



Investing in rural people

Executive Board

President's memorandum Proposed additional financing to Republic of Djibouti Integrated Water Resources Management Project (PGIRE)

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Action: The Executive Board is invited to approve the recommendation for the proposed additional financing contained in paragraph 53.

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Financing summary

Initiating institution:	International Fund for Agricultural Development
Borrower/recipient:	Republic of Djibouti
Executing agency:	Ministry of Agriculture, Water, Fisheries, Animal and Marine Resources (MAEPE-RH)
Total project cost:	US\$20.25 million
Amount of original IFAD loan:	US\$6.60 million
Terms of original IFAD financing:	Highly concessional loan: 40-year maturity, with a 10-year grace period. Amortization is fixed at 2 per cent of the total principal for years 11 to 20, and at 4 per cent of the total amount for years 21 to 40.
Amount of additional IFAD financing:	US\$6.3 million
Terms of additional IFAD financing:	Highly concessional loan: 40-year maturity, with a 10-year grace period. Amortization is fixed at 2 per cent of the total principal for years 11 to 20, and at 4 per cent of the total amount for years 21 to 40.
Cofinancier:	Adaptation Fund
Amount of cofinancing:	US\$2.62 million
Terms of cofinancing:	Grant
Contribution of borrower/recipient:	US\$4.2 million
Contribution of beneficiaries:	US\$0.52 million
Amount of original IFAD climate finance:	US\$4.2 million
Amount of additional IFAD climate finance:	US\$5.59 million
Cooperating institution:	IFAD

I. Background and project description

A. Background

1. The Integrated Water Resources Management Project (PGIRE) was approved by the Executive Board in September 2020 (EB 2020/LOT/P.7/Rev.1) and entered into force on 11 April 2021 on ratification of the financing agreement. The project is scheduled for completion on 30 June 2027, and the financing closing date is scheduled for 31 December 2027.
2. The project was approved by the Executive Board with an initial total cost of US\$14.54 million. The total cost consisted of: (i) an IFAD loan of US\$6.6 million under the 2019–2021 Eleventh Replenishment of IFAD’s Resources (IFAD11) cycle of the performance-based allocation system (PBAS) for the Djibouti portfolio; (ii) a Government contribution of US\$2.8 million, consisting primarily of the cost of offices, taxes and customs duties and part of the salaries of the PGIRE staff; (iii) provisional cofinancing from the Adaptation Fund in the amount of US\$2.4 million; (iv) an estimated beneficiary contribution of US\$0.5 million; and (v) a financing gap of US\$2.2 million, to be bridged by IFAD from the PBAS allocation to the Djibouti portfolio under IFAD12, subject to internal procedures and subsequent approval by the Executive Board. However, the amount mobilized from the Adaptation Fund for the PGIRE was US\$2.62 million, and the financing gap was reduced to US\$2 million at design.
3. The PGIRE implementation costs have risen substantially because of the COVID-19 pandemic, the war in Ukraine and recently, the attacks on shipping in the Red Sea. The cumulative effect of these consecutive crises has been supply chain disruptions and price increases. Compared to the design of the PGIRE in 2020, we note: (i) an increase in the price of equipment and materials, the majority of which are imported, particularly affecting the cost of hydraulic works and inputs for small-scale irrigated agriculture and animal husbandry; (ii) an underestimation of the cost of extension services for agricultural and pastoral production; (iii) an underestimation of the cost of services provided by the Djibouti Social Development Agency (ADDS) and the National Union of Djiboutian Women (UNFD) for the implementation of income-generating activities (IGAs) and functional literacy and nutrition activities; (iv) an underestimation of the remuneration of the staff of the project management unit (PMU); (v) the rehabilitation of borewells and the expansion of drinking water supply networks, the need for which has been expressed by women to reduce their workload and improve their health. This situation has caused total project costs to increase from US\$14.54 million to US\$20.25 million, and the financing gap to widen to US\$6.3 million.
4. It should be noted that the Government of Djibouti has asked IFAD to allocate the IFAD12 PBAS allocation of US\$6.3 million to the PGIRE. This allocation covers the increase in project costs.
5. Concerning its eligibility for additional funding, the PGIRE’s performance improved following the implementation of a performance improvement plan in 2022, and IFAD’s 2023 supervision mission noted that the project is no longer at risk of not meeting its objectives, the activities proposed for financing are aligned with the project’s initial objectives, the Government has already submitted its request for the IFAD12 PBAS allocation for the PGIRE and the fiduciary functions and compliance with the requirements of social/environmental and climate safeguards are all rated moderately satisfactory. The disbursement rate of the original IFAD loan as of February 2024 is 58 per cent.
6. The PGIRE exceeds the 20 per cent ceiling for cost increases for the reasons cited in paragraph 3. The updated economic and financial analysis indicates a satisfactory economic internal rate of return of 15.7 per cent. In view of these

considerations, it is proposed that the PGIRE be confirmed as eligible for additional funding.

B. Original project description

7. The overall project objective is to sustainably improve the living conditions of poor rural households and their resilience to climate change. The development objective is to improve sustainable access by rural households to water and rangeland resources and their resilience to climate change, food and nutrition security and income, especially for women and youth.
8. The project was to operate in the watersheds of the Obock, Tadjourah, Dikhil, Arta and Ali Sabieh regions. During the PGIRE's first year of implementation, the Government of Djibouti requested a modification of the project area and, in particular, the removal of the watersheds located in the Arta and Ali Sabieh regions because they were well-targeted by other similar projects. They were replaced by the Hanlé and Gobaad watersheds in the Dikhil region, based on the selection criteria established in the project design.
9. The project beneficiaries are all households living in the selected localities, particularly women and young people. The project initially targeted 5,230 households, divided into three socioeconomic categories: agropastoralists, settled pastoralists and semi-settled pastoralists.
10. The project has three components. **Component 1: Improving the availability and efficiency of water management.** The expected outcome of this component is to ensure sustainable access to water to meet the needs of humans, animals and small-scale irrigated agriculture. Component 1 has two subcomponents: (i) subcomponent 1.1 "hydraulic investments", in which the integrated water resources management approach is adopted from a watershed management perspective. It involves the rehabilitation and construction of a range of hydraulic works to exploit groundwater and mobilize surface water; (ii) subcomponent 1.2 "operational management of public water services", which supports decentralization of the services of the Hydraulic Resources Directorate (DHR) through the creation of two regional bases for hydraulic equipment maintenance that will also serve as relay points for the organization of other local MAEPE-RH services.
11. **Component 2: Improving the livelihoods of rural households.** The aim of this component is to increase agropastoral productivity. It has two subcomponents: (i) subcomponent 2.1 "improving the performance of agropastoral production systems". Small-scale producers will benefit from tailored advice consisting of a series of good agricultural practices, improved pastoral and livestock management practices and natural resource management techniques; (ii) subcomponent 2.2 "improving sources of income and access to basic services", which involves setting up IGAs and improving nutrition and functional literacy.
12. **Component 3: Institutional support and community development, and project management.** The aim of this component is to build the capacity of public and community stakeholders in the water, horticulture and livestock subsectors. It has two subcomponents: (i) subcomponent 3.1 "institutional support and community development", which involves strengthening the technical capacities of the MAEPE-RH and agropastoral organizations in water management and agricultural/livestock production. This subcomponent also supports communities in drafting hydraulic and pastoral development plans for rangelands and watersheds; (ii) subcomponent 3.2 "project management and coordination" by a PMU housed in the DHR. The PMU has administrative and financial autonomy.
13. **Changes between project design and implementation.** Three changes were introduced during project implementation. The first change involved the substitution of watersheds, which are now concentrated in three regions and have a total population of 11,500. The second change was to house the PMU in the

General Administration Directorate (DAG) rather than the DHR, enabling the project to work with all MAEPE-RH departments on both water mobilization and water use. The third change involved the modification of PMU staff salaries to align them with the salary scale adopted by IFAD-cofinanced projects in Djibouti. The first two changes were reflected in the amendment to the PGIRE financing agreement. The change in the salary scale was considered in this revision of the project costs.

14. **PGIRE achievements to date.** The data presented here are based on the report of the 2023 IFAD supervision mission. According to the mission's estimate, the project had reached a total of 1,137 households, or 43 per cent of the midterm target. The main achievements are related to:
- (i) The mobilization of water, for which 6 cisterns will be completed and 4 wells will be in the construction phase, bringing the completion rate to 33 per cent of the hydraulic works planned for midterm of the PGIRE;
 - (ii) 255 ha of range enclosures, or 126 per cent of the midterm target for land under climate-resilient management;
 - (iii) Training in production practices and/or technologies has reached 50 per cent of the midterm target, and this performance will be improved with the introduction of training in agricultural and livestock management techniques in 2024;
 - (iv) The start-up of 20 IGA activities – that is, 100 per cent of the project's midterm target;
 - (v) Literacy classes began in September 2023 with 421 people – that is, 175 per cent of the project's midterm target;
 - (vi) Support for decentralization of the MAEPE-RH, with two regional bases under construction, the geographic information system (GIS) software installed in the DHR, stocks of spare parts procured and 50 per cent of the project's midterm target for people trained;
 - (vii) Capacity-building extended to 37 community organizations, or 9 times the project's midterm target.
15. Given the achievements to date, the PGIRE is expected to reach the project's midterm targets in 2024.

II. Rationale for additional financing

A. Rationale

16. The Executive Board approved US\$14.54 million in funding for the PGIRE in 2020. In view of a series of external shocks, the cost of the project was revised to better reflect the reality of current prices. This has increased the total cost of the project from US\$14.54 million to US\$20.25 million. This increase has led to a funding gap of US\$6.3 million, in contrast to the US\$2 million funding gap estimated at design, that must be filled to ensure the project's efficient and effective operation.
- Special aspects relating to IFAD's corporate mainstreaming priorities**
17. In line with IFAD's mainstreaming commitments, the project has been validated as:
- Including climate finance
 - Nutrition-sensitive
 - Youth-sensitive
18. According to the Djibouti Nationally Determined Contribution, vulnerability of the water resources, agriculture and forestry and livestock sectors to climate change is acute. The project strengthens the resilience of communities to climate change by

mobilizing water resources, promoting water-saving technologies for agropastoral production and strengthening local resource management capacities.

19. The project has a carbon footprint of –3.6 tCO₂e per hectare per year. The main activities contributing to the mitigation of climate change are found in subcomponent 2.1 and are related to range enclosures and assisted natural regeneration to restore degraded rangelands, the rehabilitation of irrigated areas and the improvement of local goat breeds to boost herd productivity.
20. The project's baseline survey indicates that approximately 89 per cent of households did not have access to a variety of food in 2022. The project invests in nutrition support by screening children for malnutrition, offering demonstrations on food preparation by mother advisors and improving women's and men's knowledge about health and hygiene.
21. The project aims to include young men and women in water and rangeland user organizations, the promotion of agropastoral production and IGAs.

B. Description of geographical area and target groups

22. The project area is the modified area indicated in paragraph 8 above and has been the subject of an amendment to the financing agreement. The target groups are those defined in paragraph 9 above. The project's outreach increases from the initial 5,230 households to 7,800 households with additional financing, thanks to greater investment in water supply networks, as explained below.

C. Components, outcomes and activities

23. The project components are unchanged. The changes are introduced at the activity level and detailed as follows. The cost increases represent the increases over the costs calculated at project design.
24. For subcomponent 1.1 "hydraulic investments", the number of works has been based on the hydraulic and pastoral development plans drawn up with the participation of the watersheds' populations, with 9 surface wells requested instead of 8 and 13 water supply networks instead of 2, a reduction in recharge dykes from 18 to 4 and rehabilitation of 7 ha of irrigated area instead of 9 ha. Moreover, 6 boreholes were identified for rehabilitation, which was not contemplated in the project design. The number of excavation reservoirs, cisterns and new/replacement borewells remains unchanged. The following activities have been cancelled: the creation of new irrigated areas, as the focus is on increasing the efficiency of water use in existing areas, and the underground dykes and protection of river banks, which were not considered high priorities. These modifications are based on the participatory diagnosis of the populations' hydraulic development needs. Indeed, the project implementation strategy is characterized by its flexibility to better adapt to the communities' needs. These changes increase subcomponent costs by 20 per cent.
25. For subcomponent 1.2 "operational management of public water services", the cost of the two regional bases and their equipment increased by around 28 per cent over the figure in the project design. The heavy equipment for borehole repair remains.
26. For subcomponent 2.1 "improving the performance of agropastoral production systems", the technology package promoted to livestock breeders and farmers has been better estimated, and extension services were better quantified. For small-scale irrigated farming, the project will provide reservoirs, drip irrigation, shade nets and integrated pest management; that is, a technology package better adapted to climate change for a 30 ha area in existing irrigated areas. The allocation of agricultural extension workers to monitor the irrigation systems has been better accounted for. In terms of animal husbandry, there are plans to step up monitoring and supervision by community animal health workers and to equip

veterinary centres and laboratories (four in total) in the Obock, Tadjourah and Dikhil regions. This represents a 69 per cent increase in costs.

27. For subcomponent 2.2, the cost of training and support for IGAs by ADDS and the cost of functional literacy and nutrition by UNFD were recalculated, based on the agreements concluded with these organizations. Costs increased by 68 per cent.
28. For subcomponent 3.1, the activities are unchanged, and the costs reflect the increase in the cost of the expertise of water engineers and monitoring and evaluation (M&E), which are both charged to this component. The total increase is 11 per cent.
29. For subcomponent 3.2, PMU staff remuneration has been revised to align it with the salary scale in comparable projects implemented by MAEPE-RH and financed by IFAD. Operating costs have also been revised upwards to take the general increase in fuel, spare parts and vehicle maintenance into account. This results in a 59 per cent increase in costs. The overall ratio between operating and investments costs is 18 per cent for IFAD-managed funds (IFAD loans and the Adaptation Fund grant).

D. Costs, benefits and financing

Project costs

30. The total cost of the project is US\$20.25 million. This cost is broken down as follows: (i) a Government contribution of US\$4.2 million; (ii) the original IFAD loan of US\$6.6 million; (iii) an Adaptation Fund grant of US\$2.62 million; (iv) an additional IFAD loan of US\$6.3 million; and (v) the beneficiaries' contribution of US\$0.52 million.
31. Project components 1: improving the availability and efficiency of water management, 2: improving the livelihoods of rural households, and 3: institutional support and community development, and project management are partially counted as climate finance. As per the multilateral development banks' methodologies for tracking climate change adaptation and mitigation finance, the total amount of IFAD climate finance for this project is estimated at US\$9.79 million.
32. The total amount of additional IFAD climate finance for this additional financing proposal is estimated at US\$5.59 million.

Table 1

Original and additional financing summary

(Thousands of United States dollars)

	<i>Original financing*</i>	<i>Additional financing</i>	<i>Total</i>
IFAD loan	6 614	6 300	12 914
IFAD grant	0	0	0
Other cofinanciers	2 394	223	2 617
Beneficiaries	504	18	522
Borrower/recipient	2 825	1 366	4 191
Financing gap	2 204		0
Total	14 541	7 907	20 245

* See table 1 in EB 2020/LOT/P.7/Rev.1 for a detailed breakdown.

Table 2
Project costs by component (and subcomponent) and financier
 (Thousands of United States dollars)

<i>Component/subcomponent</i>	<i>Original IFAD loan</i>		<i>Additional IFAD loan</i>		<i>Other cofinanciers</i>		<i>Beneficiaries</i>			<i>Borrower/recipient</i>			<i>Total</i>
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Cash</i>	<i>In-kind</i>	<i>%</i>	<i>Cash</i>	<i>In-kind</i>	<i>%</i>	<i>Amount</i>
1. Improving the availability and efficiency of water management	3 284	39	2 889	34	1 092	13		220	3	951		11	8 437
1.1. Hydraulic investments	1 790	30	2 338	39	1 077	18		220	3	597		10	6 023
1.2. Operational management of public water services	1 494	62	551	23	15	0				354		15	2 414
2. Improving the livelihoods of rural households	1 484	24	2 492	40	899	15	45	258	5	625	349	16	6 151
2.1. Improving the performance of agropastoral production systems	1 465	32	1 707	38	280	6		258	6	464	349	18	4 524
2.2. Improving sources of income and access to basic services		19	1	48	785	618	38	45	3	161		10	1 628
3. Institutional support and community development, and project management	1 846	33	919	16	625	11				835	1 431	40	5 656
3.1. Institutional support and community development	361	21	72	4	380	22				202	673	52	1 688
3.2. Project management and coordination	1 484	37	847	21	246	6				633	758	35	3 968
Total	6 614	33	6 300	31	2 617	13	45	478	3	2 411	1 780	21	20 245

Table 3

Project costs by expenditure category and financier

(Thousands of United States dollars)

<i>Expenditure category</i>	<i>Original IFAD loan</i>		<i>Additional IFAD loan</i>		<i>Other cofinanciers</i>		<i>Beneficiaries</i>			<i>Borrower/recipient</i>			<i>Total</i>
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Cash</i>	<i>In-kind</i>	<i>%</i>	<i>Cash</i>	<i>In-kind</i>	<i>%</i>	<i>Amount</i>
Investment costs													
1. Civil works	1 366	31	1 284	29	890	20		458	10	443	13	10	4 430
2. Equipment and vehicles	1 940	38	2 034	40	389	8	45	20	1	648	22	13	5 099
3. Training and studies	1 587	34	1 801	38	842	18				470		10	4 700
4. Technical assistance (domestic and international)	263	39	250	37	115	17				48		7	676
Total investment costs	5 156	34	5 369	36	2 236	15	45	478	3	1 609	35	11	14 905
Recurrent costs													
5. Salaries and allowances	1 355	29	787	17	275	6				733	1 482	47	4656
6. Operating costs	103	15	144	21	105	15				68	263	48	683
Total recurrent costs	1 458	27	931	17	380					801	1 745	48	5 339
Total	6 614	33	6 300	31	2 617	13	45	478	3	2 411	1 780	21	20 245

Table 4

Project costs by component and project year

(Thousands of United States dollars)

<i>Component/subcomponent</i>	<i>2021</i>		<i>2022</i>		<i>2023</i>		<i>2024</i>		<i>2025</i>		<i>2026</i>		<i>2027</i>		<i>Total</i>		
	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>	<i>%</i>	<i>Amount</i>		
1. Improving the availability and efficiency of water management																	
1.1. Hydraulic investments					13	0	123	2	3 069	51	2 205	37	543	9	70	1	6 023
1.2. Operational management of public water services					53	2	937	39	1 093	45	261	11	70	3			2 414
2. Improving the livelihoods of rural households																	
2.1. Improving the performance of agropastoral production systems			104	2	153	3	418	9	1 798	40	1 229	27	913	20			4 524
2.2. Improving sources of income and access to basic services							118	7	834	51	676	41					1 628
3. Institutional support and community development, and project management																	
3.1. Institutional support and community development			195	11	208	12	270	16	286	17	358	21	255	15	117	7	1 688
3.2. Project management and coordination			556	14	400	10	582	15	800	20	668	17	603	15	358	9	3 968
Total			855	4	827	4	2 447	12	7 791	38	5 397	27	2 384	12	544	3	20 245

Financing and cofinancing strategy and plan

33. The amount of additional IFAD financing is US\$6.3 million from the IFAD12 PBAS allocation to the Djibouti portfolio.

Disbursement

34. The existing designated account for the original loan and the operating account in Djibouti francs (DJF) will be used to receive funds from the additional IFAD loan. To track income and expenditures and allow for accurate reconciliation of the designated and operating accounts, separate ledgers will be created and maintained for each financing instrument. All other financial management arrangements put in place to manage the original financing remain valid and will be applied to the additional financing.
35. IFAD received the 2021 and 2022 audit report 15 days after the submission deadline. The quality of the report is considered moderately satisfactory. Due to the delay in submission, the project's audit performance rating is automatically downgraded to moderately unsatisfactory. The reason for the delay is explained by the project team's lack of experience in the procurement process and recruitment of the auditor. This delay will not occur again, given the greater capacity of the PGIRE procurement team to carry out their duties and the greater capacity of the finance and administration team to produce unaudited financial statements on time.

Summary of benefits and economic analysis

36. The PGIRE has an economic internal rate of return of 15.7 per cent and a net present value of US\$3.75 million, for an economic opportunity cost of capital of 10 per cent. A sensitivity analysis based on the potential risks identified during project implementation confirms its robustness.

Exit strategy and sustainability

37. The initial exit and sustainability strategy remains in force. The project's commitment to strengthening the technical and operational capacity of water and rangeland management committees and agricultural cooperatives ensures that the beneficiaries will take charge of the activities and continue to do so beyond the duration of project implementation. The project is supporting effective decentralization of MAEPE-RH technical services and the delivery of services to producers. The project is operationalizing the hydraulic structure maintenance strategy by having the beneficiary population take charge of preventive maintenance.

III. Risk management

A. Risks and mitigation measures

38. The overall risk, both inherent and residual, was assessed as moderate at design. This remains valid. However, there is a change in the ranking of the following residual risks: (i) national context, for which the inherent risk remains moderate and the residual risk increases from low to moderate due to the multiple crises, whose cumulative effect was to increase the costs of the main investments and operating costs estimated at the time of project formulation in 2020; (ii) the scope of the project for the inherent risk remains moderate, but the residual risk increases from low to moderate, because the technical capacity of the PMU required significant strengthening, and IFAD mobilized technical assistance in this regard; (iii) institutional capacity, for which the inherent and residual risk increases from moderate to substantial due to the poor performance of the M&E system and the need for greater technical assistance in this area; (iv) procurement, for which the inherent risk remains moderate and the residual risk increases from low to moderate, because the PMU must exercise more rigour in arithmetic calculations and the validation of contract deliverables. IFAD has strengthened the prior review of procurement, and contract deliverables are systematically reviewed during

supervision and technical support missions; (v) financial management, for which the inherent risk is substantial and the residual risk falls to moderate, due to risks associated with inadequate and untimely financial reporting, resulting in treasury problems at the project level, ineligible expenditures due to cross-financing and inaccurate accounting of counterpart funds and beneficiary contributions. To mitigate these risks, project staff will receive additional training in the use of their accounting software, and IFAD will follow up closely on the submission of financial reports and support to develop a methodology for proper accounting of national contributions.

39. The PGIRE's original Social, Environmental and Climate Assessment Procedures (SECAP) covered all the regions targeted by the project. Investments remain largely like those planned at project design. No changes to the SECAP are planned.

B. Environment and social category

40. The environmental risk is preliminarily classified as category B. The activities planned with the additional financing will have a positive social and environmental impact. The technical and organizational training activities for the target groups will have a positive effect in terms of the sustainable management of hydraulic structures and pastoral developments and the improvement of living conditions. Improving water use through better equipment maintenance and the expansion of water supply networks will reduce water losses and women's drudgery and improve women's health. Boreholes (construction, replacement and rehabilitation) can only be drilled if groundwater renewal conditions allow, and once the planned hydrogeological study has determined the volume of water to be abstracted in line with groundwater renewal. A new SECAP analysis is not required for the additional financing.

C. Climate risk classification

41. The climate risk is classified as substantial. According to the Shared Socioeconomic Pathway 5 (SSP5)-8.5 scenario, the estimated average temperature change in Djibouti by 2040–2059 ranges from 1.62°C in the coastal region of Obock to 1.74°C in the Dikhil region. The critical rainy seasons that supply grazing areas from April to August are expected to decrease. In addition, the winter rains, which occur from September to February, are expected to trend downwards, especially during the rangeland growth period in September and October. The impact of these changes on livestock could be significant. The high variability and greater intensity of extreme rainfall events pose a significant threat to the pastoral southwest, where sandy soils are extremely vulnerable to periodic flooding caused by intense rainfall. Flood damage to infrastructure is likely to disable pumps and other critical equipment, exacerbating water shortages. According to the nationally determined contribution, the vulnerability of the water resources, agriculture, forestry and livestock sectors to climate change is acute.
42. In accordance with IFAD requirements, an in-depth climate risk analysis was attached to the SECAP note prepared at the design of the PGIRE and was updated in 2023. The PGIRE is currently implementing its social, environmental and climate management plan.

IV. Implementation

A. Compliance with IFAD policies

43. The project complies with IFAD policies on gender equality and women's participation; nutrition; and environmental, climate and social standards requirements. The project's performance in these areas is rated moderately satisfactory.

B. Organizational framework

Management and coordination

44. No changes are planned to the project's institutional set-up as presented in paragraph 13, above. The PGIRE PMU will continue to be housed in the General Administration Directorate (DAG), as indicated in the amendment to the financing agreement. The composition of the PMU remains unchanged. The national project steering committee remains in place.

Financial management, procurement and governance

45. The quality of financial management is considered moderately satisfactory. The administrative and financial service has made the necessary efforts to continuously improve the quality of financial management and is sufficiently staffed to ensure a sound level of segregation of duties. A well performing accounting software is available to the project, and the main project procedures are described in an operating manual. Despite the overall good quality of financial management at the project level, certain aspects need improvement, particularly in terms of: (i) increasing staff proficiency in the use of the financial and accounting software and integrating counterpart funds in project financial statements; (ii) improving the quality of supporting documentation; and (iii) improving the timeliness of the submission of interim financial reports.
46. The project has adopted IFAD's procurement guidelines. The procurement function is rated moderately satisfactory. Improvements are expected in adherence to the deadlines for the different stages of procurement; the drafting of technical specifications and evaluation criteria, doing so in a more precise and exhaustive manner, and rigour in the verification of arithmetic calculations of bids.

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

47. Performance of the monitoring and evaluation function remains moderately unsatisfactory. The PGIRE has completed the baseline study, produced a monitoring and evaluation manual and acquired monitoring and evaluation software. However, the M&E team is finding it hard to track project outputs. IFAD intends to mobilize technical assistance in monitoring and evaluation to support the PGIRE. IFAD will also ensure that the effective monitoring and evaluation system developed by the MAEPE-RH's Water and Soil Management Programme (PROGRES) and cofinanced by IFAD is capitalized upon.
48. Performance of the knowledge management function is deemed moderately satisfactory. The PGIRE is capitalizing on the experiences of PROGRES in terms of hydraulic and pastoral development, the MAEPE-RH and the Food and Agriculture Organization of the United Nations project to improve agricultural extension.

D. Proposed amendments to the financing agreement

49. Subject to approval of the additional financing by the President as delegated by the Executive Board, the PGIRE financing agreement will be amended to reflect the additional US\$6.3 million from IFAD funds on highly concessional financing terms. No new expenditure categories will be created. This funding fills the identified financing gap and will not involve any changes to the project, objectives, target area or target group. The only changes would be to the body of the agreement to include the new financing and financing terms and amend appendix II.

V. Legal instruments and authority

50. A financing agreement between the Republic of Djibouti and IFAD will constitute the legal instrument for extending the proposed financing to the borrower. The signed financing agreement will be amended following approval of the additional financing.

51. The Republic of Djibouti is empowered under its laws to receive financing from IFAD.
52. I am satisfied that the proposed additional financing will comply with the Agreement Establishing IFAD and the Policies and Criteria for IFAD Financing.

VI. Recommendation

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

RESOLVED: that the Fund shall provide additional financing on highly concessional terms to the Republic of Djibouti in an amount of six million three hundred thousand United States dollars (US\$6,300,000) and upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented herein.

Alvaro Lario
President

Updated logical framework incorporating the additional financing (refer to logframe automatically generated from ORMS)

Results hierarchy	Indicators					Means of verification			Assumptions/notes
	Name	Baseline	Midterm	Original target	End target	Source	Frequency	Responsibility	
Outreach	1.b Estimation correspondante du nombre total des membres des ménages					Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours, achèvement projet	Responsable Suivi Evaluation (RSE)	
	Membres des ménages - Nombre de personnes		15 690	31 380	54 600				
	1.a Nombre correspondant de ménages touchés								
	Ménages dirigés par une femme - Ménages		260	1050	1560				
	Ménages autres que ceux ayant une femme pour chef - Ménages		2355	4180	6240				
	Ménages - Ménages		2615	5230	7800				
	1 Nombre de personnes bénéficiant de services promus ou appuyés par le projet								
	Nombre hommes		7890	15780	27300				
	Nombre femmes		7800	15600	27300				
	Nombre Jeunes		6250	12500	21840				
	Nombre total de personnes bénéficiant de services - Nombre de personnes		15 690	31380	54600				
Objectif du projet Contribuer à l'amélioration durable des conditions de vie des ménages ruraux pauvres et la résilience au changement climatique dans la zone du Projet	Ménages faisant état d'une augmentation des revenus moyens					Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours, achèvement projet	Responsable Suivi Evaluation (RSE)	Bonne gouvernance Pas de catastrophes naturelles ou/et épidémie majeures, Situation sécuritaire stable Stabilité politique Amélioration des conditions macro-économiques
	Ménages - Pourcentage (%)		10	25	25				
Objectif de développement Améliorer l'accès durable des ménages ruraux à l'eau et aux ressources des parcours, leur résilience	3.2.3 Ménages déclarant une diminution significative du temps consacré à la collecte d'eau et de combustible					Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours, achèvement projet	Responsable Suivi Evaluation (RSE)	Les populations ouvertes à la formation aux techniques culturelles et pastorales, et à la préservation des ressources naturelles par des mesures adaptées; Participation des communautés à la
	Ménages - Ménages		2092	3 661	6 240				
	1.2.8 Femmes déclarant une diversité alimentaire minimale (MDDW)								
Femmes (nombre) - Femmes		468	1171	1170					

face au changement climatique, leur sécurité alimentaire et nutritionnelle et leurs revenus, en particulier pour les femmes et les jeunes	3.2.1 Tonnes d'émissions de gaz à effet de serre (tCO2e) évitées et/ou séquestrées								planification et à la gestion des investissements ruraux; capacité de coordination, de gestion du Projet par la DHR et la prestation effective des services par les directions techniques du MAEPE-RH et d'autres prestataires de service, disponibilité des fonds pour le Projet
	tCO2e/20 années - Nombre			54506	-80 269 tCO2-e				
Effet direct 1 L'eau est disponible et gérée de manière efficiente et durable pour les besoins de consommation domestique et de production agro-pastorale	1.2.1 Ménages faisant état d'un accès amélioré à la terre, aux forêts, à l'eau ou aux plans d'eau à des fins productives					Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours, achèvement projet	Responsable Suivi Evaluation (RSE)	Les populations ouvertes à la formation aux techniques culturelles et à la préservation des ressources naturelles par des mesures adaptées
	Ménages faisant état d'un accès amélioré à l'eau - Ménages		2000	4000	6240				
	L'efficacité des services de maintenance de proximité et les connaissances de la DHR sur le bilan des nappes exploitées sont améliorés								
	Bases régionales de maintenance établies avec équipements hydrauliques - Nombre		2	2	2				
	Maîtrise des bilans ressources renouvelables par la DHR								
	Prélèvements annuels prévisibles réalisés - Nombre		2	6	3				
Produit 1.1. Des ouvrages hydrauliques sont réalisés et la capacité de mobilisation et de stockage des eaux de surfaces est accrue pour la consommation, la production agro-pastorale et la recharge des nappes.	Ouvrages hydrauliques de captage et de stockage d'eau construits/réhabilités, et terres agricoles dotées d'infrastructures hydrauliques construites/remises en état					Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	Planification participative des ouvrages hydrauliques et pastoraux Participation des CPL et CGEP dans le suivi de la construction Mise en place de système de cotisation pour entretien préventif par le CGEP Etudes rigoureuses de faisabilité et dimensionnement des ouvrages Contrôle rigoureux des travaux
	Citernes familiales enterrées construit - Nombre		6	12	12				
	Forages de remplacement creusés - Nombre		1	3	3				
	Forages réhabilités - Nombre				6				
	Puits de surface aménagés et équipés de pompage solaire - Nombre		8	8	9				
	Réseaux d'adduction d'eau potable étendus - Nombre		1	2	13				
	Digues de retenue d'eau et/ou souterraine construites - Nombre		0	3	0				

	Retenues d'excavation construits ou réhabilitée - Nombre		7	7	7				
	Ouvrage d'épandage de crues construit - Nombre			1	1				
	Seuils de recharge de nappes construits - Nombre		0	18	4				
	Création de périmètres irrigués – Nbre Hectares		0	3	0				
	Réhabilitation de périmètres irrigués		0	9	7				
	3.1.4 Hectares de terres soumises à une gestion résiliente au climat								
	Superficie en hectares - Superficie (ha)		203	412	3455				
Produit 1.2 Capacités de gestion public des systèmes hydrauliques de la DHR sont renforcées et déconcentrées, services de maintenances améliorés et leurs connaissances sur le bilan des nappes exploitées renforcées.	Ouvrages hydrauliques mieux gérés par les structures décentralisées de la DHR					Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	MAEPE-RH dispose de budget pour déploiement du personnel de la capitale vers les bases régionales et pour le fonctionnement des bases DHR applique les formations sur le SIG et met en place un SIG fonctionnel
	Construction de locaux (bureau, hangar, atelier de réparation, magasin de stockage) de la base - Nombre		2	2	2				
	Acquisition de camions pour les deux bases - Nombre		6	6	6				
	Nombre de nappes modelées par le système SIG - Nombre		3	3	3				
	Nombre de personnes formées en système SIG et renforcement base de données - Nombre		5	5	10				
	Stock d'équipements de secours et pièces de rechange pour les deux bases - Nombre		2	2	2				
Effet direct 2 Des systèmes de production agro-pastoraux performants et résilients sont adoptés dans la zone	1.2.4 Ménages faisant état d'une augmentation de la production					Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours,	Responsable Suivi Evaluation (RSE)	Mise en place d'un encadrement technique adéquat pour la production animale et végétale
	Ménages – Nombre		2000	4000	4368				
	1.2.2 Ménages déclarant l'adoption de technologies, de pratiques ou d'intrants nouveaux/améliorés								
	Ménages – Nombre		1350	3200	3744				

du projet pour améliorer la sécurité alimentaire et la nutrition						achèvement projet			
Produit 2.1 Amélioration de la productivité et la qualité de la production agro-pastorale grâce à l'accès aux facteurs de production et appuis-conseils adaptés et améliorés	1.1.3 Producteurs ruraux ayant accès aux facteurs de production et/ou aux paquets technologiques				Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	Approvisionnement en intrants agricoles et véto est accessible aux producteurs	
	Hommes – Nombre		1500	2000					2500
	Femmes – Nombre		1500	2000					2500
	Jeunes - Nombre		1000	2000					2500
	Total producteurs ruraux – Nombre		3000	4000					5000
	1.1.4 Personnes formées aux pratiques et/ou technologies de production								
	Hommes – Nombre		100	210					250
	Femmes – Nombres		100	200					250
	Total personnes formées – Nombre		200	410					500
Effet direct 3 Les moyens d'existence des ménages pauvres sont diversifiés et les services de base dans la zone du projet sont renforcés.	2.2.2 Entreprises rurales appuyées signalant une hausse de leurs bénéficiaires				Etude de référence, Enquête mi-parcours, Enquête finale	Au démarrage, mi-parcours, achèvement projet	Responsable Suivi Evaluation (RSE)	Accompagnement adéquat des entreprises établies	
	Nombre d'entreprises - Entreprises		20	40					40
	2.2.1 Personnes ayant de nouveaux emplois / opportunités d'emploi (nouveau indicateur introduit par FIDA en 2024)								
	Hommes – Nombre								200
	Femmes – Nombre								200
	Jeunes – Nombre								160
Produit 3.1 Les entreprises rurales sont diversifiées et les capacités de création d'emploi et de génération de revenus sont renforcées dans la zone du projet	2.1.1 Entreprises rurales ayant accès à des services de développement des entreprises				Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	Sélection participative et judicieuse des organisations porteuses des AGR et des personnes impliquées	
	Entreprises rurales - Entreprises		20	48					48
	2.1.2 Personnes formées à des activités productrices de revenus ou à la gestion des entreprises								
	Hommes – Nombre		900	2160					2160
	Femmes – Nombre		1500	3600					3600
	Jeunes – Nombre		1200	2880					2880
	Personnes formées – Total		2400	5760					5760
Produit 3.2 L'accès à des services sociaux de base notamment	Alphabétisation fonctionnelle des bénéficiaires pour s'approprier les conseils techniques du projet appuyée				Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	Adaptation du curriculum alphabétisation et nutrition aux besoins des populations	
	Femmes – Nombre		200	400					1270
	Hommes – Nombre		40	100					140

de renforcer les services d'accompagnement aux producteurs et éleveurs	DHR et des autres directions du MAEPE-RE au niveau régional et local sont renforcés - Nombre							
	Dialogue politique et stratégies sous-sectorielles appuyés							
	Outils politiques appuyés (lois, règlements, politiques ou stratégies) sur la gestion de l'eau – Nombre		1	2	2			
Produit 4.1 Le MAEPR-RH est appuyé dans l'élaboration et la mise œuvre des stratégies liées à la gestion intégrée des ressources en eaux, la mise en place et la gestion d'une base de données relative aux ouvrages d'eau, ainsi que l'appui à l'institutionnalisation des groupements informels communautaires.	2.1.3 Organisations de producteurs ruraux soutenues				Suivi par le PGIRE, rapports d'avancement	Semi-annuel	RSE	Cadre réglementaire existe pour l'enregistrement des CGEP Conventions établies et opérationnelles clarifiant rôle des organisations, du PGIRE et du MAEPE-RH
Organisations de producteurs ruraux soutenues - Organisation		8	8	40				
Nombre de CGEP enregistrés en associations d'usagers d'eau								
Associations d'usagers de l'eau - Nombre		10	22	54				
2.1.4 Producteurs ruraux soutenus qui sont membres d'une organisation de producteurs ruraux								
Hommes – Nombre		1500	2000	2880				
Femmes – Nombre		1500	2000	2880				
Jeunes - Nombre		1200	1600	2300				
Total		3000	4000	5760				
Nombre de SAHP élaborés ou actualisés de façon participative pour l'aménagement et de la gestion des parcours pastoraux								
SAHP - Nombre		8	8	12				

Updated summary of the economic and financial analysis

Tableau A : Modèles de cash flows financiers

Catégories	Modèles	Marge brute additionnelle en USD						
		Année 1	Année 2	Année 3	Année 4	Année 5	Année 6	Année 7
Aménagements Hydrauliques	Retenue	138 002	138 002	138 002	138 002	138 002	138 002	138 002
Élevage et parcours	Élevage caprins	660,97	1 652,43	1 652,43	4 159,93	5 812,36	159,93 ⁴	159,93 ⁴
	Pâturage amélioré	- 1 802 000,00	- 1 802 000,00	- 970 129,64	- 541 590,37	299 282,92	737 796,53	796,53 ⁷³⁷
	Pâturage dégradé	1 579,46	1 500,49	1 425,46	1 354,19	1 286,48	222,16 ¹	161,05 ¹
	Pâturage ouvert	- 210 000,00	- 210 000,00	621 870,36	1 050 409,63	1 882 279,99	2 310 819,27	819,27 ^{2 310}
Activités Génératrices de Revenus (AGR)	Natte teinte	659,60	1 319,21	3 298,02	4 617,23	5 276,84	936,44 ⁵	596,05 ⁶
	Natte de base	500,00	1 000,00	2 500,00	3 500,00	4 000,00	500,00 ⁴	000,00 ⁵
	Sac améliorés	69,35	346,75	693,50	832,20	970,90	109,60 ¹	248,31 ¹
	Apiculture	15 536,72	15 536,72	15 536,72	15 536,72	15 536,72	15 536,72 ⁵	536,72 ¹⁵
	Agri-pépinière	270,09	5 964,44	5 401,76	4 208,87	3 151,02	964,44 ⁵	401,76 ⁵
Agriculture	Jardins	-	15 207,21	45 473,92	34 670,41	55 264,60	56 066,42	349,00 ⁵⁵

Tableau B : Coûts du Projet et Cibles du cadre logique

COÛTS DU PROJET ET INDICATEURS DU CADRE LOGIQUE	
COÛT TOTAL DU PROJET (en million USD)	20,245
Bénéficiaires	7 800 ménages
Cout par bénéficiaire	2 595 USD par ménage
Composantes	Cout unitaire (en million d'USD)
I. Amélioration de la disponibilité et de l'efficacité de la gestion de l'eau	8,437
II. Amélioration des moyens d'existence des ménages ruraux	6,151
III. Appui institutionnel et développement communautaire	5,656

Tableau C: Hypothèses principales

Effectif de cheptel s'abreuvant à une retenue (20 000 m3) par an

Unité de bétail Familial	Besoins en eau par tête (l/jour)	Nbre de têtes	Besoins eau en l/j	Volume d'eau stocké m3	Volume d'eau		Quantité d'eau disponible/j (l)	capacité d'abreuvement (UBF)	Nbre moyen animaux s'abreuvant/j
					Litre (l)	Disponible/j (l)			
Caprins	3.5	20	70	20 000	20 000 000	15 000 000	41 096	147	5 137 caprins/514 camélidés
Camelins	30	1	30						
Total	100		100						

Source : Rapport d'achèvement Programme de Mobilisation des Eaux de Surface et de Gestion Durable des Terres PROMES-GDT et Programme de Gestion des Eaux et Sols (PROGRES)

Paramètres de coûts et recettes des pâturages

Description	Pâturage amélioré (1)	Pâturage ouvert (2)	Pâturage dégradé (3)
Coûts de mise en défens (1)/ Coûts d'ouverture de 100 km2 de pâturage (2)/ Coût de surveillance et de parcours(3)	53 USD/ha/an	15USD/ha	0.034 USD/ha
Productivité pâturage attendue en année 5	228 kg MS/ha/an	228 kg MS/ha/an	50 kg MS/ha/an
Besoin en MS chèvre	228 kg MS/ha/an	1 chèvre/ha/an	0.22 chèvre/ha/an
Productivité du troupeau	0,4 chèvre/an	0,4 chèvre/an	0,4 chèvre/an
Prix de vente d'une chèvre (bord champs)	56 USD	45 USD	45 USD

Sources : Rapport d'achèvement PROMES-GDT et PROGRES

Hypothèses d'accroissement de rendements pour les principales spéculations

Principales cultures	Rendement à l'hectare		% des pertes après récoltes	Prix de vente/kg
	Sans irrigation	Avec irrigation		
Tomate	1 T	2 T	10	150
Oignon	1.2 T	3 à 4 T	5	150
Melon	0.6 T	2 à 4 T	5	200

Tableau D : Phasage et taux d'adoption des bénéficiaires

Modèles	PHASAGE, TAUX D'ADOPTION ET BENEFICIAIRES						
	Année 1	Année 2	Année 3	Année 4	Année 5	Année 6	Année 7
Élevage caprins	198,29	495,73	495,73	2 079,96	4 649,89	4 159,93	4 159,93
Paturage amélioré	- 540 600,00	- 540 600,00	- 291 038,89	- 270 795,18	239 426,33	737 796,53	737 796,53
Paturage dégradé	473,84	450,15	427,64	677,10	1 029,18	1 222,16	1 161,05
Paturage ouvert	- 63 000,00	- 63 000,00	186 561,11	525 204,82	1 505 823,99	2 310 819,27	2 310 819,27
Natte teinte	197,88	395,76	989,41	2 308,62	4 221,47	5 936,44	6 596,05
Natte de base	150,00	300,00	750,00	1 750,00	3 200,00	4 500,00	5 000,00
Sac améliorés	20,81	104,03	208,05	416,10	776,72	1 109,60	1 248,31
Apiculture	4 661,02	4 661,02	4 661,02	7 768,36	12 429,38	15 536,72	15 536,72
Agri-pépinière	81,03	1 789,33	1 620,53	2 104,43	2 520,82	5 964,44	5 401,76
Jardins	-	4 562,16	13 642,18	17 335,20	44 211,68	56 066,42	55 349,00
*Meme hypothèses qu'à la conception du PGIRE :	30%	30%	30%	50%	80%	100%	100%

Tableau E: Cash flow économique

ANALYSE RENTABILITE ECONOMIQUE

	An 1	An 2	An 3	An 4	An 5	An 6	An 7	An 8	An 9	An 10	An 11	An 12	An 13	An 14	An 15	An 16	An 17	An 18	An 19	An 20
TOTAL COÛTS ECO PROGRESS (USD)	682 060	640 386	1 617 559	2 414 387	1 430 323	983 858	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191	366 191
BENEFICES DU PGIRE (en USD)																				
1. Retenues nouvelles	-	-	-	-	-	138 002	276 004	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006	414 006
2. Retenues réhabilitées	-	-	-	-	-	414 006	1 104 017	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031	2 070 031
Élevage Caprins	-	-	661	1 652	1 652	4 160	5 812	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160	4 160
3. Mises en repos pâturages	-	-	-	-	- 1 802 000	- 1 802 000	- 970 130	- 541 590	- 299 283	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797	- 737 797
5. Agriculture (jardins)	-	15 207	45 474	34 670	55 265	56 066	55 349	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503	67 503
6. Agriculture (pépinière)	270	5 964	5 402	4 209	3 151	5 964	5 402	5 964	3 736	2 588	1 238	1 238	1 238	1 238	1 238	1 238	1 238	4 614	4 614	1 238
4. AGR Vannerie teinte	-	13 192	52 768	79 153	98 941	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325	125 325
4. AGR Vannerie base	500	1 000	2 500	3 500	4 000	4 500	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000	5 000
7. AGR Apiculture	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537	15 537
8. AGR sacs améliorés	75	375	1 125	1 125	2 250	2 250	2 250	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363	2 363
TOTAL BENEFICES DU PGIRE	16 307	50 975	122 717	139 846	- 1 621 205	- 1 036 189	624 566	2 168 299	2 999 471	3 444 309	3 440 483	3 440 483	3 440 483	3 440 483	3 440 483	3 440 483	3 437 107	3 437 107	3 440 483	3 440 483
Synthèses bénéfices environnementaux (EXACT)																				
Bénéfices environnementaux (USD) @ low estimate range (average 52 USD/TCO2e)	3 502 269	3 589 826	3 677 383	3 764 940	3 852 496	3 940 053	4 027 610	4 115 167	4 202 723	4 290 280	4 377 837	4 465 393	4 552 950	4 640 507	4 815 620	4 903 177	4 990 734	5 078 291	5 253 404	5 340 961
Environmental benefits (USD) @ high estimate range (average 104 USD/TCO2e)	7 004 539	7 179 652	7 354 766	7 529 879	7 704 992	7 880 105	8 055 218	8 230 331	8 405 444	8 580 557	8 755 670	8 930 783	9 105 896	9 281 009	9 543 684	9 806 359	10 069 034	10 331 709	10 594 384	10 857 059
CASHFLOW sans bénéfice env	665 753	589 410	1 494 842	2 274 541	3 051 528	2 020 047	258 375	1 802 108	2 633 280	3 078 118	3 074 292	3 074 292	3 074 292	3 074 292	3 074 292	3 074 292	3 074 292	3 070 916	3 070 916	3 074 292
CASHFLOW avec bénéfice env @ low estimate range (average 52 USD/TCO2e)	2 836 516	3 000 416	2 182 540	1 490 399	800 968	1 920 006	4 285 985	5 917 274	6 836 003	7 368 398	7 452 129	7 539 686	7 627 242	7 714 799	7 889 913	7 977 469	8 065 025	8 149 207	8 327 696	8 415 253
CASHFLOW avec bénéfice env @ high estimate range (average 104 USD/TCO2e)	6 338 785	6 590 242	5 859 923	5 255 338	4 565 908	5 772 502	8 226 038	10 032 441	11 038 727	11 658 678	11 829 966	12 005 079	12 267 749	12 442 863	12 617 976	12 880 646	13 052 384	13 315 054	13 581 100	13 756 214
Cash flow actualisé cumulé sans bénéfice env	665 753	- 1 255 164	- 2 750 006	- 5 024 547	- 8 076 075	- 10 096 122	- 9 837 747	- 8 035 640	- 5 402 360	- 2 324 241	750 051	3 824 343	6 898 635	9 972 928	13 047 220	16 121 512	19 192 428	22 263 344	25 337 636	28 411 928
Cash flow actualisé cumulé avec bénéfice env @ low estimate range (average 52 USD/TCO2e)	2 836 516	5 836 932	8 019 472	9 509 871	10 310 839	12 230 845	16 516 830	22 434 104	29 270 107	36 638 506	44 090 635	51 630 320	59 257 563	66 972 362	74 862 274	82 839 744	90 901 393	99 050 600	107 378 296	115 793 549
Cash flow actualisé cumulé avec bénéfice env @ high estimate range (average 104 USD/TCO2e)	6 338 785	12 929 027	18 798 950	24 044 289	28 610 197	34 382 699	42 608 736	52 641 177	63 679 904	75 338 582	87 168 548	99 173 627	111 441 376	123 884 239	136 502 215	149 382 862	162 435 245	175 750 299	189 331 400	203 087 613
Sans bénéfices environnementaux	Scenario de base	Avec Bénéfices ENV. @low estimate range	Avec Bénéfices ENV. @high estimate range																	
TRI	15,72%	#NOMBRE!	#NOMBRE!																	
VAN	3 754 504	38 550 293	73 240 569																	
VAN B	10 734 371	34 795 789	69 486 065																	
VAN C	6 979 868	6 979 868	6 979 868																	
BCR	1,5	5,0	10,0																	
DRC	9,6	6,9	6,8																	

Tableau F : Analyse de sensibilité

ANALYSE DE SENSIBILITE		TRIE	VAN (@10%)	
			Millions de FDJ	Million de USD
Cas de base		15,7%	667,3	3,8
Coûts +	10%	14,5%	543,2	3,1
Coûts +	20%	13,3%	419,2	2,4
Coûts +	30%	12,2%	295,1	1,7
Revenus -	10%	14,3%	476,5	2,7
Revenus -	20%	12,8%	285,7	1,6
Revenus -	30%	11,0%	94,9	0,5
Revenus retardés d'un an		13,5%	411,2	2,3
Revenus retardés de 2 ans		11,5%	178,4	1,0
Revenus retardés de 3 ans		9,7%	- 33,1	- 0,2