Cost	0% <b>0%</b>																		
	\$341,056,444.67 29.132% \$1.45 10.38	\$155,218,049.61 \$24.840% \$1.26 8 10.38 7 1760	(\$35,004,429.84) -1.10% \$0.91 10.38	Cost	0% <b>0%</b>																		

E.2 Economic cash flow – Additional financing

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Year 20	Year 15	Year 10
Incremental	185,200	8,302,142	26,351,590	44,934,300	65,020,096	86,674,400	103,640,118	119,644,163	135,634,778	148,155,772	154,849,266	155,941,039	155,941,039	155,941,039	155,941,039	155,941,039	155,941,039	155,941,039	155,941,039	155,941,039	739,499,149	597,985,117	370,458,015
2025	185200	8084444	16237532	22654072	32654590	40199015	45240442	53045131	58010609	62372309	62372309	62372309	62372309	62372309	62372309	62372309	62372309	62372309	62372309	62372309			
2026	0	217697	10070518	20266125	28312281	40812929	50237090	56551614	66313846	72520693	77972818	77974167	77974167	77974167	77974167	77974167	77974167	77974167	77974167	77974167			
2027	0	0	43539	2014104	4053225	5662456	8162586	10047418	11310323	13262769	14504139	15594564	15594564	15594564	15594564	15594564	15594564	15594564	15594564	15594564			
Incremental	28147473	52666341	48840882	43286858	39009799	42103672	45883080	49238257	51582761	55901492	60328282	61191314	61191314	61191314	61191314	61191314	61191314	61191314	61191314	61191314	417966722	362436571	273307195
2025	28147473	17482000	19951513	13976967	16550712	17921040	19344102	20577869	21024400	24476525	24476525	24476525	24476525	24476525	24476525	24476525	24476525	24476525	24476525	24476525			
2026	0	35184341	21852500	24939391	17471209	20688391	22401300	24180128	25722336	26280500	30595657	30595657	30595657	30595657	30595657	30595657	30595657	30595657	30595657	30595657			
2027	0	0	7036868	4370500	4987878	3494242	4137678	4480260	4836026	5144467	5256100	6119131	6119131	6119131	6119131	6119131	6119131	6119131	6119131	6119131			
Investment	7548316	12580526	5032210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21040008	21040008	21040008
2025	7548316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2026	0	12580526	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2027	0	0	5032210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Operation co	1132992	1100621	1003507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2693547	2693547	2693547
2025	1132992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2026	0	1100621	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2027	0	0	1003507		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Incremental	-36643580	-58045346	-28525009	1647442	26010297	44570728	57757038	70405907	84052016	92254279	94520984	94749726	94749726	94749726	94749726	94749726	94749726	94749726	94749726	94749726	297798872	211814992	73417265
Aggregated (	-36643580	-94688926	-123213936	-121566494	-95556197	-50985469	6771569	77177476	161229492	253483771	348004755	442754481	537504207	632253932	727003658	821753384	916503110	1011252836	1106002561	1200752287			
	20 years	15 years	10 years																				
NPV	1 . 7	\$211,814,991.84	\$73,417,265.36		0%																		
FIRR D/C	28.816%	27.506%	20.59%	COST	0%																		
B/C	\$1.67	\$1.55	\$1.25																				
Payback period	6.88 7353	6.88 5230	6.88																				
FNPV/Beneficiary	/353 -40%		1813																				
Switching value - Switching value -	-40% 67%	-35% 55%	-20%																				
Switching value -	b/%	55%	25%																				

Variables	۵%	Overa	all project		litional ancing	Link with the risk matrix
Variables	Δ70	IRR (%)	NPV (USD M)	IRR (%)	NPV (USD M)	
Base scenario		29.1%	341.1	28.8%	297.8	
Project benefits	-10%	23.7%	230.9	24.9%	223.8	Combination of risks affecting
Project benefits	-20%	17.7%	120.7	20.7%	149.9	output prices, yields and adoption rates
Project costs	10%	24.7%	269.9	25.6%	256.0	Increase of construction
Project costs	20%	20.5%	198.7	22.7%	214.2	material prices
Output prices	-10%	28.8%	335.7	28.74%	296.5	Low management, negotiating
Output prices	-20%	28.4%	330.3	28.66%	295.1	capacity of farmers groups, market price fluctuation, external shocks
Input prices	10%	26.1%	298.0	26.4%	270.3	Market price fluctuations and
Input prices	20%	23.3%	254.9	24.2%	242.8	external shocks
Adoption rate (60	%)	28.2%	285.5	28.2%	252.8	
Adoption rate (75	%)	29.5%	368.8	29.1%	320.3	Quality of technical assistance and access to technologies
Adoption rates	-20%	27.7%	263.0	27.9%	233.5	
Evaluation period years)	(15	24.8%	155.2	27.5%	211.8	Uncertainty about the continuation of the activities
Evaluation period years)	(10	-1.1%	-35.0	20.6%	73.4	supported by the project in the short, medium and/or long term
Social discount rat percent)	te (9	na	399.6	na	341.5	Linked with political and economic stability and macroeconomic context

### Table F Sensitivity analysis