Executive Board

President's memorandum

Proposed additional financing to

Republic of The Gambia

Resilience of Organizations for Transformative Smallholder Agriculture Project

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Action: The Executive Board is invited to approve the recommendation for the proposed additional financing contained in paragraph 67.

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Financing summary

Initiating institution:	IFAD
Borrower/recipient:	Republic of The Gambia
Executing agency:	Ministry of Agriculture
Total programme cost:	US$80.01 million
Amount of original IFAD loan (performance-based allocation system [PBAS]):	US$4.26 million
Amount of original IFAD grant (Debt Sustainability Framework [DSF]):	US$17.02 million
Terms of original IFAD financing:	Highly concessional
Amount of first additional IFAD grant (DSF):	US$11.94 million[1]
Amount of additional IFAD grant (DSF):	US$18.91 million
Cofinanciers:	Agence Française de Développement (AFD) Global Environment Facility (GEF) Green Climate Fund (GCF)
Amount of cofinancing:	AFD: US$7.60 million GEF: US$4.71 million GCF: US$4.98 million
Terms of cofinancing:	Grants
Contribution of borrower/recipient:	US$5.66 million
Beneficiary contribution	US$4.93 million
Amount of original IFAD climate finance:	US$8,610,000
Amount of first additional IFAD climate finance:	US$9,037,000
Amount of second additional IFAD climate finance:	US$15,027,000
Cooperating institution:	IFAD

[1] First approved additional financing, partially filling the design gap, approved on 28 December 2023.

I. Background and project description

A. Background

1. The Resilience of Organizations for Transformative Smallholder Agriculture (ROOTS) project was approved by the IFAD Executive Board on 11 December 2019.[2] The financing agreement was signed 27 December 2019 and entered into force on 1 March 2020 with completion and closing dates of 31 March 2026 and 30 September 2026 respectively.

2. The current financing comprises (i) an IFAD loan of US$4.26 million, (ii) an IFAD grant of US$17.02 million, (iii) a first additional IFAD grant under the Twelfth Replenishment of IFAD's Resources (IFAD12) for US$11.94 million, (iv) US$4.71 million from the Global Environmental Facility (GEF); (v) US$4.98 million from the Green Climate Fund (GCF); (vi) US$7.6 million from the Agence Française de Développement (AFD); (vii) US$5.66 million from the Government of the Republic of The Gambia; (viii) US$4.93 million from the beneficiaries.

3. The ROOTS project was approved with an initial financing gap of US$20.60 million at the design stage. Cofinancing expected from the OPEC Fund for International Development (OPEC Fund) did not materialize, due to the country's high debt risk, as well as small amounts from domestic cofinancing. The GEF and AFD financing was also reduced as described below, thereby increasing the financing gap to US$31.09 million.

4. In April 2023, the Government of The Gambia made an official request to utilize IFAD12 resources for an amount of US$11.94 million to partially fill the existing financing gap. This request was approved by IFAD in September 2023. As requested by the Government of The Gambia in April 2024, the remaining financing gap, including the IFAD12 allocation, amounting to US$18.91 million is to be covered by this second additional IFAD grant.

5. The Ministry of Agriculture is the lead implementing agency of the ROOTS project. The project support unit (PSU) is in charge of project-level coordination and oversight.

B. Original project description

6. **Goal.** The goal of the ROOTS project is to improve food security, nutrition and the resilience of smallholder farmers to climate change in The Gambia. The project development objective is to increase agricultural productivity and access to markets for enhanced food security and nutrition and greater resilience of family farms and farmers' organizations.

II. Rationale for additional financing

A. Rationale

7. In addition to the original financing gap, some cofinancing, such as OPEC Fund, could not be mobilized. The proposed additional financing is needed to maintain the initial objectives and to meet the expectations and the significant needs of communities in terms of resilience, food security, environmental and social challenges, and livelihood improvement (income, productive assets).

8. The ROOTS project has supported 23,629 households, or 59 per cent of the targeted 40,000 beneficiary households. The additional financing will enable the project to achieve the initial target beneficiary ambitions in the area of intervention.

9. The additional financing will not involve any changes in the project objectives or geographical area. During the period in which the project benefited from the first

[2] EB 2019/128/R.33.

additional IFAD grant, a number of targets were revised downwards slightly to consider increases in unit costs due to the significant rises in inflation in recent years.

10. The project faced start-up delays primarily attributable to the impacts of COVID-19, the recruitment of PSU staff and delays in the disbursement of funds from the GCF, AFD and the GEF. The project is evaluating the need for an extension to facilitate the completion and sustainability of planned activities, particularly those focusing on the vegetable garden sites and associated infrastructure.

11. The activities to be financed by this additional financing will support the ROOTS project in its alignment with the country strategic opportunities programme (COSOP) 2019–2024. Such activities will support the country in solving several key challenges, such as low productivity, the need for a better input supply system, improving public-private-producer partnerships (4Ps), the dissemination of environmentally-friendly and climate-resilient production techniques, and improving food and nutrition security at household and national levels.

Special aspects relating to IFAD's corporate mainstreaming priorities.

12. In line with IFAD's mainstreaming commitments, the project has been recognized as:

☒ Including climate finance

☒ Including adaptive capacity

☒ Nutrition-sensitive

☒ Youth-sensitive

Gender

13. The ROOTS project target group comprises poor rural women in the vegetable and rice value chains. Women account for 70 per cent of the agricultural workforce and face disproportionately high working hours in comparison with men. Most also have limited access to productive means, such as credit, knowledge and land ownership, in additional to facing climate-change-related challenges. The 2023 gender inequality index ranked The Gambia 119th out of 159 countries. The project will provide tailored support to the Government's policies on gender equality and women's empowerment through the scaling up of gender-responsive and participatory approaches, such as the Gender Action Learning Systems.

Young people and persons with disabilities

14. In The Gambia, poverty disproportionately affects young people, particularly young people in rural areas, with 60 per cent of the country's poor under 20 years of age. The population living with disabilities in The Gambia is estimated to be around 360,000 individuals.[3] The project will concentrate on enhancing production within the rice and vegetable value chains, placing a heightened focus on the inclusion of young people and persons with disabilities in programme activities, while incorporating digitalization strategies into its approach. Through the youth-based matching grant scheme, the project will finance young entrepreneurs by leveraging digitalization. This will include providing technical and financial training, equipment and post-investment support. The ROOTS project will ensure that young people are represented at all levels of decision-making.

Nutrition

15. The Gambia faces deep poverty and inadequate social services, leading to poor nutritional status, tenuous food security and malnutrition among its population.

[3] From general global statistics, about 15 per cent of the world's population has some form of disability, with a higher prevalence in low-income countries (data of The Gambia Bureau of Statistics). Considering The Gambia's population was estimated at approximately 2.4 million in recent census efforts (Kerr Fatou Online Media House), if the global average holds, there could be around 360,000 individuals living with disabilities in the country. However, this is an estimate and the actual number could vary based on local conditions and definitions of disability.

The Gambia is still facing challenges, including poor sanitation, nutrition insecurity and food shortages. Notable differences exist between the western region, particularly the capital Banjul, and the eastern upriver areas, where rural households experience greater poverty. In recent years, there has been an increase in micronutrient deficiencies among both children and women and a rise in the prevalence of obesity. The current prevalence of stunting is around 17.5 per cent for children under 5 years of age. The project aims to improve the nutrition and food security of the targeted beneficiaries through climate-smart agriculture, a production increase and diversity, and through farmers' access to markets to increase their income.

Climate and environment

16. According to the Notre Dame Global Adaptation Initiative Index, The Gambia is ranked as the 33rd most vulnerable country regarding its exposure, sensitivity and ability to adapt to the negative impact of climate change and the 142nd most prepared country in terms of its ability to leverage investments and convert them to adaptation actions. The nation is highly susceptible to the impacts of climate change, including decreased average rainfall and duration of the rainy season, increased frequency and duration of droughts, and rising temperatures (since 1960, mean annual temperatures have increased by 1.0° C).

17. Additionally, The Gambia faces significant environmental challenges, including deforestation, exacerbated by slash-and-burn agriculture, soil erosion, land degradation and overgrazing. National forest cover decreased from 505,300 hectares (44 per cent of the country's surface area) in 1981/82 to 423,000 hectares (37 per cent) by 2009/2010. Notably, mangrove forests declined from 67,000 hectares to 35,700 hectares during this period. If current trends continue, more than half of the remaining forest and woodland could be lost in a business-as-usual scenario.

18. To combat these challenges, The Gambia aims to promote sustainable forest and land management practices and implement climate-resilient activities.

B. Description of geographical area and target groups

19. **The target group** will remain the same. The ROOTS project primarily focuses on engaging smallholder farmers, microentrepreneurs, impoverished rural youth, and women. The project aims to benefit 40,000 households comprising approximately 320,000 individuals, or around 10 per cent of the country's population. Notably, 80 per cent of the direct beneficiaries are women and 25 per cent are young people. Additionally, the project strives to actively involve persons with disabilities.

20. **The intervention area** will remain the same. The ROOTS project concentrates its efforts on enhancing rice and horticulture value chains, strategically implementing its programmes throughout all five regions of The Gambia: Central River Region, North Bank Region, Lower River Region, Upper River Region, and West Coast Region. This project aims to collaborate with 39 districts across these regions.

C. Components, outcomes, and activities

21. The ROOTS project consists of three main components:

22. **Component 1: Agricultural productivity and adaptation to climate change,** which is divided into two subcomponents: (i) subcomponent 1.1 – infrastructure development and management; (ii) subcomponent 2.2 – provision of agriculture services.

23. The expected outcome of this component is the improved productivity of smallholder farmers through the adoption of sustainable and climate-resilient and nutrition-sensitive technologies and practices.

24. **Component 2: Access to markets.** This component comprises two subcomponents: (i) subcomponent 2.1 – building value chains and market linkages; (ii) subcomponent 2.2 – financing for 4Ps.

25. The expected outcome of this component is to enable inclusive commercial partnerships between strengthened farmers' organizations and buyers through 4Ps.

26. **Component 3: Project management**, **institutional development and citizen engagement.**

27. The activities covered by the additional financing will not differ from those of the original project design. However, after engaging in productive discussions with the PSU, the National Coordinating Organisation of Farmer Associations Gambia and various implementing partners, the parties reached a consensus on the areas that would benefit from prioritization and immediate attention. The decision considered two key factors: (i) the priority value chains promoted by the project, which include rice cultivation and vegetable gardens, and (ii) the importance of giving precedence to activities cofinanced with AFD to prevent any unnecessary delays in their implementation. The identified areas are as follows:

    - The vegetable gardens;
    - Market access;
    - Cold storage facility for isolated communities;
    - Land development and rehabilitation work in the irrigation schemes; and
    - Input support for rice production.

D. Costs, benefits and financing

Programme cost

28. The total cost of the project is approximately US$80.01 million, including contingencies, taxes and customs duties. Considering the resources initially mobilized, the first additional IFAD funding of US$11.94 million and the additional Government contribution, the total project costs included a funding gap of US$18.91 million. This financing gap will be covered by this second additional IFAD grant under IFAD12. The funding gap before and after the additional funding is summarized in the table below.

29. The project components are partially counted as climate finance. In accordance with the multilateral development banks' methodologies for tracking climate change adaptation and mitigation finance, the total amount of IFAD climate finance for this project is estimated at US$32.67 million

30. The total amount of additional IFAD climate finance for this additional financing proposal is estimated at US$15.03 million.

Table 1
Appraisal of the original financing and current financing
(Thousands of United States dollars)

Financiers	*Original financing appraisal*	*Current situation including additional financing*
IFAD11 loan	4 255	4 255
IFAD11 grant	17 020	17 020
GEF grant	5 300	4 708
GCF (portion executed by the country)	-	4 980
AFD grant	11 168	7 600
Government	5 412	5 412
OPEC Fund	10 000	-
Beneficiaries	6 250	4 933*
GAP before IFAD additional financing	**20 595**	**31 098**
IFAD12 first additional grant		11 936
Government (in kind)	-	252
Current financing gap covered by second additional IFAD grant		18 910
Total project costs	**80 000**	**80 006**

* The beneficiaries' contribution has been reduced by US$1.3 million for the following reasons: (i) part of the "green SMEs" financing from the access-to-finance component (4Ps matching grant window) planned with GEF financing was not approved by GEF, reducing the expected beneficiary contributions by approximately US$1 million; (ii) the subsidized input supply for irrigated and rainfed tidal rice planned for at least three production cycles per site can now only cover two production cycles for the latest infrastructure batches (up to an 80 per cent contribution from the beneficiaries during the third cycle), given implementation delays, reducing the beneficiaries' contributions by approximately US$0.3 million.

Financing by components

31. The total project costs by component are as follows: (i) component 1 – agricultural productivity and adaptation to climate change: US$55.85 million (69.8 per cent of project base costs); (ii) component 2 – access to markets: US$14.59 million (equivalent to 18.2 per cent of the project costs) and (iii) component 3 – project management, institutional development and citizen engagement: US$9.57 million (12.0 per cent of the project cost).

32. From the second additional IFAD grant: component 1 will receive US$11.66 million (62 per cent of the additional financing). Subcomponent 1.1 – infrastructure development and management will receive US$11.42 million to support the promotion of new vegetable gardens and tidal irrigation consolidation, and subcomponent 1.2 – provision of agriculture services will receive up to US$0.23 million to improve funding to agricultural production techniques and youth-based services. Component 2 will receive US$6.59 million to support building value chains, market linkages and financing for 4Ps (35 per cent). Component 3 will receive US$0.67 million (3 per cent).

Table 2
Original and additional financing summary
(Thousands of United States dollars)

	*Original financing**	*Additional financing 1*	*Additional financing 2*	*Total*
IFAD DSF grant	17 020	11 936	18 910	47 866
IFAD loan	4 255			4 255
AFD	11 168			7 600
GEF**	5 300			4 708
GCF**	-			4 980
OPEC Fund**	10 000			-
Government	5 412	242	10	5 664
Beneficiaries**	6 250			4 933
Financing gap	20 595	18 914	(6)	-
Total	**80 000**	**12 178**	**18 920**	**80 006**

* Initially mobilized out of the US$80 million initial total cost at the project design.
** AFD, GEF and beneficiary contributions were reduced and OPEC Fund financing did not materialize (see paras. 3 and 34).

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

	Second additional IFAD (grant)		*Government contribution (in kind)*		*Total*	
Components/subcomponents	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*
1. Agricultural productivity and adaptation to climate change	11 658	100		-	11 658	61.6
1.1. Infrastructure development and management	11 425	100		-	11 425	60.4
1.2. Provision of agriculture services	233	100		-	233	1.2
2. Access to markets	6 585	100		-	6 585	34.8
2.1 Building value chains and market linkages	3 821	100		-	3 821	20.2
2.2. Financing for 4Ps	2 764	100		-	2 764	14.6
3. Project management, institutional development and citizen engagement	667	99	10	1	677	3.6
Total	**18 910**	**100**	**10**	**0**	**18 920**	**100.0**

Table 4
Additional financing: project costs by expenditure category and financier
(Thousands of United States dollars)

	Second additional IFAD (grant)		*Government contribution (in kind)*		***Total***	
Expenditure category	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*
I. Consulting services	1 856	100		-	1 856	9.8
II. Goods and services and inputs	418	100		-	418	2.2
III. Equipment and materials	49	83	10	17	59	0.3
IV. Works	14 570	100		-	14 570	77.0
IV. Grants and subsidies	1 455	100	-	-	1 455	7.7
V. Salaries and allowances	562	100		-	562	3.0
Total	**18 910**	**99.9**	**10**	**0.1**	**18 920**	**100**

Table 5
Project costs by component and project year
(Thousands of United States dollars)

	2020		*2021*		*2022*		*2023*		*2024*		*2025*		*2026*		*Total*	
Components/subcomponents	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*	*Amount*	*%*
1. Agricultural productivity and adaptation to climate change	**35**	**0**	**136**	**0**	**1 421**	**3**	**7 782**	**14**	**21 719**	**39**	**19 304**	**35**	**5 450**	**10**	**55 846**	**69.8**
1.1. Infrastructure development and management	35	0	21	0	1 153	3	5 107	12	17 661	41	15 666	36	3 919	9	43 562	54.4
1.2. Provision of agricultural services	-	-	115	1	269	2	2 674	22	4 057	33	3 638	30	1 531	12	12 284	15.4
2. Access to markets	**-**	**-**	**184**	**1**	**659**	**5**	**2 041**	**14**	**5 493**	**38**	**4 602**	**32**	**1 609**	**11**	**14 588**	**18.2**
2.1 Building value chains and market linkages	-	-	138	2	499	6	951	12	2 556	33	2 075	27	1 541	20	7 760	9.7
2.2. Financing for 4Ps	-	-	46	1	160	2	1 090	16	2 937	43	2 527	37	68	1	6 828	8.5
3. Project management, institutional development and citizen engagement	**752**	**8**	**1 221**	**13**	**1 134**	**12**	**1 499**	**16**	**1 723**	**18**	**1 713**	**18**	**1 531**	**16**	**9 572**	**12.0**
Total	**787**	**1**	**1 540**	**2**	**3 214**	**4**	**11 322**	**14**	**28 934**	**36**	**25 619**	**32**	**8 591**	**11**	**80 006**	**100**

Financing and cofinancing strategy and plan

33. The project was approved in December 2019 for a total cost of around 4 billion Gambian dalasi, equivalent to US$80 million. The initial financing plan included:(i) an IFAD11 loan of US$4.26 million (5.3) with a US$700,000 allocation for Faster Implementation of Project Start-up (FIPS);(ii) an IFAD grant of US$17.02 million (21.3 per cent); (iii) GEF funding of US$5.30 million (6.6 per cent); (iv) an OPEC Fund loan of US$10 million (12.5 per cent); (v) AFD funding of US$11.17 million (14.0 per cent); (vi) US$5.41 million from the Government of The Gambia in tax exemption (6.8 per cent); (vii) a beneficiary contribution of US$6.25 million (7.8 per cent) and (viii) a financial gap estimated initially at US$20.60 million (25.7 per cent of the project costs) and planned to be covered by an IFAD12 allocation or from other financiers to be identified at a later date.

34. However, some financing did not materialize, including US$10 million from the OPEC Fund which had been planned to be used to finance the infrastructure, in particular new tidal irrigation systems. Additionally, AFD, GEF and beneficiary funding were reduced. This further increased the gap to approximately US$31.09 million. The first additional IFAD finance, including additional contributions from the Government of The Gambia, greatly alleviated this gap, reducing it to US$18.91 million, which would now be filled with the second additional IFAD finance.

35. The new financing plan considering this additional IFAD financing is as follows: (i) IFAD11 loan for US$4.26 million (5.3 per cent) with around US$232,792 disbursed as FIPS; (ii) IFAD grant of US$17.02 million (21.3 per cent); (iii) a first additional IFAD grant under IFAD12 of US$11.94 million (14.9 per cent); (iv) a second additional IFAD grant to countries in high debt distress estimated at US$18.91 million (23.6 per cent of the project costs) (v) US$4.71 million (5.9 per cent) from the GEF; (vi) US$4.98 million (6.2 per cent) from the GCF; (vii) US$7.6 million (9.5 per cent) from AFD; (viii) US$5.66 million from the Government of The Gambia in tax exemption and in-kind contributions (7.1 per cent); (ix) US$4.93 million (6.2 per cent) from beneficiaries.

Disbursement

36. The disbursement and procurement procedures for this additional financing will remain consistent with those specified in the original financing agreement.

37. IFAD funds are made available through a designated account opened in United States dollars at the Central Bank of The Gambia. The project will submit quarterly interim financial reports to IFAD. These reports will present the project’s cash forecast for the next two quarters and will serve as a basis for disbursement. The letter to the borrower/recipient will be amended to outline the requirements relating to the interim financial reports and disbursement.

38. As of 31 December 2023, the cumulative disbursement of IFAD funding for the project, comprising the IFAD loan and IFAD grant, was US$13.8 million, accounting for 64.9 per cent of the total IFAD financing amount of US$21.3 million.

Summary of benefits and economic analysis

39. Overall, the ROOTS project is a moderately viable programme, generating a net present value (NPV) at a 6 per cent discount rate of US$23.1 million and an economic internal rate of return (EIRR) of 14.2 per cent (for a total budget of US$80.01 million, US$33.2 million of which is funded by IFAD), without taking into account any of the environmental benefits. The full economic potential of the project, when the projected greenhouse gas mitigation is considered appropriately, is much higher. Using the average of the lower and higher estimates of the social

cost of carbon published by the World Bank4, the ROOTS project would generate an NPV of US$47.7 million and an EIRR of 21.2 per cent.

40. The results are robust under various scenarios, including implementation delays, reduced benefits and adoption rates and cost overruns. In addition, the results are conservative, given the difficulty of quantifying ex ante the project's impact on nutrition and health, rural-urban migration, and emigration, as well as import substitution for rice and other agricultural products. The project also indicates a high sensitivity to a drop in yield forecasts of more than 30 per cent. The results of the supported financial models and the economic analysis are presented in appendix II.

Exit strategy and sustainability.

41. The project is currently developing its exit strategy. The second additional grant will finance the implementation of the exit strategy which will ensure:

(i) The financial and economic profitability of the proposed investments;

(ii) Strengthened public institutions;

(iii) The enhanced capacity of training institutions for young people, with a specific focus on promoting youth and women's leadership; and

(iv) Empowered and autonomous farmers' organizations at all levels, fostering a sense of ownership within communities, and enhancing their operation and maintenance capabilities.

42. To achieve sustainability, the project will also incorporate the following activities and implementation strategies:

(i) Promoting sustainable infrastructure that is well managed by communities and farmers' organizations;

(ii) Establishing clear operational and maintenance arrangements, delineating responsibilities for large and complex infrastructure projects;

(iii) Advocating for a more structured approach to value chain support and inclusivity in rural financial services; and

(iv) Conducting a midterm review of financing mechanisms, with the potential for adjustments.

III. Risk management

A. Risks and mitigation measures

43. The mitigation measures defined at the design stage and implemented at this stage have successfully lowered the likelihood of the identified risks. Nonetheless, in the present context, it is essential to take account of new risks and implement suitable mitigation strategies to ensure the project's ongoing progress.

44. In the following summary, the key project risks and their corresponding mitigation measures are presented.

[4] World Bank guidance note on the shadow price of carbon in an economic analysis of September 2017.

Table 6
Project risks and mitigation measures

Risks	*Inherent risk*	*Residual risk*	*Mitigation measures*
Political commitment and counterparts	Substantial	Substantial	• Develop close collaboration with ministries involved in implementation to strengthen the project institutions for enhanced coordination
Macroeconomic	High	Substantial	• The International Monetary Fund (IMF) will effectively monitor and support economic and financial policies, focusing on debt sustainability and fiscal discipline • Clearly define conditions for tax exemption during project negotiations
Sector strategies and policies	Substantial	Moderate	• Policy-relevant knowledge products based on project evidence and promoting inclusive policy dialogue. • Promoting effective governance mechanisms and building institutional capacities • IFAD engagement with United Nations Country Team (UNCT) in policy coherence and leading an important technical working group. Constant communication with implementing agency, UNCT, other international financial institutions, Rome-based agencies and project beneficiaries
Institutional capacity	High	Substantial	• Addressing weakness in monitoring and evaluation (M&E) by designing an M&E digital stand-alone application and close examination of data provided during implementation • The M&E system will be enforced by facilitating the monitoring of implementation at the regional level (regional coordinators and field assistant)
Fiduciary - financial management	Substantial	Moderate	• Fast track remaining recruitments, ensure training, including with an additional financial consultant, and determine plans for alternates to strengthen staff capacities • Revise the project implementation manual to align with the new financial management requirements of IFAD including project staff training on the procedures • Exploring mobile transfer options for disbursing daily subsistence allowances to project staff and payments to beneficiaries • Internal auditors to develop a risk matrix for the project, prepare the internal audit plan with the annual workplan and budget and implement the plan within the timeline
Fiduciary – procurement	Substantial	Moderate	• Elaboration of procurement guidelines and manual and IFAD guidelines for procurement and anti-corruption • Setting up of the new IFAD OPEN (Online Project Procurement End-To-End System) and contracts monitoring platform
Environment and climate	Moderate	Low	• Introduce inclusive climate-resilient technologies and practices such as agroforestry, integrated soil fertility, anti-salinization, and anti-erosion works
Overall	Substantial	Moderate	N/A

B. Environment and social category

45. The ROOTS project is a category B project (unchanged from the original design) based on the Social, Environmental and Climate Assessment Procedures (SECAP) of 2017, indicating that the activities will be implemented in non-sensitive areas and that any potential adverse environmental and social impacts are expected to be limited, mostly reversible and manageable. The additional financing aims to promote sustainable environmental and natural resource management, ensuring

that activities involving a high risk of harm to people or the environment are avoided.

46. Risks to environmental and social management identified at the design stage include inadequate governance, a lack of institutional, technical and organizational capacity, and limitations in the implementation capacity of service providers for infrastructure. An additional risk is the social exclusion of vulnerable groups.

47. To address these risks, a comprehensive environmental and social management plan has been developed. This plan includes risk reduction measures in accordance with the requirements of the SECAP and aligns with the country's guidelines, as established by the National Environment Agency. Additionally, the stakeholder engagement plan and the grievance redress mechanism for the ROOTS project will be finalized by December 2024.

C. Climate risk classification

48. The ROOTS project is classified as having a high climate risk in view of the natural-resource-dependent communities that engage in climate-sensitive activities. The Gambia faces significant climate hazards, including flooding, water scarcity, extreme heat and wildfires. These climate-related shocks have a detrimental impact on the productivity of major crops, such as maize, sorghum, millet and groundnut, which are crucial for the well-being of rural households.

49. The western and lower-central areas of the country are particularly vulnerable, facing challenges such as salinity problems and rising sea levels. To support adaptation and climate-resilient production systems, additional financing activities incorporate climate-smart agricultural practices.

IV. Implementation

A. Compliance with IFAD policies

50. There will be no alterations to the original design of the ROOTS project with the additional financing. The project is consistent with both the IFAD Strategic Framework 2016–2025 and the IFAD environment and climate strategy 2019–2025. The implementation of The Gambia's COSOP for the period 2019–2024 is primarily carried out through the ROOTS project.

51. The project will be in accordance with IFAD policies regarding targeting gender, natural-resource management, environmental impact and rural enterprises.

B. Organizational framework

Management and coordination

52. The implementation plan builds on a decentralized PSU located in Banjul, with one regional field coordinator position established in each of the five regions covered by the project. The Ministry of Agriculture will continue to oversee the project through the central project coordination unit and a national steering committee, comprising representatives from various public, private and civil society stakeholders that will be responsible for overseeing project implementation and providing essential strategic guidance.

Financial management, procurement and governance

53. The current implementation arrangement of the ROOTS project will be retained. Financial and procurement management will be carried out in compliance with the provisions outlined in the financing agreement and the updated project procurement arrangement.

54. The project will maintain a layered and inclusive project oversight structure to ensure effective coordination among various participating government agencies and stakeholders. The Ministry of Agriculture will continue to act as the executing

agency, supported by the national steering committee and the PSU led by a project director.

55. At the national level, the national steering committee will continue to be responsible for approving annual workplans and budgets, project reports, and for providing overall policy and strategic guidance for the project.

56. The PSU will assume overall responsibility for day-to-day project management, procurement, coordination of project implementation, monitoring, evaluation, and reporting of results to stakeholders. Additionally, it will develop environment and management plans. The financial team has been strengthened with the recruitment of an internal auditor. The positions of the financial controller and accountant have been filled. The project recruited the financial controller in April 2024 and the accountant in September 2024, thus completing the finance team. Additionally, the Financial Management Services Division organized an implementation support mission to further strengthen the financial controller's capacity. A continued and long-term capacity development plan will be developed for the financial management team and specifically for the finance controller and project accountant to strengthen their skills and knowledge to maintain a strong internal control system for the project at all levels.

57. Adhering to the conditions specified in the financial agreement, the detailed financial management arrangements to be adopted are documented in the project's financial and accounting management procedures that must be followed to achieve IFAD's fiduciary objective of utilizing project funds efficiently and economically for their intended purposes, thus accomplishing the project development objective. The financial accounting management procedures will be updated to take into account changes in the project environment, including recommendations from the recent supervision missions.

58. IFAD will continue to exercise procurement and fiduciary oversight through a risk-based approach, which includes prior and post reviews, supervision and support missions, as deemed appropriate. Information on the top 10 fraud and corruption red flags have been displayed at the PSU conference room, IFAD's policy on preventing fraud and corruption in its activities and operations is included in the contracts with third parties and in the finance and administrative procedures manual with the related link to the IFAD system.

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

59. **Planning, monitoring and evaluation.** The project will continue to improve its M&E through the collection and processing of relevant data on project performance, and digital data collection will be harmonized across all regions. The project will activate its M&E dashboard to share real-time information on key indicators. Project staff and implementing partners will be trained in key M&E tasks. Participatory M&E will be incorporated to enhance beneficiary roles in M&E.

60. After the midterm review, an annual outcome survey will be undertaken to identify progress and pathways to the achievement of project outcomes. The project will also undertake special studies to assess the effects of its intervention on crop yields and the incomes of smallholder farmers. M&E will assess the contribution of the project to the achievement of the COSOPs and The Gambia Second Generation National Agricultural Investment Plan - Food and Nutrition Security.

61. **Learning, knowledge management and strategic communications**. The project will continue to identify and document experiences and lessons to promote learning and visibility. A quarterly knowledge product/outcome story series will be published to showcase results. To achieve this, the project will organize two outcome-harvesting workshops annually to identify its main results.

62. The project will continue to use appropriate outlets to share information with key stakeholders, including smallholder farmers. The additional financing will support the production of visibility materials, such as short video clips in selected local languages.

D. Proposed amendments to the financing agreement

63. An amendment to the original financing agreement between the Republic of The Gambia and IFAD will be made to reflect the additional financing.

V. Legal instruments and authority

64. The Republic of The Gambia 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.

65. According to its laws, the Republic of The Gambia has the authority to receive financing from IFAD.

66. I am confident that the proposed additional financing will adhere to the Agreement Establishing IFAD and the Policies and Criteria for IFAD Financing.

VI. Recommendation

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

> RESOLVED: that the Fund shall provide a Debt Sustainability Framework grant to the Republic of The Gambia in an amount of eighteen million nine hundred and ten thousand United States dollars (US$18,910,000) 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 second additional financing (unchanged from first additional financing)

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Name	**Baseline**	**Mid-Term**	**End Target**	Source	Frequency	Responsibility	
Outreach ROOTS	**1.b Estimated corresponding total number of households members**				Project Progress Report	Baseline, Mid-term	Completion PSU	Stable political and macro-economic environment. No major natural disaster affects the Project Area
	Household members - Number of people	0	240,000	320,000				
	1.a Corresponding number of households reached							
	Total Households	**0**	**30,000**	**40,000**				
	Women-headed households - Households	0	4800	6400				
	Non-women-headed households - Households	0	25200	33600				
	1 Persons receiving services promoted or supported by the project							
	Total Persons Receiving Services	0	20000	40000				
	Females - Females	0	16000	32000				
	Males - Males	0	4000	8000				
	Young - Young people	0	5000	10000				
	People with Disability (PwD)	0						
	Non-Indigenous people - Number							
Project Goal To improve food security, nutrition and smallholder farmers' resilience to climate change in The Gambia	**Targeted households with improved food security**							
	targeted households - Percentage (%)	0	25	50	Surveys	Baseline, Mid-term, Completion	GoTG, IFAD	Stable political and macro-economic environment. No major natural disaster affects the Project Area
	People with greater resilience including people with Disabilities				Surveys	Baseline, Mid-term, Completion	GoTG, IFAD	Stable political and macro-economic environment. No major natural disaster affects the Project Area
	People with greater resilience - men - Number of people	0	4000	8000				
	People with greater resilience - women - Number of people	0	16000	32000				

	People with greater resilience - young - Number	0	5000	10000				
Development Objective To increase agricultural productivity and access to markets for enhanced food security, nutrition and resilience of family farms and farmers organizations	**Households reporting an improved access to markets and a 30% income increase**							
	Households with improved access to market - Percentage (%)	0	25	50	Surveys	Baseline, Mid-term, Completion	PSU	Stable political and macro-economic environment. No major natural disaster affects the Project Area
	Yields							
	Rice, non-SRI, tidal - Area (Kg/ha)	1600	3600	3600	Surveys	Baseline, Mid-term, Completion	PSU	
	Tomatoes - Area (kg/ha)	9600	12600	12600				
	Onions - Area (kg/ha)	14400	19800	19800				
	% of ROOTS supported beneficiaries (smallholder farmers, processors and marketers) that have increased their real agricultural income (by average 25%)							
	Women - Percentage (%)	0	40	80	Surveys	Baseline, Mid-term, Completion	PSU	
	Men - Percentage (%)	0	10	20				
	Disabled - Percentage (%)	0	5	10				
	Young people - Percentage (%)	0	15	25				
	% Reduction in the prevalence of child malnutrition (stunting, wasting, underweight)							
	stunting - Percentage (%)	0	5	10	Surveys	Baseline, Mid-term, Completion	PSU/NaNA	
	wasting - Percentage (%)	0	10	20				
	underweight - Percentage (%)	0	15	30				
	1.2.8 Women reporting minimum dietary diversity (MDDW)							
	Women (%) - Percentage (%)	0	25	50	Surveys	Baseline, Mid-term, Completion	PSU/NaNA	
	Women (number) - Females	0	16000	32000				
	Households (%) - Percentage (%)	0	25	50				
	Households (number) - Households	0	16000	32000				
	Household members - Number of people	0	128000	256000				

Outcome 1. Environmentally sustainable, climate-resilient and nutrition sensitive technologies and practices are adopted by beneficiaries Environmentally sustainable, climate-resilient and nutrition sensitive technologies and practices are adopted by beneficiaries	**3.2.2 Households reporting adoption of environmentally sustainable and climate-resilient technologies and practices**							
	Households - Percentage (%)	0	30	75	Surveys	Baseline, Mid-term, Completion	PSU	
	Total number of household members - Number of people	0	10000	30000				
	Males - Males	0	2000	6000				
	Females - Females	0	8000	24000				
	Young - Young people	0	2500	7500				
	3.2.1 Greenhouse gas emissions (CO2) avoided and/or sequestered							
	Number of tons - translation missing: en.logframe.multiplier.unit.name.tons	0	??	-136475				
	3.2.3 Households reporting a significant reduction in the time spent for collecting water or fuel							
	Households - Percentage (%)	0			Surveys	Baseline, Mid-term, Completion	PSU	
	Households – Households	0						
	Total household members - Number of people	0						
	Males – Males	0						
	Females – Females	0						
	Young - Young people	0						
	Not Young – Number	0						
Output 1.1 Natural resources are sustainably managed for rice and vegetable production	**3.1.4 Land brought under climate-resilient practices**							
	Hectares of land - Area (ha)	0	3000	3800	Progress reports	Annual	PSU	
	Upgraded women-led vegetable gardens (consolidated and new)							
	Upgraded Women-led vegetable gardens - Number	0	20	40	Progress reports	Annual	PSU	
	New Women-led vegetable gardens - Number	0	15	30				
Output 1.2 Access to agricultural services is improved	**1.1.4 Persons trained in production practices and/or technologies**							
	Men trained in crop - Males	0	2628	4610	Progress reports	Annual	PSU	
	Women trained in crop - Females	0	10511	18440				

	Young people trained in crop - Young people	0	1441	5763				
	PwD		1314	2305				
	Total persons trained in crop - Number of people	0	14830	23050				
	1.1.3 Rural producers accessing production inputs and/or technological packages							
	Females – Females	0	4800	8000	Progress reports	Annual	PSU	
	Males – Males	0	1200	2000				
	Young - Young people	0	1500	2500				
	Total rural producers - Number of people	0	6000	10000				
	Jobs created (100% youth-led agricultural service businesses)							
	Jobs – Number	0	200	240	Progress Reports	Annual	PSU	
	1.1.8 Households provided with targeted support to improve their nutrition							
	Total persons participating - Number of people	0	3000	7000	Progress Reports	Annual	PSU	
	Males – Males	0	600	1400				
	Females – Females	0	2400	5600				
	Household members benefitted - Number of people	0	25000	56000				
Output 1.3 Forest and land resources are sustainably managed (GEF)	Community Institutional development plans developed and implemented - Number			4	Progress Reports	Annual	PSU	
	Households promoting integrated water and SM practices -Number			700				
	Area of integrated water and SM practices -Ha			1500				
	Area under natural assisted regeneration - Ha			10,000				
	woodlots integrated into sustainable wood and biomass energy-Ha			1000				
	Community agroforestry area-Ha			5000				
	Area under integrated crop livestocks systems-Ha			2000				

	Area with participatory SLM plans - Ha			15000				
	Jambar cooking stoves distributed - Number			1000				
Outcome 2. Inclusive commercial partnerships between FOs and buyers (through the public-private producers' partnerships/4Ps) are established	**2.2.3 Rural producers' organizations engaged in formal partnerships/agreements or contracts with public or private entities**							
	Number of POs - Organizations	0	40	60	Surveys	Baseline, Mid-term, Completion	PSU	
	Women in leadership position - Females	0	80	120				
Output 2.1 Women- and youth-based FOs are equipped with the knowledge and bargaining power to enter into inclusive and sustainable 4Ps	**Effective agricultural value chain interaction platforms (AVIPs)**							
	Value chain platforms - Number	0	12	12	Progress reports	Annual	PSU	
	2.1.6 Market, processing or storage facilities constructed or rehabilitated							
	Market facilities constructed/rehabilitated - Facilities	0	2	4	Progress reports	Annual	PSU	
	Processing facilities constructed/rehabilitated - Facilities	0	2	4				
	Storage facilities constructed/rehabilitated - Facilities	0	2	4				
Output 2.2 Viable and sustainable 4P business plans are designed and financed	**SMEs engaged in 4Ps**							
	SME - Number	0	10	20	Progress reports	Annual	PSU	
Youth led enterprises	Number YLE	0	6	240	Progress reports	Annual	PSU	
C3								
3.2 Number of agricultural policy reforms and investment plans	Number		2	4	Progress reports	Annual	PSU	

Updated summary of the economic and financial analysis

Part 1: Summary tables

Financial cash-flow models

A)		Activities												
		Irrigated tidal rice non-SRI (1 ha)		Irrigated tidal rice SRI (1 ha)		Rain fed tidal zone rice (1 ha)	Rain fed lowland rice (1 ha)	Upgraded vegetable garden	New vegetable garden	Poultry - broiler	Poultry - layer	Youth-led agribusiness	Coop agribusiness/FO	SME agribusiness
		Rehabilitated	New	Rehabilitated	New	Existing	Existing	Existing	New	New	New	New	New	New
FINANCIAL ANALYSIS	PY1	24,779	30,321	75,628	81,338	6,767	7,137	(1,326,616)	(5,680,727)	19,755	(33,615)	(330,000)	(2,250,000)	(9,000,000)
	PY2	34,298	39,840	90,334	96,044	9,584	9,954	474,200	1,180,016	340,689	387,278	55,000	400,000	1,750,000
	PY3	41,206	46,748	105,145	110,855	11,123	11,493	525,016	1,290,758	409,590	460,055	65,000	600,000	2,250,000
	PY4	42,101	47,643	105,345	111,055	11,643	12,013	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY5	40,708	46,250	104,746	110,456	10,992	11,362	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY6	41,988	47,530	103,823	109,533	11,613	11,983	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY7	40,765	46,307	102,760	108,470	11,007	11,377	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY8	41,761	47,303	101,504	107,214	11,553	11,923	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY9	39,998	45,540	99,856	105,566	10,743	11,113	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
	PY10	40,717	46,259	99,916	105,626	11,194	11,564	525,016	1,290,758	409,590	481,430	75,000	600,000	3,000,000
NPV (Local curr.)		255,386	292,573	656,120	694,434	69,892	72,374	1,764,860	2,111,069	2,328,352	2,655,853	103,171	1,215,692	7,352,085
NPV (USD)		5,108	5,851	13,122	13,889	1,398	1,447	35,297	42,221	46,567	53,117	2,063	24,314	147,042
FIRR (@8%)		N/A	N/A	N/A	N/A	N/A	N/A	38%	22%	N/A	N/A	15%	20%	25%
B/C ratio		1.90	1.90	2.50	2.50	1.30	1.40	2.60	2.20	1.46	1.44	1.18	1.86	1.49

Table B: Project costs and log-frame indicators

B)					
PROJECT COSTS AND INDICATORS FOR LOGFRAME					
TOTAL PROJECT COSTS (in million USD)	**80**	Base costs	72.3	PMU	9.5
Beneficiaries	**320,000** people	**40,000** Households			
Cost per beneficiary	**250** USD x person	2,000 USD x HH		**Adoption rates**	**100%**
Components and Cost (USD million)		**Outcomes**			
Agriculture Productivity and Adaptation to Climate Change	55.8	Outcome 1: Environmentally sustainable, climate-resilient and nutrition sensitive technologies and practices are adopted by beneficiaries			
Access to Markets	14.6	Outcome 2: Inclusive commercial partnerships between FOs and buyers (through the public-private producers' partnerships/4Ps) are established			
Project Management and Coordination	9.5				

Table C: Main assumptions and shadow prices

C)	MAIN ASSUMPTIONS & SHADOW PRICES[1]				
FINANCIAL	**Output**	Av. Increm. Yields (%)	Price (in LC)	**Input prices**	Price (LC)
	Rice (paddy)	100%	21	NPK (15-15-15)	28
	Rice (milled)	100%	30	Urea (46%)	28
	Tomato	33%	23	Compost	1
	Bitter tomato	33%	30	Rice seed (local)	16
	Onion	33%	30	Rice seed (improved)	24
	Cabbage	33%	30	Land preparation	2,500
	Eggplant	33%	40	Rice milling	50
	Chili pepper	33%	100	Rice bag	50

ECONOMIC				
	Official Exchange rate (OER)	50	Discount rate (opportunity cost of capital)	8%
	Shadow Exchange rate (SER)	52	Social Discount rate	6%
	Standard Conversion Factor	1.03	Output conversion factor	1.19
	Labour Conversion factor	0.80	Input Conversion factor	0.58

Table D: Beneficiary adoption rates and phasing

D)	BENEFICIARIES, ADOPTION RATES AND PHASING							
	Benef. HH	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Rice producers	***10,500***	***0***	***0***	***0***	***1,080***	***5,712***	***3,708***	***900***
Irrigated tidal rice non-SRI & SRI	*8,400*	*0*	*0*	*0*	*0*	*3,792*	*3,708*	*900*
Rain fed tidal zone rice	*2,400*	*0*	*0*	*0*	*960*	*1,440*	*0*	*0*
Rain fed lowland rice	*600*	*0*	*0*	*0*	*120*	*480*	*0*	*0*
Vegetable producers	***13,400***	***0***	***0***	***760***	***6,400***	***3,900***	***2,340***	***0***
Upgraded gardens	*10,400*	*0*	*0*	*260*	*5,200*	*2,600*	*2,340*	*0*
New gardens	*3,000*	*0*	*0*	*500*	*1,200*	*1,300*	*0*	*0*
Youth-led agribusinesses	***240***	***0***	***0***	***0***	***100***	***80***	***60***	***0***
Coop agribusiness/FO	***3,000***	***0***	***0***	***0***	***800***	***1,000***	***1,200***	***0***
SME agribusiness	***1,500***	***0***	***0***	***0***	***400***	***600***	***500***	***0***
Sustainable Forest and Land Management (SFLM)	***6,500***				***117***	***2,750***	***2,683***	***950***
Other beneficiaries from market access	***4,860***	***0***	***0***	***500***	***800***	***1,200***	***1,360***	***1,000***
Total Households	***40,000***							
Household members - Number of people	***320,000***							

Table E: Overall Economic Analysis

E)		NET INCREMENTAL BENEFITS (GMD)											Cashflow (USD)	
		Irrigated tidal rice non-SRI	Irrigated tidal rice SRI	Rain fed tidal zone rice	Rain fed lowland rice	Upgraded vegetable garden	New vegetable garden	Poultry - broiler	Poultry - layer	Youth-led agribusiness	Coop agribusiness/FO	SME agribusiness	Total Incremental Costs	Total Incremental Benefits
ECONOMIC ANALYSIS	PY1	-	-	-	-	-	-	-	-	-	-	-	636,105	(636,105)
	PY2	-	-	-	-	-	-	-	-	-	-	-	1,540,001	(1,540,001)
	PY3	-	-	-	-	(1,261,931)	(29,679,303)	-	-	-	-	-	2,093,804	(2,415,298)
	PY4	-	-	8,719,251	522,712	(24,693,633)	(63,076,299)	-	-	4,500,000	2,000,000	8,000,000	6,970,538	(7,641,533)
	PY5	67,764,196	3,639,000	18,096,488	2,764,134	(1,117,455)	(48,734,162)	593,691	(958,320)	9,100,000	5,700,000	26,000,000	20,686,036	(18,206,597)
	PY6	150,468,577	13,306,168	22,087,507	3,585,621	6,733,008	51,332,494	3,017,190	295,147	13,600,000	11,800,000	49,000,000	19,411,736	(11,631,187)
	PY7	194,938,702	30,911,206	23,835,789	4,081,566	23,564,643	53,174,155	5,322,962	2,752,519	16,000,000	15,600,000	68,500,000	426,532	10,494,211
	PY8	204,391,068	54,628,476	23,628,759	4,174,606	24,076,997	53,174,155	5,798,925	3,115,668	17,400,000	18,000,000	82,500,000	426,532	12,178,957
	PY9	197,383,782	77,444,133	23,676,415	4,086,309	24,076,997	53,174,155	5,798,925	3,233,230	18,000,000	18,000,000	90,000,000	426,532	12,734,002
	PY10	190,521,784	83,831,446	23,560,456	4,155,633	24,076,997	53,174,155	5,798,925	3,233,230	18,000,000	18,000,000	90,000,000	426,532	12,791,689
	PY11	187,580,899	86,608,400	23,561,818	4,002,828	24,076,997	53,174,155	5,798,925	3,233,230	18,000,000	18,000,000	90,000,000	426,532	12,853,366
	PY12	187,367,491	86,163,769	23,302,422	4,041,795	24,076,997	53,174,155	5,798,925	3,233,230	18,000,000	18,000,000	90,000,000	426,532	12,904,134
	PY13	186,212,123	85,429,803	23,065,041	3,901,046	24,076,997	53,174,155	5,798,925	3,233,230	18,000,000	18,000,000	90,000,000	426,532	12,927,994
	PY14	184,289,021	84,581,196	22,664,866	3,927,918	24,076,997	53,174,155	5,798,925	3,233,230	10,500,000	13,200,000	66,000,000	426,532	12,254,215
	PY15	181,982,563	83,731,611	22,549,009	3,832,980	24,076,997	53,174,155	5,798,925	3,233,230	4,500,000	7,200,000	30,000,000	426,532	11,326,880
	PY16	179,415,965	82,969,846	22,112,217	3,867,204	24,076,997	53,174,155	5,798,925	3,233,230	-	-	-	426,532	10,537,137
	PY17	175,499,141	82,375,321	22,153,802	3,756,139	24,076,997	53,174,155	5,798,925	3,233,230	-	-	-	426,532	10,538,776
	PY18	175,516,580	81,946,194	21,764,631	3,801,747	24,076,997	53,174,155	5,798,925	3,233,230	-	-	-	426,532	10,591,931
	PY19	173,512,131	81,376,502	21,702,243	3,666,017	24,076,997	53,174,155	5,798,925	3,233,230	-	-	-	426,532	10,628,607
	PY20	172,813,096	80,861,914	21,364,237	3,715,144	24,076,997	53,174,155	5,798,925	3,233,230	-	-	-	426,532	10,712,477

With Env. Benefits	
NPV@ 6 % (GMD bn)	2.46
NPV@ 6 % (USD)	47,710,342
EIRR	21.2%

Without Env. Benefits	
NPV@ 6 % (GMD bn)	1.1
NPV@ 6 % (USD)	23,143,616
EIRR	14.2%

Table F: Sensitivity analysis

Scenarios		EIRR	NPV (6,0%)	
			GMD billion	USD million
Base scenario		14.2%	1.1	23.1
Costs +	10%	12.3%	0.9	19.0
Costs +	20%	10.7%	0.7	14.9
Costs +	50%	6.7%	0.1	2.6
Benefits -	10%	12.1%	0.8	16.7
Benefits -	20%	9.9%	0.5	10.3
Benefits -	30%	5.9%	0.0	-0.3
Benefits delayed by 1 year		11.6%	0.8	17.3
Benefits delayed by 2 year		9.6%	0.6	11.8
Benefits delayed by 3 year		7.9%	0.3	6.7
Benefits delayed by 4 year		6.5%	0.1	1.7
Adoption rate -	10%	13.1%	0.9	18.8
Adoption rate -	20%	11.9%	0.7	15.2
Production prices -	10%	11.7%	0.7	15.0
Production prices -	20%	6.9%	0.1	2.1
Input prices +	10%	14.0%	1.0	21.7
Input prices +	20%	13.6%	1.0	20.5
Rice price -	10%	12.4%	0.8	17.0
Rice price -	20%	10.6%	0.6	11.9
Rice price -	30%	8.7%	0.3	6.7
Rice yield -	10%	11.7%	0.7	14.9
Rice yield -	20%	9.0%	0.4	7.7
Rice yield -	30%	6.2%	0.02	0.5

Part 2: Detailed Economic and Financial Analysis

1. This annex presents the economic and financial analysis (EFA) of the proposed IFAD-funded Resilience of Organizations for Transformative Smallholder Agriculture (ROOTS) project in The Gambia. The evaluation is built on the cost-benefit analysis (CBA) applied to a range of agricultural production models (irrigated and rain fed rice, irrigated vegetable gardens, poultry) and income-generating activities (youth-led agricultural service provision, agri-SMEs and cooperatives) and it incorporates the estimated benefits resulting from the greenhouse gases (GHG) accounting, using the EX-ACT methodology. Part I of this annex introduces the identification of benefit streams, followed by Part II which describes the methodology and assumptions used for the CBA analysis, Part III summarizes the financial results of the main models. The GHG accounting is presented in Part IV, and finally Part V summarizes the results of the economic analysis, including sensitivity analysis to explore how the results might change under different scenarios.

2. Overall, ROOTS is a profitable project, with an economic rate of return (EIRR) of 14.2% and generating a new present value (NPV at 6%) of the net additional benefits of USD 23.1 million (GMD 1.1 billion) without valuing any of the environmental benefits. The full economic potential of the project, when the projected GHG mitigation are valued appropriately, is much higher. Using the average of the Lower and higher estimates for the social cost of carbon published by the World Bank5, ROOTS would generate a net present value (NPV) of US$47.7 million and an economic internal rate of return (IRR) of 21.2 % (on a budget of USD 80 million). The results are robust under various scenarios of implementation delays, reduced benefits and adoption rates and cost overruns. In addition, the results are conservative, given the difficulty of quantifying ex-ante the project's impact on nutrition and health, rural-urban migration and emigration as well as import substitution for rice and other agricultural products.

I. Identification of benefits

3. The identification of benefits is based on the analysis of the project's main intervention areas and the main cost building blocks. As the first component, focused on agricultural productivity and adaptation to climate change, accounts for two-thirds of the overall budget, the present analysis is centered on the benefits arising from the main production-related activities. In particular, the project is expected to generate additional improved production and incomes for beneficiaries through its mix of land of land development and support to agricultural input provision tailored to irrigated and rain fed rice and upgraded and new vegetable gardens. In addition, poultry production (broilers and layers) will be integrated into some of the new market-oriented vegetable gardens. The first component will also generate income-generation benefits to the youth, which will be supported to engage in agri-businesses.

4. The second component, designed to promote inclusive commercial partnerships, will generate two streams of benefits: first, its main intervention areas, coupled with the support to SMEs and cooperatives, will generate a pull effect for the production activities. Effects are expected to include a reduction of post-harvest losses, in particular for vegetables, gradual price increases (through better FO organization and linkages with buyers) as well as value addition. Second, the project will support based on demand 4P-engaged SMEs and cooperatives in 4Ps, which will generate additional benefits as they develop and grow.

5. Although modest, given the requirements to mitigate the rice production externalities, the project will generate net positive environmental benefits through its reforestation activities and improved cropping practices (including better water management). ROOTS will also impact other developmental outcomes, unquantifiable at this stage, but which include better nutrition and human health, improved policy dialogue and enabling environment for agriculture and rural development, lower food imports, better value chain integration, value addition and equity, etc.

II. Methodology and assumptions

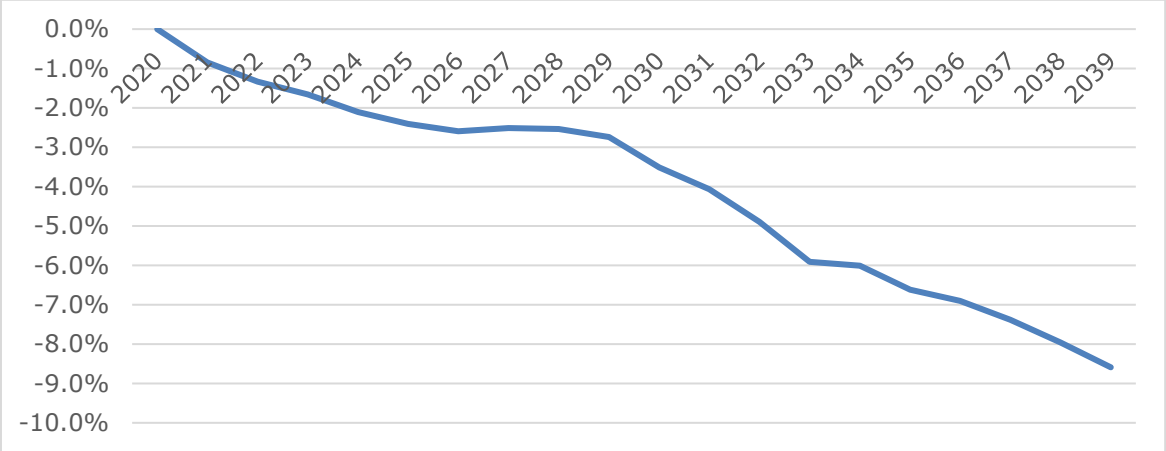
6. This analysis follows the standard methodology recommended for evaluating agriculture and rural development investment operations, as described in Gittinger (1982) and Belli et al. (2001) and is aligned to the IFAD guidelines for economic and financial analysis. The financial analysis was conducted to assess the profitability of the proposed project activities, modelled from the perspective of the target beneficiaries, and compared with the without-project situation (which reflects the current situation and has been considered static for the purpose of the analysis). Crop budgets have been prepared for the different rice production systems and for each season, with computed costs and benefits experienced by the beneficiaries with and without the project intervention, using market prices (full list in the Excel file). A total of 13 production models have been prepared: eight rice crop budgets (non-SRI irrigated tidal rice: wet season cultivation in rehabilitated and new perimeters, dry season cultivation in rehabilitated perimeters, dry season cultivation in new perimeters; same models for SRI irrigated tidal rice; rain fed tidal zone rice; rain fed lowland rice), three mixed vegetable garden crop budgets (wet season cultivation in upgraded gardens; dry and wet season cultivation in new gardens) and two models for poultry (broiler and layer). The economic analysis followed a similar approach but using economic prices and aggregating the results at the level of the project and from the society viewpoint. The economic analysis uses the incremental benefits, adoption rates and expected total number of beneficiaries (aligned to the updated logical framework), adding to that the environmental co-benefits arising from reduced GHG emissions and subtracting the total project economic costs to determine the

[5] World Bank Guidance note on shadow price of carbon in economic analysis September 2017

overall economic viability of the project. The discount rates used are in line with the recommended guidelines, the practice of recent project and in-country discussions: 8% for the financial analysis and 6% for the economic analysis.

7. Given The Gambia's climate change vulnerability and the increasing use of climate-related tool in EFAs, the present analysis has used the newly developed IFAD Climate Adaption in Rural Development (CARD) tool, in order to include the estimate of climate-induced yield variability. Given the project's target value chains and the tool's current scope, only rice production has been considered, using the data for irrigated production, under the pessimistic scenario, for the analysis period 2020-2039. As shown in figure 1 below, the climate-induced yield decrease for irrigated rice is expected to reach about 9% by the end of the analysis period, when compared with the base year.

Figure 1 Climate-induced yield variability for irrigated rice in The Gambia (percentage change relative to base year 2020)



Source: IFAD Climate Adaptation for Rural Development (CARD) Tool

8. *Key assumptions for rice models*. As detailed in table 1 below, the analysis has identified four rice production systems and modelled their *without project* (WOP) and *with project* (WP) parameters: non-SRI irrigated tidal rice (2-season cultivation in rehabilitated and new perimeters), SRI irrigated tidal rice (same cultivation patterns), rain fed tidal zone rice (wet season cultivation with better water retention due to dykes), and rain fed lowland rice (wet season cultivation with better water retention due to dykes). The proposed yield increases are significant, yet they are realistic based on the fact that project will shift production from rain fed to irrigated, water managed systems and on the field observations during the design mission. In addition, the project will promote the adoption of SRI practices in the irrigated perimeters and the analysis has assumed that 20% of the beneficiaries will adopt it gradually over a normal-distribution 6-year period. It is worth noting that the yield targets below are not adjusted for climate variability, which has been done directly in each model. Overall, all the rice models have been modelled with a three-year learning curve, to recognize that the productivity gains will be gradual despite the infrastructure investments and input provision.

Table 1 Key assumptions and parameters for rice production models

Rice models: Key parameters		WOP Situation	Target Yields (kg/ha)		WP Situation	Target Yields (kg/ha)	
			WOP Yield (wet)	WOP Yield (dry)		WP Yield (wet)	WP Yield (dry)
Irrigated tidal rice	Rehabilitated perimeters	Rain fed, traditional tidal production (local seeds, no/limited fertilizer application)	1,500	1,600	2-season cultivation, with improved water control, better agronomical practices and use of improved seeds and fertilizer	3,200	3,600
Non-SRI (80%)	New perimeters		1,500	700		3,200	3,600
Irrigated tidal rice	Rehabilitated perimeters	As above	1,500	1,600	As above, but with SRI practices (differentiated water management, additional labour, etc.)	6,000	6,000
SRI (20%)	New perimeters		1,500	700		6,000	6,000
Rain fed tidal zone rice	Existing sites	Rain fed, wet season traditional production (local seeds, no/limited fertilizer application)	600	N/A	Wet season cultivation with better water retention due to dykes, better agronomical practices, use of improved seed and fertilizer	1,800	N/A
Rain fed lowland rice	Existing sites	Rain fed, wet season traditional production (local seeds, no/limited fertilizer application)	700	N/A	Wet season cultivation with better water retention due to dykes, better agronomical practices, use of improved seed and fertilizer	1,800	N/A

9. *Key assumptions for vegetable gardens.* Garden users cultivate a wide range of vegetables, based on individual consumption preferences and market demand. For the purpose of this analysis, the four of the most widely cultivate vegetables have been selected: tomato, onion, cabbage and chili pepper. For the upgraded gardens, which are cultivated only in the dry season given labor constraints, it is assumed that the project intervention will have two impacts: one is to increase yields, while reducing post-harvest losses, and the second to double the land utilization from the current low average level of 30% to 60%. For the new, market-oriented gardens, it is planned to design them with land utilization rates of 80%, drip irrigation throughout and to have the beneficiaries participate in farmer field schools (FFS), thus resulting in higher productivity levels. The WOP situation for the new gardens has been considered a partial valuation of the used labor.

10. *Key assumptions for poultry activities*. Based on the lessons learned from other projects and expected demand from beneficiaries, the project will include poultry activities for some of the new vegetable gardens. To estimate these additional benefits, layer and broiler models have been prepared based on data collected during the design mission and the standard parameters for these poultry activities. A 1000-bird broiler unit using day-old chicks (DOC) has been considered, with 7-week cycles and 3-4-week rest period, resulting in 5 cycles per year. Mortality has been assumed at 5% and gradual uptake over 3 years has been modelled. Similarly, a 1000-bird layer unit, also using DOCs and mortality 10%, has been considered, with an average laying per production cycle of 78% and gradual uptake in the first three years.

11. *Key assumptions for matching grant financed activities*. First, given the proposed mechanism for business plan formulation and approval, the focus of the matching grant will be on financing viable businesses. In particular, the business plan to be submitted will be required to include a cash flow analysis and profitability indicators (IRR), together with a solid market assessment. Second, a brief literature review of profitability analysis of small agribusinesses in the sub-region indicates that rates of return between 15%-30% are to be expected, in strong correlation with the business size. For these reasons, the present analysis has retained the following, rather conservative, IRRs as indicative in the economic analysis: 15% for youth-led businesses, 20% for cooperatives and 25% for SMEs. Depending on the matching grant ceiling for each of these businesses, a 10-year cash flow has been estimated and included in the overall economic aggregation.

12. *Financial and economic prices.* Market prices for the financial analysis were collected on the ground by the project Monitoring and Evaluation system and updated during the additional financing mission, and economic prices were estimated using conversion factors designed to reflect prevailing taxes and subsidies. The conversion factors were estimated as follows: 1.11 for rice, 0.95 for imported inputs (like fertilizer and pesticides), and 0.8 for labor given the current market conditions, while for the rest of the inputs and outputs it has been considered that the economic prices were in line with the market prices. It is important to mention that accurate information on the use of non-family labor (paid labor) in the total labor requirements was not readily available: the analysis estimated that 80% of the labor needs for improved rice production will be met by family members (with a day of work valued at 100 GMD), while the remaining 20% is contracted outside of the family at a price of 125 GMD. In the vegetable gardens, it has been hypothesized that only family labor will be employed.

III. Financial results

13. All of the models assessed as part of this analysis appear viable, generating significant amounts of additional income and attractive returns on the investment (see Table 2 below).

Table 2 Summary results of the financial analysis

Financial Analysis: Summary results			Additional benefits/year		FIRR	NPV @ 8% (10-year)	
		Unit	(GMD)	(USD)	(percentage)	(GMD)	(USD)
Irrigated tidal rice	Rehabilitated perimeters	ha	76,482	1,530	N/A	465,569	9,311
Non-SRI (80%)	New perimeters	ha	90,342	1,807	N/A	557,443	11,149
Irrigated tidal rice	Rehabilitated perimeters	ha	188,190	3,764	N/A	1,174,204	23,484
SRI (20%)	New perimeters	ha	202,050	4,041	N/A	1,267,205	25,344
Rain fed tidal zone rice	Existing sites	ha	22,893	458	N/A	139,444	2,789
Rain fed lowland rice	Existing sites	ha	22,329	447	N/A	144,423	2,888
Upgraded vegetable garden	Existing sites	unit	601,925	12,038	46%	2,264,366	45,287
New vegetable garden	New sites	unit	1,611,338	32,227	29%	4,904,375	98,087
Poultry - broiler	New sites	unit	527,175	10,544	N/A	3,075,017	61,500
Poultry - layer	New sites	unit	293,930	5,879	N/A	1,465,228	29,305
Youth-led agribusiness*	New	unit	75,000	1,500	15%	103,171	2,063
Coop agribusiness*	Existing	unit	600,000	12,000	20%	1,215,692	24,314
SME agribusiness*	New/existing	unit	3,000,000	60,000	25%	7,352,085	147,042

* Conservative estimates

IV. Greenhouse gas (GHG) accounting

14. The environmental externalities of the project were updated using the EX-ACT tool, developed by FAO to provide estimations of the impact of AFOLU (agriculture, forestry and other land use) projects and policies on the carbon balance. The carbon balance is defined as the net balance across all GHGs expressed in CO2 equivalents (CO2e) that will be emitted or sequestered due to project implementation (WP), as compared to a business-as-usual scenario (WOP). EX-ACT is a land-based accounting system, estimating CO2e stock changes (i.e. emissions or sinks of CO2) expressed in equivalent tons of CO2 per hectare and year. The tool was designed using mostly data from the Intergovernmental Panel on Climate Change (IPPCC) Guidelines for National Greenhouse Gas Inventories (NGGI-IPCC, 2006), which furnishes EX-ACT with recognized default values for emission factors and carbon values in soils and biomass (the so-called “Tier 1 level” of precision).

15. For ROOTS, the GHG accounting calculations are based on characteristics in the predominant AEZ in The Gambia (moist tropical climatic conditions with HAC soils) and the land use and crop management practices for WP and WOP situations. The changes expected to result from the project were included in the tool’s different modules (in full alignment with the EFA assumptions and budget provisions) and include increased rice cultivation (irrigated and rain fed), land use changes from other crops to rice and vegetable cultivation, and increased use of chemical inputs, and Sustainable Forest and Land Management (SFLM) activities through 34500 ha promoted under GEF financing. Overall, the carbon balance results are modest, yet positive, with ROOTS’s activities leading to a total reduction in CO2 emissions of 903,821 tons over a period of 20 years starting from project implementation. Per year, the mitigation potential is roughly -45,191 tons of CO2-e.

16. The social cost of carbon attempts to capture the marginal global damage (cost) of an additional unit of CO2e emitted. The recent World Bank Guidance Note on Shadow Price of Carbon in Economic Analysis (September 2017) recommends “projects’ economic analysis use a low and high estimate of the carbon price starting at US$40 and 80, respectively, in 2020 and increasing to US$50 and 100 by

2030". Following these World Bank guidelines, this analysis has used the yearly average between these two scenarios in the valuation of the environmental benefits.

V. Economic results

17. The overall benefits of the project were estimated using the economic results of the models and of the carbon balance, against the economic project costs and including phasing rates aligned with the Costab. The analysis, developed over 20 years, assumed a full adoption rate, given that i) learning curves have been included in each model; ii) several project activities are fully demand driven and logical framework targets represent the minimal results (e.g. targets for matching grant windows are based on the maximum investment size, yet in practice lower values will be financed, resulting in a higher number of beneficiaries); and iii) the NEMA experience indicates high adoption rates for production activities. In addition, to model the pull effect of the inclusive commercial partnerships supported by the second component, an increase factor of 5% has been applied to SRI rice (considered the prime avenue for surplus and increased commercialization) and of 10% for the new vegetable gardens. These adjustments have been made in order to reflect the project's logic of increased value chain integration, better bargaining power through grouped sales and ultimately higher prices for producers. Lastly, the project financial costs were converted into economic costs in Costab, by removing the effects of inflation and transfer payments (i.e. taxes and subsidies). In addition, costs already included in the models were removed from Costab to avoid double-counting.

18. Under all these parameters, ROOTS is a moderately viable program, generating a net present value (NPV at 6% discount rate) of US$23.1 million and an economic internal rate of return (EIRR) of 14.2% (on a total budget of US$80.0 million, US$33.2 million of which are funded by IFAD), without valuing any of the environmental benefits. The full economic potential of the project, when the projected GHG mitigation are valued appropriately, is much higher. Using the average of the Lower and higher estimates for the social cost of carbon published by the World Bank, ROOTS would generate a net present value (NPV) of US$47.7 million and an economic internal rate of return (IRR) of 21.2 %.

19. The results are conservative, given the difficulty of quantifying ex-ante the project's impact on nutrition and health, rural-urban migration and emigration as well as import substitution for rice and other agricultural products.

20. The sensitivity analysis shows that the baseline results are robust under most scenarios, as summarized in table 3. The robustness of these results was explored by testing the effects of changes in several critical parameters: (i) reduced project benefits; (ii) increased project costs; (iii) delayed project benefits; (iv) decreased output prices; (v) increased input prices; and (vi) reduced adoption rate. Even in the most unlikely scenarios of a 4-year delay, or a decrease in benefits by 30% or an increase in costs by 50%, the project remains profitable. The project also indicates a high sensitivity to a drop in yield forecasts of more than 30%.

Table 3 Summary of the sensitivity analysis

Scenarios		EIRR	NPV (6,0%)	
			GMD billion	USD million
Base scenario		14.2%	1.1	23.1
Costs +	10%	12.3%	0.91	19.02
Costs +	20%	10.7%	0.72	14.91
Costs +	50%	6.7%	0.12	2.55
Benefits -	10%	12.1%	0.80	16.71
Benefits -	20%	9.9%	0.49	10.28
Benefits -	30%	5.9%	-0.01	-0.27
Benefits delayed by 1 year		11.6%	0.83	17.33
Benefits delayed by 2 year		9.6%	0.57	11.85
Benefits delayed by 3 year		7.9%	0.32	6.65
Benefits delayed by 4 year		6.5%	0.08	1.75
Adoption rate -	10%	13.1%	0.90	18.76
Adoption rate -	20%	11.9%	0.73	15.20
Production prices -	10%	11.7%	0.72	15.03
Production prices -	20%	6.9%	0.10	2.14
Input prices +	10%	14.0%	1.04	21.66
Input prices +	20%	13.6%	0.98	20.49
Rice price -	10%	12.4%	0.82	17.04
Rice price -	20%	10.6%	0.57	11.89
Rice price -	30%	8.7%	0.32	6.74
Rice yield -	10%	11.7%	0.72	14.94
Rice yield -	20%	9.0%	0.37	7.71
Rice yield -	30%	6.2%	0.02	0.49