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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF-14398

ON A

GLOBAL ENVIRONMENT FACILITY TRUST FUND GRANT

IN THE AMOUNT OF US\$6.44 MILLION

TO THE

KINGDOM OF MOROCCO

FOR THE

MOROCCO SOCIAL AND INTEGRATED AGRICULTURE PROJECT

June 23, 2019

Agriculture Global Practice
Middle East And North Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective December 31, 2018)

Currency Unit = Moroccan Dirham
(MAD)

MAD 9.53 = US\$1

US\$ 0.10 = SDR 1

FISCAL YEAR

July 1 - June 30

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ABBREVIATIONS AND ACRONYMS

ADA	Agricultural Development Agency (<i>Agence pour le développement agricole</i>)
ANDZOA	National Agency for Development of Oasis Zones and the Argan Tree (<i>Agence nationale pour le développement des zones oasiennes et d'arganier</i>)
ASIMA	Morocco Social and Integrated Agriculture Project (<i>Agriculture solidaire et intégrée au Maroc</i>)
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DB	Budget Directorate (<i>Direction du budget</i>)
DELP	Desert Ecosystems and Livelihoods Program
DF	Finance Directorate (<i>Direction financière</i>)
DPA	Provincial Agricultural Directorate (<i>Direction provinciale de l'agriculture</i>)
DPL	Development Policy Loan
DRA	Regional Agricultural Directorate (<i>Direction régionale de l'agriculture</i>)
DSS	Strategy and Statistics Directorate (<i>Direction de la stratégie et des statistiques</i>)
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessments
ESIAP	Environmental and Social Impact Assessment Framework
FDA	Agricultural Development Fund (<i>Fonds de développement agricole</i>)
GCF	Green Climate Fund
GEF	Global Environment Facility
GoM	Government of Morocco
IFAD	International Fund for Agricultural Development
INDH	National Initiative for Human Development (<i>Initiative nationale pour le développement humain</i>)
INRA	National Institute for Agronomic Research (<i>Institut national de la recherche agronomique</i>)
IRR	Internal Rate of Return
ISR	Implementation Status and Results Report
MAD	Moroccan Dirham
MAPMDREF	Ministry of Agriculture, Maritime Fisheries, Rural Development, Water and Forestry (<i>Ministère de l'agriculture, de la pêche maritime, du développement rural et des eaux et forêts</i>)
M&E	Monitoring and Evaluation
MENA	Middle East and North Africa
MEF	Ministry of Economy and Finance (<i>Ministère de l'Économie et des finances</i>)
NPV	Net Present Value
ONCA	National Agency for Agricultural Advisory Services (<i>Office national du conseil agricole</i>)
ONSSA	National Office for Health Security of Food Products (<i>Office national de sécurité sanitaire des produits alimentaires</i>)
PAD	Project Appraisal Document
PAM	Medicinal and Aromatic Plants (<i>Plantes aromatiques et médicinales</i>)
PDO	Project Development Objective
PICCPMV	Project Integrating Climate Change in the implementation of the PMV
PIM	Project Implementation Manual
PMV	Green Morocco Plan (<i>Plan Maroc Vert</i>)

RF	Results Framework
SCCF	Special Climate Change Fund
TA	Technical Assistance
ToC	Theory of Change
UV	Processing unit (<i>Unité de valorisation</i>)

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID P129774	Project Name Morocco Social and Integrated Agriculture
Country Morocco	Financing Instrument Investment Project Financing
Original EA Category	Revised EA Category

Organizations

Borrower Kingdom of Morocco	Implementing Agency Agence pour le Developpement Agricole
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Project Development Objective (PDO)

Original PDO

The Project Development Objective is to increase the implementation of land and biodiversity conservation measures in selected projects directed to small farmers located in targeted marginal areas in the project area.



FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
TF-14398	6,440,000	6,440,000	6,323,914
Total	6,440,000	6,440,000	6,323,914
Non-World Bank Financing			
Total	0	0	0
Total Project Cost	6,440,000	6,440,000	6,323,914

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
12-Mar-2013	14-Aug-2013	14-Dec-2015	31-Dec-2017	31-Dec-2018

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
23-Sep-2016	1.39	Change in Results Framework
28-Sep-2017	3.80	Change in Loan Closing Date(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Modest

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	17-May-2013	Satisfactory	Satisfactory	0
02	07-Dec-2013	Satisfactory	Moderately Satisfactory	0
03	07-May-2014	Moderately Satisfactory	Moderately Satisfactory	0



04	19-Nov-2014	Moderately Satisfactory	Moderately Satisfactory	.16
05	17-Apr-2015	Moderately Satisfactory	Moderately Satisfactory	.28
06	16-Oct-2015	Moderately Satisfactory	Moderately Satisfactory	.61
07	25-May-2016	Moderately Satisfactory	Moderately Unsatisfactory	1.04
08	02-Dec-2016	Moderately Unsatisfactory	Moderately Unsatisfactory	1.43
09	27-Apr-2017	Moderately Unsatisfactory	Moderately Satisfactory	2.48
10	16-Aug-2017	Moderately Satisfactory	Moderately Satisfactory	3.67
11	07-Feb-2018	Moderately Satisfactory	Moderately Satisfactory	4.44
12	23-Aug-2018	Moderately Satisfactory	Moderately Satisfactory	5.35
13	27-Dec-2018	Satisfactory	Satisfactory	5.89

SECTORS AND THEMES

Sectors

Major Sector/Sector (%)

Agriculture, Fishing and Forestry 100

Agricultural Extension, Research, and Other Support Activities	50
Fisheries	10
Crops	20
Public Administration - Agriculture, Fishing & Forestry	10
Livestock	10

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

Social Development and Protection 21

Social Inclusion	21
Indigenous People and Ethnic Minorities	7
Other Excluded Groups	7
Participation and Civic Engagement	7



Human Development and Gender	10
Gender	10
Urban and Rural Development	23
Rural Development	23
Land Administration and Management	23
Environment and Natural Resource Management	46
Renewable Natural Resources Asset Management	46
Biodiversity	23
Landscape Management	23

ADM STAFF

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. At the time of approval of the project in 2013, Morocco was implementing the ambitious Plan Maroc Vert (PMV) which aimed to promote market-oriented agricultural growth, doubling sector value added and creating 1.5 million jobs. A key goal was to close the gap between the highly efficient export-oriented commercial farming sector and the lower productivity small farm sector, in which smallholders were farming largely rainfed lands in marginal areas with limited infrastructure and services. PMV support to the smallholder sector was provided under the PMV 'Pillar II' through farmer associations and cooperatives to improve productivity and to link increased output to downstream processing and markets.
2. The PMV Pillar II investment program in smallholder agriculture was designed to help farmers overcome land constraints, access knowledge, technology and finance, and develop processing and marketing. A particular focus was on female participation and entrepreneurship both in mixed associations and cooperatives and in all female ones. The Bank supported the PMV through two DPLs.¹
3. The Government of Morocco (GoM), the Ministry of Agriculture and Maritime Fisheries (MAPM)² and ADA (Agricultural Development Agency), the implementing agency for the PMV, working together with the Bank, identified the need to improve the sustainability of smallholder farming and, in particular, to address the high costs associated with land degradation and loss of biodiversity.³ The PMV offered the opportunity to develop and test conservation approaches linked to the PMV Pillar II investment program.
4. The Social and Integrated Agriculture Project (*Agriculture solidaire et intégrée au Maroc*, 'ASIMA') was developed for GEF financing. ASIMA is part of the MENA-Desert Ecosystems and Livelihoods Program (MENA-DELP), a regional program aimed at enhancing knowledge and sharing experience on ways to improve livelihoods in desert ecosystems sustainably through an ecosystem management approach.
5. ASIMA was the second GEF-financed project supporting the PMV, and built on the lessons of the first - *Integrating Climate Change in the Implementation of PMV Projects* (PICCPMV).⁴ Both ASIMA and PICCPMV were designed to promote innovative measures to be piloted in Pillar II projects and potentially scaled up at the PMV level. Both projects targeted

¹ P116557, the first DPL (\$205 million) in support of the PMV, was presented to the Board on March, 15 2010. P127822, the second DPL (\$204 million) in support of the PMV was presented to the Board on March 26, 2013.

² Later reorganized as Ministry of Agriculture, Maritime Fisheries, Rural Development, Water and Forestry MAPMDREF (*Ministère de l'agriculture, de la pêche maritime, du développement rural et des eaux et forêts*).

³ The issues are analysed in the Bank's Morocco Agricultural Sector Policy Note (2009) and Morocco Agricultural Sector Review (2010), and in the Morocco analysis in the Bank's 2010 Cost of Environmental Degradation – Case studies from the Middle East and North Africa (2010). In 2012, ADA carried out an environmental assessment of the PMV (*Évaluation Environnementale Stratégique du Plan Maroc Vert*, 2012) that highlighted the need to integrate measures to conserve soils and biodiversity in PMV sub-projects.

⁴ P117081. The US\$4.35 million GEF project was presented to the Board on May 17, 2011 and closed in 2015.



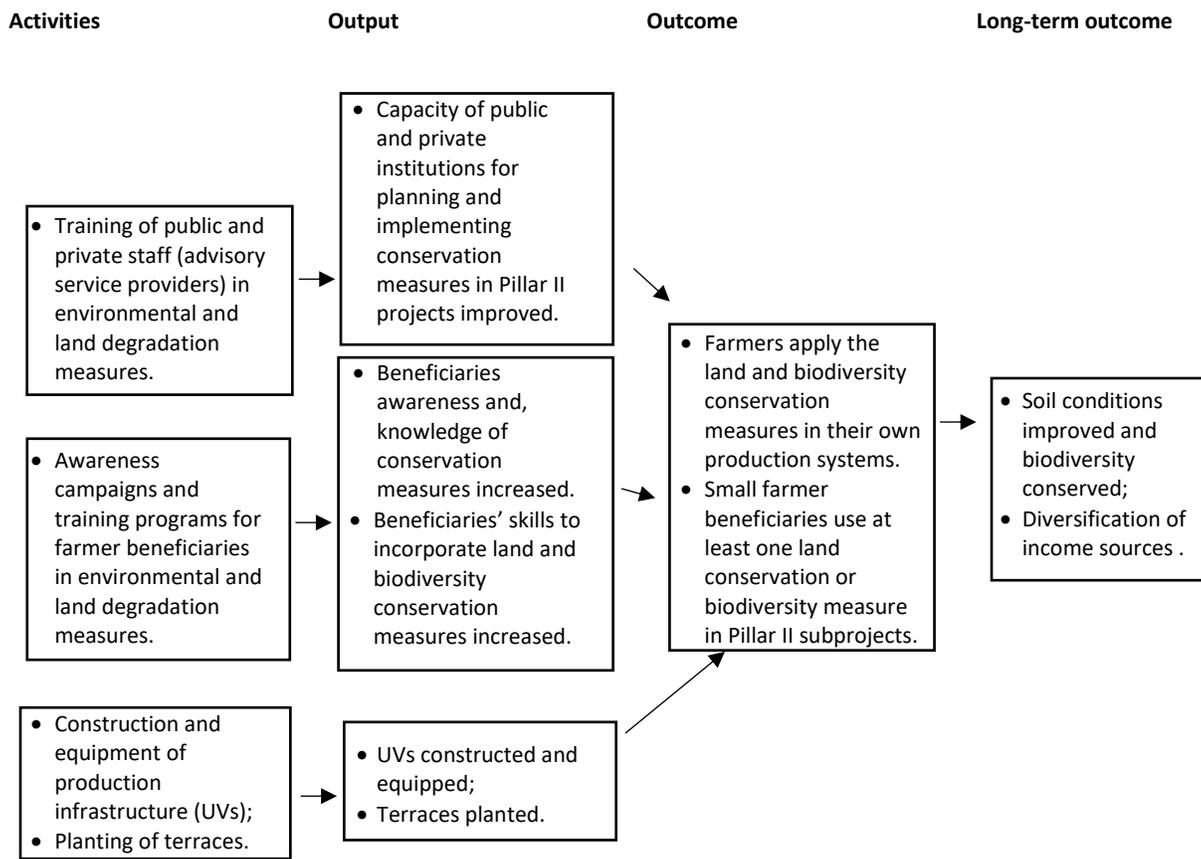
small farmers, who were considered the most vulnerable to the climate change impacts, environmental degradation and biodiversity loss which could jeopardize the potential gains from the PMV.

6. ASIMA was fully aligned with the objectives and priorities of the World Bank’s MENA strategy, supporting the focus areas of sustainable growth, social and economic inclusion, and governance. The project was also fully aligned with the Morocco CPS 2010-2013, particularly the CPS pillar of ‘sustainable development in a changing climate’. The project also contributed to two key objectives of the GEF: the ‘sustainable flow of agro-economic services for local communities’ (Land Degradation Objective 1) and ‘mainstreaming biodiversity conservation and sustainable use’ (Biodiversity Objective 2).

Theory of Change (Results Chain)

7. The logic behind the design of the project - as described in the Project Appraisal Document (PAD) - is illustrated in Figure 1, presenting the links between the activities supported under the main components of the project and the related key outputs, outcomes, and long-term outcomes.

Figure 1: Overview of the Project’s Theory of Change





Project Development Objectives (PDOs)

8. The PDO⁵ of ASIMA as set out in the Grant Agreement was *to increase the implementation of land and biodiversity conservation measures in selected projects directed to small farmers located in targeted marginal areas in the project area*. The 'selected projects' refer to eight Pillar II projects in the PMV which the activities of ASIMA were to support. The project area means the regions of Marrakech-Tensift-Al Haouz and Souss-Massa-Draa.

Key Expected Outcomes and Outcome Indicators

9. Two indicators were set up to assess the achievement of the PDO. The indicator *'the number of direct project beneficiaries'*, a World Bank core sector indicator, was designed to capture the success of the project in promoting the adoption and implementation of conservation measures. This indicator included a separate target for the number of female beneficiaries, designed to capture the gender-differentiated results of the project. The indicator *'the number of successful pilots'* was designed to capture the sustainability and replicability of the piloted measures for land and biodiversity conservation from the perspective of the farmers and public stakeholders.

Components

10. The project was financed by a GEF grant of US\$6.44 million. The GoM contributed US\$35.54 million in financing to eight predefined Pillar II projects for which the ASIMA project developed eight complementary sub-projects. The Project had two components:

11. Component 1: Development of the capacities of public and private institutions on land and biodiversity conservation (US\$1.32 million, or 20 percent of the grant amount). The aim was to develop the capacities of selected staff of public and private institutions involved in the planning and implementation of Pillar II projects on land and biodiversity conservation measures. Activities included: training, study tours and field visits, and studies and dissemination materials. The component also financed project M&E and reporting, and audits. The component was implemented by ADA.

12. Component 2: Transfer of land and biodiversity conservation measures among small farmers (US\$5.12 million, or 80 percent of the grant amount). The aim was to disseminate land and biodiversity conservation measures in eight sub-projects that were developed as complements to eight existing Pillar II projects directed to small farmers located in the two target regions of Souss-Massa-Draa and Marrakech-Tensift-Al Haouz. The criteria for selection of the measures to be piloted were 'proven conservation measures in agri-food chains typical of marginal areas, and with engagement of women' (PAD Annex 2 para 69). Final selection was based on a three month study and on farmer consultations and included: (i) the use of cactus and argan-based livestock feed as a means of reducing pressure on rangeland; (ii) soil enrichment using olive by-products; (iii) methods of protecting soil and water from wastewater produced during olive oil processing; and (iv) ways of conserving biodiversity by sustainable harvesting and adding value to medicinal and aromatic plants and by conservation of the Saharan yellow bee.

⁵ As for all stand-alone GEF operations, the PDO and Global Environmental Objective (GEO) are the same.



13. Each of the eight sub-projects consisted of works and goods for implementing land and biodiversity conservation measures as well as training, field visits, study tours and awareness campaigns for small-scale farmers. Specifically, the sub-projects included major investments in: (i) processing units, called *unités de valorization* or UV, for adding value to primary production by processing (for example, medicinal and aromatic plants) or by fabrication of new or improved products such as animal feed, essential oils, improved wax, new beehive models, and indigenous bees; and (ii) storage basins to protect soil and water from wastewater from olive processing, and composting units to produce compost from pulpy olive residues for soil amendment. As required for Pillar II projects, small farmers were required to be organized in farmer associations or cooperatives. The Ministry of Agriculture (MAPM, later reorganized as MAPMDREF) was the implementing agency through its provincial departments (DPAs) in the project area, with the assistance of ADA.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

14. No changes were made to the PDO.

Revised PDO Indicators

15. In September 2016, the project was restructured and changes were made to the PDO indicators. The indicator *'the number of successful pilot subprojects'* was dropped and replaced by the indicator *'the number of small farmers using at least one biodiversity or soil conservation measure in the sub-projects.'* The target for the other PDO indicator *'the number of direct project beneficiaries'* was changed from 12,000 to 8,500.

Revised Components

16. No changes.

Other Changes

17. In September 2017, the grant closing date was extended by 12 months from December 31, 2017 to December 31, 2018.

Rationale for Changes and Their Implication on the Original Theory of Change

18. The results framework was amended in September 2016 to include clearer indicators, with more realistic targets. The Mid-Term Review of the project concluded that one of the PDO indicators for the Project did not directly measure the PDO because the criteria for what constituted a successful pilot were not clear. The Review recommended that a PDO indicator be developed that would measure the degree to which land and biodiversity conservation measures were adopted by farmers in the target project area. As a result, the original PDO indicator *'the number of successful pilot subprojects'* was replaced by the indicator *'the number of small farmers using at least one biodiversity or soil conservation*



measure in the sub-projects. The target for the other PDO indicator *'the number of direct project beneficiaries'* was corrected from 12,000 to 8,500 because the original number incorrectly referred to all the beneficiaries of the eight Pillar II projects covering 122 rural communes whereas the ASIMA sub-projects covered only 30 rural communes and 8,500 beneficiaries.

19. At the time of the 2016 restructuring, four intermediate results indicators were added that were designed to demonstrate achievement of the second intermediate result *'transfer of land and biodiversity conservation measures among small farmers.'* Two of the four new indicators were output indicators which registered the construction and equipment of the UVs. The third new indicator measured the construction of compost units and wastewater storage for olive by-products. The fourth new indicator measured *'the land area where sustainable land management practices were adopted as a result of the project.'*

20. One intermediate results indicator was dropped (*'the percentage of targeted clients who are members of an association'*) because all sub-project beneficiaries were members of associations, so the indicator was redundant. The target values for other indicators were revised, largely upwards, to take into account the results achieved in the first two years of project implementation. Overall, the changes did not affect the original theory of change.

21. The rationale for the September 2017 extension of the project implementation period by twelve months was to give the necessary time to complete and operationalize the UVs, including the creation of microenterprises for their management.

Do the changes call for a split rating?

22. A split rating is not required as the PDO and project scope were unchanged and the change in indicators reflected a better measurement of the project's achievement rather than a lowering of the project's ambition.

II. OUTCOME

A. RELEVANCE OF PDOs

23. The PDO *'to increase the implementation of land and biodiversity conservation measures in selected projects directed to small farmers located in targeted marginal areas in the project area'* remains highly relevant to Morocco's priorities in agricultural development and to GoM's efforts to reduce environmental and land degradation due to agricultural practices. Morocco is continuing the PMV and is incorporating land and biodiversity conservation into Pillar II projects (see below).

24. At completion, the PDO was in line with the most recent GEF strategy (GEF-7), in particular with the Biodiversity Focal Area: *sustainable use of plant genetic resources* and with the Land Degradation Focal Area: *sustainable land management and restoration of degraded production landscapes*. More specifically, ASIMA targeted GEF-7 objectives in *'climate smart agriculture'*, *'inclusive and resilient territorial development'*, and *'sustainability of resource management'*.



25. The PDO was also consistent with both the World Bank 2019 *Strategy for the MENA Region: Open for Business* and with the World Bank's current CPF. ASIMA was in line with the overall accent in *Open for Business* on sustainable growth and on strengthening resilience in relation to natural resources. The project was also consistent with the *Strategy's* ambitions to support female inclusion and to increase the number of projects with a gender tag. ASIMA was also very much in line with the objectives of the MENA Gender Action Plan (FY18-23) in prioritizing women's economic empowerment, voice and agency. There was a good match with the current CPF, particularly with the 'foundational principle of citizen engagement' and the 'cross-cutting theme of gender inclusivity', and more specifically with Focus C: *promoting inclusive and resilient territorial development*.⁶ The PDO was also in line with the current CPF's support for climate-smart agriculture, and with its cross-cutting theme: *empowering women and girls for shared prosperity*, together with specific focus area (9) 'improve access to sustainable water resources' and (10) 'enhance adaptation to climate change and resilience to natural disasters, adopting effective spatially targeted interventions where they are needed'. ASIMA is singled out in the CPF as an example of 'land management support, piloting innovative approaches to engaging citizens in solving problems in agriculture and to leveraging these entry points into broader sector-wide approaches, and to scaling them up'.

Assessment of Relevance of PDOs and Rating

26. With the alignment of the PDO with GEF objectives and World Bank CPS/CPF at both approval and completion, as well as the PDO's relevance to Morocco's national agricultural policies, the relevance of the PDO is rated **High**.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

27. ASIMA was essentially a pilot project designed with the goal of testing farmer take-up of innovative and potentially replicable models of land and biodiversity conservation and of seeing whether the models could be scaled up and integrated within the large investment program of the PMV. The Theory of Change (Figure 1) sets out the assumptions about how the change of behavior on which the project was based was supposed to come about: (i) that specialized training would create institutional capacity for promoting land and biodiversity conservation in marginal production systems; (ii) that a package of awareness campaigns, structured training and some complementary investment, for example in terracing, would equip small farmers to integrate conservation measures in their production systems; and (iii) that investment in and operation of downstream units (the UVs) for supporting aspects of conservation activity and for processing the product associated with those activities would create sustainable incentives for continuing and expanding the conservation practices.

28. The two outcomes in the Theory of Change largely captured the goal and the assumptions. The first outcome – 'farmers apply the land and biodiversity measures in their own production systems' – concerns farmer take-up. It implicitly asks the question: have the farmers acquired skills in land and biodiversity conservation so that they are able to apply the techniques? This outcome was directly measured by the indicator: *the number of direct project beneficiaries*, defined as all those who benefited from project activities (awareness and training activities as well as from UVs). The

⁶ CPF FY19-FY24, January 18th, 2019 (Report 131039-MA).



target was 12,000 but this was corrected in the 2016 restructuring to 8,500. At completion the actual achievement was 9,416, more than the revised target.⁷ The result demonstrates that the institutional capacity to promote the targeted change in farmer behavior was developed (*assumption (i)*) and that the package of awareness campaigns, structured training and investment equipped the small farmers to integrate conservation measures in their production systems (*assumption (ii)*), with the result that the *goal* of achieving farmer take-up of innovative and potentially replicable models of land and biodiversity conservation was likely to be achieved.

29. The second outcome – ‘small farmer beneficiaries use at least one conservation or biodiversity measure in Pillar 2 subprojects’ – was designed to show whether the conservation measures adopted added economic value that would give incentives to farmers to continue to apply them and that would also justify the Pillar 2 investment in downstream processing facilities. This outcome was measured by the indicator: *the number of small farmers using at least one biodiversity or soil conservation measure in the sub-projects*. At completion, this number was a sub-set of the ‘direct beneficiaries’ and was calculated to include the beneficiaries of the processing units, the beneficiaries of the terraces constructed, and others who were already benefiting from the conservation measures, such as farmers feeding their animals with feed from argan or cactus by-products. While some UVs became only operational in the final stages of the project, the target set for this indicator (2,500) was slightly exceeded at completion (2,526). The result demonstrates that setting up and operating the downstream units (the UVs) is indeed creating incentives for farmers to continue and expand the conservation practices (*assumption (iii)*).

30. The two outcomes as measured by the indicators were thus essentially met, the underlying assumptions on which the project was based were confirmed, and the outcomes contributed to achieving the overall goal of the project. This finding - that farmers within the project are applying the conservation measures and that value is being created from the measures downstream - is supported by the results of the Beneficiary Survey. The satisfaction of small farmers with the techniques demonstrated (74% satisfied or very satisfied, according to the survey) and their satisfaction with the training given in soil and biodiversity conservation (77% satisfied or very satisfied) confirms that most of the farmers are convinced of the measures. The great majority (82%) also said that their skills in biodiversity and soil conservation had been strengthened by the project. The downstream value added is confirmed by the high percentage of farmers who expected to register positive economic impacts, with three quarters (75%) saying their incomes had increased or were likely to increase as a result of the project. A further survey conducted by the research organization INRA on the sub-project at Essaouira which was designed to add value to argan by-products reinforces the findings on downstream value added. The survey found that the product could sell profitably in the area, three quarters of farmers were intending to expand production, and meat produced from animals fed on the by-product was prized by both butchers and consumers (see annex 6.7).

31. ASIMA can thus be said to have achieved its intended outcomes (and its PDO). But to what extent did the project achieve the broader goal of testing whether the models could be scaled up and integrated within the large investment program of the PMV? This goal of piloting conservation measures and having them incorporated in the PMV is apparent from the PAD (PAD paragraph 33). The main gauge of ‘pilot success’ proposed in the PAD is farmer satisfaction. This was in fact positive, as can be seen from the surveys under the project. But beyond that, did ASIMA actually succeed in incorporating conservation measures in the PMV? There is indeed evidence that it is already doing so. A number of new

⁷ This indicator was gender-differentiated and at completion 34% of these farmers were female – above the target of 20%, which had in fact been increased at restructuring from the original 15% targeted.



investments are underway or planned, drawing on the model of ASIMA. The most important of these is the PMV Argan Project, financed by the Green Climate Fund and implemented by ADA. This \$49 million project on 10,000 hectares in the region of Marrakech/Souss Massa builds on the conservation model of the ASIMA project. Similarly, the smaller ANDZOA Project, which is bringing 2,000 hectares under cultivation of medicinal and aromatic plants, is modelled on ASIMA. In the Agadir region, the provincial department of MAPMDREF is testing the cultivation of medicinal and aromatic plants based on the ASIMA experience, and in the same region farmers have themselves planted 15 hectares of these plants, drawing on training and lessons learned under the ASIMA project.

32. More generally, ASIMA has influenced the design of PMV projects through the systematic inclusion of environmental and gender issues. Encouraged by the successful implementation of ASIMA, the project prioritization criteria that ADA applies for PMV projects now systematically incorporate environmental conservation and gender issues and these provisions have been included in the ADA implementation manuals. Practical examples from recent PMV projects include: the systematic inclusion in all PMV investments in olive processing units of a storage tank for the raw wastewater and a composting facility; and inclusion in animal feed projects of measures on the reduction of pressure on natural resources, notably on pastureland to improve soil conservation.

33. The likelihood that the ASIMA model can be scaled up sustainably is strengthened by the project's contribution to institutionalization of the approach. A rough measure of this is the scope and success of the training programs for staff from public agencies. The original target of 120 was revised upwards at restructuring to 450 and then exceeded at completion (520 staff trained in total). The capacity created amongst public sector staff was an essential part of planning and implementation of the conservation measures under the project and most of the trained staff were directly involved in implementation. Beyond that, however, the knowledge and enthusiasm of the officials interviewed during the ICRR mission was testament to a broader outcome beyond the PDO – the development of interest and capacity in public agencies for conservation and their ability to apply it all across the PMV. This pattern of positive appreciation and ownership is confirmed by the highly positive statements made at the project closing workshop by the sub-project sponsors, the research staff and consultants who had been involved, and by management and line officials of MAPMDREF. The achievements of ASIMA also received widespread favorable coverage in the local media.

34. A rider to this picture of farmer and public sector engagement is the one measure piloted that did not work well. This was training of the private sector where the target was revised down in the 2016 restructuring from 700 trainees to just 50 (this reduced target was met). The logic of the inclusion of the private sector in ASIMA training was that Pillar II projects are designed to create linkages with private investors, traders, and entrepreneurs (*agrégateurs*), in order to integrate small farmers in local markets in a vertical integration of the agri-food chain that is fostered by the public financing of Pillar II projects. In this case, the number of private sector agents who showed interest in the training at the pilot stage was much smaller than expected. From this it can be deduced that the ambition of the project to develop capacity in land and biodiversity conservation was readily met amongst farmers, officials and the general public but that larger scale commercial engagement in the value chain being tested was not to be aroused simply through offering training at the pilot stage. Presumably private sector interest will strengthen once the UVs become fully operational and have begun to show the prospect of profit. This is a valuable lesson appropriate to a pilot project.

35. At completion, the project had thus achieved its intended outcomes: farmers, including many women, were applying the conservation measures and drawing profit from them, the models piloted by the project were being taken



up in the PMV and beyond, and farmers and public servants were engaged and committed to scaling up the conservation activities.

Justification of Overall Efficacy Rating

36. In summary, the PDO indicators, as revised, do measure the achievement of the PDO as it is formulated. The intermediate results contribute to the PDO and the intermediate indicators allow an appreciation of the achievement of the PDO. The key revised targets were met at completion and the survey of farmers registers their positive appreciation of the project, the development of their capacities, and the likely positive economic impacts. Taken together, these results confirm that the project achieved the PDO and make it likely that the longer term outcomes proposed in the Theory of Change (Figure 1) – improved soil conditions and increased biodiversity as well as diversification of income sources – can be obtained as the project model is scaled up. This picture of a project which achieved its PDO is supported by a number of other outcomes which are linked to the project – see above and also *Unintended outcomes and impacts* below. The overall efficacy of the operation is therefore rated **Substantial**.

C. EFFICIENCY

Assessment of Efficiency and Rating

37. The economic impacts of the project were expected to be twofold: the environmental benefits of soil and biodiversity conservation; and the income benefits from investing in several product value chains.

Conservation benefits

38. By making a relatively small investment integrated within much larger Pillar II projects, ASIMA was expected to improve the sustainability of those projects through soil and biodiversity conservation. At appraisal it was expected that ASIMA would invest US\$ 427 per farmer. In the event, ASIMA invested somewhat more - US\$ 544 per farmer, due to the correction of the number of direct project beneficiaries. The area targeted was 170,000 hectares, and ASIMA's actual investment came to US\$ 30/ha. Although no quantification of the overall conservation benefits achieved has been carried out, the techniques in which farmers were trained have a significant positive impact. For example, research conducted under the project found that soil conservation measures promoted under the project reduce soil erosion from as much as 2.0 tons per hectare annually to 0.6 tons or less.⁸ The economic benefits of reduced soil erosion have been found in many studies and projects to be considerable: one typical program in Spain, for example, was found to generate annual benefits of between US\$46 and US\$80 per hectare.⁹ Research under the ASIMA project also demonstrated that soil amendment using olive by-products, the object of two ASIMA sub-projects, would improve both soil texture and soil fertility. In another example, research demonstrated the technical and economic feasibility of raising medicinal and aromatic plants in plantation, with the result that the destructive harvesting of these plants in the wild would be

⁸ See *Projet ASIMA Province Chtouka Ait Baha. Rapport Final Annuel et d'Achevement*. INRA December 2018.

⁹ Source: *The economic benefits of soil erosion control: An application of the contingent valuation method in the Alto Genil basin of southern Spain*. S. Colombo, J. Calatrava-Requena, and N. Hanley. <http://www.jswnonline.org/content/58/6/367.abstract>



reduced.¹⁰ Although the economic benefits of biodiversity conservation were not measured under the project, global research suggests highly positive benefit to cost ratios of up to 100:1.¹¹ The project was not only successful in promoting these conservation techniques within the project area but in leveraging further investment in these techniques outside the project area (see *Other outcomes and impacts* below).

Income benefits

39. Data on projected costs and benefits of five out of ten processing units were collected by INRA and consultants. The data allowed the calculation of Internal Rates of Return (IRR) and Net Present Values (NPV). The analysis (Annex 4) shows a projected average IRR of 33.4 percent across all sub-projects for which data was available. Specifically, the project 'Al Haouz Beekeeping' shows an IRR of 55 percent, the project 'Rhamna Cactus' an IRR of 27 percent, the project 'Essaouira Argan' an IRR of 39 percent, the project 'Agadir PAM' an IRR of 24 percent, and the project 'Tiznit Beekeeping' an IRR of 22 percent.

Efficiency rating

40. Although the project was successfully completed within the revised project period, the delays in project implementation and the late completion of many project investments indicate that administrative efficiency was modest. However, balanced against this is the fact that the project achieved the targeted benefits both on conservation and on income in an efficient way. For the former, the project was not only efficient in promoting conservation techniques within the project area but in leveraging further investment in these techniques outside the project area. The analysis shows a highly satisfactory projected average IRR of 33 percent. All awareness and training programs and UVs were efficiently completed and most UVs were operational at the time of completion. Based on this evidence, efficiency is rated **Substantial**.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

41. The ASIMA project was relevant to the context and to the strategies of both GoM and of the financing partners, the GEF and the World Bank. With the minor exception of two electricity connections now underway and some delays, implementation is complete and the revised PDO indicators have been achieved. Efficiency has been found to be substantial due to conservation and income benefits. The project also leveraged further investment beyond the project. Evidence is that on the ground the land and biodiversity conservation measures are being adopted and scaled up and will prove cost-effective. Based on these positive findings, a rating of **Satisfactory** is appropriate.

¹⁰ INRA *op. cit.*

¹¹ See, for example: *Economic Benefits of Biodiversity*. Conservation Tools.org, Pennsylvania Land Trust Association. https://conservationtools.org/guides/95-economic-benefits-of-biodiversity#heading_7



E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

42. Although the PAD says little about gender issues, it is clear that gender inclusion was an important part of project design. Female inclusion or satisfaction are tracked by four indicators (female percentage of beneficiaries, of small farmers trained, of small farmers satisfied with the project, and of clients satisfied with agricultural and rural advisory services).

43. It is clear from the indicators, all of which were amply met (see Annex 1), as well as from the Satisfaction Survey, that the project had a positive impact on women by increasing their knowledge on land degradation and biodiversity measures through various training activities, and by enabling women to expand their income base and extend their agency and voice through the development and management of newly constructed UVs. A total of 3,150 women either benefited through training activities or through the use of the UVs. These women represent 35% of all direct project beneficiaries. Female participation and training exceeded targets and women (like men) were overwhelmingly satisfied with the project (96%) and with the training (94%).

44. The sponsors of three of the eight Pillar II sub-projects were comprised mainly of women: 'Agadir PAM' (a union of seven cooperatives), 'Essouira Argan' (a GIE); and 'Agadir Olive' (a single cooperative). These projects have brought particularly strong benefits to women. The women involved have voice, in that they proposed the project and participated in preparation. The women have control of assets, having signed a contract with ADA under which the women have taken over management of the UV. The women have agency, running the Board of Directors, and they either run the cooperative which manages the UV or they select and supervise the management.

Institutional Strengthening

45. The project contributed to the strengthening of institutional capacity in the public sector, with 520 officials trained on land and biodiversity conservation measures, and staff from ADA, the regional departments ('DRAs') of MAPMDREF, and the DPAs trained and gaining hands-on experience of project management, including fiduciary and safeguard matters. Sub-project sponsors from the farmer organizations, largely cooperatives, involved in the project also built capacity through training and on-the-job experience. A further valuable result which was facilitated by the project was the official accreditation of the UVs and their products by the regulatory authority, the National Office for Health Security of Food Products (ONSSA).¹²

¹² This included: official recognition of the Tiznit honey 'brand' and of specific honey provenances, including honey from Al Houz; official branding of olive oil from Al Houz; and the recognition of the Agadir aromatic and medicinal plant brands and the Essaouira argan oil brand, both of which are in process.



Poverty Reduction and Shared Prosperity

46. While there is no indicator measuring the impacts of the project on the poor, all project activities were aimed at testing models that linked conservation with increased value added, and project activities were directed to a poor class of farmer - ‘small farmers in targeted marginal areas’. Thus, although no data are available, successful implementation of the project will *a priori* have a poverty reducing impact on the 9,500 small farmers who directly benefited from the project.

Other Unintended Outcomes and Impacts

47. ASIMA has had several broad effects beyond the specified objectives of the project and the results discussed above. First, ASIMA helped ADA qualify for climate financing. The fact that ASIMA had been instrumental in integrating land and biodiversity conservation into the PMV was a material factor in ADA gaining accreditation as an implementing agency for the Green Climate Fund. Second, ASIMA has helped orient GoM policies for agricultural subsidies towards conservation activities. For example, the policy of Morocco’s agricultural development fund, the FDA, now provides subsidy for projects incorporating land and biodiversity conservation measures. One example is the subsidy given to pure race Saharan queen bees. Third, ASIMA has mobilized further financing for PMV Pillar II projects and facilitated complementarity with other projects and donors. For example, in the PMV Pillar II project for olives in Marrakech, the ASIMA example has encouraged complementary investment from IFAD which has financed a bottling plant and olive plantations, promoting both horizontal and vertical integration. In the Tiznit Bees project, INDH is financing the equipment of offices.

48. Learning from ASIMA is already being shared across the MENA region. Beyond the effects of the project within Morocco, there is a wider impact, with the lessons on sustainable land and biodiversity conservation being shared through field visits and workshops under the MENA-DELP program (see Section I A above). This wider dissemination and exchange includes: dissemination to regional partners of the techniques of production and use of soil amendments based on olive oil by-products; introduction in Tunisia and Jordan of Moroccan best practices for cactus planting in drylands, to reduce pressure on rangelands; and spreading of techniques of both sustainable harvesting in the wild and of cultivation of aromatic and medicinal plants and of extraction of oils.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

49. Project design was clear and based on experience and on existing institutional capacity. ASIMA was designed as a complement to eight existing Pillar II projects where ADA was already financing the main project investments. Using a pilot approach, the sub-projects were designed in a way to be both technically innovative and viable for scaling up. The pilot approach chosen clearly aimed at showing the potential of using land and biodiversity conservation practices in these projects and developing models for replication and mainstreaming in the PMV. Building on the implementation lessons from the PICCPMV, where problems had arisen because implementation had been assigned to MAPMDREF’s regional



level, responsibility for the implementation of ASIMA sub-projects followed the normal arrangements for Pillar II projects, a partnership between ADA as financing agency and the provincial departments of MAPMDREF as the implementing agency. Both ADA and MAPMDREF had extensive experience with the implementation of World Bank projects.

50. Project design was built on a relatively well-developed technical basis. For example, the threats to biodiversity related to the Saharan honey bee and to the indigenous plants on which the bee depended, and the relationship between these two elements and sustainable bee-keeping and honey production, had been demonstrated in previous studies and GEF projects. A previous GEF project had also tested and developed sustainable value chains for medicinal plants. There were, however, a number of technical aspects - for example practical approaches to monitoring erosion, the behavior of medicinal plants in cultivation, the use of olive wastes as soil amendments etc. - where knowledge was incomplete, and the project design correctly provided for strong inputs from the national agricultural research agency, INRA.

51. Although the private sector were important stakeholders, the incentives designed to include them were frail. Because the project aimed to establish sustainable models based on new income streams, private sector involvement was prioritized. However, the medium for their involvement was limited to training rather than any role in actual business, for example in promoting or managing the UVs.

52. One open question concerns readiness. The project was thoroughly prepared, yet implementation was very slow off the mark – see below. A critical factor was the assignment of land for the construction of the UVs, which proved arduous and slow.

B. KEY FACTORS DURING IMPLEMENTATION

53. The ASIMA project became effective on time¹³ and implementation followed design with no significant changes. There were, however, delays in implementation which caused disbursements to fall behind schedule and for completion ultimately to be delayed by a year. Instead of project activities being completed by the targeted completion date of December 2017, the investments were completed (with very minor exceptions of two electricity connections) a year later, with the grant closing on December 31st, 2018.

54. The project was restructured twice. Following a mid-term review, the project was restructured in September 2016 to revise the Results Framework (RF). Subsequently, GoM requested an extension of the closing date. In September 2017, the World Bank agreed and extended the closing date from December 31, 2017 to December 31, 2018.

55. Implementation Progress was rated Moderately Unsatisfactory from April 2016 to April 2017 mainly due to the delays in procurement and disbursements and to slow implementation of the contracts for construction of the UVs. Measures agreed at the mid-term review led to accelerated implementation of project activities and an increase in the disbursement rate. As a result, the rating was upgraded to Moderately Satisfactory in April 2017. With the one-year

¹³ The project was approved by the Board on March 12, 2013 and the legal documents were signed on April 16, 2013. All effectiveness conditions were fulfilled on time (disclosure of the Project Implementation Manual (PIM), recruitment of a financial management (FM) specialist, authorization by the Government for the Project Implementing Entity, execution of the Subsidiary Agreement) and the project became effective within 120 days of signature, on August 14, 2013.



extension, the project closed almost fully disbursed (98.2%) at the end of December 2018 and with the planned investments very substantially completed. The factors that influenced this history of delayed but ultimately successful implementation were:

56. Institutional factors of organization and engagement: There was a clear definition of functions and a high level of commitment to the project at all levels, and appropriate leadership was provided by the management of all the agencies involved (ADA, DRA, DPA). ADA and its project unit performed energetically and well, although some delays in procurement and disbursement could have been resolved earlier if ADA had provided more hands-on implementation support to the DPAs. Towards the end of the project, ADA could also have drawn more on its internal experience in agribusiness to help the producer groups to develop workable business plans and marketing strategies.

57. Human resources: ADA and MAPMDREF made significant efforts to assign adequate human resources and basic logistics. By 2016, ADA had assigned four officers to support implementation and the MAPMDREF assigned sixteen staff to monitor the technical, fiduciary, and environmental and social aspects. The selection of high quality technical assistance and consultants, notably the three large contracts with the national agricultural research agency, INRA, gave strong support to the technical aspects of implementation.

58. Procurement, budgeting and disbursement: The major factor in project delay was the process of budgeting, procurement and disbursement, each of which initially proved challenging. The delay was mainly due to an incomplete mastery of procurement and financial management procedures for World Bank projects by the local teams. Although both ADA at the central level and the DPAs at the decentralized level had previous experience of implementing World Bank-financed projects, some staff assigned to the ASIMA project had little exposure to previous projects. This was a risk identified at appraisal, to be mitigated by tailored training and the preparation of guidelines in the Project Implementation Manual. The Bank did in fact invest considerable effort in training and hands-on guidance, beginning with an intensive procurement training in September 2013. However, this proved inadequate, and as delays began to emerge, the project team was reinforced, further hands on support was provided by the Bank, and procurement plans and thresholds were revised. To reduce the lag in disbursements, a task force comprising the Ministry of Finance, the World Bank, ADA and MAPMDREF developed guidelines and an action plan to speed up disbursement.

59. Land issues: The contribution of the farmer associations to the sub-projects was typically in the form of land, but often it took time to get this land legally assigned. This was a major factor in the delays, as procurement could not start before the land was assigned, and subsequently the environment and social assessments took longer than expected and procurement also faced some delays. All these factors explain the delays in Project implementation.



IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

60. The Project followed a clearly structured theory of change, as described in Figure 1. The first PDO indicator – *the number of direct project beneficiaries* – was clear. The project beneficiaries were plainly identified as those already benefiting from the eight Pillar II projects to which ASIMA would provide the complement of additional land and biodiversity conservation measures. Beneficiaries would receive material support in implementing land and biodiversity conservation measures, and capacity building in the form of awareness and training activities. While measuring only an output, this indicator was chosen for corporate requirement purposes.

61. The original second indicator was *the number of successful pilots*. The notion of ‘pilot’ did not form part of the PDO, although the PAD does make clear that ‘ASIMA will use a pilot approach to incorporate land and biodiversity conservation measures in Pillar II projects.....and will aim to finance land and biodiversity conservation measures that, if successful, are viable to scale up.’ However, attempts to establish a baseline and to measure progress against this indicator proved difficult. The Mid-Term Review found that it was unclear what constituted successful pilots and recommended a more direct measure of adoption of land and biodiversity conservation measures. Bank management agreed and at the 2016 restructuring a new indicator measuring *the number of farmers using conservation measures* and, hence, showing behavioral change among farmers was substituted.

M&E Implementation

62. M&E was integrated into the overall M&E system of Pillar II projects in order to avoid duplicating systems. The M&E function provided systematic management information on project implementation activities, procurement and disbursement, and provided the basis for the regular project reports which were well prepared.

63. The second, more evaluative, component of the M&E system was to be ‘the proper M&E of the piloted measures and institutional support’.¹⁴ A baseline survey was to be carried out to allow the subsequent tracking and evaluation of the pilot results. Questionnaires were prepared but the project had difficulty in achieving the necessary clarity and objectivity. As a result, this component of M&E was not implemented, and eventually it became redundant because Bank management decided to change the relevant PDO indicator.

M&E Utilization

64. The M&E function provided good information that allowed the progress of implementation to be tracked. This informed management and supported decision-taking on implementation. The M&E of the ‘pilot’ aspects of the project was dropped for the reasons discussed above.

¹⁴ PAD para 33



Justification of Overall Rating of Quality of M&E

65. The M&E system as designed and implemented was sufficient to track and manage project implementation and to permit assessment of the achievement of project objectives as measured by the revised indicators. However, the M&E system did not track the pilot aspect of the project. M&E quality overall is therefore rated **Modest**.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

Environmental safeguards

66. ASIMA was expected to have significant positive environmental impacts. Because the project involved interventions in the environment it was rated B and an ESIAF was prepared. This provided for the preparation of ESIAFs for sub-projects related to olive and argan processing, and for simple EMPs to be prepared for sub-projects for cactus, red meat, bee keeping, and medicinal and aromatic plants, and for any construction activity. The required ESIAFs and EMPs were properly prepared, although with some delay, and mitigation measures were included in the tender documents. Compliance with environmental safeguards was closely monitored through supervision by the DPAs. Only slight inconsistencies in compliance arose, as it was found that during the construction of the UVs some minor safety measures were not complied with. An environmental safeguard specialist was closely monitoring the construction sites, and these inconsistencies were quickly detected and remedied.

Social safeguards

67. Although no social safeguard was triggered, the project successfully addressed a number of social issues. Adopting a consultative and participatory approach, the project brought in marginalized groups and strengthened their economic capacity and institutions. The project also ensured female inclusion across all project activities (see Section II E above). A grievance redress mechanism, recommended at mid-term review, was established in early 2016 in all the five concerned Provincial Agricultural Directorates, training was given and performance was closely monitored by the Bank team, which included a social safeguards specialist. No complaint was received.

Financial Management

68. Moderate risks were assessed at appraisal, to be mitigated by capacity building and recruitment. The required mitigation measures were carried out. Fiduciary aspects were satisfactory throughout and reporting was of acceptable quality, although with some delays. Interim Unaudited Financial Reports were made available in a timely manner and audit reports were submitted regularly with only slight delays. The audit reports were acceptable to the Bank, and comments by the auditors were addressed in a timely manner.

69. Commitments and disbursements were slow at the outset due to delays in both procurement and payments to contractors. With the support of the Bank, a task force which included representatives from key partners (ADA, the Financial Directorate in the Ministry of Agriculture, and Budget Directorate in the Ministry of Finance, and the World Bank) was set up to monitor project activities and solve delays in disbursements. This task force elaborated a road map



and met almost weekly to iron out issues. This speeded up disbursements, and no further issues arose. This approach was presented as a good practice during the Morocco portfolio review.

Procurement

70. Procurement risk was assessed at appraisal as moderate, and training and close supervision were to mitigate any risks. The Bank provided considerable training from the outset. However, considerable delays were encountered, due to a combination of technical issues – particularly the identification of the required land and confirmation of titles - and of relative inexperience of the procurement teams. At the time of the mid-term review at the end of 2016, many tenders still remained to be launched, particularly under Component 2. The Bank then worked intensively with ADA to accelerate procurement processing and to revise the payment calendar to systematically include advance payments and to accelerate the processing of invoices from contractors and suppliers. These corrective actions ensured that implementation was completed and the grant fully disbursed, with a single extension of the closing date of twelve months.

71. No cases of misprocurement were found and no complaints from contractors or other stakeholders were received.

C. BANK PERFORMANCE

Quality at Entry

72. This was a thoroughly prepared project with a clear vision of how to achieve development impact by testing activities on a small scale with a view to scaling them up within the massive nationwide PMV program. The design was well-aligned with government, Bank and GEF strategies, was well targeted to marginal communities, and had a commendable gender focus. The technical basis of design was solidly grounded in research and experience (see *Key features during preparation* above). The linking of income incentives to conservation was well thought through – for example, profitable honey and wax production linked back to biodiversity of the Saharan honey bee and to conservation of its habitat. Safeguards and fiduciary arrangements were adequately prepared and mitigation for the risks involved was incorporated. Implementation arrangements were based on previous successful project experience and were adapted to reflect lessons from that experience.

73. Some aspects of preparation reflected the difficulty of gauging in advance all the likely negative and positive results of an innovating project. On the one hand, the interest of the private sector at this pilot stage in the training offered proved to have been over-estimated. On the other hand, the considerable and quite weighty list of positive ‘other outcomes and impacts’ (see Section II above) could not have been anticipated at appraisal.

74. In preparation, there was clearly a ‘pilot’ ambition. The expectation was that the project would test about eight examples of ways to improve soil and biodiversity conservation for scaling up in the larger PMV investment program. However, this aspiration was not explicit in the PDO. A more modest objective was thought appropriate to an innovative project where the larger result could not be assured. In the event the project did achieve the larger ambition, but the prudent approach at the time of preparation was appropriate, given the fact that this larger outcome could not be guaranteed.



75. Quality at entry was overall sound. Subsequent delays in implementation resulted largely from delays in the assignment of land to several sub-projects. These delays could not have been foreseen during preparation as they arose from specific local conditions, and the selection of land for the construction of the UVs could not have been done prior to the start of the project.

Quality of Supervision

76. The Bank allocated significant resources to the supervision of this small project on the rationale that it was piloting measures that could have a very significant impact when scaled up. This focus on development impact was maintained throughout supervision and is reflected in the frank and detailed reporting in the lengthy aide memoires and well-presented ISRs. All relevant technical competences were mobilized for supervision missions, and supervision of safeguard and fiduciary aspects was well conducted and fully documented.

77. Supervision was initially led from Washington in coordination with Rabat. The key problem at the outset was the slow start of implementation, despite the thoroughgoing institutional and technical preparations. To some extent this was due to the nature of the project – decentralized, dispersed, with multiple small activities in far-flung marginal areas. This challenge had been to an extent anticipated in design. The Bank supervision during the first three years provided support on procurement and financial management. However, the slow assignment of land for project construction led to delays in implementation which then translated into delays in disbursements.

78. Supervision responsibility was transferred to Rabat and efforts to bring implementation up to speed were intensified, with frequent, well-structured interventions, on-the-job coaching, and regular visits to project locations, together with the organization of task forces and working groups to unblock specific problems. The involvement of the Ministry of Finance in the disbursement task force (see above) brought an unusually high level of engagement from that key agency. This approach proved to be appropriate to the conditions and led directly to the successful completion of implementation with nearly full disbursement after a twelve month delay.

79. The mid-term review in 2016 triggered a restructuring, with change of indicators etc. The rationale for dropping the indicator regarding ‘successful pilots’ was that the word ‘pilot’ is not mentioned in the PDO and therefore analytically an indicator mentioning ‘pilot’ was not appropriate. The Bank and the project had, in any case, been unable to develop a means of drawing a baseline and tracking progress on what was to be piloted, and the mid-term review found a lack of clarity in the definition of ‘success’. The proposal to drop the indicator was thus correct, although ironically the project did in fact largely achieve the pilot ambition.

Justification of Overall Rating of Bank Performance

80. Quality at entry was sound. Initial implementation flagged, delaying disbursements, and ratings of project performance in ISRs were only ‘Moderately Satisfactory’ for much of the project implementation period (and ‘Moderately Unsatisfactory’ in two ISRs for a period in 2016/2017). From 2014, it was recognized that the implementation of multiple innovative activities in remote areas required frequent, hands-on support from the Bank and supervision responsibility was transferred to Rabat. Overall, energy and effectiveness characterize Bank supervision performance which resulted in satisfactory completion with a twelve month delay. Bank teams remained highly focused on development impact



throughout, the quality and frankness of reporting was consistently high, and supervision made sound provision for the transition from project development to operations. Overall, shortcomings were minor and Bank performance is therefore rated **Satisfactory**.

D. RISK TO DEVELOPMENT OUTCOME

81. There is a risk that the subproject units – the UVs – will face management issues as not all sub-project sponsors have experience in this kind of operation. At completion, these units were in the early stage of their operation and their future viability was not assured. Management arrangements were not in place for all UVs and several were dependent on subsidized technical assistance but the follow-on arrangements were unclear.

82. The mitigation of this risk lies in continued follow-up and support. This is provided for under the PMV, and the responsible DPAs are fully aware of the need and of how to handle it. However, the risk remains and managing the risk is vital to the sustainability of project achievements.

83. There is a linked risk that small farmers might not continue to practice improved production techniques that conserve land and biodiversity. The essence of the project was to change the behavior of small farmers and to demonstrate the links between sustainable management of soil and biodiversity and farmer livelihoods. If the UVs prove viable (see the risk above), the prospects are good as all farmers are organized in cooperatives and other groupings and have direct links to the downstream processing outlet. There is nonetheless the risk, identified at appraisal, that long-term preservation of the environment may remain a subsidiary concern to short term livelihood preoccupations. The mitigation of this risk lies both in the success of the downstream processing operation and the livelihood incentives to conservation that it creates, and in follow up extension and guidance from the DPAs.

V. LESSONS AND RECOMMENDATIONS

Project specific lessons and recommendations

84. A significant blockage to early implementation was the delay in assignment of land. In any future operation of this kind, land might, if at all possible, be clearly identified and available before effectiveness, and commitment on land might be an eligibility criterion for sub-project sponsors.

85. The success and sustainability of the sub-projects depends on their commercial viability. In this and similar operations, attention could be paid at the outset to the likely profitability of these sub-project activities and to the best way to develop commercial models of management.

86. As the sub-projects are getting under way, there is a strong case for close follow up and support both to the processing units and to the application and generalization of the conservation techniques, as well as to monitoring of these activities and their results for at least two years. A further report by GoM on outcomes may be appropriate at that time.



Technical lessons

87. The principal technical lessons of the project are that ‘conservation can be profitable to farmers’, and that a conjunction of sound conservation techniques in farming with technical support and downstream processing and marketing can provide incentives to sustainability of conservation measures. The specific technical farming practices include: (i) the use of cactus and argan-based livestock feed as a means of reducing pressure on rangeland; (ii) soil enrichment using olive by-products; (iii) methods of protecting soil and water from wastewater produced during olive oil processing; and (iv) ways of conserving biodiversity by sustainable harvesting and adding value to medicinal and aromatic plants and by conservation of the Saharan yellow bee. The specific sources of downstream value added include: processing and marketing of medicinal and aromatic plants; fabrication of new or improved products such as animal feed, essential oils, improved wax, new beehive models, and indigenous bees; storage basins to protect soil and water from wastewater from olive processing; and composting units to produce compost from pulpy olive residues for soil amendment.

Lessons of more general application

88. If a project is clearly of a pilot nature, and whether it is labelled ‘pilot’ or not, it is advisable to define clear criteria for success, to monitor them against a baseline, and to conduct an evaluation once complete.

89. If – as is often or usually likely - a project of a pilot nature nears completion without being able to demonstrate and evaluate the full results of the piloted activities, a clear institutional mechanism may be devised to allow continued follow up and evaluation of those results and reporting on them, even if it takes several years.

90. In a project that intends to engage with the private sector, it is advisable to base the approach on a realistic assessment of the incentives for the private sector to participate, particularly where the model is at a pilot stage.

91. Where issues of conservation in small farmer production systems arise within large scale national programs like Morocco’s PMV, a small pilot project financed by the GEF is an appropriate way to raise awareness on land and biodiversity conservation measures and test sustainable approaches for scaling up. Where this project is designed and implemented within a larger learning framework, as ASIMA was within the MENA-Desert Ecosystems and Livelihoods Program (MENA-DELP) this can raise the sharing of the knowledge generated to regional or global levels.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Increase the implementation of land and biodiversity conservation measures in selected projects

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00	12000.00	8500.00	9416.00
		01-Jul-2013	31-Dec-2017	31-Dec-2017	31-Dec-2018
Female beneficiaries	Percentage	0.00	15.00	20.00	34.00
			30-Jun-2018		

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Small farmers using at least one biodiversity or soil conservation measure in the sub-projects	Number	0.00	2500.00		2526.00
		01-Jul-2013	31-Dec-2017		31-Dec-2018



Comments (achievements against targets):

A.2 Intermediate Results Indicators

Component: C1: Development of the capacities of public and private institutions on land and biodiversity conser

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of staff from public institutions trained on the integration of land and biodiversity conservation measures	Number	0.00	120.00	450.00	520.00
		01-Jul-2013	31-Dec-2017	31-Dec-2017	31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of staff from private institutions trained on the integration of land and biodiversity conservation measures	Number	0.00	700.00	50.00	50.00
		01-Jul-2013	31-Dec-2017	31-Dec-2017	31-Dec-2018

Comments (achievements against targets):

Component: C2: Transfer of land and biodiversity conservation measures among small farmers



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of small farmers trained on the integration of land and biodiversity conservation measures	Number	0.00	4000.00	1200.00	3021.00
		01-Jul-2013	31-Dec-2017	31-Dec-2017	31-Dec-2018
Of which share of women	Percentage	0.00	15.00	20.00	41.00
			30-Jun-2018		
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Small farmers who are satisfied of the project	Percentage	0.00	70.00		96.00
		01-Jul-2013	31-Dec-2017		31-Dec-2018
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Targeted clients satisfied with agricultural services (percentage)	Percentage	0.00	70.00		94.00
		01-Jul-2013	31-Dec-2017		31-Dec-2018

**Comments (achievements against targets):**

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Valorization units of oliveâs sub-product constructed	Number	0.00 01-Jul-2013	2.00 31-Dec-2017		7.00 20-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Land area where sustainable land mgt. practices were adopted as a result of proj	Hectare(Ha)	0.00 01-Jul-2013	180.00 31-Dec-2017		180.00 31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Bee hive manufacturing unit constructed	Number	0.00 01-Jul-2013	5.00 31-Dec-2017		5.00 31-Dec-2018

Comments (achievements against targets):



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Animal feed production units from agriculture by-products (cactus and argan) constructed and equipped	Number	0.00	4.00		2.00
		01-Jul-2013	31-Dec-2017		31-Dec-2018
Comments (achievements against targets):					



B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1 Development of the capacities of public and private institutions on land and biodiversity conservation	
Intermediate Results Indicators	<ol style="list-style-type: none"> 1. Staff from public institutions trained on the integration of land and biodiversity conservation measures 2. Staff from private institutions trained on the integration of land and biodiversity conservation measures
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> 1. 520 Staff from public institutions trained 2. 50 Staff from private institutions trained
Objective/Outcome 2 Transfer of land and biodiversity conservation measures among small farmers	
Outcome Indicators	<ol style="list-style-type: none"> 1. Number of direct project beneficiaries 2. Number of small farmers using at least one biodiversity or soil conservation measure in the sub-projects
Intermediate Results Indicators	<ol style="list-style-type: none"> 1. Number of small farmers trained on the integration of land and biodiversity conservation measures 2. Small farmers who are satisfied with the project 3. Targeted clients satisfied with agricultural and rural advisory services 4. Targeted clients who are members of an association 5. Olive value added units constructed 6. Land area where sustainable land management practices were adopted as a result of the project 7. Beehive manufacturing units constructed 8. Animal feed production units from agriculture by-products (cactus and argan) constructed and equipped
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	<ol style="list-style-type: none"> 1. 3,021 small farmers trained 2. 9,416 small farmers in total direct project beneficiaries 3. 2,526 small farmers adopting biodiversity or soil conservation measures 4. 7 olive value added units constructed 5. Sustainable land management practices adopted on 180 ha 6.. 5 beehive manufacturing units constructed 7. 2 animal feed production units constructed and equipped 4.



C. ACHIEVEMENT OF INTERMEDIATE RESULTS INDICATORS

1. Performance against the intermediate results confirms the results discussed in the Outcome section of the ICRR (Section II). The first intermediate result – ‘development of the capacities of public and private institutions on land and biodiversity conservation’ – was measured by the number of staff from public institutions trained. The original target of 120 was revised upwards at restructuring to 450 and then exceeded at completion (520 staff trained in total). This intermediate result forms part of the PDO in the sense that training of public sector staff is an essential part of planning and implementation of the conservation measures under the project and most of the trained staff were directly involved in implementation.
2. It also confirms a broader outcome beyond the PDO – the development of interest and capacity in public agencies for conservation and their ability to apply it all across the PMV. The training indirectly contributes to the increase in the use of land conservation and biodiversity measures by small farmer beneficiaries in other Pillar II subprojects beyond ASIMA, as public sector officials can support farmers in the use of these measures using the knowledge acquired. That this was the case is confirmed by the provision and adoption of these measures in other public investments – see Section E below.
3. This successful performance was balanced against a disappointment on the second indicator ‘staff from private institutions trained’, where the target was revised down in the 2016 restructuring from 700 to just 50 (this reduced target was met). From this it can be deduced that the ambition of the project to develop capacity in land and biodiversity conservation was readily met in the public sector but that interest in these public goods from the private sector was not likely to be aroused simply through offering training. This is a valuable lesson appropriate to a pilot project.
4. The second of the two intermediate results – ‘transfer of land and biodiversity conservation measures among small farmers’ - is integral to the PDO (the PDO could not have been achieved without it) and the indicators directly contribute to assessment of the project’s achievement of the PDO. This result is measured by three sets of output indicators – number of farmers trained, number of processing units constructed within the sub-projects, and the area where sustainable land management practices were adopted (see the table below). The latter two sets of indicators were added at the 2016 restructuring. At the same time the target for farmers trained was reduced to 1,200, with the final result (3,021) reaching 76% of the original target (4,000). This intermediate result is also measured by two indicators of beneficiary satisfaction: satisfaction with the project, and satisfaction with agricultural and rural advisory services. The table below shows that the targets, as revised, were achieved, in some cases by a considerable margin. In total, 14 UVs were constructed against a target of 11, with some rebalancing – more olive oil units, fewer animal feed units. The UVs are complete and operational, except for two where power supply will only be connected by June 2019.

**Table 1: Intermediate result 2 - Transfer of land and biodiversity conservation measures among small farmers**

Indicator	Original target	Target at restructuring	Actual at completion
Number of small farmers trained on the integration of land and biodiversity conservation measures	4,000	1,200	3,021
Of whom female	15%	20%	41%
Olive value added units constructed		2	7
Beehive manufacturing units constructed		5	5
Animal feed production units from agriculture by-products (cactus and argan) constructed and equipped		4	4 ¹⁵
Land area where sustainable land management practices were adopted as a result of the project		180 ha	180 ha
Small farmers who are satisfied with the project	70%	70%	96%
Targeted clients who are satisfied with agricultural and rural advisory services	70%	70%	90%

¹⁵ At project closing on December 31, 2018 two animal feed production units (Rhamna cactus) were finalized and two further animal feed production units (Essaouria argan) were waiting for the equipment to be delivered. By May 31, 2019, the equipment has been delivered and the production units are complete.

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Gabriella Izzi	Task Team Leader(s)
Mohamed Medouar	Senior Rural Development Specialist
Michelle Battat	Economist
Andrew Losos	Environmental Specialist
Concepcion del Castillo	Social Development Specialist
Lamyae Hanafi Benzakour	Financial Management Specialist
Laila Moudden	Operations Assistant
Abdoulaye Keita	Senior Procurement Specialist
Jean-Charles de Daruvar	Legal Counsel
Maya Abi Karam	Counsel
Hassine Hedda	Finance Officer
Marie A.F. How Yew Kin	Language Program Assistant
Supervision/ICR	
Mohamed Medouar	Task Team Leader(s)
Abdoulaye Keita	Procurement Specialist(s)
Laila Moudden	Financial Management Specialist
Markus Friedrich Vorpahl	Social Specialist
Mohamed Khatouri	Team Member
Fatou Fall	Social Specialist
Soumia Driouch	Team Member
Andrew Michael Losos	Team Member
Mohamed Adnene Bezzaouia	Environmental Specialist
Asma Ben Abdallah	Team Member



B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY12	2.175	11,980.84
FY13	15.144	77,407.51
FY14	1.675	4,611.09
Total	18.99	93,999.44
Supervision/ICR		
FY14	10.922	40,870.93
FY15	16.312	82,505.09
FY16	7.600	35,232.74
FY17	12.650	53,901.26
FY18	10.675	47,259.95
FY19	2.575	14,543.69
Total	60.73	274,313.66



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$M)	Actual at Project Closing (US\$M)	Percentage of Approval (US\$M)
Component 1: Development of the capacities of public and private institutions on land and biodiversity conservation	1.32	1.32	100%
Component 2: Transfer of land and biodiversity conservation measures among small farmers	5.12	5.12	98%
Total	6.44	6.44	98%



ANNEX 4. EFFICIENCY ANALYSIS

1. **Scope of analysis.** The analysis focuses on two areas: (i) incremental cost analysis; and (ii) Cost-Benefit Analysis (CBA) including the calculation of IRRs and NPVs for specific sub-projects.
2. Due to data limitations, the CBA was conducted for a subset of sub-projects only. In specific, the CBA was conducted for 5 out of 10 sub-projects, which represents a good sample in terms of the different types of UVs covered.
3. **Source of data.** The MAPMDREF commissioned business plans to different private consulting companies, which collected data from the sub-project sites and partly conducted data analysis. INRA, as part of its agreements in the cactus and argan sub-projects also prepared business plans, which included a CBA.

Incremental cost analysis

4. As envisioned, eight ASIMA sub-projects benefitted from the GEF grant allocated to Component 2. While 12,000 small farmers benefitted from the selected eight Pillar II projects, 9,416 small-scale farmers benefitted from the corresponding ASIMA sub-projects.
5. At appraisal an investment of the GEF grant of US\$ 427 per direct ASIMA beneficiary was expected. As the number of beneficiaries was corrected from 12,000 to 9,416, the investment of the GEF grant per project beneficiary reached US\$ 544. In the two target regions, 1,382,756 hectares of land are under diversified production and subject to land degradation. The ASIMA targeted land degradation by promoting the sustainability of the vegetative cover in the argan, cactus, and olive agri-food chains for at least 12% (or 169,510 hectares) of this land. This corresponds to an investment of the GEF grant of approximately US\$ 30 per hectare.
6. The GEF allocation by sub-project and the GoM investment for each corresponding Pillar II project is presented in Table 2.

Table 2: GoM investment by Pillar II project and GEF investment for each corresponding ASIMA sub-project (US\$ Mn)

DPA	Pillar II Project	Amount at approval (USD)		Amount at project closing (USD)	
		GoM investment	GEF investment	GoM investment	GEF investment
Marrakech	Development of olive agri-food chain in the piedmont zone	4.1	0.2	3.70	0.32
Rhamna	Development of beekeeping agri-food chain the Al Haouz province	4.8	0.3	3.69	0.53
Rhamna	Intensification of and increasing value-added to the Sardi lamb of Rhamna	19.8	0.7	22.47	0.81
Marrakech	Planting of cactus on 30,000 ha	0.4	0.4		
Essaouira	Project to support the emergence, development, and good governance of argan cooperatives in the Essaouira province	2.2	0.9	2.02	0.73
Agadir	Extension and rehabilitation of and increasing value-added to the olive agri-food chain in Ait Baha	0.6	0.4	2.58	0.76
Agadir	Increasing value-added to medicinal and aromatic plants value chain	2.8	0.6	0.39	0.19
Tiznit	Intensification of honey production through the modernization of beekeeping	0.4	0.4	0.48	1.1
				35.33	4.44

Cost Benefit Analysis

7. The independent consulting companies and INRA collected data from 5 sub-projects at the end of the project and made assumptions about prices expected and quantities sold, which allowed for the calculation of NPVs and IRRs. While the analysis has been conducted for a subset of sub-projects only, it depicts a good sample as at least one UV of each category was evaluated. The analysis shows that the average IRR across all sub-projects is 33.4%.

8. **Project 'Al Haouz Beekeeping'**. Using data provided for a five-year period and an interest rate of 10%, the calculated NPV is 11,784,632 DH and the IRR is 55%.

9. **Project 'Rhamna Cactus'**. Using data provided for a five-year period and an interest of 10%, the calculated NPV is 2,529,014 DH and the IRR is 27%. Due to a cactus disease outbreak in 2018 the processing unit is currently facing problems to acquire raw material. Yet, alternatives, such as the waste from tomatoes or apples, can equally be used for animal feed production and can allow for this unit to be adopted to circumstances.



10. **Project 'Essaouira Argan'**. For a time period of 10 year and a discount rate of 8%, the NPV of the project is 19,332,222 DH and the IRR is 39%.

11. **Project 'Agadir PAM'**. The CBA for the PAM project takes into account data for a ten-year time period. The calculation shows that the PAM sub-project unit depicts an IRR of 24% and a benefit-cost ratio of 2.18.

12. **Project 'Tiznit Beekeeping'**. Based on a Feasibility Study prepared for the bee project in Tiznit, the IRR is 22%, with a payback period of the investment of 5 years and 2 months. The NPV calculated for a 10-year time period and an interest rate of 6% is KDHS 18.870,04, while it is KDHS 10,090.6 for an interest rate of 10%, and KDHS 7,211.47 for an interest rate of 12%.



ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

The ICR was shared with ADA on May 27, 2019. ADA endorsed the report on June 6 and didn't have any particular comment.



ANNEX 6. SUPPORTING INFORMATION AND DOCUMENTS

6.1 Project components

The project was composed of two components.

Component 1: Development of the capacities of public and private institutions on land and biodiversity conservation (US\$1.21 million, or 19 percent of grant amount)

13. The component aimed to develop the capacities of selected staff of public and private institutions involved in the planning and implementation of Pillar II projects, to integrate land and biodiversity conservation measures in projects directed to small farmers located in marginal areas.

14. Activities to be financed included: (i) training, field visits, and study tours (domestic and international); (ii) studies and dissemination materials; (iii) awareness campaigns; (iv) Monitoring and Evaluation (M&E) and reporting; and (v) audits.

15. Training, field visits, and study tours, studies and dissemination materials and awareness campaigns concerned the integration of the land and biodiversity conservation measures in the PMV, building on the results and lessons learned from the sub-projects under Component 2.

16. Capacity building specifically concerned the risks and potential of by-products in agriculture, the use of by-products as animal feed, and the biodiversity conservation role of specific agri-food chains, in addition to training on transversal themes like gender awareness and sensitization. Importance will be given to international exchanges, also in relation to the information sharing activities carried out under the MENA-DELP regional program.

Component 2: Transfer of land and biodiversity conservation measures among small farmers (US\$5.23 million, or 81 percent of grant amount)

17. Component 2 aimed to disseminate land and biodiversity conservation measures in selected projects directed to small farmers located in the two target regions of Souss-Massa-Draa and Marrakech-Tensift-Al Haouz. Eight ASIMA sub-projects were identified

18. For each of these sub-projects, activities to be financed included: (i) works and goods for implementing land and biodiversity conservation measures; (ii) training, field visits, and study tours; (iii) awareness campaigns; and (iv) Monitoring and Evaluation (M&E).

19. The land and biodiversity conservation measures were to be integrated in existing Pillar II projects in the targeted marginal areas of Souss-Massa-Draa and Marrakech-Tensift-Al Haouz regions, for which a corresponding ASIMA sub-project was to be designed to complement the PMV investment. Small farmers, already beneficiaries of Pillar II projects each focusing on an agri-food chain typical of marginal areas, were also to benefit from the integration of conservation measures.

6.2 Training under the project

Table 3: Training under Component 1

Theme	Number of training sessions	Number of training days	Total beneficiaries	Of whom, women
World Bank procedures	3	6	87	33
Environmental and social safeguards I	3	6	49	30
Soil and biodiversity conservation I	3	20	46	20
Environmental and social safeguards II	3	6	53	29
Grievance redress mechanisms	1	2	7	4
Soil and biodiversity conservation II	3	20	41	13
Soil and biodiversity conservation III	3	20	48	14
Environmental and social safeguards III	3	6	47	21
TOTAL	22	86	378	164



Table 4: Training under Component 2

	Target audience and topics	Number of training sessions	Total farmers trained	Of whom, women
DPA Marrakech	Olive farmers <i>Development of the olive industry in the piedmont of al Haouz</i>	20	633	150
	Bee keepers <i>Development of the honey industry in the piedmont of al Haouz</i>	14	176	No information
DPA Rhamna	Cactus farmers <i>Adding value to cactus</i>	14	176	30
	Cactus farmers <i>Research findings</i>	17	255	40
DPA Essaouira	Argan farmers <i>Adding value to argan fruits</i>	9	122	99
	Argan farmers <i>Research findings</i>	2	40	No information
DPA Agadir	Olive farmers <i>Development of the olive industry in Ait Baha</i>	3	80	49
	Olive farmers & Farmers of medicinal and aromatic plants <i>Research findings</i>	25	855	601
	Farmers of medicinal and aromatic plants <i>Adding value to medicinal and aromatic plants</i>	3	87	70
DPA Tiznit	Bee keepers <i>Development of the honey industry in Tiznit</i>	53	209	Nil



6.3 Overview of sub-projects (unités de valorization or UVs)

Table 5 – Overview of UVs

Expansion of olive agri-food chain in the piedmont zone
DRA: Marrakesh-Tensift-Al Haouz
DPA: Marrakech
Reference: Al Haouz Olive
<i>Covering 8 communes and 2,000 ha, with 710 beneficiaries and a total investment of DH 34.8 million. 2 UVs, 3 accumulation basin and 2 compost bins.</i>
<p>The UV produces compost by using by-products from olive oil production (pulpy residues and wastewater) which would have been left unused and resulted directly in environmental degradation. The use of the byproducts for compost production attenuates negative environmental effects directly as the pomace or pulpy residue is not thrown on the fields and the wastewater does not pollute groundwater. The product is used and sold by the cooperative members, hence, it results in lower input costs and additional income for cooperative members.</p>
Development of beekeeping agri-food chain in the Al Haouz province
DRA: Marrakesh-Tensift-Al Haouz
DPA: Marrakech
Reference: Al Haouz Beekeeping
<i>Covering 4 communes, with 710 beneficiaries and 2,000 hives and a total investment of DH 34.7 million. 1 site, 2 UVs for production of wax, processing of honey and fabrication of bee hives.</i>
<p>The UV promotes honey and wax production. The UV indirectly attenuates negative environmental effects by creating economic incentives for pure race bees and for habitat conservation. The beekeeper benefits from having access to high quality machinery, which will increase the quality of wax produced.</p> <p>The UV fabricates bee hives. The UV indirectly attenuates negative environmental effects by creating incentives for conservation and sustainable production. The bee farmers benefit from having access to high quality and affordable beehives, which will increase their productivity and, hence, their income.</p>
Planting of cactus on 30,000 ha
DRA: Marrakesh-Tensift-Al Haouz
DPA: Rhamna
Reference: Rhamna Cactus
<i>Covering 21 communes, with 54,000 beneficiaries and 150,000 head and a total investment of DH 41.0 million. 2 sites, 2 UVs</i>
<p>The UV processes animal feed produced from cactus byproducts. The project attenuates negative environmental effects indirectly in another value chain (animal), by using products from the cactus value chain to produce animal feed, which will result in a reduction of animal overgrazing. Hence, negative environmental effects in another value chain are attenuated. The product will be used and sold by the cooperative members, which will result in lower input cost and higher income.</p>



Project to support the emergence, development, and good governance of argan cooperatives in the Essaouira province
DRA: Marrakesh-Tensift-Al Haouz
DPA: Essaouira
Reference: Essaouira Argan
<i>Covering 4 communes, with 40 female cooperatives and their members as beneficiaries, and a total investment of DH 19.0 million. 2 site, 2 UVs</i>
The UV was designed to produce and sell animal feed produced from argan byproducts. The project attenuates negative environmental effects indirectly in another value chain (animal), by using products from the argan value chain to produce animal feed, which results in a reduction of animal overgrazing and less land degradation. The product will be used and sold by the cooperative members, which will result in lower input costs and higher income.

Extension and rehabilitation of and increasing value-added to the olive agri-food chain in Ait Baha
DRA: Souss-Massa-Draa
DPA: Agadir
Reference: Agadir Olive
<i>Covering 5 communes, with 1,200 beneficiaries on 1,600 ha and a total investment of DH 24.2 million. 1 site, 1 UV, 1 accumulation basin, 1 compost bin</i>
The UV produces compost by using byproducts from olive oil production (pulpy residues and wastewater) which would have been left unused and resulted directly in environmental degradation. The use of the byproducts for compost production attenuates negative environmental effects directly as the pomace or pulpy residue is not thrown on the fields and the wastewater does not pollute groundwater. The product is used and sold by the cooperative members, hence, it results in lower production input costs and additional income for cooperative members.

Increasing value-added to medicinal and aromatic plants value chain in Chtouka
DRA: Souss-Massa-Draa
DPA: Agadir
Reference: Agadir PAM
<i>Covering 11 communes, with 550 beneficiaries and a total investment of DH 3.7 million. 1 site, 1 UV, 1 accumulation basin, 1 compost bin</i>
The UV was designed to produce numerous new products (oils) depending on the plants used. The UV supports sustainable conservation harvesting practices which attenuate negative environmental effects on biodiversity and enable value-addition and therefore results in higher income of cooperative members.



Intensification of honey production through the modernization of beekeeping
DRA: Souss-Massa-Draa
DPA: Tiznit
Reference: Tiznit Beekeeping
<i>Covering 17 communes, with 200 beneficiaries and a total investment of DH 4.5 million. 1 site, 3 UV: processing of honey and wax, production bee hives, artificial insemination</i>
<p>The valorization unit produces honey and wax. The beekeepers benefit from having access to high quality machinery, which increases the quality of wax produced and, hence, the income of beekeepers.</p> <p>The UV produces bee hives. The bee farmers benefit from having access to high quality and affordable beehives, which will increase their productivity and, hence, their income.</p> <p>The UV allows for artificial insemination of the yellow bee. The UV indirectly adds to biodiversity as it aims at protecting the yellow bee. As the yellow bee is more productive, the product results in higher productivity of beekeepers and will increase their income.</p>



6.4 ASIMA and MENA-DELP

20. ASIMA aimed to contribute to increasing the sustainability of the agricultural sector in Morocco. In setting a precedent through the integration of land and biodiversity conservation measures in Pillar II Projects in marginal regions of Morocco, ASIMA aimed at facilitating the future integration of these measures in PMV projects throughout the country. Two manuals that outline the procedures regarding the financing, preparation, submission, and implementation of Pillar II projects now include environmental-related and conservation selection criteria and monitoring.

21. As one of the country-level projects within the MENA-DELP, ASIMA offers concrete examples on how to harness the value of priority agri-food chains in an environmentally and socially sustainable way and thereby promote sustainable agricultural growth. Successful stories were shared with the other countries under the MENA-DELP umbrella.

6.5 The effect of ASIMA sub-projects on land degradation and biodiversity conservation

22. The ASIMA sub-projects focused on six agri-food value chains: olives, cactus, argan, red meat, bee keeping, and Medicinal and Aromatic Plants (MAPs). These value chains are expanded under the PMV. The expansion of these agri-food chains, while contributing to agriculture value-added and farmers' income, poses various degrees of risks for the environment. By-products generated during oil extraction are a threat for groundwater, and thus land conservation. Livestock can induce overgrazing of rangelands, which can be exacerbated by droughts. Excessive pressure on the harvest of wild MAPs can result in loss of biodiversity. Modern techniques for honey production can discourage the use of local races of bees up to their extinction.

23. Nevertheless, sustainable intensification of these agri-food chains can also have important positive environmental implications. Planting of olive trees in marginal areas can reduce the risk of soil erosion, similarly to cactus which can be planted in even more extreme environments. The argan trees can shade the ground, reducing evaporation, and facilitating the growth of vegetation. Cultivation of traditional MAPs can reduce pressure on natural environments, while conserving the germplasm and ensuring livelihood. Increased honey production thanks also to the introduction of transhumance can facilitate pollination of natural and cultivated plants.

24. By mitigating the negative and reinforcing the positive impacts, the ASIMA project aimed to increase the long-term sustainability of the PMV. The table below shows an extract of the direct and indirect effects of the measures implemented on land and biodiversity conservation. The table takes into consideration the horizontal integration among agri-food chains in the ASIMA project, which will allow for the by-products of one value chain to be used in another value chain.

Table 6: The effect of ASIMA sub-projects on land degradation and biodiversity conservation

Value chain/Interaction	Soil conservation		Protection of biodiversity	
	Direct	Indirect	Direct	Indirect
Olive	Soil and water protected	Soil amendment Development of microecosystem of plants	None	Conservation of associated ecosystems
Argan	None	Less pressure on pasture rangeland	None	Conservation of associated ecosystems
Aromatic and medicinal plants	None	Conservation of grass cover and existing shrubs	Domestication of diverse aromatic and medicinal plants	Conservation of associated ecosystems
Cactus	None	Less pressure on pasture rangeland	None	Conservation of associated ecosystems
Bee	None	None	Protection of the local race 'yellow bee'	Conservation of associated ecosystems
Red meat	None	Less pressure on pasture rangeland	Protection of the local race 'Sardi'	Conservation of associated ecosystems



6.6 Case studies: Effect on land and biodiversity conservation

Project 'Agadir Olive'

25. The objectives of the sub-project were to use the by-products from olive oil extraction to produce compost for organic fertilization of olive trees and other plants. INRA was involved in choosing the location of the compost unit and the dimension of the compost and basin units, the training of farmers on compost production and organic fertilization, the demonstration of compost and organic fertilization in olive plantations, and the elaboration of guides on the treatment of by-products of pressing.

26. INRA conducted scientific analysis on the environmental risks avoided and the positive effects of fertilizer application on soil content. They estimate that the risk of environmental pollution due to olive mill wastewater of 4500 to 6000m³ per year can be avoided, as it is used for compost production. Furthermore, INRA conducted treatment analysis by applying the fertilizer to olive plantations and taking measures both before and then 4 months and 8 months after the application. Their results show that the physicochemical content of the soil improved substantially. Specifically, they estimate that the UV allows for a production of high value compost between 2460 and 3360 tons per year for the region. The consequent use of the fertilizer is estimated to result in increased carbon sequestration (107,19Mg C/ha/an) and improved soil organic matter (1,08 to 2,4 percent MO total).

Project 'Essaouira Argan'

27. The objectives of the sub-project were to develop animal feed based on argan by-products. INRA conducted a diagnostic study, proposed building plans and equipment of the UV, conducted awareness campaigns and training for farmers on good practices of herding and optimization of animal feed based on argan by-products, conducted trials on the animal feed produced and the effect on smell and taste of meat.

28. The traditional practices of goat fattening involve full-day goat herding in the argan forests and are therefore labor intensive. The new practice recommended by INRA envisages that animals are fed in the stable using animal feed based on argan by-products, which would be less labor intensive. This would also reduce the pressure of herds on grasslands for 2 ½-3 months per year. Alternatively, INRA suggests a mixed approach, which foresees goats to be on the rangeland for approximately 2-3 hours per day and the rest of the time in the stable, which would still substantially reduce the pressure on grasslands.

6.7 Presentation of survey results

Satisfaction survey conducted by MAPMDREF

29. A satisfaction survey was implemented by an independent consulting firm with a sample of direct project beneficiaries of Component 2. In total, 171 beneficiaries were interviewed, of which 123 were men and 48 were women (see the table). As 2,526 farmers benefited directly from Component 2, the sample drawn represents 6.8% of all sub-project beneficiaries.

Table 7: Number of beneficiaries interviewed by sub-project

Project	total	men, %	women, %	men	women
Al Haouz Olive	24	100	0	24	0
Al Haouz Beekeeping	36	100	0	36	0
Rhamna Sardi lamb and cactus	26	100	0	26	0
Essaouira Argan	34	12	88	4	30
Agadir Olive	11	9	91	1	10
Agadir PAM	8	0	100	0	8
Tiznit Beekeeping	32	100	0	32	0
Total	171			123	48

30. The goal of the survey was to understand the appreciation and satisfaction of the project beneficiaries with the interventions and measures from which they benefited. The survey focused on the overall degree of satisfaction, appreciation of various activities, evaluation of the impact of the activities on land and biodiversity conservation and income of small and medium farmers.

31. Approximately 96% of direct project beneficiaries expressed satisfaction with the project as well as with its immediate and future impacts. Concerning the construction of the UVs, the survey shows that 67% were satisfied or very satisfied with the timing of the construction, while 8% were not satisfied. Overall, 80% were satisfied or very satisfied with the quality of equipment and 88% with the quality of construction.

32. The survey shows a high satisfaction with respect to duration, timing, content and organization of training sessions, study tours, field visits, and information days. Specifically, the quality of content was rated satisfactory or highly satisfactory by 94% of training session participants, 100% of study tour participants, 97% of field visit participants, and 98% of information days participants.

33. The technical assistance was equally well received. The survey shows that participants were satisfied or very satisfied with the fattening trials (90%), design and supervision of the construction of the UVs (88%), maintenance of equipment (89%), information days (95%), trainings (97%), and audio-visual material prepared (92%).

34. The survey shows that the economic, social and environmental impacts of the sub-projects are considered to be substantial by the beneficiaries. The majority of respondents indicate that they believe that the project will have a medium to very high impact on product quality (81%), income (75%), valorization of products (81%) and revenue (76%). Furthermore, 70% of the survey respondents indicate that they expect a medium to very high effect on the autonomy



of women. 86% of survey respondents indicate that they believe that ASIMA had a medium to very high impact on their competences regarding land and biodiversity conservation. In addition, 83% indicate that the project has a medium to very high effect on their acquisition of skills and on their adoption of better practices regarding land and biodiversity conservation.

Satisfaction surveys conducted by INRA

Project 'Essaouira Argan'

35. INRA interviewed 126 people, which included consumers, butchers, breeders, and cooperative members which benefited from the argan project in Essaouira. The results show that all argan cooperatives prefer to sell their by-products to the UVs in the region and 73% wish to expand their production in this regard. Supply seems to be sufficient as 47% of the cooperatives are capable of selling approximately 5 tons/year of argan residues and 40% can sell between 5 to 10 tons of argan residues.

36. Furthermore, 60% of the breeders in the region are aware of the existence of the UVs installed. Of the surveyed breeders who participated in fattening tests using argan by-products, 80% are satisfied with the learning experience. 90% of the interviewees have already used the animal feed and say that the effect on meat production (90%) is higher than on milk production (50%). The majority of the surveyed breeders (90%) stated that they consider the animal feed based on argan by-products as cost-effective for livestock production.



6.8 Supporting documents

Etude relative à la réalisation d'une enquête sur le degré de satisfaction des bénéficiaires. SIS Consultants. Rabat, 2019

Open for Business: Middle East and North Africa Regional Update 2019

Restructuring Paper on a Proposed Project Restructuring of Morocco Social and Integrated Agriculture, approved on March 12, 2013 to the Kingdom of Morocco

Assessment of Results and M&E of Operations, Morocco and Tunisia Portfolio (Reviewed by Mohamed Khatouri and Cristina Ling, October 2015)

Rapport Final Assistance Technique Province Chtouka Ait Baha. INRA, Rabat, December 2018