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Investing in rural people

President's memorandum

Proposed additional financing to

Republic of Sierra Leone for the

Agriculture Value Chain Development Project

Project ID:2000001544

Note to Executive Board representatives

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Abbreviations and acronyms

AVDP	Agriculture Value Chain Development Project
AWP/B	annual workplan and budget
IFAD10	Tenth Replenishment of IFAD's Resources
M&E	monitoring and evaluation
NPCU	National Programme Coordination Unit
OPEC Fund	OPEC Fund for International Development

Financing summary

Initiating institution:	IFAD
Borrower/recipient:	Republic of Sierra Leone
Executing agency:	Ministry of Agriculture and Forestry
Total project cost:	US$101.2 million
Amount of original IFAD financing:	US$11.8 million
Terms of original IFAD financing:	50 per cent Debt Sustainability Framework (DSF) grant and 50 per cent loan on highly concessional terms, over 40 years, including a grace period of 10 years, with a service charge of three quarters of 1 per cent (0.75 per cent per cent) per annum.
Amount of additional IFAD financing:	US$12.3 million
Terms of additional IFAD financing:	27 per cent DSF grant and 73 per cent loan on highly concessional terms, over 40 years, including a grace period of 10 years, with a service charge of 1.46 per cent per annum. Principal is to be repaid at 4.5 per cent of the total each year for years 11 to 30, and 1 per cent of the total per annum for years 31 to 40.
Amount of IFAD climate finance:	US$2.5 million
Cofinanciers:	Adaptation Fund; Tony Blair Institute; OPEC Fund for International Development (OPEC Fund)
Amount of cofinancing:	Adaptation Fund: US$9.2 million(grant) Tony Blair Institute: US$0.15 million (grant)
Financing gap:	US$5 million
Contribution of borrower/recipient:	US$14.5 million (taxes and duties)
Contribution of beneficiaries:	US$2.7 million
Contribution from private sector:	US$2.1 million
OPEC Fund cofinancing:	US$15 million
Appraising institution:	IFAD
Cooperating institution:	Directly supervised by IFAD

Recommendation for approval

The Executive Board is invited to approve the recommendation contained in paragraph 52.

I. Background and project description

A. Background

1. The Agriculture Value Chain Development Project (AVDP) was approved by the IFAD Executive Board through the lapse-of-time (LOT) procedure in December 2018, with financing of US$11.8 million in the form of a US$5.9 million loan and a US$5.9 million grant from the Tenth Replenishment of IFAD's Resources (IFAD10). A financing gap of US$28.5 million was foreseen at design stage, equivalent to the amount expected to be allocated to the Republic of Sierra Leone under IFAD11.

2. In December 2018, the Executive Board officially confirmed the IFAD11 allocation for Sierra Leone in the amount of US$40.8 million, or US$12.3 million beyond the US$28.5 million financing gap originally foreseen.

3. In March 2019, the Government of Sierra Leone subsequently requested that the full IFAD11 amount of US$40.8 million be allocated to the AVDP. In September 2019, the IFAD Executive Board approved an additional financing proposal of US$28.5 million to cover the original financing gap. In addition, an increase in the project scope and overall costs was also approved by the Executive Board, to be financed under the remaining balance of the IFAD11 performance-based allocation system (PBAS) allocation for Sierra Leone, i.e. US$12.3 million. The planned cofinancing of US$20 million from the OPEC Fund for International Development (OPEC Fund) was reflected in the project financing. The project cost tables, economic and financial analysis, logical framework and social, environmental and climate assessment were updated accordingly in the President's Memorandum approved by the Executive Board in September 2019.

4. This additional financing proposal of US$12.3 million for the AVDP project for Executive Board approval thus refers to the financing gap identified and approved by the Executive Board in September 2019.

B. Original project description

Project goal and development objective

5. The overall goal of the AVDP is to improve the livelihoods, food security and climate resilience of rural farming households in Sierra Leone. The project development objective is to increase the income of smallholder farmers through the promotion of agriculture as a business.

6. The main outcomes by component are as follows:

7. **Component 1: Climate-resilient and climate-smart agricultural production.** The expected outcome of component 1 is that the volume and value of production are increased and more climate-resilient production systems established.

8. **Component 2: Agricultural market development.** The expected outcome of this component is improved performance and organization of the selected value chains for increased smallholder production and productivity.

9. **Component 3: Project coordination and management.** The expected outcome is effective and efficient project implementation, with greater transparency and policy engagement for the project.

II. Rational for additional financing

A. Rationale

10. Sierra Leone's economic development and rural poverty reduction remain anchored in agricultural development. The project will exploit the considerable untapped potential for increasing the production and productivity of both staple and cash crops and thereby offer flexibility and choice to beneficiaries to improve their livelihoods and support climate resilience and nutrition.

11. This additional financing will ensure implementation of the activities, in compliance with the proposal approved by the Executive Board in 2019, to achieve the objective of improving the livelihoods, food security and climate resilience of rural farming households.

12. The Government also requested US$20 million from the OPEC Fund, whose Board approved only US$15 million. These resources will be used for further rehabilitation and maintenance of rural roads, which is a priority in the Government's Medium-term National Development Plan 2019-2023 and its New Direction People's Manifesto. These amounts were incorporated into the overall project costs presented in the President's Memorandum approved by the Board in 2019.

13. In line with IFAD11 mainstreaming commitments, the project has been validated as:

☒Including climate finance;

☒Gender transformational;

☒ Nutrition-sensitive;

☒ Youth-sensitive.

B. Description of geographical area and target groups

14. The AVDP will be implemented in all 16 districts of Sierra Leone. The poverty rates in all the districts range from 50 to 62 per cent, with the exception of the Western Area Urban District, where the rate is 20.7 per cent. Moyamba and Tonkolili have the highest poverty rates: 70.8 per cent and 76.4 per cent, respectively. The widespread poverty in the country justifies the national geographic coverage of the AVDP. While rice is produced throughout the country, the production of cocoa, palm oil, vegetables and tubers is localized within specific districts, and thus, the composition and intensity of project interventions will vary from district to district.

15. The profile of the target population remains unchanged from the original approved design: men, women and youth. However, with the additional financing, project outreach has expanded and the number of direct beneficiaries has grown from 204,000 (or 34,000 households) in the original design report to 258,000 (or 43,000 households).

C. Components, outcomes and activities

16. The project design, including all the proposed financing sources, will have the following characteristics:

17. **Component 1: Climate-resilient and climate-smart agricultural production.** The expected outcome is an increase in the volume and value of production and more climate-resilient production systems. Component 1 has three subcomponents, as follows:

    (i) **Subcomponent 1.1: Support for smallholder rice production and productivity.** The project would initially support 10,000 rice farmers by providing technical assistance through farmer field schools (FFSs) and financial support for the development of inland valley swamps to allow for double or triple rice cropping and improved access to quality inputs and mechanized farming services. With the additional financing, another 625 rice farmers will be reached. Furthermore, more farmers will have access to irrigation through boreholes and earth dams.

(ii) **Subcomponent 1.2: Support for tree crop production and productivity.** The original design involved work with 13,000 farmers (5,000 cocoa and 8,000 palm oil producers) receiving technical assistance and support for the establishment of 1-hectare plots on fallow or abandoned agricultural land. No deforestation to clear land for smallholder plantations is permitted. No large plantations will be supported. With the additional financing, another 2,000 tree crop farmers will be reached.

(iii) **Subcomponent 1.3: Support for smallholder vegetable and tuber production.** This is a new subcomponent, to be financed with the proposed additional IFAD funds. The subcomponent will facilitate increased access to improved vegetable seeds, fertilizer and agrochemicals; set up irrigation; support mechanization for land preparation and harvesting; and improve on-farm and off-farm storage and processing facilities to reduce post-harvest losses.

18. **Component 2: Agricultural market development.** The expected outcome is improved performance and organization of the selected value chains for increased smallholder production and productivity. The component has two subcomponents:

(i) **Subcomponent 2.1: Market access.** This focuses on improving the business skills of agribusiness centres. Farmers' organizations and FFSs and facilitating value chain organizations and deal-making through the establishment of provincial multi-stakeholder platforms. The additional financing will result in only marginal changes to this subcomponent, as the project is promoting private sector counterpart funds to ensure ownership.

(ii) **Subcomponent 2.2: Climate-resilient rural infrastructure.** This subcomponent originally involved the rehabilitation of warehouses to improve product drying and storage capacity, the provision of potable water and latrines and the rehabilitation of feeder roads and farm tracks. The additional financing and OPEC Fund cofinancing will enable the project to increase the amount of rehabilitated feeder roads from 100 km to 420 km and the amount of farm tracks built from 150 km to 350 km and make spot improvements on approximately 150 km of trunk roads. Additionally, some buildings will be financed to house the frontline staff of the Ministry of Agriculture and Forestry in the areas with the highest concentration of project activities.

19. **Component 3: Project coordination and management.** The objective of this component is to facilitate effective and efficient project implementation and monitoring and evaluation (M&E). With the additional financing, frontline staff will be hired, particularly engineers to facilitate the roadworks. Also, drawing on the proposed scaling-up of financing, with the objective of enhancing the ability of the Ministry of Agriculture and Forestry to deliver agricultural transformation and meet the targets of the Medium-term National Development Plan 2019-2023, the project will set-up a delivery unit with support from the Tony Blair Institute.

D. Costs, benefits and financing

Project costs

20. The total combined AVDP investment and incremental recurrent costs, including physical and price contingencies, are estimated at US$101.2 million.
Table 1 presents a summary of the breakdown of original and additional financing, while table 2 presents a breakdown of the costs by component and subcomponent for the additional financing, cofinancing and the financing gap. Component 1, climate-resilient and climate-smart agricultural production, will receive an additional US$29.8 million (43 per cent of the additional costs), while component 2, agricultural market development, will receive US$29.0 million

(42 per cent of additional costs), and US$10.4 million (15 per cent of additional project costs) will be allocated for component 3, project coordination and management. Table 3 below presents the additional project costs by expenditure category and financier, while table 4 presents project costs by component and year.

21. Project component 1: climate-resilient and climate-smart agricultural production, and in particular, subcomponents 1.1 and 1.2, each contribute in part to IFAD climate finance. The total IFAD climate finance for this project has been preliminarily calculated at US$ 2.5 million representing 20.2 per cent of IFAD's investment.

Table 1
Original and additional financing summary
(Thousands of United States dollars)

	Original financing	*IFAD additional loan and grant 1*[a]	*IFAD additional loan and grant 2*[b]	*Cofinancing*[c]	*Financing gap*[d]	*Total*
IFAD loan	5 895	20 805	8 998			35 698
IFAD grant	5 895	7 695	3 328			16 918
Subtotal IFAD	11 790	28 500	12 326			52 616
Adaptation Fund	9 156					9 156
OPEC Fund[c]				15 000		15 000
Tony Blair Institute				145		145
Beneficiaries/ private sector	2 772			1 986		4 760
Borrower/recipient	8 084			6 416		14 500
Financing gap[d]					5 000	5 000
Total	**31 802**	**28 500**	**12 326**	**23 547**	**5 000**	**101 175**

a. In September 2019, the IFAD Executive Board approved a financing proposal of US$28.5 million to cover the original financing gap.
b. The IFAD additional loan and grant 2 of US$12.36 million is the amount currently being requested for approval.
c. The US$15 million in OPEC Fund financing approved by the OPEC Fund Board in December 2020.
d. Financing gap included to reflect the US$5 million from OPEC Fund that has not materialized.

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

Component/ Subcomponent	*IFAD additional loan 1*		*IFAD additional grant 1*		*IFAD additional loan 2*		*IFAD additional grant 2*		*OPEC Fund*		*Financing gap*		*Tony Blair Institute*		*Private sector, beneficiaries*			*Government*			*Total*	
	Amount	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Cash*	*In-kind*	*%*	*Cash*	*In-kind*	*%*	*Amount*	*%*
1. Climate-resilient and climate-smart agricultural production																						
1.1 Support for smallholder rice production and productivity	6 637	45	2 455	17	3 252	20	1 047	8							125	169	2	1207		8	14 869	21.22
1.2. Support for tree crop production and productivity	6 619	51	2 448	19	2 250	17	905	7							88	92	1	557		4	12 959	18.8
1.3 Support for smallholder vegetable and tuber production		-		-	1 220	59	500	25									-	308		15	2 028	3
Subtotal	13 256	44	4 903	16	6 722	21	2 452	9	-	-	-	-	-		190	261	2	2 072	-	7	29 856	43
2. Agricultural market development																						
2.1. Market access	1 112	41	411	15	-		-								298	673	37	168		6	2 686	4
2.2. Climate-resilient rural infrastructure and information	2 105	8	779	3	-		-		15 000	57	5 000	19			363	177	2	2 971		11	26 395	38
Subtotal	3 217	11	1 190	4	-		-		15 000	52	5 000	17	-		662	873	5	3 139		11	29 080	42
3. Project coordination and management																						
Project coordination and management	4 332	41	1 602	15	2 276	22	876	9				0	145	1				1 205		11	10 436	15
Total	**20 805**	**30**	**7 695**	**11**	**8 998**	**12**	**3 328**	**5**	**15 000**	**22**	**5 000**	**7**	**145**	**0.21**	**875**	**1 111**	**3**	**6 416**	**-**	**9**	**69 372**	**100**

Table 3
Additional financing: project costs by expenditure category and financier
(Thousands of United States dollars)

	IFAD Additional loan 1		*IFAD Additional grant 1*		*IFAD Additional loan 2*		*IFAD Additional grant 2*		*OPEC Fund*		*Financing gap*		*Tony Blair Institute*		*Private sector, beneficiaries*			*Government*			*Total*	
Component/ Subcomponent	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Cash*	*In-kind*	*%*	*Cash*	*In-kind*	*%*	*Amount*	*%*
I. Investment costs																						
A. Civil works	2 105	8	779	3	1 287	4	448	2	12 798	51	4 000	16		-	380	216	2	3 130		13	25 142	35.9
B. Goods, equipment and vehicles		-		-	1 247	58	455	25		-		-		-			-	363		17	2 065	3.1
C. Technical assistance	2 851	27	1 055	10	967	9	414	4	2 202	21	1 000	9	145	1	282	658	9	1009		10	10 582	15.2
D. Grants and subsidies	13 081	55	4 838	20	3 277	13	1 201	6		-		-		-	213	238	2	999		4	23 846	34.4
Total investment costs	**18 037**	**29**	**6 671**	**11**	**6 778**	**10**	**2 517**	**4**	**15 000**	**24**	**5 000**	**8**	**145**	**0.24**	**875**	**1 111**	**3**	**5 501**	**-**	**9**	**61 634**	**88.7**
II. Recurrent costs																						
A. Salaries and allowances	1 940	38	718	14	1 746	34	608	15												-	5 012	7.4
B. Operating costs	828	30	306	11	474	17	203	7										915		34	2 726	3.9
Total recurrent costs	**2 768**	**35**	**1 024**	**13**	**2 220**	**28**	**811**	**12**										**915**		**12**	**7 738**	**11.3**
Total	**20 805**	**30**	**7 695**	**11**	**8 998**	**12**	**3 328**	**5**	**15 000**	**22**	**5 000**	**7**	**145**	**0.21**	**875**	**1 111**	**3**	**6 416**	**-**	**9**	**69 372**	**100**

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

	PY1 (2020)		PY2 (2021)		PY3 (2022)		PY4 (2023)		PY5 (2024)		PY6 (2025)		Total
Component/subcomponent	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*
1. Climate-resilient and climate-smart agricultural production													
1.1. Support for smallholder rice production and productivity	667	2	8 606	30	9 764	34	5 699	20	3 047	11	705	3	28 488
1.2. Support for tree crop production and productivity	1 058	6	4 830	25	9 917	52	3 174	17	53	-	53	-	19 083
1.3. Support for smallholder vegetable and tuber production	1 028	50	764	37	259	13	-	-	-	-	-	-	2 051
Subtotal	**2 752**	**6**	**14 240**	**29**	**19 940**	**40**	**8 873**	**18**	**3 100**	**5**	**758**	**2**	**49 623**
2. Agricultural market development													
2.1. Market access	963	16	1 579	27	1 337	23	795	14	595	10	607	10	5 875
2.2. Climate-resilient rural infrastructure	2 727	9	8 178	28	7 978	27	7 093	24	1 785	6	1 651	6	29 413
Subtotal	**3 689**	**10**	**9 757**	**28**	**9 315**	**26**	**7 888**	**22**	**2 380**	**7**	**2 258**	**7**	**35 288**
3. Project coordination and management													
Project coordination and management	4 358	27	2 639	16	2 657	16	2 672	16	1 905	12	2 033	13	16 265
Subtotal	**4 358**	**27**	**2 639**	**16**	**2 657**	**16**	**2 672**	**16**	**1 905**	**12**	**2 033**	**13**	**16 265**
Total	**10 800**	**11**	**26 596**	**26**	**31 912**	**32**	**19 432**	**19**	**7 385**	**7**	**5 049**	**5**	**101 175**

Financing and cofinancing strategy and plan

22. In December 2018, the IFAD Executive Board approved US$11.8 million in financing for the AVDP, consisting of an IFAD loan and IFAD grant, each in the amount of US$5.9 million. In September 2019, the Executive Board approved the additional financing proposal of US$28.5 million to cover the original financing gap. The original IFAD financing also included a contribution from the borrower/recipient of US$8.1 million and contributions of approximately US$2.8 million from beneficiaries and the private sector. Furthermore, US$9.2 million from the Adaptation Fund has been mobilized.

23. As mentioned earlier, the project was reviewed and altered to accommodate an additional US$20 million in cofinancing from the OPEC Fund, whose board approved US$15 million in December 2020.

24. The revised project proposal presented to the Executive Board in September 2019 included an amount of US$12.3 million (an IFAD loan of US$8.6million and an IFAD Debt Sustainability Framework grant of US$3.7 million) to be approved at a later stage under IFAD11. This second additional financing of US$12.3 million is therefore presented herein for approval by the IFAD Executive Board. With this additional financing, the Tony Blair Institute has also provided cofinancing in an amount of US$0.15 million, while the Government will provide US$6.4 million in additional counterpart funds. Beneficiaries and the private sector will further contribute approximately US$2 million respectively.

Disbursement

25. The IFAD financing shall be disbursed against duly certified withdrawal applications, in accordance with IFAD disbursement procedures. Three standard disbursement procedures may be used for the withdrawal of financing: (i) advance withdrawal; (ii) direct payment; and (iii) reimbursement.

26. The designated account for the IFAD financing will be operated and replenished following imprest account arrangements. The authorized allocation will be outlined in the letter to the borrower/recipient.

27. The borrower/recipient will open separate designated accounts in United States dollars on behalf of the project at a commercial bank for each of the financing sources. The funds will not be mingled. The disbursements will be front-loaded, with around two thirds of the funds being disbursed by project midterm.

Summary of benefits and economic analysis

28. The economic analysis shows that the project has the capacity to generate an economic rate of return (ERR) of 32 per cent over a 20-year period, with a net present value of Sierra Leonean leone 583,734 billion (approximately US$67.3 million). Given the many unquantifiable benefits, the actual ERR will likely be higher than this.

Exit strategy and sustainability

29. The overall exit strategy for the AVDP includes consolidating the achievements of the “legacy farmers” involved in IFAD-supported projects in the past. Private sector partners will be identified to provide market outlets for all value chains. In areas where large private-sector processors do not exist, the project will promote the establishment of small-scale oil presses, rice mills, etc. at various strategic locations. The AVDP will strengthen the capacity of farmers’ organizations to collectively plan production, purchase inputs and sell their produce through stable private-sector engagement.

30. In coordination with the Rural Finance and Community Improvement Programme Phase II, the project will seek to ensure that farmer-based organizations (FBOs) are sustainably accessing rural financial services for inputs. In addition, productive investments will be climate-proofed through financing from the Adaptation Fund.

Finally, through policy engagement, the project will help maintain the Government's focus on the rural poor and build its capacity to support the target group after project completion.

III. Risk management

A. Risks and mitigation measures

31. Since governance issues could compromise the expected impacts on communities and increase project costs, the risk is classified as high. Elite capture of outputs – especially physical assets, which are intended for well-defined target groups – is another problem associated with poor governance. These governance risks will be mitigated by supplementing the Government's initiatives with: (i) increased transparency measures and publicity about the distribution of outputs; (ii) training in financial management, procurement, M&E and reporting procedures for implementers at all levels; (iii) implementation of a clear targeting strategy; and (iv) continued improvement of the grievance mechanism for beneficiaries. During implementation of the AVDP, the Good Governance Framework developed for the Smallholder Commercialization Programme/Global Agriculture and Food Security Programme (SCP-GAFSP) will be applied.

32. Risks related to institutional implementation capacity and sustainability are considered moderate. Project coordination failure is a risk, especially among and within non-state actors and private agribusinesses. Private stakeholders consistently indicate that institutions that provide critical support services to private sector investors remain weak and the coordination among them fragmented. The project will mitigate this risk by ensuring that the project implementation unit (PIU) has clear mechanisms for effective coordination during project implementation.

B. Environment and social category

33. The AVDP is not expected to have negative social or environmental impacts overall. However, since small commercial agricultural activities may produce unexpected cumulative impacts, careful design of an appropriate monitoring system is critical. The major concerns are associated with greater use of fertilizers and pesticides, which could potentially result in wider distribution of these products, in addition to their negative impacts on biodiversity and human health. The following are considered to be sufficient mitigation measures: training in proper use and disposal; adoption of the principles of the Food and Agriculture Organization of the United Nations' International Code of Conduct on the Distribution and Use of Pesticides; and the design of an environmental monitoring system in partnership with the Sierra Leone Environmental Protection Agency. Based on this information, the project has been classified as category B in accordance with IFAD's classification standards.

34. The promotion of palm oil is considered to entail limited risks, as only smallholder oil palm plantations of a maximum of 1 hectare will be established under the project. Large plantations will not be supported. Furthermore, new smallholder plantations will be established only on fallow or abandoned agricultural land, with no deforestation being accepted. Moreover, oil palm (*Elaeis guineensis*) is indigenous to West Africa and is therefore a natural part of the vegetation in Sierra Leone. The palm oil produced will be used largely for cooking and sold on the domestic market.

C. Climate risk classification

35. The AVDP is categorized as a high-risk project for climate. The project offers an opportunity to transform the Sierra Leone agricultural sector into a sustainable, climate-smart production system, boosting productivity and increasing the resilience and adaptive capacity of rural smallholder farmers. Strengthening the meteorological office – with capacity-building and the dissemination of climate

information to rural smallholder farmers – will increase agricultural resilience. However, the most important climate risk is the projected climate change, which suggests that Sierra Leone will suffer increasingly reduced climate suitability for cocoa over the next 30 years. Maximum temperatures are expected to increase. While overall precipitation is not projected to change significantly, annual rainfall variability may result in an increased risk of droughts and dry spells during the dry season and storms and floods during the rainy season. Greater risk of surface runoff increases the risk of river flooding, landslides and damage to road infrastructure.

IV. Implementation

A. Compliance with IFAD policies

36. The project is aligned with IFAD11 priorities and policies on a range of parameters by (i) addressing gender, youth, nutrition and climate change, and therefore supporting the IFAD11 mainstreaming agenda; (ii) attracting cofinancing from the Adaptation Fund and OPEC Fund (subject to approval) and thereby contributing to corporate cofinancing targets; (iii) having a relatively front-loaded disbursement profile, underpinned by substantial investments in equipment and irrigation systems, as well as road rehabilitation and maintenance in the initial years, all of which will contribute to an increasing corporate disbursement ratio; and (iv) covering two PBAS cycles, it is therefore aligned with the notion of delivering bigger, better and smarter.

B. Organizational framework

Project management and coordination

37. A PIU has been set up within the existing IFAD National Programme Coordination Unit (NPCU) at the Ministry of Agriculture and Forestry to implement the AVDP, in partnership with the district level of the Ministry, private sector partners and FBOs/cooperatives. Its responsibilities include project planning, financial management, procurement, M&E, communication and knowledge management, supervision of project activities at the district level, facilitating linkage with governmental, private sector and development institutions, and integrating project experience into policy dialogue. The capacity of the NPCU will be complemented with technical assistance, performance-based contracts for staff of the project management unit and a multi-year implementation workplan to ensure effective delivery of activities.

38. In addition to the IFAD NPCU, a delivery unit has been set up within the Ministry of Agriculture and Forestry, in collaboration with the Tony Blair Institute, with the overall objective of boosting the Government's capacity to promote agricultural transformation and deliver on the country's Medium-term National Development Plan 2019-2023. No changes in this framework are foreseen with this additional financing.

Financial management, procurement and governance

39. **Financial management.** The inherent risk has been assessed as high. As a result, the project largely follows the financial management arrangements already established under ongoing IFAD projects, with a ring-fenced PIU responsible for implementation and financial management. The financial management arrangements include: (i) the appointment of a qualified financial controller and an accountant; (ii) entry of all project transactions in a customized accounting software, in keeping with the International Public Sector Accounting Standards cash basis of accounting; (iii) maintenance of a designated account in United States dollars for IFAD financing at a commercial bank to avoid any mingling with other funds; (iv) disbursement of IFAD financing in accordance with IFAD disbursement procedures; and (v) preparation of quarterly financial reports by the PIU in formats agreed upon with IFAD.

40. Furthermore, the consolidated financial statements are audited annually by the Audit Service Sierra Leone in the Office of the Auditor General, in accordance with the audit requirements of the International Standards of Supreme Audit Institutions and IFAD. Together with the management letter, the audit report is submitted to IFAD within six months of the end of the fiscal year. This additional financing will follow the same principle and procedures as the original financing, as described above.

41. In the first half of 2021, and after the second supervision mission, key weaknesses were identified with respect to financial management and accounting, which were also highlighted by the audit report for fiscal year 2020. Moreover, two implementation support missions took place during this period, and both reported on the limited capacity of the financial management team. Looking forward to the approval of this additional financing, the country team has agreed to implement a contingency plan to mitigate the risk for the project (for example, a new finance manager is being recruited). In particular, a third and longer implementation support mission was fielded in the third quarter of 2021 to boost financial management and planning capacity and avoid disruptions in the flow of funds and project financial reporting. The project has identified an international technical assistance consultant to support it during the recruitment of the new finance manager and to support the new recruit in the initial months. Furthermore, IFAD will support the deployment of a project-specific roadmap/action plan and quarterly financial management meetings with the project to keep track of key milestones. These measures will mitigate the financial management risks and address the project's capacity issues on a more permanent basis.

42. IFAD has a zero-tolerance policy toward fraudulent, corrupt, collusive or coercive practices in all projects financed through its loans and grants. IFAD's anticorruption policy and whistleblower protection procedures have been mainstreamed in the project implementation manual.

43. **Procurement.** A procurement assessment was undertaken as part of the design mission. The legal and regulatory framework for public procurement in Sierra Leone will be used for all AVDP procurement activities, with the exception of international competitive bidding, for which the World Bank guidelines and framework will apply. In addition, the procurement plan used by the AVDP is based on the version presented as part of the IFAD Project Procurement Handbook.

44. **Governance.** The AVDP is under the technical supervision of the Ministry of Agriculture and Forestry. A national steering committee provides oversight, direction and advice for project implementation and, in particular, approves the project's annual workplan and budget (AWP/B), as well as its periodic progress reports. No changes are foreseen with the additional financing.

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

45. **Planning, M&E.** The project will prepare an AWP/B for approval by the national steering committee and subsequent presentation to IFAD for its no objection. The AWP/B will serve as the basis for all work undertaken by the project. The AWP/B will be prepared in consultation with beneficiaries and other stakeholders and will build on the project's progress.

46. The project's logical framework will be the main document for supporting results-based and objective-oriented implementation. The AVDP M&E system will build on the system developed in the SCP-GAFSP, including its M&E manual. The M&E system will be in line with the requirements of the Government of Sierra Leone, as well as IFAD's Operational Results Management System, and will generate gender- and age-disaggregated data on project outputs, outcomes and impacts.

47. Knowledge management and learning are key to meeting project objectives and are the basis of results-based management. Best practices and proven concepts will be fed into the Ministry of Agriculture and Forestry and regional knowledge management systems. The lessons learned will also be fed into ongoing improvement of manuals, concepts and strategies and will be disseminated to the various target groups through appropriate communications media. The additional financing will not imply changes in this respect.

D. Proposed amendments to the project financing agreement

48. The project financing agreement will be amended to reflect the additional financing in the amount of US$12.3 million.

V. Legal instruments and authority

49. A revised financing agreement between the Republic of Sierra Leone and IFAD will constitute the legal instrument for extending the proposed financing to the borrower/recipient. The signed financing agreement will be amended following approval of the additional financing.

50. The Republic of Sierra Leone is empowered under its laws to receive financing from IFAD.

51. 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

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

> RESOLVED: that the Fund shall provide a Debt Sustainability Framework grant to the Republic of Sierra Leone in an amount of three million three hundred thirty thousand United States dollars (US$3,330,000) 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 highly concessional terms to the Republic of Sierra Leone in an amount of nine million United States dollars (US$9,000,000) and upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented herein.

Gilbert F. Houngbo
President

Updated logical framework incorporating additional financing

Narrative Summary	Key Performance Indicators: Name [CORE INDICATOR (CI)]	Baseline (Y0)	Mid-term (Y3)	End Target (Y6)	Means of Verification: Source	Frequency	Responsibility	Assumptions
Outreach	Number of households receiving services promoted or supported by the project(CI:1) [1] Lead	0	33,000	43,000	Project M&E system	bi-annual, annual	IFADPIU	Commitment of all stakeholders to participate in poverty reduction efforts
Goal:								
Improved livelihoods, food security and climate change resilience of rural farming households in Sierra Leone	Targeted households that experience a reduction in length of hungry season from 4 to 2 months Lead [2]	0	13,200 (40% of total outreach)	25,800 (60% of total outreach)	Baseline, Completion Survey or secondary data	PY1, PY6	IFADPIU, survey providers	N/A
	Proportion of target population below the minimum level of dietary energy consumption by gender and vulnerable groups [3]	TBD	TBD	TBD	Baseline, Completion Survey. Secondary data: CFSVA	PY1, PY6	IFADPIU, survey providers	
	Households reporting increased assets (asset ownership index) Lead [4]	N/A	8,250 (25% of total outreach)	21,500 (50% of total outreach)	Baseline, Completion Survey	PY1, PY6	IFADPIU, survey providers	
Project Development Objective:								
Increased incomes for smallholder farmers through the promotion of agriculture as a business	Number of rural producers reporting an increase in sales (CI:2.2.5)* Y,S [5]	0	10,650of which 4,260 youth and 4,260 women	22,500 of which 9,000 youth and 9,000 women	Mid-term Review, Completion Survey	PY1, PY3, PY6	IFADPIU, survey providers	Government policies are stable and global demand for oil palm and cocoa do not decrease
	Number of rural producers reporting an increase in income Y,S[6]	0	10,650 of which 4,260 youth and 4,260 women	22,500 of which 9,000 youth and 9,000 women	Mid-term Review, Completion Survey	PY1, PY3, PY6	IFADPIU, survey providers	

Narrative Summary	Key Performance Indicators				Means of Verification			Assumptions
	Name	**Baseline(Y0)**	**Mid-term(Y3)**	**End Target (Y6)**	**Source**	**Frequency**	**Responsibility**	
Component 1:Climate Resilient and Smart Agricultural Production								
Outcome1: Volume and value of produce increased	Number of persons reporting an increase in production (CI:1.2.4)* [Y,S] [7]	0	13,000 of which 5,200 youth; 5,200 women	22,500 of which 9,000 youth; 9,000 women	Baseline, MTR, Completion Survey	PY3, PY6	IFADPIU, survey providers	Land tenure system in project districts does not pose any limitations to project activities Communities are involved and responsive to interventions made
	Number of persons reporting adoption of new/ improved inputs technologies or practices (CI:1.2.2)* [Y,S] [8]	0	13,000 of which 5,200 youth; 5,200 women	22,500of which 9,000 youth; 9,000 women	Baseline, MTR, Completion Survey	PY3, PY6	IFADPIU, survey providers	
	Number of persons reporting adoption of environmentally sustainable and climate-resilient technologies and practices (CI:1.2.2)* [Y,S] [9]	0	6,700 of which 2,700 youth; 2,700 women	22,500 of which 9,000 youth; 9,000 women	PMU progress Baseline, MTR, Completion Survey	PY3, PY6	IFADPIU, survey providers	
Outputs	Number of agribusiness centres with improved capacity for service provision (CI: 2.1.6)* [10]	0	107	113	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of persons trained in production practice and/or technologies (CI:1.1.4)* [Y,S, Lead] [11]	0	24,000 of which 9,600 youth and 9,600 women	26,625 of which 10,650 youth and 10,650 women	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of rural producer organizations supported (CI: 2.1.3)* [Lead][12]	0	890	937 (FOs – both new and legacy)	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of supported rural producers that are part of a rural producer's organization (CI: 2.1.4)* [Y,S][13]	0	24,000 of which 9,600 youth and 9,600 women	26,625 of which 10,650 youth and 10,650 women	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of hectares of land brought under climate-resilient management (CI:3.1.4)* [14]	0	13,950	15,500	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of farmers inter-cropping food crops [Y,S][15]		20,400 of which 8,160 youth; 8,160 women	22,500 of which 9,000 youth and 9,000 women				

Component 2: Agricultural Market Development

Outcome2: Value chain organization and performance improved	Number of rural producer's organizations engaged in formal partnerships/agreements with public or private entities (CI: 2.2.3)* Lead [16]	0	281 (30%)	843 (90%)	Baseline, MTR, Completion Survey	PY3, PY6	IFADPIU, survey providers	Stakeholders incl. agribusinesses maintain interest in integrating smallholders in value chains. Commodity prices for oil palm and cocoa stay attractive.
	Jobs created through road construction and rehabilitation (temporary employment) Y,S[17]	0	1,940 (1455 youth)	3,880 (2,910 youth)	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
Outputs	Number of functioning multi-stakeholder platforms supported (Policy 2)* [18]	0	12	12	Project M&E system	Quarterly, Biannual, Annually	IFADPIU	
	Number of kilometres of roads constructed, rehabilitated or upgraded (CI:2.1.5)* [19]	0	450	920	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	
	Number of families with improved access to potable water and sanitation [20]**	0	5,000	10,000	Project M&E system	Quarterly, Bi-annual, Annually	IFADPIU	

Updated summary of the economic and financial analysis

Table A: Models' financial cash flow

Six financial models were developed: (i) IVS Rice (1ha) with vegetables side rotational cropping (0.15ha);(ii) IVS Rice/double cropping (1ha) with vegetables side rotational cropping; (iii) Cocoa gradual replanting (1ha) with vegetables side rotational cropping (0.15 ha), cassava (0.25 ha) and plantain (0.25ha); (iv) Cocoa new planting (1ha) with vegetables side rotational cropping (0.15 ha), cassava (0.25 ha) and plantain (0.25ha),(v) Oil palm new plantation (1 ha), and (vi) vegetables (5 ha) of potato (3 ha), bulb onion (1 ha) and black pepper (1 ha). The analysis compares a "without project" and "with project" situation for indicative one hectare of land. "Without project" scenario has been calculated based on the prevailing traditional average production, where applicable.

Project profitability for IRR crops/trees is between 27 per cent and 67 per cent where noted the highest IRR is for IVS Rice/double cropping. The highest IRR is for IVS rice double cropping scheme, estimated at value of 67 per cent.

Table A above provides financial profitability indicators for crop/tree type and production, net present value/hectare, B/C ratio and return on family labour. The highest profitability for crop/tree is for IVS rice/double cropping with NPV of 26,8 million SLL/ha. The vegetable is the second highest profitable crop with NPV of 22,1 million SLL/ha. The oil palm new planation is the third highest profitable tree, with NPV of 17,9 million SLL/ha. According to B/C ratio, vegetables stand out as the most profitable crop assuming a project period of 20 years. The internal rate of return is highest for IVS rice/double cropping (67 per cent), following by cocoa gradual plantation (48 per cent) and at value of 42 percent for new oil palm plantations and new cocoa plantations. As expected, return on family labour is the highest for new cocoa plantations (~6,6 million SLL/ha) due to the high international demand for cocoa.

FINANCIAL ANALYSIS	PRODUCTION						Infrastructure (SLL)
	IVS Rice (1 ha) (SLL)		Tree crop model 'net incremental benefits (1 ha)(SLL)			Vegetables (5 ha) (SLL)	
	IVS Rice (Nerica)*	IVSRice/double cropping scheme*	Cocoa Gradual Replanting **	Cocoa New Planting**	Oil Palm New Plantation***	Vegetables (5 ha) (SLL), Irish potato, onion, black pepper)	Roads
PY1	-23.975.255	-19.308.380	-2.832.883	-9.423.554	-7.850.342	10.502	6.167.573
PY2	6.082.745	11.297.120	-2.655.100	-2.596.877	-1.442.361	101.986	-39.011.029
PY3	7.542.745	13.852.120	-1.389.213	1.536.363	4.662.639	101.991	-31.384.381
PY4	7.542.745	13.852.120	2.511.260	4.358.917	4.083.657	101.996	-1.041.467
PY5	7.542.745	13.852.120	5.079.692	6.588.360	5.193.657	102.000	47.362.617
PY6	8.272.745	15.129.620	6.754.484	10.474.180	6.303.657	101.043	47.362.617
PY7	8.272.745	15.129.620	7.977.536	13.155.361	10.743.657	102.007	47.362.617
PY8	8.272.745	15.129.620	8.748.849	13.080.072	11.298.657	102.010	47.362.617
PY9..	8.272.745	15.129.620	9.200.589	13.155.361	15.183.657	102.013	47.362.617
PY20/PY10+	8.302.745	15.182.120	9.200.589	13.531.811	15.183.657	102.015	47.362.617
NPV (SLL)	3.553.806	26.807.828	11.694.085	16.211.847	17.852.817	110.932.913	54.236.166
NPV (USD)	456	3.437	1.499	2.078	2.289	14.222	6.953.355
FIRR (@22%)	27%	67%	48%	42%	49%	30%	39%
B/C	1,2	1,7	1,3	2,0	1,9	2,5	1,6

**plus side rotational cropping of vegetables 0,15 ha; + for Rice is final PY 10 and other culture is PY20,*
*** plus side rotational cropping of vegetables 0,15ha , plaintain 0,30 ha and cassava 0,30 ha,*
**** plus upland rice/1 ha*

Table B: Programme/project costs and Logframe targets

Table B provides overall project costs by components and beneficiaries. The total project costs have been estimated at US$ 101.2 million over a six-year project implementation period. The cost per beneficiary has been estimated at US$392 and cost per household has been estimated at US$2,355. Adoption rate of the project is 85 per cent and it is estimated that up to 43,000 households will be impacted by the project implementation (equivalent to 260,000 beneficiaries). The following table summarizes the expected outcomes of the project interventions and indicators linked to Logframe targets.

PROJECT COSTS AND INDICATORS FOR LOGFRAME						
TOTAL PROJECT COSTS (in million USD)		101,2				
Beneficiaries	**257.910**	People	42.985	Households		
Cost per beneficiary	392	USD x person	2.355	USD x HH	**Adoption rates**	**85%**

Components and Cost (EUR million)		Outcomes and Indicators		
Comp 1. Climate Resilient and Smart Agricultural Production	49,7	Up to 43 000 HH or 258 000 beneficiaries receiving services promoted or supported by project (40% women; 40% youth)	up to 26 000 rural producers that are part of ruralproducer's organization	7 360 youth jobs created through road construction and rehabilitation
Comp.2.Agricultural Market Development **C.3. Project Coordination and Management Unit**	35,3	181 ABCs with improved capacity for service provision and 977 FOs supported	up to 26 000 HHhaving access to production input or technological packages up to 26 000 HH trained in production practice and/or technologies	support to 12 multi-stakeholders platforms
Total	101,2	10 000 HH with improved access to potable water and sanitation	15 700 ha of land brought under climate-resilient management	920 km of kilometres of road constructed, rehabilitated or upgraded

Table C: Main assumptions and shadow prices

Table C provides data on the expected yield (t/ha) for rice (3t/ha), rice double cropping (5t/ha), cocoa (1t/ha), oil palm(16t/ha), Irish potato (15t/ha) and onion and chilli pepper (20t/ha). It summarizes some of the main input prices included in the models. To establish input and output prices, 2018 constant prices were used based on information collected from farmers, entrepreneurs, business proposals submitted/funded for/by on-going IFAD projects and the National Bureau of Statistics of Sierra Leone. Price estimates for tradable commodities were based on the World Bank's Global Commodity Price Projections. All local costs were converted into their approximate economic values using a Standard Conversion Factor (SCF) of 1.11. The economic analyses include the investment and incremental recurrent costs of the project components. The project's financial costs have been converted to economic values by removing price contingencies, taxes and duties. To avoid double counting, the final aggregation considered only those costs that were not included in the financial models. Economic pricing was undertaken using the following assumptions: (a) the opportunity cost of labour is between SLL 19.060 /day and 23.825 /day (depending on work type), or equivalent to 95 per cent of the financial cost of labour, which is justified given rural unemployment; (b) the shadow exchange rate (SER) has been calculated at 1 USD = 8 672 SLL, (c) the standard conversion factor for the exchange rate has been calculated at 1.11, and(d) the conversion factors for outputs and inputs have been calculated starting from FOB and CIF prices when data were available; when data were not available, CFs were calculated starting from the financial price, deducting any duty or tax and multiplying it by the SCF. Overall, all CF vary between 0.94 (for imported inputs) and 1.113 (for exported inputs).

MAIN ASSUMPTIONS & SHADOW PRICES					
	Output (kg)	**End Yield t/ha**	**Price (SLL)**	**Input prices**	**Price (SLL)**
FINANCIAL	Rice (double crop.)	5	4.000	Rice improvedseeds	2.800
	Rice	3	12.500	Fertilizer	7.000
	Cocoa, I grade	1	1.110	Rural wage-family \p.d.	20.000
	Oil Palm	16	11.700	Rural wage-hired \p.d.	25.000
	Irish Potato	15	11.700	Feeder Road/km	15.600.000
	Onion	20	15.600	Farm track/km	78.000.000
	Chilli Pepper	20	15.600	IVS Rice development/ha	29.328.000
				Cocoa Investment Package/ha	7.329.543
				Oil Palm Investment Package/ha	8.984.324
				Curing Machines	200.000.000
				Greenhouse	106.800.000
ECONOMIC	Official Exchange rate (OER)	7.800	Discount rate (opportunity cost of capital)		22%
	Shadow Exchange rate (SER)	8.672	Social Discount rate		16,5%
	Standard Conversion Factor	1,11	Output conversion factor		1,13
	Labour Conversion factor	0,95	Input Conversion factor		0,94

Table D: Beneficiaries adoption rates and phasing

Table D shows the phasing and adoption rate across years and type of activities for producers/farmers assuming that 85 per centof new beneficiaries will adopt the measures and the adoption rate for legacy farmers will be 100 per cent.

	PY1	PY2	PY3	PY4	PY5	PY6	Total	Adoption rates
IVS Rice	984	1.313	1.313	766	0	0	4.375	
Adjusted (adoption rate)	*837*	*1.116*	*1.116*	*651*	*0*	*0*	3.719	*85%*
IVS rice/double cropping	281	375	375	219	0	0	1.250	
Adjusted (adoption rate)	*239*	*319*	*319*	*186*	*0*	*0*	1.063	*85%*
Cocoa Gradual Replanting	900	1.575	525	0	0	0	3.000	
Adjusted (adoption rate)	*765*	*1.339*	*446*	*0*	*0*	*0*	2.550	*85%*
Cocoa New Planting	900	1.575	525	0	0	0	3.000	
Adjusted (adoption rate)	*765*	*1.339*	*446*	*0*	*0*	*0*	2.550	*85%*
Oil Palm New Plantation	*1.212*	*2.576*	*1.212*	*0*	*0*	*0*	5.000	
Adjusted (adoption rate)	*1.030*	*2.189*	*1.030*	*0*	*0*	*0*	4.250	*85%*
Oil Palm/ Legacy Farmers	*4.000*	*0*	*0*	*0*	*0*	*0*	4.000	
Adjusted (adoption rate)	*4.000*	*0*	*0*	*0*	*0*	*0*	*4.000*	*100%*
IVS Rice/ Legacy Farmers	*5.000*	*0*	*0*	*0*	*0*	*0*	5.000	
Adjusted (adoption rate)	*5.000*	*0*	*0*	*0*	*0*	*0*	*5.000*	*100%*
Trg. on access to potable water	2.250	2.250	2.250	2.250	0	-	9.000	
Adjusted (adoption rate)	*1.913*	*1.913*	*1.913*	*1.913*	*0*	-	*7.650*	*85%*
Roads con./rehab. Employment	2.320	2.720	2.320	0	0	0	7.360	
Adjusted (adoption rate)	*1.972*	*2.312*	*1.972*	*0*	*0*	*0*	*6.256*	85%
Vegetables	*100*	*350*	*350*	*100*	*50*	*50*	*1.000*	
Adjusted (adoption rate)	85	298	298	85	43	43	*850*	*85%*
Nr of Targeted Beneficiaries							**42.985**	
Adopting Beneficiaries							**37.887**	

Table E: Programme/project economic cash flow

Costs included cover the project's base costs (as extracted from the COSTAB tables) with their physical contingencies but without taxes and price contingencies. Costs from Costab include all investment, operational, recurrent costs related to the activity and crop models (over 20 years for trees and 10 years for rice cultivation). The table below presents the net incremental benefit of each financial model, converted into shadow prices (table C) and multiplied by the number of beneficiaries (table D).Net incremental costs include all project costs while avoiding double counting. The analysis shows that the project has the capacity to generate an economic rate of return (ERR) of 32 per cent over a 20-year period, in addition to many benefits that could not be quantified. Thus, the actual ERR will likely be higher than the 32 per cent reported. The base case net present value of the project's net benefit stream, discounted at 16.5 per cent, is SLL 583.734 billion (US$67,3million).

ECONOMIC ANALYSIS

	NET INCREMENTAL BENEFITS								Net Incremental Costs	Cash Flow
	IVS Rice*	IVS Rice/double cropping*	Cocoa Gradual Replanting **	Cocoa New Planting**	Oil Palm New Plantation***	Vegetables	Roads	Total Net Inc. Benefits	Economic Investment + O&M Costs	Net Incremental benefits
PY1	(7.891.129)	(1.652.260)	(676.528)	(2.214.488)	(2.945.162)	(125.536.796)	-	(140.916.362)	60.700.546	**(201.616.909)**
PY2	(24.953.082)	(4.352.785)	(2.988.081)	(8.096.034)	(10.702.367)	(68.986.306)	(31.951.097)	(152.029.752)	58.949.756	**(210.979.508)**
PY3	(15.005.609)	961.117	(4.837.950)	(8.126.491)	(9.152.970)	(27.237.611)	(24.548.568)	(87.948.082)	49.835.594	**(137.783.676)**
PY4	16.212.009	11.176.831	(3.067.169)	1.121.749	7.349.272	96.431.538	3.942.981	133.167.210	30.271.713	**102.895.496**
PY5	24.982.695	14.512.712	2.386.796	9.481.884	20.145.354	124.763.662	45.136.574	241.409.678	35.875.230	**205.534.447**
PY6	27.241.024	15.690.471	9.142.564	16.756.526	26.206.575	128.953.400	45.136.574	269.127.134	32.544.258	**236.582.877**
PY7	33.907.614	17.925.709	14.766.333	26.054.971	35.071.945	151.477.111	45.136.574	324.340.258	4.870.920	**319.469.338**
PY8	35.295.705	18.619.755	19.256.571	34.272.908	46.789.747	151.499.007	45.136.574	350.870.268	4.870.920	**345.999.348**
PY9	35.604.170	18.773.987	22.819.221	38.827.298	57.974.922	152.691.353	45.136.574	371.827.525	4.870.920	**366.956.606**
PY10	35.769.034	18.856.419	24.974.605	40.594.291	68.094.842	152.943.617	45.136.574	386.369.383	4.870.920	**381.498.463**
PY11	32.358.583	17.054.003	26.006.194	41.892.730	76.217.410	152.943.617	45.136.574	391.609.110	4.870.920	**386.738.191**
PY12	19.789.161	10.429.127	26.413.743	42.614.113	79.280.017	152.943.617	45.136.574	376.606.351	4.870.920	**371.735.431**
PY13	7.193.159	3.790.960	26.590.456	42.704.317	80.345.272	152.943.617	45.136.574	358.704.355	4.870.920	**353.833.435**
PY14	3.596.579	1.895.480	26.644.579	42.758.440	81.277.370	152.943.617	45.136.574	354.252.639	4.870.920	**349.381.719**
PY15	1.800.948	949.069	26.644.579	42.803.542	81.277.370	152.943.617	45.136.574	351.555.698	4.870.920	**346.684.779**
PY16			26.644.579	42.803.542	81.277.370	152.943.617	45.136.574	348.805.682	4.870.920	**343.934.762**
PY17			26.644.579	42.803.542	81.277.370	152.943.617	45.136.574	348.805.682	4.870.920	**343.934.762**
PY18			26.644.579	42.803.542	77.016.351	152.943.617	45.136.574	344.544.663	4.870.920	**339.673.743**
PY19			26.644.579	42.803.542	61.037.530	152.943.617	45.136.574	328.565.842	4.870.920	**323.694.922**
PY20			26.644.579	42.803.542	41.862.944	152.943.617	45.136.574	309.391.256	4.870.920	**304.520.336**

NPV@ 16,5% ('000 SLL)	**583.734.087,66**
NPV@ 16,5% ('000 USD)	**67.313,71**
EIRR	**32%**

** plus side rotational cropping of vegetables 0,15 ha*

*** plus side rotational cropping of vegetables 0,15ha , plantain 0,30 ha and cassava 0,30 ha*

**** plus upland rice/1 ha*

Table F: Sensitivity analysis

To test the robustness of the above results, a sensitivity analysis has been carried out. The outcomes are presented in table F below. The sensitivity analysis investigates the effect of fluctuations in project costs, benefits and delays in implementation on the NPV and EIRR. It shows the economic impacts that a decrease in project benefits of up to 20 per cent will have on the project's viability. Similarly, it shows how the economic viability of the project will be affected with an increase of up to 20 per cent in project costs and with one and/or two-year delay in project implementation. A sensitivity analysis shows that the EIRR drops to 30.5 per cent with a 20 per cent increase in project costs. a 10 per cent increase in costs yields a high EIRR of value, 31.5 per cent, and a delay of project aggregate benefits by one to two years still yields a high EIRR. Finally, the analysis shows that the economic viability of the project remains attractive by preserving positive NPV and EIRR in each case.

SENSITIVITY ANALYSIS (SA)				
	Δ%	**Link with the risk matrix**	**IRR**	**NPV (SLL)**
Base scenario			32,0%	583.734.087,66
Project benefits	-10%	Combination of risks affecting output prices, yields and adoption rates	31,5%	506.996.696,45
Project benefits	-20%		30,0%	430.259.305,25
Project benefits	-50%		25,3%	200.047.131,64
Project costs	10%	Increase of construction material prices	31,5%	565.370.105,22
Project costs	20%		30,5%	547.006.122,78
Project costs	50%		28,5%	491.914.175,47
1 year lag in ben.		Risks affectingadoption rates and low implementation capacity	29,6%	462.528.519,98
2 years lag in ben.			27,3%	357.713.370,66