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President's memorandum

Proposed additional financing to Republic of Madagascar for the

Inclusive Agricultural Value Chains Development Programme

Project ID: 2000001492

Note to Executive Board representatives

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- II. Updated summary of the economic and financial analysis

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Abbreviations and acronyms

AfDB	African Development Bank
AWP/B	annual work plan and budget
DEFIS	Inclusive Agricultural Value Chains Development Programme
DSF	Debt Sustainability Framework
FDA	Agricultural Development Fund
FO	farmers' organizations
GALS	Gender Action Learning Systems
GCF	Green Climate Fund
MAEP	Ministry of Agriculture, Livestock and Fisheries
OPEC Fund	OPEC Fund for International Development
PCU	programme coordination unit

Financing summary

Initiating institution:	IFAD
Borrower/recipient:	Republic of Madagascar
Executing agency:	Ministry of Agriculture, Livestock and Fisheries
Total programme cost:	US\$250 million
Amount of original IFAD financing:	Special drawing rights (SDR) 37.8 million (equivalent to approximately US\$53 million)
Terms of original IFAD financing:	Highly concessional terms; 50% loans, 50% Debt Sustainability Framework (DSF) grant
Amount of additional IFAD financing	US\$83.5 million
Terms of additional IFAD financing:	Highly concessional terms; 73% loans, 27% DSF grant
Cofinancier(s):	OPEC Fund for International Development (OPEC Fund) Green Climate Fund (GCF)
Amount of cofinancing:	OPEC Fund: US\$20 million GCF: US\$53.9 million
Terms of cofinancing:	OPEC Fund: 100% loans GCF: 100% grant
Contribution of borrower/recipient:	US\$25.3 million
Contribution of beneficiaries:	US\$14.3 million

Recommendation for approval

The Executive Board is invited to approve the recommendation for the proposed additional financing contained in paragraph 52.

I. Background and programme description

A. Background

1. The Inclusive Agricultural Value Chains Development Programme (DEFIS), approved by the Executive Board in December 2017¹, entered into force on 5 March 2018 for a period of six years, though designed with a 10-year time frame. Its total cost is US\$250 million, including an approved highly concessional IFAD loan of US\$26.5 million and a DSF grant of US\$26.5 million; approved cofinancing from the OPEC Fund of US\$20.0 million; a government contribution of US\$33.7 million; and beneficiary contributions of US\$14.3 million. Cofinancing from GCF of US\$15 million and the African Development Bank (AfDB) of US\$50 million were also expected at the time of approval. DEFIS was purposely designed with a financing gap of US\$64 million, to be financed by the country's allocation under the Eleventh Replenishment of IFAD's Resources (IFAD11).

B. Original programme description

2. DEFIS's goal is to sustainably improve the income and food and nutrition security of vulnerable rural people in eight regions in southern Madagascar. Its development objective is to transform family farming through large-scale adoption of high-performing, resilient production systems and integrate family farms into profitable value chains.

II. Rationale for additional financing

A. Rationale

3. Since start-up in December 2018, DEFIS's implementation has been progressing well, despite the challenges stemming both from COVID-19, which has affected one third of the staff in the programme coordination unit (PCU), and from drought, putting 1.1 million people in the south in need of emergency food aid in 2021. Indeed, IFAD's partial² supervision report of June 2021 confirms that DEFIS is not at risk, with the likelihood of achieving its development objective and overall implementation progress both rated satisfactory.
4. DEFIS has completed investments in improved water management for 7,618 ha of irrigation projects (22 per cent of the 35,000-ha target); construction is under way on 1,608 ha of irrigated areas; and procurement is under way for 9,783 ha. The role of farmers' organizations (FOs) in seed multiplication has been consolidated, with DEFIS supporting the production of 280 tonnes of certified seeds and 385,000 coffee seedlings, enabling 28,400 family farms to access seeds and planting materials.
5. Partnership with FOs enabled the delivery of agricultural advisory and extension services to nearly 63,000 family farms through livestock and farmer field schools. In terms of value chain development, the technical and organizational capacity of 1,789 FOs has been strengthened, enabling them to provide services to their members in terms of access to inputs, finance and markets. In addition, 33 contractual arrangements have successfully been negotiated between FOs and private sector firms, with the support of the chamber of commerce.

¹ EB 2017/122/R.11.

² Given the passing of DEFIS's financial manager in May 2021, supervision of the financial management was postponed to September 2021, when recruitment of the new financial manager would be completed.

6. These key achievements materialized thanks to DEFIS's design approach to scale up positive results from IFAD's country programme, including investments in the organizational and institutional capacity of rural institutions, such as FOs and the Agricultural Development Fund (Fonds de Développement Agricole [FDA]). The rapid start-up of investments was also the result of the DEFIS approach of linking the mobilization of additional financial resources to the achievement of five performance triggers³, namely: (i) at least 50,000 family farmers receive DEFIS services; (ii) 50 per cent disbursement of the initial IFAD financing; (iii) adoption of a policy instrument that increases the sustainability of the FDA; (iv) finalization of a reform process for the chamber of agriculture and agricultural service centres; and (v) rehabilitation of one road in the south by the Government to facilitate access to markets.
7. Although the five performance triggers were not binding, they have been powerful policy engagement tools, incentivizing the Government to invest in basic rural infrastructure and empowering smallholders. According to IFAD's June 2021 supervision report, four out of five triggers have been achieved. DEFIS's outreach is double the related performance trigger. In June 2021, disbursement of IFAD's initial financing stood at 41 per cent, with strong prospects of reaching 50 per cent by December 2021. The strategic partnership with the FDA⁴ shifted into higher gear, with US\$7.5 million in investments to finance FO business plans. With technical assistance from DEFIS, the FDA's financing instrument is being modified from the provision of grants only to loans and grants, in partnership with private financial institutions.
8. The policy engagement during the design of DEFIS yielded major investments in the rehabilitation of three roads cofinanced by the AfDB, the World Bank, the European Union and the Government. Progress in the reforms to establish a full-fledged chamber of agriculture has been much slower than expected, but the Minister of Agriculture is committed to accelerating this reform process, with technical assistance from the Food and Agriculture Organization of the United Nations.
9. Key challenges during the 30 months of implementation have been: (i) the different capacity levels of decentralized institutions; (ii) the COVID-19 outbreak in early 2020, after which the Government of Madagascar imposed strict lockdown measures, notably restrictions on in-country movement; and (iii) the continuing drought.
10. The main lessons learned include: (i) the need for intensified capacity-building in decentralized rural institutions; (ii) the need to accelerate the planned investments in water management infrastructure, taking the potential of each targeted region into account; (iii) the use of performance triggers, as policy engagement tools have incentivized the Government of Madagascar to introduce policy reforms (e.g. sustainable funding options for FDA and more investments in roads in the south); and (iv) the decentralized programme management unit (PMU) approach has facilitated procurement activities at the regional level. Given the impact of COVID-19, two additional lessons learned are the need for flexibility to include: (i) COVID-related recovery interventions (e.g. access to inputs and markets, etc.); and (ii) the decentralized PMU approach has been particularly effective in supporting business continuity.
11. The Government of Madagascar considers DEFIS one of its flagship rural development projects in the south, and the persistent humanitarian crisis underscores DEFIS's relevance as a major integrated agriculture-led poverty reduction investment. IFAD's June 2021 supervision report indicated that the

³ Page 29, paragraph 128 of the PDR.

⁴ Historically, FDA has been supported by IFAD, as well as the Agence Française de Développement (AFD) and the European Union, which in 2020 launched a new project for EUR 19.5 million.

beneficiaries who are resilient to the impact of the ongoing drought have access to irrigated areas, multiservice water points, agroecological block, water harvesting technologies (REEPS),⁵ access to small ruminants, technologies for processing cassava into *garri*,⁶ nutrition-sensitive activities (e.g. home gardens).

Special aspects relating to IFAD's corporate mainstreaming priorities

12. With the prospect of mobilizing cofinancing from the GCF (US\$53.9 million) and a supplementary grant of US\$0.5 million from the Norwegian Agency for Development Cooperation (Norad) for nutrition and scaling up the Gender Action Learning System (GALS), to be funded by AFD, DEFIS integrates IFAD11 mainstreaming themes.
13. **Gender challenges.** In rural areas, 21 per cent of households are headed by women, 70 per cent of whom work in agriculture. Women experience difficulties in accessing land and agricultural equipment. Although the law promulgates gender equality, prevailing customs perpetuate discriminatory practices against women. DEFIS's gender strategy seeks to ensure rural women's empowerment through: (i) tailored support for vulnerable women to strengthen their productive capacity and increase their revenue; (ii) women's participation in FOs; and (iii) the scaling up of GALS to empower rural women. Women currently account for 45 per cent of DEFIS beneficiaries.
14. **Youth.** Around 500,000 rural young people enter the workforce annually in Madagascar, but the formal sector can absorb less than 10 per cent of them. Employment creation in the agriculture sector is one of the solutions, since 77 per cent of youth live in rural areas and 75 per cent of those employed are under the age of 30. Through a partnership with the IFAD-financed Vocational Training and Agricultural Productivity Improvement Programme (FORMAPROD), DEFIS facilitated the participation of youth in FOs' value chain activities and their access to productive assets. DEFIS will also scale up integration of IFAD's mainstreaming themes using GALS and support a pilot government initiative aimed at giving youth access to newly developed irrigated land. In 2021, youth account for 24 per cent of DEFIS beneficiaries.
15. **Nutrition.** Madagascar has one of the highest rates of household food insecurity and chronic malnutrition, with one third of households living in food insecurity and 47 per cent of children under 5 years of age suffering from chronic malnutrition. Through the strategic partnership with Madagascar's National Nutrition Office, DEFIS is investing in greater access to nutrition education⁷ and nutritionally enhanced varieties, as well as fortification.
16. **Climate challenges.** Madagascar is ranked the fifth most vulnerable country to climate change. In recent decades, the average temperature in southern Madagascar has risen from 21.5° to 22.4° C,⁸ and mean rainfall has decreased, becoming more erratic but intense. The frequency and duration of droughts have also increased. DEFIS seeks to address the adverse impacts of climate change by: (i) increasing the resilience of basic rural infrastructure (e.g. water/irrigation, markets); (ii) building farmer and FO capacity to adopt climate-resilient production practices and technologies; (iii) promoting access to resilient adapted varieties and planting material; (iv) restoring degraded lands and soils; and (v) adopting integrated land management at the watershed and landscape level.

⁵ REEPS (Réservoir d'Eau Enterré Plein de Sables) is a local technology, developed by a local firm.

⁶ Cassava flour native to West Africa, introduced in southern Madagascar by the IFAD-funded Support to Farmers' Professional Organizations and Agricultural Services Project (AROPA), in partnership with the World Food Programme.

⁷ For example: raising mothers' awareness about adequate maternal and child nutrition, cultivating small vegetable gardens, cooking demonstrations.

⁸ National Meteorological Service.

17. In line with the mainstreaming commitments of IFAD11, the programme has been validated as:

- Including climate finance; and
- Nutrition-sensitive.

B. Description of geographical area and target groups

18. DEFIS operates in eight regions⁹ in southern, central and eastern Madagascar. Its direct beneficiaries will be 320,000 vulnerable family farms (corresponding to 1.6 million persons), at least 30 per cent of which are headed either by young people or by women. Eight value chains (rice, maize, cassava, groundnut, coffee, onion, small ruminants and honey) have been selected, three in each region. Support is also provided for sorghum and millet value chains, which can boost the resilience of production systems for family farms in semi-arid zones.

C. Components, outcomes and activities

19. DEFIS comprises three components: (i) increasing the productivity and resilience of crop and livestock farming systems; (ii) developing inclusive value chains; and (iii) institutional support, coordination and programme management.

Component 1. Increasing the productivity and resilience of crop and livestock farming systems

20. **Subcomponent 1.1. Efficient water mobilization.** Key expected outcomes include: (i) rehabilitation of 20,000 ha of existing perimeters; (ii) development of 8,000 ha of new irrigated perimeters; (iii) installation of micro-improvements on 7,000 ha; (iv) 300 water points equipped; (v) 50 underground water catchment reservoirs; and (vi) support for resilient feed production on 2,500 ha.
21. **Subcomponent 1.2. Proximity access to agricultural input networks.** Proximity access by farmers to quality seeds and plant material with: (i) the creation of a network of 1,400 seed multiplier farmers; (ii) production of seeds and plant material to grow crops on 151,500 ha; (iii) promotion of climate-resilient varieties; and (iv) promotion of a network of agricultural input providers and workshops to manufacture small-scale farming equipment. The non-agricultural activities promoted are expected to provide employment for more than 200 people, 30 per cent of whom are youth.
22. **Subcomponent 1.3. Proximity agricultural advisory assistance and nutrition education.** DEFIS will finance: (i) the establishment of 2,400 farmer field schools; (ii) advisory assistance services for 260,000 family farmers; (iii) capacity-building for 2,400 women and 2,400 youth in organization, leadership and management; and (iv) literacy training for 14,000 young people and adults. Nutrition education initiatives will target 270,000 family farmers and include biofortified varieties and food fortification.

Component 2. Development of inclusive value chains

23. **Subcomponent 2.1. Strengthening FOs for market access and partnership building between producer organizations and private sector market operators (MO).** DEFIS will support: (i) capacity-building for 2,000 FOs to enable them to provide economic services to their members; and (ii) 480 contracts between FOs and MOs, involving 100,000 family farms.
24. **Subcomponent 2.2. Access to financing.** The main expected outcomes are: (i) 160,000 family farmers have access to rural finance institutions; (ii) 120,000 family farmers have access to credit; and (iii) 90,000 family farmers receive microsubsidies through the targeting mechanism for the most vulnerable.

⁹ Androy, Anosy, Ihorombe, Haute Matsiatra, Amoron'i Mania, Vatovavy-Fitovinany, Atsimo-Atsinanana, and Atsimo-Andrefana.

25. **Subcomponent 2.3. Development of post-harvest and market access infrastructure.** DEFIS will support: (i) the construction of 490 storage warehouses; (ii) the creation of 45 collection centres; (iii) the rehabilitation of 50 local markets; and (iv) the rehabilitation of 800 km of rural tracks.

Component 3. Institutional support, coordination and programme management

26. **Subcomponent 3.1. Institutional support and policy engagement.** DEFIS will contribute to capacity-building for public institutions and systems involved in its implementation (e.g. the regional agriculture office, chamber of commerce, chamber of agriculture, seed certification office, services to fight biotic stress [fall armyworms, desert locusts, varroa mites, etc.] and agricultural statistics). These structures all have a decentralized footprint. Capacity-building will include the deployment of digital solutions.
27. **Subcomponent 3.2. Programme coordination, management and monitoring and evaluation (M&E).** This covers: (i) programme coordination and administrative, technical and financial management; (ii) M&E of programme activities and outcomes; (iii) relations with the pertinent authorities, IFAD and other participants; as well as (iv) knowledge management (KM) and communication.

D. Costs, benefits and financing

Programme costs

28. DEFIS's total cost is US\$250 million, including a highly concessional IFAD loan of US\$26.5 million and DSF grant of US\$26.5 million; and a additional highly concessional IFAD loan of US\$61 million and additional DSF grant of US\$22.5 million; cofinancing from the OPEC Fund in the amount of US\$20.0 million, which has been mobilized, and expected cofinancing from GCF in the amount of US\$53.9 million. The Government contribution will be about US\$25.3 million and the beneficiary contribution, US\$14.3 million.

Table 1

Original and additional financing summary
(Millions of United States dollars)

	<i>Original financing</i>	<i>Additional financing</i>	<i>Total</i>
IFAD loan	26.5	61.0	87.5
IFAD grant	26.5	22.5	49.0
Other cofinanciers	149.0		73.9
Beneficiaries	14.3		14.3
Borrower/recipient	33.7		25.3
Total	250	83.5	250

Table 2

Additional financing: programme costs by component (and subcomponent) and financier

(Thousands of United States dollars)

Component/ subcomponent	Additional IFAD loan		Additional IFAD grant		Additional						Total Amount		
	Amount	%	Amount	%	Other cofinanciers		Beneficiaries			Borrower/recipient			
					Amount	%	Cash	In kind	%	Cash		In kind	%
Component 1. Increasing the productivity and resilience of crop and livestock farming systems	20 293		10 465									30 757	
1. Efficient water mobilization.	8 128	40	970	9								9 098	
2. Proximity access to agricultural input networks.	3 817	19	4 211	40								8 028	
3. Proximity agricultural advisory assistance and nutrition education	8 347	41	5 284	50								13 631	
Component 2. Development of inclusive value chains	31 504		4 513									36 018	
1. Strengthening FOs for market access and partnership building	15 752	50	981	22								16 733	
2. Access to financing.	4 281	14	1 377	31								5 658	
3. Development of post-harvest and market access infrastructure	11 471	36	2 156	48								13 627	
Component 3. Institutional support, coordination and programme management	9 204		7 522									16 726	
1. Institutional support and policy engagement.	5 829	63	4 147	55								9 976	
2. Programme coordination and management	2 814	31	2 814	37								5 627	
3. Programme M&E	561	6	561	7								1 122	
Total	61 000		22 500									83 501	

Table 3

Additional financing: programme costs by expenditure category and financier

(Thousands of United States dollars)

Expenditure category	Additional IFAD loan		Additional IFAD grant		Additional						Total Amount				
	Amount	%	Amount	%	Other cofinanciers		Beneficiaries			Borrower/recipient					
					Amount	%	Cash	In kind	%	Cash		In kind	%		
1. Civil works	13 609	13	2 678	3											16 287
2. Vehicles, equipment and materials	560	12	560	12											1 120
3. Studies, training, technical assistance and contracts	27 956	40	8 048	11											36 003
5. FDA	16 416	29	8 800	16											25 216
6. Operations (salaries and benefits, vehicles, offices)	2 459	24	2 414	23											4 874
Total	61 000	24	22 500	9											83 501

Table 4

Programme costs by component and project year (PY)

(Thousands of United States dollars)

Component	PY1-3		PY4		PY5		PY6		PY7		PY8		PY9		PY10		Total Amount
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	
Component 1	8 430	6	14 090	9	21 874	14	26 454	18	26 886	18	26 262	17	18 768	12	8 312	6	151 077
Component 2	3 374	5	6 817	10	13 352	20	13 354	20	13 477	20	8 469	13	4 435	7	3 644	5	66 921
Component 3	4 812	15	3 157	10	3 989	12	3 794	12	4 791	15	4 047	13	3 207	10	4 206	13	32 002
Total	16 616	7	24 064	10	39 215	16	43 602	17	45 154	18	38 777	16	26 410	11	16 162	6	250 000

Financing and cofinancing strategy and plan

29. The expected cofinancing of US\$50 million from the AfDB did not materialize, and will therefore be removed from DEFIS's financing structure. To bridge the resulting financing gap, the cofinancing sought from GCF was increased from US\$15 million to US\$53.9 million, while the entirety of IFAD11 resources for Madagascar will be allocated to DEFIS. The cost tables have been duly updated to reflect the revised cost structure and prioritize investments with rapid impacts on the livelihood of the poorest rural households affected by COVID-19 and the ongoing food insecurity crisis in the semi-arid southern regions of Madagascar. Counterpart funding has been reduced in light of the tight fiscal space for Madagascar, which worsened due to COVID-19. Finally, the duration of DEFIS will be extended to 2028, in keeping with its design time frame.

Disbursement

30. The letter to the borrower mentions the following disbursement methods, still applicable to DEFIS: (a) advances to the designated accounts (DAs): initial deposits and subsequent replenishments/justifications of advances to DAs; (b) reimbursements, where the borrower/recipient pre-finances project financing costs; (c) direct payment: payments made by the Fund to contractors on behalf of the borrower/recipient using financing proceeds. IFAD allows the borrower/recipient to use a statement of expenditures (SOE) for withdrawals from the loan/grant accounts. The letter to the borrower outlines the types and categories of expenditure eligible for SOE withdrawals, as well as SOE thresholds established as US\$75,000. The original letter to the borrower and its amendment remain the same for the additional financing. DEFIS's disbursement profile is aligned with the implementation period.

Summary of benefits and economic analysis

31. In addition to the benefits generated by higher yields and production stemming from the adoption of improved varieties and planting material and management practices, investments in building and rehabilitating irrigation systems allow for multiple cropping while reducing the risks inherent to rainfed farming. Basic infrastructure such as rural tracks and warehouses will have the effect of facilitating access to markets. This in turn will boost incentives to adopt new technologies, improve yields and expand marketable surpluses. DEFIS also aims to empower and strengthen the institutional capacities of smallholder farmers and their organizations, who will be better equipped to take collective action.
32. In terms of environmental benefits, EX-ACT tool calculations show a potential for attenuation on the order of 2,263,558 tCO₂eq for DEFIS. It also has a leveraging ratio of 15.7 and a cost per tCO₂eq of 28.8, indicating high efficiency in funding interventions and carbon mitigation. Based on conservative assumptions, DEFIS's economic internal rate of return is 25.1 per cent, and its net present value, US\$268 million.

Exit strategy and sustainability

33. DEFIS's use of national systems, particularly its partnership with institutions that support agricultural development in Madagascar (including FOs, the chambers of agriculture and commerce, FDA) increase the sustainability of DEFIS outcomes. The technical and operational capacities of these national institutions will be strengthened to enable them to better deliver on their mandate and provide improved services to rural populations. Concentrating core investments in agricultural development hubs will result in marketable surplus, which will attract private sector actors. Investments in rural infrastructure (e.g. roads and rural tracks) and contractual arrangements between the private sector and farmers will facilitate sustainable market access. The sustainability of irrigation and other productive infrastructure and equipment improve when the technical and organizational capacities of water or other infrastructures users' associations are

built on the sound operation, management and governance of such investments. Strengthening the technical capacities of FOs will enable them to provide sustainable proximity agricultural services to their members (access to inputs, markets, extension services, etc.).

III. Risk management

A. Risks and mitigation measures

34. The table below presents the key risks and their mitigation measures.

<i>Risks</i>	<i>Rating</i>	<i>Mitigation Measures</i>
Impact of COVID-19	High	<ul style="list-style-type: none"> • Back-up delivery team in the event of COVID-19 infection. • Adherence to COVID-19 protocols and implementation of preventive measures for beneficiaries (small-group in-person trainings and internet packages provided by DEFIS to key rural stakeholders).
Political instability	High	<ul style="list-style-type: none"> • Decentralized implementation of DEFIS.
Financial management capacity	Substantial	<ul style="list-style-type: none"> • Hiring of qualified project finance manager and provision of technical assistance. • Strengthening internal control capacities. • Yearly performance audits of the FDA will be conducted. • Policy engagement with the Government to improve the efficiency and flow of fund.
Procurement, given lengthy administrative procedures and limited national capacities	Substantial	<ul style="list-style-type: none"> • Building the capacity of project and government officers in procurement procedures. • Institutionalizing post-review of procurement activities through a partnership with the public procurement commission, located in the Ministry of Finance.

35. Moreover, in the unlikely event that the expected cofinancing (GCF and domestic) is not mobilized, IFAD-financed interventions can still be fully implemented. However, the programme would need to be restructured to scale down the foreseen GCF-financed interventions.

B. Environment and social category

36. DEFIS's environmental and social risk is moderate. IFAD classified the programme as category B, as it could result in adverse environmental and/or social impacts on human populations or environmentally significant areas. However, the potential negative impacts can readily be addressed by preventive actions and/or mitigation measures. The environmental and social management plan has already been developed, taking the national environmental and social impact assessment legislation (MECIE decrees 99-954 and 04-167) for infrastructure-related works into account. The programme's performance in complying with Social, Environmental and Climate Assessment Procedures (SECAP) procedures is rated moderately satisfactory (4).¹⁰

C. Climate risk classification

37. The programme is classified as having a moderate climate risk. Irrigated perimeters are designed and built in accordance with national standards. Infrastructure is built in compliance with standards for protection against cyclones, floods and erosion. Water users' associations are trained and provided with support to improve water resource management and the maintenance of irrigation networks. The promotion of an integrated land management approach at the sub-watershed level is based on social engineering and climate-friendly farming

¹⁰ IFAD partial supervision mission report, June 2021.

techniques to reduce erosion, combat sedimentation in hydroagricultural structures and increase the life span of all investments. Anti-erosion works and improvements in vegetation cover allow farmers to preserve and boost the potential of their fields. Strengthening community management capacities remains fundamental to ensuring adequate use and preservation of watershed resources.

IV. Implementation

A. Compliance with IFAD policies

38. DEFIS is aligned with IFAD's mandate and Strategic Framework 2016-2025 and is consistent with the COSOP 2022-2026 and its objective of transforming rural areas and food systems through sustainable improvement of incomes and food and nutrition security for vulnerable rural people, while building their resilience to climate shock. It will contribute to achievement of the COSOP's two strategic objectives (SOs): SO1, improved climate-resilient production systems for increased productivity of family farms and rural microenterprises; and SO2, strengthened agricultural value chains and improved access to inclusive financing for targeted rural producers and organizations. DEFIS is consistent with IFAD's targeting strategy to reach the poorest; with the financial policy to achieve financial inclusion; and with IFAD's approach of partnering with the private sector. The programme incorporates IFAD's policies on natural resource management and the environment.

B. Organizational framework

Programme management and coordination

39. The Ministry of Finance and Budget represents the borrower, and the Ministry of Agriculture, Livestock and Fisheries (MAEP) leads the implementation of DEFIS. Strategic oversight is provided by a national steering committee that validates annual work plans and budgets (AWP/Bs) and evaluates the progress made on activities and programme outcomes and their alignment with rural sector strategies. There is also a regional steering and monitoring committee that oversees compliance with regional development strategies and priorities.
40. DEFIS is administered directly by a PCU with administrative and financial autonomy. The PCU is responsible for implementing DEFIS's activities pursuant to the financing agreement, programme manuals and AWP/Bs. Planning, supervision and coordination of activities at the regional level are provided by four regional or interregional¹¹ coordination units.

Financial management, procurement and governance

41. The applicable procedures for programme resource management are outlined in the letter to the borrower and the programme administrative, financial and accounting procedures manual. The PCU is accountable to the national authorities and to IFAD for the management and use of programme resources, accounting management, budget monitoring and financial reporting, pursuant to the financing agreement. DEFIS's inherent and residual financial management risks are substantial and moderate, respectively. The programme's financial management performance is rated moderately satisfactory (4).
42. IFAD loan and grant funds are received in two designated accounts administered by the advance account modality. Operating accounts at a commercial bank are opened in Antananarivo and the intervention regions to facilitate the flow of funds.
43. In addition to the MAEP internal audit division, the Madagascar country programme has an internal audit function already in place in the IFAD programme support unit (CAPFIDA), a unit within the MAEP providing common services to IFAD-funded

¹¹ Located in Fianarantsoa (covering Ihorombe, Haute Matsiatra and Amoron'i Mania); in Manakara (covering Vatovavy-Fitovinany and Atsimo-Atsinanana); in Taolagnaro (covering Androy and Anosy); and in Ampanihy (covering Atsimo-Andrefana).

projects and reporting to the MAEP General Secretariat. An external audit of DEFIS's financial statements is done annually, following IFAD guidelines.

44. Procurement is in compliance with IFAD guidelines and the programme administrative and financial procedures manual, and in accordance with the procurement plan prepared on the basis of AWP/Bs. The programme's performance in procurement is rated satisfactory (5).¹²
45. DEFIS promotes good governance, including by: (i) establishing selection procedures for service providers, based on transparency and competitive calls for offers; (ii) having beneficiaries participate in opening bids and the awarding of contracts at the regional level; (iii) training FO principals in good governance. Finally, workshops to receive feedback and conduct participatory evaluations are incorporated in M&E systems to ensure transparency and regular exchanges with beneficiaries on the quality and effectiveness of programme interventions.

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

46. DEFIS uses a results-based M&E system that meets MAEP and IFAD requirements. This system is developed and implemented with the participation of all stakeholders, while drawing on the established M&E plan and manual. The programme's performance in M&E and KM are both rated moderately satisfactory (4).¹³
47. The DEFIS approach calls for scaling up gains and successes from completed and ongoing IFAD-funded projects. The programme's KM strategy is consistent with the overall approach adopted at the country level and promoted by CAPFIDA. During this first phase of implementation, the information products prepared are a general brochure, short articles on success stories (e.g. *garri*, farmer field schools, contract arrangement with the private sector) published in the MAEP newsletter and short documentary videos.

D. Proposed amendments to the financing agreement

48. Upon approval by the Executive Board, DEFIS's financing agreement will be amended to reflect the proposed activities and the additional financing in the programme budget. The additional financing will bridge the financing gap and supplement the financing plan initially agreed on at design.

V. Legal instruments and authority

49. A financing agreement between the Republic of Madagascar and IFAD will constitute the legal instrument for extending the proposed financing to the borrower/recipient.
50. The Republic of Madagascar 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.

¹² IFAD partial supervision mission report, June 2021.

¹³ Ibid.

VI. Recommendation

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

RESOLVED: that the Fund shall provide a loan on highly concessional terms to the Republic of Madagascar in an amount of sixty-one million United States dollars (US\$61,000,000) 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 grant to the Republic of Madagascar under the Debt Sustainability Framework in the amount of twenty-two million five hundred thousand United States dollars (US\$22,500,000) and upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented herein.

Gilbert F. Hougbo
President

Updated logical framework incorporating the additional financing

Chaîne logique	Indicateurs					Moyens de vérification			Hypothèses/ Risques
	Nom	Situation de référence	Mi-parcours	Cible Finale	Situation actuelle (2021)	Sources	Fréquence	Responsabilité	
Portée	1.b Estimation correspondante du nombre total des membres des ménages								
	Membres des ménages - Nombre de personnes	-	500 000	1 600 000	520 735				
	1.a Nombre correspondant de ménages touchés								
	Ménages dirigés par une femme - Ménages	0	26250	67 200	24 459				
	Ménages autres que ceux ayant une femme pour chef - Ménages	0	98750	252 800	79 688				
	Ménages - Ménages	0	125000	320000	104 147				
	1. Nombre de personnes bénéficiant de services promus ou appuyés par le projet								
	Femmes - Femmes	0	45000	115200	192 921				
	Hommes - Hommes	0	105000	268000	225 591				
	Jeunes - Jeunes	0	37500	96000	67 995				
	Personnes autres que les jeunes - Nombre	0	112500	288000	350 516				
Nombre total de personnes bénéficiant de services - Nombre de personnes				418 512					
Objectif du projet	Taux de prévalence de la pauvreté rurale								
Amélioration durable des revenus et de la sécurité alimentaire et nutritionnelle des ruraux vulnérables dans les zones d'intervention	Pauvreté rurale - pourcentage - Pourcentage (%)	88	78	73		Enquêtes de référence, évaluation à mi-parcours et finale	Démarrage, mi-parcours et fin du programme.	UCP	La stabilité politique est renforcée (H). Les conditions macro-économiques s'améliorent (H).
	Pourcentage de personnes ciblées dont la diversité alimentaire est améliorée								
	Pourcentage de personnes ciblées dont la diversité alimentaire est améliorée - Nombre		45	84					
Objectif de développement	Revenu moyen annuel des ménages (Ariary)								
	Revenu moyen annuel des ménages (Ariary) - - Nombre	838100	4000000	4500000	nd				
La transformation des agricultures familiales par l'adoption à grande échelle de systèmes de production performants et résilients et l'intégration des EAF dans des filières rémunératrices	1.2.4 Nombre de EAF déclarant une augmentation de la production								
	Nombre ménages - Nombre	0	80000	260000	9 833	Rapports d'avancement	Semestrielle	UCP, Partenaires	Insécurité rurale (R).
	Hommes - Nombre	0	52000	182000	6 266				
	Femmes - Nombre	0	28000	78000	2 142				
	Jeunes - Nombre	0	24000	39000	1 799				
	Personnes autres que les jeunes - Nombre	0	56000	221000	8 034				
Taux d'accroissement des rendements dans les filières de concentration									
	Accroissement des rendements dans les filières de concentration - - Pourcentage (%)	0	20	30	50%	Rapports d'avancement	Annuelle	UCP, Partenaires	
Effet direct	1.2.8 Femmes déclarant une diversité alimentaire minimale (MDDW)								
1. Des systèmes de production résilients et performants sont adoptés.	Femmes (%) - Pourcentage (%)		50	85		Enquête de référence, évaluation à mi-parcours et finale	Démarrage, mi-parcours et fin du programme	UCP	Catastrophes naturelles (R).
	Femmes (nombre) - Femmes		90000	344250					
	Ménages (%) - Pourcentage (%)		30	84					
	Ménages (nombre) - Ménages		100000	270000					
	Membres des ménages - Nombre de personnes		500000	1350000					
	1.2.2 Ménages déclarant l'adoption de technologies, de pratiques ou d'intrants nouveaux/améliorés					Enquêtes adoption	Annuelle	UCP, Partenaires	
	Hommes - Hommes	0	77000	182000	19 274				
	Femmes - Femmes	0	33000	33000	7 520				
Jeunes - Jeunes	0	27500	65000	4 631					
Personnes autres que les jeunes - Nombre	0	82500	195000	22 061					

Chaîne logique	Indicateurs					Moyens de vérification			Hypothèses/ Risques
	Nom	Situation de référence	Mi-parcours	Cible Finale	Situation actuelle (2021)	Sources	Fréquence	Responsabilité	
	3.2.2 Ménages déclarant l'adoption de pratiques et technologies durables et résilientes au changement climatique								
	Hommes - Hommes	0	15092	37730	13 550	Enquêtes adoption			
	Femmes - Femmes	0	6468	16170	5 052				
	Jeunes - Jeunes	0	5390	13475	3 729				
	Personnes autres que les jeunes - Nombre	0	16170	40425	9 821				
Produit	1.1.2 Terres agricoles dotées d'infrastructures hydrauliques construites/remises en état								
1.1 Les eaux de surface sont mobilisées et gérées d'une manière efficiente	Superficie en hectares - Superficie (ha)	0	25000	35000	7 618	Rapport d'avancement	Annuelle	UCP, Partenaires	Appropriation et implication des communes et régions (H).
	3.1.4 Hectares de terres soumises à une gestion résiliente au climat								
	Superficie en hectares - Superficie (ha)		15000	45000	5 802	Enquêtes adoption	Annuelle	UCP, Partenaires	
Produit	Nombres de EAF ciblés ayant accès aux services de distribution d'intrants								
1.2 Les EAF ont un accès durable et de proximité aux intrants de qualité pour l'agriculture et l'élevage	Nombre ménages - Nombre	0	195000	260000	82 570,00	Rapport d'avancement	Annuelle	UCP, Partenaires	Adhésion des opérateurs privés (H)
	Hommes - Nombre	0	136500	182000	45 732,00				
	Femmes - Nombre	0	58500	78000	36 815,00				
	Jeunes - Nombre	0	48750	65000	20 298,00				
	Personnes autres que les jeunes - Nombre	0	146250	195000	62 272,00				
Produit	Nombre de EAF ayant accès aux dispositifs de conseils agricoles								
1.3 Des services de conseils agricoles adaptés et d'éducation nutritionnelle sont disponibles	Nombre ménages - Nombre		195000	260000	72 594	Rapport d'avancement	Semestrielle	Partenaires	
	Hommes - Nombre	0	151900	186900	41 328				
	Femmes - Nombre	0	65100	80100	31 265				
	Jeunes - Nombre	0	54250	66750	18 588				
	Personnes autres que les jeunes - Nombre	0	162750	200250	54 006				
Effet direct	Valeur annuelle (Ariary) des produits des EAF commercialisés dans le cadre des partenariats OP/OM								
2. Les petits producteurs sont intégrés dans des filières rémunératrices	Valeur annuelle des produits des EAF (USD) - Nombre		3 500 000	5 000 000	1 759 695	Etudes & enquêtes sur la commercialisation	Annuelle	UCP, Partenaires	Volatilité des marchés (R)
Produit	Nombres des EAF impliquées dans le couple OP-OM								
2.1 Les producteurs sont organisés pour saisir les opportunités de marchés présentes dans le cadre d'arrangements OP-OM	Ménages – Nombre		100000	240000	6 989	Rapport d'avancement			Adhésion des opérateurs privés (H).
	Hommes – Nombre		70000	168000	4 522				
	Femmes – Nombre		30000	72000	1 972				
	Jeunes – Nombre		25000	60000	1 181				
	Personnes autres que les jeunes – Nombre		75000	180000	5 735				
	2.1.4 Nombres d'EAF soutenus qui sont membres d'une organisation de producteurs ruraux								
	EAF – Nombre		100000	240000	52 586	Rapport d'avancement			
	Hommes – Nombre		70000	168000	32 379				
	Femmes – Nombre		30000	72000	20 210				
	Jeunes – Nombre		25000	60000	7 922				
	Personnes autres que les jeunes – Nombre		75000	180000	44 499				
	Femmes en position de leader – Nombre		10 000	24 000	3 953				
	1.1.8 Ménages recevant un soutien ciblé pour améliorer leur nutrition								
		Nombre de personnes qui participent - Nombre de personnes		300000	675000	10 922	Rapports d'avancement	Semestrielle	ONN/ORN
	Hommes - Hommes		120000	270000	2 228				

Chaîne logique	Indicateurs					Moyens de vérification			Hypothèses/ Risques
	Nom	Situation de référence	Mi-parcours	Cible Finale	Situation actuelle (2021)	Sources	Fréquence	Responsabilité	
	Femmes – Femmes		180000	405000	8 694				
	Ménages – Ménages		100000	270000	9 757				
	Membres des ménages bénéficiaires - Nombre de personnes		500000	1350000	51 943				
	Jeunes – Jeunes		90000	202500	2 809				
	Personnes autres que les jeunes – Nombre		210000	472500	7 956				
Produit	1.1.5 Personnes ayant accès à des services financiers dans les zones rurales								
2.2 Des produits et services financiers adaptés sont accessibles aux producteurs	Femmes-accès services financiers en zones rurales-épargne - Femmes		17240	48000	0	Rapports d'avancement	Semestrielle	UCP, Partenaires	Adhésion des IMF (H)
	Jeunes-accès services financiers en zones rurales-épargne - Jeunes		14366	40000	0				
	Personnes autres que jeunes-accès services financiers en zones rurales. Epargne – Nombre				0				
	Hommes-accès services financiers dans les zones rurales-épargne – Hommes		10775	30000	0				
	Hommes-accès services financiers dans les zones rurales-crédit - Hommes		30169	72000	0				
	Femmes - accès à des services financiers dans les zones rurales-crédit – Femmes		12930	48000	0				
	Jeunes-accès à des services financiers dans les zones rurales-crédit - Jeunes		10775	30000	0				
	Personnes autres que jeunes-accès services financiers dans les zones rurales. –crédit – Nombre				0				
	Personnes autres que autochtones- accès services financiers dans zones rurales-crédit – Nombre				0				
	Personnes ayant accès-services financiers dans les zones rurales-épargne - Nombre de personnes	0	57465	15000	0				
	Personnes-accès à des services financiers dans les zones rurales-crédit - Nombre de personnes	0	43099	120000	0				
	Nombre de personnes qui participent Nombre								
Produit	2.1.6 Installations de commercialisation, transformation et stockage construites ou remises en état								
2.3 Des infrastructures liées à la mise en marché des produits sont mises en place	Nombre total d'installations – Installations				23	Rapports d'avancement	Semestrielle	UCP, Partenaires	Appropriation et implication effective des communes et régions (H)
	Installations de commercialisation construites ou remises en état – Installations	0	30	40	-				
	Installations de transformation construites ou remises en état – Installations	0	15	30	16				
	Installations de stockage construites ou remises en état – Installations		250	490	20				
	2.1.5 Kilomètres de routes construites, refaites ou améliorées								
	Longueur des routes (km)	0	300	800	52	Rapports d'avancement	Semestrielle	UCP	

Updated summary of the economic and financial analysis

Table A
Financial cash flow models

Coûts et Avantages production de semences de MAIS dus au DEFIS				
Rubriques	Situation sans projet	Situation avec projet	Situation additionnelle due au DEFIS	Accroissement (%)
Capacité aménagée et exploitée (ha)	1	1	0	0%
Coût d'investissement (Ar)	271700	746700	475000	175%
Charges totaux (Ar)	1109100	1480100	371000	33%
Charges variables (Ar)	296400	115000	-181400	-61%
Production (kg de Mais en année de croisière)	950,0	1143	193	20%
Produit Brut (Ar) en année de croisière	1187500	1828800	641300	54%
cout de production en année de croisière	1114	831	-283	-25%
Marge brute(Ar)	441600	1152792	711192	161%
Main d'œuvre familiale	4	4	0	0
remuneration de la main d'œuvre familiale	110400	288198	177798	161%

Source: Mission de conception DEFIS juillet 2017

Coûts et Avantages production riz SRI dus au DEFIS				
Rubriques	Situation sans projet	Situation avec projet	Situation additionnelle due au DEFIS	Accroissement (%)
Capacité aménagée et exploitée (ha)	0,4	0,4	0	0%
Coût d'investissement (Ar)	236 800,00	566 800,00	330 000,00	139%
Total Coûts (Ar)	627 500,00	1 187 800,00	560 300,00	89%
Charges variables (Ar)	467 500,00	1 277 600,00	810 100,00	173%
Production (kg paddy en année de croisière)	1152,0	4180	3028	263%
Produit Brut (Ar) en année de croisière	921 600,00	3 344 000,00	2 422 400,00	263%
cout de production en année de croisière	406	306	-100	-25%
Marge brute(Ar)	454 100,00	2 066 400,00	1 612 300,00	355%
Main d'œuvre familiale	31	87	56,00	178%
remuneration de la main d'œuvre familiale	14 461,78	23 643,02	9 181,24	63%

Table B
Project/programme costs and logframe targets

Component / Subcomponent	IFAD 10 Pret		IFAD 10 Don		IFAD 11 Pret		IFAD 11 Don		Fond Vert du Climat		OFID		Gouvernement		Beneficiaries		Total	
	Montant	%	Montant	%	Montant	%	Montant	%	Montant	%	Montant	%	Cash	%	Espece	%	Montant	%
Composante 1. Amélioration de la productivité et de la résilience des systèmes de production agricole et d'élevage	14 372	10	17 439	12	20 971	14	10 465	7	48 623	32	17 151	11	13 327	9	8 730	6	151 077	21
1. Mobilisation efficiente des eaux	4 851	34	7 366	42	8 806	42	970	9	47 726	98	17 151	100	10 203	77	4 631	53	101 704	67
2. Accès de proximité à des réseaux d'intrants agricoles	4 972	35	3 653	21	3 817	18	4 211	40	486	1	-	-	1 418	11	1 552	18	20 108	13
3. Appui-conseil agricole de proximité et éducation nutritionnelle	4 549	32	6 419	37	8 347	40	5 284	50	411	1	-	-	1 706	13	2 548	29	29 264	19
Composante 2. Développement des filières inclusives	5 774	9	6 015	9	30 756	46	4 513	7	5 187	8	2 850	4	7 184	11	4 642	7	66 921	61
1. Renforcement organisation producteurs pour accès aux marchés et développement des PPPP	969	17	2 115	35	15 752	51	981	22	-	-	-	-	406	6	1 887	41	22 110	33
2. Accès au financement	1 478	26	1 553	26	4 281	14	1 377	31	-	-	-	-	606	8	83	2	9 378	14
3. Développement infrastructures de stockage, de conditionnement et de mise en marché	3 327	58	2 347	39	10 724	35	2 156	48	5 187	100	2 850	100	6 172	86	2 671	58	35 433	53
Composante 3. Appui institutionnel, engagement politique, coordination et gestion des ressources du Programme	6 355	20	3 048	10	9 272	29	7 522	24	89	0	-	-	4 806	15	909	3	32 002	18
1. Appui institutionnel et engagement politique	2 881	45	1 003	33	5 829	63	4 147	55	-	-	-	-	2 388	50	909	100	17 158	54
2. Coordination du programme	3 215	51	1 795	59	2 814	30	2 814	37	63	71	-	-	2 064	43	-	-	12 765	40
3. Suivi & Evaluation du programme	258	4	250	8	630	7	561	7	26	29	-	-	354	7	-	-	2 079	6
Total	26 500	11	26 502	11	61 000	24	22 500	9	53 900	22	20 000	8	25 317	10	14 281	6	250000	100

Table C: **Main assumptions and shadow prices**

Intrants / Produits	Unité	Coût / prix (Ar)	
		Avant projet	Avec projet
Main-d'œuvre saisonnière	Personne jour	4 000	4 000
Main-d'œuvre permanente	Personne mois	35 000	35 000
NPK	Kg	2 400	2 400
Urée	Kg	2 400	2 400
Fumure organique fumier	Tonne	30 000	30 000
Guano	Kg	1 200	1 200
Produits de traitement	Litre	60 000	60 000
Semences, Bouture et plants améliorés			
Mais	Kg	2 000	1 600
Manioc	Bouture	50	25
Riz	Kg	2 000	2 000
Arachide	Kg	4 000	4 000
Oignon	Kg	350 000	350 000
Plants caféiers	Unite	700	1 100
Géniteurs petits ruminants	Unite	100 000	80 000
Produits commercialisés			
Riz	Kg	700	800
Manioc sec	Kg	300	300
Mais	Kg	800	950
Café coque	Kg	4 000	5 000
Oignon	Kg	1 000	1 500
Arachide coque	Kg	1 000	1 300

Tableau: Production et rendement des cultures ciblées

Spéculations agricoles	Production (kg)*				SAU (ha)	Rendement (kg/ha)**			
	Sans projet	Avec projet	Accroissement	%		Sans projet	Avec Projet	Accroissement	%
Semences maïs	950	1143	193	20,32%	1	1200	1499,87	299,87	24,99%
Arachide	510	950	440	86,27%	1	600	1000	400	66,67%
Maïs	640,00	1900	1260	196,88%	1	800	1500	700	87,50%
Riz SRA	1 080,00	3 040,00	1960	181,48%	0,4	3000	4000,00	1000	33,33%
Riz SRI	1152	4180	3028	262,85%	0,4	3200	5500,00	2300	71,88%
Manioc	1280	4560	3280	256,25%	1	4000	12000	8000	200,00%
Oignon	1 600	3 563	1963	122,66%	0,25	8 000,00	15 000,00	7000	87,50%
Pépinière (Plants)	8 200	9 600	1400	17,07%	0,03	273333,33	320000	46666,667	17,07%
Café	450	1700	1250	277,78%	1	450	1700	1250	277,78%
Apiculture (kg/ruche)	725,76	1 270,08	544	75,00%	48	15,12	26,46	11,34	75,00%
Petits ruminants	115	147	32	28,20%					
Labour-transport rural de proximité	75	105	30	40,00%					
Collecte de produits agricole	971200	1214000	242800	25,00%					
Artisan forgeron production et réparation ma	40	60	20	50,00%					
Décorticage de riz	1 480,00	2 123,33	643	43,47%					
*/la production considérée est celle utilisée (production totale déduite des pertes post-récolte)									
**/le rendement est le quotient de la production totale par la surface exploitée ou le nombre de ruche									

Table D
Beneficiary adoption rates and phasing

Financial model by crop activity	No EAF	EAF touchées en										Total
		year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	
1.seeds multiplication	1 400	50	100	150	300	300	200	200	100			1 400
2.Peanuts cultivation	51 000	500	3000	7000	11400	10000	10000	4600	4000	500		51 000
3.Maize cultivation	76 800	550	5100	8750	15100	13400	16100	11000	4700	2100		76 800
4.Cassava cultivation	34 000	500	4000	7000	7000	7000	4000	3000	1000	500		34 000
5.Rice SRA cultivation	62 000		500	4500	8000	8000	10000	12000	12600	6400		62 000
6.Rice SRI cultivation	8 000		600	900	2000	1000	1000	900	900	700		8 000
7. Onion cultivation	6 000	500	800	900	900	1000	800	600	500			6 000
8.Pépinière Caféiers	100	0	10	20	30	20	10	10				100
9.Coffee production	30 000		600	1865	6056	6001	6400	4946	3044	1088		30 000
10.Small ruminants	40 000	400	5960	6000	8000	6000	7000	3000	2000	1640		40 000
11.Bee keeping	10 000		2000	2000	2100	2000	1000	300	200	400		10 000
12.Rice dehulling	100		10	20	25	25	10	10				100
13.Rice, maize, eanuts, cofee collectors	100		10	20	30	20	10	10				100
14. blacksmith craftsman	200		20	30	50	50	30	20				200
15. Transport service provision, etc labour	300		19	50	61	60	50	40	20			300
Total	320 000	2500	22729	39205	61052	54876	56610	40636	29064	13328	0	320 000

Table E
Economic cash flow

Année	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. COSTS																				
Transfer pricing -PMU costs	300	90	92	140	90	95														
2. COSTAB COSTS																				
Economic costs	1 702	3 556	3 639	3 070	2 337	1 275	-													
Total costs	2 002	3 646	3 731	3 210	2 427	1 370	373	373	373	373	373	373	373	373	373	373	373	373	373	373
2. NET ECONOMIC BENEFITS																				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Benefits	-648	-4 109	-6 448	-8 318	-3 633	1 363	7 517	16 004	23 007	29 702	29 702	29 702	29 702	29 702	29 702	29 702	29 702	29 702	29 702	29 702
Environmental benefits / EXACT	0	0	0	0	0	0	0	504	504	504	504	504	504	504	504	504	504	504	504	504
3. ECONOMIC CASH FLOW	-2 650	-7 755	-10 180	-11 528	-6 060	-7	7 144	15 631	22 634	29 329	29 329	29 329	29 329	29 329	29 329	29 329	29 329	29 329	29 329	29 329

ERR	24.8%
NPV	91 768
Ratio B/C	3.3

Table F
Sensitivity analysis

Résultats	TRE	VAN	VAN
		Ar Million	\$US Million
Base (VAN = 0)	30.2%	1 398 372.21	437.0
Si hausse des coûts de 10%	29.1%	1 366 039.3	426.9
Si hausse des coûts de 20%	28.0%	1 333 706.5	416.8
Si hausse des coûts de 30%	27.0%	1 301 373.6	406.7
Si hausse des coûts de 50%	25.1%	1 236 707.9	386.5
Si baisse de la Marge brute de 10%	29.0%	1 226 202.1	383.2
Si Baisse de la marge brute de 20%	27.5%	1 054 032.0	329.4
Si Baisse de la marge brute de 30%	25.8%	881 861.9	275.6
Si Baisse de la marge brute de 50%	21.3%	537 521.7	168.0
Si bénéfices retardés de 1 an	27.1%	1 197 374.9	374.2
Si bénéfices retardés de 2 ans	24.3%	1 009 585.3	315.5