

SYNTHESIS REPORT

Contract N°APP/2012/PP10/QCBS/ME-16-lot 1

FINAL EVALUATION OF MCA-MOROCCO COMPACT PROJECTS

Final Evaluation of the Fruit Tree Productivity Project (PAF)

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Analytical Summary

I. Objectives, Aim and Assessment Methodology

Objectives. This report presents the results of the final evaluation for the Fruit Tree Productivity Project (PAF, MCC- Morocco Compact, 2007). Four specific objectives are targeted by this evaluation: *I)* evaluating the performance of the PAF through an analysis of its relevance, consistency, effectiveness, efficiency and sustainability, *II)* measuring perceptible results at the end of the compact, including the effects and impact, both positive and negative, awaited or not awaited at the level of all stakeholders, *III)* analyzing the level of implementation of the recommendations of the Fruit Tree Productivity Project mid-term evaluation to see whether they have affected the project performance, and *iv)* making recommendations for strengthening the project results and teachings and key lessons to build upon when designing and implementing future similar projects. The temporal scope of the final evaluation mission focuses on the implementation period of the Fruit Tree Productivity Project, running from September 2008 through September 2013.

Purpose of the Evaluation. The Fruit Tree Productivity Project (PAF) is part of the program which had been granted financial support from the Millennium Challenge Account (MCC-Morocco Compact, 2007) in 2007. It has set itself an overall target of improving economic growth in the agricultural sector and reducing its volatility, through transformation from cropping of cereals to more productive tree crops (olives, almonds, figs and dates) in mountain and oasis areas both in non-irrigated and irrigated lands. Planned to last five years (2008-2012), the Fruit Tree Productivity Project focused on five main activities: I) Rain-fed Olive, Almond and Fig Tree expansion and intensification; II) Olive Tree Irrigation and Intensification in small- and medium-sized irrigated perimeters called PMH (Petites et Moyennes Hydrauliques); III) Date Tree Irrigation and Intensification in oasis areas; iv) Fruit Tree Sector Services; v) Catalyst Fund. On the organizational level, the Agency of partnership for progress (APP), which was responsible for the implementation of the whole Compact-Morocco, delegated responsibility for the day to day implementation of the PAF to the Ministry of agriculture and maritime fishing (MAPM).

Evaluation Methodology. The final evaluation mission of PAF was organized in four phases. The first preparation step was devoted respectively to an analysis of the available documentation on the project, to carrying out preliminary interviews with the stakeholders and to visiting a few intervention sites. The second *design* stage of the evaluation approach aimed at formulating the key evaluation issues, developing the assessment tools and data collection protocols as well as defining the organizational methods for the conduct of the evaluation mission. The third field phase dedicated to primary data collection at the level of the sampled perimeters and the realization of surveys, interviews and focus groups with the various beneficiary groups concerned. Lastly, the fourth phase was devoted *to data*

compilation, processing and analysis for each project activity. The evaluation approach used for all PAF activities, except for the rain-fed olive tree rehabilitation sub-activity, combined the qualitative assessment methods (focus group and interviews) and the quantitative assessment methods (indicator updating and performance criteria analysis). The results from the experimental randomized approach (random choice of treatment and control perimeters) using the method of double differences, have been integrated into the final evaluation of PAF.

II. Evaluation of PAF's Performance

II.a. Relevance

Relevance of initial design and the intervention approach of PAF. The targets set by PAF were perfectly in line with the sectorial strategies and policies aimed at reducing poverty and improving the living conditions of rural populations. They were specifically relevant to Morocco's new agricultural development strategy - the Morocco Green Plan, in particular as regards the goal of sustainable and inclusive agriculture development. The project was also relevant in its territorial-based participatory and inclusive approach (rain-fed, PMH, oasis areas) and the integration of the upstream and downstream target fruit tree sectors (plants, production, harvesting, post-harvesting), by systematically taking into account the environmental, social and gender dimensions. The targeting of areas, beneficiaries, professional organizations, de-concentrated state technical services, government institutions, private companies and local associative networks also provided it with good relevance. However, the initial design of the Fruit Tree Productivity Project had not sufficiently anticipated and taken into account the negative externalities of the imbalances which the implementation of the perimeters of new plantings would create on the agro-pastoral territories where breeding is a vital activity for their populations. The “fruit tree plantings - extensive breeding” conflicts of interest and their consequences have seriously flawed the relevance of the targets set by PAF and its implementation in certain areas.

Relevance of the targets set by PAF to the needs of beneficiaries. In all agricultural areas targeted by the project, the levels of poverty are high because of several structural constraints and issues (great vulnerability to weather conditions, limited economic resources and alternatives, inefficient production practices, very low valorization of production, inadequately organized professional groupings and sectors, low and unstable income levels, etc.). In this context, the project objectives of strengthening and diversifying the productive capacities of these regions, of creating a new economic dynamism, especially for unemployed young sons and daughters, and of holding out hope that further developments could result in a stable and better situation, were perfectly in line with the concerns and expectations of the target farmers. The actions for fruit tree orchard expansion, rehabilitation and intensification (olive, almond, fig and date trees), hydro-agricultural development work, technical

support services (training, mentoring and technical assistance), date tree tuft cleaning, offshoot recovery and in-vitro plant distribution operations, development of socio-economic and decision-making skills and capabilities of beneficiary women, implementation of women's projects, Catalyst Fund initiative and research-action platforms were very well received by a large proportion of farmers and their professional organizations and were subsequently deemed relevant, useful and very beneficial to address their concerns and meet their expectations. However, in certain areas where the actual needs of local populations are considered to be more of a socio-economic nature, mainly related to the need for infrastructure, equipment and basic social services, the objectives of the Fruit Tree Productivity Project have not been convincing enough as an alternative likely to reduce poverty. This perception resulted in the emergence, in certain areas, of sometimes antagonistic behaviors within the communities of the target perimeters and territories, which have weighed on the efficient implementation of the project and on its performance.

Compliance of the objectives of PAF with agricultural policy. The good indicator of project compliance with the country's agricultural policy lies in the use of its approach and intervention tools in the current design of Green Morocco Plan (PMV). Indeed, the Fruit Tree Productivity Project is viewed as one of the founding matrices of the Green Morocco Plan's consistency insofar as the latter also revolves around three types of projects: reconversion projects, intensification projects and diversification projects. By adopting the sector approach, integrating the upstream and downstream, by building the technical, managerial and organizational capacities of beneficiaries, the Fruit Tree Productivity Project is perfectly in line with the developments in the agricultural policy. Similarly, by integrating the GIE component and the Catalyst Fund, the project has also well anticipated Green Morocco Plan's vision to promote self-aggregation in rural areas.

Taking into account those considerations, the project relevance was felt to be good.

II.b. Consistency

Internal Consistency

Interlinking and complementarity between the activities of PAF. According to the intervention logic of the Fruit Tree Productivity Project, its four main activities are perfectly articulated and consistent with the objectives set and outcomes targeted. In the three areas of intervention (Bour, PMH, Oasis), activities were articulated around two complementary lines of intervention: the strengthening, diversification and sustainable management of local productive capacities (orchard expansion, intensification and rehabilitation in Bour areas, hydro-agricultural development in PMH and oasis areas, valorization and marketing equipment) and individual and organizational capacity-building for players along the various links of the value chain in the target sectors (training, mentoring and technical assistance). The indicators of good internal consistency for the Fruit Tree Productivity Project are the development of “upstream-downstream” integrated activities, systematic integration of

environmental dimension, transversality and gendarization of the technical support service provision (upstream-downstream) and targeting of all links in the value chain of the target sectors.

Consistency of the resources mobilized with the objectives set. Originally, PAF had set itself overambitious objectives with respect to the financial and human resources allocated, and in view of the time horizon and a complex reality in the field. The indicators of this disconnect are the multiple revisions and rescopings made throughout project implementation: downward revision of those areas to be planted in rain-fed zones, upward revision of developments in irrigated areas (PMH and Oasis), downward revision of in-vitro plant provision and transplanting, upward revision of date tree offshoot distribution, downward revision of palm tree tuft cleaning operations. However, one might also interpret these revisions/rescopings as evidence of efforts to improve the coherence of the project's intervention, given beneficiaries' complaints and the needs for adaptation during the implementation of PAF. Furthermore, the introduction of the Catalyst Fund Initiative, which had not been envisioned in the initial design of PAF in 2011, aimed at strengthening the “Valorization of Production” component, has undoubtedly provided substantial complementarity between the project activities and improved its overall consistency.

Coherence of technical support services with the objectives set. PAF counted on training, mentoring and technical assistance to contribute to increased productivity and improved quality and commercial value of production. However, this assumption has proven very strong and implies risks for the project targets. This is an even greater risk since the very reason why these beneficiaries were targeted by the Fruit Tree Productivity project is precisely their economic indigence and the poverty they endure. In several areas, the adoption of the good practices recommended by the Fruit Tree Productivity Project has been hampered by the farmers' financial constraints to gain access to inputs and finance the recommended work.

Consistency of implementation approaches with the objectives set. PAF's design proposed the adoption of highly relevant approaches: regionalization of interventions, participation of beneficiaries, integration of upstream and downstream targeted sectors, integration of environmental, social and gender dimensions, outsourcing-contractualisation. Admittedly, these approaches are consistent with the targets set by the project, but the fact remains that their implementation posed many challenges, according to the stakeholders' perception-support and field realities. A few indicators of possible inconsistencies in the implementation approaches of the Fruit Tree Productivity project can be illustrated by the following findings: i) the participation according to PAF was reduced to the beneficiaries' support to a preconceived program for its implementation, ii) the regionalization of the approach was developed in the face of the standardization of feasibility studies, the systematic application of the same criteria of eligibility at all perimeters, the standardization of training modules and other technical support services, etc., the iii) the outsourcing challenge was faced with the inability

issues of service provision and contracting companies (limitations in financial and material resources) to carry out the services agreed upon under the expected deadline, cost and quality conditions.

External consistency

Conformity with the national strategic orientations. By aiming to contribute to economic growth and poverty reduction, PAF is in principle in line with the priority targets of all national and sector-level strategies and policies. The targets it has set for itself are perfectly in line with the efforts made by the public authorities with a view to improving incomes and reducing poverty among the agricultural populations, in particular rural populations. And the uniqueness of PAF for having integrated the “Valorization and marketing” component has given this consistency an even more significant scope. Similarly, the concepts developed (self-aggregation) and approach adopted (sector approach) testify to a similarity between the approach of PAF and that of the PMV, in particular as regards Pillar II. At an operational level, the inclusion of the implementation process of PAF's activities within a sustainable fruit tree development perspective (EES, PGE, CES, good practice guides, etc.) is perfectly in line with the efforts made by the public authorities with respect to natural resource and environmental protection, especially in vulnerable mountain and oasis ecosystems.

The question of territorial anchoring and institutional support. The strategic orientation of PAF is certainly a relevant lever for contributing to local development and the poverty reduction. However, this strategic orientation of the project could have not sufficiently integrated the local dynamics and locally adopted choices in territorial development. The scope of PAF's activities and their structuring potentials of local economies, was in principle to rely on a territorial anchoring and broader institutional support by encouraging greater involvement of territorial authorities and civil society. The same applies for PAF's activities which were to further align themselves with the Communal Development Plans and Local Human Development Initiatives. The involvement of community councils and associational networks of the targeted territories would have created useful synergies for the successful execution of the project and above all, strengthened its social acceptance.

All of these considerations provide the project with good internal consistency, but a lesser magnitude for external consistency.

II.c. Effectiveness

In terms of the attainment of expected results, PAF registered generally very positive efficiency levels, yet variable according to the activities carried out and areas targeted. Good efficiency has been observed in terms of the achievement of the specific objective of *creating the perimeters of high-value fruit trees in rain-fed areas*, materializing through very high rates of physical achievements, given the scope of the planting program and the complexity of its implementation. Indeed, the overall assessment of rain-fed expansion was about 91% compared to the targets set (90.4% for olive-trees and 96.1% for

almond trees). Environmental mainstreaming was effectively achieved since the overall completion rate for WSC work reached 83% for all the perimeters in rain-fed areas. In the same way, the planting maintenance operations covered a total acreage of 66,947 ha for the first maintenance (E1), that is a total coverage rate close to 90% compared to the planted acreage, and later fell between 74% for the second maintenance (E2) and 47% for the third maintenance (E3). These sustained efforts, upon project completion, helped reach rates of definitive perimeter transfer to the beneficiaries of about 51% for olive trees and 48% for almond trees, whose quality of orchard's vegetative state remains broadly acceptable. As regards the rehabilitation of existing orchards in rain-fed areas, the final assessment is also very encouraging and reports on a total rehabilitated acreage of 52,488 ha, or 94% of the target initially planned.

A quite good efficiency was achieved in the objective of *sustainably increased olive tree productivity in the planting and rehabilitation* perimeters. Good indicators of effectiveness have been identified in the hydro-agricultural development work on the one hand, and in the actions for the rehabilitation of existing orchards in PMH and mountain areas on the other hand. Overall, the areas developed focused on the 65 perimeters initially planned, over an area of 33 983 ha. Achievements included developing and rehabilitating 603 km of hydraulic networks and creating 66 hydraulic structures, representing respective rates of 100% compared with the initial targets. Although these achievement rates have recorded substantial levels, there are some areas where technical services on ancillary works are still to be completed. As for the overall plan for the rehabilitation of existing orchards in PMH mountain areas, the assessment is also very positive, as the overall target was exceeded by 22% for all areas and species taken together with respect to the initially intended acreage,. It is the same for the number of perimeters and beneficiaries where achievements exceeded the anticipated levels by respectively 3% and 79%. However, the main shortcoming was an underestimation of the work maintenance component in the after-project, during the initial design.

These same levels of efficiency have been identified in terms of achievement of the target for *increasing date tree productivity in oasis areas*. On the one hand, the achievement rates of hydro-agricultural developments have reached 100% and the total acreage developed was 19,393 ha. These developments involved building 187 km of hydraulic networks and creating 24 hydraulic structures, or 100% with regard to targets. On the other hand, the overall assessment of in-vitro plant operations was a great success in all target areas, insofar as the planned program has been fully carried out (250,967 in-vitro plants distributed). However, the success rate of plantings did not exceed 50%. The same applies for date tree tuft cleaning and offshoot planting operations, since, on the one hand, tuft cleaning has enjoyed strong support from farmers, or a total of 9, 629 beneficiaries, and on the other, offshoot planting reached 295,121 units, or almost 5 times the anticipated 60,000. To these achievements is added the rehabilitated acreage of date trees in oasis areas which involved a total of 15,718 ha.

The project's effectiveness as regards the objective of *supporting the services related to the target fruit tree sectors* was quite limited, especially for the training component. Admittedly, the project has recorded good achievement rates in the training modules, specific to the upstream target sectors, to the benefit, respectively, of women and men farmers, of sons/daughters of farmers and rural youth and of OPA board members (100% and more in mountain areas and between 54% and 105% in oasis areas). However, beneficiary participation rates have failed to meet the targets set. It is the same for the adoption rates of crop husbandry techniques learned in the training courses, which remain well below the objectives initially set. These same trends apply to the training modules, specific to the downstream from production in the target sectors, intended respectively for managers, technicians, collectors and transporters, however with a clear improvement in oasis areas, compared to rain-fed and PMH areas. On the other hand, female participation rates in the various training modules have been very satisfactory overall.

In the area of mentoring and technical support downstream from production, the effectiveness achieved has been very satisfactory overall. For olive and almond tree sectors, a number of 20 GIEs have been set up, or an aggregation rate of 56% compared to the 10,651 total members of existing co-operatives. As for the date sector, the number of GIEs formed reached seven, from 58 co-operatives, two of them being operational. The gender approach has been sufficiently integrated into the process for establishing GIEs, with proportions ranging between 9% and 11%. However, the newly formed GIEs are still in the launch stage, not fully operational and with no experience. Additional support, empowerment, autonomization and good governance should therefore be provided, with a view to forge an effective and dynamic network of GIEs. Lastly, as for the objective to improve production valorization infrastructure and equipment, the project recorded a very mixed effectiveness very mitigated in achieving the expected results. On the one hand, the works to construct and equip the seven date packaging units planned were completed, but only two of them commenced operations upon project completion. In addition, the two programs for the upgrading of the date packaging and olive crushing units displayed modest to average levels of efficiency.

As for the review of support for marketing, the effectiveness in achieving the expected outcomes has been very satisfactory overall. Good indicators were recorded with regard to the participation in both national and international business events (43 participations in various fairs and shows at the national (Meknès, Erfoud) and international (Paris, Berlin, Cologne, Washington) levels were recorded between 2010 and 2013), to the computerization of price information systems support for marketing. An overall very positive balance has been achieved in terms of implementation of female pilot projects (PPF) both in mountain and oasis areas. These good results, however, should not hide the multiple sources of inefficiency which have sullied the implementation of PPFs (cumbersome approach adopted for coaching, low motivation among women to engage in the process, delays in the launching of PPFs,

proliferation of stakeholders and cumbersome procedures, etc.). Lastly, a good efficiency has been observed as regards the objective of *adding value to production through relevant investments in the downstream olive growing sector*. The Catalyst Fund initiative, belatedly decided upon, has generally achieved substantial levels of efficiency. Besides very important organizational achievements (20 GIEs formed), the execution of the CF has led to a significant improvement in the technical capacity of olive crushing through the setting-up of 20 modern units.

In conclusion, taking into account the background data mentioned above, and given the baseline situation in the project's intervention areas, the effectiveness of PAF has been deemed very satisfactory overall.

II.d. Efficiency

At closeout, PAF has managed to spend 99% of the overall budget and to disburse 97% of the amount committed. By activity, these rates remain very positive overall. The commitment and disbursement rates reached respectively 98% and 95% of the allocated budget (US\$ 139,449,268) for the rain-fed expansion and rehabilitation activity. They are also high for the olive orchard irrigation and intensification in PMH areas activity, or respectively 100% and 98% of the allocated budget (US\$ 90,317,370) and for the date tree orchard irrigation and intensification in oasis areas activity, or respectively 97% and 100% of the allocated budget (US\$65,131,375). For the sector-related training, technical support and mentoring services activity, the levels recorded were respectively 99% and 97% of the allocated budget (US\$ 21,988,954). As for the Catalyst Fund initiative, the budget (US\$ 19 million) was fully used. Thus, taking into account the overall physical execution rates recorded for each activity, these financial performances are another indication of project efficiency.

However, the efficiency of certain service provisions (consulting and technical assistance services, services provided by private companies, training and technical support services) was quite modest, which resulted in higher costs for certain sub-activities than those planned initially (costs per hectare of the plantations in certain zones, costs per hectare of hydro-agricultural development work in certain oasis areas, actual cost /trained individual). Several sources of inefficiency were identified, the most important of which resulted either from the operational management of project activities (underestimation of actual needs, timing and programming of activities, lack of a strategy to anticipate the risks of farmers' reluctance and refusal, cumbersome operating methods, delays in the launching and completion of planting work, inadequate human resources for contractor supervision, coordination and communication issues between the various stakeholders), or from the internal capacity of private planting companies (insufficient oversight personnel, under-equipment in material resources, failure in subcontracting monitoring), or from protesters' and non-beneficiaries' behavior, or from the procedures used by the Catalyst Fund (financial package, land constraint for unit establishment, difficulties in

complying with the environmental recommendations, cumbersome procedures for obtaining the construction authorizations, proliferation of stakeholders, GIE operation).

Taking into account the background information above, project efficiency has been deemed satisfactory.

II.e.. Impacts

In view of the nature of the intervention of PAF, centered on fruit growing, the expected impacts have not all been generated yet at the closing date of the project. However, an examination of the outputs achieved reveals significant positive impacts in perspective, especially if the dynamics created by PAF is maintained and consolidated during the after project. At this time, these impacts remain, admittedly, variable from one domain to another, but the ratings from the beneficiaries are overwhelmingly positive and encouraging.

Productivity and fruit tree production. In this field, the first ratings from farmers were, admittedly, positive overall both for the new plantings and for the rehabilitated ones. However, a quantitative assessment of the impacts of the new plantings and of those rehabilitated in rain-fed areas, in terms of productivity and production, has not found any positive result from the program. The main reason lies in the duration of the assessment, which was too short to identify the expected impacts. Indeed, the project's training and support services, the vectors for the desired impacts, were not carried out until 2011 and 2012, when the last survey was conducted at the beginning of 2013. This means that the assessment only focused on one or, at the most, two harvests since the training, and thus, the duration was too short to have an impact.

As regards the rehabilitated orchards in PMH areas, the expected impacts were halfway achieved in 2012-2013, since the 5T/ha target was only 2,66 T/ha. However, this performance should not hide the good appreciation from beneficiaries as to the developments in their olive tree husbandry techniques since project startup: about 1/3 of the entire sample surveyed (half in oasis areas) considers that they have improved. This proportion increases with the farm size: only 27.1% in small farms, against 36.3 % in average and 41.1% in large ones. These ratings remain similar to those from the assessment of the adoption/application of improved crop husbandry techniques by the farmers who had benefited from the project's training.

As regards the impact on date tree productivity in oasis areas, the performance recorded is still at a modest level. While the target provided for an average productivity of 51 Kg/tree by the end of the Compact, it was only 28.8 Kg/tree in the year of project completion; i.e. a performance that is well below that expected by end of the project. However, according to the beneficiaries, the project had appreciable effects on date tree yields. Indeed, 41.4% of the total number of respondents consider that

they are better than those achieved before the project. This assessment which is shared by 36.1% of the small farm category, 51.0% of medium-sized farms and 38.0% of large ones. In equal proportions, they consider that the quality of their date productions has also improved since the advent of the project.

Direct job creation. In addition to the job opportunities created during project implementation, the expected impacts in this field are far from insignificant. On the basis of minimum level of maintenance, or an average of 15 man-days/ha, the planting perimeters in rain-fed areas could indeed generate between 4,000 and 5,000 direct jobs annually. This is very significant, especially in the target areas where the participation rate is low overall. In oasis areas, date tree orchards will in turn offer considerable job opportunities, especially in the medium term with the entry into production of the new plantings. In addition, in the downstream target sectors, the commissioning of the new facilities (date crushing and packaging units) and of female pilot projects (olive, almond, fig and date) would be likely to create considerable dynamism in the local job markets, especially to the benefit of unemployed young boys and girls.

Agricultural revenue and household incomes. Overall, the positive impacts at this level are still at an early stage, though showing variable trends depending on the sector and area. In rain-fed areas, the new olive-tree plantings might reach an average yield of 2 T/ha and on the basis of a selling price of MAD 4 /kg, they might generate an annual receipt of about MAD 10,000 /ha, based on the data collected as part of the focus groups conducted at the level of 15 perimeters. This level of income might be higher among the farmers who have received more than one hectare planted in olive trees as part of the project. Concerning the rehabilitated orchards, the expected impacts on the net receipts and income from olive productions were not confirmed by the quantitative evaluation. Indeed, as mentioned above, the length of time during which the evaluation was conducted, was insufficient for the project impact to be visible. It takes time for some good practices such as pruning, to start improving yields and farmers may only choose to change their behavior in a limited way at the beginning. However, this cannot be regarded as evidence of the failure of the project in terms of increased production and income. Also, the fact that farmers voluntarily choose to “participate” or “not to participate” in the project complicates the analysis and introduces the possibility of selection bias which cannot be completely eliminated by the assessment protocol. Lastly, the precise definition of a “control group” also proved difficult and biased insofar as there may be positive effects even among olive producers who had not taken part in the training, and yet adopted the improved practices through “imitation” of beneficiary farmers.

In PMH areas, the agricultural gross margin calculated for a follow-up sample in 2012-2013, was estimated at some US \$ 4,175, against US \$ 5,143 selected by the project. This result appears very encouraging, since the beneficiaries' overall rating on the effects and impacts was very satisfactory overall. Nearly 40 to 60% of them consider that the project has made a satisfactory contribution to

meeting their needs, nearly 30 to 40% of them believe that their farm income has improved, as has the standard of living of 1/4 to 1/3 of them, against only 10 to 20% for agricultural employment. Among the changes brought about by PAF the hydro-agricultural developments take precedence over all other interventions since about 90% of the total number of respondents ranked them first; 78% being the lowest rating recorded in the large farm category. They are followed by training but for less than 20% only.

In oasis areas, the average gross farm income per farm was estimated at the equivalent of US \$ 5,057, corresponding to a 7% increase in income compared to that estimated when establishing the reference situation (US \$ 4,740) but which remains lower by 13% than the target value at the end of the Compact (US \$ 5,830). Compared to PMH areas, the impact of the project's intervention in oasis areas proves much more convincing. Also, the overall appreciation of beneficiaries on the effects and impacts of the project further confirm the good performance in oasis areas. Nearly 50 to 60% of the date tree growers surveyed expressed their satisfaction with the project's contribution compared to the needs of their households. And for nearly 30 to 40%, the farm income, standard of living and agricultural employment of household members have improved.

Social capital and capacity building. The project also had a positive impact on farmer individual and collective capacity building through training, mentoring and technical support. Also, it has allowed a beginning of structuring for producers and the emergence of a fabric of local co-operatives and economic interest groupings (GIE). Indeed, the sector approach and self-aggregation process have fostered better social and economic integration for traditionally marginalized categories (small farmers, young sons and daughters of farmers and women in particular). Also, the gender approach and female pilot projects (PPF) helped to clearly improve the social and economic status of women. They are now better involved in the new local development dynamics, representing more than 10% of the members of the groupings set up as part of the project. However, the situation of young people has not shown substantial improvement owing to the lack of specific targeting approaches and insertion through economic measures.

Positive externalities and environment. The project has helped generate several positive externalities on the agricultural development of the target areas. The expansion and rehabilitation of olive, almond and date tree orchards, in mountain and oasis areas would be likely to contribute to land security and marginal land valorization, to the strengthening and diversification of local productive capacities and to the creation of a productive capital transferable to future generations. These aspects further consolidate the project performance for the achievement of the specific objective for the mobilization of potential and improvement of the production context in the target areas. As regards environment, the project also generated significant externalities, in particular with regard to water and soil conservation works (WSC), to the shaping of natural landscapes and increase in local tourist attractiveness. However, some

negative externalities need to be internalized during the after-project and which are associated to the risks of increased pressures on water resources, of a probable decline in pastoral livestock receipts and of weakening social cohesion in the planting perimeters (conflicts between stockbreeders and fruit growers).

II.f. Sustainability

The project introduced many innovations focusing respectively on I) large scale operational management of an agricultural development approach in mountain and oasis areas, II) adoption of the sector approach and its integration with the gender approach and strategic environmental assessment, III) adoption of the self-aggregation model and its operationalization through the Catalyst-Fund initiative, iv) testing of technical support outsourcing, and v) introduction of good production practices. However, the project has missed some interesting innovation opportunities especially as regards the project's anchoring in the existing local strategic planning processes (PCD and ILDH).

The strengths in favor of the sustainability of project results and achievements are many. These involve the following:

- Implementing a perimeter transfer strategy that falls within a perspective of farmer empowerment and strengthening of their entrepreneurship powers;
- Creating service provision co-operatives, as the project's contribution to insertion through economic measures for unemployed rural youth;
- Developing training materials and trainer and relay training to promote the management, sharing and generalization of knowledge and good practices;
- Adoption of a Compact closeout Plan to preserve the project's assets and investments and ensure the sustainability of the results to be implemented by MAPM after the Compact.

The consolidation of these sustainability factors will be based on the fulfilment of a number of conditions, in particular the operational capability of the National office of the agricultural council, monitoring of the functioning of valorization units, support for the operational capability of OPAs and GIEs, continuation of research-action activities to benefit from the adoption of the good crop husbandry techniques and support for the self-aggregation process.

III. Lessons Learned and Recommendations

The evaluation of both the performance and impact of PAF pointed to lessons that deserve to be taken into account when designing and implementing similar future programs and projects. With respect to implementation, the limitations of the supply-based approach proved socially costly and often do not meet the regionalization, inclusion and participation principles. Also, the nature of activities to be

carried out should not be disconnected from reality on the ground, and should rather build and capitalize on the existing situation and local knowledge, in particular as regards the preferences and know-how of beneficiaries. Outsourcing, contractualization and partnership are certainly beneficial strategies for the deployment of large-scale activities on the ground, provided that provision is made for appropriate mechanisms and safeguards to ensure quality in the delivery of services. Support through farmer training is essential, but the experience of PAF has shown that the relevance of achievements is not a guarantee that they will be adopted by the beneficiaries, as they still need to have the capacity to do it. In the same way, mass training (for reasons of economies of scale) is not necessarily the most effective option.

Given the importance and scope of project achievements, and considering the stakes and challenges to be met to ensure the sustainability and perenniality of its achievements, the present evaluation proposes three key strategic recommendations which focus respectively on I) securing the productive capital deployed by the project, II) financing the players in the value chain of the target sectors, and III) building the managerial capacities of the players in the value chain of the target sectors.

Preamble

The present report discusses the final evaluation of the "Fruit Tree Productivity Project (PAF)", which is part of the program which had been granted financial support from the Millennium Challenge Account (MCC-Morocco Compact, 2007) in 2007. The overall target of PAF, the central purpose of this evaluation, is to improve economic growth in the agricultural sector and reduce its volatility, through transformation from cropping of cereals through fruit farming development (olive, almond, fig and date trees) in mountain and oasis agro-ecosystems both in rain-fed and irrigated areas.

This evaluation was entrusted to NORC at the University of Chicago, under the terms of Contract N° APP/2012/PP10/QCBS/ME-16-lot 1 signed on May 15, 2013, and conducted by a team of consultants consisting of Larbi Zagdouni (Head of Mission, Agro-economist and Country Planner), Michael Reynolds (Sociologist and Mission Coordinator), Khalil Allali (Economist), Driss Benatya (Economist, Survey Data Monitoring Expert), Mohammed Dehhaoui (Statistician), Hassan Elattir (Agronomist, Arboricultural Expert), Salah Edine El Aboudi (Rural Engineer), Allal Hamouda (Statistician), Hassan Kamil (Sociologist) and Brahim Soudi (Environmental Agronomist).

The main purpose of this final evaluation is to present the results achieved, the teachings and key lessons from the implementation experience of PAF. In response in the terms of reference of the final evaluation mission, four specific objectives are targeted: I) assessing the performance of PAF through an analysis of the relevance, consistency, effectiveness, efficiency and sustainability, II) measuring the results visible at the end of the compact, including the effects and impacts, both positive and negative, expected or not expected at all stakeholders' level, III) analyzing the level of implementation of the recommendations from the mid-term evaluation of PAF to determine whether they have affected project performance, and iv) making recommendations for the strengthening of the project's results and teachings and key lessons to build upon when designing and implementing similar projects in the future.

The final evaluation of PAF focuses on its five main activities, respectively: I) Rain-fed Olive, Almond and Fig Tree expansion and intensification; II) Olive Tree Irrigation and Intensification in small- and medium-sized irrigated perimeters called PMH (Petites et Moyennes Hydrauliques); III) Date Tree Irrigation and Intensification in oasis areas; iv) Fruit Tree Sector Services; v) the Catalyst Fund. The temporal scope of the evaluation focuses on the implementation period of PAF, running from September 2008 through September 2013.

This final report is a summary of the results from five thematic evaluations conducted by the NORC team: Report ME-16.1. "Integration of environment and gender aspects"; Report ME-16.2. "Rain-fed Olive, Almond and Fig Tree Expansion and intensification"; Report ME-16.3. "Hydro-agricultural

development component in PMH and Oasis areas”; Report ME-16.4 “Rehabilitation of olive orchards in PMH areas and of date orchards in Oasis areas”; and Report ME-16.4. “Promoting value addition and supporting the marketing of fruit tree products in rain-fed and irrigated areas (PMH and Oasis)”. This synthesis report also summarizes the results produced by consultant ME-2 in charge of assessing the impact of olive tree rehabilitation in rain-fed areas. The data-gathering at the base of the analysis developed in this report was focused on the quantitative survey conducted with a representative sample of beneficiaries and their professional organizations (Co-operatives, AUEA) in the irrigated areas (PMH and Oasis) targeted by the project and on focus groups carried out with the beneficiaries and their professional organizations.

The main results are structured into five chapters. The 1st chapter provides a brief overview of the project and recalls the broad outlines of the methodological approach used. The 2nd chapter analyzes the relevance and consistency of the project in its entirety. The 3rd chapter assesses the effectiveness and efficiency of each of the activities of PAF. The 4th chapter addresses the aspects relating to the impact and sustainability of the project results. The 5th and final chapter presents the major lessons and recommendations from the final evaluation of PAF.

During their work, the consultants had the opportunity to meet a great number of people who were directly or indirectly involved in project implementation (see list in Appendix 1). They wish to thank all their interlocutors for their availability and spirit of cooperation. The team especially wants to thank Mrs. Malika Laasri, Deputy Director-General of APP, Mr. Essaid Azzouzi, Monitoring & Evaluation Director, as well as Mr. Khalil Aït Omar and Mrs. Nadira Bejdad from the UGP monitoring and evaluation section, whose support was essential for performing of its work. The consultants are also particularly grateful for all APP Directors and to the Directors of the implementing entities for their openness and support.

Chapter 1. Project Presentation and Evaluation Methodology

1.1. PAF Framework, Foundations and Objectives

1.1.1. Overview of PAF

Over the last decade, Morocco has made tremendous reform efforts and put in place a set of sector level strategies that seek to upgrade high potential and job-generating sectors. In this context, Morocco proposed for MCA funding (in 2007) the Compact-Morocco program, which aimed to achieve sustainable poverty reduction by stimulating economic growth in three high growth potential sectors: agriculture, artisan crafts and small-scale fisheries. This program had a dual purpose. First, speeding up the implementation of the strategies in place in the three target sectors and improving their medium-term efficiency. Second, seizing the opportunities offered by potential markets, while promoting the restructuring and modernization of these sectors to accelerate economic growth.

On August 31, 2007, the Millennium Challenge Corporation (MCC) and the Government of the Kingdom of Morocco signed a Compact Millennium Challenge Account (Compact), amounting to 697.5 million US dollars, in the framework of the Millennium Challenge Account. This program was designed *to reduce poverty in Morocco through economic growth* and its objective *was to stimulate economic growth by increasing productivity and improving employment* in three high potential sectors: agriculture, artisan crafts and fisheries (MCC-Morocco Compact, 2007). This program, which is planned to last five years, includes *five* projects and *a cross-cutting activity*, each with its specific budget and objectives:

- Fruit Tree Productivity Project (PAF) (US\$ 300.90 million);
- Small-Scale Fisheries Project (US\$ 116.2 million);
- Artisan and Fez Medina Project (US\$ 111 million, 57.8 million after refocusing);
- Financial Services Project:(US\$ 46.2 million)
- Enterprise Support Project (US\$ 33.9 million);
- Functional Literacy and Vocational Education (US\$ 32.8 million).

The implementation of the Morocco Compact as a whole was entrusted to the Agency of Partnership for Progress (APP), a Moroccan public *ad hoc* institution, managed by a Strategic Orientation Council (COS) under the chairmanship of the Head of Government. APP delegated responsibility for the day-to-day implementation of the Fruit Tree Productivity Project to the Ministry of Agriculture and Maritime Fishing (MAPM).

1.1.2. PAF's Genesis and Foundations

The idea behind the genesis of the Fruit Tree Productivity Project considers that the vulnerability of agricultural production with respect to climate hazards, the scarcity of water resources and degradation of natural resources are the most important structural constraints affecting the national agricultural sector and its growth potential. These stakes are particularly critical for the sustainable development of mountain and oasis areas that remain subject to high levels of poverty, low and unstable incomes and limited production opportunities. The alternative proposal of the Fruit Tree Productivity Project is the development of fruit tree cultivation around the species that are suited to the agro-economic conditions of mountain and oasis areas. A number of arguments were put forward to justify this strategic choice. On the one hand, mountain and oasis areas have significant potential and natural resources for the development of the target fruit tree sectors. On the other hand, fruit tree cultivation would be a major asset to develop the agronomic, pedoclimatic and water potential and a viable alternative for the appropriate development of these areas. Moreover, the development of fruit tree production would generate an important agro-industrial activity contributing to linking farmers to markets, to job creation and to improving farmers' cash flows and income stability in the medium and long term. On the environmental front, the Fruit Tree Productivity Project considers that better use of water by fruit tree cultivation leads to the improved efficiency of irrigation infrastructures through appropriate hydro-agricultural developments and institutional capacity-building for irrigation water users on a more efficient and effective use of water.

1.1.3. Fruit Tree Productivity Project's Objectives

The Fruit Tree Productivity Project, proposed for MCA funding, set itself the global target of “improving economic growth in the agricultural sector and reducing its volatility, through transformation from cropping of cereals to more productive tree crops (olives, almonds, figs and dates) in mountain and oasis areas both in non-irrigated and irrigated lands”. The two resulting specific objectives of the Fruit Tree Productivity Project are as follows:

- Creating the conditions needed to *increase the productivity and competitiveness of the target fruit tree sectors* (olive, almond, fig and date trees), thus helping to improve growth and reduce poverty in the lands concerned;
- Bringing about a major transformation of current agricultural production systems dominated by cereals, to switch from traditional cropping which is vulnerable to climate hazards to *more productive, competitive and perennial cropping linked to the national and international markets*.

1.2. PAF Logic and Areas of Intervention

1.2.1. PAF Intervention Logic

The PAF proposal was based on the hypothesis that “reducing the volatility of agricultural production and increasing the volumes and value of fruit tree production would be major sources of economic growth in the agricultural sector and of poverty reduction in the country”. Following this logic, the Fruit Tree Productivity Project aimed to facilitate transformation from rain-fed cropping of annuals, notably cereals, to market-oriented cultivation of perennial tree crops (olives, almonds, figs and dates), while improving their productivity and value-chain segments and ensuring environmental protection and well-being of beneficiaries, in particular men and women farmers in the project's target areas. The Fruit Tree Productivity Project's logical framework was designed using results-based management (RBM). The hierarchy of results is expressed as follows:

- Medium and long-term impacts:
 - ▶ reduced poverty in target areas;
 - ▶ improved economic growth in target areas.
- Effects :
 - ▶ reduced agricultural production volatility ;
 - ▶ sustainably increased volume and value of fruit tree production in target areas.
- Outputs :
 - ▶ Higher-value fruit trees are expanded and diversified in the target areas;
 - ▶ Olive tree productivity is efficiently increased in the planting and rehabilitation perimeters;
 - ▶ date tree productivity is effectively increased in the target oasis areas;
 - ▶ Beneficiaries are supported and trained on improved value addition and marketing of target products in the covered areas;
 - ▶ Valuable investments downstream of the olive sector are promoted in the target areas.

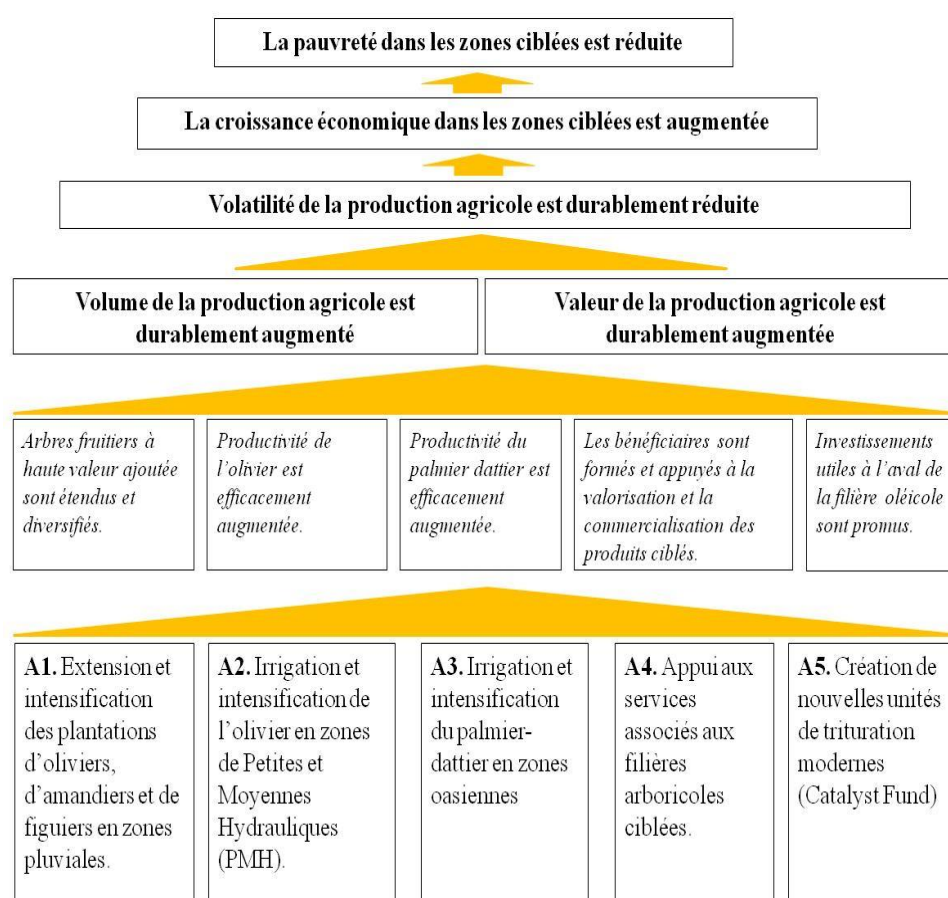
1.2.2. PAF Priority Areas

The interventions proposed by PAF aimed at creating the conditions needed to increase the productivity and competitiveness of the recommended fruit tree sectors with a goal to bringing about a major transformation in the current production systems to facilitate the switch from traditional cropping, which is vulnerable to climate hazards, to more productive, competitive and perennial

cropping linked to the national and international markets. The proposed interventions also integrated all segments in these sectors, from production to marketing, focusing respectively on:

- Mobilizing potentials and improving the production context;
- Promoting value addition, support for marketing and strengthening of professional organization;
- Strengthening support actions: technical assistance, training, applied research and scientific support.
- Strengthening research and technology transfer work.

Figure 1. PAF Logic Model



1.3. Elements of PAF

At the operational level, PAF was implemented through *five main activities*, namely: I) rain-fed olive, almond and fig tree expansion and intensification; II) olive tree irrigation and intensification in small- and medium-sized irrigated perimeters called PMH (petites et moyennes hydrauliques); III) date tree irrigation and intensification in oasis areas; iv) fruit tree sector services; and v) the Catalyst Fund initiative.

1.3.1. “Rain-fed Olive and Almond Tree Rehabilitation and Expansion” Activity

This activity included two separate sub-activities:

- a. *Expansion of tree crops* by converting hillsides into fruit tree perimeters, on a total area of 61,000 ha (58,000 ha of olive-trees and 3,000 ha of almond trees). This intervention benefited approximately 40,000 farms. An additional program of about 20,000 ha was launched in 2011. It was financed as part of the reallocation of US\$ 35 million (MAD 290.5 million) coming from the contribution of the Government of Morocco that was initially planned for the Artisan and Fez Medina Project’s “Makina” component.
- b. *Expansion of existing orchards* on a total area of 60,000 ha (52,000 ha of olive trees and 8,000 ha of almond trees), representing approximately 28,000 farms. It consisted in providing technical assistance for farmers on improved orchard productivity and support for a better value addition and marketing of their productions.

1.3.2. “Olive Tree Irrigation and Intensification in Small- and Medium-sized Irrigated Perimeters” Activity

This second activity also consisted of *two complementary activities*:

- a. Hydro-agricultural development of 65 small- and medium-sized irrigated perimeters extending over an area of approximately 34,000 ha and including nearly 28 000 farms. The proposed developments involved agricultural water development works to improve water transport conditions as part of a participatory approach with the beneficiaries organized in agricultural water user associations (AWUA).
- b. Rehabilitation of olive orchards in these same perimeters by providing training and technical assistance for farmers on increased farm productivity and sustained value addition of their production.

1.3.3. “Date Tree Irrigation and Intensification in Oasis Areas” Activity

This activity included three complementary sub-activities:

- a. *Hydro-agricultural development of 12 oasis perimeters* covering an area of approximately 19,000 ha and benefiting nearly 16,500 farms. As in small- and medium-sized irrigated perimeters, the proposed developments involved hydro-agricultural development works to improve water transport conditions, *the implementation of which is to be conducted* according to a participatory approach with the organized beneficiaries.
- b. *Date orchard reconstitution and densification* through the provision of *in-vitro plants* of specially cultivated, Bayoud-resistant date palm varieties which are suited to the production conditions of date tree cultivation areas. The program focuses on the provision and

transplanting of 250,000 in-vitro plants, cleaning of 170,000 date tree tufts and provision of more than 240,000 suckers for date growers.

- c. *Rehabilitation of existing date tree cultivation in these same perimeters* by providing technical assistance and training to *the farmers concerned* on improved date tree productivity.

1.3.4. “Targeted Fruit Tree Sector Services” Activity

This activity, which cuts across the three previous ones, consisted mainly of:

- a. Training for producers, members of professional agricultural organizations, upstream and downstream stakeholders, *support and technical assistance for sector actors*.
- b. Promoting value addition through the upgrading of existing date crushing and packaging units, *implementation of new date valorization units and promotion of women's activities* to increase the value of the targeted products.
- c. Support for *marketing* aimed at strengthening trade ties between the various links in the target sectors and identifying and securing more profitable markets for these products through *the implementation of a market information system and a certification and marketing support program*.
- d. Support for *professional organization* through *support and technical assistance* for professional associations and second-order co-operatives.
- e. Implementing a research program comprising *4 axes* (soil conservation, management of target fruit tree crops, value-added production, irrigation) which break down into a total of 22 research topics.
- f. Designing and implementing a *project management training plan for the MAPM staff* involved in overseeing and implementing the Fruit Tree Productivity project.
- g. Designing and implementing *pilot projects for women's organizations* involved in the development of olive, almond, fig and date tree value chain.

1.3.5. “Catalyst Fund” Activity

This activity *was not part of the initial project design*; it was added only in July 2011 *in response to the need for greater crushing capacity*. It aims *to stimulate useful investments downstream of the olive*

oil production chain, by strengthening the leveraging role played by olive crushing infrastructures in supply chain organization, productivity and quality improvement, and environmental protection. With a budget of US\$ 21.2 million, the fund dedicated to this activity was intended to contribute up to 50% to the projects *for creating new modern crushing units* (construction and equipment) *by the GIE* (*Groupements d'Interet Economique*) led by PAF. Added to that was a 30% subsidy from MAPM, a 20% beneficiary contribution, 5% of which through self-financing and 15% through a bank loan from “Crédit agricole du Maroc” (CAM). This package includes funding for part of the working capital needs (labor, consumables) through the loans that the GIE would take out with CAM (15%). The remaining needs should be financed by the GIE through in-kind contributions of raw material (olives).

1.4. PAF's Organization and implementation

1.4.1. Overview of PAF's Preparation Processes and Program Launch

The preparation process of the Fruit Tree Productivity Project took place over a two-year period and consisted of *three major steps* namely:

1. **Identification** from September through December 2005 for *screening potential projects and intervention areas*;
2. **Opportunity analysis** from January through September 2006 for *defining the program's key areas* in accordance with the eligibility criteria set by MCC: sectors, value chains and activities;
3. **Proposal monitoring and evaluation** from October 2006 through July 2007 focusing on *the evaluation and analysis of the proposed projects*.

PAF's launch, designed in accordance with an incremental process based on strategic and operational planning, was carried out in *two major periods*:

4. **Prelaunch period** (Compact Implementation Funding- CIF) from September 1, 2007 through September 14, 2008 dedicated to the *setting up of the Compact MCA-Morocco implementation teams* (APP and UGP), *launch of baseline studies* and *development of terms of reference* for the various programmed activities, in particular the pilot program for the planting work.
5. **Five-year effective implementation period** running from September 15, 2008 through September 15, 2013.

1.4.2. PAF's General Principles for Implementation

In accordance with the initial design, PAF's implementation activities are expected to adopt a *regional, integrated, participatory and supportive approach*. “*The regional approach*” was aimed to

achieve *consistency* between the objectives, areas of intervention and *target sectors* in the 25 provinces located in mountain and oasis areas. Areas where levels of poverty are higher than in the rest of the country but where there is also considerable potential and resources for the development of the target fruit tree sectors. “*The integrated approach*” emphasized *complementary interventions in all links in the value chains of the target sectors*, through: I) upstream, the mobilization of potential and improvement of the production context; II) downstream, the strengthening of support services and actions for the target value chains; and, III) upstream and downstream, the improvement of the technical levels of stakeholders involved. On the other hand, the “*participation and solidarity*” principles should guide *the close association of the various operators in the sector at all stages of project implementation* within a partnership and contractual framework. Also, the “*aggregation*” principle was adopted as a lever for implementing interventions both in the upstream (*cooperative producer organization*, by perimeters) and downstream targeted sectors (*creation of the Groupements d'Interet Economique - GIE*), formed by the producer cooperatives). For PAF, *it was about promoting the partnership model between small farmers, their organizations and the remaining links in the value chain of the target sectors*, based on effective and efficient contractual relationships allowing for a balanced distribution of the added value and encouraging investment among all partners to improve productivity, competitiveness and quality.

At the operational level, the general principles adopted for the implementation of activities and tasks were as follows:

- Allocation of tasks and responsibilities between stakeholders on a contractual and partnership basis;
- Interventions focused on homogeneous perimeters that were identified based on objective eligibility criteria;
- Programming based on the grouping of perimeters into intervention tranches;
- Procurement based on detailed and precise terms of references and technical and economic feasibility studies validated beforehand;
- Outsourcing of technical assistance at the different phases of preparation, execution and oversight of the various project activities;
- Structural integration of the environmental, social and gender aspects at all stages of project design and implementation.

Box 1. Project contractualization with producer Organizations

Article 1: Contract Objectives

The contract is part of the project financed by the Millennium Challenge Account (MCA), the objectives of which are:

- Integrated development of the fruit tree sector, with particular focus on olive trees.
- Improved income of farmers and promotion of job creation.
- Environmental and natural resources conservation.

The present contract is part of the participatory approach adopted by the project to carry out the actions planned, and aims at defining the *respective commitments between the project and the organization for the implementation of interventions jointly agreed by both parties*.

Article 2: Project Commitments

The project is committed to:

- *Carrying out the work* for the creation (expansion) of olive-growing (as well as almond and fig trees in some cases) hillside perimeters which fall under the responsibility of the organization members, in compliance with the technical standards provided for in the project specifications.
- *Bearing the maintenance costs for the new young plantings* during the first two years of implementation.
- *Ensuring oversight, technical assistance and training for organization members* on various aspects of production, value addition and marketing.

Article 3: Organizational Commitments

The organization is committed to:

- *Ensuring beneficiaries' effective participation* in the implementation and monitoring of the work for the development of perimeters and installation of plantings.
- *Providing maintenance for the new plantings and benches as well as any other works carried out* as from the third year of implementation, and ensuring sustainability of actions after the project.
- *Raising the awareness of members about taking an active part in the training sessions* held by the project.

Box 2. Eligibility criteria adopted for the selection of perimeters and beneficiaries.

Upstream, these criteria involved, respectively I) the location of perimeters in the target provinces, II) the proven specialization and natural resources for the development of the target fruit tree species, III) the prevalence of small and medium-scale farms (75% of farms with less than 5 hectares of land), and iv) the voluntary enrollment of beneficiaries organized in formal representative groups.

Downstream, they involved three aspects: I) the actors downstream of production and operating in the relevant provinces, II) the second-order organization bringing together the beneficiary perimeters, and III) the potential partners of the perimeters benefiting from the project activities.

Box 3. Organization of PAF activities by contracts

Contract	Activity	Target areas	Purpose
TC-1A	1	Rain-fed areas	Environmental studies, feasibility studies and supervision of work.
TC-1B	2 & 3	Irrigated areas (PMH, Oasis)	Environmental Studies, feasibility studies and supervision of work.
TC-2A	4	All areas	Assessment of training needs for MAPM staff.
TC-2B	4	All areas	Provision of the training needed for the capacity-building of MAPM staff.
TC-3A	1	Rain-fed areas (Extension)	Planting work in rain-fed areas.
TC-3B	2 & 3	Irrigated areas (PMH, Oasis)	Irrigation infrastructure work in PMH and Oasis areas.
TC-4A	4	All areas	Applied research and scientific support centers.
TC-5A	1, 2 & 3	Rain-fed and irrigated areas (PMH)	Training, technical support and guidance for beneficiaries, professional organizations and value chain operators in the olive, almond and fig tree sectors.
TC-5B	3 & 4	Irrigated areas (Oasis)	Training, technical support and guidance for beneficiaries, professional organizations and value chain operators in the date tree sector.
TC-6A	3	Irrigated areas (Oasis)	Provision of certified in-vitro plants and date tree suckers. Rehabilitation and maintenance of existing date trees.
TC-6B	4	Irrigated areas (Oasis)	Support for second-order cooperatives and professional organizations.
TC-7	4	All areas	Evaluation study of the carbon potential.
TC-9	5	Rain-fed and irrigated areas (PMH)	Support for the implementation and monitoring of the Catalyst Fund

1.2. Methodological Approach to the Evaluation

1.2.1. Overview of Evaluation Objectives

The overall objective of this report is to contribute to the final evaluation of PAF, by assessing the performance and impact of its various activities, while capitalizing on the mid-term evaluation results and recommendations as well on all activity reports, analyses and studies carried out as part of the project's monitoring and evaluation.

Three specific objectives are pursued for the final evaluation of the project, which aim to:

- Evaluating the performance of the activity, as a whole, like the mid-term evaluation, based on relevance, consistency, effectiveness, efficiency and sustainability criteria, while capitalizing on the data and results of the project's monitoring and evaluation.
- Completing and updating the results from the assessment of the outcomes and impact of the “*Orchard rehabilitation and intensification*” sub-activity on beneficiaries, their professional organizations and the rest of community members in the target areas, while building on the study conducted by NORC (Contract ME-2, 2010-2013);

- Making recommendations for the capitalization of results and sustainability of the gains and outcomes generated by the activity for the benefit of the PAF closeout plan and of similar ongoing (PMV) and future measures.

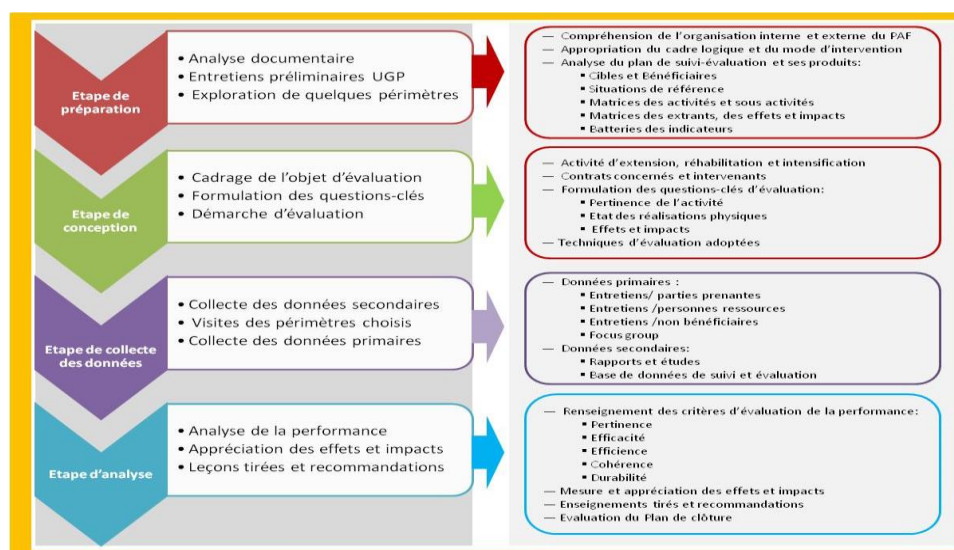
In the light of these objectives, *two important observations must be made*. The first is related to the incompleteness of the evaluation of the “Expansion” sub-activity since its outcomes and impact have not yet been produced to date. The second comment relates to performance assessment for the “Rain-fed rehabilitation and intensification” sub-activity. The latter has already been the subject of a separate study under contract ME-2 (NORC, 2010-2013), the results of which will be included in this report in accordance with the evaluation criteria adopted.

1.2.2. Stages of the Evaluation Approach Adopted

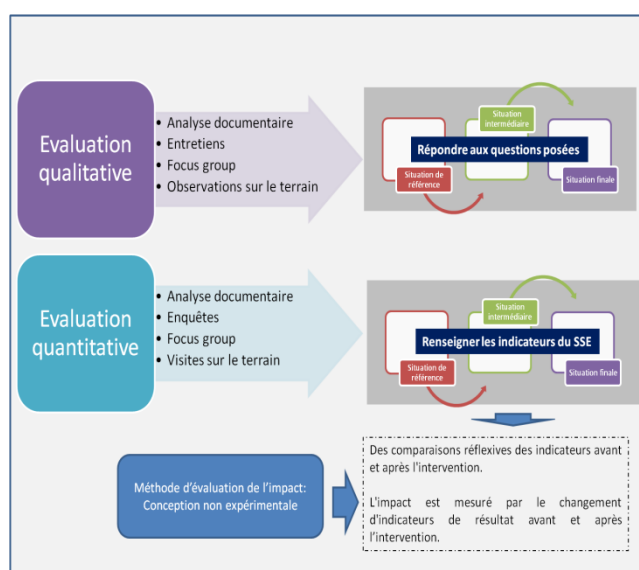
The final evaluation approach adopted consisted of four key steps (Figure 2):

- **Preparation stage:** it was devoted to analyzing the documentation on the project activities, conducting preliminary interviews with the resource persons of APP, UGP and MAPM's field offices and to visiting a number of perimeters. The purpose of this stage was to better understand the internal organization of the project implementation, adopt its logical framework and method of intervention and acquire good knowledge of all contracts, as well as of the contractors and service providers who were hired for its implementation.
- **Design stage:** it focused on the ownership of the subject of evaluation among which are the project activities, the formulation of the key issues for assessing its performance and its impact, and the development of the comprehensive approach and organizational methods for conducting the evaluation, in particular the sampling of perimeters and beneficiaries to be surveyed as well as the design of data collection tools.
- **Data collection stage:** this stage included the collection and analysis of secondary data on all project activities (studies, reports, monitoring and evaluation databases), the collection of primary data in the sampled perimeters and the conduct of surveys, interviews and focus groups with the various categories of relevant beneficiaries.
- **Analysis and evaluation stage:** this last stage involved the collection, processing and analysis of the secondary and primary data for each of the project activities. This work was carried out both for all the perimeters targeted by the Fruit Tree Productivity Project and for those sampled for the needs of its final evaluation.

Figure 2. Overview of the stages of the methodological evaluation approach adopted



1.2.3. Implementation of the Evaluation



The implementation of the final evaluation combined quantitative and qualitative methods where each brought relevant research tools for realizing the desired objectives. Figure 3. provides an overall view of the approach adopted.

The implementation of this approach is based, firstly, on the examination of pre-existing data, i.e. the logical frameworks, monitoring and evaluation sheets and quantitative data collected and analyzed, and secondly, on an

Figure 3. Overview of the stages of the methodological evaluation approach adopted

Analysis and evaluation of the various criteria of the project's overall performance, based on the primary data collected through *quantitative surveys*, *semi-structured interviews* and *focus groups* with the stakeholders in the areas targeted by the Fruit Tree Productivity Project.

Quantitative surveys focused solely on irrigated areas (PMH and Oasis) and were conducted with two samples corresponding to two beneficiary categories: women/men farmers and professional agricultural organizations (AUEA and co-operatives). Four types of questionnaires were administered: two for the Men/Women farmer survey (including one in PMH irrigated areas and one in oasis areas)

and two for OPAs (including one for the AUEA survey and one for the Co-operative survey). The implementation of these surveys was ensured by teams of experienced supervisors and surveyors, including conducting similar surveys as part of the Fruit Tree Productivity Project (Evaluation conducted by NORC under Contract ME-2 on the rehabilitation of existing olive tree orchards in rain-fed areas).

As for the semi-structured interviews, they were conducted throughout all areas covered by the project and were conducted by the expert evaluators meeting with the various project stakeholders.

Appropriate tools were developed for collecting relevant data for each of the five main activities.

As for the focus group method, it was used for evaluating the sub activity for the expansion of olive and almond tree orchards in rain-fed areas through a sample of nineteen perimeters. These focus groups were conducted under the supervision of the expert evaluator in charge of the qualitative evaluation, led by five experienced teams, each consisting of an expert-facilitator and their assistant. Exchanges were organized based on previously agreed thematic issues included in the agendas used by facilitators in moderating these groups.

The sampling design adopted was conducted, from end to end, in close cooperation between the evaluation mission team, on the one hand, APP's DES and UGP's USE, on the other hand. The data and criteria used for the sampling, the size of samples to be surveyed as well as the survey questionnaires were the subject of a long process of discussion which resulted in jointly agreed choices¹. The basic premise that preceded the development of this plan is that the collection of data will have to meet perfectly all the needs of the performance and impact assessment for the various project activities. Also, the required qualitative and quantitative data were collected with the farmers, their professional organizations and value-addition actors, so as to obtain their perception of the activities which they benefited from as part of the project and their appreciation of the possible benefits they have derived.

In order to establish an adequate sample design, a literature search enabled relevant secondary data necessary for understanding the specific challenges of each of the project's zones of intervention to be collected. These are technical documents primarily comprising the deliverables from the consultations undertaken by the project under the various contracts. This information concerns, inter alia, the site plans of perimeters, their zoning maps as well as many data of a descriptive nature (number of beneficiary farmers, duration of work, areas planted/developed, origins of water for irrigation, nature and progress of the hydro-agricultural development work carried out, contracting agency, etc.).

For details about the sampling of the perimeters, the beneficiaries surveyed, the data collection tools, the measures for preparing and deploying the field research teams, the monitoring, entry and

¹ Throughout this process, USE-UGP showed great knowledge of project's documentary collection and valuable interactivity with the NORC evaluation.

processing of the data collected, readers are invited to refer to the final version of the methodological report of the project's final evaluation see appendix 1 & 2 Appendix design .

Chapter 2. Evaluation of the Fruit Tree Productivity Project's Relevance and Consistency

2.1. Relevance

This section reviews the relevance of the Fruit Tree Productivity Project's intervention, i.e. the compliance of its design with the national strategic orientations for the development of the agricultural sector, and its alignment with the beneficiaries' needs and expectations.

2.1.1. Relevance of the Intervention Logic

2.1.1.1. Relevance of the Overall Design

At the beginning, the strategic option selected by PAF was the development of the fruit tree sector (olive, almond, fig and date trees) as a lever for the upgrading and restructuring of the agricultural economy in the target poor rural areas. To do this, PAF designed a participatory and cooperative approach, the intervention of which was based on *the integration of the upstream and downstream target tree sectors*, covering *the entire value chain* : upstream of production (nurseries), fruit tree production (farms) and downstream of production through post-harvest addition of value and support for marketing.

Upstream, the project planned activities for the mobilization of potentials and improvement of the production context through *actions of expansion, rehabilitation and intensification of fruit tree orchards* (olive, almond, fig and date trees), *agricultural water developments and provision of technical support* (training, guidance and technical assistance) and action-research services for farmers and their professional organizations. *Downstream*, the Fruit Tree Productivity Project planned *actions complementing those* conducted upstream, aiming to add value to and improve the quality of production. These actions focus on *promoting value addition* and *support for marketing* of olive, fig, almond, and date yields. The integration of the target upstream and downstream sectors while giving systematic consideration to the environmental, social and gender dimensions at every stage of the project intervention, brought relevance to its initial design. This relevance was strengthened by the introduction, in 2011, of the Catalyst Fund initiative in view of its benefits and effects in terms of *value chain structuring* and *closer vertical links* in the olive oil production chain. This initiative played an undeniable role in stimulating farmers to join the project, in particular in the provinces (Moulay Yacoub and Taounate) where farmers from the target perimeters were particularly reluctant to embrace the project's initial offer- converting cereal crops to olive orchards - as they felt that this offer did not provide them with the link they were lacking: the expected transformation to increase the value of olive oil production.

However, it has to be said that PAF's design completely ignored a fundamental component of farming, in particular for those affected in the lands targeted by the expansion of planting. These lands are known for *the importance of their extensive livestock activity* which forms, together with cereal and fruit tree cropping, an essential component of farmers' income and a significant source of cash for them. The targeting of fruit tree expansion in these areas, without taking sufficient account of the many negative externalities on extensive livestock raising, is one of the well-known deficiencies that had marked PAF's design. Indeed, neither its initial design, nor the preliminary feasibility studies (TC-1A contract) have deeply analyzed the interrelationship between existing activities, or anticipated the consequences of imbalances which the implementation of the new planting perimeters would create in the agro-pastoral farming lands. The extent of the reluctance and even refusal to embrace this sub-activity and the levels of conflict and litigation with the pastoralists and sharecroppers, have strongly undermined the inclusive and participatory principles of the approach advocated by the project. Everywhere, the claims of those opposed to its intervention and/or of non-beneficiaries have required more advocacy and mobilization efforts than expected. This has led to delays which have accumulated over time and the emergence of multiple inter-actor tensions (within the target perimeters but also with the surrounding land) which have undermined the smooth implementation of the project.

Box 4. Main problems encountered

Farmers' partial or total refusal to participate is the main constraint experienced during the term of Contract TC-1A. This reluctance resulted in the cancellation of certain perimeters or parts of the perimeter.

It should be recalled that the main reason for this reluctance is mainly due to:

- A shift back to cannabis cultivation in some northern provinces;
- Political litigation;
- The ill-intentioned interventions of a number of associations have resulted in delays in the completion of works and sometimes in reluctance, leading to a reduction in the acreage of some perimeters;
- The conflict of interest between landowners and others farmers dedicated to livestock breeding that created tensions,
- The problems of land tenure;
- Problems with local residents.

The areas of refusal or reluctance to participate, since the beginning of the project, all segments included, totaled 11,987 hectares. After the establishment of the different contractual amendments designed to overcome reticence, 5,719 hectares were replaced primarily in 12 perimeters (as were expansions within the requesting perimeters).

Box 5. Conflicts with livestock breeders and sharecroppers

As soon as the delimitation of perimeters was announced, relationships became litigious between beneficiaries, livestock breeders and sharecroppers.

Within the Bab Ward perimeter (province of Ouezzane), most farmers own land in areas that are quite far from their douar. These lands are used in leasing or share-farming, mostly by landless farmers from another douar called Gnaouna. The leasing or sharecropping informal contracts lasted several years and it became increasingly difficult for owners to recuperate their land and terminate the contracts which they had signed with tenants or associates. For owners, the project was an opportunity with a dual advantage: it would both finance the use of their lands and help them to terminate the contracts to which they were subjected, and thereby to recover their land. It was therefore easy to involve them in the project, but problems emerged after the program implementation. When newly planted olive-trees were not protected from grazing by animals from douar Gnaouna's livestock breeders.

Particularly in the provinces of Taounate and Taza, open conflicts emerged between program beneficiaries and livestock breeders from bordering tribes, who were historically used to grazing their herds in the perimeters targeted by the project, in particular after the harvest of cereals (common grazing). The project's implementation has deeply modified these relationships by preventing grazing on planted lands ("putting them under protection"). This has led to heightened social tension and called into question the traditional alliances and relationships of reciprocity and understanding.

In Chaâbate Laârara (province of Moulay Yacoub), livestock breeders complain about the restrictions imposed on their herds' mobility, both through the reduction of pastoral areas and the lack of corridors of passage that long served as access points for livestock watering. The beneficiaries of the perimeter now deny them this right of access and threaten to take legal action.

Of course, this is not just a simple question of design, but also involves major economic dimensions in connection with the poverty reduction target. Even when small farmers accepted the plantings and had no option but to reduce the size and even deprive themselves of their herds as a result of pastureland reduction, it remained to be seen whether this alternative (plantings) would be able to make up for the earning losses due to the resulting decline in husbandry activity. Ultimately, the "fruit tree plantings-extensive husbandry" dilemma will continue to impact the initial design of the Fruit Tree Productivity Project and may even compromise the achievement of its overall objective of reducing poverty, at least in the areas concerned by the new plantings, where husbandry is a vital activity for their populations.

Box 6. Non-beneficiaries of the PAF versus supportive approach

Three non-beneficiary categories of the “Expansion” sub-activity can be distinguished:

- **Sharecroppers or landless peasants** perceive PAF as a project that has dispossessed them of the harvesting rights they enjoyed under local leases often going back several generations. They no longer have the opportunity to be indirectly involved in the cropping of planted fields, nor to enjoy them as they did previously through common grazing. The new plantings have caused their production relationships with the entitled parties to be called into question. Some believe that their rights and autochthony have been called into question.
- **Livestock breeders who were excluded from the perimeters** have experienced a reduction in their mobility since they are no longer able to benefit from former wild lands and fallow lands where they used to graze their livestock.
- **Non-beneficiary farmers excluded from perimeter delimitation.** They often form very powerful lobbies and express their claim in a very strong manner. In Beni Oussime, Ait Maâlla or Sidi Maâdane Titi, they have obtained the possibility of benefiting from the plantings under the PMV. But in other perimeters, like Bab Ward, the situation remains tense and non-beneficiaries are not ready to abandon the claims which they have filed with the Agricultural Services and the Province.

2.1.1.2. Relevance of the PAF Intervention Approach

All PAF documentation of the Fruit Tree Productivity Project emphasize the novelty of the approach adopted throughout the preparation, implementation and monitoring-evaluation of its activities. Two major characteristics are often put forward.

- The stated approach was meant to be *regional* in that it ensured a balance between the trilogy objectives - intervention areas - target sectors. Several strengths boost the application of this regionalization principle: zoning of the intervention area (rain-fed, PMH, oasis), intervention around “homogeneous” perimeters, adaptation of technical specifications and proposed best practices to the specific needs of the lands, consideration of the environmental and social dimensions, integration of the upstream and downstream target sectors, and implementation of local technical assistance services;
- The recommended approach was also intended to be *participatory* and *supportive*, through the close association of the different actors in the target sectors at all stages of project implementation within a partnership and *contractual framework*. The targeting of small farmers, the involvement, participation and *organization of farmers* by raising them to the status of stakeholders in the process of implementation and acceptance of the work, *capacity-building for beneficiaries and their professional organizations* as well as the carrying out of mobilizing and facilitating social actions to help local populations, are all in line with the recommended participatory and supportive approach.

However, in spite of its relevance to meet the objectives set, the feasibility of the intervention approach adopted by the project faced numerous challenges which are discussed in the sections on the evaluation of the other project performance criteria.

2.1.2. PAF's relevance to Beneficiary Needs

2.1.2.1. To Producers' Needs

All analyses on Moroccan agriculture are unanimous that it still faces many deficits: *high vulnerability to climate conditions, inefficient production practices, very low value-added products, insufficient professional and value chain organization...* The result is very volatile agricultural production and productivity, untapped potential and a process amplification that is detrimental to the sustainability of natural resources. In the areas targeted by PAF, these problems are more acute than elsewhere: they are densely populated and have limited productive resources and economic alternatives. These are also highly fragile areas from an ecological standpoint, and have benefited less from public development policies than the rest of the country... The consequence is the persistence of an economically poor traditional agriculture with little technical and financial support to improve its production and organizational capacity, so as to take better advantage of market opportunities. This finding, which is fully backed up by PAF, points to the existence of a real need for the farmers in the intervention areas to improve and diversify their agricultural production and demonstrate that the objectives set by the project in terms of improved production in the targeted sectors are completely in line with the concerns and expectations of these farmers.

Box 7. The need for improved technical practices and professional organization of farmers *in rain-fed areas*.

- **Best Practices Indicators:** the proportion of farms having adopted all best practices of olive tree technical is almost nil (0.1%), while nearly 40% have not adopted any such practices.
- **OPA membership indicators:** only 8% of farms are members of associations other than AUEA and 4% are members of cooperatives, while membership to other OPA forms (in particular associations) is almost nonexistent.

Source: Key reports of Contract: ME-1A: Establishing the reference situation for the monitoring and evaluation of the Fruit Tree Productivity Project

Box 8. The need for improved technical practices and professional organization of farmers in *PMH* areas.

Best Practices Indicators:

- Only about 3% of olive tree farms have adopted the full range of best practices for olive tree management, about 4% have not adopted any such practices.
- Irrigation is the most common technique; it is used by slightly more than 90% of farms.
- Pruning and chemical fertilization have been adopted respectively by 54% and 51% of farms.
- Mechanical tillage and plant protection are used by only 19% and 16% of farms.
- Mechanical pruning is almost nonexistent: it is used by less than 1% of farms.

OPA membership indicators:

- 14.2% of farms are members of agricultural cooperatives and 14.5% are members of AUEAs.
- 5.5% of farms are members of associations related to olive production (other than AUEAs).
- In general, the membership rate to UAEAs increases with the acreage. The highest rate is recorded by farms with more than 5 hectares of utilized agricultural land. With large areas, the needs for water become higher, providing incentive for producers to better organize themselves around irrigation water resources.
- The membership rate of farms to other OPA forms (in particular associations) is very low: about 2%.

Source: Key reports of Contract ME-1A: Establishing the reference situation for the monitoring and evaluation of the Fruit Tree Productivity Project

Box 9. The need for improved technical practices and professional organization of farmers (oasis areas).

Best Practices Indicators:

- Most producers have adopted less than three recommended practices for the proper management of date trees.
- Only 1% of holdings have adopted five practices considered to be of good management and none applies the six practices of the technical train, while about 3% have not adopted any such practices.
- Holdings of more than 2 hectares are those with the highest score, in particular through their tillage, irrigation and chemical fertilization practice.
- Irrigation is the most common technique, it used by about 86% of holdings, followed by pruning and chemical fertilization by respectively 77% and 58% of holdings, and then tillage by 26% of holdings.
- Plant protection practice is insignificant (less than 1%) and mechanical harvest remains nonexistent.

OPA membership indicators:

- Only 10% of holdings are members of AUEAs, 6% are members of other associations and 3% of co-operatives.
- The AUEA membership rate increases with the farm size; those with more than 2 hectares of utilized agricultural land have the highest rate (their needs for water seem to provide incentives for them to organize themselves more).
- The membership rate of holdings to other forms of OPA (in particular associations) is close to zero.

Source: Key reports of ME-1A Contract: Establishing the reference situation for the monitoring and evaluation of the Fruit Tree Productivity Project

In the upstream target value chains, PAF planned activities for the mobilization of potentials and improvement of the production context through expansion, rehabilitation and intensification of fruit tree orchards (olive, almond, fig and date trees), hydro-agricultural developments and provision of technical support (training, guidance and technical assistance) and action-research services for farmers and their professional organizations. These activities aim at overcoming or at least reducing the constraints which hinder the development of target value chains and making the best use of available resources and the opportunities offered to beneficiaries, and thus meeting their needs and expectations.

Box 10. Positive perceptions of the project's relevance by the beneficiaries (rain-fed areas)

In the 20 perimeters visited, beneficiaries consider the expansion work as one of the rare opportunities for mobilizing and developing potentials and local resources, considering the relatively limited interest given to these areas by previous public interventions. *The intervention's link with poverty reduction* is almost constant in the discourse of farmers and their professional organizations. Everywhere, a range of benefits associated with the expansion of plantings and development of existing orchards were highlighted, particularly in terms of *income generation and diversification, job creation for youth, land revaluation and security, and market linkage*, etc.

Box 11. Positive perceptions of the project's relevance by OPAs (PMH and Oasis areas)

Perception of AUEAs: An opportunity for farmers to derive numerous benefits from the project, in particular from the hydro-agricultural development measures considering the scope of their impact on beneficiaries' income and living conditions, but also on the fight against desertification.

Perception of co-operatives in PMH areas:

- Improving the quality of olive and olive oil;
- Adding value to olive-tree products;
- Adding value to and selling olive oil.

Perception of co-operatives in oasis areas:

- Importance of the project: it focuses on sensitive objectives: dates and oasis;
- Organizing the sector and standing in the way of intermediaries whose profits are higher than farmers';
- Planting, Production, Marketing;
- Organizing themselves better and joining the GIE;
- Structuring the sector and facing intermediaries who disturb us during the date season.

Source: Survey ME-16

Table 1. Farmers in PMH areas positive perception of the project's relevance

Project's perceived objectives	Class-size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Nb	%	Nb	%	Nb	%	Nb	%
Improved irrigation (reduced water turn waiting time, facilitated irrigation, decreased amount of water loss, increased irrigated area, etc.)	65	37	36	49	35	44	136	41
Reduced poverty/Improved living conditions/Improved farmers' income	69	39	28	38	17	22	114	35
Increased yields, productivity, production	64	36	25	34	22	28	111	34
Improved canals <i>sequias</i> (construction, development, etc.)	24	14	14	19	19	24	57	17
Improved quality and value of products (olives and others)	2	1	3	4	11	14	16	5
Improved marketing conditions (olive, oil, etc.)	1	1	1	1	3	4	5	2
Multiple responses for the 329 farmers whose responses were retained.								

Source: Survey ME-16

The relevance of PAF's hydro-agricultural developments in PMH and oasis areas has been supported by the results of surveys ME-16 conducted with the beneficiaries. They show clearly that both AUEAs and the various farmer categories have expressed, with a very large majority, their satisfaction over the usefulness of these developments. Those who consider them unnecessary are in roughly negligible proportions. And of all the PAF interventions whose usefulness has been most highly regarded by farmers, these developments were ranked first by no less than 75% of respondents.

Table 2. Beneficiary AUEA's rating of the usefulness of hydro-agricultural developments

Development type	Rating	PMH areas		Oasis areas	
		Nb	%	Nb	%
Oued works	<i>Respondents</i>	16	64.0	7	25.0
	Very useful	8	50.0	7	100.0
	Fairly useful	7	43.8		
	Not at all useful	1	6.3		
Spring development	<i>Respondents</i>	12	48.0	1	3.6
	Very useful	5	41.7	1	100.0
	Fairly useful	7	58.3		
	Not at all useful				
Seguia Coating/Rehabilitation	<i>Respondents</i>	25	100.0	24	85.7
	Very useful	17	68.0	21	87.5
	Fairly useful	7	280.0	2	8.3
	Not at all useful	1	4.0	1	.,2
Development of Khetaras	<i>Respondents</i>	3	12.0	1	3.6
	Very useful			1	100.0
	Fairly useful	1	33.3		
	Not at all useful	2	66.7		
Pumping station/impoundage construction	<i>Respondents</i>	1	4.0	2	7.1
	Very useful			2	100.0
	Fairly useful	1	100.0		
	Not at all useful				

Source: Survey ME-16

Table 3. Beneficiary farmers (PMH) rating usefulness of hydro-agricultural developments

Development type	Rating	Class-size of total UAA (ha)							
		≤2		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Oued works	<i>Respondents</i>	94	100.0	21	100.0	9	100.0	124	100.0
	Very useful	73	77.7	15	71.4	6	66.7	94	75.8
	Fairly useful	18	19.1	5	23.8	3	33.3	26	21.0
	Not at all useful	3	3.2	1	4.8			4	3.2
Spring development	<i>Respondents</i>	28	100.0	8	100.0	14	100.0	50	100.0
	Very useful	16	57.1	3	42.9	7	50.0	26	53.1
	Fairly useful	9	32.1	3	42.9	5	35.7	17	34.7
	Not at all useful	3	10.7	1	14.3	2	14.3	6	12.2
Seguia Coating/Rehabilitation	<i>Respondents</i>	156	100.0	75	100.0	85	100.0	316	100.0
	Very useful	101	64.7	46	61.3	44	51.8	191	60.4
	Fairly useful	43	27.6	25	33.3	33	38.8	101	32.0
	Not at all useful	12	7.7	4	5.3	8	9.4	24	7.6
Pumping station/impoundage construction	<i>Respondents</i>	1	100.0					1	100.0
	Very useful								
	Fairly useful	1	100.0					1	100.0
	Not at all useful								

Source: Survey ME-16

Table 4. Beneficiary farmers (Oasis) rating of the usefulness of hydro-agricultural developments

Development type	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Oued works	<i>Respondents</i>	10	100.0	21	100.0	86	100.0	117	100.0
	Very useful	6	60.0	7	33.3	32	37.2	45	38.5
	Fairly useful	3	30.0	7	33.3	32	37.2	42	35.9
	Not at all useful	1	10.0	7	33.3	22	25.6	30	25.6
Spring development	<i>Respondents</i>	4	100.0	3	100.0	3	100.0	10	100.0
	Very useful	3	75.0	2	66.7	3	100.0	8	80.0
	Fairly useful	1	25.0	1	33.3			2	20.0
	Not at all useful								
Development of Khettaras	<i>Respondents</i>	10	100.0	19	100.0	17	100.0	46	100.0
	Very useful	9	90.0	16	84.2	11	64.7	36	78.3
	Fairly useful	1	10.0	3	15.8	4	23.5	8	17.4
	Not at all useful					2	11.8	2	4.3
Seguia Coating/Rehabilitation	<i>Respondents</i>	50	100.0	72	100.0	119	100.0	241	100.0
	Very useful	37	74.0	43	59.7	53	44.5	133	55.2
	Fairly useful	10	20.0	20	27.8	54	45.4	84	34.9
	Not at all useful	3	6.0	9	12.5	12	10.1	24	10.0
Pumping station/impoundage construction	<i>Respondents</i>	1	100.0			4	100.0	5	100.0
	Very useful	1	100.0			2	50.0	3	60.0
	Fairly useful					2	50.0	2	40.0
	Not at all useful								

Source: Survey ME-16

The results of Survey ME-16 support the relevance of tuft cleaning operations, offshoot management recovery and in-vitro date plant distribution: the vast majority of beneficiary farmers believe these operations are useful; only 10% reported that the in-vitro plants distributed by the project were not useful to them. This rating is all the more significant since these operations benefited a significant proportion of farmers surveyed: about 63% benefited from in-vitro plant distribution, 60% from tuft cleaning and 51% from sucker management.

Table 5. Beneficiary farmers rating of the usefulness of date tree tuft cleaning and sucker management operations (Oasis)

Operation	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Tuft cleaning	<i>Respondents</i>	41	100.0	67	100.0	104	100.0	212	100.0
	Very useful	29	70.7	53	79.1	70	67.3	152	71.7
	Fairly useful	11	26.8	12	17.9	27	26.0	50	23.6
	Not at all useful	1	2.4	2	3.0	7	6.7	10	4.7
Sucker management	<i>Respondents</i>	34	100.0	58	100.0	91	100.0	183	100.0
	Very useful	23	67.6	43	74.1	54	59.3	120	65.6
	Fairly useful	11	32.4	13	22.4	33	36.3	57	31.1
	Not at all useful	0	0	2	3.4	4	4.4	6	3.3
In-vitro plant distribution	<i>Respondents</i>	31	100.0	65	100.0	130	100.0	226	100.0
	Very useful	19	61.3	33	50.8	63	48.5	115	50.9
	Fairly useful	11	35.5	25	38.5	52	40.0	88	38.9
	Not at all useful	1	3.2	7	10.8	15	11.5	23	10.2

Source: Survey ME-16

With regards to the value of *training* delivered for farmers as part of the two activities dedicated to irrigated areas, it is first noted that in PMH areas, the results of Survey ME-16 reveal that the proportion of its beneficiaries remained particularly low; as the “olive-tree pruning” module which appears to be the most interesting to the farmers eventually mobilized only 34% of them against only 15% for the “phytosanitary treatment” module. In oasis areas, the project's training benefited the farmers surveyed in proportions far higher than in PMH areas, for all the modules delivered: with a minimum of 41% for the “phytosanitary treatment and biological control” module and a maximum of 57% for the “in-vitro plant and sucker planting and maintenance” module. We note, in these areas, that the participation rate increases with the size of farm, for all six modules delivered.

Table 6. Surveyed farms who received training (PMH)

		Class-Size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Farms surveyed		190	100	80	100	90	100	360	100
Farms trained	Olive-tree pruning	58	31	26	33	39	43	123	34
	Soil tillage and fertilization	47	25	16	20	26	29	89	25
	Phytosanitary treatment	23	12	7	9	23	26	53	15
	Olive harvesting	45	24	18	23	33	37	96	27

Source: Survey ME-16

Table 7. Surveyed farms who received training (Oasis)

		Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Farms surveyed		71	100	101	100	187	100	359	100
Farms trained	In-vitro plant and sucker planting and maintenance	23	32	53	52	128	68	204	57
	Tuft pruning and cleaning	24	34	49	49	123	66	196	55
	Pollen harvesting and pollination	21	30	48	48	117	63	186	52
	Bunch cutting, staking and bagging	18	25	45	45	101	54	164	46
	Phytosanitary treatment and biological control	18	25	40	40	89	48	147	41
	Date harvesting, drying and preservation	23	32	48	48	109	58	180	50

Source: Survey ME-16

That said, the ratings of the project's training by the beneficiary farmers, AUEAs and co-operatives strongly support their relevance. Indeed, both in PMH and oasis areas, these three beneficiary categories almost unanimously consider all the training modules received either useful or very useful to them.

Table 8. Farmers' rating of the usefulness of training received (PMH)

Module	Rating	Class-Size of total UAA (ha)							
		≤2		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Olive-tree pruning	<i>Respondents</i>	58	100.0	26	100.0	39	100.0	123	100.0
	Very useful	36	62.1	10	38.5	22	56.4	68	55.3
	Fairly useful	21	36.2	16	61.5	16	41.0	53	43.1
	Not at all useful	1	1.7			1	2.6	2	1.6
Soil tillage and fertilization	<i>Respondents</i>	47	100.0	16	100.0	26	100.0	89	100.0
	Very useful	23	48.9	7	43.8	19	73.1	49	55.1
	Fairly useful	24	51.1	9	56.3	7	26.9	40	44.9
	Pas du tout utile								
Phytosanitary treatment	<i>Respondents</i>	23	100.0	7	100.0	23	100.0	53	100.0
	Very useful	9	39.1	4	57.1	17	73.9	30	56.6
	Fairly useful	14	60.9	2	28.6	6	26.1	22	41.5
	Not at all useful			1	14.3			1	1.9
Olive harvesting	<i>Respondents</i>	45	100.0	18	100.0	33	100.0	96	100.0
	Very useful	30	66.7	6	33.3	20	60.6	56	58.3
	Fairly useful	15	33.3	12	66.7	12	36.4	39	40.6
	Not at all useful					1	3.0	1	1.0

Source: Survey ME-16

Table 9. Farmer's rating of the usefulness of training received (Oasis)

Module	Rating	Class-Size of total UAA (ha)							
		≤0.5		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
In-vitro plant and sucker planting and maintenance	<i>Respondents</i>	23	100.0	53	100.0	128	100.0	204	100.0
	Very useful	18	78.3	36	67.9	91	71.1	145	71.1
	Fairly useful	4	17.4	16	30.2	34	26.6	54	26.5
	Not at all useful	1	4.3	1	1.9	3	2.3	5	2.5
Tuft pruning and cleaning	<i>Respondents</i>	24	100.0	49	100.0	123	100.0	196	100.0
	Very useful	17	70.8	36	73.5	91	74.0	144	73.5
	Fairly useful	6	25.0	13	26.5	30	24.4	49	25.0
	Not at all useful	1	4.2			2	1.6	3	1.5
Pollen harvesting and pollination	<i>Respondents</i>	21	100.0	48	100.0	117	100.0	186	100.0
	Very useful	16	76.2	35	72.9	86	73.5	137	73.7
	Fairly useful	4	19.0	12	25.0	28	23.9	44	23.7
	Not at all useful	1	4.8	1	2.1	3	2.6	5	2.7
Bunch cutting, staking and bagging	<i>Respondents</i>	18	100.0	45	100.0	101	100.0	164	100.0
	Very useful	16	88.9	35	77.8	75	74.3	126	76.8
	Fairly useful	1	5.6	10	22.2	25	24.8	36	22.0
	Not at all useful	1	5.6			1	1.0	2	1.2
Phytosanitary treatment and biological control	<i>Respondents</i>	18	100.0	40	100.0	89	100.0	147	100.0
	Very useful	15	83.3	22	55.0	62	69.7	99	67.3
	Fairly useful	2	11.1	18	45.0	25	28.1	45	30.6
	Not at all useful	1	5.6			2	2.2	3	2.0
Date harvesting, drying and preservation	<i>Respondents</i>	23	100.0	48	100.0	109	100.0	180	100.0
	Very useful	21	91.3	35	72.9	79	72.5	135	75.0
	Fairly useful	1	4.3	13	27.1	29	26.6	43	23.9
	Not at all useful	1	4.3			1	9	2	1.1

Source: Survey ME-16

Table 10. AUEA's rating of the usefulness of training

Module	Rating	PMH		OASIS	
		Nb	%	Nb	%
Handling of hydraulic structures (TC1-B)	<i>Respondents</i>	20	80.0	11	39.3
	Very useful to useful	20	100.0	11	100.0
	Not at all useful				
Irrigation network maintenance and servicing (TC-1B)	<i>Respondents</i>	19	76.0	17	60.7
	Very useful to useful	19	100.0	17	100.0
	Not at all useful				
Introduction to entrepreneurship	<i>Respondents</i>	14	56.0	13	46.4
	Very useful to useful	14	100.0	13	100.0
	Not at all useful				
Second order professional organization (GIE)	<i>Respondents</i>	17	68.0	13	46.4
	Very useful to useful	17	100.0	13	100.0
	Not at all useful				

Source: Survey ME-16

Table 11. Cooperatives' rating of the usefulness of training

Module	Rating	PMH		OASIS	
		Nb	%	Nb	%
OPA Establishment and operation	<i>Respondents</i>	21	95.5	16	61.5
	Very useful to useful	21	100.0	16	100.0
	Not at all useful				
OPA leadership and management	<i>Respondents</i>	19	86.40	17	65.0
	Very useful to useful	19	100.0	17	100.00
	Not at all useful				
Introduction to entrepreneurship	<i>Respondents</i>	20	90.9	13	50.0
	Very useful to useful	20	100.0	13	100.0
	Not at all useful				
Second order professional organization (GIE)	<i>Respondents</i>	21	95.5	22	84.6
	Very useful to useful	21	100.0	22	100.0
	Not at all useful				

Source: Survey ME-16

However, in the case of *the “Expansion” sub-activity* in rain-fed areas in particular, *the assessment of the objectives’ relevance to the needs and expectations of beneficiaries has highlighted two quite different perceptions*. According to the *first one*, which is largely dominant in the discourse of the interviewees, *the project objectives meet their needs*: they tend to strengthen and diversify the production capacity of their territories, create new economic dynamism (especially for underemployed youth) and give hope for a better situation. However, the *second* perception considers that *the actual needs of territories are more of a socio-economic nature, mainly related to the need for equipment and*

basic social services). In this case, the project is *perceived more from the perspective of “seizing the opportunity”* and taking advantage of its immediate benefits in terms of the free services provided (seedlings, work maintenance, training, etc.) and the income derived from the jobs generated by the performance of the work. This difference in perception has led to the emergence of sometimes conflicting behaviors within the communities in the relevant perimeters and territories, which will certainly weigh on the conditions for carrying out this sub-activity and on its performance.

2.1.2.2. The Needs of Beneficiaries Downstream of Production

All findings on *value-adding* and *marketing* of agricultural production in general and of fruit tree production in particular, are unanimous that they still face *many deficits*: lack of *infrastructure*, *deficient value-adding techniques*, *opaque marketing channels*, *inadequate human and material resources*, *inefficient producer marketing strategies*, *informal commercial operators’ stranglehold*... These two links in the value chain therefore continue to act as a *bottleneck* to the development of fruit tree sectors in Morocco, often depriving producers, in particular the poor, from benefiting from the commercial added value generated in the distribution channels. In this context, the objectives set by PAF downstream of the sectors address these problems perfectly.

In the project’s target areas, the marketing issue is even more acute than elsewhere. Both these areas and their producers face a variety of constraints, including infrastructure (in particular highways and access roads) and often inadequate and/or obsolete commercial equipment (markets, packaging units, storage, cold), isolated production sites², remoteness from major urban centers, low volumes produced and the generally deficient economic flexibility of small producers (transport and financial resources). In the context of the project's intervention areas, *producing is not enough to ensure a decent income for small producers*; the costs of production post-harvest and marketing operations are often not affordable to them. Already, the feasibility studies conducted under contracts TC-1A and TC-1B have widely documented this issue of increasing the value and marketing of agricultural products in these areas, and stressed the need to provide solutions for addressing them. All these elements as well as those reported through the following boxed texts testify to the existence of a real need among the targeted farmers and therefore reveals that the objectives set by the Fruit Tree Productivity Project for the downstream target sectors are perfectly in line with producers' concerns and expectations.

² Several requests submitted by the beneficiaries to the project and contractors have focused on the problem of isolation of territories and perimeters, to which some of these companies responded favorably by carrying out small works and building tracks at their own expenses. These achievements were later described in the project documentation as “facilitating social actions” or “social and societal actions”.

Box 12. A clear need to help OPAs improve their governance and performance!

In the PAF zone, most OPAs target the realization of benefits (about 42% of surveyed OPAs), improved product quality (25%) and higher production (17%). Those seeking *to build their members' technical capacity are very weak*. Also, all surveyed OPAs state that they have a formally written statutes. But 80% only have written rules of procedure. A majority of them have never amended the statutes or rules of procedure *despite some management problems encountered over the course of their exercise*. With regards to governance, the analysis of the data collected at the PMH area level shows that in 45% of cases, *decisions are often made by the president alone. This has created conflicts and a climate of lack of confidence between members, thus hampering the strategic decisions of OPAs*.

In addition to these internal operating constraints, other *external* constraints are reported by respondents at the PMH area level and are either of a geographical (92%), *economic* (96%), *institutional* (88%), *political* (70%) nature, *or related to the lack of training* (90%) and *mentoring* (57%).

Source: Contract ME-12A, Phase 2 Report: Analysis of olive and date tree value chain - Case of olive oils, January 2012.

Box 13. A real need to support the target processing units in the target sectors

Deficiencies in olive oil value chain:

- *In terms of manufacturing and hygiene practices:* Overall, crushing units do not comply with good manufacturing practices... They do not have a laboratory for the physico-chemical characterization of olive production and individual oil storage... There are sometimes poor hygienic conditions, especially within traditional units... Many failures are noted with regard to conformity with previous programs, making it crucial to upgrade the crushing units.
- *In terms of waste and by-product management:* Olive crushing units discharge two types of effluents: liquid (vegetable water) and solid (pomace). Vegetable water is often discharged into the environment, without any prior treatment. Pomace is sold as fuel, and is rarely used for residual oil extraction. More than half (58,8%) of the crushing unit owners surveyed confirm that they are not aware of the charges introduced by Decree N° 2-04-553 of 13 Hijja 1425 (January 24, 2005) relating to discharges, spillage, disposals, direct or indirect deposits in surface and ground water .

Source: Contract ME-12A, Phase 2 Report: Analysis of olive and date tree value chain - Case of olive oils, January 2012.

PAF has implemented three types of measures as part of *gender mainstreaming*: institutional gender capacity-building; strengthening of beneficiary women's skills as well as socio-economic and decision-making capacities; implementation of Women's Pilot Projects (PPF). *All of these measures proved relevant to the needs identified and in view of the deficiencies in gender mainstreaming that affected the agriculture sector before the project*. Activities under the cross-cutting axis of the gender mainstreaming strategy have been relevant in view of the need for women's integration into the economic fabric and the creation of income-generating activities for them. The relevance of PPFs is supported by their contribution to fulfill three categories of actual needs as expressed by the women's community: improving their income; professionalizing their know-how; facilitating greater access to the market, resources and various relevant sectors. Meeting these needs also means ensuring upstream/downstream integration, as PPFs are part of the "weak" links in value addition-marketing. The relevance of the Fruit Tree Productivity Project objectives through its gender prescription has been largely substantiated and justified: the representatives of women's co-operatives have greatly appreciated the project's gender measures and show their support for the targets it had set.

2.1.3. Compliance of the Fruit Tree Productivity Project with Agricultural Policies

Both through the objectives it has set and the principles and approaches used to implement its activities, PAF as a whole is perfectly in line with the country's current agricultural policies. Two arguments support this assessment: its design has been jointly developed by MAPM and MCC; the new strategy for the development of Moroccan agriculture has internalized it by making it one of the founding matrices of its design. In fact, the Green Morocco Plan focuses on two pillars. Pillar I aims to develop modern, efficient and value-added agriculture subject to market regulations and supported by private investors based on models of aggregation. Pillar II focuses on developing *solidarity agriculture* through a substantial improvement in the income of nearly 600,000 small farms over a 10-year horizon. Both in terms of design and content, this pillar has *a strong similarity with PAF* insofar as it also revolves on *three types of projects*, namely: reconversion, intensification and diversification projects. Also, like PAF, the Green Morocco Plan and more specifically the third foundation of Pillar II has also made the choice of providing small-scale farming with the same technical support services (training, mentoring and technical assistance) for improving productivity and supporting conversion into high-growth sectors. By integrating the GIE and Catalyst Fund component, the project has anticipated the Green Morocco Plan's vision to encourage self-aggregation in rural areas.

Box 14. The three types of projects of the Green Morocco Plan's Pillar II (PMV)

1. **Reconversion projects** aim to bring about a *major transformation in the current production systems, which are primarily dominated by cereal cropping, to high value-added orchards*, mainly Olive trees with 77% of the target cereal land, Almond trees (9%), Fig trees, etc.
2. **Intensification projects** are intended to improve the existing gains in livestock (for example ANOC) and vegetable sectors. This was carried out through *farmers' mentoring* to help them improve their husbandry techniques and substantially increase their productivity and increase the value of their production.
3. **Diversification projects** consist of providing support for *the promotion of special or local products* in order to create additional agricultural income with other productions (saffron, honey, medicinal plants, etc.).

And like PAF, one of the fundamental orientations of the Green Morocco Plan involved the professionalization and structuring of small and medium-sized farms, their integration into and transition to business logics, and the strengthening of vertical coordination among agricultural sectors for a better use of territorial potentialities and market opportunities. Also, by adopting an integrated upstream and downstream sector approach, by building the technical, managerial and organizational capacities of beneficiaries, PAF is perfectly in line with developments in the agricultural policy.

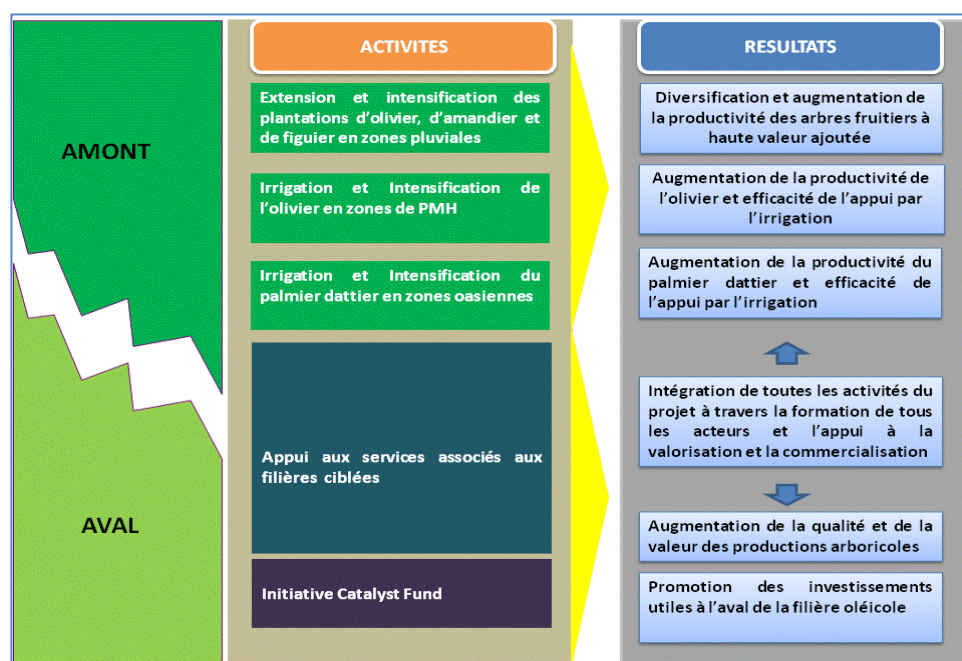
Box 15. The seven pillars of the Green Morocco Plan's Strategy (PMV)

1. Making agriculture the main driver of growth over the next 10 to 15 years.
2. Adopting **aggregation** as an organizational model of agriculture.
3. Promoting **private investment**.
4. Ensuring the **development of Moroccan agriculture** in its entirety without any exclusion.
5. Adopting a **contractual approach** to implementing the Green Morocco Plan.
6. **Achieving the sustainable development** of Moroccan agriculture.
7. Preparing the **redesign of the sector framework**.

2.2 Consistency

The consistency of PAF is assessed from two perspectives: i) internal consistency that checks linkages and synergy between its activities as well as concordance between the various (human and financial) resources and instruments mobilized to facilitate the achievement of established goals; II) external consistency that examines the level of harmonization and synergy of PAF with other government programs and projects, since the project operates in a broader context which not only includes other programs and projects but also other exogenous factors that may affect its performance. The following figure shows the various activities planned by PAF and their linkages to the upstream and downstream target sectors.

Figure 3. Activities planned by PAF in the upstream and downstream sectors and their expected results



2.2.1. Internal Consistency

2.2.1.1. Interlinking/synergy between PAF Activities

The focus on upstream growth, the value chain approach used, the cross-cutting technical support services provided (upstream-downstream) and the targeting of all links in the value chain of the target sectors are *prima facie* the premises for PAF's good internal consistency, if not for a high degree of synergy between its activities. In fact, in its initial design, the project's intervention included four activities:

- ***Rain-fed Olive, Almond and Fig Tree Expansion and Intensification***, the overall purpose of which is to contribute to the sustainable improvement of small-scale farmers' incomes through the intensification and rehabilitation of existing orchards, and expansion of tree crops by converting hillsides planted with cereal crops to new high-value, perennial olive, almond and fig orchards. According to PAF's design and intervention logic, the expected results of this activity should contribute to reducing the volatility of agricultural production and increasing the volume and value of fruit tree production and have medium and long term spillover effects on increased economic growth and reduced poverty in the target areas.
- ***Olive Tree Irrigation and Intensification in PMH areas***, the primary goal of which is to increase the efficiency of water-use through the upgrading of existing irrigation infrastructure and encourage farmers to use improved crop husbandry techniques to enhance the yield and profitability of olive production in the target areas.
- ***Date Tree Irrigation and Intensification in Oasis areas***, the primary goal of which is to increase the efficiency of water-use through the upgrading of existing irrigation infrastructure and encourage farmers to use improved crop husbandry techniques to enhance the yield and profitability of date production in the target areas.
- ***Fruit Tree Sector Services*** This activity cuts across the previous three. Its goal is to ensure the success and integration sought by the project through a variety of critical value chain support services, including technical, organizational and managerial capacity building for farmers, agricultural professional organizations and other actors in the targeted fruit tree value chains.

The analysis of this design of PAF shows that for each of these three intervention areas (Bour, PMH, Oasis), the relevant activities are organized around *two different yet complementary types of intervention* : the *strengthening of the core resources of agricultural production in the targeted perimeters* (expansion of plantings in “Bour” areas, hydro-agricultural development in PMH and oasis areas); *capacity-building for actors in the various links of the targeted value chains* (training, mentoring and technical assistance). This constitutes another way of confirming the integrated nature of the intervention approach adopted by the project as well as the synergy between its activities.

2.2.1.2. Consistency of Resources and Approaches Mobilized with the Objectives Set

Consistency of the resources mobilized with the objectives set

The resources mobilized by PAF to meet the objectives set took the form of various major contracts, the scheduled tasks of which are either common or specific to its various activities and sub-activities:

- Originally, the project planned to carry out a series of strategic and technical studies, design and execution plans, and supervisory technical assistance services. These cross-cutting tasks, the overall aim of which was to better prepare the launch of the work in order to proceed with high visibility, have been the subject of Contracts TC-1A and TC-1B with two consortia of national companies. However, evaluation report ME-2 reported that these studies and plans have been too standardized in view of the perimeters' agronomic and socio-economic specific features.
- Contracts TC-3A and TC-3B are respectively intended to carry out the rain-fed expansion and hydro-agricultural development works in irrigated areas (PMH and Oasis), through the awarding of several procurement contracts in favor of national and foreign companies.
- Contracts TC-5A and TC-5 are specific: they focus on the upstream and downstream targeted sectors and are designed to provide training, technical support and mentoring services for beneficiaries, professional organizations and operators in the olive, almond and fig tree value chain under the first contract and in the date tree value chain under the second.
- The implementation of PAF downstream from production in the targeted sectors, was also carried out through other service provision contracts that were assigned either to agricultural research and training institutions (IAV, ENA, INRA ENFI) which is the case for Contract TC-4A, or to private companies (TC-6B and TC-9).

The content and organization of these contracts certainly testify to the consistency with the objectives set for the various activities of PAF. However, field implementation subjected this consistency to severe hardships, thus revealing the risks surrounding its design and consequently leading to *reviews and re-scopings of its activities*.

As part of its usual procedures, MCC has financed, during the period between the signing and the enforcement of the Compact, a series of preliminary activities through the Compact Implementation Funding (CIF). This constitutes an advance payment on the total amount of financing provided for under the Compact. The purpose of this period is to prepare for the implementation of the program planned and its first activities. In the case of MCA Morocco, this period lasted almost a year (August 31, 2007 to September 15, 2008). The funds made available during this period were used, inter alia, to finance *conceptual and feasibility studies, environmental and social assessments, rehabilitation action plans*. In addition to the difficulties inherent to the social complexity of the zones of intervention, the

studies and works for the rain-fed expansion and hydro-agricultural developments in irrigated areas undertaken in the pilot perimeters during this period have shown *significant cost increases over their initial estimates*. Since the initial budget wasn't adequate to achieve the planned objectives, the project's ambitions had to be lowered, resulting in a re-scoping of targets for the relevant activities and sub-activities.

Target revision/re-scoping for the “Rain-fed expansion” sub-activity. There were several re-scopings in the specific targets for the “Expansion” sub-activity. Originally, the rain-fed expansion involved a total area of 120,000 ha of olive, almond and fig trees. This target was gradually reduced, by the end of 2010, to around 61,000 ha, of which 58,000 ha for olive trees and 3,000 ha for almond trees, to the benefit of some 40,000 beneficiaries. There are two main reasons for such a reduction: the unexpected additional costs revealed by the plantings carried out during the pilot phase; the multiple challenges posed by the social complexity of this intervention on the ground. In 2011, this sub-activity underwent another significant revision, upward this time, since its overall target was increased to 81,000 ha (of which 76,000 ha was for olive trees and 5,000 ha for almond trees), representing an additional program of 20,000 ha financed through the reallocation of US\$ 35 million (MAD 290.5 million) which was initially planned as the contribution of the Government of Morocco for the Artisan and Fez Medina Project’s “Makina” component.

Target revisions/re-scoping for activities in irrigated areas (PMH and Oasis). In these areas, revisions involved the hydro-agricultural developments for which the financial resources originally anticipated have proved insufficient given the cost overruns reported on the works performed under the contracts (TC-3B1) awarded during the preparatory phase. These cost overruns were partially offset by the increased amount of land targeted compared to initial projections, ultimately leading to a cost overrun of +18% per hectare. Thus, the agricultural area of all perimeters targeted by these improvements in irrigated areas (PMH and Oasis) went from 43,000 ha to 53,000 ha, representing an increase of 23%. In fact, the re-scoping of the MCA-Morocco Program established in 2012 helped release additional resources for PAF which were primarily directed at hydro-agricultural developments. This helped design and implement a major complementary program of work with a twofold justification: restoring the usefulness and relevance of a number of downstream structures and developments through the rehabilitation of defective upstream structures, and addressing some of AUEAs’ grievances. Revisions also focused on date tree intensification in oasis areas, the specific targets of which developed as follows: provision and planting of 250,000 in-vitro plants (instead of 282,500) and 140,000 date tree offshoots selected from existing trees (instead of 60,000) and cleaning of 140,000 and then 170,000 (instead of 222,500) date tree tufts. As a result, the number of date trees has hardly decreased (530,000 instead of 560,000). All such revisions have been carried out while maintaining the number of perimeters initially targeted both in PMH and oasis areas.

Introduction of the Catalyst Fund Initiative. This initiative, which was not included in the initial design of PAF, was introduced in 2011 to consolidate the project's “*Increased value of production*” component. Its main purpose is to promote useful investments downstream of the olive production chain, while strengthening vertical coordination as a lever for improving quality and integrating the environmental, social and gender dimensions. The idea behind the CF was to be able to equip GIEs with their own specialized crushing unit by endowing them with a subsidy for its acquisition. Funding for the CF was provided by the MCC fund released from the removal of Artisan and Fez Medina Project’s “Makina” component following the Compact's re-scoping approved by the COS on October 19, 2010. With an amount of US\$ 21.2 million, the CF Initiative is intended to contribute 50% of the investment required for the creation of new modern crushing units (construction and equipment) by GIEs; the remaining 50% being distributed between a subsidy from MAPM (30%) and the beneficiaries' contribution (20% including 5% by self-financing and 15% by loan with CAM). This package does not include the working capital for GIEs remain fully responsible. The integration of this initiative has undeniably strengthened the consistency of PAF and has given it greater credibility in the eyes of beneficiaries. The re-scoping approved on October 19, 2010 by COS, more than two years after the enforcement of the Compact, and which led to the introduction in 2011 of the CF component, was conducted without any changes to the total amount of the contributions of MCC and of the Kingdom of Morocco (Table 12).

Table 12. Allocation of the MCA-Morocco Program’s resources (US\$ Million)

Projects and Activities	Before re-scoping		After re-scoping	
	MCC’s contribution	Morocco’s contribution (*)	MCC’s contribution	Morocco’s contribution (*)
Fruit tree cultivation	300.9	2.9	300.9	42.9
Small-scale fishing	116.2	22.8	116.2	22.8
Artisan and Fez Medina Project	111.9	40.0	57.8	0.0
Functional Literacy and Vocational Training (**).	0.0	0.0	32.8	0,0
Financial services	46.2	0.0	46.2	0.0
Business support	33.9	0.0	33.9	0.0
Public-private Partnership (***)	0.0	0.0	21.3	0.0
Administrative management	67.7		67.7	
Monitoring and evaluation	20.7		20.7	
TOTAL	697.5	65.7	697.5	65.7

(*) Direct contribution to the Program only. Indirect contributions of the Kingdom of Morocco are not quantified in the MCA.

(**) Activity combining and complementing the Program's AFFP components after re-scoping.

(***) Later to become the Catalyst Fund Initiative and to be integrated into PAF as a separate activity.

The integration of the CF has, albeit belatedly, undeniably reinforced the synergy between the project activities and improved its overall consistency. It has also been a key motivation for farmers' integration into co-operatives

Box 16. The Catalyst Fund or the strengthened consistency of PAF!

- The CF has been a great source of motivation for farmers, whose membership in OPAs was not evident as long as they didn't understand the benefits they were likely to derive from doing so. It has contributed to financing the establishment of high-capacity crushing units for GIEs, which helped the project better structure its actions and provide guideline for working in an integrated manner across the sector.
- By providing farmers with their own transformation tool rather than working only with private crushing units, the project's message has become more credible since there is a clear vision of all activities performed throughout the olive production chain. These GIEs will thus be able to establish direct partnerships with salespeople and hypermarkets and maybe even consider exporting to international markets.
- An integrated system enables farmers to collect only the amount needed for the crushing, and it also improves quality since olives are crushed immediately after the harvest. Moreover, with larger capacity crushing units, farmers will be able to store their olive oil in better conditions. The harvest period only lasts a few months while the sales period may extend over the year. Before that, farmers had to crush and liquidate their production immediately, but these crushing units with high storage capacity will help them regulate their supply in time and sell when prices best suit them.

The recourse to re-scoping can be viewed from two perspectives. It can be indicative of the disproportionate ambition of PAF's objectives and of their spatial and temporal dimensioning. It can also be an indicator of the project's ability to deal with the unexpected and to reconcile its original goals with the constraints encountered in the field. While re-scopings have significantly reduced the number of beneficiaries, they were done under acceptable conditions. They have sought to fulfill the commitments towards MCC and the beneficiaries. They have also led, in successive steps, to an effective improvement in the coherence of the project's intervention with the claims of beneficiaries and of the approaches adopted for its implementation. This certainly attests to the existence of proven engineering skills for large scale projects and programs in the country.

Box 17. Engineering in action: From the re-scoping of targets to the re-scoping of the terms of performance!

One of the key findings emerging from the completion of the "Expansion" sub-activity: *"There have been changes in the technical tender documents as the crop planting and maintenance work has progressed. Changes have focused, on the one hand, on aspects which proved difficult to implement by companies, difficult to monitor by technical assistance and/or having an impact on the rising tender price without any significant effect on the success of the plantings. Thus, a total of 4 technical versions of tender documents for TC-3A companies were developed over the TC-1A period.*

The re-scoping of technical specifications focused on a reduction in the number of irrigations, orchard density, disposal of the manure used for seedling planting, etc. This re-scoping enabled to contain the planting costs per hectare at MAD 13,000 for olive trees and between 18,000 and 19,000 DH for almond trees, after exceeding MAD 20,000 under the contracts which were found unsuccessful by the project.

Coherence of technical support services with the objectives set

There is no doubt that the re-scopings done improved the overall consistency of PAF. But the project design remained marred by several other sources of inconsistency whose risks for the implementation of project activities and on its performance appeared at the time of their implementation. This is particularly true in the case of the "Capacity building" component under the "Fruit Tree Sector

Services” activity. The project's “way of working” at this level assumed that training, coaching and technical assistance would change the technical, organizational and managerial knowledge, attitudes and practices of farmers, agricultural professional organizations and other actors in the value chain, which would have a ripple effect and therefore lead to increased productivity and improved production quality, value-added and marketing, and result in the equitable sharing of value added between the various links in the targeted sectors.

Given the multiple *pitfalls associated with any capacity-building program* (low participation, insufficient ownership, low level of commitment, difficulty of adoption, etc.), such an assumption has proven to be very strong and implies risks for the project objectives. This risk is even greater since the very reason why these beneficiaries were targeted by PAF due precisely to their economic indigence and poverty! Under these conditions, even the assumption that farmers cannot be motivated to improve their production if they are not better paid and that this higher remuneration can only be achieved through better farmer organization is proving compelling. A higher remuneration may provide an incentive for the relevant actors to organize themselves better, especially since membership in a professional organization does not cost very much. But when it comes to adopting the recommended practices, their financing capacity becomes a determining factor. However, in the project design, the rehabilitation of olive and date tree orchards as well as the further development of existing valorization units remained the responsibility of the relevant beneficiaries insofar as the project only bears the costs of technical support services. The following assessment of the other project performance criteria shows clearly that while the training, mentoring and technical assistance delivered to the different types of beneficiaries are necessary, that doesn't necessarily mean that they have unconditionally adopted the recommended best practices for production, processing, value-adding, organization and management. They still need to have *the financial capacity to do this!*

Consistency of implementation approaches with the objectives set

In order to implement the activities planned, the design of PAF advocates adopting highly relevant approaches: territorialization of interventions, participation of beneficiaries, integration of the upstream and downstream target sectors, integration of environmental, social and gender dimensions, outsourcing. While these approaches are consistent with the objectives set by the project, the fact remains that their successful deployment and feasibility is not a foregone conclusion. It depends on their basic design, their perception by the stakeholders involved, and the effective conditions for their use. This constitutes the many sources of possible inconsistencies in project design, and of potential risks for its performance.

Participation under PAF: supporting a preconceived program. In the Moroccan context, as in others, the concept of participation has experienced mixed success. Although it only involved at first the support of beneficiaries for the implementation of the predefined activities that were offered to them

(training courses for example, it has since been extended to their participation in the design, implementation and monitoring and evaluation of the activities intended for them). A review of the design documents of PAF, of the contracts with providers of technical assistance and technical support services, and of the agreements entered into with beneficiaries clearly shows that *the participation adopted by this project has more to do with the consultation and participation of beneficiaries in the implementation of its activities than with their effective accountability on the whole process, from the diagnosis, identification of solutions and setting of priorities, through the implementation and ongoing management of interventions. In operational terms, the strategic objective for the proponents of PAF was primarily to prompt potential beneficiaries to join in the intervention program preconceived by its designers and to contribute to its implementation.*

Box 18. Participation under PAF: joining in a preconceived program

Commitments required by PAF from producer organizations (MAPM Program - Producer organizations Contract): "The present contract falls within the framework of the participatory approach adopted by the project for carrying out the planned activities. ... The organization is committed to: ensuring the effective participation of beneficiaries in the implementation and monitoring of the works for the development of perimeters and establishment of plantings; maintaining the new plantings and benches as well as any other work carried out from the third year following their establishment and ensuring sustainability of actions after the project; increasing the awareness of members to take an active part in the training sessions held by the project."

Guidelines of PAF for providers (TOR of consultant TC-1A): "It should also be noted that the implementation of all interventions planned as part of the project will be carried out using a participatory approach involving beneficiaries at all phases of delivery. ... The Consultant will have to take into account the major socio-economic and environmental factors in the development of their delivery approach for this activity. It is important to note that the implementation of all planned activities will require a participatory approach involving beneficiaries at each stage of the process."

Guidelines of PAF for providers (TOR of consultant TC-1B): In his/her approach, the consultant will take into account socio-economic and environmental considerations which are important for the implementation of all tasks. It should also be noted that the implementation of all interventions planned under the project will be carried out using a participatory approach involving beneficiaries at all phases of delivery. This participation, which will be facilitated by the organization of beneficiaries, remains a fundamental element that is key to ensuring the sustainability and continuity of project interventions.

Information and awareness-raising meetings held as part of the locally-led consultative process were mostly used for the announcement and formulation of an "intervention offer" in which the potential beneficiaries were asked to participate. The meetings held as part of this process with the beneficiaries and their representatives were devoted to inform and raise their awareness of *the project and of its implementation modalities*, and present them with the *approaches it has adopted and its requirements in terms of beneficiary commitment and participation in its various implementation stages*. This shows that *the approach of PAF has more to do with a "membership offer" than with a "call for participation" for beneficiaries!* Of Course, the complaints expressed by the invited beneficiaries were collected and promises to take them into account were made to them, but with no guarantee of integrating them into the project planning process insofar as *its interventions had been predefined*. In the case of the *rain-fed expansion* sub-activity for instance, the "miracle" solution developed around olive trees does not seem to be accepted everywhere, and this speculation is often compared to carob

trees, vines and extensive farming. In other words, olive trees are not perceived everywhere as the best alternative, more especially since, in practice, they were a predefined choice that was imposed upon beneficiaries. Technical feasibility studies were more focused on whether olive trees are appropriate to the characteristics of the targeted territories than on the search for the best alternatives. *This is incompatible with one of the strong principles set forth in the conceptual framework of PAF and with the directives assigned to providers of technical assistance and technical support services, which stress that account must be taken of the specific features and needs of beneficiaries in each target perimeter, in other words the territorialization of project interventions at this scale.*

Also, the project has not used a consistent communication strategy to support its intervention strategy with its key partners and target groups. Understandings of the project vary depending on the areas, perimeters and types of beneficiaries: the information provided is not harmonized and standardized. This opened the door for rumors to which providers of technical assistance and technical support services as well as contractors have contributed to recruit project beneficiaries. Leaving aside their level of truthfulness, the level of sophistication of the statements enabled the leading associations, technicians, providers etc., to serve interrelated interests, in this case by securing the beneficiaries' consent while positioning themselves in place of agricultural services, the legitimate proponents of the information.

Box 19. Instrumentalizing the principles of PAF to recruit the beneficiaries!

"Also, given the absence of pesticides and chemical inputs, the proposal for an organic management of **orchards** was discussed at length as an alternative **to be advocated in certain areas**, in particular Khenifra. It has been agreed, however, that we had to consider providing support for the farmers through training on good farming and marketing practices (labeling, certification, etc.)."

"The clarifications of the group of research firms were as follows: The integration of organic farming into the project will depend on the field studies which should take account of the specificities of each area. **Organic production may be considered in the light of the specificities of each perimeter.**"

"Replies and clarifications provided by the group's representative: Training of beneficiaries will be delivered at the basin level **while respecting the specific features of the relevant perimeters.**"

"**The development of local know-how** (grafting onto oleasters), preparation and use of compost, biological control, use of drought resistant crop varieties, without recurring to repeated irrigation, or **the introduction of other species like the carob tree (known as "black gold")**, are all equally rich solutions that have been identified."

Source: Report TC-1A: Strategic Environmental Assessment. The consultative process. Final version, 2009

Ultimately, the participation of beneficiaries in PAF was limited to its implementation. Four participation modalities were provided for: two of them through the individuals: participation as hired labor recruited by the companies which have been hired for the execution of works and participation as a trainee; two through the local organizations: facilitating and ensuring the smooth running of actions, monitoring and following up the completion of works.

The results of the two Surveys ME-16 conducted in irrigated areas provide relevant information for assessing the involvement of farmers and their professional organizations in the implementation of PAF. Concerning the launch of the project, these results show that more than 80% of the hundred or so OPAs surveyed reported that they had been informed. They also show that for AUEAs and co-operatives, both in PMH and oasis areas, it is MAPM's services which were their primary source of information on the project launch. Local authorities, research firms and technical assistance were far less informative, while the intervention of elected representatives remained very marginal. About 18% of all OPAs surveyed stated that they had not been informed of the launch of the project; many of these are AUEAs in PMH areas, while in oasis areas these are mostly co-operatives.

Table 13. Sources of information of OPAs on the project launch.

		PMH areas				Oasis areas				Total					
		AUEA		Coop.		AUEA		Coop.		AUEA		Coop.		Total	
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
Respondents		25	100	22	100	28	100	26	100	53	100.0	48	100.0	101	100.0
Source of information	MAPM services	9	36.0	14	63.6	18	64.3	15	57.7	27	50.9	29	60.4	56	55.4
	Local authority	7	28.0	6	27.3					7	13.2	6	12.5	13	12.9
	Research firm					5	17.9	3	11.5	5	9.4	3	6.3	8	7.9
	Technical assistance			1	4.5	4	14.3			4	7.5	1	2.1	5	5.0
	Commune	1	4.0							1	1.9	0	0.0	1	1.0
	None	8	32.0	1	4.5	1	3.6	8	30.8	9	17.0	9	18.8	18	17.8
	Cumulative responses	25	100.0	22	100.0	28	100.0	26	100.0	53	100.0	48	100.0	101	100.0

Source: Survey ME-16

Unlike OPAs, the survey results show that in both areas, farmers of all categories were informed on the project launch through several sources at once; however with a much stronger multiplicity of these sources in oasis areas than in PMH areas. They also show that everywhere, it is the information from other farmers which comes way ahead. Next come OPAs, MAPM services and local authorities, followed by research firms and elected representatives.

Table 14. Farmers' sources of information on project launch (PMH).

		Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents		189	100,0	80	100,0	88	100,0	357	100,0
Source of information	Other farmer	129	68.3	48	60.0	51	58.0	228	63.9
	OPA	24	12.7	16	20.0	20	22.7	60	16.8
	MAPM services	22	11.6	19	23.8	26	29.5	67	18.8
	Local authority	53	28.0	14	17.5	9	10.2	76	21.3
	Research firm	2	1.1	1	1.3	2	2.3	5	1.4
	Commune	2	1.1	2	2.5	3	3.4	7	2,0
	Cumulative answers	232	122.8	100	125.0	111	126.1	443	124.1

Source: Survey ME-16

Table 15. Farmers' sources of information on project launch (Oasis).

		Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents		63	100.0	100	100.0	185	100.0	348	100.0
Source of information	Other farmer	29	46.0	41	41.0	101	54.6	171	49.1
	OPA	18	28.6	36	36.0	61	33.0	115	33.0
	MAPM services	7	11.1	16	16.0	31	16.8	54	15.5
	Local authority	9	14.3	15	15.0	11	5.9	35	10,1
	Research firm	4	6.3	3	3.0	3	1.6	10	2.9
	Commune	3	4.8	1	1.0	2	1.1	6	1.7
	Cumulative answers	133	211.1	212	212.0	394	213	739	212.3

Source: Survey ME-16

Surveys ME-16 also helped assess some forms of OPA involvement in the project implementation. The majority of surveyed AUEAs indicated that they had actively participated in the preparation of project interventions and recognized even more widely that they had been consulted on their training needs. Some actions proposed by the project were the subject of adjustment requests from a significant proportion of AUEAs, more than half of which were satisfied with them (Table 16).

Table 16. Forms of OPA involvement/participation in the project implementation

	PMH areas						Oasis areas						Total					
	AUEA		Coop.		Total		AUEA		Coop.		Total		AUEA		Coop.		Total	
	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
surveyed OPAs	25	100	22	100	47	100	28	100	26	100	54	100	53	100	48	100	101	100
OPAs having participated in the preparation phase	14	56	19	86	33	70	20	71	11	42	31	57	34	64	30	63	64	63
OPAs having submitted adjustment requests	22	88	17	77	39	83	13	46	4	15	17	31	35	66	21	44	56	55
OPAs whose requests were taken into consideration	8	36	13	76	21	45	8	62	3	75	11	65	16	46	16	76	32	57
OPAs consulted on their training needs	21	84	22	100	43	91	15	54	14	54	29	54	36	68	36	75	72	71

Source: Survey ME-16

Training for farmers and their sons and daughters is at the forefront of the interventions of PAF where AUEAs and cooperatives surveyed stated that they have been actively involved, followed by awareness-raising on gender and environment. As for the interventions of hydro-agricultural development and installation/equipping of valorization units, it is primarily AUEAs in oasis areas which were actively involved. We note finally the high level of mobilization of cooperatives - in particular AUEAs- in the tuft cleaning and in-vitro plant transplanting operations in oasis areas (Table 17).

Table 17. Project actions in which OPAs reported to have been actively involved

Intervention	PMH areas				Oasis areas			
	AUEA		Co-operatives		AUEA		Co-operatives	
	Number	%	Number	%	Number	%	Number	%
Hydro-agricultural developments	3	12.0	0	0.0	23	82.1	4	15.4
Farmers' training	19	76.0	22	100.0	25	89.3	16	61.5
training for daughters/sons of farmers	11	44.0	14	63.6	24	85.7	10	38.5
Sensitization on gender	11	44.0	8	36.4	20	71.4	11	42.3
Environmental awareness-raising	4	16.0	5	22.7	16	57.1	7	26.9
Installation/fitting-out of valorization units	1	4.0	2	9.1	13	46.4	3	11.5
Cleaning of date tree tufts					23	82.1	11	42.3
Distribution of date tree in-vitro plants					23	82.1	11	42.3

Source: Survey ME-16

By participating in the preparation and/or launching of the project activities, the surveyed AUEAs were basically motivated by the benefits which farmers could derive from them, in particular from the interventions of hydro-agricultural development which they mention as a major lever for improving the incomes and living conditions of beneficiaries, but also for combating desertification. As for co-

operatives, their participation was motivated by their perception of the project as an opportunity to meet the farmers' needs in terms of hydro-agricultural development, production, value-adding and marketing of products, training on good practices for production, management, and advancement of rural women...

Unlike OPAs, only a tiny proportion of surveyed farmers (4.2% in PMH areas and 5.4% in oasis areas), for all farm categories taken together, stated that they had taken part in the project preparation phase (Table 18).

Table 18. Farmers who reported to have participated in the project preparation phase

PMH areas	Class-size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Number	%	Number	%	Number	%	Number	%
	11	5.9	2	2.5	2	2.2	15	4.2
Oasis areas	Class-size of total UAA (ha)							
	0.5≤		0.5-2		>2		Total	
	Number	%	Number	%	Number	%	Number	%
	2	3.1	5	5.1	12	6.4	19	5.4

Source: Survey ME-16

These farmers were also very slightly responsive to the interventions proposed by the project, at least directly, insofar as hardly 8% in PMH areas and 4% in oasis areas took the initiative of submitting adjustment requests for these interventions, but these were taken into account only very partially. This seems to be in coherence with the positive perception they expressed about the project objectives and which the survey has reported. See section relevance). And despite the limited number of cases revealed by the survey, this does not hide the fact that the requests made by oasis inhabitants, although they were half as many, have been more successful (31% against 14% in PMH areas). They were more involved in lobbying by soliciting all beneficiaries much more (including elected representatives), in particular MAPM's services (Tables 19 and 20).

Table 19. Farmers' initiatives for adjusting the project actions (PMH).

		Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents having requested adjustment of interventions		13	7	7	9	8	9	28	8
Party seized	Contractor	4	31	3	43	6	75	13	46
	OPA	7	54	1	14	1	13	9	32
	Local authority	3	23	2	29	1	13	6	21
	MAPM service	2	15	2	29			4	14
	Commune	1	8			1	13	2	7
	Cumulative total	17	131	8	115	9	114	34	120
Respondents whose requests were taken into consideration		2	15	1	14	1	13	4	14

Source: Survey ME-16

Table 20. Farmers' initiatives for adjusting the project actions (Oasis).

		Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents having requested adjustment of interventions		2	3	3	3	8	4	13	4
Party seized	Contractor	1	50	1	33	1	13	3	23
	OPA					3	38	3	23
	Local authority			1	33	3	38	4	31
	MAPM service	1	50	3	100	4	50	8	62
	Commune					3	38	3	23
	Cumulative total	2	100	5	167	14	175	21	162
Respondents whose requests were taken into consideration		1	50	1	33	2	25	4	31

Source: Survey ME-16

The interviews with gender officials at the APP and UGP level, companies and groups in charge of technical assistance, testify to a greater presence of women during the activities associated with plantings, in particular maintenance operations. As with the environmental component, this integration was slow at the initial stage of the project.

Box 20. An illustration of the project's contribution to integrating rural women.

Women's unprecedented participation as workers in carrying out the expansion works was reported in the majority of the twenty sample perimeters. This form of participation was mentioned as a real change like in Beni Oussime where one of the beneficiaries told the mission: *"Before the project, farmers wouldn't allow their daughters to work, women wouldn't even go out.* Now, things have changed and many women have been employed and paid by the company" or at Kouassem where focus group participants found that female labor force has been given priority over male labor force: *" Men made only a small contribution, only women have benefited from the work. One day, we staged a sit-in in response to the situation, but we were persuaded to suspend the protest by the association leaders".*

The territorial approach of PAF and the challenge of its implementation. Despite the promises made during the consultation process to address beneficiary claims and UGP's efforts to meet the guidelines of the recommended approach, providers of technical assistance and technical support services and contractors, both *under time pressure and the requirement to observe the procedures and complexity of field realities*, were often required to shorten and/or adjust the specifications. These adjustments which were made under various labels (re-scoping, adaptation, harmonization, standardization, etc.) affected some of the major principles of the approach advocated by PAF. Thus, the harmonization of feasibility studies, the systematic application of the same eligibility criteria to all perimeters, the standardization of training modules and other technical support services, has deeply eroded the "territorialization" of the intended approach.

Box 21. Harmonization - Standardization versus Territorial Approach.

Given the scope of the perimeters to be covered and the multiple constraints related to the human, material and time resources, technical assistance (TC-1A and TC-1B) found in *the harmonization of feasibility studies* the solution to provide this service within the agreed timeframe. For their part, technical support providers (TC-5A and TC-5B) opted for the *standardization of the training modules and program* so as to deliver them in a timely manner. These two "adaptation" categories inevitably created *contradictions with the territorial and integrated approach advocated by PAF*. The *specific characteristics of territories have therefore not been sufficiently internalized* in the approaches used to conduct the feasibility studies and provide the training, oversight, and technical assistance services for farmers and their professional organizations.

The specific characteristics of the territories and the needs expressed by the beneficiaries have therefore not always been sufficiently internalized in the feasibility studies and technical support services for farmers and their professional organizations. However, MCA-Morocco program's 2007 Synthesis report provides that, in terms of production rehabilitation and value-adding in the various intervention areas of PAF, technical assistance will focus, amongst other things, on *the development of an action plan setting out the actions to be undertaken for each perimeter* and oversight of the implementation of this program". *Except that the same document already sets out the training themes on which the project will focus its intervention.* This confirms the choice made by the designers of PAF from the beginning, according to which beneficiary involvement will only be requested during the implementation of its interventions, while revealing *an inconsistency in the initial project design.*

Box 22. Manifestations of an original inconsistency in the design of PAF!

For existing olive orchards in rain-fed areas: The proposed intensification operations will focus on the most determining farming methods for production quality and quantity, namely: tillage, pruning, fertilization and plant protection.

For existing olive orchards in PMH irrigated areas: The proposed rehabilitation interventions will involve improved irrigation conditions, pruning, fertilization and plant protection for existing olive orchards. This rehabilitation will be carried out by the farmers receiving close oversight and appropriate training which will be covered by the project. Expenses for the rehabilitation of orchards are estimated at MAD 136 million and will be borne by the beneficiary farmers.

Training: Training is a fundamental tool to improve the productivity and competitiveness of the target sectors. Its main purpose is to improve the level of technical development and performance of the various value chain operators. ... In this context, the project will include the development of a training plan addressing the needs of the various categories of players involved in the target sectors, namely the farmers as well as their sons and daughters, the owners and technicians of valorization units, the producer co-operatives and associations and the technicians from the ministry's management structures.

Training for DPA and ORMVA farmers. The main training modules planned are impluvium construction and maintenance, appropriate irrigation techniques, tillage and fertilization, orchard pruning techniques, diseases and parasites for the various species (olive, almond; fig and date trees) and control methods as well as production harvesting and storage techniques.

MCA-Morocco Program, Synthesis report, 2007

This original inconsistency was replicated in contracts TC-5A and TC-5B, insofar as the two consultants hired were both required to: I) delivering training modules - *the same as those already provided for in the project design document* - for which the number of beneficiaries trained, according to the target categories, were set and the corresponding costs were quantified; II) using the studies carried out by consultants TC-1A and TC-1B as a basis for their work, in particular *the action plans for olive and date tree rehabilitation and intensification* (PARIOP). These plans were to be drawn up by consultants TC-1A (for perimeters in rain-fed areas) and TC-1B (for perimeters in irrigated areas) and used by consultants TC-5A (for olive trees) and TC-5B (for date trees) as a basis for their services, and complemented where appropriate by conducting the necessary additional investigations, with the object of *developing an approach and intervention plan taking account of the specific characteristics of the relevant perimeters and clearly defining their training and coaching needs and the appropriate modalities for addressing them.* As described below, these inconsistencies will cause a number of problems which will affect the conduct of the project activities and therefore their performances.

Box 23. Establishing PARIOPs: one of the tasks of consultants TC-1A and TC-1B.

TC-1A: Developing specific action plans for rehabilitation perimeters: Preparing the technical action plans and associated documentation required for the perimeters selected for rehabilitation. *Developing a list of recommended interventions to be carried out in each proposed perimeter.*

TC-1B: Action plans for the rehabilitation and intensification of olive and palm orchards: Preparing a detailed description of the relevant characteristics (in particular agronomic) of each perimeter, carrying out a diagnosis of the key issues and constraints in each perimeter, then *producing concrete action plans and appropriate interventions recommended for each perimeter to improve the productivity, value and profitability* of existing olive and date tree orchards .

Box 24. The implementation of PARIOPs: a task of consultants TC-5A and TC-5B.

TC-5A- Upstream production tasks : The consultant shall analyze the reports of action plans for the rehabilitation of olive, almond and fig orchards in rain-fed areas (developed under contract TC-1A) and the action plans for the rehabilitation of olive orchards in irrigated areas (developed under contract TC-1B) and carry out the necessary supplementary investigations with the aim of developing an approach and intervention plan clearly defining the training and coaching needs of the perimeters of the "tranche" concerned and how to address these needs. The aforementioned plan of intervention, which will be developed for each of the four areas (equivalent to groups of provinces), shall take into account the specific characteristics of the perimeters concerned and shall draw up a typology of these perimeters according to the production, valorization or marketing methods which will be established in coordination with the professional organizations of the beneficiaries concerned. ... The content of tasks presented hereafter is given for indicative purposes only. Qualitative and quantitative adjustments will be made according to the above-mentioned plans of intervention.

TC-5B: Relationship with TC-1B: "Consultant TC-5B shall be called upon, at the time of performance of the contract, to take into account a certain number of studies carried out by TC-1B as a basis for their work. These studies are the following: Action plans for the Rehabilitation and Intensification of Date Palm orchards (PARIP) concerned by hydro-agricultural developments."

Feasibility of the technical specifications recommended by PAF. Delimitation of intervention perimeters based on "*objective eligibility criteria*" allowing for "homogeneous" perimeters, has been a milestone for launching the activities of PAF. This task was assigned to technical assistance, with the help of MAPM's various field offices. Although conceptually relevant, this procedure proved much more difficult to implement. The following examples drawn from the final assessment of the "Expansion" sub-activity may be cited here.

■ **Perimeter homogeneity.** The involvement of PAF in homogeneous perimeters was considered as one of its strengths, if not one of its original features. But the difficulty in meeting that target was not fully appreciated in the initial design. On the visited lands, the perimeters are not always a continuum of plantings and exhibit areas of scattered planting blocks. This heteroclite layout is a consequence of the significant impact of the socio-ethnic and property dimensions and of some farmers' refusal to join the project. In fact, technical aspects were given greater prominence by feasibility studies than socio-cultural and legal dimensions. Although awareness-raising, broader consultation and OPA creation were vital phases to prepare the execution, they were often carried out under time pressure, by restricting to leaders, notables and key people of influence, and relying more on "the following behavior". Thus, social awareness-raising and its corollary ownership of project intervention were often incomplete.

■ **Perimeter eligibility criteria.** While feasibility studies and perimeter delimitation in particular, based on "*objective eligibility criteria*" are logical stages compliant with the requirements for a better intervention, the fact remains that farmers' reluctance and objections were sometimes insurmountable. From a technical viewpoint, perimeter delimitation was hampered by the insufficient human and material resources locally mobilized. Even provincial level MAPM officials found this stage, through its complexity, scope and programming, to be well above

their human and logistical resources. Beni Mellal's DPA argued this difficulty as follows “*The imposed eligibility criteria were both too many (a total of 19) and not easily appropriated by our field technicians*”. This is also the case for some technical assistance technicians for whom the systematic application of these criteria was a hard task in view of the field realities: they are not territorialized, nor ranked or substitutable. The dilemma between “applying the rules strictly” and “adapting to realities in the field” has constantly been a common discrepancy between UGP and technical assistance teams, and between the latter and target groups. This was the basis of the disturbances recorded in launching the planting work in several perimeters.

- *Perimeter size.* Since PAF is part of an effort to implement territorialized, economically viable projects focusing on the development of high value and growth fruit tree sectors, large perimeters were designed. Although this is certainly a relevant choice both for a structuring intervention and a matter of scale economies, realities in the field have not often been favorable to the realization of this option. During the launch phase, amendments to rectify the areas provided for in the technical feasibility studies involved 20% of projected perimeters. In several perimeters, the negotiations and task forces with beneficiaries were given priority in determining the final acreage of intervention perimeters. This led to a change in the targets of the “Expansion” sub-activity in terms of perimeter number and acreage. In the course of the project, large perimeters caused serious problems for contractors, owing to the social problems and insufficient logistical and technical resources which they mobilized. The relevance of large perimeters also ties into another economic issue related to economies of scale. The average cost per hectare should normally decrease with the increase in perimeter acreage; but this premise has not been confirmed in the case of expansion perimeters.

The outsourcing challenge. PAF was designed in a context that was marked by a strong will from the State to support agricultural development, while changing its role. MAPM’s services indeed moved from a role of direct development operator to one of donor and designer of projects to be implemented through greater recourse to private operators. Also, one of the distinctive features of its design was that it relied on private companies to ensure its preparation, implementation, execution, technical support, monitoring and follow-up. This outsourcing materialized through several procurement contracts concluded in the form of often substantial, separate lots. However, *the use of outsourcing assumes that the proponents and initiators of PAF, namely APP, UGP and MAPM services (in particular those in the field) have taken ownership of the project and have the necessary capacity and resources to ensure the satisfactory fulfillment of the tasks for which they are responsible. It also assumes that the service providers and contractors hired have the human, financial and material resources, and managerial capacity to carry out the services agreed upon within the expected time, cost and quality conditions.*

However, several findings and facts prove that this underlying assumptions for outsourcing are proving quite strong. They revealed various risks for PAF in terms of consistency, which the project's M&E system has regularly and pertinently detected and reported, while making recommendations to the relevant decision makers about the measures to be taken to remedy them or at least mitigate their effect. *There were major delays in APP and UGP establishment, thereby delaying the implementation of PAF.* While APP was created in February 2008, it only started to be structured and organized following the appointment of its General Manager on September 15, 2008, only one month from the end of the CIF period. Therefore, when the Compact entered into force in mid-September 2007, it was still in its initial stages. UGP was not structured or staffed during that same period either. Also, and as reported in the mid-term evaluation, the efficiency and effectiveness of this entity are largely dependent on the goodwill of both the staff assigned to it and MAPM's services, which is incompatible with the project's ownership by these services, especially since they are responsible for ensuring the continuity and consolidation of its achievements. We have had the opportunity to observe this during PAF Final Workshops held in June 2013, whose works were inaugurated by MAPM's Secretary General but which no head of central, regional, or provincial services attended!

Box 25. Which ownership of the project by the staff of MAPM services?

The statement of facts established by the mid-term assessment: UGPs include civil servants, temporarily assigned to performing the Compact within their administration. While the compact offered them valuable experience, this assignment is of little interest in terms of career progression. With the idea of motivating seconded officials, the Compact plans to pay them compensation which often exceeds their wage. Despite this, and despite the control procedures introduced, the efficiency and effectiveness of UGPs' work are heavily dependent on the goodwill of their personnel. UGP members are, in turn, often dependent in their work of the intervention of their civil service colleagues, who are not entitled to compensation. Here too, progress depends greatly on the goodwill of people, APP having ultimately little influence on the work carried out by the civil servants assigned to UGPs, despite the premiums it pays them.

Observation one year from closeout: Since the planting work was not completed by the due date, the September 2012 Quarterly performance report of PAF considers that owing to the remaining duration of the Compact, it will not be possible to ensure the plantation maintenance during 15 months for replacement perimeters and even less for perimeters of the last tranche for which contracts require a minimum maintenance of 18 months. As it recommends, inter alia: I) Increasing the involvement of decentralized MAPM teams and especially at CT level in order to ensure effective management of possible problems of beneficiaries' refusal and/or reluctance likely to cause even more blockages to the smooth running of planting activities; II) Speeding up post-compact preparation in order to ensure that MAPM structures will take responsibility for the perimeters that were not completed by the Compact closeout date.

MAPM field offices do not have the additional technical and human resources necessary to perform the extra work arising from project implementation. This observation had been revealed by the mid-term assessment and hasn't changed since.

Box 26. The lack of human resources of MAPM's outreach services!

The project management plans continuity and a supervision plan of works involving specific resources and the allocation of local resources of the DPAs and ORMVAs concerned. However, the latter do not have their own additional technical and human resources to face extra work to deal with a significant additional management work and sometimes have difficulty with scheduling. In some DPAs, there is one extension agent for every 9 rural communities, being 10,000 farmers: it is materially impossible for extension agents to follow up and support the perimeters in the light of actual needs. The CMV of Tinghir (Zagora subdivision) and CT of Chichaoua for example, have only one technician each for the follow-up and monitoring of works, which is insignificant considering the dimensions of perimeters in their areas of action and the importance of improvements from which they have benefited.

Contractors did not all have the required capacities and resources to deal with the scope of the tasks to be carried out within established timeframes, which led them to resort to subcontracting. Such subcontracting has led to several problems whose initial manifestations were revealed by the Compact's mid-term assessment and will continue until its completion, and whose effects will impact the performances of project activities in terms of deadlines, costs and qualitative achievements...

Box 27. Poor subcontractor performance.

Apprehension of mid-term evaluation: For project management, MCC introduced new rules into the procurement and contracting process, whose application proved to be problematic: MCC tends to impose legal and environmental standards in the implementation of the Program, which seems more stringent than the standards in force in Morocco. As a result, no regional company offered its services, leaving the way open to a very limited number of large companies, which later sub-contracted work with regional companies thereafter, without providing adequate supervision. The thoroughness of the procurement process helps ensure total transparency in the selection of service providers, but it is time consuming and does not seem to be able to fully ensure the quality of providers.

The statement of facts one year from closeout: Since the planting work was not completed by the due date, the September 2012 Quarterly performance report of PAF considers that owing to the remaining duration of the Compact, it will not be possible to ensure the plantation maintenance during 15 months for replacement perimeters and even less for perimeters of the last tranche for which contracts require a minimum maintenance of 18 months. And it recommends, inter alia: I) Pushing contractors to adequately provide construction sites with sufficient human and material resources to accelerate the pace of planting works and meet the timetable for interviews in order to safeguard the achievements; II) Encouraging the group in charge of AT and supervision of expansion work to strengthen the field supervision teams especially in areas with very few monitoring staff members.

Confirmation at closeout: Subcontracting has been a deliberately accepted convenience to accelerate the pace of works. Such subcontracting has led to several problems primarily related to the low liquidity of sub-contracting companies, lack of supervisory teams, unavailability of material resources, presence of multiple stakeholders on the same site, payment delay and acceptance methods which do not take the task into account but the success of the perimeter. According to the beneficiaries' perceptions, several grievances seem troublesome and offset the benefits of subcontracting: the instructions given to the subcontractors are often unreasonable, they worked without clear instructions, paid scant regard to technical requirements, and were unreceptive to the claims of beneficiaries... Work quality has suffered a severe blow: Since they were recruited by task and for a limited duration, they were often tempted to complete their task hastily in disregard of technical standards (to the point of digging holes at night and planting the seedlings with their plastic bags). In addition, the little emphasis put on the monitoring of subcontractors has increased the number of interlocutors and reduced the opportunities for their monitoring by the relevant stakeholders (CT, CDA, AT).

The use of outsourcing to carry out a complex and major project has as a corollary the involvement of a large number of stakeholders. Under such circumstances, meeting the challenge of outsourcing presupposes that the challenges of communication and coordination between actors have been met. This assumption also entailed some risks for the project. Despite the existence of project management

procedures, communication and coordination between the stakeholders are often marked by initiatives and relationships between people. And where there is communication and coordination, activities are carried out properly and problems are anticipated.

Box 28. The stake of coordination between project beneficiaries!

Organization of work, supervised by DPA's CTs-ORMVA and AT, is not immune from dysfunctions related to social problems with the farmers. In some cases, there was a lack of coordination missed when problems emerged. These problems had not been anticipated by the experts in charge of preliminary studies, the OPAs established under this framework made up within this framework have not played their part in expressing the needs/finding solutions. Sometimes these problems were due to defects associated with the implementation of activities, or to delays which were often the consequence of contract management procedures, and the lack of communication lead beneficiaries to protest and sometimes prevent the continuation of work.

Source: Contract ME-15, Mid-term assessment of the MCA Morocco Program, final Report, June 2011

Ultimately, the designers of PAF do not seem to have taken great risks in planning to carry out, within an extremely tight time frame, such a complex and large project whose implementation requires the mobilization of a multitude of stakeholders, additionally with the ambition of implementing it using approaches which cannot be easily reconciled with time pressure and which require a minimum of capacity and resources to be implemented. These risks could have been mitigated if the preparatory stage (CIF) had been put to good use, which was not the case.

2.2.2. External Consistency

2.2.2.1. Compliance of the Fruit Tree Productivity Project with the National Strategic Orientations

In Morocco, economic development, human development and environmental protection are key priorities for all ongoing strategies, policies, plans and programs. On one side, *sector-level proactive policies with essentially economic aims*, have been developed and implemented through several plans: Emergence Plan I and II (Industry), Vision 2010 and Vision 2020 (Tourism), Rawaj Plan (Trade), Morocco Numeric Plan (new information and communication technologies i), Halieutis Plan (Marine Fisheries), Logistics 2020 Strategy/Morocco Innovation Strategy, etc. On the other hand, *human development*, in particular in rural areas, has been a particular point of attention with a series of programs for social services (PAGER, PERG, PNRR, etc.) and more recently with the launch of the National Initiative of Human Development (INDH). As regards *environmental protection*, there have been significant efforts in the areas of environmental upgrading and promotion of environmental awareness and sustainable development: National Sanitation Program (PNA), Household Waste Management National Program (PNDM), Institutionalization of Sustainable Development (National Charter for Environment and Sustainable Development and National Strategy for Sustainable Development), etc.

By aiming to contribute to economic growth and poverty reduction, PAF is perfectly consistent with national policies and contributes appropriately to implementing the country's major strategies. The objectives it has set for itself, namely to diversify high value fruit trees and increase their productivity as well as improve the valorization and marketing of products in the targeted sectors are perfectly in line with efforts made by the authorities to improve the incomes and reduce poverty among the farming populations and rural households in particular. In addition, PAF's uniqueness is due to having integrated the component "*Valorization and marketing*" and this has given this consistency an even broader scope. Indeed, an improvement of valorization and marketing of agricultural products plays an important role in country's agricultural policy (PMV). In terms of intervention, PMV aims on the one hand to develop a high value agriculture focused heavily towards marketing and export and, on the other, towards increasing small farmers' income through the diversification and intensification of their production, their professional organization and their integration into the production and processing chain.

A similarity between the approach of PAF and that of the PMV emerges from the developed concepts (aggregation) and the intervention strategies adopted (sector-based approach), in particular as regards Pillar II. The self-aggregation concept adopted *under* the Catalyst Fund initiative, taken up and widened by the PMV under the term *aggregation*, is a striking example of the relationship of the PMV to PAF and therefore, of their perfect convergence and alignment. In the same way, for the implementation of the PMV, the Moroccan government, with the assistance of the World Bank, has launched a major program covering four main components: the modernization of national distribution systems, improvement of PMV's Pillar II governance, effective management of irrigation water and improved quality of *agricultural services*. The first component aiming to reform wholesale fruit and vegetable markets and develop the agro sectors in several areas of the country (Beni Mellal, Berkane, Meknes, Marrakech, etc.), *shows a second level of coherence of the objectives* of PAF downstream the targeted sectors with the efforts which have been or are being made under the PMV, whose common denominator is the valorization and marketing of agricultural products, fruit trees in particular.

The inclusion of the implementation process of PAF's activities within a sustainable fruit tree development perspective is perfectly in line with the efforts made by the authorities with respect to natural resource and environmental protection, especially in vulnerable mountain and oasis ecosystems. Indeed, the strengths of the PAF design lies in the systematic inclusion of environmental measures throughout the preparation and execution phases of its activities. Mobilization of potential for fruit tree production in target areas, while ensuring water resources preservation and soil conservation management, has been a real challenge which required substantial inputs: two strategic environmental studies with public consultations, a set of environmental management plans (PGE) with expert missions, manuals of good husbandry practices and tangible actions in the target perimeters

(preparation of basins and impluvia, reasoned phytosanitary treatment), training for farmers, professional organizations and operators in the target value chain. Preparation of the strategic environmental evaluation within the framework of PAF is pioneering and is a first of this scope ever carried out in Morocco. This was beneficial for the project, first by identifying the conditions most likely to impact positively or negatively the field, but also for promoting the “environmental cause” in the country, by paving the way for taking into account the environmental and social concerns as of the design phase of comprehensive and sector-level policies, strategies and action plans. Even if the measures recommended in this area were not always received favorably by all stakeholders and beneficiaries of PAF.

Box 29. Sustainability assurance of a high quality, environmentally friendly good production.

The integration of environment as part of the upstream activities of contract TC-5A lies, among other things, in the proposal to establish technology package demonstration platforms based on good production practices, the implementation of integrated crop protection management, development of organic farming and local produce through the promotion of a production with distinctive quality and origin markers (tags). In fact, the development of these activities is part of the strategic approach adopted for the integration of environment into the training/technical support activities upstream from production. This approach aims to promote the principles and practices of sustainable development through a professional, profitable, equitable agricultural management in line with the requirements of biodiversity protection, the fight against climate change and desertification and land degradation.

Source: Contract TC-5A, Final upstream/downstream activity report, July 2013

According to the intervention logic of PAF, the expected results of its activities should translate into reduced volatility of agricultural production as well as diversified and improved income for small farmers. Through the expected effects and changes, they should lead to an increase in economic growth and more specifically to poverty reduction in target areas.

2.2.2.2. The Question of Territorial Anchoring and Institutional Support of PAF

PAF’s strategic orientation directed towards a diversification of agricultural productions, a reduction in their volatility by strengthening fruit tree breaks, and an increase in the value added of target sectors to the benefit of small farmers are certainly relevant levers that contribute to local development and poverty reduction. However, the project’s strategic orientation could have been better articulated with local dynamics and more responsive to locally adopted choices in territorial development. Given the scope of PAF activities and the structuring potential on local economies, implementation on the ground was to have strong territorial roots *and broader institutional support* involving, in addition to operators in the target sectors, other local key players (local authorities and civil society). Since each rural commune has a Communal Development Plan (PCD) or a Local Initiative for Human Development (ILDH) which are strategic planning documents with regard to territorial development, developed through a broad participatory and collaborative process, the PAF intervention was, in principle, to be an integral part of the vision of development of each target territory in terms of

ensuring more consistency and a convergence with the actions already planned for the different sectors of activity in the territory. This is a *first critical gap in the preliminary feasibility studies*; not taking adequately into account the development actions that emanated from the participatory processes for strategic territorial planning. Hence, the first lesson learned on *alignment of projects for the creation of planting perimeters with the process of strategic territorial planning (PCD and ILDH)*. The involvement of community councils and local network associations would have created useful synergies for the successful execution of actions in the field and strengthened the level of acceptance.

Chapter 3. Assessment of the Effectiveness and Efficiency of PAF

3.1. Effectiveness

Assessing the effectiveness of the PAF intervention consists in reviewing **achievement rates** for the various activities and sub-activities, the **timing** for their completion with respect to the established deadlines as well as the **quantity** and **quality** of **outputs** with respect to the **targets** and **standards** initially set. Results are presented by activity and **sub-activity**, in conformity with the content of PAF.

3.1.1. Rain-fed Olive and Almond Tree Rehabilitation and Expansion

For the “*Expansion in rain-fed areas*” sub-activity, assessment of the effectiveness examines the extent to which the following outputs have been achieved:

- Area newly planted in olive trees;
- Areas planted in almond trees and transferred to the farmers;
- Areas of land treated with WSC measures in the target perimeters;
- Areas receiving maintenance work ;
- Areas planted in olive trees transferred to the farmers;
- Areas planted in almond trees transferred to the farmers;
- Quality of vegetative olive and almond orchards.

For each of these outputs, effectiveness is evaluated from two angles: **review of achievements** with respect to the targets set and **timing of achievements** with respect to the **set deadlines**. For each of these two aspects, three levels of evaluation are considered: I) *the overall level*, all species, lots and areas taken together, II) *the sector level*, according to the target fruit tree species, and III) *the territorial level*, according to the intervention areas and regions covered.

Overall assessment of fruit tree expansion in rain-fed areas. According to the original objectives of PAF, planted acreage projection was 120 000 hectares. This should be carried out in 253 perimeters and divided into five tranches: 5,500 hectares in 2008 (pilot perimeters), 22,000 hectares in 2009, 42,000 hectares in 2010, 38,000 hectares in 2011 and 12,500 hectares in 2012. With this original target, *the overall rate of achievement* was 62% by September 2013, corresponding to a planted total planted acreage of 74,858 hectares. Which results in a differential of more than a third (nearly 38%) from the original objective of PAF. However, in response to the problem of excess costs which occurred when the first lots were launched, there was, in 2010, a re-scoping and downward revision of the initial target, going from 120,000 hectares to **82,514 hectares** (acreage with amendment), with the removal of the fifth tranche (2012) and manifest reductions in the targets of tranche 3 (6,620 fewer hectares) and tranche 4 (18 383 fewer hectares). Ultimately, the final achievement rate by September

2013 reached approximately **91%**, all species taken together (Table 23). These achievements are very significant, given the complexity of field interventions and multiplicity of demands (sector approach, upstream-downstream integration, environmental dimension, gender approach, etc.). PAF has thus been able to mobilize effectively with its partners to meet the challenges and reach more than 90% of the results intended after re-scoping.

Table 21. Overall assessment of achievements for the “expansion” sub-activity

Year	Tranche	Planned acreage (ha)	Amended acreage (ha)	Planted acreage (ha)	Amended acreage/ Planned acreage (%)	Planted acreage / Amended acreage (%)	Planted acreage / Planned acreage (%)
2008	1	5,500	4,803.04	4,803.04	87.34	100.00	87.33
2009	2	22,000	22,714.00	22,538.50	103.25	99.23	102.45
2010	3	42,000	35,380.00	32,742.50	84.24	92.55	77.96
2011	4	38,000	19,617.00	14,774.00	51.62	75.31	38.88
2012	5	12,500	-	-	0.00	-	0.00
Total		120,000	82,514.04	74,858.04	68.76	90.72	62.38

Review of planted areas by species (olive and almond trees) in rain-fed areas. Overall, achievement rates for expansion operations (planted acreage/amended acreage) are significant and comparable for both species: **90.4% for olive trees** and **96.1% for almond trees**. However, these rates show a *decreasing trend* from one tranche to the next, increasing from **100%** for tranche 1 (2008) to approximately **73%** for tranche 4 (2011) in the case of olive trees, and from **100%** for tranche 1 (2009) to about **91%** for last tranche 4 (2011) in the case of almond trees (Table 24).

Table 22. Review of expansion operations by species (olive and almond trees): achievement rate in%

Year	Tranche	Olive trees			Almond trees		
		Amended acreage (ha)	Planted acreage (ha)	Planted acreage / Amended acreage (%)	Amended acreage (ha)	Planted acreage (ha)	Planted acreage / Amended acreage (%)
2008	1	4,803.04	4,803.04	100.00	0	0	-
2009	2	20,625.00	20,449.50	99.15	2,089	2,089	100.00
2010	3	34,580.00	31,942.50	92.37	800	800	100.00
2011	4	17,499.00	12,852.00	73.44	2,118	1,922	90.75
Total		77,507.04	70,047.04	90.38	5,007	4,811	96.09

Review of areas planted in olive and almond trees by major region in rain-fed areas. In relation to the territorial approach adopted by PAF, a review of achievement rate distribution across regions emphasizes three different scenarios for olive trees : the first one is distinguished by achievement rates of 100%, which means that the targets set have been effectively achieved (which is the case for the Meknes-Tafilalet and Tadla-Azilal regions); the second one has recorded rates between 90 and 95%

(which is the case for the Fes-Boulmane, Oriental and Taza-Al Hoceima-Taounate regions); in the third one, the rates registered are lower than 90% (this being the case of the Tangier-Tétouan and Marrakech-Tensift-Al Haouz regions). According to UGP, these results should be viewed in carefully; due in part to the amendments signed that led to a re-scoping of the areas to be planted, following the partial or total reluctance/refusal observed in certain perimeters, through intra-provincial transfers of areas to be planted. Thus, a large portion of the acreage that was initially planned for the provinces of Khenifra and Beni-Mellal was transferred to the province of Al Haouz³. Since the lands transferred there were also negatively impacted by the farmer reluctance/refusal, the upwardly adjusted objectives due to this transfer, could not be achieved. Therefore, achievement rates stood below those recorded in the provinces of Khenifra and Beni-Mellal (respectively subject to the regions of Meknes-Tafilalet and Tadla-Azilal). For almond orchards, achievement rates are very high overall: Al Hoceima (100%) and Taza (95%) (Table 25).

Table 23. Review of olive and almond expansion by region: achievement rates in%

Species/Regions	Amended acreage	Planted acreage	Planted acreage / Amended acreage (%)
Olive trees:			
Fes-Boulmane	3,106.54	2,980.54	95.94
Marrakech-Tensift-Al Haouz	3,516.00	2,509.00	71.36
Meknes-Tafilalet	1,884.00	1,884.00	100.00
Oriental	313.00	299.00	95.53
Tadla Azilal	5,005.00	5,004.50	99.99
Tangier-Tetouan	19,140.50	17,201.50	89.87
Taza-Al Hoceima-Taounate	44,542.00	40,168.50	90.18
Total 1	77,507.04	70,047.04	90.38
Almond trees:			
Taza-Al Hoceima-Taounate	5,007.00	4,811.00	96.09
Total 2	5,007.00	4,811.00	96.09

Timing of achievement rates for olive and almond plantings in rain-fed areas. For olive trees, the lowest achievement rates were mainly recorded during the last tranche (2011), in particular in some perimeters of the provinces of Al Haouz (45.95%), Ouezzane (46.52%) and Taounate (43.02%) (Table 26). The farmers interviewed on this subject in some perimeters of the sample (Tétouan, Ouezzane, Taounate and Taza) emphasized that there was, since early 2012, a significant slackening and weakening in the planting work and service provision (technical assistance, contractors, management structures). In the same way, farmers from some perimeters, especially Taza, Taounate and Tetouan,

³ The flexibility afforded by the contracts for the work launched in accordance with APP/MCC procurement rules/arrangements in the intra-provincial transfer of areas to be planted, played an important part in the compensation of differentials between projected areas and areas actually planted. Otherwise, the achievement rate would have been lower.

claimed that there is no comparison between the planting launched in 2008 and 2009 and those that followed (2010 and 2011). This shows that there are areas where effectiveness in executing, monitoring and following-up the services and work experienced a significant shift over time.

Table 24. Timing of achievement rates for olive plantings in rain-fed areas.

Region	Province	Achievement rates for olive plantings (%)			
		2008	2009	2010	2011
Fes-Boulmane	Moulay Yacoub	100.00	100.00	81.47	
	Sefrou	100.00			
Marrakech-Tensift-Al Haouz	Al Haouz			100.00	45.95
Meknes-Tafilalet	Khenifra		100.00	100.00	
Oriental	Berkane			95.53	
Tadla-Azilal	Azilal		100.00	100.00	
	Beni Mellal		99.96	100.00	
Tangier-Tetouan	Larache	100.00	100.00	100.00	82.29
	Ouezzane	100.00	100.00	98.69	46.52
	Tetouan	100.00	99.03	94.11	79.87
Taza-Al Hoceima-Taounate	Al Hoceima				100.00
	Taounate	100.00	100.00	90.47	43.02
	Taza	100.00	97.16	88.77	92.06
Total		100.00	99.15	92.24	73.44

Overall assessment of water and soil conservation works (WSC) in rain-fed areas. The systematic integration of the environmental dimension in the expansion work is one of the positive aspects of PAF's integrated approach. Overall, the project planned to implement WSC measures over a total acreage of 48,559 ha, representing a coverage rate of **59%** compared with the planted acreage projection (amended acreage), and of **65%** compared with the acreage actually planted. Adoption of WSC measures is assessed by comparing *the acreage projection* compared to *the treated acreage*. On this basis, the achievement rate reached is **83%** or 40,523 ha (Table 27). However, this rate indicates a downward trend from one tranche to the next, representing only **55%** during the final tranche (2011) with all species taken together. It follows that the initial target has been moderately *achieved*, insofar as the adoption of WSC was moderate to low overall.

Table 25. Overall assessment of WSC work, all fruit tree species taken together

Year	Tranche	Number of perimeters	Amended acreage (ha)	Planted acreage (ha)	WSC		
					Planned (ha)	Achieved (ha)	Achievement rate (%)
2008	1	20	4,803.04	4,803.04	1,658	1,658	100
2009	2	61	22,714.00	22,538.50	10,992	10,963	100
2010	3	106	35,380.00	32,742.50	21,456	19,966	93

Year	Tranche	Number of perimeters	Amended acreage (ha)	Planted acreage (ha)	WSC		
					Planned (ha)	Achieved (ha)	Achievement rate (%)
2011	4	66	19,617.00	14,774.00	14,453	7,937	55
Total		253	82,514.04	74,858.04	48,559	40,523	83

Assessment of WSC work by species and regions in rain-fed areas. For *olive trees*, the overall achievement rate for WSC work reached **83%**. For *almond trees*, this rate was higher overall than the overall average level, being **92%**. Here again, the lowest achievement rates were recorded in the last tranche (2011) where only **51%** were reached for olive trees and **79%** for almond trees (Table 26).

Table 26. Assessment of WSC work by fruit tree species in rain-fed areas.

Species/Year	Tranche	Area (ha)		WSC work		
		Amended acreage (ha)	Planted acreage (ha)	Planned (ha)	Achieved (ha)	Achievement rate (%)
Olive trees						
2008	1	4,803	4,803	1,658	1,658	100
2009	2	20,625	20,450	8,663	8,634	100
2010	3	34580	31,943	20,733	19,243	93
2011	4	17,499	12,852	12,501	6,403	51
Total		77,507	70,047	43,555	35,937	83
Almond trees						
2009	1	2,348	2,348	2,329	2,329	100
2010	2	800	800	723	723	100
2011	3	1,859	1,663	1,952	1,534	79
Total		5,007	4,811	5,004	4,586	92

While in the first three tranches, the WSC achievement rates were **100%** at the level of all regions, reflecting the great efforts made by technical assistance firms and MAPM coaching services, the last tranche (2011) witnessed, however, a turnaround to the point where these works have been virtually forgotten in several perimeters. Admittedly, the mid-term evaluation mission had made recommendations for streamlining the procedures adopted in the planting work⁴. But these recommendations were interpreted differently by technical assistance and contractors insofar as a number of operations such as the WSC, were reduced or put aside in certain perimeters. For this tranche (2011), all contracts were signed only between January and February 2012. And since the time limit allowed for implementation can be spread out over 24 months as from the date of signature, the related

⁴ It had recommended: "To ensure greater efficiency of Tranche 3 work, the specifications should be reviewed locally and adjusted where necessary before issuing calls for tender, or the contract should enable operational adjustments to be made before the launching of work, which would provide an opportunity to solve technical issues beforehand (benches, impluvia) as well as issues related to construction site and acceptance of work."

work - funded from the government's budget - has been carried forward beyond September 2013 as part of the renewal/subrogation of the contracts with successful bidders, following APP dissolution.

Timing for performance of WSC work by rain-fed regions. While WSC work is designed to conserve water and soil in the planting perimeters, it was perceived as quite unnecessary and space consuming by farmers in some places. This refers to farmers' awareness raising and ownership of these practices which technical assistance was to ensure before field work was launched. The distribution of WSC achievement rates by regions reveals part of the difficulties faced by the project in some perimeters to convince farmers of the value of constructing earth basins and especially impluvia. Interviews and focus groups with the farmers as part of this evaluation, clearly confirm their negative attitude towards WSC work. Overall, the lowest achievement rates were recorded in Tetouan (0%), Ouezzane (4%), Taounate (30.53%), Larache (44.38%), Al Haouz (45%) and Taza (64.32%) (Table 27).

Table 27. Timing of WSC work by tranches and rain-fed areas.

Region	Province	Achievement rate of WSC work			
		2008	2009	2010	2011
Fez-Boulmane	Moulay Yacoub		100	100	
	Sefrou	100			
Marrakech-Tensift-Al Haouz	Al Haouz			100	45.95
Meknes-Tafilalet	Khenifra		100	100	
Oriental	Berkane			100	
Tadla Azilal	Azilal		100	100	
	Beni Mellal		100	100	
Tangier-Tetouan	Larache	100	100	100	44,38
	Ouezzane	100	100	100	3.61
	Tetouan	100	100		0,00
Taza-Al Hoceima-Taounate	Al Hoceima				100.00
	Taounate	100	100	100	30.53
	Taza	100	99	78.30	64.32
Total		100	99.67	92.81	51.22

Overall Assessment of rain-fed olive and almond maintenance operations. In order to transfer successful, strong, well-laid out and potentially very productive plantings to the farmers, PAF planned a series of technical and environmental recommendations which it has imposed on all perimeters and during all planting interventions. Control, surveillance and monitoring of the proper implementation of these recommendations had been assigned to technical assistance (TC-1A). As for their implementation, this was the responsibility of contractors, with the assistance of MAPM coaching services and OPAs. For young plant maintenance interventions (olive and almond trees), the recommended interventions consisted of watering (at least three times during a period of 24 months from the date of the planting), fertilization in three inputs (foliar fertilizer in the first year and soil

fertilizer + foliar fertilizer in the second year), fungicides and insecticides for pest control, tilling of beds, weeding and mulching, pruning, security and maintenance of WSC works . The time limit established for all of these maintenance operations was 18 months from the date of acceptance of the seedling planting operation. The data provided on these maintenance operations were not sufficiently detailed to quantify and assess the contributions made. Only the cover rate, in terms of maintained areas in relation to the planted areas, is used to assess part of the effectiveness of maintenance operations. For all of the planted perimeters, *all tranches and species taken together*, the first maintenance operation (E1) involved a total area of 66,947 ha, representing a total cover ratio of nearly **90%** relative to the planted area. This ratio fell during the second maintenance operation (E2) to close to **74%** and to **47%** only during the third one (E3) (Table 28).

Table 28. Size of rain-fed olive and almond acreage maintained

Species/Year	Amended acreage (ha)	Planted acreage (ha)	Maintenance operation 1		Maintenance operation 2		Maintenance operation 3	
			Area (ha)	%	Area (ha)	%	Area (ha)	%
Olive trees								
2008	4,803	4,803	4,790.04	99.73	4,559.04	94.92	2,414.04	50.26
2009	20,625	20,450	19,816.00	96.90	16,714.00	81.73	15,992.10	78.20
2010	34,580	31,943	26,072.00	81.62	20,183.00	63.19	14,201.00	44.46
2011	17,499	12,852	11,657.00	90.70	10,544.00	82.04	0.00	0.00
Total 1	77,507	70,047	62,335.04	88.99	5,2000.04	74.24	32,607.14	46.55
Almond trees								
2009	2,348	2,348	2,348.00	100.00	1,997.00	85.05	1,507.00	64.18
2010	800	800	80.000	100.00	800.00	100.00	800.00	100.00
2011	1,859	1,663	1,464.00	88.03	308.00	18.52	0.00	0.00
Total 2	5,007	4,811	4,612.00	95.86	3,105.00	64.54	2,307	47.95
Total	82,514	74,858	66,947.04	89.43	55,105.04	73.61	34,914.14	46.64

Timing of rain-fed olive and almond maintenance operations. Overall, planting maintenance operations did not take place according to the initial programming, due to delays recorded during the two 2010 and 2011 tranches. In addition, planting maintenance was neither systematic, nor of sufficient magnitude, falling short of the technical standards recommended in the specifications. The third maintenance operation which was very beneficial for the growth of young trees, involved less than half of the overall planted area, owing to the fact that it was not conducted during the 2011 tranche (Table 29). Our visits to the perimeters enabled us to determine that the young plantings exhibited areas that were suffering from a lack of maintenance; after contractors left, few initiatives were taken by beneficiaries to remedy the situation.

Table 29. Review of last tranche (2011) maintenance operations in rain-fed areas

Region	Province	Planted acreage (ha)	Maintenance operation 1 (ha)	Maintenance operation 2 (ha)	Maintenance operation 3 (ha)
Marrakech-Tensift-Al Haouz	Al Haouz	856	856	856	0
Tangier-Tetouan	Larache	1,947	1,866	1,398	0
	Ouezzane	950	333	0	0
	Tetouan	1,194	1,104	1,104	0
Taza-Al Hoceima-Taounate	Taounate	943	943	943	0
	Taza	6,709	6,302	5,990	0
	Al Hoceima	253	253	253	0
Total		12,852	11,657	10,544	0

Rate of transfer to the beneficiaries of rain-fed olive and almond planting perimeters. Given the delays in the launching of PAF and those accumulated during some steps of planting work implementation, especially for the last tranche, the timing planned for the achievement of the targets set was only partially met. The number of perimeters definitively transferred to the beneficiaries provides an overall assessment of them. The situation established in September 2013, shows that only half of the total area of the target planting perimeters was definitively transferred: close to **51%** for olive trees and **48%** for almond trees. Overall rates conceal significant variations between the tranches for both species (Table 30). For olive plantings, all perimeters of tranche 2008 were transferred. But for the remaining tranches, the post-planting 24-month deadline set for definitively transferring the perimeters to the beneficiaries were not always met, in particular for 2009 (81%) and 2010 (45%) tranches. Whether for olive or almond trees, there were delays in the implementation of 2011 tranche and therefore, none of its perimeters was transferred in September 2013.

Table 30. Rate of transfer of perimeters to the farmers until September 2013

Tranche	Amended acreage (ha)	Planted acreage (ha)	Transferred acreage (ha)	Transferred acreage/Planted acreage (%)
Olive trees				
2008	4,803	4,803	4,803.04	100.00
2009	20,625	20,450	1,6615.70	81.25
2010	34,580	31,943	14,459.00	45.27
2011	17,499	12,852	0.00	0.00
Total 1	77,507	70,047	35877.74	51.22
Almond trees				
2009	2,348	2,348	1,507.00	64.18
2010	800	800	800.00	100.00
2011	1,859	1,663	0.00	-
Total 2	5,007	4,811	2,307.00	47.95
Total	82,514	74,858	38,184.74	51.01

Quality of vegetative olive and almond orchards in rain-fed areas. PAF initially set a technical specification *providing for a 100% return on plantings* to ensure that the plantations transferred to the farmers were in good growing condition. This technical clause was previously imposed as a way to encourage contractors to offer quality services such as techniques for planting, tree maintenance and the integration of environmental dimensions. The final acceptance statement for the planted perimeters is drawn up only if 100% of the seedlings a. Where appropriate, recommendations are made to companies to proceed with the replacement of uprooted, dead or weak trees. Overall, the first two tranches (2008, 2009) benefited from a strict application of this procedure, enabling a large part of their perimeters to be received in very good condition. However, during tranches 2010 and 2011, the 100% return requirement was gradually weakened in the face of the multiple claims and protestations from technical assistance and contractors who deemed this rate unrealistic and very expensive. Consequently, this led to approvals with a return tolerance of up to 70%. Our visits to the perimeters enabled us to determine substantial differences in the vegetative state of plantings. We have identified perimeters in good condition in the provinces to Beni Mellal, Taounate, Taza, Larache and Tetouan. We have also identified perimeters suffering from problems of irrigation and maintenance in the provinces of Moulay Yacoub, Ouezzane, Azilal, Taounate, Taza and Al Hoceima. Our interviews with the beneficiaries allowed us to gather their feedback on a wide range of topics (see focus group report).

For the “intensification and rehabilitation of existing orchards in rain-fed areas” **sub-activity**, the assessment of effectiveness focuses on the three following outputs:

- Number of olive tree hectares rehabilitated in target perimeters;
- Number of almond tree hectares rehabilitated in target perimeters;
- Number of fig tree hectares rehabilitated in target perimeters;

Assessment of the overall plan for the rain-fed rehabilitation of existing fruit tree orchards.

Different from the provisional program for the rehabilitation of perimeters, several changes were made to the main targets, and these should be taken into consideration when evaluation the effectiveness of this sub-activity. Among these were a 25% reduction in the total number of perimeters to be rehabilitated and **a 2% reduction** in the total number of beneficiaries. The main reason for these reduction reside in the nature of the procedures for identifying and delimiting perimeters. The rehabilitation perimeters of 2009, 2010 and 2011 tranches were identified by MAPM field offices as contract TC-1A moved forward, while the figures in contract TC-5A (signed in 2010) were based on estimates and not on the reality on the ground. The final targets were decided upon only in 2012 with the completion of all TC-1A studies at the level of the rehabilitation perimeters (2011 tranche). The final assessment of the rain-fed rehabilitation of existing fruit tree orchards, which was drawn up at the

time of the closing of PAF, describes a total acreage of **62,848 hectares**, exceeding by 13% the **55,543 hectare** target originally expected. (Table 31).

Table 31. Assessment of the overall plan for the rain-fed rehabilitation of orchards

Situation indicators	Number of perimeters	Acreage (ha)	Number of beneficiaries
Acreage projection	270	55,543	40,747
Achieved acreage	187	62,848	32,962
Final assessment (%)	69%	113%	81%

3.1.2. Olive Tree Irrigation and Intensification in PMH Mountain Areas

For the “Hydro-agricultural development of PMH mountain perimeters” sub-activity, the assessment of effectiveness focuses on two major outputs:

- Area of land managed in PMH mountain areas;
- Number of hydro-agricultural works built in PMH mountain areas.

Overall assessment of the areas managed in PMH mountain areas. Originally, the provisional program for this sub-activity focused on the hydro-agricultural development of 65 PMH perimeters on an area of about 26,000 ha to the benefit of some 33,000 beneficiaries; the proposed developments included the construction of hydro-agricultural structures to the benefit of the beneficiaries organized in AUEAs. However, following the problem of additional costs that occurred from the moment the first lots were launched and during the 2012 re-scoping of the Compact - releasing additional funds for PAF which allocated them, as a priority, to the hydro-agricultural developments and enabling a major complementary program of works to be designed and implemented - the surface to be developed was expanded to about 34 000 ha (+31%) to the benefit of nearly 28,000 farms (+8%). Achievements involved the **65** perimeters initially projected, on an area of **33,983**. The distribution of the area developed by region reveals a high concentration in Marrakech-Tensift-Al Haouz, with 40.9%, followed by Meknes-Tafilalet with 23.2%. The remainder is divided between Fez-Boulmane (12.0%), the Oriental (11.4%), Tadmra-Azilal (9.9%), Taza-Al Hoceima-Taounate (1.7%) and Goulmim-Smara (0.8%). It should be noted that in each of these regions, 100% of the targets set after re-scoping, have been achieved (Table 32).

Table 32. Achievement rate of hydro-agricultural developments in PMH mountain areas

Region	Acreage projection (*) (ha)	Acreage developed		Achievement rate (%)
		Ha	%	
Marrakech-Tensift-Al Haouz	13,911	13,911	40.9	100
Meknes-Tafilalet	7,890	7,890	23.2	100
Fez-Boulmane	4,085	4,085	12.0	100
Oriental	3,864	3,864	11.4	100
Tadla-Azilal	3,377	3,377	9.9	100
Taza-Al Hoceima-Taounate	579	579	1.7	100
Goulmim-Smara	277	277	0.8	100
Total	33,983	33,983	100.0	100

(*) After re-scoping

Assessment of the hydro-agricultural structures built in PMH mountain areas. The achievements included developing and rehabilitating **603 km** of hydraulic networks and creating **66** hydraulic structures. With regard to the targets originally set, the achievements have demonstrated great efficiency, for all covered regions, representing respective rates of **100%** (Table 33).

Table 33. Review of achievements upon project completion of the construction of hydro-agricultural structures

Tranche	Khettara and Seguia Linear (km)	Number of structures		
		Sill/outlet	Source	SP/Drilling
Tranche 1	95	4	-	-
Tranche 2	347	35	2	2
Tranche 3	161	19	2	2
Total	603	58	4	4

Timing of hydro-agricultural developments made in PMH mountain areas. Although achievement rates demonstrate substantial gains, there are some areas where technical services still have to be completed. That is the case, for instance, for the perimeters of Ouaoumana in the province of Khenifra and of Ait Ouirrah in the province of Beni Mellal where the backfilling of seguia dock walls and slab construction have yet to be carried out. The constraints encountered on the ground, including the frequent suspensions of construction sites due to inclement weather, resulted in a delay of the targets set and timetable for implementation. There were also delays in the launch of calls for tenders and the awarding of contracts. Delays were also due to the addition of several additional works (the completion of which required amendments to formalize them) to adapt interventions to the social requirements, complaints and natural constraints. But despite the constraints and delays faced, the results of survey ME-16 show that in their vast majority (around 75% at least), farmers who benefitted from the developments carried out in PMH areas believe that the length of the work was appropriate, with the exception of the a case dealing with the construction of pumping stations/storage basins, who

consider that the work was performed on a rather lengthy period of time (Table 34). This positive assessment regarding the length of the work is shared by the large majority of the AUEAs surveyed, except for the developments relating to “segua coating/rehabilitation” where 48% of them found this work to be rather lengthy to very lengthy (Table 35).

Table 34. Rating of the length of agricultural development works by the beneficiary farmers (PMH areas)

Development type	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Oued works	<i>Respondents</i>	87	100	21	100	7	100	115	100
	Appropriate	79	90.8	19	90.5	7	100	105	91.3
	Rather lengthy	4	4.6	1	4.8	0	0	5	4.3
	Excessively long	4	4.6	1	4.8	0	0	5	4.3
Spring development	<i>Respondents</i>	25	100	7	100	14	100	46	100
	Appropriate	17	68	6	85,7	11	78,6	34	73,9
	Rather lengthy	5	20	1	14,3	1	7,1	7	15,2
	Excessively long	3	12	0	0	2	14.3	5	10.9
Seguia Coating/Rehabilitation	<i>Respondents</i>	146	100	75	100	79	100	300	100
	Appropriate	119	81.5	51	68	57	72.2	227	75.7
	Rather long	20	13.7	13	17.3	12	15.2	45	15
	Excessively long	7	4.8	11	14.7	10	12.7	28	9.3
Pumping station/storage basin construction	<i>Respondents</i>	1	100	0	0	0	0	1	100
	Appropriate	0	0	0	0	0	0	0	0
	Rather long	1	100	0	0	0	0	1	100
	Excessively long	0	0	0	0	0	0	0	0

Source: Survey ME-16

Table 35. Rating of the length of agricultural development works by the beneficiary AUEAs (PMH areas)

Development type	Rating	Number	%
Oued works	<i>Respondents</i>	16	100.0
	Appropriate	10	62.5
	Rather long	4	25.0
	Excessively long	2	12.5
Spring development	<i>Respondents</i>	12	100.0
	Appropriate	9	75.0
	Rather long	3	25.0
	Excessively long		
Seguia Coating/Rehabilitation	<i>Respondents</i>	25	100.0
	Appropriate	13	52.0
	Rather long	10	40.0
	Excessively long	2	8.0

Development type	Rating	Number	%
Development of Khettaras	<i>Respondents</i>	3	100.0
	Appropriate		
	Rather long	3	100.0
	Excessively long		
Pumping station/storage basin construction	<i>Respondents</i>	1	100.0
	Appropriate	1	100.0
	Rather long		
	Excessively long		

Source: Survey ME-16

Overall quality of hydro-agricultural developments made in PMH mountain areas Overall, the quality of work is good and consistent with standards, apart from a few structures which were washed away by floods, just after their completion (case of the 12 ml underground pipe main canal in the Ououmana perimeter which was damaged by floods). But PAF built structures that are of great importance to the beneficiaries. The diversion sills which it either rehabilitated or built will remain among its most outstanding achievements insofar as they enable the mobilization of additional water with greater efficiency. Its intervention also led to singular technical innovations such as the Tajoujt gallery which serves an important area of the Chichaoua perimeter and which was threatened by water service interruption following unstable bank undercuts, and TP drain cleaning with a significant improvement in its flow. The construction of this gallery not only ensured a stable water supply for the perimeter, but also was a means of communication between the douars through the creation of a stable traffic lane. The delivery of certain work was sometimes not compliant with baseline studies and required modifications and adjustments which were made by AT, DPA or ORMVA during the execution. This mainly concerned the alignment of seguias to be developed and the establishment of ancillary works to be built for water catchment and mobilization, the selection and validation of which were made by AT in dialogue with beneficiaries and AUEAs.

A large majority of beneficiaries indicated that they are either *very satisfied* or *satisfied* with the quality of the hydro-agricultural development works performed by PAF in their perimeters (Table 36). Indeed, the rate reporting *dissatisfied* to *very dissatisfied* was no higher than 18%, while the rate of *satisfied* to *very satisfied* varied between 60 and 100% depending on the type of development.

Table 36. Rang of the quality of agricultural development works by the beneficiary farmers (PMH)

Development type	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Oued work	<i>Respondents</i>	94	100.0	21	100.0	9	100.0	124	100.0
	Very satisfied	25	26.6	5	23.8	3	33.3	33	26.6
	Rather satisfied	53	56.4	7	33.3	3	33.3	63	50.8
	Neutral/normal	13	13.8	5	23.8	2	22.2	20	16.1
	Somewhat dissatisfied	1	1.1	3	14.3	1	11.1	5	4.0
	Very dissatisfied	2	2.1	1	4.8			3	2.4
Spring development	<i>Respondents</i>	28	100.0	8	100.0	14	100.0	50	100.0
	Very satisfied	9	32.1	2	25.0	4	28.6	15	30.0
	Rather satisfied	11	39.3	1	12.5	3	21.4	15	30.0
	Neutral/normal	3	10.7	2	25.0	6	42.9	11	22.0
	Somewhat dissatisfied	3	10.7	2	25.0			5	10.0
	Very dissatisfied	2	7.1	1	12.5	1	7.1	4	8.0
Seguia Coating/Rehabilitation	<i>Respondents</i>	157	100.0	77	100.0	85	100.0	319	100.0
	Very satisfied	42	26.8	17	22.1	23	27.1	82	25.7
	Rather satisfied	79	50.3	34	44.2	31	36.5	144	45.1
	Neutral/normal	17	10.8	14	18.2	18	21.2	49	15.4
	Somewhat dissatisfied	7	4.5	6	7.8	4	4.7	17	5.3
	Very dissatisfied	12	7.6	6	7.8	9	10.6	27	8.5
Pumping station/storage basin construction	<i>Respondents</i>	1	100.0					1	100.0
	Very satisfied								
	Rather satisfied	1	100.0					1	100.0
	Neutral/normal								
	Somewhat dissatisfied								
	Very dissatisfied								

Source: Survey ME-16

The same very positive assessment regarding the quality of the hydro-agricultural development work performed by PAF is shared by an overwhelming majority of beneficiary AUEAs, the dissatisfaction rate of which is less than 10% except for the development of Khetaras where this rate is 100% (Table 37).

Table 37. Rating of the quality of agricultural development works by the beneficiary AUEAs (PMH)

Development type	Rating	Number	%
Oued work	<i>Respondents</i>	16	100.0
	Very satisfied	7	43.8
	Rather satisfied	8	50.0
	Rather unsatisfied		
	Not at all satisfied	1	6.3
Spring development	<i>Respondents</i>	12	100.0
	Very satisfied	5	41.7
	Rather satisfied	7	58.3
	Rather unsatisfied		
	Not at all satisfied		
Seguia Coating/Rehabilitation	<i>Respondents</i>	25	100.0
	Very satisfied	12	48.0
	Rather satisfied	11	44.0
	Rather unsatisfied	1	4.0
	Not at all satisfied	1	4.0
Development of Khetaras	<i>Respondents</i>	3	100.0
	Very satisfied		
	Rather satisfied		
	Rather unsatisfied	3	100.0
	Not at all satisfied		
Pumping station/storage basin construction	<i>Respondents</i>	1	100.0
	Very satisfied		
	Rather satisfied	1	100.0
	Rather unsatisfied		
	Not at all satisfied		

Source: Survey ME-16

For the ***“Rehabilitation of olive orchards in PMH mountain areas”*** sub-activity, the evaluation of effectiveness focuses on the achievement for the following output

- Area of plantings rehabilitated in PMH areas;
- Area of olive trees rehabilitated in PMH areas;
- Area of land treated with soil conservation measures in PMH areas.

The first two outputs are not the direct results of the intervention of PAF, but the expected impact of the *“Fruit Tree Sector Services”* activity in the upstream sector in particular. According to the initial PAF design, the rehabilitation of olive orchards in PMH mountain perimeters could be achieved through the provision of training, oversight and technical assistance for farmers.

Review of the overall plan for the rehabilitation of existing orchards, all areas and species taken together, in PMH mountain areas. At the closing of PAF, the acreage of rehabilitated land in PMH

mountain areas reached a total of **17,115 ha**. In relation to the originally projected acreage, all areas and species taken together, the total target was exceeded by **22%**. It is the same for the number of perimeters and beneficiaries, where achievements exceeded the anticipated levels by respectively **3%** and **79%** (Table 38). While achievement rates are further confirmed by these results, they are however well below the provisional program for the rehabilitation of perimeters in PMH areas originally established by PAF.

Table 38. Review of the overall plan for the rehabilitation of orchards in PMH mountain areas

Situation indicators	Number of perimeters	Acreage (ha)	Number of beneficiaries
Acreage projection	58	14,048	8,753
Achieved acreage	60	17,115	15,656
Final assessment (%)	103%	122%	179%

3.1.3. Date Tree Irrigation and Intensification in Oasis Areas

Two outputs are considered for assessing the effectiveness of the “*hydro-agricultural development of oasis perimeters*” sub-activity:

- Area of land developed in oasis areas;
- Number of hydro-agricultural structures built in oasis areas.

Overall assessment of the acreage developed in oasis areas. The program originally envisioned for this sub-activity focused on the hydro-agricultural development of 12 perimeters covering an area of about 16,600 ha and including 14,500 farms. The proposed developments consisted of constructing hydraulic structures for the benefit of AUEAs in the target perimeters. In all target perimeters, the achievement rate of the hydro-agricultural developments planned after re-scoping reached 100%, as the total acreage developed was **19,393 ha** (Table 39). Its distribution across regions shows a high concentration at the level of the Souss-Massa-Draa region, with close to 58%, followed by Meknes-Tafilalet, with 33 %. The remainder is distributed between the regions of Goulmim-Smara (6%) and the Oriental (3%).

Table 39. Achievement rates of hydro-agricultural developments in oasis areas

Region	Acreage projection (*) (ha)	Acreage developed (ha)	%
Meknes-Tafilalet	6,549	6,549	100
Oriental	509	509	100
Goulmim-Smara	1,173	1,173	100
Souss-Massa-Draa	11,162	11,162	100
Total	19,393	19,393	100

(*) After re-scoping

Review of the hydro-agricultural structures built in oasis areas. Upon completion of PAF, the physical achievements in terms of hydro-agricultural structures are accounted for in the construction of **187 km** of hydraulic networks and creation of **24** hydraulic structures. As for the developed areas, these achievements testify to a high efficiency, since the achievement rate reached **100%** for all regions covered (Table 40).

Table 40. Review of achievements in hydro-agricultural structures upon project completion

Tranche	Khattara and Seguia Linear (km)	Number of structures		
		Sill/intake	Source	SP/Drilling
Tranche 1	84	13	-	-
Tranche 2	88	-	-	3
Tranche 3	15	8	-	-
Total	187	21	-	3

Timing of hydro-agricultural developments in oasis areas. Although achievement rates reached substantial levels, there are areas where technical services on ancillary works are still to be completed. The constraints encountered in the field, including the work interruptions due to adverse weather, resulted in delays with respect to the anticipated targets and schedule. There were also delays in the launch of calls for tender and contract awarding. Delays are also due to the addition of a number of works (the performance of which required amendments for their regularization) to adapt interventions both to social complaints and demands, and natural constraints. However, and despite the constraints and delays faced, survey ME-16 reveals that 80 to 100% of farmers in oasis areas who benefitted from these developments feel that the duration of work was appropriate (Table 41). This assessment was widely shared by AUEAs (Table 42).

Table 41. Beneficiary farmer rating of the length of agricultural development works (Oasis)

Development type	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Oued work	<i>Respondents</i>	10	100	20	100	83	100	113	100
	Appropriate	10	100	15	75.0	67	80.7	92	81.4
	Rather long			4	20.0	10	12.0	14	12.4
	Excessively long			1	5.0	6	7.2	7	6.2
Spring development	<i>Respondents</i>	4	100	3	100	3	100	10	100
	Appropriate	4	100	3	100	2	66.7	9	90.0
	Rather long					1	33.3	1	10.0
	Excessively long								
Development of Khettaras	<i>Respondents</i>	11	100	19	100	17	100	47	100
	Appropriate	11	100	19	100	17	100	47	100
	Rather long								
	Excessively long								
Seguia Coating/Rehabilitation	<i>Respondents</i>	51	100	71	100	115	100	237	100
	Appropriate	48	94.1	61	85.9	93	80.9	202	85.2
	Rather long	1	2.0	7	9.9	14	12.2	22	9.3
	Excessively long	2	3.9	3	4.2	8	7.0	13	5.5
Pumping station/storage basin construction	<i>Respondents</i>	1	100			4	100	5	100
	Appropriate	1	100			3	75.0	4	80.0
	Rather long					1	25.0	1	20.0
	Excessively long								

Table 42. Beneficiary AUEA's rating of length of agricultural development works (Oasis)

Development type	Rating	Number	%
Oued work	<i>Respondents</i>	7	100.0
	Appropriate	6	85.7
	Rather long		
	Excessively long	1	14.3
Spring development	<i>Respondents</i>	1	100.0
	Appropriate	1	100.0
	Rather long		
	Excessively long		
Seguia Coating/Rehabilitation	<i>Respondents</i>	24	100.0
	Appropriate	17	70.8
	Rather long	3	12.5
	Excessively long	4	16.7
Development of Khetaras	<i>Respondents</i>	1	100.0
	Appropriate	1	100.0
	Rather long		
	Excessively long		
Pumping station/storage basin construction	<i>Respondents</i>	2	100.0
	Appropriate	2	100.0
	Rather long		
	Excessively long		

Source: Survey ME-16

Overall quality of hydro-agricultural developments in oasis areas. Overall, the work is viewed as being of good quality and meeting the established standards. They included major technical innovations as exemplified by the sill of Tinfou (Draa perimeter) which enabled irrigation to resume after a 17-year interruption. However, a number of structures have been washed away by flood, shortly after their completion: it is the case of the guide bank at the level of the sill of Tinfou on Oued Draa (Fezouata date orchard). It was rebuilt on another location and two gabion walls covered with concrete were built with lining to protect the new pipe main canal. Also, the delivery of some works has sometimes been not compliant with baseline studies. This required modifications and adjustments made at the execution by AT, DPA or ORMVA with the involvement of AUEAs and farmers. With regard to assessing the quality of the hydro-agricultural developments by beneficiaries, the results from survey ME-16 show that the majority of them are very satisfied to satisfied (Table 43). The highest dissatisfaction rates were recorded for oued works and pumping stations/storage basins with 33.4 % and 20 % respectively. The surveyed AUEAs appeared even more satisfied with the quality of the developments from which their perimeters have benefited, with satisfaction rates of 90 to 100 %, regardless of the development type (Table 44).

Table 43. Rating of the quality of agricultural development works by the beneficiary farmers (Oasis)

Development type	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Oued work	<i>Respondents</i>	10	100.0	21	100.0	86	100.0	117	100.0
	Very satisfied	2	20.0	4	19.0	19	22.1	25	21.4
	Rather satisfied	4	40.0	7	33.3	23	26.7	34	29.1
	Neutral/normal	1	10.0	3	14.3	15	17.4	19	16.2
	Somewhat dissatisfied	2	20.0	5	23.8	16	18.6	23	19.7
	Very dissatisfied	1	10.0	2	9.5	13	15.1	16	13.7
Spring development	<i>Respondents</i>	4	100.0	3	100.0	3	100.0	10	100.0
	Very satisfied	3	75.0	1	33.3	1	33.3	5	50.0
	Rather satisfied			2	66.7			2	20.0
	Neutral/normal	1	25.0			1	33.3	2	20.0
	Somewhat dissatisfied								
	Very dissatisfied					1	33.3	1	10.0
Development of Khettaras	<i>Respondents</i>	11	100.0	19	100.0	17	100.0	47	100.0
	Very satisfied	7	63.6	10	52.6	7	41.2	24	51.1
	Rather satisfied	1	9.1	5	26.3	3	17.6	9	19.1
	Neutral/normal	3	27.3	3	15.8	6	35.3	12	25.5
	Somewhat dissatisfied			1	5.3	1	5.9	2	4.3
	Very dissatisfied								
Seguia Coating/Rehabilitation	<i>Respondents</i>	51	100.0	71	100.0	119	100.0	241	100.0
	Very satisfied	17	33.3	21	29.6	36	30.3	74	30.7
	Rather satisfied	20	39.2	27	38.0	34	28.6	81	33.6
	Neutral/normal	11	21.6	11	15.5	28	23.5	50	20.7
	Somewhat dissatisfied			7	9.9	14	11.8	21	8.7
	Very dissatisfied	3	5.9	5	7.0	7	5.9	15	6.2
Pumping station/storage basin construction	<i>Respondents</i>	1	100.0			4	100.0	5	100.0
	Very satisfied					1	25.0	1	20.0
	Rather satisfied	1	100.0			1	25.0	2	40.0
	Neutral/normal					1	25.0	1	20.0
	Somewhat dissatisfied								
	Very dissatisfied					1	25.0	1	20.0

Table 44. Rating of the quality of Hydro-Agricultural Development works by the beneficiary AUEAs (Oasis)

Development type	Rating	Number	%
Oued work	<i>Respondents</i>	7	100.0
	Very satisfied	7	100.0
	Rather satisfied		
	Rather unsatisfied		
	Not at all satisfied		
Spring development	<i>Respondents</i>	1	100.0
	Very satisfied	1	100.0
	Rather satisfied		
	Rather unsatisfied		
	Not at all satisfied		
Seguia Coating/Rehabilitation	<i>Respondents</i>	24	100.0
	Very satisfied	14	58.3
	Rather satisfied	6	25.0
	Rather unsatisfied	2	8.3
	Not at all satisfied	2	8.3
Development of Khettaras	<i>Respondents</i>	1	100.0
	Very satisfied	1	100.0
	Rather satisfied		
	Rather unsatisfied		
	Not at all satisfied		
Pumping station/storage basin construction	<i>Respondents</i>	2	100.0
	Very satisfied	2	100.0
	Rather satisfied		
	Rather unsatisfied		
	Not at all satisfied		

Source: Survey ME-16

For the ***“Date tree rehabilitation and intensification in oasis areas”*** sub-activity, three main outputs are discussed for assessing effectiveness:

- Area planted with the date tree in-vitro plants provided by the project
- Number of date tree tufts cleaned and thinned;
- Area planted with the date tree offshoots transferred to the farmers.

According to the provisional program, this second sub-activity was focused, after re-scoping, on the rehabilitation and intensification of date orchards, through i) the provision of 250,000 date tree in-vitro plants from noble varieties that are resistant to Bayoud disease and suited to the production conditions of date tree areas iii) the cleaning of 170,000 date tree tufts iii) The provision of more than 240,000 offshoots for date producers.

Overall assessment of in-vitro plant distribution operations, all varieties and areas taken

together: PAF initially planned providing **282,000** in-vitro plants from several date tree varieties in 12 perimeters, distributed across 5 provinces (Figuig, Errachidia, Zagora, Tinghir and Tata). After the project's re-scoping, this target was reduced to **250,000** in-vitro plants. According to the final assessment drawn up at the closing of PAF, the distribution of in-vitro plants was a great success in all target regions, insofar as the provisional program has been fully implemented (Table 45).

Table 45. Overall assessment of in-vitro plant distribution operations in oasis areas

Region	Province	Program planned	Achievements	Achievement rate
Oriental	Figuig	13,930	13,930	100%
Meknes-Tafilalet	Errachidia	81,737	81,737	100%
Souss-Massa-Draa	Zagora	120,300	120,300	100%
	Tinghir	20,000	20,000	100%
Goulmim-Smara	Tata	15,000	15,000	100%
Total		250,967	250,967	100%

Timing of in-vitro plant distribution operations in oasis areas, all varieties and zones taken

together: Even though the targets initially set by PAF were reached, the timing for the provision of in-vitro plants suffered disruptions and delays due to low plant availability, so that the largest delivery was completed only in 2013. The distribution of in-vitro plants between 2011 and 2013 involved a total of **250,967** plants, divided as follows: 53,400 in 2011 (**21 %**), 61,400 in 2012 (**24 %**) and 137,167 in 2013 (**55 %**). This pace is characterized by an increase in the in-vitro plants distributed in 2013, in order to compensate for the delays accumulated over the first two years (Table 46).

Table 46. Timing of in-vitro plant distributions in oasis areas (2011-2013)

Year		2011	2012	2013	Total
In-vitro plants distributed	In number	52 400	61 400	137 167	250 967
	In %	21%	24%	55%	100%

Achievement rate of in-vitro plant distribution operations by variety. The main varieties of date tree in-vitro plants distributed to farmers are Nejda, Boufeggous, Mejhoul and Bouzekri. Overall, the originally approved proportions of varieties were not adhered to, and significant adjustments were made and alternative varieties distributed. The final assessment by variety reports on the prevalence of Nejda and Boufeggous varieties, which represented respectively **60 %** and **29 %** of the total in-vitro plants distributed (or 150,700 and 73,200 plants). The proportions of remaining varieties ranged between **6 %** for Mejhoul and **4 %** for Bouzekri (Table 47). With regard to forecasts, it is mainly the Mejhoul variety of in-vitro plants that was replaced by the Nejda variety.

Table 47. Achievement rates of the in-vitro plant distribution program by variety

Varieties distributed	2010-2012 initial program		2010-2012 achievements		2013 final planting program		Total	
	Nb of in-vitro plants	%	Nb of in-vitro plants	%	Nb of in-vitro plants	%	Nb of in-vitro plants	%
Nejda	61,200	56	72,966	64	77,734	57	150,700	60
Boufeggous	39,200	36	37,434	33	35,766	26	73,200	29
Mejhoul	7,300	7	2,300	2	13,667	10	15,967	6
Bouzekri	1,100	1	1,100	1	10,000	7	11,100	4
Total	108,800	100	113,800	100	137,167	100	250,967	100

Achievement rates of in-vitro plant distribution operations by province. Overall, the valley of Draa, Zagora province, irrigated by the Mansour Eddahbi dam, has been the major beneficiary of date tree in-vitro plant distribution. The province alone received about 51 % of the total number of in-vitro plants distributed. Next comes the province of Errachidia with 33 %, followed by the provinces of Tinghir, Tata and Figuig (Bouanane) which received respectively an endowment ranging from **4%** to **6%** of the total distributed (Table 48).

Table 48. Distribution of in-vitro plant provision by province in oasis areas

Province	Beneficiaries		Varieties of vitro-plants distributed									
			Nejda		Boufeggous		Mejhoul		Bouzekri		Total	
	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
Zagora	1,186	28	91,900	61	21,000	29	6,300	39	9,850	89	129,050	51.4
Errachidia	976	23	27,404	18	44,666	61	9,667	61	0	0	81,737	32.6
Tata	688	16	13,000	9	2,000	3	0	0	0	0	15,000	6.0
Figuig	837	20	9,200	6	4,730	6	0	0	0	0	13,930	5.6
Tinghir	585	14	9,196	6	804	1	0	0	1,250	11	11,250	4.5
Total	4,272	100	150,700	100	73,200	100	15,967	100	11,100	100	250,967	100

Success rate of the transplanting of in-vitro plants distributed. According to the final report of contract TC-5, the success rate of in-vitro plant transplanting was **80%**. Even though around 2/3 of the surveyed farmers have expressed their satisfaction with the quality with which this operation was performed (Table 49), they also stated that there were areas where in-vitro plants were distributed under adverse weather conditions (cold or strong heat), and that they didn't benefit from the precautions necessary in their handling, which negatively impacted the success rates of plantings. This is the case for the Todgha perimeter. According to the survey ME-16 conducted with oasis farmers, the success rate of in-vitro plant transplanting did not even reach **50 %**, for all three farm categories.

Table 49. Rating of the execution quality for the "date tree in-vitro plant distribution" operation, by beneficiary farmers (Oasis)

		Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents		31	100.0	65	100.0	129	100.0	225	100.0
Rating	Very satisfied	9	29.0	18	27.7	35	27.1	62	27.6
	Rather satisfied	12	38.7	26	40.0	45	34.9	83	36.9
	Neutral/normal	2	6.5	7	10.8	18	14.0	27	12.0
	Somewhat dissatisfied	6	19.4	13	20.0	22	17.1	41	18.2
	Very dissatisfied	2	6.5	1	1.5	9	7.0	12	5.3

Source: Survey ME-16

Box 30. Date tree producers lack of interest for in-vitro plant transplanting!

The success of the transplanting of date tree in-vitro plants depends on the type of farmer. Those who believe in this operation have planted them at a density of 10m x 10m and ensure their irrigation to obtain a good recovery, and protect them right after their transplanting. The farmers met in the field state that in-vitro plants are extremely sensitive to cold and strong heat, and may be unable to recover if not protected at the time of planting.

The CT (crushing unit) technician in Tinghir showed us the remains of a planting established in 2011 during a royal visit without the approval of farmers. These farmers did not protect or follow-up their vitro-plants. We were able to find, within alfalfa and corn plots, 20-month-old in-vitro plants that are still holding on. Some plants were scythed at alfalfa harvesting time. The result was that more than 75 % of in-vitro transplanted in this area has been destroyed by cold, due to a lack of maintenance from the farmers who neglected them.

Farmers met on location expressed their unwillingness to plant date trees due to the small size of their plots. They would rather grow alfalfa to feed cattle. These farmers consider that date trees take time to fruit. They feel they already have enough trees (date, olive, pomegranate and peach trees) all around the Lucerne and corn plots.

Assessment of date tree tuft cleaning and offshoot planting operations. During the re-scoping of PAF in October 2010, the number of date tree tufts to be cleaned was reduced from 222,500 to 140,000. But following the success of this operation, this number was revised upwards again to **170,000**. The results of the work, as of February 28, 2013 shows that the entire provisional program was implemented, representing 170,000 roots. This is also the case for offshoot planting, which reached a total of 295,121, about 5 times the anticipated 60,000. The distribution of tuft cleaning operations across perimeters also shows that achievements have been mainly concentrated within the valley of Draa perimeter (**34 %**), followed by the Aoufous (**11 %**), Erfoud (**11 %**), Goulmima (**10 %**) and Todgha (**10 %**) perimeters. For the seven remaining perimeters, in this case Akka, Jorf, Bouanane, Akka Ighan, El Khorbat, Tamezret and Tadakoust, proportions range between **1 %** and **7 %** of the overall provisional program (Table 50). As for the success rate of date tree offshoot transplanting, the results from our surveys revealed that less than half (40 %) of the offshoots planted were in good vegetative condition. Tuft cleaning operations, in turn, received great support from farmers, reaching a total of **9629** beneficiaries.

Table 50. Final assessment of tuft cleaning and offshoot planting operations

Perimeter	Tufts cleaned		Nb of offshoot weaned and planted	Nb of beneficiary farmers
	Number	%		
Akka	12,000	7	9,344	694
Tamezraret	1,000	1	1,350	83
Tadakoust	1,000	1	600	48
Akka Ighan	6,000	4	20,143	456
Todgha	16,500	10	28,894	2,084
Goulmima	17,000	10	24,719	599
Bouanane	6,500	4	9,500	830
Khorbate	4,000	2	3,932	137
Subtotal 1	64,000	38	98,482	4,931
Valley of Draa	58,000	34	160,230	1,653
Aoufous	19,000	11	4,160	950
Erfoud	19,000	11	19,875	1,330
Jorf	10,000	6	12,374	765
Subtotal 2	106,000	62	196,639	4,698
Grand Total	170,000	100	295,121	9,629

The results from survey ME-16 show that about 90 % of the beneficiary date producers across the various farm categories are satisfied to very satisfied with the quality of the tuft cleaning operation. (Table 51).

Table 51. Beneficiary farmers' rating of the execution quality for the "date tree tuft cleaning" operation (Oasis)

		Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>		41	100.0	66	100.0	102	100.0	209	100.0
Rating	Very satisfied	17	41.5	38	57.6	51	50.0	106	50.7
	Rather satisfied	22	53.7	23	34.8	35	34.3	80	38.3
	Neutral/normal	1	2.4	2	3.0	2	2.0	5	2.4
	Somewhat dissatisfied	0	.0	2	3.0	8	7.8	10	4.8
	Very dissatisfied	1	2.4	1	1.5	6	5.9	8	3.8

Source: Survey ME-16

For the "Rehabilitation of existing date tree orchards in oasis areas" sub-activity, the output reviewed for assessing effectiveness focuses on:

- Date tree acreage rehabilitated in oasis areas.

The provisional program under this sub-activity involved the rehabilitation of the existing date tree orchards in oasis areas. It more specifically consisted in providing specific training, oversight and technical assistance to the beneficiary farmers to improve the productivity of their date trees.

Overall assessment of date tree rehabilitation in oasis areas. At the closing of PAF, the acreage of rehabilitated date tree orchards in oasis areas involved a total of **15,718 ha** (Table 52). The largest rehabilitated area was located in the Souss-Massa-Draa region with a total of **10,402 ha**, representing a 66.2 % proportion, followed by Meknes-Tafilalet with about 25.9 %. The remainder is divided across the regions of Goulmim-Smara (6.7 %) and the Oriental (1.3 %).

Table 52. Assessment of the overall plan for the rehabilitation of orchards in oasis areas

Region	Rehabilitated acreage (ha)	%
Souss-Massa-Draa	10,402	66.2
Meknes-Tafilalet	4,067	25.9
Goulmim-Smara	1,046	6.7
Oriental	203	1.3
Total	15,718	100.0

3.1.4. Fruit Tree Sector Support Services.

Considering the cross-cutting nature of this activity, support services (including training, oversight and technical assistance) concerned both the upstream and downstream value chains in the target sectors, for all three types of areas covered by PAF (rain-fed, PMH - Small and Medium-sized irrigated perimeters, irrigated in oasis areas). The results from the evaluation of effectiveness for this activity are presented by separating the overall evaluation based on these two segments (upstream and downstream) in the target sectors⁵.

3.1.4.1. Review of the support provided upstream of the target fruit tree sectors

This section focuses on assessing the effectiveness in implementing the outputs relating to the *training, oversight and technical assistance services for beneficiaries and their professional organizations*, in the upstream olive, almond and fig tree sectors in *mountain areas* (rain-fed and PMH) and in the upstream date tree sector in *oasis areas*.

⁵ The terms of reference of contract TC-5A make no distinction as to the beneficiaries to be trained in rain-fed and PMH areas. Accordingly, it was not possible to address the effectiveness of the "Rehabilitation of existing orchards in rain-fed areas" sub-activity separately from that of the "Rehabilitation of existing orchards in PMH areas" sub-activity

For **olive, almond and fig tree sectors** in mountain areas, the evaluation of effectiveness reviews the following outputs:

- Number of farmers trained in all target sectors in mountain areas,
- Young farmers trained in all target sectors in mountain areas,
- Young women trained in all target sectors in mountain areas
- Number of OPA members trained in mountain areas;

Final assessment of men and women farmers training in all target fields in mountain areas

The final evaluation established by the final report of contract TC-5A, reports very mixed rates of success. In terms of the number of days completed, the targets set for 2013 were effectively achieved, that is **100 %**. However, if we consider the number of beneficiaries trained, it should be noted that achievements were below the targets set. In all perimeters, the number of men/women farmers trained did not exceed **50 %**, or **16,500** people (including approximately 1,780 women), with rates ranging from **47 %** for tillage and fertilization works and **51 %** for pruning (Table 61). This low rate of beneficiaries trained is due to several sources of inefficiency both inherent in the training approach and course used and in the quality of trainers: targeting of beneficiaries (physical inability of elderly beneficiaries to attend the training courses, inconsistency of some overly theoretical training modules, scheduling of some training sessions at the time the construction work was performed (beneficiaries faced a dilemma choosing between attending training courses or seizing the opportunity of paid work).

Table 53. Final assessment of training for men/women farmers in mountain areas (Rain-fed and PMH)

Module	Targets 2013 (Nb)		Final achievements (Nb)				Achievement rate (%)	
	Beneficiaries	Days	Perimeters	Trained	Including women	Days	Trained	Days
Pruning	33,000	330	236	16,980	1,492	332.0	51	101
Soil Tillage and Fertilization	33,000	330	241	16,436	1,796	338.0	50	102
Phytosanitary treatment	33,000	330	243	15,404	1,385	335.5	47	102
Harvest	33,000	330	232	16,489	2,462	314.5	50	95
Total	33,000	1,320				1,320		100

STF: Soil tillage and fertilization; PT: Phytosanitary treatments

Source: Contract TC-5A, Final Upstream/Downstream activity report, Final version, August 2013

Assessment of gender mainstreaming in the training of men and women farmers in mountain areas.

Despite the structural integration of the gender approach in the initial design of PAF, and the efforts made throughout the implementation of actions in the perimeters, the training, technical assistance and oversight service offering doesn't appear to have sufficiently internalized this orientation in its intervention approach. Indicators provided by the final TC-5A report consider that rates of female

participation in the technical training sessions are very high. The latter represented between **10 %** and **15 %** of the number of people who have benefited from the technical training modules (Table 54). This indicator may be used as one of the indirect measures of effectiveness of the cross-cutting approaches for the structural integration of the gender approach into all training, technical support and oversight activities.

Table 54. Proportion of women trained in the upstream sectors in mountain areas (Rain-fed and PMH)

Species	Module	Rating indicators			
		Average Nb of beneficiaries/perimeter	Average Nb of beneficiaries/session	% of women trained	Average duration/session (D)
Olive trees	Pruning	76	26	9%	0.5
	Soil Tillage and Fertilization	68	25	10%	0.5
	Phytosanitary treatment	68	23	9%	0.5
	Harvest	74	27	14%	0.5
Almond trees	Pruning	40	20	12%	0.5
	Soil Tillage and Fertilization	67	20	19%	0.5
	Phytosanitary treatment	40	20	17%	0.5
	Harvest	38	20	34%	0.5
Fig trees	Pruning	40	25	1%	0.5
	Soil Tillage and Fertilization	83	33	11%	0.5
	Phytosanitary treatment	72	27	14%	0.5
	Harvest	31	20	0%	0.5

TSF: Soil tillage and fertilization; PT: Phytosanitary treatments

Source: Contract TC-5A, Final Upstream/Downstream activity report, Final version, August 2013

Assessment of the training program for the sons/daughters of farmers and rural youth in mountain areas. To increase rural youth employability, the project had planned hands-on training for unemployed youth (boys and girls) under TC-5A activity. The expected outcomes of this service was to encourage rural youth in target areas to acquire the knowledge required to enter agricultural professions and to form groupings that would offer paid technical services and assistance at the level of the expansion and rehabilitation perimeters. While, in terms of achievements, the **outputs** have been **effectively achieved**, their expected outcomes are not fully implemented on the ground and were limited to a few marginal initiatives which are still in an embryonic stage (cases of Taza and Taounate). Thus, compared with the targets set (2013), all of the **3,630** training days planned were held, representing a **100 %** success rate. The same applies to the number of beneficiaries trained

insofar as the overall achievement rate reached about **91 %**, with values ranging between **84 %** for phytosanitary treatment training and **102%** for pruning training.

Table 55. Evaluation of achievements in the training of the sons and daughters of farmers and rural youth in mountain areas (Rain-fed and PMH)

Modules	Targets 2013 (Nb)		Final achievements (Nb)				Achievement rate (%)	
	Beneficiaries	Days	Perimeters	Trained		Days	Trained	Days
				Total	Women			
Pruning	6,600	1,320	237	6,704	536	1,356	102	103
Soil Tillage and Fertilization	6,600	990	234	5,974	645	1,002	91	101
Phytosanitary treatment	6,600	660	231	5,568	562	640	84	97
Harvest	6,600	660	227	5,761	582	632	87	96
Total	6,600	3,630				3,630		100

Source: Contract TC-5A, Final Upstream/Downstream activity report, Final version, August 2013

Evaluation of the training delivered for OPA board members in mountain areas. Since OPAs represent one of the main stakeholders in the execution of the planting expansion and rehabilitation work, they benefitted from a major capacity-building program in terms of awareness-raising, training and oversight. In terms of training, the final cumulative achievements for OPA board members have been generally satisfactory. Compared with the targets set (2013), all of the 906 days of training planned were conducted, that is a 100% rate. In terms of number of people trained, the success rate was about 77%.

As for the training on OPA constitution and operation, achievements exceeded the targets set in terms of number of days, or 110%, and accounted for 89% of the people to be trained. For the remaining training modules, accomplishments have been very significant overall, ranging between 94% and 104% compared with the number of days planned, and between 67% and 81% compared with the number of expected beneficiaries.

Table 56. Review of achievements in the training of OPA board members in mountain areas (Rain-fed and PMH)

Modules	2013 targets (Nb)		Final achievements (Nb)				Achievement rate (%)	
	Beneficiaries	Days	Perimeters	Trained		Days	Trained	Days
				Total	Women			
OPA Board members	7,200	906		5,520		906	77	100
Setting-up/operation	1,620	136	277	1,444	142	150	89	110
Administration and management	1,620	272	264	1,314	110	284	81	104
Entrepreneurship	1,980	332	300	1,426	140	316	72	95
OPSO	1,980	166	285	1,336	121	156	67	94

Source: Contract TC-5A, Final Upstream/Downstream activity report, Final version, August 2013

The effectiveness of the training carried out among OPA board members was reinforced by their large and massive satisfaction with the quality of the training delivered to them. Indeed, the results of survey ME-16 show that with very rare exceptions, all co-operatives and AUEAs concerned are very satisfied to satisfied with the quality of all modules delivered.

Table 57. Rating of the quality of training received by co-operatives (PMH)

Training module (Contract)	Rating	Number	%
OPA Establishment and operation (TC-5A)	<i>Respondents</i>	21	100.0
	Very satisfied	16	76.2
	Rather satisfied	5	23.8
	Rather unsatisfied		
	Not at all satisfied		
OPA leadership and management (TC-5A)	<i>Respondents</i>	19	100.0
	Very satisfied	12	63.2
	Rather satisfied	7	36.8
	Rather unsatisfied		
	Not at all satisfied		
Introduction to entrepreneurship (TC-5A)	<i>Respondents</i>	20	100.0
	Very satisfied	13	65.0
	Rather satisfied	6	30.0
	Rather unsatisfied	1	5.0
	Not at all satisfied		
Second order professional organization - GIE (TC-5A)	<i>Respondents</i>	21	100.0
	Very satisfied	16	76.2
	Rather satisfied	3	14.3
	Rather unsatisfied	2	9.5
	Not at all satisfied		

Source: Survey ME-16

Table 58. Rating by AUEAs of the quality of training received (PMH)

Training module	Rating	Number	%
Handling of hydro-agricultural structures (TC-1B)	<i>Respondents</i>	20	100.0
	Very satisfied	15	75.0
	Rather satisfied	4	20.0
	Rather unsatisfied		
	Not at all satisfied	1	5.0
Irrigation network maintenance and servicing (TC-1B)	<i>Respondents</i>	19	100.0
	Very satisfied	14	73.7
	Rather satisfied	4	21.1
	Rather unsatisfied	1	5.3
	Not at all satisfied		
Introduction to entrepreneurship (TC-5A)	<i>Respondents</i>	14	100.0
	Very satisfied	9	64.3
	Rather satisfied	5	35.7
	Rather unsatisfied		
	Not at all satisfied		
Second order professional organization - GIE (TC-5A)	<i>Respondents</i>	17	100.0
	Very satisfied	9	52.9
	Rather satisfied	6	35.3
	Rather unsatisfied	2	11.8
	Not at all satisfied		

Source: Survey ME-16

For the *date sector in oasis areas*, the relevant outputs are as follows:

- Number of men and women farmers trained in oasis areas;
- Young farmers (FFAJR) trained in all target fields targeted in oasis areas.
- Number of OPA members trained in oasis areas;

Overall assessment of the training program for men and women farmers in the upstream date sector in oasis areas. According to the provisional program, the TC-5B contract planned six training modules, each of which targeted 9000 men and women farmers. Overall, effectiveness in achieving this target was average, corresponding to a 54% achievement rate compared to the provisional program. Depending on modules, the highest achievement rates were recorded for the cleaning and harvesting modules, or 70% respectively. The treatment and cutting modules only attracted respectively 38% and 40% of beneficiaries to be trained. Success rates for the planting and pollination modules were respectively 59% and 50%. As pertinently underlined in the final TC-5B report, “one of the guarantors of training sessions’ success was that the training topics were supported by concrete action on the ground, *so that training sessions on planting were followed by the provision of in-vitro plants and, in a similar way, training sessions on tuft cleaning were followed by a tuft cleaning operation on the same perimeter. This organization has had a double positive impact, first on*

training insofar as it was clear that it has been useful, and second, on the operation itself insofar as farmers were prepared to complete the planting and cleaning successfully”.

Table 59. Review of training for men and women farmers in oasis areas

Modules	Number of people to be trained	Number of people trained	Achievement rate
In-vitro plant and offshoot planting	9,000	5,294	59%
Tuft pruning and cleaning	9,000	6,295	70%
Pollen harvesting and pollination	9,000	4,456	50%
Bunch cutting, staking and bagging	9,000	3,591	40%
Phytosanitary treatment	9,000	3,424	38%
Date harvesting, drying and preservation	9,000	6,300	70%

Source: TC-5B, Final Report, Final Version, September 2013

With regard to *assessing the quality of the training modules* received, survey ME-16 shows that a large majority of beneficiaries are very satisfied to satisfied, except for the “Bunch cutting, staking and bagging” and “Phytosanitary treatment and biological control” modules for which dissatisfaction rates were particularly high with 94% and 88% respectively (Table 60).

Table 60. Farmers’ rating of the quality of training received (Oasis)

Module	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
In-vitro plant and offshoot planting and maintenance	<i>Respondents</i>	23	100.0	53	100.0	128	100.0	204	100.0
	Very satisfied	14	60.9	25	47.2	65	50.8	104	51.0
	Rather satisfied	6	26.1	20	37.7	54	42.2	80	39.2
	Neutral/normal	1	4.3	7	13.2	6	4.7	14	6.9
	Somewhat dissatisfied	2	8.7					2	1.0
	Very dissatisfied			1	1.9	3	2.3	4	2.0
Tuft pruning and cleaning	<i>Respondents</i>	24	100.0	49	100.0	123	100.0	196	100.0
	Very satisfied	13	54.2	25	51.0	72	58.5	110	56.1
	Rather satisfied	9	37.5	20	40.8	41	33.3	70	35.7
	Neutral/normal	1	4.2	4	8.2	7	5.7	12	6.1
	Somewhat dissatisfied	1	4.2			1	0.8	2	1.0
	Very dissatisfied					2	1.6	2	1.0
Pollen harvesting and pollination	<i>Respondents</i>	21	100.0	48	100.0	118	100.0	187	100.0
	Very satisfied	11	52.4	24	50.0	65	55.1	100	53.5
	Rather satisfied	9	42.9	18	37.5	42	35.6	69	36.9
	Neutral/normal	1	4.8	5	10.4	8	6.8	14	7.5
	Somewhat dissatisfied			1	2.1			1	0.5
	Very dissatisfied					3	2.5	3	1.6

Module	Rating	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Bunch cutting, staking and bagging	Respondents	18	100.0	45	100.0	101	100.0	164	100.0
	Very satisfied					2	2.0	2	1.2
	Rather satisfied								
	Neutral/normal	1	5.6	3	6.7	4	4.0	8	4.9
	Somewhat dissatisfied	4	22.2	20	44.4	35	34.7	59	36.0
	Very dissatisfied	13	72.2	22	48.9	60	59.4	95	57.9
Phytosanitary treatment and biological control	Respondents	18	100.0	41	100.0	88	100.0	147	100.0
	Very satisfied					3	3.4	3	2.0
	Rather satisfied					1	1.1	1	0.7
	Neutral/normal	1	5.6	8	19.5	4	4.5	13	8.8
	Somewhat dissatisfied	4	22.2	18	43.9	33	37.5	55	37.4
	Very dissatisfied	13	72.2	15	36.6	47	53.4	75	51.0
Date harvesting, drying and preservation	Respondents	23	100.0	48	100.0	108	100.0	179	100.0
	Very satisfied	16	69.6	28	58.3	63	58.3	107	59.8
	Rather satisfied	6	26.1	15	31.3	36	33.3	57	31.8
	Neutral/normal	1	4.3	5	10.4	8	7.4	14	7.8
	Somewhat dissatisfied								
	Very dissatisfied					1	0.9	1	0.6

Source: Survey ME-16

Review of the training program for sons/daughters of farmers and rural youth in oasis areas.

According to the provisional program, contract TC-5B planned the same six training modules intended for both men and women farmers for this category of beneficiaries. The targets set for each module, were 900 youth, representing a total of 5,400 youth. For all modules taken together, effectiveness in achieving the overall target was appreciable with an overall rate of 105% compared to the provisional program. However, this rate does not mean that there were new participants in each module. Indeed, only 60% of all participants attended four modules at least. This means that *achievement rates per module are well below those reported in the final TC-5B report* (Table 61).

Table 61. Review of training for sons and daughters of farmers and rural youth in oasis areas

Modules	Number of people to be trained	Number of people trained	Achievement rate
In-vitro plant and offshoot planting	900	928	103%
Tuft pruning and cleaning	900	897	99.6%
Pollen harvesting and pollination	900	948	105%
Bunch cutting, staking and bagging	900	983	109%
Phytosanitary treatment	900	941	104%
Date harvesting, drying and preservation	900	967	107%

Source: TC-5B, Final Report, Final Version, September 2013

Overall assessment of the training program for OPA board members in oasis areas. According to the provisional program, contract TC-5B planned four training modules, each of which targeted 1,500 beneficiaries. In short, the overall target for the training of co-operative and producer association (OPA) members was 6,000 recipients. Effectiveness in achieving this target was significant overall, corresponding to an achievement rate of 99% compared to the provisional program. However, depending on the modules, achievement rates are highly variable. The management/establishment module far exceeded the target set (265%). This is due to the fact that at the beginning of the project, the date sector was not structured into co-operatives and producer associations. At the time when it was imperative to form GIEs from already formed cooperatives so that they could benefit from the date storage and packaging refrigeration units established by the project and from support for managing them. Entrepreneurship and OPSO modules were of interest to respectively 51% and 58% of the beneficiaries to be trained. For communication modules, the achievement rate did not exceed 22% (Table 62).

Table 62. Review of training for OPA members in oasis areas

Modules	Number of people to be trained	Number of people trained	Achievement rate
OPA leadership and management (Communication)	1,500	331	22%
Introduction to Entrepreneurship	1,500	768	51%
OPSO (GIE)	1,500	867	58%
OPA establishment and management (Creation)	1,500	3,976	265%

Source: TC-5B, Final Report, Final Version, September 2013

Another indicator also informs about the effectiveness of the training delivered and its chances to induce the expected outcomes: the assessment of their quality by those who have taken part. On this aspect, survey ME-16 shows that both co-operatives and AUEAs interviewed overwhelmingly expressed their high level of satisfaction with the quality of the training received, for all modules delivered to them (Tables 63 and 64).

Table 63. Rating of the quality of training received by co-operatives in oasis areas

Training module	Rating	Number	%
OPA establishment and operation	<i>Respondents</i>	16	100.0
	Very satisfied	12	75.0
	Rather satisfied	4	25.0
	Rather unsatisfied		
	Not at all satisfied		
OPA leadership and management	<i>Respondents</i>	17	100.0
	Very satisfied	15	88.2
	Rather satisfied	2	11.8
	Rather unsatisfied		

Training module	Rating	Number	%
Introduction to entrepreneurship	Not at all satisfied		
	<i>Respondents</i>	13	100.0
	Very satisfied	10	76.9
	Rather satisfied	3	23.1
	Rather unsatisfied		
Second order professional organization (GIE)	Not at all satisfied		
	<i>Respondents</i>	22	100.0
	Very satisfied	17	77.3
	Rather satisfied	4	18.2
	Rather unsatisfied		
	Not at all satisfied	1	4.5

Source: Survey ME-16

Table 64. Rating of the quality of training received by AUEAs in oasis areas

Training module	Rating	Number	%
Handling of hydraulic structures (TC1-B)	<i>Respondents</i>	11	100.0
	Very satisfied	8	72.7
	Rather satisfied	3	27.3
	Rather unsatisfied		
	Not at all satisfied		
Irrigation network maintenance and servicing (TC-1B)	<i>Respondents</i>	17	100.0
	Very satisfied	16	94.1
	Rather satisfied	1	5.9
	Rather unsatisfied		
	Not at all satisfied		
Introduction to entrepreneurship	<i>Respondents</i>	13	100.0
	Very satisfied	10	76.9
	Rather satisfied	2	15.4
	Rather unsatisfied	1	7.7
	Not at all satisfied		
Second order professional organization (GIE)	<i>Respondents</i>	13	100.0
	Very satisfied	8	61.5
	Rather satisfied	4	30.8
	Rather unsatisfied	1	7.7
	Not at all satisfied		

Source: Survey ME-16

In terms of implementation of achievements, the training intended for the board members of co-operatives and AUEAs in oasis areas also proved generally effective. The results of survey ME-16 show that both for co-operatives and AUEAs, the proportion of those stating they haven't applied any of the gains from the training received does not exceed 15%, except for the "Second-order professional organization" module for AUEAs where this proportion was around 54%. This seems logical to me and consistent with the 82% application rate recorded among co-operatives considering

that AUEAs cannot be part of a GIE as an association. Their members are often invited to set up new co-operatives or to possibly join the new co-operatives trained how to enter the GIEs (Tables 65 and 66).

Table 65. Application rate of training for co-operatives in Oasis areas

Training module	Level of application	Number	%
OPA establishment and operation	<i>Respondents</i>	16	100.0
	Applied	12	75.0
	Little applied	3	18.8
	Not at all applied	1	6.3
OPA leadership and management	<i>Respondents</i>	17	100.0
	Applied	12	70.6
	Little applied	3	17.6
	Not at all applied	2	11.8
Introduction to entrepreneurship	<i>Respondents</i>	13	100.0
	Applied	7	53.8
	Little applied	4	30.8
	Not at all applied	2	15.4
Second order professional organization (GIE)	<i>Respondents</i>	22	100.0
	Applied	18	81.8
	Little applied	2	9.1
	Not at all applied	2	9.1

Source: Survey ME-16

Table 66. Application of training for AUEAs in Oasis areas

Training module	Level of application	Number	%
Handling of hydraulic structures (TC1-B)	<i>Respondents</i>	11	100.0
	Applied	8	72.7
	Little applied	2	18.2
	Not at all applied	1	9.1
Irrigation network maintenance and servicing (TC-1B)	<i>Respondents</i>	17	100.0
	Applied	13	76.5
	Little applied	4	23.5
	Not at all applied		
Introduction to entrepreneurship	<i>Respondents</i>	13	100.0
	Applied	8	61.5
	Little applied	3	23.1
	Not at all applied	2	15.4
Second order professional organization (GIE)	<i>Respondents</i>	13	100.0
	Applied	3	23.1
	Little applied	3	23.1
	Not at all applied	7	53.80

Source: Survey ME-16

Overall assessment of gender mainstreaming in the training program, all categories taken together, upstream of the date sector in oasis areas. Gender mainstreaming in the provisional training program was one of the major specifications for PAF. However, no indication was initially provided on the targets to be reached, making it impossible to assess effectiveness on this aspect. Given the very conservative environment of the oasis area, the overall assessment of achievements testifies to high efficiency and notable success of PAF in terms of gender mainstreaming. Women's participation rates range between 12% and 30% of the beneficiaries trained (Table 67).

Table 67. Assessment of gender integration into training courses in oasis areas

Targeted categories	Number of people trained	Number of women trained	Participation rate
Training for men/women Farmers	29,360	3,669	12.5%
Training for sons and daughters of farmers and rural youth	5,664	1,604	28.3%
Training for co-operatives and producer associations (OPA)	5,942	1,277	21.5%

Source: TC-5B, Final Report, Final Version, September 2013

Review of farmers' adoption of improved crop husbandry techniques in oasis areas. Concerning this component, it should firstly be noted that unlike the situation at the end of contract TC-5B, the criteria for evaluating the adoption rate of date tree cop husbandry techniques had not all been documented at the beginning of the contract: proper in-vitro transplanting, proper offshoot transplanting, heavy bunch staking, use of harvesting kits, use of plastic to protect dates. For those who had been documented, the largest increase in the adoption rate has been recorded for the "Dry leaf thinning" and "Offshoot weaning" criteria with 60% and 49%, followed by "Pollination at the right time" and "selection of the right pollinator" with 26% and 20%. "Phytosanitary treatment" achieved an adoption rate of 10% only. The "Bunch reduction by cutting" criteria remained stable with an insignificant rate of less than 1%. These results show that the farmers were sensitive to the adoption of the recommended practices through the two training modules "Tuft pruning and cleaning" and "Pollen harvesting and pollination", as they were for nearly all of the other modules (Table 68). So well that the 20% increase in the expected adoption rates were generally exceeded; as farmers became aware that the application of the techniques learned results in an immediate increase in harvest levels and income.

Table 68. Developments in the adoption rate of improved practices between the start and end of Contract TC-5B

Modules	Evaluation criteria	Adoption at contract start	Adoption at contract end
Plantation	Proper in-vitro plant transplanting	N/A	58%
	Proper offshoot transplanting	N/A	49%
Thinning, cleaning	Dry leaf thinning	28.9%	88.8%
	Offshoot weaning	13.3%	62%
Pollination	Selection of the right pollinator	Estimated at 75%	94.5%

Modules	Evaluation criteria	Adoption at contract start	Adoption at contract end
	Pollination at the right time	Estimated at 66%	91.7%
Staking, cutting, bagging	Heavy bunch staking		73%
	Bunch reduction by cutting	0.9%	0.9%
Harvesting	Use of harvesting kit	N/A	30%
	Use of plastic for date protection	N/A	92.6%
Phytosanitary treatment		5.9%	15.8%

TC-5B, Final Report, Final Version, August 2013

The results of survey ME-16 relating to the application rate of the training received by the farmers tend to be consistent with those set under contract TC-5B. This trend becomes further established if the two rates corresponding to “Applied” and “Little applied” are added up, which gives a cumulative adoption rate of about 17% for the “phytosanitary treatment and biological control” and of 60% to 80% for the five others (Table 69). Nonetheless, the rates put forward by TC-5B for the "Tuft pruning and cleaning", “Pollen harvesting and pollination” and "Harvesting" modules are particularly higher.

Table 69. Application rate of the training received by beneficiary farmers (Oasis)

Module	Level of application	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
In-vitro plant and offshoot planting and maintenance	<i>Respondents</i>	23	100.0	54	100.0	128	100.0	205	100.0
	Applied	10	43.5	26	48.1	65	50.8	101	49.3
	Little applied	7	30.4	18	33.3	30	23.4	55	26.8
	Not at all applied	6	26.1	10	18.5	33	25.8	49	23.9
Tuft pruning and cleaning	<i>Respondents</i>	24	100.0	50	100.0	122	100.0	196	100.0
	Applied	11	45.8	23	46.0	61	50.0	95	48.5
	Little applied	6	25.0	18	36.0	33	27.0	57	29.1
	Not at all applied	7	29.2	9	18.0	28	23.0	44	22.4
Pollen harvesting and pollination	<i>Respondents</i>	21	100.0	49	100.0	118	100.0	188	100.0
	Applied	8	38.1	21	42.9	49	41.5	78	41.5
	Little applied	6	28.6	13	26.5	25	21.2	44	23.4
	Not at all applied	7	33.3	15	30.6	44	37.3	66	35.1
Bunch cutting, staking and bagging	<i>Respondents</i>	18	100.0	46	100.0	99	100.0	163	100.0
	Applied	3	16.7	23	50.0	42	42.4	68	41.7
	Little applied	5	27.8	13	28.3	30	30.3	48	29.4
	Not at all applied	10	55.6	10	21.7	27	27.3	47	28.8
Phytosanitary treatment and biological control	<i>Respondents</i>	18	100.0	43	100.0	89	100.0	150	100.0
	Applied			3	7.0	10	11.2	13	8.7
	Little applied	2	11.1	3	7.0	8	9.0	13	8.7
	Not at all applied	16	88.9	37	86.0	71	79.8	124	82.7
	<i>Respondents</i>	23	100.0	49	100.0	109	100.0	181	100.0

Module	Level of application	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Numb er	%	Numb er	%	Numb er	%	Numb er	%
Date harvesting, drying and preservation	Applied	8	34.8	23	46.9	40	36.7	71	39.2
	Little applied	5	21.7	10	20.4	25	22.9	40	22.1
	Not at all applied	10	43.5	16	32.7	44	40.4	70	38.7

Source: Survey ME-16

3.1.4.2. Review of the Support Services Provided in the Downstream Target Fruit Sectors

Assessment of the effectiveness of the training services downstream of target fruit tree sectors reviews the outputs focusing respectively on I) training services downstream of production, and II) oversight and technical support downstream of production, and the III) oversight and technical support with the pilot projects for women (PPF).

Concerning the **training services downstream of target sector production** in mountain and oasis areas, assessment of effectiveness focuses on reviewing the following outputs:

- Number of training sessions conducted downstream of production in rain-fed and PMH areas ;
- Number of training sessions conducted downstream of production in oasis areas;
- Number of people trained conducted downstream of production in rain-fed and PMH areas;
- Number of people trained conducted downstream of production in oasis areas;
- Proportion of women trained downstream of production in rain-fed and PMH areas;
- Proportion of women trained downstream of production in oasis areas.

Overall assessment of the training delivered downstream of target sector production in mountain areas (Rain-fed and PMH). With regard to the training on improved manufacturing practice, management and hygiene, success rates almost achieved the targets for crushing unit technicians (96%) and exceeded them for crushing unit managers (105%). Lastly, for the training on olive handling and transport conditions for collectors and transporters, this rate reached 86% of the expected beneficiaries (Table 70).

Table 70. Overall assessment of the training downstream from production in mountain areas (Rain-fed and PMH)

Trained category	Training module/topic	Target end of Fruit Tree Productivity Project	Number of people trained	Achievement rate
Crushing Unit Managers	Improved manufacturing, management and hygiene practice	100	105	105%
Crushing unit technicians	Improved manufacturing and hygiene practice	200	192	96%

Trained category	Training module/topic	Target end of Fruit Tree Productivity Project	Number of people trained	Achievement rate
Collectors & Transporters	Olive handling and transport conditions	200	172	86%

Source: TC-5A, Final Report, Final Version, August 2013

Female participation rate in the training delivered downstream of target sector production in mountain areas (Rain-fed and PMH). Gender mainstreaming in PAF resulted in varying rates of female participation in the training. For their training downstream of production, these rates ranged between 0% and 15% of the total number of beneficiaries trained. The lowest attendance rates were registered by the “Improved manufacturing, management and hygiene practice” module with only 8% for crushing unit managers and 6% for crushing unit technicians. As for the “Olive handling and transport conditions” module, no women attended (0%) (Table 71).

Table 71. Women's participation in the training program in mountain areas (Rain-fed and PMH)

Trained category	Training module/topic	Number of people trained	Achievement rate	Including women	% of women
Crushing Unit Managers	Improved manufacturing, management, hygiene practice	105	105%	8	8%
Crushing unit technicians	Improved manufacturing and hygiene practice	192	96%	12	6%
Collectors & Transporters	Olive handling and transport	172	86%	0	0%

Source: TC-5A, Final Report, Final Version, August 2013

Overall evaluation of the training delivered downstream the date production chain in oasis areas.

Achievement rates for the training delivered to crushing unit technicians, crushing unit managers and date transporters also recorded quite different levels, with respectively 114%, 100% and 52% (Table 84).

Table 72. Overall evaluation of the training downstream from production in oasis areas

Formed categories	Training modules/topics	Target end of Fruit Tree Productivity Project	Number of people trained	Achievement rate
Packaging unit managers	Financial and accounting management	40	40	100%
Packaging unit technicians	Improved practice	200	228	114%
Date transporters	-	100	52	52%

Source: TC-5B, Final Report, Final Version, September 2013

Female participation rate in the training delivered downstream of target sector production in oasis areas. The many inconsistencies and ambiguities surrounding the documentation and data made

available to the mission do not allow an evaluation of the training services conducted under TC-5B downstream from date production. The latter affect both the target beneficiaries, which it had not been possible to identify for certain categories, than the beneficiaries trained (*for further details see Evaluation report ME-16: “Intervention of PAF downstream of target fruit tree sector production”*.)

Overall evaluation on the targeting of beneficiaries. The training services provided under TC-5A and TC-5B contracts is characterized by its focus on a restricted panel of players operating in the downstream target value chains (managers, technicians, collectors, transporters), thereby expressing the choice of focusing this offering on the existing operators, instead of extending it to other categories such as unemployed youth (boys and girls) instead of extending it to other categories, including unemployed youth (boys and girls) in particular. The latter option could have been considered by implementing training modules dedicated to the promotion of *income-generating activities* (IGA) for increasing the value of local production, such as training on crop husbandry techniques provided to the youth which motivated them to form service co-operatives. If this had been the case, the performance of the training program would have been significantly improved, in particular through its contribution to reducing unemployment and alleviating the social marginalization of rural youth.

Overall evaluation on the training services provided. Generally, success rates for the training provided are high, but with significant differences depending on the training modules and beneficiary categories. The module on the OPA establishment and management proved to be the most successful for the vast majority of the categories for which it was intended. This could be considered as revealing two concomitant underlying facts: the interest of target beneficiaries in forming or joining OPAs; the existence of a real need from beneficiaries to receive training on the legal, regulatory and procedural aspects governing the creation and operation of OPAs. The construction and equipping of the date packaging and storage refrigeration units which were planned in the original design of PAF⁶ and the project’s strategic choice to include the Catalyst Fund designed to support the establishment of new olive crushing units. The establishment of these two types of units as a lever to promote self-aggregation proved to be a catalyst for the creation of second-order organizations, namely the GIEs, by the farmers in the intervention perimeters of PAF or other non-MCA perimeters. As for the *gender approach*, **female participation rates** in the various training modules were **very satisfactory** overall. Despite the *generally conservative* social context in the target rural areas, female participation reached **one third** of beneficiaries trained as it was the case for the training of sons and daughters of farmers on the cutting (40%) and pollination modules (32,4%). This reveals the project’s particular attention given to *gender mainstream* during the implementation of the training program. But it also reveals the

⁶ The feasibility studies for these units were available well before the start of the project and were conducted by IOS Partners.

existence of a need for women to get involved in professional organizations and to invest fields that are not always accessible to them. This fully backs the relevance of the integration of this dimension into the design of PAF.

For the **oversight and technical support downstream of production**, the evaluation of effectiveness reviews the following outputs:

- Number of co-operatives established and operational at the level of target sectors;
- Number of GIEs established and operational at the level of target sectors;
- Proportion of women in the GIEs established at the level of target sectors;
- Number of olive crushing units assisted by the project;
- Number of refrigeration units installed;
- Number of storage and packaging date units assisted;
- Number of female pilot projects supported by the project in mountain areas;
- Number of female pilot projects supported by the project in oasis areas.

Review of the support for the development of professional organizations, including women's

Professional Organizations. Considerable efforts were made by PAF under its two contracts TC-5A and TC-5B, to galvanize and promote the structuring of farmers. The increased number of associations and co-operatives was identified as one of the significant output for support services. As part of contract TC-5B, a total of 77 co-operatives filed applications for approval with ODCO. However, these efforts were hampered by the slow procedures for establishing co-operatives, which reduced the achievements of the targets set, insofar as a significant portion of them were not able to start the approval procedure. Therefore, the support process for establishing co-operatives needs to be continued to enable their integration in GIEs.

Review of the technical support and guidance for GIE in the olive and almond tree sectors. In the framework of contract TC-5A, the adoption of the self-aggregation model planned to cover 271 perimeters, totaling 104,922 ha of olive and almond trees. The project also planned to recognize 374 co-operatives bringing together 53,546 beneficiaries. At the end of the project, the achievements provided by the final TC-5A report on a perimeter coverage rate of 42% only, representing a total of 113 perimeters on a total area of 55,931 ha. In terms of adoption, aggregation rates reached 49% compared to the number of beneficiaries and 42% compared with the number of co-operatives concerned. Considering the number of members in the target cooperatives alone, the aggregation rate increases to 56%, or 5,976 aggregated members compared with the 10,651 total members of existing co-operatives. The final evaluation of the guidance provided for the GIEs formed, indicates that the 20 GIEs were able to hold their organizational meetings, conduct all administrative proceedings for the setting-up and obtain the GIE business registries. In terms of timing, the GIE constitution procedure

required more than seven months on average. This duration is even longer for producer cooperative constitution.

Review of the technical support and guidance for GIE in the date sector. The evaluation carried out at the closing of contract TC-5B reports on 66 recognized co-operatives and 77 in the process of being constituted. **Seven** GIEs were formed from **58 co-operatives**. The 2013 final evaluation reports on **two** operational GIEs out of the **seven** formed. A number of issues remain to be addressed at the five others, mainly relating to the units' power and/or drinking water supply (Table 73).

Table 73. Assessment of GIEs formed for the date tree sector (December 2013)

GIEs formed	Location	Number Co-operatives	Members	Completion	Operational in 2013
Toumour Wahat Aoufous	Aoufous	9	259	✓	No
Difat Ziz	Erfoud	31	500	✓	✓
Ghriss Ferkla Amagha	Goulmima	6	334	✓	No
Tinzouline Draa	Tinzouline	3	280	✓	✓
Wahat Ternata Draa	Ternata	2	20	✓	No
Mezguita Agdez	Agdez	4	4	No	No
Wahat Dattes Tata	Tata	3	44	No	No
Total		58	1,441	5/7	2/7

Proportion of women in GIE constitution, all sectors taken together. Women's co-operatives involved in the GIEs formed under contract TC-5A reached a proportion of 11%, those with mixed membership represented 21%, against 68% for men-only cooperatives. Under contract TC-5B, the number of women's co-operatives formed accounted for 9% of the total. These results testify to the mobilization and sensitization efforts made within the perimeters covered to meet the gender mainstreaming target in the establishment of the new GIEs.

Overall assessment of the self-aggregation model. It follows from the above that *effectiveness* in achieving the targets set was *overall quite satisfactory*: the self-aggregation model was initiated on the ground, and the gender approach was sufficiently integrated in the GIE constitution process. However, the recently established GIEs are still in the launch phase, not fully operational and with no experience. Additional support, capacity-building, empowerment and good governance actions must follow with a view to building an effective and dynamic GIE fabric.

Review of the establishment of modern date valorization units in oasis areas. The actions carried out under contracts TC-6B primarily involved *the cold and isolation equipment for date packaging units*. A mixed financial package was adopted, stipulating that MAPM bears the cost of civil engineering work while PAF finances the equipment acquisition and installation. The implementation of these measures was covered by several contracts, and divided into lots to speed up the pace of achievements.

Contract TC-6B1 focused on the setting-up of a pilot date packaging unit in Tamezmout, province of Zagora. Contracts TC-6B2 and TC-6B3 focused on the establishment of five units (two in Zagora and three in Errachidia). Contract TC-6B4 which was divided into five lots, consisted of purchasing the packaging material for the target units. It was not until September 2013, through an amendment to contract TC-6B4; the two remaining units (those of Aoufous and Tata) were not able to receive the support of PAF for the packaging material before September 2013, through an amendment to contract TC-6B4. Lastly, contract TC-6B5 focused on the acquisition of refrigeration equipment for the Tata unit. In terms of achievements, the **final evaluation** shows that all of the construction and equipment work for the seven units planned was completed. On the other hand, connection to electricity and drinking water networks are not fully achieved (Table 74). In terms of operation, only **two units** out of the seven created have entered into service: the unit of the “Wahat Tamezmout - Tinzouline” GIE in Zagora and that of the “Difaf Ziz” GIE in Errachidia.

Table 74. Final assessment of the creation of date packaging and storage units

Provinces	GIEs formed	Progress status		Power supply		Drinking water
		Built	Equipped	Connected	Subscribed	
Zagora	Wahat Tamezmout - Tinzouline	100%	100%	Yes	Yes	Yes
Zagora	Mezquita - Agdez	100%	100%	Yes	No	In progress
Zagora	Wahat Tarnata	100%	100%	Yes	No	No
Errachidia	Ghriss - Ferkla - Amagha	100%	100%	Yes	Yes	No
Errachidia	Difaf Ziz	100%	100%	Yes	Yes	Yes
Errachidia	Wahat Aoufous	100%	100%	No	No	No
Tata	Oult Tata	90%	100%	No	No	No

Overall evaluation of the implementation of the program for upgrading the existing date packaging units. At the beginning, 30 OPAs with valorization units were listed as priority targets for the upgrading program of existing units. After the diagnoses carried out, only seven units (co-operatives) were selected to benefit from the upgrading program, given that they had a minimal infrastructure (Toumour Tinzouline, Toumour Al Assala-Tagounite, Annakhil-Zagora, Zriguette-Aoufous, AlKawtar-Erfoud, Taskala-Tata and Afra-Tata). These co-operatives benefited from the strengthening of their technical and managerial capacity (improved manufacturing practice, improved hygiene practice, HACCP, financial and accounting management, post-harvest processing of dates, date marketing and commercialization, etc.) and outreach assistance throughout the program (preparation of special conditions for the developments and the procurement of equipment, drawing up of technical plans, demonstrations on the processes, packaging techniques and labeling).

In this context, special attention was given by the project to obtain permission for post-harvest treatment (fumigation). Following the authorization for the use of phosphine in date post-harvest

treatment (Ministerial decree of May 31, 2011), a series of tests was conducted with the oversight of TC-5B and ONSSA.

These efforts have materialized through the establishment of the grading map for fumigation to benefit *three co-operatives*: Annakhil in Zagora, Toumour Assalah in Tagounite and Zriguette in Aoufous. For the four others, the process was started, but the grading maps could not be established within the allowed time. Among the reasons for the delay in obtaining the grading map by these co-operatives is the need for rehabilitating the premises according to regulatory requirements for fumigation. At the project closure, a review of achievements reports on three different situations: two units which are already operating (Toumour Tinzouline and Toumour Al Assala - Tagounite), three operational units, but their business activities are still limited (Annakhil-Zagora, Taskala-Tata and Afra-Tata) and two units that are not yet operational (Zriguette-Aoufous and Al Kawtar-Erfoud). The reasons for these mixed results lie either in the failure of the recommended constructions and equipment (timing and quality of work), or in organizational problems (group cohesion in relation to the ownership and piloting of actions).

Overall evaluation of operations for the upgrading of existing olive crushing units. The project planned accompanying and technical assistance measures for upgrading the existing olive crushing units (TC-5A). These actions focused on several aspects (inventory of existing units, diagnosis and pre-audits of their operation, development of individualized business plans per unit, organizational and managerial capacity-building for stakeholders, technical support for the construction and equipment procurement works, process demonstration and testing). Of the 368 crushing units inventoried, of which 183 were diagnosed, only 110 were selected for the upgrading program. This program consisted of training crushing unit managers and technicians, development of pre-audits, action plans and business plans, technical assistance for the development of infrastructure and equipment as well as technical support for HACCP certification. Despite advocacy and mobilization efforts, only 34 crushing units finally embraced the upgrading program. *Here again, the low financial capacity of crushing units was a major barrier to the self-financing of the equipping and construction work recommended by action plans.* Also, the application of the Catalyst Fund in 2011, in particular owing to the fact that its incentive mechanisms are reserved exclusively for the new crushing units, had induced reluctant behavior among the crushing units engaged in the upgrading, by claiming the principle of equity to enjoy the same advantages granted to OPAs under this initiative. As a result, achievements in upgrading these units were well below the ambitions set out at the beginning. Success rates for the construction work at project closure did not exceed 80% for the 16 crushing units and 50% for the 18 others. In the same way, crushing unit equipment with evaporation tanks for vegetable water and storage pad for pomace could not be completed. In addition, only 15 of the 34 units engaged were selected for HACCP certification guidance, following the 2011 annual review. And even this

decision was, in turn, abandoned at the time of the 2012 annual review, to ultimately include only the *extra virgin olive oil “Alfiya Label” certification*.

Assessment of marketing support. Three main actions were developed by PAF to strengthen the capacity of beneficiaries in the areas of marketing and commercialization of their products. These were respectively: i) technical assistance and mentoring of beneficiaries and their OPA/GIEs for the participation in business events at the national and international levels (fairs and shows), while conducting sales tests in mass distribution; II) design and implementation of price information systems (olives and dates); III) marketing support.

-- *Participation in national and international business events.* Between 2010 and 2013, 43 participations in different shows and fairs at the national (Meknes, Erfoud) and international (Paris, Berlin, Cologne, Washington) level were carried out. For the olive sector, the 32 participations carried out under contract TC-5A, are distributed as follows: eight in 2010, ten in 2011, ten in 2012 and four in 2013. Under contract TC-5B, 11 participations were undertaken for small beneficiary groups from the date sector including two in 2010, five in 2011, three in 2012 and one in 2013 (Table 75). In addition to information exchange and direct contact between beneficiaries (they themselves are exhibitors) and potential customers, these participations were also the opportunity to carry out sales tests. The purpose was to teach the beneficiaries the marketing principles so they can use them in the marketing of their products. For dates, sales tests involved a volume of almost 21 tons; they were conducted in the BIM and Marjane stores in 2012 and 2013. According to the final TC-5B report, which does not indicate the breakdown of the quantities of dates marketed according to OPA/GIEs, the sales tests reveals both several benefits for the marketing of Moroccan dates in the modern circuits, but also notable weaknesses to overcome.

Table 75. Assessment of beneficiary participation in fairs and shows

Sector/Destination	2010	2011	2012	2013	Total
Olive sector					
Morocco	2	2	2	2	8
Europe	5	6	6	2	19
USA	1	2	2	0	5
Subtotal 1	8	10	10	4	32
Date sector					
Morocco	1	2	2	1	6
Europe	1	2	1	0	4
USA	0	1	0	0	1
Subtotal 2	2	5	3	1	11
Grand Total	10	15	13	5	43

Implementation of price information systems (PIS). The PAF planned the development and implementation of two price information systems: one for olive oil under contract TC-5A and the other one for dates under contract TC-5B. Since MAPM already has a market information system (MIS), this action was conducted in collaboration with MAMP's Strategy and Statistics Division. The original purpose of this action was revised to include only the further development of the MIS, by incorporating the prices of two products (olive oil and oil). The final reports of contracts TC-5A and TC-5B report on the achievement of this target by building on illustrative examples. However, our visit to the website “www.prixagriculture.org” has revealed problems in the application developed, resulting from the non-availability of the prices of these two products. In that respect, it should be noted that price collection and input into the application were the responsibility of men and women facilitators under TC-5A and TC-5B, but after September 15, 2013, the GIEs are expected to take over and ensure that these prices are updated and disseminated to their members.

Marketing support. PAF planned to provide support to beneficiaries and their professional organizations in the development and implementation of marketing strategies. *For olive, almond and fig sectors*, the adopted approach focused on five pillars: I) organization of upstream producers in GIEs (Groupements d'Interet Economique); II) production of product lines for each sector according to the various segments identified in the market research, III) development of a generic agricultural labels for all of the targeted perimeters; iv) development of participatory operational marketing action plans (PAMOP); and v) mobilization and communication. The key outputs can be summarized as follows: I) an increase in the harvest quantities receiving support, rising from 12 tons in 2010 to 266 tons in 2011, but this trend could not be sustained due to poor 2012 harvests; II) more diversified sales channels to reach manufacturers, Economats, Fairs, Show, Maroc Taswiq and fragmental distribution ; III) improved oil quality since all produced quantities were extra virgin; iv) start of the labeling process for Al Alfiya oil; v) development of the operational marketing action plans with and for the GIEs, but whose experimentation 2012 failed to achieve any results due to the lack of marketing support (transport, storage, working capital, etc.). *For the date sector*, PAF involved establishing a quality assurance system at the new valorization units as well at existing units. The recommended system is based on the HACCP approach. Despite the efforts made within the framework of contract TC-5B, in particular to update the infrastructures and equipment for units to meet the required standards, and search for working capital to finance required actions, the results were not up to the goals envisioned. *At the end of the project, none of the target existing units have been able to start the certification process for its quality system.* However, the new units installed will be able to start setting-up their quality system as soon as they are commissioned.

Overall evaluation of olive, almond and fig PFF achievements in mountain areas. A total of **470** women benefited from **eight** pilot projects which are distributed by products as follows: **two**

crushing units (Al Houdda-Ouezzane and Azzouhour-Boulemane), **two** olive canning units (Al Amal-Taounate and Tawenza-Chichaoua), **one** development project for the management of spent olives and vegetable waters at the level of the crushing units (Al Oumnia-Ouezzane), **one** date valorization unit (Tayssire-Taounate), **one** unit for agricultural service provision (Taitmatine-Azilal) and **one** almond upgrading unit (Tighzratine-Taza). At the end of PAF, the achievement rates for the construction of **eight units** are **100%**, putting aside the unit of Azzouhour co-operative in Boulemane (40%). It is the same with equipment rates, putting aside the unit of Tighzratine co-operative in Tata (35%). In terms of operation, **only two** of the eight units built entered **into service**. For the **six** others, it's the problems of electricity hook-up and drinking water supply which experienced delays (Table 88).

Table 76. Final assessment of PPF achievements in mountain areas (Rain-fed and PMH)

Province	Co-operative	Progress status		Electricity		Drinking water	Commissioning
		Built	Equipped	Connected	Subscribed		
Ouezzane	Oumnia	100%	100%	Yes	Yes	Yes	Yes
Ouezzane	Al Houdda	100%	100%	No		No	No
Taounate	Al Amal	100%	100%	No		No	No
Taounate	Tayssire	100%	100%	No		No	No
Azilal	Taitmatine	100%	100%	No		No	Yes
Chichaoua	Tawanza	100%	100%	Yes	No	No	No
Boulmane	Azzouhour	40%	100%	No		No	No
Taza	Tighzratine	100%	35%	No		No	No

Overall assessment of date PPF achievements in oasis areas. The number of beneficiary women reached **286**. Six projects have been carried out **and** distributed as follows: **four** sorting, conditioning and storage units associated with a crusher (Al Mahabba Al Filahiya-Tata, Moustakbal Draa-Zagora, Attakadoun-Tinghir, Moulay Brahim-Errachidia), **one** production unit for date paste and crushing of lower quality dates (Attaazor-Figuig) and **one** unit for service provision: transport, pollination and harvest (Tifawine-Tata). The final assessment of date PPF shows that results have been satisfactorily achieved insofar as the completion rates for construction and capital works are **100%** for the six target co-operatives. Their commissioning remains subject to the power supply at for **four** out of the six units built (Table 89)

Table 77. Final assessment of date PPF achievements in oasis areas.

Province	Co-operative	Activity	Built	Equipped	Electricity
Zagora	Moustakbal Draa	Date packaging	100%	100%	Yes
Tata	Tifawine	Date tree service	100%	100%	Yes
Tata	Al Mahabba Al Filahiya	Date packaging	100%	100%	No
Tinghir	Attakadoun	Date packaging	100%	100%	No
Errachidia	Moulay Brahim	Date packaging	100%	100%	No
Figuig	Attaazor	Date processing	100%	100%	No

Overall review of the mentoring and technical support program for PPF, all areas taken together.

In addition to the physical achievements, women project promoters received a capacity-building and support program. The main achievements in this area involved training, internships and visits. *For olive, almond and fig sectors*, an assessment of the training since the starting of the support plan in January 2013, gives an overall achievement rate, by the end of June 2013, of about **84%**, or 93 sessions held out of the 111 programmed sessions for **659** beneficiary women. Similarly, the **six** internships and **seven** visits provided for in the support plan have been totally fulfilled, *With regard to the date sector*, the overall program of modular training (a dozen modules) involved **784** women, *while the number of PPF beneficiary women was 286 only!* Similarly, 15 of the members of each of the six co-operatives received exchange visits, or a total of **90** women. Also, **12** women (two members of each of the six co-operatives) benefited from a participation in national and regional shows (2012 International Dates Show and 2013 International Agricultural Show of Meknes). Certainly, at this time, changes in attitude and behavior expected from these PPF with the target group have not been produced yet. But a beginning of dynamism and female entrepreneurship is starting to take place in the target territories.

Sources of PPF inefficiency. The implementation of PPFs encountered several difficulties which are related either to the intervention methods of PAF (programming by tranche), or to the cumbersome approach adopted for coaching, identification and implementation of projects (awareness-raising and mobilization, guidelines, stages and procedures to be followed, eligibility criteria, action plans, feasibility studies) or even to the low motivation of women to engage in the process. These difficulties required significant efforts and generated considerable delays in achieving the planned objectives within the set timeframe. This leads to two sources of inefficiency which deserve to be examined:

- ***Delays in PPF launch.*** For instance, according to contract TC-5A, PPF activities were to start in the perimeters of tranche 1 in early February 2010, those of tranche 2 in September 2010 and those of tranche 3 by September 2011. But PPF identification with women or their organizations only started in October 2010 in tranche 1 perimeters. This represents a delay of almost **nine** months which impacted on the two following tranches.
- ***Multiple stakeholders and cumbersome procedures.*** The execution of PPFs involved a large number of public structures (APP, UGP, MAPM field offices, local authorities), private providers (contractors and service firms) and committees (steering committee, monitoring and technical assistance committee). These multiple stakeholders, combined with cumbersome procedures, have slowed down the pace of implementation of PPFs. The result has been delays during almost all phases of project development and execution, resulting in the non-completion of operations within the expected time limits.

Partial review of achievements for the applied research program. At the end of the project, achievements mainly concerned the *production of scientific articles*, databases and computer tools *as well as the introduction of improvements at experimental, demonstration and field school sites*. The other achievements include the organization of *workshops, training and field trips*, and the production of program monitoring report (Table 78). Due to the late adoption of this program (2010) and multiple delays in the setting-up of research teams and purchase of technical equipment and materials, it was not possible to achieve tangible results that could have been made available to the target groups of the various targeted sectors. This means that, until September 2013, scientific and technical productions could not be developed to enable their distribution by the services of MAPM's agricultural council services and the ONCA for the farmers and their OPAs.

Table 78. Partial review of achievements for the applied research program.

Area	Review of achievements (June 2013)
Scientific and technical productions	<ul style="list-style-type: none"> • Publications of scientific articles are underway but production is concentrated on national or electronic journals. • Development of data sheets and guides • Organization of several progress workshops
Production of monitoring reports	<ul style="list-style-type: none"> • 13 quarterly technical and financial reports <ul style="list-style-type: none"> • 7 semi-annual activity reports • 3 annual reviews
Production of data bases and computer tools	<ul style="list-style-type: none"> • Conduct of surveys, sample collection and laboratory analyses • Development of computer tools and Web sites
Development work	<ul style="list-style-type: none"> • Development of experimental sites • Development of demonstration and the field school sites
Design of farmer support approaches	<ul style="list-style-type: none"> • Workshops • Training • Field trips

3.1.5. Creation of New Modern Crushing Units: Catalyst Fund

The assessment of the effectiveness of the CF activity examines the achievement rates and timing of the following outputs:

- Number of proposals made to the CF approved;
- Number of CF-funded operational olive crushing units;
- Volume of olives crushed by CF-funded crushing units.

According to the provisional program, the CF has planned to establish **20** modern crushing units, distributed over **16** provinces. The technical capacities expected at cruise rate are likely to achieve the following targets: a total crushing capacity of **1,250 T/d** (or about 9, 000 T/year), a total storage capacity of **6,000 T** of oil and a packaging capacity of 6 000 T/year.

Final CF assessment. Overall, achievements as part of the CF indicate that more **than 20,000** male/women farmers have formed **152** co-operatives, which organized themselves into **20 GIE**. These GIEs led to the setting-up of a national Association of GIEs (ANGIE). In addition to these very important organizational accomplishments, the execution of the CF has led to a significant improvement in the technical capacity of olive crushing through the setting-up of **20** modern units. The final state of these units is as follows: **17 units** were provisionally accepted and the 3 remaining units are being finalized. On the operational level, **19 units** were connected to the power mains (except for Alhassania), **of which 15** were put into operation (Table 79).

Table 79. Final review of achievements within the framework of the Catalyst Fund

Provinces	Built GIEs	Progress status		Power supply		Drinking water	Commissioning
		Built	Equipped	Connected	Subscribed		
Ouezzane	Jenane Ouezzane	100%	100%	Yes	Yes	Yes	Yes
Tetouan	Zoyout Al Hassaniya	98%	98%	No	No	Yes	No
Larache	Bni Arouss Zaâroua	100%	98%	Yes	Yes	<i>insufficient</i>	No
	Zaitoune Oued El Makhazine	98%	98%	Yes	Yes	<i>salt drilling</i>	No
Taounate	Al Wahda Ghafsai	100%	100%	Yes	Yes	<i>salt drilling</i>	Yes
	Olea Jabalia	100%	100%	Yes	Yes	<i>very insufficient</i>	Yes
	Ain Aicha	100%	100%	Yes	Yes	Yes	Yes
My Yacoub	Lemta Fez	100%	100%	Yes	Yes	<i>very insufficient</i>	Yes
Sefrou	Oil of Sefrou	100%	100%	Yes	Yes	<i>insufficient</i>	Yes
Chichaoua	Abaynou Olives	100%	100%	Yes	Yes	Yes	No
Essaouira	Zouyout Chiadma Mogador	100%	100%	Yes	Yes	Yes	No
Al Haouz	Zoyout Oued Ourika	100%	100%	Yes	Yes	<i>salt drilling</i>	Yes
	Bassin Oued Zat	100%	100%	Yes	Yes	Yes	Yes
Khenifra	Oguouy Lkhir	100%	100%	Yes	Yes	Yes	Yes
Beni Mellal	Dir Beni Mellal	98%	98%	Yes	Yes	No	No
Azilal	Zoyout Aït Aâtab	98%	98%	Yes	Yes	No	No
Taourirt	Ahlaf Olive oil	100%	100%	Yes	Yes	Yes	Yes
Taza	T'Souli	100%	100%	Yes	Yes	Yes	Yes
Boulmane	Tahadi Al Alfia	100%	100%	Yes	Yes	Yes	Yes
Midelt	Dahab Ziz Guir	100%	100%	Yes	Yes	Yes	Yes

3.2. Efficiency

The efficiency criterion evaluates **resources mobilized** in relation to the results obtained, based on a comparison of the **costs incurred** by each of the activities and sub-activities with the corresponding **outputs**. Efficiency informs partially on the performance of the operational management system adopted, in terms of financial achievements and control over the trajectory of expected outcomes.

Results are presented at the level of PAF as a whole and according to the activities and sub-activities where available baseline data so permit.

3.2.1. Overall Assessment of PAF's Financial Performance

At the time of closeout, PAF has managed to spend **99%** of the allocated budget and to disburse **97%** of the amount committed. These rates attest to the effectiveness of the internal system implemented by APP and UGP for the operational management of the project. Internally, PMU has developed skills that helped it organize and pilot the execution of a large number of agreements, contracts, procurement through many and various providers, services and works. However, despite the efforts made by UGP and its partners, the process of outsourcing of technical assistance and technical support services could not avoid relatively high transaction costs and consequently lead to higher costs than initially expected. The initial budget of PAF (**US\$ 300,898,547**) has been revised upwards during budget re-scopings of MCA Program (removal of Makina project and reallocation of the corresponding amounts for PAF, including the contribution of the Government of Morocco, to which were added other budget reallocations made later on). These reallocations to support PAF were used primarily to strengthen its “Plantation expansion in rain-fed areas” sub-activities, whose target acreage increased from 62,000 to 82,000 hectares, and “hydro-agricultural developments” in PMH and oasis areas through the addition of a major complementary program. The amount finally decided for PAF was **US\$ 339,987,320** of which **US\$ 335,342,904** were committed and **US\$ 325,370,270** were disbursed (Table 80).

Table 80. Assessment of the financial achievements of PAF at closeout (September 2013).

Activity	Budget	Commitments		Disbursements	
		(US\$)	(%)	(US\$)	(%)
Studies, expansion and rehabilitation work in rain-fed areas	139,449,268	137,114,529	98%	130,289,075	95
Studies, works and rehabilitation in PMH areas	90,317,370	90,211,271	100%	88,043,271	98
Studies, works and rehabilitation in oasis areas	65,131,375	63,442,302	97%	63,177,318	100
Sector-related services	21,988,954	21,785,025	99%	21,024,489	97
Catalyst Fund	20,764,968	20,764,968	100%	20,674,583	100
Management and Operation	2,335,386	2,024,809	87%	2,161,534	107
Total	339,987,320	335,342,904	99%	325,370,270	97

3.2.2. Assessment of the Efficiency of PAF by Activity

3.2.2.1. Plantation Expansion and Rehabilitation in Rain-fed Areas

Overall assessment of the financial achievements of the activity. The final budget allocated to this activity, including studies, was set at **US\$ 139,449,268**. The commitment and payment rates reached **98%** and **95%** respectively. Given the complexity of implementing this activity, in particular the

social acceptance issues faced by the new plantings, these indicators testify to the importance of the efforts required to mobilize the planned financial resources and comply the trajectory of expected results.

Cost of the new plantations per hectare. The overall costs of olive tree expansion operations was close to **MAD 1 billion** excluding taxes (MAD 999,793,250), or on average **MAD 14,273/hectare planted**. For almond trees, the overall cost was **MAD 89.57 million**, or **MAD 18,618 Dh/hectare planted** on average. These average costs remain very acceptable, but consideration of taxes makes them higher. Similarly, a review of their distribution by tranches and perimeter size raises several questions. On the one hand, these unit costs undergo wide fluctuations from one tranche to another. Overall, it's the costs for the final tranche (2011) which are the highest; they far exceeded **MAD 20,000 per hectare** to stand at **MAD 28,158/hectare** in Taounate, **MAD 25,232 /hectare** in Al Haouz and **MAD 24,932/hectare** in Ouezzane. The inclusion of benches, variations in density, size of lots and VAT burden have been differentiating factors in planting costs. *For olive trees*, the inter-annual variation of average costs, all perimeters taken together, is significant; they went from **MAD 12,362/hectares** in 2008, to **MAD 16,018/hectare** in 2009, then to **MAD 12,657/hectare** in 2010 and **MAD 16,227/hectare** in 2011. In contrast, *for almond trees*, the development of these costs rather indicates a small downward trend: **MAD 19,305/hectare** in 2009; **MAD 18,942/hectare** in 2010 and **MAD 17,492/hectare** in 2011. But, overall, the average costs per hectare to establish an almond orchard were higher than those of olive orchards. In addition, the distribution of average planting costs by perimeters, all lots taken together, and without taking account of the rebates paid by the companies, doesn't reveal any correlation with their size, nor the existence of *economies of scale*. At the level of the sample of the visited perimeters, we note that the highest average costs for olive orchards have been recorded, all tranches taken together, in Taza (Ahl Zawia: **MAD 19,728 /ha** ; Mkarcha: **MAD 19,238/ha**), Beni Mellal (Sidi Maâdane Titi: **MAD 18,880/ha**), Azilal (Ait Maâlla: **MAD 17,786/ha**), Taounate (Maussatou: **MAD 17,035/ha**). For almond trees, the highest costs per hectare were recorded in the province of Al Hoceima (Igarouanou: **MAD 23,588/ha**) (Table 81).

Table 81. Average cost of plantation expansion work in rain-fed areas (*Sample Perimeters*)

Region	Province	Perimeter	Tranche	Planted acreage (ha)	Total cost (ex-Tax)	Average cost (MAD/ha)
Marrakech-Tensift-Al Haouz	Al Haouz	Tamda	2010	137	1,783,740	13,020
Tadla Azilal	Azilal	Ait Maâlla	2009	293	5,211,494	17,786
	Beni Mellal	Sidi Maâdane Titi	2009	881	16,633,280	18,880
Fez-Boulmane	My Yacoub	Chaâbate Laâraâra	2008	598	6,421,025	10,737
Taza-Al Hoceima-Taounate	Taounate	Faytoura	2008	274	2,831,457	10,333
		Kouassem Od Addou	2009	924	15,228,906	16,481

Region	Province	Perimeter	Tranche	Planted acreage (ha)	Total cost (ex-Tax)	Average cost (MAD/ha)
		Maussatou	2009	163	2,776,786	17,035
		Slass	2010	819	10,629,063	12,978
	Taza	Khandaq Senhaja	2008	300	4,572,300	15,241
		Ahl Zawia	2009	290	5,721,269	19,728
		Mkarcha	2009	600	11,541,948	19,236
		Bab Dagbbar	2010	320	4,389,060	13,715
Tangier-Tetouan	Tetouan	Bni Oussine	2008	298	3,651,790	12,254
	Larache	Tamtayech	2009	396	4,174,972	10,542
	Ouezzane	Bab Ward	2009	580	9,029,520	15,568
All olive orchards				6,873	104,596,611	15,218
Taza-Al Hoceima-Taounate	Al Hoceima	Igarouanou	2009	529	12,478,297	23,588
	Taza	Tazmacht	2009	600	9,960,000	16,600
		Feddane Touhou	2009	170	2,822,000	16,600
		Tizi Nador	2010	240	4,502,976	18,762
All almond orchards				1,539	29,763,274	19,339

Main sources of inefficiency inherent in the expansion sub-activity. One of the important aspects that have characterized the conduct of planting development operations was the significant variances between the original budget forecasts and costs actually incurred. The latter proved higher than initially forecast due to a number of problems and unexpected events related to: **I)** the ambition of the original quantitative targets, **II)** the complexity of technical specifications in the terms of reference and procedures adopted, considering the difficulties of their systematic implementation on the ground, and **III)** the large weight of unexpected events inherent in social rejection, in certain areas, of the proposed interventions (reluctance, litigation, refusal, etc.). Cost overruns in the work of the first contracts (TC-3AP and TC-3A1) was about **+85%** (US\$ 2,240/ha) compared to the original 2006 estimate (US\$1,142/ha). APP and UGP responded quickly to reduce the costs and deadlines of work. Thus, they revised the programs, by reducing the targets of areas to be planted and the technical specifications (revision of planting density, elimination of certain items of work, etc.), and adjusting the planting cost per hectare from US\$ 1,800 to US\$ 1,500. This rescoping helped to partially remedy the situation, but the selected technical reference framework and the environmental measures maintained unchanged did not permit to accelerate work or reduce its cost. *In the sample of perimeters visited*, a sense of disappointment at the quality of the services provided by technical assistance companies, of work and of technical support has been a constant trend in a majority of the farmers interviewed. The common consequence of the multiple failures evoked was recurring delays which have everywhere (Beni Mellal, Taza, Taounate, Moulay Yacoub, Ouezzane, Tetouan, Al Hoceima) affected the implementation of virtually all interventions. Several factors were cited as being sources of inefficiency: **I)** delays in the launch and completion of the planting work; **II)** insufficient technical support resources of technical assistance companies and MAPM field offices; **III)** insufficient human

resources for the supervision of contractors and understaffing of these companies (TC-3A);
iv) coordination and communication problems between the various local (TC-1A teams, TC-5A teams, TC-3A contractors and beneficiaries) and national stakeholders (UGP, APP); and **v)** multiple social costs generated by reluctance, refusals and conflicts of interest.

Inefficiency related to research and consulting services. The incompleteness of the feasibility studies to the allowed time (TC-1A), the delays in the identification by the eligible CT/CDA of perimeters to the plantations, the efforts of sensitizing carried out near the farmers to gain their adhesion with the project of plantation, the multiple checks with the load of technical aid TC-1A, the late launching of the markets of plantation (APP, UGP), the delays in the evaluations of the offers and signature of the contracts as well as the climatic, unfavorable conditions by places, were at the base of the shifts recorded compared to the programming planned for the execution of the contracts of plantation (TC-3A). In addition to the delays in their delivery, the quality of feasibility reports (TC-1A) also raised a few problems, in particular the relevance and compliance of their contents (perimeter delimitation, ownership of proposed interventions, costs, etc.) with the complex ground realities. This required additional field missions and/or task force organization to review the results of these studies or to start parts thereof all over again. One of the many relevant examples of the recurring delays that have negatively impacted the completion of the planting work is taken from a perimeter in Taza: *“The Company to which the lot was awarded had signed the contract at the end of 2009 which was to be completed in March 2011. But since there had been a delay of more than 6 months in the establishment of the service order, the plantings only started in April 2010 and delivered in June 2012!”* As for maintenance operations, their number was reduced from three to two. In 2011 already, the mid-term assessment had drawn the attention of UGP to the existence of considerable delays in the progress of PAF, and recommendations were made to that effect... In 2013, our observations from the visited perimeters and our interviews with beneficiaries lead us to confirm that the recommendations of the mid-term assessment have not sufficiently produced the expected effects.

Inefficiency related to the development of plantation expansion work. The feedback received from the farmers (interviews and focus groups) on the delays and their consequences has sometimes been highly virulent. All delays experienced by the farmers can be summarized in the following points: **I)** a time lag between OPA constitution (signing of commitments) and the beginning of field execution, which has been deemed excessive and the delays of which were at the root of the disappointments and refusals of the interventions proposed afterwards; **II)** a gap between the periods of intervention and the agronomic cycles of planted trees which were considered unacceptable owing to the fact that several farming operations were carried out outside the required periods; planting and irrigation dates were mentioned by the beneficiaries: instead of planting in the rainy period (September to November) and adding irrigation in period of strong heat (July and August), in some areas there has been extensions of

the planting period beyond May; **III**) an allotment of planting works in the same perimeter and a wide range of intermediate acceptance procedures which were considered unnecessary and irrational by the beneficiaries, and often resulted in long periods of inactivity in the perimeters and therefore led to significant delays with regard to the overall time period allowed to complete the planting work; **iv**) technical choices (olive trees everywhere and no other species) and environmental measures which were systematically imposed (impluvia, basins), broadly not understood and not accepted by all beneficiaries, and led to a number of tensions between service companies and contractors and between the latter and the beneficiaries. According to UGP, the first two sources of delays/gaps can be attributed to a complex and lengthy procurement procedure (revision and approval of tender documents by MCC, lengthy delays for the publication of invitations to tender and preparation of technical proposals by companies, the procedure for evaluating the bids of companies and the need to obtain MCC no objection on the results of the technical and financial evaluation of bids, the high timelines used by the successful contractors to provide all the administrative document required by the contract such as the guarantee/bank deposit,...), the submission of the action plan for the completion of work by companies and its validation by UGP, APP and AT, and the installation of building sites. Similarly, there were times when the project was faced with a shortage of seedlings meeting the technical requirements of contracts, particularly for almond seedlings, and a high failure rate for the first almond plantings (TC-3A1 (a) almond) due to the poor quality of the seedlings, to unfavorable growing periods and low technical capacities of companies on that matter.

Inefficiency related to the inadequate coaching resources and under-equipment of companies. In most perimeters visited, the problems of lack of managerial staff and under-equipment of technical assistance, MAPM local structures and contractors in material resources were pushed forward as one of the important shortcoming to which the completion of field interventions were subject. Many examples were mentioned by the farmers to describe the acuteness of failures and express their disappointment. The officials of DPAs, and those of technical assistance and contractors we interviewed link these problems with the size of intervention perimeters, the multiplicity and complexity of procedures, references and rules to be respected, time pressure, the issue of social rejection of the planting projects by some farmers and with the importance of the emergence of disputes and escalation of unexpected tensions (committed workers, stockbreeders, sharecroppers, etc.). But, at the same time, these same officials in charge recognize that the operating methods imposed by UGP are broadly logical and consistent with the technical requirements for successful planting. Two typical examples are taken to illustrate the problem of poor technical management. The first concerns the managerial services attached to the Taza DPA: there was an extension agent to supervise four contracts, covering a total of 4,280 ha of olive and almond orchards. The second example concerns technical assistance: a company which was part of the consortium assigned five supervisors to monitor six contracts covering a total of 34 perimeters with an overall acreage of 20,000

ha and executed by five different companies, representing an average of nearly seven perimeters per supervisor. From the perspective of UGP, these are not problems of sub-management, but of stakeholders' lack of understanding of their roles. The team bore full responsibility, but it wasn't the extension agent's role to supervise AT; each had a role in overseeing the work, in addition to the role of the company's technicians and technical director. This complementarity between all partners was behind the use of acceptance sampling.

Inefficiency related to the social costs generated by protesters and non-beneficiaries. One of the great surprises for PAF was the reluctance and refusal that farmers have shown for the planting projects, if not their conditional acceptance. How can we explain this attitude knowing that all operations were free since they were borne entirely by the project? Is it a problem of farmers' perception of PAF in its entirety, or a problem of approach embodied by the recommended operating modes? In both cases, the facts speak volumes and the adjustments that had to be made have cost the project a lot of money. In the field, contestation was most often the common denominator of all problems and delays in the completion of operations. In addition to UGP and its private (technical assistance companies, technical support service companies) and public partners (DPA, CT, CDA), local authorities have played an important part in shattering these social constraints and finding compromises between the various stakeholders in the conflicts.

3.2.2.2. Olive Tree Rehabilitation and Intensification in PMH Areas

Overall assessment of the financial achievements of the activity. The final budget allocated to this second activity, including baseline studies, was in the order of **US\$ 90,317,370**. Its commitments and disbursements rates reached particularly high levels at the end of the project, with respectively **100%** and **98%**. In terms of total amount committed, the studies, work and rehabilitation required an envelope of **US\$ 90,211,271** of which **US\$ 88 043 271** have been disbursed. This resulted in significant performances in terms of the financial achievements of the activity.

Hydro-agricultural development costs per hectare. By comparing the budget allocated to the area of the perimeters concerned, the *average cost of the hydro-agricultural development work* carried out is estimated at **MAD 17,000/ha**; i.e. a globally efficient cost since it is lower than the maximum cost tolerated by the donors which is in the order of **MAD 20,000/ha** (Table 82). As for the *cost of a cubic meter of (m³) water*, it varies greatly from one perimeter to another and depends primarily on the cost of development, the volume of water it enables to mobilize and of the Utilized Agricultural Land of the perimeter benefiting from it. The results obtained for two perimeters are illustrative: that of Draa where this cost is estimated at **\$ 0.03/m³**, or **MAD 0.22/m³**, and that of upstream Chichaoua with **\$ 0.23/m³**, or **MAD 1.91/m³**. In the latter perimeter, the developments carried out are very important in reference to its area and post-development additional inflow of water.

Table 82. Average cost of hydro-agricultural developments in PMH areas

Company	Province/ Perimeter	Area (ha)	Cost of contract (US\$)	Average cost (\$US/ha)	Average cost (MAD/ha)
SNCE	Chichaoua	2,775	4,449,705	1,603	14,431
SOGETRAMA	Outat El Haj El Orjane	2,955	7,839,406	2,653	23,876
Sub-Total TC3B1		5,730	12,289,111	2,145	19,302
SOGETRAMA	Oujda, Berkane	1,025	1,810,392	1,766	15,896
SOGETRAMA	Sefrou, Taza	1,650	3,355,377	2,034	18,302
SNCE	Al Haouz (Guers, Ben sellou)	4,970	4,843,370	975	8,771
SNCE	Al Haouz (Ourika, Ghmat)	2,565	6,845,463	2,669	24,019
BENMIMOUNE	Beni Mellal, Khenifra	3,762	4,982,376	1,324	11,920
MOULIN TP/BOUABIDI	Rich, Gourrama	4,407	7,327,628	1,663	14,965
Sub-Total TC3B2		18,379	29,164,606	1,587	14,282
SNCE	Taourirt	1,007	2,628,443	2,610	23,492
SNCE	Chichaoua (Dourane), Essaouira (Tyout, Ain Lahjar)	2,000	3,387,680	1,694	15,245
MOULIN TP/BOUABIDI	Khenifra	798	1,205,259	1,510	13,593
Sub-Total TC3B3		3,805	7,221,382	1,898	17,081
LOURIKI TRAVAUX & TECHNO EXPERTISE	Taza	365	1,980,435	5,426	48,833
BERRAHO	Taounate	134	772,552	5,765	51,888
SNCE	Marrakech	1,360	3,544,253	2,606	23,455
SNCE	Marrakech	100	652,531	6,525	58,728
GHRIS TRAVAUX	Azilal	858	1,652,422	1,926	17,333
BENMIMOUNE	Azilal	469	2,153,211	4,591	41,320
Sub-Total TC3B3 a		3,286	10,755,404	3,273	29,458
Total		*31,200	59,430,503	1,905	17,143

(*): The overall area should be 34 000 ha.

Inefficiency related to subcontracting of hydro-agricultural development works. PAF introduced new rules into the procurement and contract management process designed to impose legal and environmental standards in the implementation of activities. These rules have been perceived by the contracting companies as constraining the completion of work within the set timeframe. As a result, they relied heavily on subcontracting of the work with regional companies without providing sufficient oversight and support to them. These procedures have resulted in both more expensive and lower quality works. According to statements by MVC's Acting Director in Tinghir, the contracting company subcontracted the work with a local company at prices well below (by 40%) than those of its offer. The application of local prices would have achieved double the work of seguia development: the bid unit price of concrete is MAD 1,400/m³ while local market price is approximately MAD 850/m³; the unit cost of masonry is MAD 300/m³ while it is only MAD 40/m³ at the local level.

Problems in the design and quality of irrigation works.

Findings of supervisory missions:

The technical design for water distribution does not seem to have been studied in depth. In channels with a width of 80 cm or more, it is impossible to handle the valves, especially during periods of high flow. Also, sending "water hands" of more than 100 l/s could certainly result in damage to secondary and tertiary canals.

The excess flow valve consists of an outfall designed to discharge the flow that exceeds the channel's capacity into the Oued. This design is adequate when a diversion weir or sill results in sufficient level difference, which is not the case in some of the visited perimeters (Douirane, Oued Ziat for example). Also, the length of outfalls appears insufficient.

Some outfalls associated with the derivation sills were built with a considerable lateral slope (Oued Ziad), indicating a misunderstanding of the role of these "walls" by the company and/or TC1-B oversight staff.

Numerous cracks have been observed at the surface of the sills which are being built in the perimeter of Douirane probably due to a defective cleaning of concrete and/or a percentage too high of water.

Erosion of concrete is already evident on the sills which are subject to pebble paths (for example the sill of seguia El Chrif in the perimeter of Guers and in Ourika).

It is recommended that precautions be taken to avoid increased erosion (epoxy resin.) downstream of the Khorbate dam.

Findings of the final Evaluation:

In the perimeters of Ghmat and Zagora, the farmers raised the issue of the low flow of the intake and thus of the sizing of the work at the entrance of the network, which makes it impossible to pass the water through the primary seguia to meet the water right of right holders which remains unchanged according to project design. Faced with this situation, these farmers informed MAPM local officials who in turn referred to on-site technical assistance but the latter did not get involved because the decision to rule on these requests should be made by the company in Rabat. If no decision is made, farmers are determined to destroy these intakes to enable the flow rate to be increased.

The issue of water rights was also raised in the upstream Chichaoua perimeter, though in opposite terms; according to the secretary general and a member of the Talmest AUEA, the flow rate of Talmest 1 and Talmest 2 seguias doubled after development (120 l/s instead of 60 l/s and 70 l/s instead of 35 l/s respectively). This problem was raised before the administration first, then the company and technical assistance. At the time of our visit, there had still not been a reply to this request!

Inefficiency related to the forecasted actual need in hydro-agricultural development works. The statement in the mid-term assessment already indicated that "the development work provided for in the contract will not be sufficient to increase water resource availability, if the structures damaged by floodwaters such as the siphons which transport water from bank to the other are not repaired: Ibrachen siphon, Tajjoujt siphon. The 240 l/s Tajjout seguia irrigates an important area and the gallery is threatened by a cliff which is at risk of collapsing, Ttarmast 2 siphon, section of the Mhamdia seguia, TP drain with a flow rate of 450 l/s. These works have priority for the farmers over those provided for by the contract". In addition, the re-scoping made for PAF due to significant increases in the costs initially planned for irrigation infrastructures and expansion of plantings, did not ultimately include the irrigation component and forecast in terms of development. As underlined by the mid-term evaluation "the number of perimeters to be rehabilitated in irrigated areas remained unchanged, with the aim of developing the skills of the farmers and control of sectors for increasing the value of products, which are prerequisites for the sustainable increase of agricultural incomes durably and to foster the co-operative agricultural development".

3.2.2.3. Rehabilitation and Intensification of Date Orchards in Oasis Areas

Overall assessment of financial achievements for this activity. The final budget allocated to this third activity, including baseline studies, was in the order of US\$ 65,131,375. The rates of commitments and disbursements have been high, or **97% and 100% respectively**. The amount committed for the studies, work and rehabilitation in these areas was in the order of US\$ **63,442,302**, about US\$ **63,177,318 of which** have been disbursed. This reflects the importance of performance in terms of financial achievements for this activity.

Hydro-agricultural development costs per hectare. In oasis areas, the unit cost of the hydro-agricultural development work carried out in all beneficiary perimeters is on average nearly **MAD 20,500 /ha**. This cost remains acceptable; it is very close to that which donors consider as a maximum not to be exceeded (MAD 20,000/ha) (Table 83). The highest average costs have been recorded in the perimeters of the provinces of Tinghir (MAD 39,623/ha), Tata (MAD 35,377/ha) and Figuig (MAD 32,512/ha). On the other hand, the lowest costs have been obtained in the perimeters of the provinces of Zagora (MAD 10,379/ha) and Errachidia (MAD 15,003/ha).

Table 83. Average costs of the hydro-agricultural development work in oasis areas

Company	Province (Perimeter)	Acreage (ha)	Contract amount (US\$)	Average cost (US\$/ha)	Average cost (MAD/ha)
SNCE	Tinghir (Khorbat –Todgha)	3,200	14,088,089	4,403	39,623
STAIP	Zagora (Draa)	9,000	10,379,330	1,153	10,379
BENMIMOUNE	Errachidia (Jorf, Goulmima)	2,665	6,177,032	2,318	20,861
SNCE	Errachidia (Aoufous, Erfoud)	3,657	6,096,053	1,667	15,003
CAPEP	Figuig (Bouanane, Bni Tadjit, Talsint)	2,341	8,456,683	3,612	32,512
SELLAM AZZOUZ	Tata	1,450	5,699,636	3,931	35,377
Total		22,313	50,896,823	2,281	20,529

3.2.2.4. Training, Technical Support and Mentoring Services Related to the Sectors

Overall evaluation of financial achievements for this activity. The final budget allocated to this fourth activity was on the order of US\$ **21,988,954**. Under these cross-sectional support services, the budgetary envelope committed was US\$ **21,785,025**, US\$ **21,024,489 of which have been disbursed**. Thus, these rates of commitments and disbursements were, respectively **99% and 97%**. These are evidence of the positive financial achievements associated with this activity.

Cost of training in the upstream target sectors in mountain areas. According to contract TC-5A, the overall cost planned for training men and women farmers, farmers' sons and daughters and members of olive and almond tree sector OPAs in mountain areas was \$US **2,435,280** . On this basis, the average cost per day of training *and person trained*, all categories taken together, represented

respectively **US\$ 418** and **53** , the equivalent of **MAD 3,759/day of training** and **MAD 475/person trained**. Taken together, these unit costs remain lower than prices on the national market. However, if the unit cost per day of training is virtually the same for all categories, the unit cost per person trained is highly variable: **MAD 2,079** for the farmers' sons and daughters and rural youth category, against **MAD 499** only for OPA members and **MAD 151 only** for men and women farmers (Table 84).

Table 84. Expected costs of training in the upstream target sectors in mountain areas (Rain-fed and PMH)

Targeted category	Number of people to be trained	Scheduled day of training	Overall cost (US\$)	Cost/day of training (US\$)	Cost/person trained (US\$)	Cost/day of training (MAD)	Cost/person trained (MAD)
Men farmers/Women farmers	33,000	1,320	554,400	420	17	3,780	151
Sons and daughters of farmers and rural youth	6,600	3,630	1,524, 600	420	231	3,780	2,079
OPA members	3,600	506	199,585	394	55	3,550	499
All categories	43,200	5,456	2,278,585	418	53	3,759	475

The **actual cost/day of training**, calculated based on the achievements (see efficiency Section), did not undergo any changes; since the number of days achieved is in line with forecasts, for all three targeted categories. However, owing to the fact that the number of people trained has been well below expectations, the **actual cost/person trained** experienced a sharp increase as compared early forecasts, for all three categories, since it rose from **MAD 151 to 302** (+100%) for men/women farmers, from **MAD 2,079 to 2,289** (+10%) for sons and daughters of farmers and rural youth, from **MAD 499 to 659** (+32%) for OPA members and **from MAD 475 to 813** (+71%) for all categories (Table 85). This testifies to one of the most significant sources of inefficiency for PAF.

Table 85. Actual costs of the training provided in the upstream target sectors in mountain areas (Rain-fed and PMH)

Targeted category	Number of people trained	Day of training completed	Overall cost (US\$)	Cost/day of training (US\$)	Cost/person trained (\$US)	Cost/day of training (MAD)	Cost/person trained (MAD)
Men farmers/Women farmers	16,500	1,320	554,400	420	34	3,780	302
Sons and daughters of farmers and rural youth	6,006	3,630	1,524,600	420	254	3,780	2,285
OPA members	2,727	506	199,585	394	73	3,550	659
All categories	25,233	5,456	2,278,585	418	90	3,759	813

Cost of training in oasis areas. Under contract TC-5B, the overall budget allocated to training for men/women farmers, sons and daughters of farmers and rural youth and date tree sector OPA members was in the order of **\$US 2,335,037**. The average cost, calculated based on the planned training program, represented, all categories taken together, \$US 1,291/day of training and \$US 205/person trained; the equivalent of MAD 11,617/day of training and MAD 1,843/person trained. These unit costs show a *significant difference* as compared to those of contract TC-5A, in all three targeted categories (Table 86).

Table 86. Expected cost of training in the upstream target sectors in oasis areas.

Targeted category	Number of people to be trained	Scheduled day of training	Overall cost (US\$)	Cost/day of training (US\$)	Cost/person trained (US\$)	Cost/day of training (MAD)	Cost/person trained (MAD)
Men farmers/Women farmers	9,000	540	771,363	1,428	86	12,856	771
Sons and daughters of farmers and rural youth	900	675	790,236	1,171	878	10,536	7,902
AUEA and OPA members	1,500	594	773,438	1,302	516	11,719	4,641
All categories	11,400	1,809	2,335,037	1,291	205	11,617	1,843

Since the number of training days planned for each of the three targeted categories has been achieved, **the average real cost/day of training** corresponds to the planned unit cost, or MAD **11,617**. By contrast, **the average real cost/person trained** has been quite higher than the planned unit cost, at least in the *men/women farmer category*: **MAD 1,419 instead of MAD 771, an increase of 84%**. This resulted in a 56% **increase (MAD 2,870 instead of MAD 1,843)** for the *three categories taken together* (Table 87).

Table 87. Real cost of training in the upstream target sectors in oasis areas.

Targeted category	Number of people trained	Day of training completed	Overall cost (US\$)	Cost/day of training (US\$)	Cost/person trained (\$US)	Cost/day of training (MAD)	Cost/person trained (MAD)
Men/Women farmers	4,893	540	771,363	1,428	158	12,856	1,419
Sons and daughters of farmers and rural youth	944	675	790,236	1,171	837	10,536	7,534
AUEA and OPA members	1,485	594	773,438	1,302	521	11,719	4,688
All categories	7,322	1,809	2,335,037	1,291	319	11,617	2,870

The efficiency of training conducted can also be assessed using the level of adoption among beneficiaries of the knowledge acquired and improved practices recommended. However, the low

adoption rates generally recorded in the various intervention areas of PAF testify to the limited effects of training in terms of changes in farmers' crop husbandry techniques. One reason for this, from the beneficiaries' perspective, lies in how the field deployment of the training program was managed and in the limited human and material resources mobilized. Under contracts TC-5A and TC-5B, the number of farmers concerned was 50 people in the morning and 50 people in the afternoon. This is deemed unrealizable and of very little benefit, taking into account the time pressure and content assimilation problems. Similarly, demonstration sessions for farmers took place under unfavorable conditions for learning (number of people by group, quality of audio-visual media, behaviors of uninterested people, etc.).

3.2.2.5. Creation of New Modern Crushing Units: Catalyst Fund

Scope of financial resources mobilized by the CF. For the implementation of the CF initiative, the amounts committed in MCC's Budget have reached a budget envelope of almost **US\$ 19 million**, with a disbursement rate of nearly **100%**. The share of investment funds intended for the implementation of modern crushing units, represented close to **98%** of the total budget committed, or **US\$ 18.6 million** (Table 88). By integrating the other sources of financing, the construction and equipping of olive crushing units in mountain areas had mobilized nearly MAD 360 million of investments, broken down as follows: **50%** by **MCC**, **30%** by **MAPM** and **20%** by the **GIE** (of which 15% by a loan with CAM).

Table 88. Financial performance of the Catalyst Fund initiative

Contract n°	Commitments (US\$)	Payments	
		(US\$)	(%)
TC-9.1	221,300	221,300	100%
TC-9.2	197,975	28,406	14%
Funds	18,603,263	18,603,263	100%
Management	2,401	2,401	100%
Events	3,660	3,660	100%
Travels	32,021	32,021	100%
Grand Total	19,060,620	18,891,051	99%

Overall assessment of achievements under the CF. At the closure of PAF, mountain areas had benefited from the construction and outfitting of **20 modern olive crushing units**, bringing their total crushing capacity to **1,250 T/d** (approximately 90,000 T/yr), their total storage capacity to **6,000 T** of oil and their packaging capacity to **6,000 T/yr**. These achievements are likely to significantly improve the conditions for increasing the value of olives, in both quantitative and qualitative terms. In addition, they testify to the significant efforts made by PAF and its partners to make this structuring program successful. However, a number of problems encountered during its implementation have generated **a few sources of inefficiency**. The most important ones are related to the late start of the CF; to delays

in the construction and equipment of valorization units, in women's pilot projects (PPF) and commissioning of date cold storage units; to the insufficient management resources; and to the reluctance towards GIE membership.

Inefficiency related to the financial package adopted by the CF initiative. The self-financing issue (GIE contribution) was one of the major constraints which heavily weighed upon the efficient implementation of this initiative. The hesitating behavior of beneficiaries and their OPAs, and in particular the financial incapacity of a significant portion of them, required additional advocacy and mobilization efforts to gain their trust first and then convince them to get involved in the CF initiative and/or to take responsibility for the actions to prepare the intervention of PAF. The collection of GIE contribution in particular, proved to be a very time-consuming operation, of which one of the detrimental effects on the efficiency of the CF activity has been induced by the significant delays in the launch of the projects for the construction and equipment of the new valorization units.

Inefficiency related to the land issue for the implementation of projects for the construction of modern olive crushing units. This problem was one of the major challenges for the CF. Everywhere, the identification of intervention sites and resolution of the land issue, have been very laborious. This was a second constraint, no less significant than the first one, and the consequences of which resulted in considerable delays in CF implementation. At the project closure, none of the crushing units provided for under the CF were yet in operation due to many problems (delays in the constructions, electricity, drinking water, etc.).

Other sources of inefficiency associated with the CF implementation:

- *The systematic integration of the environmental dimension* has translated into difficulties on the ground related to the environmental acceptability of crushing units construction projects. There were several delays due to the slow procedures of EIE regional Committees (compliance with statutory deadlines for public consultations, repeated rejection of proposed sites for some units, non-approval of sites by River Basin Agencies, search for new lands, resumption of feasibility studies and EIEs.
- *Cumbersome procedures for obtaining construction approvals and the multiplicity of stakeholders* (Urban Agencies, Rural Communes, ONEE, Civil Protection, River Basin Agencies, etc.) for their part caused significant delays (revision of architectural and topographic plans, resumption of contract awards, non-compliance of bidders' technical references, etc.).
- *The difficulties that GIEs* (under the supervision and support of TC-5A) have faced in obtaining tax exemptions (VAT) relating to contracts of construction and equipment supply contracts, despite efforts by the PMU especially, APP and technical assistance (TC-5A) from

the General Tax Directorate (including regional services). This was a completely new case for the DGI

- *The difficulties related to customs clearance of imported equipment* (which are also exempt from customs duties); the Morocco-MCC Compact stipulates that all contracts related to the MCA program are excluding taxes.
- *Lack of bidders in tenders*, combined with the cumbersome procurement and special specification development procedures have also taken a lot of time which resulted in significant delays in implementing actions.
- *Non-compliance by service providers of the times planned for deliverables* has also affected the good implementation of the intervention and contributed to the accumulation of considerable delays during the implementation of activities.

Chapter 4.

Evaluation of the Impact and Sustainability of the Project

4.1. Impact by Activity

This section presents the results from the evaluation of outcomes and the impact of PAF in terms of levels of contribution from the main outputs of the various activities to the expected changes.

According to the project's initial design, the principal changes expected should concern productivity and production volumes in the relevant tree sectors targeted, produce quality (raw and processed), as well as the revenues and income generated for beneficiaries' households. For the latter, the trajectory of results was based on a sustainable improvement in their incomes through increased production (raw and processed) and improved revenues and contributions from fruit tree production. This results in the key indicators of effects and impact as suggested by the logical framework of PAF. And as illustrated in the figure below, the expected changes (intermediate effects and impact) have led to the adoption by the value chains operators in the target sectors of the good practices recommended by the project.

Figure 4. PAF intervention logic

Inputs ➡	Outputs ➡	Immediate effects ➡	Intermediate effects ➡	Impact
MCC funded the planting and hydro-agricultural development work and related studies, and the support services for olive, almond, fig and date tree value chain operators.	<ul style="list-style-type: none"> Planted and maintained acreage transferred to beneficiaries in rain-fed areas. Acreage developed in irrigated areas (PMH and oasis). Date tree acreage maintained and densified. Value chain operators in the target sectors trained and mentored Valorization units built and equipped. 	<ul style="list-style-type: none"> Higher-value fruit trees are expanded, rehabilitated and diversified. The improved crop husbandry, manufacturing, hygiene and management practices were adopted by the target operators. The valorization units established by the project are operational. 	<ul style="list-style-type: none"> The productivity of the target species is effectively increased. The quality of products within the sectors is improved. The value of fruit tree production is increased. 	The incomes of farmers are improved.

4.1.1. Rain-fed Expansion and Intensification

The main results from the evaluation of effects and the impact of this activity are presented in two parts. The first part concerns the results for the "Expansion" sub-activity and reviews all of the positive and negative externalities associated with the establishment of the new planting perimeters.

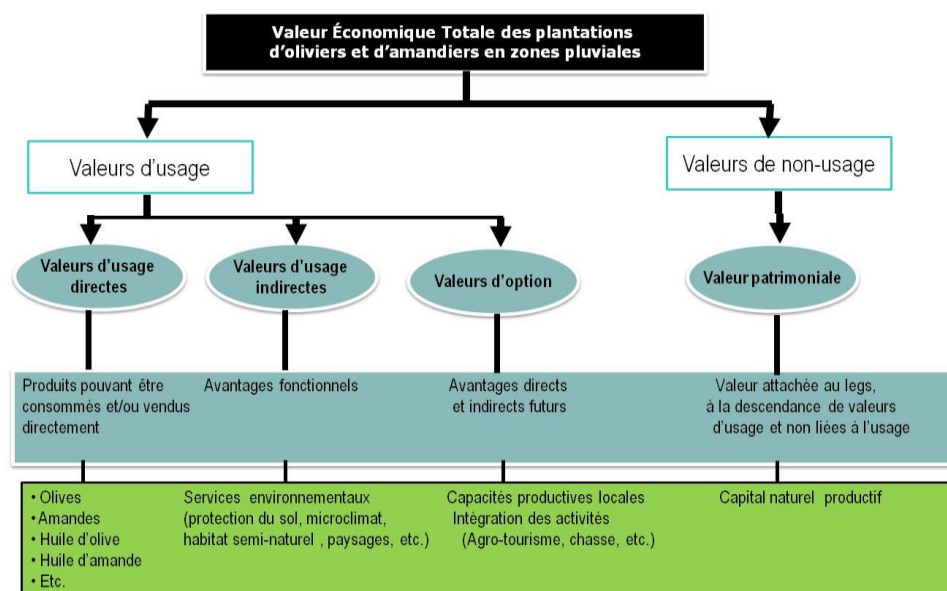
The second part examines the results for the “Rehabilitation” sub-activity, while building upon the results of the evaluation conducted by NORC (2010-2013) under contract ME-2.

4.1.1.1. Rain-fed Expansion

The results from the evaluation of the effects and impact under this sub-activity are mostly qualitative in nature. They arise from the assessments made during field visits, as well as interviews and focus groups conducted with farmers and their professional organizations, but also from interviews conducted with members of the local teams of technical assistance and MAPM's oversight services.

The establishment of a list of direct and indirect values in relation to the creation of the expansion perimeters, using the concept of the total economic value (TEV), helped identify and determine all possible positive impacts for this sub-activity. Among these are all products that can be consumed and/or sold directly (impact on production and incomes), the functional advantages associated with the environmental services of planted hillsides (impact on soil protection, creation of a microclimate and semi-natural habitat, shaping of landscapes, etc.), direct and indirect benefits (impact on the local productive capacity, integrated diversification of the planting-cereal cultivation activities, etc.), and the benefits associated with the existence value of plantings as productive assets (legacy for children and future generations) (Figure).

Figure 5. Total economic value (TEV) associated with the new expansion plantings



Of course, these direct and indirect values and benefits are still not fully produced by the expansion perimeters. But there is considerable evidence that is already apparent in the perimeters visited which supports the likelihood that these impacts will materialize in the near future.

a. Positive impact of the “Rain-fed expansion” sub-activity

- Impact on small farmers' production and direct incomes

Potentially, the acreage and number of olive and almond trees planted at the level of each perimeter, testify to the importance of the expected production volumes. Depending on the maintenance status of the transferred perimeters, estimates made together with the farmers on expected olive production show areas where volumes are non-negligible and likely to generate effects on the generation of future income. On average, a 2-ton yield of olives/ha can easily be achieved as of the fifth year, which, on the basis of a selling price of MAD 4/Kg, could generate an annual income of MAD 10,000/ha. This level of income would be higher among the farmers who have received more than one hectare planted in olive trees as part of the project. Also, the observations made on the sample perimeters visited provided favorable evidence in terms of production, since some of the plantings done in 2008 and 2009 have begun to enter into production. This suggests that the expected impact in terms of production is highly achievable. However, the effects on incomes will remain dependent on producers' capacities to ensure harvesting and marketing operations, especially in very uneven and landlocked areas, and on the olive and almond market conditions that will prevail in the future.

- Outcomes and impact on direct job creation

One of the most important immediate positive outcomes of the “Expansion” sub-activity for local populations in the target areas has been direct job creation. During the completion of the planting work, the recruitment of beneficiaries, of members of their families (including women) and of other social categories has been a mobilizing action perceived very positively in all the plantings perimeters. Estimates made with the farmers in the sampling perimeters (interviews and focus groups) and verified with some contractors, indicate that each planted hectare generated directly about **40 to 50 man-days** in the first year and **30 to 40 man-days** in the second year, for a total of **70 to 90 man-days of direct work in these two years**. Given the number of planted hectares, approximately 75,000 hectares, this sub-activity would have created approximately **6 million days of direct work**. This estimate would be even higher if the days of indirect work caused by other activities that have mobilized other socio-professional categories are considered: tractor drivers, transportation service providers, nursery workers, foremen, etc. After the planting perimeters were transferred to the farmers, the positive impact of the project in terms of direct job creation dropped dramatically. In fact, very few farmers hired labor to carry out maintenance work on their plantings after the contractors left. However, this situation could probably change, once the plantings become productive. On the basis of minimum level of maintenance, or an average of 15 man-days/ha, the planting perimeters could generate between **4,000 and 5,000 direct jobs annually**. That is significant, especially in the target areas where the participation rate is low overall.

- Impact on the provision of environmental services

Protection of soils against erosion and storm water retention. Nearly two thirds of the planting expansion perimeters involved the High-Atlas, Middle Atlas and Prerif mountain areas. These areas are characterized by uneven terrain, predominance of hillsides on the planting lands and soil vulnerability. The latter are generally subjected to varying levels of erosion depending on the degree of slope and cropping practices. The structural integration of the environmental dimension into the process for the creation of the planting perimeters has been a significant source of generation of multiple environmental services. In fact, when water retention and soil conservation structures are properly developed and maintained by the farmers, they can potentially generate positive effects on the protection of soils against erosion. These structures also enable the harmonious development of young plants in particular by improving storm water retention.

Shaping of natural landscapes and local tourism attractiveness. The technical standards imposed for the creation of the expansion perimeters which aimed at having continuous, well-laid out, homogeneous and regular plantings, are potential sources of shaping and structuring of the natural and semi-natural landscapes in the target areas. In several perimeters, the slopes planted in olive or almond trees have begun to deliver substantial landscape value (provinces of Taza, Taounate, Azilal and Beni Mellal). In these areas, some farmers mentioned having an interest in the new plantings, in relation to the tourist attractiveness of their areas. On other farms located adjacent to a hunting reserve, farmers stressed the benefit which the planting perimeter will create for wildlife development and increases in visitor flow during the hunting seasons.

■ *Other positive social externalities in the expansion perimeters*

Beginning of producer structuring and the emergence of a fabric of local associations and co-operatives. Significant efforts have been granted by the project to the professional organization of small farmers, even making it a prerequisite to benefit from its actions. Despite multiple problems encountered, a beginning of organizational change, at varying speeds, was initiated at the level of all perimeters. The professional organization of small farmers had certainly enabled, upon execution of the planting work, to perform as a facilitator and interface between the various stakeholders. But it is still in an embryonic stage, requiring enhanced actions for farmers' mobilization and development of own funding sources, in order to move towards functional and operational co-operatives in the form of businesses.

Land security and development of fringe lands. The procedures for perimeter delimitation and drawing-up of beneficiary lists, etc. and for the establishment of the new plantings have reactivated land ownership rights and have given them a collective recognition and real legitimacy. They helped the relevant landowners to definitively assert their property rights, at least on the plots planted by the project. This is also the case for owners, who are often absentees, as they often gave their land in

exchange for partnership and/or lease with the lessees who used it. For these owners, the project's intervention has been an opportunity to reassert their property right of ownership on the planted plots, and even to recover them and operate them directly. This did not fail to cause conflicts between lessees and lessors. The project also brought considerable value added to the lands it has planted, including those whose uneven topography and/or remoteness makes them fringe lands.

Strengthening and diversification of local productive capacities. All analyses of production systems in the target areas conducted as part of the preliminary feasibility studies, underlined the predominance of the grains-extensive breeding system and its strong vulnerability to climate hazards. Originally, PAF displayed the ambition to shift part of the grain cultivation to fruit tree crops to help reduce volatility in agricultural production in rain-fed areas. This objective was subsequently abandoned due to the complexity of economic situations on the ground, and the term “reconversion” was replaced by “intercropping”. In all perimeters, the new plantings have added to the existing production system. Provided that these plantings are managed and maintained by the farmers, their entry into production would significantly contribute to strengthening and diversifying the productive capacities of small farmers in the project's targeted areas. In fact, and provided that market conditions permit, the expected olive and almond volumes will contribute to improving producers' income and, in certain situations, will reduce the impact of poor grain harvests (buffer effect).

Genesis of productive capital transferable to future generations. Since their lifespan has been set at a time horizon of up to 50 years, the plantings established by the project constitute a productive inheritance which will be passed down to the descendants of the beneficiary small farmers, in particular, and to the future generations in the targeted areas, in general.

b. Some negative externalities relating to the rain-fed expansion perimeters

Risk of increased pressure on water resources. Everywhere, farmers complain about the insufficient maintenance operations over the planned 24 months, in particular irrigation. Of course, technical feasibility studies had adequately addressed the irrigation issue and the local technical assistance teams have put particular emphasis on the rain-fed nature of plantings. However, after contractors left, some farmers who have wells brought other irrigations, and others are even planning to equip their plots with drip irrigation. In addition to these individual behaviors, in other perimeters, collective irrigation projects are being developed with the assistance of DPA's agents, with a view to making them benefit from subsidies from the Agricultural Development fund (FDA). If this trend continues and becomes generalized in the near future, it would result in increased pressure on water resources. Knowing that the majority of perimeters are subjected to the issue of water resource vulnerability, the effects of pumping would play a role in weakening the environmental performance of PAF in general and of the planting projects in particular.

Probable decline in pastoral livestock receipts. Despite the absence of preliminary economic appraisals, several arguments were put forward with the farmers by the local teams of technical assistance and oversight services on the higher profitability of olive and almond tree plantings, comparing these to pastoral livestock. In several perimeters, downward trends in the number of small ruminants possessed have been recorded among small farmers (perimeters of Beni Mellal, Taounate, and Taza). In cases where the decreasing receipts resulting from a reduction in livestock numbers would not be offset by those expected after the entry into production of plantings, small farmers' sources of cash may be weakened, which would expose them to adverse effects. This potential development, which is incompatible with the poverty reduction objectives set by PAF, would constitute a significant negative externality associated with the planting projects. This is a crucial issue which requires special attention in monitoring developments in the target perimeters.

Risk of weakening social cohesion in the planting perimeters. One of the negative social externalities of the “Expansion” sub-activity was the phenomenon of conflicts of interests which occurred in almost all perimeters. With the advent of the project, several disputes arose between the actors on the ground. The delimitation of intervention perimeters, the establishment of official beneficiary lists and the launch of work provided an opportunity for tensions to emerge and/or increase. These conflicts, often caused by a difference of interests, arose either between beneficiaries and non-beneficiaries, or between the beneficiaries themselves because of the many divergences that occurred during the planting work (conflict about the designation of candidates at the level of perimeters, disagreement between the co-heirs as to whether or not to include the jointly owned lots, tensions between the beneficiaries and the association or association's office, inter-clan conflicts in connection with elections, etc.). These conflicts persist and were even exacerbated by the retrocession of perimeters to the beneficiaries. Their consequences represent a potential risk for the weakening of social cohesion. The number of complaints filed and requests being processed in various courts can be used as an indicator for assessing these social externalities generated by the planting projects.

4.1.1.2. Rehabilitation of Existing Orchards

According to the initial design, the ultimate goal of the “Rehabilitation of existing orchards in rain-fed areas” was to help reduce poverty among rural households in these areas. To this end, the intervention design was based on an important offer of training, technical support and mentoring services for farmers and their professional organizations (Contract TC-5A). Under the assumption of strong beneficiary support and broad adoption of the recommended crop husbandry techniques, the expected impact of the rehabilitation of existing orchards would result in an increase in net farm incomes by **15.6%** and in the revenues from olive production by **29.8%** over a three-year time horizon. In order to check if these impacts are actually produced on the ground, the NORC team, under Contract ME-2, had adopted an evaluation approach combining qualitative and quantitative methods which required a

significant data collection process with beneficiaries and non-beneficiaries (between 2011 and 2013)⁷. The results which will be presented here will be limited to informing the key indicators of the effects and impacts selected by the logical framework of PAF. They begin by assessing the effects of the training, technical support and mentoring services on beneficiaries in terms of adoption of the recommended crop husbandry techniques, followed by the results in regard to the effects of such adoption on production productivity, volumes and quality, and the results regarding the economic and social impact in terms of change in revenues, income and poverty reduction.

a. Impact on the adoption of improved crop husbandry techniques on olive trees

The data from the monitoring of cultivation operations among the beneficiary farmers show mixed trends, albeit with positive developments in some of the techniques put forward in the training sessions. The techniques whose adoption rates improved slightly between 2011 and 2013 are those relating to the works of tillage, pruning in general and pruning of adult trees in particular, and of harvesting operations, including mechanical harvesting, the use of vibrators or tarps (Table 89). The deviations obtained between the baseline (2011) and the final situation (2013) among all sampled farmers, are not significant overall. These results are compliant with those drawn on the scale of all perimeters and confirm that the impact of the training, technical support and mentoring services on beneficiaries could not have been of sufficient magnitude or of stable evolution over time. The main reason lies in the duration of the assessment, which was too short to identify the expected impacts of the training program. Indeed, the training sessions, which are the vectors for the desired impacts, were not carried out until 2011 and 2012, while the last survey was conducted at the beginning of 2013. This means that the assessment only focused on one or, at the most, two harvests since the training, and thus, the duration was too short to have an impact, knowing that training and ownership processes require an amount of time sufficient for producing the expected effects on farmers' behavior.

Table 89. Adoption rate of improved crop husbandry techniques on olive trees in rain-fed areas

Farming operations	Percentage of farmers from treated perimeters (%)					
	2011		2012		2013	
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation
Fertilizer application	16.1	36.8	13.1	33.8	14.9	35.6
Manure application	27.8	44.8	26.7	44.2	24.1	42.8
Insect control	3.8	19.2	1.6	12.6	2.6	15.9
Pest control	1.5	12.0	0.6	7.5	0.7	8.5

⁷ For further details on the methodological approach, quantitative evaluation methods and sample characteristics, see the 2013 NORC Report.

Farming operations	Percentage of farmers from treated perimeters (%)					
	2011		2012		2013	
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation
Bacterial disease control	0.8	9.0	0.3	5.7	0.2	4.9
Wound treatment	0.7	8.5	0.7	8.0	0.1	2.9
Phytosanitary treatments	0.6	7.5	0.2	4.0	0.1	2.9
Tillage work	83.8	36.8	83.9	36.7	86.2	34.5
WSC preparation	3.5	18.3	2.1	14.4	3.9	19.3
Land development work	8.4	27.8	6.4	24.5	2.5	15.6
Hydro-agricultural work	4.1	19.9	1.1	10.6	1.1	10.6
Pruning	42.7	49.5	46.8	49.9	43.3	49.6
Pruning of adult trees	86.6	34.1	88.9	31.4	92.9	25.8
Pruning of young trees	67.7	46.8	65.7	47.5	54.2	49.9
Mechanical harvesting	0.5	7.0	0.5	7.0	0.7	8.5
Use of vibrator	0.6	7.5	1.1	10.6	1.4	11.7
Harvesting with tarpaulin	93.5	24.6	94.8	22.3	97.2	16.5
Total number of respondents	1,236		1,236		1,236	

Source: 2013 NORC report

Since the training was not mandatory and since the participation rate of farmers was highly variable from one perimeter to the next, these results remain aggregate in nature and do not adequately inform about the specific impact of training on beneficiaries. To shed new light on this issue, it was therefore necessary to compare adoption rates between both groups (those who had participated in the training and those who hadn't) (Table 90).

Table 90. Adoption rate of improved production techniques on olive trees among training participants and non-participants

Farming operations	Beneficiaries who had not attended the training (in %)		Beneficiaries who had attended the training (in %)	
	Year 2013		Year 2013	
	Average	Standard deviation	Average	Standard deviation
Fertilizer application	12.2	32.7	<u>23.1</u>	42.2
Manure application	21.5	41.1	<u>34.7</u>	47.7
Insect control	1.8	13.4	4.8	21.3
Pest control (%)	0.3	5.4	2.4	15.3
Bacterial disease control	0.2	4.2	0.7	8.2
Wound treatment	0.1	2.4	0.0	0.0
Phytosanitary treatments	0.4	6.0	0.3	5.8
Tillage work	85.3	35.4	90.8	28.9
Basin/impluvium construction	3.1	17.3	8.2	27.4
Other land development work	3.4	18.0	3.4	18.2
Hydro-agricultural work	1.4	11.8	3.1	17.3
Pruning	39.4	48.9	<u>64.0</u>	48.1
Pruning of adult trees	92.9	25.7	89.4	30.9

Farming operations	Beneficiaries who had not attended the training (in %)		Beneficiaries who had attended the training (in %)	
	Year 2013		Year 2013	
	Average	Standard deviation	Average	Standard deviation
Pruning of young trees	52.7	50.0	54.8	49.9
Mechanical harvesting	0.4	5.9	2.0	14.2
Use of vibrator	0.3	5.4	4.8	21.3
Harvesting with tarpaulin	97.5	15.5	96.2	19.3
Number of beneficiaries surveyed	1,693		294	

Source: Adapted from the 2013 NORC report

Overall, adoption rates of improved production techniques are higher among the beneficiaries who had attended the training. However, the deviations recorded for the same year (2013) are not significantly different between both groups, except for pruning, and application of fertilizers and manure. This suggests that it will take some time before farmers perceive the usefulness and interest of the recommended techniques, in particular their impact on productivity and production volumes.

b. Impact on olive production

Overall, the impact of the adoption of improved crop husbandry techniques on olive production in rain-fed areas remains lower than expected by the project. Of course, improvements in production volumes were recorded among beneficiaries as compared to non-beneficiary groups. Olive production has been higher in the treatment perimeters by **12%** in 2011, **4.1%** in 2012 and **7.2%** in 2013. However, the weak 2013 harvests, as compared to those of 2012 and 2011, did not permit one to identify any positive development within the same group of beneficiaries. On the contrary, production fell by more than one-half between 2011 and 2013 (Table 91). This indicates that the expected positive impact on olive production in rain-fed areas still requires continued technical support for farmers.

Table 91. Change in olive production volumes between 2011 and 2013 in rain-fed areas

Indicator	Control perimeters						Treatment perimeters					
	2011		2012		2013		2011		2012		2013	
	Aver	AND	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion
Total production of olives (kg)	2191	2231	1963	1849	1171	1164	2516	2717	2047	2085	1262	1347
Total number of respondents	751						1,236					

Source: Adapted from the 2013 NORC report

a. Impact on the net revenues and income from olive production

The same trend, recorded for production volumes has characterized the evolution of net revenues and income from olive marketing between 2011 and 2013. Between beneficiaries and non-beneficiaries, olive revenues were higher by **5.1%** in 2011, **5.5%** in 2012 and only **1.5%** in 2013. It is the same for net olive income which exhibited differences by **12.8%** in 2011, **6%** in 2012 and **0.8%** in 2013. While these results may be interpreted as a positive impact attributable to the project, the development of both indicators among the group of beneficiaries, between 2011 and 2013, does not support the effectiveness of these induced effects. At the time when olive revenue increased by **8.7%** between 2011 and 2012, then fell drastically between 2012 and 2013, representing a relative decline of approximately **8.7%** (**Table 92**). Between the baseline (2011) and 2013, olive revenue decreased even more, by about **51.7%**. This means that not only has the overall goal of improving the revenue from olive production set at **29.8%** over a three-year time horizon, not been achieved. Here again, the high vulnerability of the impacts set for the net olive revenue and income to climate hazards in rain-fed areas is confirmed.

Table 92. Development of net olive revenue and income between 2011 and 2013 in rain-fed areas

Indicator (MAD)	Control perimeters						Treatment perimeters					
	2011		2012		2013		2011		2012		2013	
	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion
Olive revenue	7,973	9,107	8,703	8,198	5,457	5,760	8,408	10,026	9,216	10,885	5,541	6,192
Olive net income	4,898	9,208	6,385	7,174	4,066	4,825	5,622	9,602	6,792	9,778	4,100	5,684
Olive revenue per tree	69.6	93.9	70.6	68.7	45.4	59.0	71.7	81.9	83.1	97.6	45.5	58.1
Total	751						1,236					

Source: Adapted from the 2013 NORC report

b. Impact on farm and household income

The results obtained for net farm income and net household income didn't show any coherent positive development between 2011 and 2013. Net farm income was higher by **6.5%** among beneficiaries as compared to non-beneficiaries in the reference year (2011), but lower by **1.4%** and **5.5%** in the following two years (2012 and 2013). As to net household income, it was higher among beneficiaries in the first two years (2011 and 2012), but to varying degrees: **12.4%** and **0.2%** respectively. While in 2013, net household income was higher among non-beneficiaries, representing a difference of about **9.1%** (Table 93). Based on this comparison between beneficiaries and non-beneficiaries, it appears that the impact of the project on farmers' income in rain-fed areas has not been clearly established. The review of changes in both indicators only among beneficiaries between the baseline (2011) and 2013 shows a decline by 7% in net farm income and by 1.2% in net household income. It follows that the

expected impact of the rehabilitation of existing orchards which sets a 15.6% increase in net farm income over the anticipated three-year horizon, is far from being achieved among all beneficiaries.

Table 93. Changes in farm and household incomes between 2011 and 2013 in rain-fed areas

Indicator (MAD)	Control perimeters						Treatment perimeters					
	2011		2012		2013		2011		2012		2013	
	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion
Net farm income	8,012	13,781	9,502	12,828	8,454	12,201	8,572	14,841	9,373	15,081	8,010	11,029
Net household income	8,956	17,858	10,736	33,088	10,955	15,055	10,224	17,149	10,760	18,390	10,039	13,980
Total	751						1,236					

Source: Adapted from the 2013 NORC report

However, in order to better organize these results which remain comprehensive in nature, it is important to verify the evolution of both income indicators among the farmers who had received the training modules and those who hadn't. The results obtained show significant differences between the two categories of beneficiaries insofar as both incomes proved higher among the beneficiaries who had attended the training. The rate of growth in net farm income was **33.1%** in 2011, **35.3%** in 2012 and **22.6%** in 2013. Net household income was also higher by **26.2%** in 2011, **44%** in 2012 and **25%** in 2013 (Table 94). It is true that it is very difficult to relate these increases in income only to the fact of having or not attended the training. Indeed, the results obtained on adoption rates are not such as to strengthen the causal relationship between the project's training programs and changes in income.

Table 94. Income earned by the beneficiaries who had taken part in the training and those who hadn't

Indicator	Farmers who had not taken part in the training						Farmers who had taken part in the training					
	2011		2012		2013		2011		2012		2013	
	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion	Aver	Stand ard deviat ion
Net farm income	7,790	13,561	8,718	13,143	7,838	11,184	11,645	18,447	13,474	19,056	10,134	12,932
Net household income	9,259	17,082	9,622	16,475	9,885	13,349	12,545	19,081	17,251	51,096	13,264	19,144
Total	1,693						294					

Source: adapted from the 2013 NORC report

The following findings emerge from the assessment of effects and impact for the “Rain-fed rehabilitation of existing orchards” sub-activity:

- Overall, no indicator of the impacts set for the activity could be reached at the 2013 horizon. Conversely, a number of indicators such as those relating to the revenue or income experienced downward trends between the 2011 baseline and 2013;
- The effects and impacts produced at the level of beneficiaries and non-beneficiaries by the rehabilitation activities were heavily subject to and dominated by the significant weight of weather conditions, especially the unfavorable weather conditions of year 2013;
- The causal relationships between “the training, technical support and mentoring services” and “the adoption of improved production techniques” have not materialized into stable and growing of productivity, revenue and income gains among the beneficiary farmers;
- The hope to see the farmers who attended the training adopt the crop husbandry techniques recommended by the project, is still a possibility, but provided that accompanying measures, in particular in the form of material support, are implemented as part of the actions to consolidate the gains of PAF in the context of the Morocco Green Plan.

4.1.2. Olive Tree Irrigation and Intensification in PMH Areas

The “Olive tree irrigation and intensification in PMH areas” activity was designed around two sub-activities: the first one is dedicated to the implementation of a broad hydro-agricultural development action program, the second one to an important offering of training technical support and mentoring services for the farmers and their professional organizations. In general, impact assessment is intended to determine more broadly whether a project has had the desired outcomes on beneficiaries, households and institutions and whether these outcomes are attributable to the project's direct intervention (effectiveness). For assessing the effects and impact of this activity, (as for the “Date tree irrigation and intensification in oasis areas” activity), and unlike the “Rain-fed rehabilitation of existing orchards”, it is not possible to adopt the quantitative methods based on the statistical comparison of the target and control groups (random simulation, score harmonization, double difference, instrumental variables) since control groups were not provided for at the time the project was launched. Since the project conducted an initial survey (baseline) in the perimeters which have benefited from its interventions, the selected method will consist, in this case, in comparing developments in the situation of beneficiaries before and after the intervention (reflexive comparison). For all these reasons, a similar survey was conducted as part of the final evaluation of the PAF, with a sample of beneficiaries and professional agricultural organizations at the level of a perimeter sample targeted by PAF⁸ project (see 4.2. Sample design of the categories of beneficiaries to be surveyed). Evaluation of outcomes and impacts will be measured by the change in indicators before and after the intervention. However, a thorough causal attribution (effectiveness) of the progress or developments

⁸ See ME-16, Methodological Report, final Version, September 2013

observed between the beginning and end of the project to its activities will always prove difficult without a control group for quantitative data. Also, the approach used for assessing the outcomes and impact of the relevant activities also includes the qualitative methods where perceptions and ratings of the surveyed beneficiaries and their analysis proved extremely useful. The findings of this evaluation will be presented, focusing on three indicators in accordance with the logical framework of PAF: adoption of improved olive tree production techniques by the farmers trained, produce productivity and quality; farm income.

a. Impact on the adoption of improved olive tree production techniques

In the upstream olive sector, PAF set itself the goal of introducing the improved crop husbandry and harvesting techniques, by providing training, mentoring and technical support services for farmers, through contract TC-5A. Under the assumption of strong support from beneficiaries and widespread adoption of the recommended crop husbandry techniques through the training delivered by the project, the productivity of olive trees in particular and of the crops cultivated in general, should increase. This will potentially and positively impact the farm income of the target households.

A comparison between the production techniques used at the beginning of the project (crop year 2008/2009 of the baseline) and those used at the end of the project (crop year 2012/2013 of survey ME-16 for the final project evaluation) reveals a clear increase in the proportion of farmers who use the pruning of olive-tree which increased from 54.4% to 98.3%, i.e. representing an improvement of **44%**, against only **8%** for irrigation, **6** for mechanized tillage and **0.2** for mechanical harvesting. However, the proportions of farmers who use chemical fertilization and plant-health protection recorded a **decrease by 17%** and **5%** respectively. The fact that crop year 2012/2013 was less rainy than that of 2008-2009 explains the decline in both practices. Especially given that these are operations whose completion necessarily requires money expenditures for the purchase of the required inputs (chemical fertilizers and plant health products). However, it has been well established that under adverse weather situations, family farms in general, and the poorest in particular, deploy risk minimization strategies by reducing production costs (notably cash). As regards the construction of benches and impluvia, this comparison could not be made as the survey of the baseline had not taken into account this type of developments (Tableau 95).

Table 95. Developments in olive tree technical management between the baseline and project completion

Operation	ME-1A_Baseline	ME-16_Final evaluation	Variation
Pruning	54.4	98.3	+43.9
Irrigation	90.2	98.6	+8.4
Mechanized tillage	18.6	24.4	+5.8
Mechanical harvesting	0.6	0.8	+0.2

Operation	ME-1A_Baseline	ME-16_Final evaluation	Variation
Chemical fertilization	51.1	34.4	-16.7
Plant health protection	16.3	11.3	-5.0
Basin construction	N/A	94.1	N/A
Impluvia construction	N/A	16.1	N/A

As for the results of survey ME-16 in PMH areas, they show that the levels of adoption of the improved technical practice by the trained farmers are somewhat encouraging. Indeed, and except for the phytosanitary treatment module for which it rises to nearly 50%, the non-application rate of the training received remains in limited proportions for the other three modules: 12.2% for pruning, 15.7% for soil tillage and fertilization and 23.2% for olive harvesting. This being so, it should be noted that for the four modules, this rate decreases from the smallest to the largest farms, which could more definitively reflect the insufficient capacity of the poorest to apply the practices in which the project has trained them. This assumption seems to be supported by application rates, half of which are represented by olive harvesting (51.1%) and olive tree pruning (48.3%). These beneficiaries thus trained can themselves carry out these operations without having to rely on others and/or incur expenses to perform them. For the farms in the intermediate category, their incapacity is less obvious and shows especially through those among them who state that they have only little applied the training received and whose corresponding rates are the highest in the three categories and for the three most applied modules: 62.5% for soil tillage and fertilization, 61.5% for pruning, and 55.8% for olive harvesting (Table 96). The lesson to be drawn is that the training of beneficiaries in a good practice is certainly useful and necessary, but it still has to be accessible to them so that they can apply it, adopt it! The fact that there are beneficiaries who state that they only apply little of what they have learned means in fact that they only do so on part of their olive trees. This corresponds to the second indicator to assess the training outcomes: the level of application. On all four modules and relevant beneficiaries in the three categories, the results from survey ME-16 show that the recommended techniques were applied for 55% to 75% of olive trees. This constitutes in itself a tangible and convincing impact of the training provided by the project (Table 97).

Table 96. Application rate of the improved production practice by the beneficiaries trained

Module	Application rate	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Olive tree pruning	Respondents	58	100.0	26	100.0	39	100.0	123	100.0
	Applied	28	48.3	8	30.8	22	56.4	58	47.2
	Little applied	20	34.5	16	61.5	14	35.9	50	40.7
	Not at all applied	10	17.2	2	7.7	3	7.7	15	12.2
Soil tillage and fertilization	Respondents	47	100.0	16	100.0	26	100.0	89	100.0
	Applied	13	27.7	4	25.0	16	61.5	33	37.1

Module	Application rate	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
	Little applied	24	51.1	10	62.5	8	30.8	42	47.2
	Not at all applied	10	21.3	2	12.5	2	7.7	14	15.7
Phytosanitary treatment	<i>Respondents</i>	23	100.0	7	100.0	23	100.0	53	100.0
	Applied	4	17.4	4	57.1	14	60.9	22	41.5
	Little applied	1	4.3			4	17.4	5	9.4
	Not at all applied	18	78.3	3	42.9	5	21.7	26	49.1
Olive harvesting	<i>Respondents</i>	45	100.0	18	100.0	32	100.0	95	100.0
	Applied	23	51.1	6	33.3	17	53.1	46	48.4
	Little applied	6	13.3	10	55.6	11	34.4	27	28.4
	Not at all applied	16	35.6	2	11.1	4	12.5	22	23.2

Source: Survey ME-16

Table 97. Level of application of improved practices by the trained beneficiaries (% of olive trees exploited)

Module	Indicators	Class-size of total UAA (ha)			
		2≤	2-5	>5	Total
Olive tree pruning	<i>Respondents</i>	48	23	36	107
	Minimum	40.00	40.00	30.00	30.00
	Maximum	100.00	100.00	100.00	100.00
	Median	77.50	60.00	60.00	70.00
	Average	74.79	62.43	68.75	70.10
	Standard error	2.53	3.30	4.09	1.97
Soil tillage and fertilization	<i>Respondents</i>	37	14	24	75
	Minimum	40.00	40.00	30.00	30.00
	Maximum	90.00	100.00	100.00	100.00
	Median	60.00	50.00	70.00	60.00
	Average	63.92	59.29	70.83	65.27
	Standard error	3.13	4.30	5.37	2.55
Phytosanitary treatment	<i>Respondents</i>	5	4	19	28
	Minimum	50.00	50.00	40.00	40.00
	Maximum	80.00	60.00	100.00	100.00
	Median	60.00	55.00	70.00	65.00
	Average	62.00	55.00	72.89	68.39
	Standard error	1.96	1.77	4.11	2.57
Olive harvesting	<i>Respondents</i>	29	16	29	74
	Minimum	50.00	40.00	30.00	30.00
	Maximum	100.00	100.00	100.00	100.00
	Median	80.00	60.00	70.00	70.00
	Average	81.38	65.00	72.93	74.53
	Standard error	2.98	3.69	3.99	2.52

Source: Survey ME-16

As to the question of giving an overall assessment of the developments in their olive tree husbandry techniques since project startup, 1/3 of the entire sample surveyed (half in oasis areas) considers that they have improved. This proportion increases with the farm size: only 27.1% in small farms, against 36.3 % in average and 41.1% in large ones. The results from this assessment are thus consistent with those from the evaluation and analysis of the adoption/application of improved crop husbandry techniques by the farmers who had benefited from the project's training.

Table 98. Beneficiaries' rating of the developments in their olive tree husbandry techniques since project startup

	Class-size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>	188	100.0	80	100.0	90	100.0	358	100.0
Better than before	51	27.1	29	36.3	37	41.1	117	32.7
As before	135	71.8	51	63.8	53	58.9	239	66.8
Worse than before	2	1.1	0	0.0	0	0.0	2	0.6

Source: Survey ME-16

b. Effects on olive tree productivity and product quality

On the basis of crop year 2008/2009, the baseline had estimated the average yield of olive-trees at 4.20 T/ha. According to the project's forecasts, it was expected to reach 5 T/ha at the end of the Compact, representing an increase by almost 20%. Paradoxically, the results of survey ME-16 on crop year 2012/2013 set its average production at 2.66 T/ha (the equivalent of 26.6 Kg/olive tree harvested with a density of 100 olive trees/ha), for each of the three categories of farms surveyed. This inconsistency in the results of the survey can come from problems, especially with respect to the reference situation. In any event, the yield is well below that used as a reference for the draft project and that which was expected to be reached at the end of the project.

Table 99. Yield of the olive-trees harvested in 2012/2013

		Class-Size of total UAA (ha)			
		≤2	2-5	>5	Total
<i>Respondents (Number)</i>		170	73	80	323
Yield (Kg/olive tree)	Minimum	3	3	1	1
	Maximum	160	148	125	160
	Average	26.7	26.7	26.5	26.6

Source: Survey ME-16

The difference between the yield in the baseline and the yield in the final project evaluation may be attributed to the alternation phenomenon, and on the other hand, to the unfavorable rain conditions that

affected the crop year of the final evaluation survey, as compared to the excellent rainfall during the baseline which was excellent. As for the deviation from the yield expected at the end of the project, it may be explained, in addition to the adverse weather conditions, by the insufficient adoption of best practices by the olive growers trained. However, survey ME-16 provides other results that suggest considering that despite the poor performance thus identified, the project has produced significant effects on olive tree yields. Indeed, about half of the surveyed beneficiaries consider that, since project startup, the productivity of olive trees and the quality of the olives and oil produced have improved.

Table 100. Farmers' rating of the developments in the yield of olive trees and quality of olives and oil produced since project startup

Indicator		Rating	Class-size of total UAA (ha)							
			2≤		2-5		>5		Total	
			Number	%	Number	%	Number	%	Number	%
Yield	Olives	Respondents	188	100.0	80	100.0	90	100.0	358	100.0
		Better than before	91	48.4	47	58.8	41	45.6	179	50.0
		As before	91	48.4	31	38.8	46	51.1	168	46.9
		Worse than before	6	3.2	2	2.5	3	3.3	11	3.1
	Oil	Respondents	188	100.0	80	100.0	90	100.0	358	100.0
		Better than before	100	53.2	47	58.8	41	45.6	188	52.5
		As before	83	44.1	33	41.3	47	52.2	163	45.5
		Worse than before	5	2.7	0	0.0	2	2.2	7	2.0
Quality	Olives	Respondents	188	100.0	80	100.0	90	100.0	358	100.0
		Better than before	101	53.7	48	60.0	38	42.2	187	52.2
		As before	84	44.7	32	40.0	51	56.7	167	46.6
		Worse than before	3	1.6	0	0.0	1	1.1	4	1.1
	Oil	Respondents	186	100.0	80	100.0	89	100.0	355	100.0
		Better than before	95	51.1	45	56.3	29	32.6	169	47.6
		As before	89	47.8	35	43.8	58	65.2	182	51.3
		Worse than before	2	1.1	0	0.0	2	2.2	4	1.1

Source: Survey ME-16

About half (45.8%) of the surveyed olive growers also consider that the time interval between the harvesting of the olives produced and their crushing is better than it was before. In fact, this aspect is part of the improved crop husbandry techniques recommended through the training provided. This is consistent with and supports and strengthens the assessment of respondents as to the improved quality of the olive oil they produce, since the advent of the project.

Table 101. Farmers' rating of the developments in the duration of the olive harvesting - crushing time interval since project startup

	Class-size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>	186	100.0	80	100.0	90	100.0	356	100.0
Better than before	97	52.2	36	45.0	30	33.3	163	45.8
As before	88	47.3	43	53.8	60	66.7	191	53.7
Worse than before	1	0.5	1	1.3	0	0.0	2	0.6

Source: Survey ME-16

More specifically concerning the level of olive yield achieved during crop year 2012/2013, 40% were dissatisfied to very dissatisfied, 17% considered it was normal, while 43% were satisfied to very satisfied. The latter level of satisfaction suggests bearing in mind that while the expected yield at the end of the project could not be reached, one of the outcomes of its interventions has probably been the mitigation of the negative effect of the prevailing adverse weather conditions. Without the project, the yield for this crop year would have been lower and the olive growers who were satisfied with it would have been much less numerous.

Table 102. Farmers' rating of the level of yield of olives harvested in 2012/2013

		Class-size of total UAA (ha)							
		≤2		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>		169	100.0	73	100.0	81	100.0	323	100.0
Including:	Very satisfied	16	9.5	5	6.8	9	11.1	30	9.3
	Rather satisfied	54	32.0	32	43.8	23	28.4	109	33.7
	Neutral/normal	29	17.2	14	19.2	13	16.0	56	17.3
	Somewhat dissatisfied	60	35.5	17	23.3	25	30.9	102	31.6
	Very dissatisfied	10	5.9	5	6.8	11	13.6	26	8.0

Source: Survey ME-16

c. Impact on farm income

Based on production in crop year 2008/2009, the reference situation had estimated the average income per farm at the equivalent of **US \$ 4,784**. According to the project's forecasts, it was expected to reach the equivalent of S \$ 5,143 at the end of the Compact, representing a 7.5 % increase. Since it wasn't able to measure the overall net income of the project's beneficiary farmers, survey ME-16, which focused on agricultural production for the 2012/2013 crop year, proceeded with evaluating their gross farm income. According to the survey results, the average farm gross margin for the entire sample was estimated at about MAD 35,000 per farm, or the equivalent of **US \$ 4,175**. Not only is this level of income well below the level expected to be reached at the end of the project, it is also lower than that

of its reference situation. As previously discussed, the gaps recorded in gross agricultural income are to a large extent due to the adverse weather conditions in crop year 2012/2013 as compared to 2008/2009, is for the deviations in gross farm income. To this factor, add the fluctuations in market prices during the period examined.

Table 103. Average farm gross margin per farm: crop year 2012/2013 (MAD)

	Class-size of total UAA (ha)							
	≤2		2-5		>5		Total	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total Products	24,013	2,241	46,243	3,985	101,667	7,026	47,834	3,579
Total Expenses	5,549	426	12,547	1,249	29,781	2,654	12,996	890
Gross margin	18,463	1,928	33,697	4,170	71,886	5,576	34,838	2,994

Source: Survey ME-16

Table 104. Average farm gross margin per farm: crop year 2008/2009 (MAD)

Class-size of total UAA (ha)				
≤2	2-5	>5	Total	
			Estimate	Standard error
19,044	37,974	80,873	40,464	4,825

Source: ME-1A Baseline establishment for the monitoring and evaluation of PAF, Main Report: PMH area, June 2011

A comparison between the final project evaluation and the baseline also reveals that the average gross farm income per farm has recorded an overall fall of about 14%. This decrease has only scarcely affected the small farm category with -3.1% against -11.3% for medium-sized farms and -11.1% for large ones. This confirms the previous results obtained regarding the efforts made by the beneficiaries from this category in terms of rate and level of adoption/application of the technical know-how acquired from the training received, and the improvements in terms of productivity and quality of products resulting from their olive oil production activity. The project's interventions therefore seem to have been beneficial for the beneficiaries, in particular the poorest. Seen in this light, the generated and perceptible outcomes and impacts are consistent with the ultimate purpose of the project: combating poverty.

At the end of the survey, respondents were requested to give an overall assessment of the outcomes and impacts they may have felt for themselves and for their household since project startup. Nearly 40 to 60% of them consider that the project has made a satisfactory contribution to meeting their needs, nearly 30 to 40% of them believe that their farm income has improved, as has the standard of living of ¼ to 1/3 of them, against only 10 to 20% for agricultural employment.

Table 105. Beneficiaries' perception of the developments in their economic and social conditions with the project

Indicator	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Farm income	<i>Respondents</i>	189	100.0	80	100.0	89	100.0	358	100.0
	Better than before	55	29.1	32	40.0	27	30.3	114	31.8
	As before	133	70.4	46	57.5	62	69.7	241	67.3
	Worse than before	1	0.5	2	2.5	0	0.0	3	0.8
Agricultural employment of household members	<i>Respondents</i>	189	100.0	80	100.0	90	100.0	359	100.0
	Better than before	28	14.8	14	17.5	10	11.1	52	14.5
	As before	160	84.7	65	81.3	80	88.9	305	85.0
	Worse than before	1	0.5	1	1.3	0	0.0	2	0.6
Household living conditions (standard of living)	<i>Respondents</i>	189	100.0	80	100.0	89	100.0	358	100.0
	Better than before	47	24.9	26	32.5	21	23.6	94	26.3
	As before	141	74.6	53	66.3	68	76.4	262	73.2
	Worse than before	1	0.5	1	1.3	0	0.0	2	0.6
Contribution to meeting the household needs	<i>Respondents</i>	188	100.0	78	100.0	87	100.0	353	100.0
	Very satisfied	28	14.9	8	10.3	9	10.3	45	12.7
	Rather satisfied	80	42.6	36	46.2	29	33.3	145	41.1
	No opinion	43	22.9	23	29.5	29	33.3	95	26.9
	Somewhat dissatisfied	31	16.5	9	11.5	12	13.8	52	14.7
	Very dissatisfied	6	3.2	2	2.6	8	9.2	16	4.5

Source: Survey ME-16

With a view to understanding, at least qualitatively, the outcomes and impacts attributable to the various project's interventions as part of the “Date tree irrigation and intensification in PMH areas” activity, survey ME-16 asked the interviewed farmers what interventions, among those received, they appreciated most. Hydro-agricultural developments take precedence over all other interventions since about 90% of the total number of respondents ranked them first; 78% being the lowest rating recorded in the large farm category. They are followed by training but for less than 20% only.

Table 106. Interventions of PAF most valued by the beneficiary farmers (PMH)

Type of intervention	Class-Size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>	190	100.0	80	100.0	90	100.0	360	100.0
Hydro-agricultural development work	175	92.1	75	93.8	70	77.8	320	88.9
Training received on crop husbandry techniques	31	16.3	15	18.8	19	21.1	65	18.1
Awareness-raising	5	2.6	12	15.0	10	11.1	27	7.5
Technical support	0	0.0	6	7.5	4	4.4	10	2.8
Provision of inputs and small equipment	0	0.0	1	1.3	3	3.3	4	1.1

Hydro-agricultural developments are undeniably the project's most emblematic intervention. This is strongly reflected in the overall positive rating given by a large majority of beneficiaries. In their diversity, these developments have multiplier effects which were highly appreciated by the beneficiaries. By improving irrigation water mobilization, transport and distribution infrastructure, these developments substantially reduce the costs and drudgery of the maintenance work charged to users and enable them to have more water in time and space. What results in conflict reduction, improved coverage of crop water needs, their diversification where land and water availability permit, increased yields and ultimately in improved farm income.

Table 107. Beneficiaries' rating of the outcomes of the segua coating/rehabilitation work

Indicator	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
More irrigation water	Respondents	160	100.0	77	100.0	85	100.0	322	100.0
	Yes	117	73.1	50	64.9	49	57.6	216	67.1
Fewer conflicts between users	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	116	99.1	46	92.0	45	91.8	207	95.8
Increased flow velocity of water in the irrigation network	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	111	94.9	48	96.0	40	81.6	199	92.1
Reduced drudgery in maintenance work	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	99	84.6	30	60.0	21	42.9	150	69.4
Irrigation of plots which were no longer being irrigated	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	66	56.4	30	60.0	28	57.1	124	57.4
Introduction of new cash crops	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	45	38.5	23	46.0	23	46.9	91	42.1
Increased number of crops	Respondents	115	100.0	50	100.0	49	100.0	214	100.0
	Yes	48	41.7	25	50.0	27	55.1	100	46.7
Improved olive tree yield	Respondents	117	100.0	50	100.0	49	100.0	216	100.0
	Yes	85	72.6	41	82.0	38	77.6	164	75.9
Improved yield of other fruit trees	Respondents	95	100.0	42	100.0	46	100.0	183	100.0
	Yes	57	60.0	21	50.0	22	47.8	100	54.6
Improved crop yield	Respondents	115	100.0	50	100.0	49	100.0	214	100.0
	Yes	84	73.0	35	70.0	35	71.4	154	72.0
Improved farm income	Respondents	116	100.0	50	100.0	49	100.0	215	100.0
	Yes	58	50.0	38	76.0	36	73.5	132	61.4

Source: Survey ME-16

Table 108. Beneficiaries' rating of the outputs/impact of the hydro-agricultural work on oueds

Indicator	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
More irrigation water	Respondents	94	100.0	21	100.0	9	100.0	124	100.0
	Yes	70	74.5	14	66.7	4	44.4	88	71.0
Fewer conflicts between users	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	70	100.0	14	100.0	4	100.0	88	100.0
Increased flow velocity of water in the irrigation network	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	67	95.7	14	100.0	4	100.0	85	96.6
Reduced drudgery in maintenance work	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	65	92.9	13	92.9	3	75.0	81	92.0
Irrigation of plots which were no longer being irrigated	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	55	78.6	11	78.6	2	50.0	68	77.3
Introduction of new cash crops	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	44	62.9	6	42.9	1	25.0	51	58.0
Increased number of crops	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	38	54.3	6	42.9	1	25.0	45	51.1
Improved olive tree yield	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	52	74.3	13	92.9	4	100.0	69	78.4
Improved yield of other fruit trees	Respondents	51	100.0	6	100.0	3	100.0	60	100.0
	Yes	40	78.4	6	100.0	2	66.7	48	80.0
Improved crop yield	Respondents	69	100.0	14	100.0	4	100.0	87	100.0
	Yes	55	79.7	14	100.0	4	100.0	73	83.9
Improved farm income	Respondents	70	100.0	14	100.0	4	100.0	88	100.0
	Yes	29	41.4	13	92.9	4	100.0	46	52.3

Source: Survey ME-16

Table 109. Beneficiaries' rating of the outputs of the spring development work

Indicator	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
Spring development	Respondents	28	100.0	8	100.0	14	100.0	50	100.0
	Yes	20	71.4	5	62.5	7	50.0	32	64.0
Fewer conflicts between users	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	20	100.0	5	100.0	6	85.7	31	96.9
Increased flow velocity of water in the irrigation network	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	19	95.0	5	100.0	5	71.4	29	90.6
Reduced drudgery in maintenance work	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	19	95.0	5	100.0	3	42.9	27	84.4
Irrigation of plots which were no longer being irrigated	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	10	50.0	2	40.0	2	28.6	14	43.8
Introduction of new cash crops	Respondents	20	100.0	5	100.0	7	100.0	32	100.0

Indicator	Rating	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
	Yes	3	15.0	1	20.0	3	42.9	7	21.9
Increased number of crops	Respondents	19	100.0	5	100.0	7	100.0	31	100.0
	Yes	2	10.5	1	20.0	3	42.9	6	19.4
Improved olive tree yield	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	13	65.0	3	60.0	5	71.4	21	65.6
Improved yield of other fruit trees	Respondents	14	100.0	3	100.0	5	100.0	22	100.0
	Yes	8	57.1	1	33.3	1	20.0	10	45.5
Improved crop yield	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	14	70.0	3	60.0	5	71.4	22	68.8
Improved farm income	Respondents	20	100.0	5	100.0	7	100.0	32	100.0
	Yes	12	60.0	3	60.0	6	85.7	21	65.6

Source: Survey ME-16

The primacy of hydro-agricultural developments as the intervention almost unanimously preferred by the beneficiaries was corroborated by the qualitative information collected by survey ME-16 on the nature of the investments which some beneficiaries have been able to make since the advent of the project, and on the interventions which may have motivated them to do so.

Table 110. Beneficiaries who have undertaken investments since the advent of the project

Type of investment	Class-size of total UAA (ha)							
	2≤		2-5		>5		Total	
	Number	%(*)	Number	%(*)	Number	%(*)	Number	%(*)
Establishment of new plantings	16	8.4%	8	10.0%	12	13.3%	36	10.0%
Habitat construction/development	7	3.7%	2	2.5%	5	5.6%	14	3.9%
Purchase of breeding stock	6	3.2%	3	3.8%	4	4.4%	13	3.6%
Land purchase/development	2	1.1%	3	3.8%	1	1.1%	6	1.7%
Purchase of farm machinery and/or equipment	2	1.1%	1	1.3%	2	2.2%	5	1.4%

(*) % in relation to the total number of respondents

Source: Survey ME-16

Table 111. Project interventions that have incentivized the investments made

Type of investment	Intervention	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
New plantings	Respondents	16	100	7	100	10	100	33	100
	Hydro-agricultural developments	15	94	7	100	10	100	32	97
	Training on crop husbandry techniques	6	38	2	29	4	40	12	36
	Provision of inputs and small equipment	1	6	0	0	0	0	1	3
	Technical support	1	6	1	14	0	0	2	6

Type of investment	Intervention	Class-size of total UAA (ha)							
		2≤		2-5		>5		Total	
		Number	%	Number	%	Number	%	Number	%
	Awareness actions	0	0	1	14	1	10	2	6
Habitat construction/development	<i>Respondents</i>	1	100	2	100	2	100	5	100
	Hydro-agricultural developments	1	100	2	100	2	100	5	100
	Training on crop husbandry techniques	0	0	0	0	0	0	0	0
	Provision of inputs and small equipment	0	0	0	0	0	0	0	0
	Technical support	0	0	0	0	0	0	0	0
	Awareness actions	0	0	0	0	0	0	0	0
Breeding flock purchase	<i>Respondents</i>	5	100	3	100	2	100	10	100
	Hydro-agricultural developments	5	100	3	100	2	100	10	100
	Training on crop husbandry techniques	0	0	0	0	1	50	1	10
	Provision of inputs and small equipment	0	0	0	0	0	0	0	0
	Technical support	0	0	0	0	0	0	0	0
	Awareness actions	0	0	0	0	1	50	1	10
Land purchase/development	<i>Respondents</i>	1	100	3	100	1	100	5	100
	Hydro-agricultural developments	1	100	3	100	1	100	5	100
	Training on crop husbandry techniques	0	0	1	33	1	100	2	40
	Provision of inputs and small equipment	0	0	0	0	0	0	0	0
	Technical support	0	0	0	0	0	0	0	0
	Awareness actions	0	0	0	0	0	0	0	0
Farm building construction	<i>Respondents</i>	1	100	2	100	3	100	6	100
	Hydro-agricultural developments	1	100	2	100	3	100	6	100
	Training on crop husbandry techniques	0	0	0	0	0	0	0	0
	Provision of inputs and small equipment	0	0	0	0	0	0	0	0
	Technical support	0	0	0	0	0	0	0	0
	Awareness actions	0	0	0	0	0	0	0	0
Purchase of farm machinery/equipment	<i>Respondents</i>	1	100	0	0	2	100	3	100
	Hydro-agricultural developments	0	0	0	0	2	100	2	67
	Training on crop husbandry techniques	1	100	0	0	0	0	1	33
	Provision of inputs and small equipment	0	0	0	0	0	0	0	0
	Technical support	0	0	0	0	0	0	0	0
	Awareness actions	0	0	0	0	0	0	0	0

Source : Enquête ME-16

4.1.3. Date Tree Irrigation and Intensification in Oasis Areas

The "Date Tree Irrigation and Intensification in Oasis Areas" activity is designed around three sub-activities: the first consists in developing a substantial hydro-agricultural development program at the level of 12 perimeters to improve the conditions for the mobilization, transport and valuation of water resources for irrigation; the second aims to provide Bayoud resistant, high-value varieties of date tree in-vitro plants for farmers in the target perimeters for the reconstitution and densification of orchards; the third one, dedicated to the rehabilitation of the existing date tree heritage, focuses on the provision

of training, technical support, and mentoring services for beneficiaries and their professional organizations to improve date tree productivity.

In these basic principles, the approach used to assess the outcomes and impacts of the “Date tree irrigation and intensification in oasis areas” is the same as that used for the “Olive tree irrigation and intensification in PMH areas”. The presentation of the results will be focused on the same indicators: adoption by the farmers trained of improved date tree crop husbandry techniques; productivity and produce quality; farm income.

a. Adoption of improved crop husbandry techniques by farmers in oasis areas

Concerning the improved crop husbandry techniques applied to date trees, the comparison between the pre-project situation and that at the final project evaluation show that of the six operations they both cover, three have increased, although at quite different rates: first the mechanization of soil tillage (+20%), followed by irrigation (+7%) and health plant protection (+2%). However, plant health protection decreased by 28%. Pruning practices remained unchanged, with 77% of respondents. It is the same for mechanical harvesting, except that in both situations, none of the respondents use it.

Table 112. Date tree management techniques at project inception and completion

Operation	ME-1A_Baseline	ME-16_Final Evaluation	Variation
Irrigation	86	93	+7
Pruning	77	77	0
Mechanized soil tillage	26	46	+20
Chemical fertilization	58	30	-28
Plant health protection	1	3	+2
Mechanical harvesting	0	0	0

Unlike TC-5A whose reports addressed the issue of the adoption of the improved crop husbandry techniques recommended for olive trees without distinction between rain-fed and PMH areas, TC-5B which only covered date trees in oasis areas provides an extremely useful source of information for assessing the impact of the training, technical support and mentoring services for the farmers for whom it was responsible. Except that the criteria for assessing the rates of adoption which were informed at the end of the contract (and therefore of the project), had not all been informed at the beginning (Proper in-vitro plant transplanting, proper offshoot transplanting, heavy bunch staking, use of harvesting kit, use of plastic for date protection). Concerned the criteria informed, the highest increase in the adoption rate has been recorded for the “Dry leaf thinning” and “Offshoot weaning” criteria with 60% and 49%, followed by “Pollination at the right time” and “Selection of the right pollinator” with 26% and 20%. There was an increase of only 10% in the rate of adoption of “Phytosanitary treatment”. As for the “Bunch reduction by thinning” criterion, it was maintained at the

same level with an insignificant rate of less than 1%. These results show that farmers have been responsive to the adoption of the recommended practices through the two training modules “Tuft cutting and cleaning” and “Pollen harvesting and pollination”, as they have also been for nearly all other modules. Meaning that, in general, the expected 20% increase in adoption rates has been exceeded. This means that farmers have become aware that the application of the techniques learned will result in increased date tree productivity and production and improved income.

Table 113. Developments in the adoption rate of improved practices between the start and end of Contract TC-5B

Modules	Evaluation criteria	Adoption at contract start	Adoption at contract end
Planting	Proper in-vitro plant transplanting	N/A	58%
	Proper offshoot transplanting	N/A	49%
Thinning, cleaning	Dry leaf thinning	28.9%	88.8%
	Offshoot weaning	13.3%	62%
Pollination	Selection of the right pollinator	Estimated at 75%	94.5%
	Pollination at the right time	Estimated at 66%	91.7%
Staking, cutting, bagging	Heavy bunch staking		73%
	Bunch reduction by cutting	0.9%	0.9%
Harvesting	Use of harvesting kit	N/A	30%
	Use of plastic for date protection	N/A	92.6%
Phytosanitary treatment		5.9%	15.8%

TC-5B, Final Report, Final Version, September 2013

The results of survey ME-16 tend to be consistent with those of TC-5B. This trend becomes further established if the two rates corresponding to “Applied” and “Little applied” are added up, which gives a cumulative adoption rate of about 17% for the “phytosanitary treatment and biological control” and of 60% to 80% for the five others. However, TC-5B rates for “Tuft pruning and cleaning”, “Pollen harvesting and pollination” and “Harvesting” are particularly higher.

Table 114. Application rate of the training received by beneficiary farmers

Module	Application rate	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
In-vitro plant and sucker planting and maintenance	Respondents	23	100.0	54	100.0	128	100.0	205	100.0
	Applied	10	43.5	26	48.1	65	50.8	101	49.3
	Little applied	7	30.4	18	33.3	30	23.4	55	26.8
	Not at all applied	6	26.1	10	18.5	33	25.8	49	23.9
Tuft pruning and cleaning	Respondents	24	100.0	50	100.0	122	100.0	196	100.0
	Applied	11	45.8	23	46.0	61	50.0	95	48.5
	Little applied	6	25.0	18	36.0	33	27.0	57	29.1

Module	Application rate	Class-Size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
	Not at all applied	7	29.2	9	18.0	28	23.0	44	22.4
Pollen harvesting and pollination	Respondents	21	100.0	49	100.0	118	100.0	188	100.0
	Applied	8	38.1	21	42.9	49	41.5	78	41.5
	Little applied	6	28.6	13	26.5	25	21.2	44	23.4
	Not at all applied	7	33.3	15	30.6	44	37.3	66	35.1
Bunch cutting, staking and bagging	Respondents	18	100.0	46	100.0	99	100.0	163	100.0
	Applied	3	16.7	23	50.0	42	42.4	68	41.7
	Little applied	5	27.8	13	28.3	30	30.3	48	29.4
	Not at all applied	10	55.6	10	21.7	27	27.3	47	28.8
Phytosanitary treatment and biological control	Respondents	18	100.0	43	100.0	89	100.0	150	100.0
	Applied			3	7.0	10	11.2	13	8.7
	Little applied	2	11.1	3	7.0	8	9.0	13	8.7
	Not at all applied	16	88.9	37	86.0	71	79.8	124	82.7
Date harvesting, drying and preservation	Respondents	23	100.0	49	100.0	109	100.0	181	100.0
	Applied	8	34.8	23	46.9	40	36.7	71	39.2
	Little applied	5	21.7	10	20.4	25	22.9	40	22.1
	Not at all applied	10	43.5	16	32.7	44	40.4	70	38.7

Source: Survey ME-16

When asked about their overall assessment of the developments in their technical practices on date trees, nearly 51% of all farmers surveyed feel that they have improved with the advent of the project (42.2% of small farms, 57.0% of medium-sized farms and 50.5% of large ones). That's a much higher appreciation than that collected from the farmers surveyed in PMH areas (33%).

Table 115. Farmers' perception of the developments in their technical practice on date trees since project startup

	Class-size of total UAA (ha)							
	0.5≤		0.5-2		>2		Total	
	Number	%	Number	%	Number	%	Number	%
Respondents	64	100.0	100	100.0	186	100.0	350	100.0
Better than before	27	42.2	57	57.0	94	50.5	178	50.9
As before	34	53.1	40	40.0	86	46.2	160	45.7
Worse than before	3	4.7	3	3.0	6	3.2	12	3.4

Source: Survey ME-16

b. Effects on date tree productivity and date quality

Concerning the average yield of date trees, it was set at 36.3 Kg/tree in the reference situation and it was expected to reach 51 Kg/tree at the end of the Compact. However, for the final evaluation, it was only 28.8 Kg/tree; corresponding to a much lower yield than that used as a reference for the pre-

project and that which was expected to be reached at the end of the project. Again, arises the problem of inconsistency in the results of the two surveys.

Table 116. Yield of the date trees harvested in 2012/2013

		Class-size of total UAA (ha)			
		0.5≤	0.5-2	>2	Total
Respondents		64	91	178	333
Yield (kg/root)	Minimum	6.4	4.8	2.3	2.3
	Maximum	100.0	100.0	153.8	153.8
	Average	31.5	30.3	27.0	28.8

Source: Survey ME-16

The difference between the yield in the reference situation and the yield in the final project evaluation is attributable to the adverse weather conditions having prevailed during crop year 2012/2013 on which the final evaluation survey was focused, compared to the reference situation characterized by an excellent crop year (2008/2009). As for the deviation from the target value, in addition to the adverse weather situation of the crop year under consideration in the final evaluation, it may also be explained by the insufficient adoption of improved practices by date tree growers. But survey ME-16 revealed other results which suggest that despite this poor performance, the project has had significant effects on date tree yields. This assessment is reinforced by that of the farmers surveyed on the developments in their yields since the advent of the project. Indeed, 41.4% of the total number of respondents considers that they are better than those achieved before the project. This assessment is shared by 36.1% of the small farm category, 51.0% of medium-sized farms and 38.0% of large ones. In equal proportions, they consider that the quality of their date productions has also improved since the advent of the project.

Table 117. Farmers' rating of the developments in the yield of date trees and quality of the dates produced since project startup

		Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Yield	Respondents	61	100.0	100	100.0	184	100.0	345	100.0
	Better than before	22	36.1	51	51.0	70	38.0	143	41.4
	As before	38	62.3	45	45.0	107	58.2	190	55.1
	Worse than before	1	1.6	4	4.0	7	3.8	12	3.5
Quality	Respondents	61	100.0	100	100.0	183	100.0	344	100.0
	Better than before	23	37.7	51	51.0	74	40.4	148	43.0
	As before	37	60.7	45	45.0	103	56.3	185	53.8
	Worse than before	1	1.6	4	4.0	6	3.3	11	3.2

Source: Survey ME-16

Although the project's interventions failed to reach the expected yield, they have most likely mitigated the negative effect of the adverse weather conditions of crop year 2012/2013. Without them, the yield for this crop year would have been lower, as would the proportion of satisfied date tree growers (45%).

Table 118. Rating by the surveyed farmers of the date yield level achieved in 2012/2013

		Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Respondents		64	100	89	100	176	100	329	100
Including:	Very satisfied	0	0	5	6	18	10	23	7
	Rather satisfied	33	52	36	40	55	31	124	38
	Neutral	8	13	20	22	26	15	54	16
	Somewhat dissatisfied	17	27	19	21	59	34	95	29
	Very dissatisfied	6	9	9	10	18	10	33	10

Source: Enquête ME-16

c. Impacts on farm income

Survey ME-16 under the final project evaluation estimated the average gross farm income per farm in Oasis areas at the equivalent of US \$ 5,057, corresponding to a 7% increase in income compared to that estimated when establishing the reference situation (US \$ 4,740) but which remains lower by 13% than the target value at the end of the Compact (US \$ 5,830). Compared to PMH areas, the impact of the project's intervention in oasis areas proves much more convincing. Remember that 51% of date tree growers in oasis areas consider that their technical practices on date trees have improved with the project, against only 33% for olive growers in PMH areas.

Table 119. Farm gross margin: crop year 2012/2013 (MAD)

	Class-size of total UAA (ha)							
	0.5≤		0.5-2		>2		Total	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Income	17,965	3,626	39,710	4,000	84,385	16,916	58,952	14,526
Expenses	4,299	1,488	9,732	2,146	23,658	6,722	16,167	5,729
Gross margin	13,842	2,367	29,979	2,237	60,855	10,258	42,983	8,783

Source: Survey ME-16

By giving their overall appreciation on the effects and impacts of the project, nearly 50 to 60% of the date tree growers surveyed expressed their satisfaction with the project's contribution compared to the

needs of their households. And for nearly 30 to 40%, the farm income, standard of living and agricultural employment of household members have improved.

Table 120. Beneficiaries' perception of the developments in their economic and social conditions with the project

Indicator	Rating	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Household farm income	<i>Respondents</i>	63	100.0	100	100.0	186	100.0	349	100.0
	Better than before	23	36.5	39	39.0	57	30.6	119	34.1
	As before	37	58.7	57	57.0	122	65.6	216	61.9
	Worse than before	3	4.8	4	4.0	7	3.8	14	4.0
Agricultural employment of household members	<i>Respondents</i>	63	100.0	100	100.0	186	100.0	349	100.0
	Better than before	23	36.5	36	36.0	48	25.8	107	30.7
	As before	37	58.7	59	59.0	128	68.8	224	64.2
	Worse than before	3	4.8	5	5.0	10	5.4	18	5.2
Household living conditions (standard of living)	<i>Respondents</i>	63	100.0	100	100.0	186	100.0	349	100.0
	Better than before	22	34.9	38	38.0	59	31.7	119	34.1
	As before	37	58.7	58	58.0	119	64.0	214	61.3
	Worse than before	4	6.3	4	4.0	8	4.3	16	4.6
Project's contribution to meeting household needs	<i>Respondents</i>	64	100.0	98	100.0	179	100.0	341	100.0
	Very satisfied	6	9.4	13	13.3	22	12.3	41	12.0
	Rather satisfied	34	53.1	44	44.9	63	35.2	141	41.3
	No opinion	13	20.3	21	21.4	50	27.9	84	24.6
	Somewhat dissatisfied	9	14.1	14	14.3	29	16.2	52	15.2
	Very dissatisfied	2	3.1	6	6.1	15	8.4	23	6.7

Source: Survey ME-16

As for olive growers in PMH areas, survey ME-16 sought to identify in oasis areas the interventions which date tree growers appreciated most. Unlike PMH areas, the preferences of interviewees in oasis areas cover all actions carried out as part of the activity, although in different proportions. And while, there too, hydro-agricultural developments are the most preferred interventions with 75% of occurrences, the training is ranked second with 62%, next come technical support and awareness-raising with 39% and 37% respectively, the provision of inputs (including in-vitro plants and date tree offshoots) and of small equipment with 30%. This result illustrates the stronger relevance of the design of the “Date tree irrigation and intensification in oasis areas” activity due to the diversity, complementarity and integration of its components.

Table 121. Interventions of PAF most valued by the beneficiary farmers (Oasis)

Type of intervention	Class-Size of total UAA (ha)							
	0.5≤		0.5-2		>2		Total	
	Number	%	Number	%	Number	%	Number	%
<i>Respondents</i>	56	100.0	93	100.0	170	100.0	319	100.0
Hydro-agricultural development work	49	87.5	72	77.4	117	68.8	238	74.6
Training received on crop husbandry techniques	26	46.4	59	63.4	112	65.9	197	61.8
Technical support	24	42.9	48	51.6	52	30.6	124	38.9
Awareness-raising	23	41.1	46	49.5	49	28.8	118	37.0
Provision of inputs and small equipment	17	30.4	35	37.6	45	26.5	97	30.4

Source: Survey ME-16

As an illustration, we report hereafter the perception of beneficiaries on two interventions that stand out from all others due to the multiplier effects attributed to them by the beneficiaries, as well as their positive impact on production and income: hydro-agricultural development work and date tree tuft cleaning.

Table 122. Beneficiaries' perception of the outcomes and impact of the oued development work

Outcome/Impact	Perception	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
More irrigation water	<i>Respondents</i>	10	100.0	21	100.0	87	100.0	118	100.0
	Yes	7	70.0	10	47.6	25	28.7	42	35.6
Fewer conflicts between users	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	7	100.0	10	100.0	24	96.0	41	97.6
Increased flow velocity of water in the irrigation network	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	7	100.0	9	90.0	21	84.0	37	88.1
Reduced drudgery in maintenance work	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	5	71.4	7	70.0	19	76.0	31	73.8
Irrigation of the plots which were not being irrigated	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	4	57.1	5	50.0	12	48.0	21	50.0
Introduction of new cash crops	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	2	28.6	4	40.0	7	28.0	13	31.0
Increased number of crops grown	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	5	71.4	3	30.0	6	24.0	14	33.3
Improved olive tree yield	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	6	85.7	7	70.0	17	68.0	30	71.4
Improved yield of other fruit trees grown	<i>Respondents</i>	6	100.0	10	100.0	24	100.0	40	100.0
	Yes	2	33.3	2	20.0	10	41.7	14	35.0
Improved crop yield	<i>Respondents</i>	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	7	100.0	6	60.0	20	80.0	33	78.6

Outcome/Impact	Perception	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Improved farm income	Respondents	7	100.0	10	100.0	25	100.0	42	100.0
	Yes	6	85.7	6	60.0	19	76.0	31	73.8

Source: Survey ME-16

Table 123. Beneficiaries' perception of the outcomes and impact of the seguia development work

Outcome/Impact	Perception	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
More irrigation water	Respondents	51	100.0	72	100.0	119	100.0	242	100.0
	Yes	43	84.3	60	83.3	71	59.7	174	71.9
Fewer conflicts between users	Respondents	43	100.0	60	100.0	70	100.0	173	100.0
	Yes	43	100.0	60	100.0	68	97.1	171	98.8
Increased flow velocity of water in the irrigation network	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	43	100.0	59	98.3	71	100.0	173	99.4
Reduced drudgery in maintenance work	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	41	95.3	57	95.0	65	91.5	163	93.7
Irrigation of the plots which were not being irrigated	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	37	86.0	45	75.0	56	78.9	138	79.3
Introduction of new cash crops	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	28	65.1	33	55.0	39	54.9	100	57.5
Increased number of crops grown	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	29	67.4	33	55.0	39	54.9	101	58.0
Improved olive tree yield	Respondents	42	100.0	60	100.0	71	100.0	173	100.0
	Yes	30	71.4	47	78.3	55	77.5	132	76.3
Improved yield of other fruit trees	Respondents	42	100.0	59	100.0	69	100.0	170	100.0
	Yes	26	61.9	38	64.4	42	60.9	106	62.4
Improved crop yield	Respondents	42	100.0	60	100.0	71	100.0	173	100.0
	Yes	32	76.2	45	75.0	57	80.3	134	77.5
Improved farm income	Respondents	43	100.0	60	100.0	71	100.0	174	100.0
	Yes	29	67.4	43	71.7	48	67.6	120	69.0

Source: Survey ME-16

Table 124. Beneficiaries' perception of the outcomes of the khattara development work

Outcome/Impact	Perception	UAA farmed (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
More irrigation water	Respondents	11	100.0	19	100.0	17	100.0	47	100.0
	Yes	10	90.9	16	84.2	14	82.4	40	85.1
Fewer conflicts between users	Respondents	10	100.0	16	100.0	14	100.0	40	100.0

Outcome/Impact	Perception	UAA farmed (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
	Yes	10	100.0	16	100.0	13	92.9	39	97.5
Increased flow velocity of water in the irrigation network	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	9	90.0	15	93.8	13	92.9	37	92.5
Reduced drudgery in maintenance work	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	8	80.0	16	100.0	13	92.9	37	92.5
Irrigation of the plots which were not being irrigated	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	6	60.0	7	43.8	6	42.9	19	47.5
Introduction of new cash crops	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	5	50.0	3	18.8	5	35.7	13	32.5
Increased number of crops grown	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	5	50.0	3	18.8	3	21.4	11	27.5
Improved olive tree yield	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	7	70.0	10	62.5	8	57.1	25	62.5
Improved yield of other fruit trees	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	7	70.0	6	37.5	6	42.9	19	47.5
Improved crop yield	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	7	70.0	9	56.3	8	57.1	24	60.0
Improved farm income	Respondents	10	100.0	16	100.0	14	100.0	40	100.0
	Yes	6	60.0	10	62.5	7	50.0	23	57.5

Source: Survey ME-16

Table 125. Beneficiaries' perception of the outcomes and impact of tuft cleaning

Outcome	Rating	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
Improved access to the palm grove	Respondents	41	100.0	67	100.0	104	100.0	212	100.0
	Very satisfied	14	34.1	44	65.7	63	60.6	121	57.1
	Rather satisfied	20	48.8	15	22.4	28	26.9	63	29.7
	No opinion	3	7.3	2	3.0	2	1.9	7	3.3
	Somewhat dissatisfied	3	7.3	5	7.5	10	9.6	18	8.5
	Very dissatisfied	1	2.4	1	1.5	1	1.0	3	1.4
Facilitated harvesting or pollination operation	Respondents	41	100.0	67	100.0	104	100.0	212	100.0
	Very satisfied	14	34.1	40	59.7	59	56.7	113	53.3
	Rather satisfied	20	48.8	18	26.9	31	29.8	69	32.5
	No opinion	3	7.3	3	4.5	5	4.8	11	5.2
	Somewhat dissatisfied	2	4.9	3	4.5	8	7.7	13	6.1
	Very dissatisfied	2	4.9	3	4.5	1	1.0	6	2.8
Reduced harvest losses	Respondents	41	100.0	67	100.0	104	100.0	212	100.0
	Very satisfied	16	39.0	39	58.2	58	55.8	113	53.3
	Rather satisfied	18	43.9	15	22.4	30	28.8	63	29.7
	No opinion	3	7.3	7	10.4	5	4.8	15	7.1

Outcome	Rating	Class-size of total UAA (ha)							
		0.5≤		0.5-2		>2		Total	
		Number	%	Number	%	Number	%	Number	%
	Somewhat dissatisfied	2	4.9	4	6.0	7	6.7	13	6.1
	Very dissatisfied	2	4.9	2	3.0	4	3.8	8	3.8
Date yield of cleaned mother plant	<i>Respondents</i>	<i>41</i>	<i>100.0</i>	<i>67</i>	<i>100.0</i>	<i>104</i>	<i>100.0</i>	<i>212</i>	<i>100.0</i>
	Very satisfied	11	26.8	36	53.7	56	53.8	103	48.6
	Rather satisfied	18	43.9	22	32.8	31	29.8	71	33.5
	No opinion	8	19.5	5	7.5	5	4.8	18	8.5
	Somewhat dissatisfied	2	4.9	1	1.5	10	9.6	13	6.1
	Very dissatisfied	2	4.9	3	4.5	2	1.9	7	3.3
Quality of dates harvested on cleaned mother plant	<i>Respondents</i>	<i>41</i>	<i>100.0</i>	<i>67</i>	<i>100.0</i>	<i>104</i>	<i>100.0</i>	<i>212</i>	<i>100.0</i>
	Very satisfied	12	29.3	34	50.7	50	48.1	96	45.3
	Rather satisfied	18	43.9	20	29.9	35	33.7	73	34.4
	No opinion	7	17.1	8	11.9	7	6.7	22	10.4
	Somewhat dissatisfied	2	4.9	2	3.0	9	8.7	13	6.1
	Very dissatisfied	2	4.9	3	4.5	3	2.9	8	3.8
Date selling price	<i>Respondents</i>	<i>41</i>	<i>100.0</i>	<i>67</i>	<i>100.0</i>	<i>103</i>	<i>100.0</i>	<i>211</i>	<i>100.0</i>
	Very satisfied	12	29.3	31	46.3	42	40.8	85	40.3
	Rather satisfied	14	34.1	18	26.9	31	30.1	63	29.9
	No opinion	11	26.8	11	16.4	18	17.5	40	19.0
	Somewhat dissatisfied	1	2.4	4	6.0	10	9.7	15	7.1
	Very dissatisfied	3	7.3	3	4.5	2	1.9	8	3.8

Source: Survey ME-16

4.1.4. Activities Downstream of Production

Of course, the effects and impacts associated with the intervention of PAF downstream the target production chains were not yet generated at the closing date of the project (Tables 126 and 127). But a review of the outputs achieved reveals significant changes in perspective, if dynamics created is maintained and further consolidated during the after-project.

For the olive sector, the CF initiative resulted in the establishment and equipping of 20 modern crushing units whose expected structuring impact on the value chain would be crucial to sustainably improve the competitiveness and added value of the olive value adding activity. Similarly, PPFs (olive, almond and fig) could generate significant impacts as regards women's economic market insertion and improvement of their socio-economic conditions. The significant investment in human capital and professional organization through the crosscutting support services program adds to these effects. Under the assumption that the financing issues are resolved to allow the beneficiary farmers and their OPAs access the technologies and improved practices disseminated by the project, the new knowledge and know-how acquired (organizational, technical, managerial, commercial) could be of

significant interest to bring about substantial changes in practices, and therefore incorporate the developments in the target sectors into the path towards modernization and progress.

Table 126. Documentation of output and outcome indicators for the olive sector

Results	Results indicators	Indicator documentation
Outcomes	Share of virgin and extra virgin olive oil in total production	When indicators were last revised, this indicator was removed from the logical framework due to the difficulties in measuring it.
	Number of crushing units that have adopted the improved techniques	18 crushing units
Outputs	Volume of olives crushed by CF-funded crushing units.	6 units are operational Quantity crushed: 500 T of olives (Dec. 2013)
	Number of CF-funded operational olive crushing units	20 units have been built and equipped, but none of them was operational at the closing of PAF
	Number of olive crushing units assisted by the project	20 units under the CF + 110 CU having received technical support and backing for the upgrading
	Number of women's pilot projects supported by the project	8 pilot projects (470 women)

For the date sector, the outputs produced promise many positive changes, the premises of which are already being felt on the ground. The significant achievements in technical facilities (storage and conditioning units) are likely to improve the upgrading process and contribute to increasing added value in this sector. Similarly, capitalizing many achievements in human and organizational capacity-building (adoption of new methods for increasing the value of dates, GIE managerial and administrative organization, standardization, certification, marketing approaches, marketing via the modern distribution channels, etc.) is likely to generate significant effects on the behavior and performance of the target groups. This means that the advances in the downstream date sector have both been many and promising, provided that the dynamics thus created by the project is continued through rapid and substantial efforts to provide financial and technical support and backing for the various target groups as a basis for the strengthening of vertical links and efficient structuring of the sector.

Table 127. Documentation of output and outcome indicators for the date sector

Results	Results indicators	Indicator documentation
Outcomes	Production value of the dates processed by the valorization units	0 : The units installed are not yet in operation at the closure of the project
	Share of stored and packed dates	0 : Idem
	Share of dates marketed as a group by co-operatives	0 : Idem
Outputs	Number of women's pilot projects supported by the project	6 women's projects (286 women)

Results	Results indicators	Indicator documentation
	Number of packaging units established	7 new units
	Number of refrigeration units established and operational	0 : The 7 units established are equipped with refrigeration equipment, but were not yet operational at the closure of the project
	Number of newly established OPAs	14 GIEs (according to TC-5B final report, page 34, Table 12)
	Numbers of GIE members trained	5,942 cases (this figure represents a cumulative total of all the trained members of OPAs formed or in the process of forming GIEs)
	Number of packaging unit managers trained	40 officials trained (including 6 women): (100%)
	Number of packaging unit technicians trained by gender	228 technicians trained (including 15 women): (114%)
	Price information system for dates	PIS for dates improved with the assistance of DSS and APP's M&E division

4.2. Sustainability

Assessing sustainability (perenniality) consists in estimating the probability of sustaining the benefits generated by the project for the beneficiaries, beyond its completion. In other words, this assessment consists in questioning the likely development of the qualities that are attributed to the project results of the project results by the present evaluation. Assessing reproducibility, on the other hand, focuses on its approaches, methods and tools to verify whether they can be re-used in other contexts and by other actors, whether they will be spontaneously disseminated in the environment where they were developed and whether they will remain effective and usable after the end of the project.

The sustainability criterion is evaluated based on the results achieved by PAF after its completion while examining the key factors likely to ensure the sustainability of the gains achieved and replicate successful experiences. The goal is to define priority axes on which the capitalization of its achievements should be based, for the benefit of similar existing and proposed programs and projects. In other words, sustainability examines the conditions required for outputs and effects obtained from PAF's activities to be maintained, consolidated, improved and/or extended on the long term.

4.2.1. Strengths in Favor of Sustainability

The sustainability of the successes of PAF is a major objective of Compact MCA-Morocco. Achieving sustainable change requires a long-term strategy, appropriate policies and an infrastructure and community of key actors who are engaged in the activity. All respondents agree that a three to four year program is not sufficient to have a significant impact on the sector, and that it is absolutely essential that the government and MAPM establish a strategy so that the activities initiated by the project can continue, in particular mentoring activities. Thus, in its last year, PAF made a lot of efforts

to ensure the transition of activities with various institutions, in particular MAPM services (DRA/DPA), OPAs and GIEs.

4.2.1.1. Implementation of a Perimeter Transfer Strategy

The last year of PAF was devoted to the establishment of a transition strategy with MAPM services, in particular the regional directorates for agriculture (DRA) which will be responsible for ensuring sustainability of actions and mentoring for GIEs through which all support for farmers will have to be channeled: assistance provided by MAPM in terms of provision of materials and small equipment will be done this way. GIEs will manage the new crushing units and assistance for farmers' co-operatives.

As regards professional organization in the downstream targeted sectors, PAF aimed to provide support for the formation of co-operatives and their structuring in GIEs. A model of self-aggregation was thus designed and implemented. For the olive sector, 48 GIEs were identified, 20 of which were formed under PAF by benefitting from the Catalyst Fund and 28 are still to be formed. For the date sector, 23 GIEs were identified of which 7 were formed under PAF, 13 by the ANDZOA-DRA, while 3 are still to be formed. This means that *the self-aggregation process is still in an embryonic stage, thus requiring an outreach support program*. It is therefore MAPM that will be responsible for all the GIE at the end of PAF.

For these purposes, the project prepared records for transferring the perimeters which have benefited from its intervention. For the perimeters covered by contracts TC-5A and TC-5B, they become transferable when they are “completed”, i.e. when: 1) there is a registered cooperative, 2) technical training has been completed, 3) OPA training is completed and 4) a minimum additional adoption rate of 20 points as compared with the initial situation has been registered⁹. These transfer records include a wide range of documents, including: 1) the feasibility study and action plan for the perimeter, 2) the data sheet for the perimeter with its location map if available, 3) the exhaustive list of beneficiaries, indicating OPA members, 4) individual follow-up sheets for men and women farmers, 5) the OPA follow-up sheet, 6) the data sheet for the demonstration/learning platform, 7) the data sheet for the “integrated management” platform when appropriate, 8) the consolidated list of beneficiaries trained on technical modules, 9) the consolidated list of beneficiaries trained on OPA modules and 10) the data sheet for youth co-operatives. A closing ceremony is held to formalize the transfer of each perimeter. This ceremony is attended by a MAPM representative, the president of the perimeter's GIE or co-operative and a representative of the provider (TC-5A or TC-5B depending on the perimeters).

⁹These include pruning and tillage operations (basin and impluvium design) for olive trees, and of tuft cleaning, pollination, cutting and bagging of bunches for date trees.

4.2.1.2. Formation of Service Provision Co-operatives

In an effort to prepare the upcoming generation of farmers and build a skilled workforce for rehabilitation perimeters, the project, through contracts TC-5A and TC-5B, implemented specific training for sons/daughters of farmers and rural youth who could thus become service providers crop husbandry techniques. These training courses have met with great success: the youth were very motivated to become skilled and apply the new recommended husbandry techniques and many of them organized themselves into service co-operatives. These co-operatives are perceived to be an essential component to ensure quality in each perimeter, which we need to continue to support and help with subsidies. Also note that, during the application of the training program, young literate farmers have been elected as board members and have provided AUEA administration and management with a more dynamic approach (case of the upstream Chichaoua perimeter for example). The presence of literate youth at the AUEAs' board of directors makes it easier to implement the training program and introduce the instruments for AUEA administration and management (activity planning, drawing up of budget, archiving of documents, selection of premises to serve as the Association's headquarters, inclusion of the "gender" behavior and "good environmental practices"). The sensitivity of the board of directors is more favorable to the introduction of irrigation techniques and improvement of water turns for irrigation without, however, changing the "acquired water rights".

Box 32. The dynamics of creating service co-operatives by sons and daughters of farmers and rural youth: One of the strengths of PAF

Testimonial of the TC-5A: "A new dynamics emerged that encouraged sons and daughters of farmers and rural youth in particular, to form groups providing paid technical services in several perimeters (example of Zaouit Issounane in Taza). The interest was so important that, to date, about thirty service co-operatives have been created by the sons and daughters of farmers and rural youth, many of which have already acquired equipment for their operation. Training on pruning raised the question of setting up service co-operatives in particular for agricultural work relating to olive trees, in a first phase. Thus, a women's service co-operative was created in the perimeter of Assemsil My Aissa Ben Driss, Ait Aâttab; it is referred to as the Tayatmatine Co-operative. ... Young people who have been trained in other areas are also interested in the creation of this kind of co-operatives. The TC-5A teams oversee and support these types of initiatives, in particular in project formulation and search for funding in consultation with agricultural services, either with Credit Agricole or within the framework of the National Initiative for Human Development (INDH)."

Testimonial of the TC-5B: "The training of sons and daughters of farmers was also a success. The high percentage of youth who attended at least half of the six modules proves that participants were convinced of the usefulness of training. ... Another positive impact of the technical training of sons and daughters of farmers is the creation of the Wahat Annakhil Douira co-operative. It is a co-operative of young men from the region who went into the service provision business - especially with a view to providing the tuft cleaning service. The TC-5B team supported the creation and startup of this co-operative through close oversight and the provision of an agricultural equipment kit necessary for the implementation of the "tuft cleaning" action. This example is the launching of a valuable and necessary service in the perimeters. This kind of initiative fills a void insofar as service provision is a new activity in the sector."

4.2.1.3. Production of Training Materials and Training of Trainers and Relais

In order to ensure the sustainability of the results and achievements of PAF, in particular through the adoption of best practices in olive and date tree management, a set of educational materials (manuals, guides and data sheets) were prepared and made available to the farmers, co-operatives, AUEAs and

MAPM services at the national, regional and local level. In a similar vein, the project has invested in the training of trainers from MAPM's staff and required technical assistant consultants and support service providers to involve, from the beginning and throughout the completion of their contracts, all actors who are likely to ensure its relay after the end of PAF, both at the level of MAPM services (in particular field offices) and professional organizations (AUEAs, co-operatives and OPSO (GIE)).

4.2.1.4. Adoption of a Compact Closeout Plan

In order to preserve the project's assets and investments and to ensure the sustainability of results to be implemented by MAPM after the Compact, the project team (APP/UGP) worked out a Plan for its closure the reference document of which is dated June 15, 2013. This Plan serves as a roadmap indicating the provisions and measures intended to complete any unfinished activities after the end of the Compact. Their closure is designed with the need to preserve the project's assets and investments and achieve the targets set. For the rain-fed "Expansion and rehabilitation" activity, the Plan provides for the execution of two operations, the financing of which will be borne by the Government of Morocco: the continuation of the planting expansion work over an area of 5,500 ha, which will not be completed before the end of the Compact and the signing of another technical assistance contract for the monitoring of the planting work which will continue beyond that same deadline. Once these works are completed and their final acceptance is announced, the transfer of the relevant perimeters to the beneficiaries will be carried out according to the same procedures and under the same conditions as those applied to the plantings completed before the end of the Compact. In this context, the contracts for all unfinished works at the end of the Compact need to be changed to plan for the transfer of responsibilities and commitments from APP to MAPM.

Concerning "*Irrigation and intensification*" activities for olive trees in PMH areas and for date trees in oasis areas, the Closeout Plan considers that a majority of contracts for the execution of hydro-agricultural development works will not be completed before the end of the Compact, insofar as even if all of the work are completed and all provisional acceptances are declared by September 15, 2013, the structures built will remain under the warranty period for a one-year duration following their provisional acceptance. This warranty period will be managed by MAPM which will also be responsible for the costs associated with the post-Compact technical assistance. After completion of the work for the relevant perimeters, agreements will be signed between DPAs/DRAs and AUEAs establishing the responsibilities of each party; with a view to ensuring the proper functioning and sustainability required for irrigation infrastructure to the benefit of direct beneficiaries in particular and of the national community in general¹⁰.

¹⁰ Dahir n°1-87-12 of December 21, 1990 promulgated law n° 02.84 on establishing the Agricultural Water Users Association (AUEA) in all cases where the State participated in the financing of hydro-agricultural infrastructure for irrigation. AUEA is a recognized public-interest association and all users of the

As regards the actions provided for under the “Fruit Tree Sector Services” activity, the Closeout Plan considers that they will all be completed before the end of the Compact. Except for some of the themes in the research program which need to be extended beyond the Compact and which will be addressed by the partner research institutions. For this purpose, an agreement was signed between these institutions and MAPM. And since the contracts for the supply and installation of equipment for the date conservation and packaging units provide for a three-year warranty period that extends beyond the end of the Compact, the latter will be managed by MAPM. After provisional acceptance, an agreement to transfer these units will be signed between APP, MAPM and the relevant GIE.

Finally, for the “Catalyst Fund” activity, the Closeout Plan indicates that the construction and equipment of 20 modern olive crushing units envisaged in this framework will be completed before the end of the Compact. It also stipulates that the public-private partnership approach used for this activity can be replicated for future similar actions carried out by MAPM. It stresses that the Government of Morocco will ensure sustainability of all of the program's assets through continued support to the 600 agricultural cooperatives and 27 GIEs created by the project at both expansion and rehabilitation/intensification perimeter level.

All provisions and measures thus considered in the Closeout Plan to carry out in full the activities which will not be completed before the Compact's end date certainly reflect Moroccan authorities' concern to fulfill its commitments to the partner that financed the program but also to the populations that are expected to benefit from it at the level of the targeted perimeters with which they reinforce the credibility of MAPM's services at the same time. And the fact that the activities of PAF are largely appreciated by the different categories of beneficiaries is a necessary condition for ensuring ownership and sustainability of its results. But it is not sufficient insofar as the preservation and capitalization of the many achievements which are already among the project assets can be compromised if a certain number of current risks persist.

4.2.2. Sustainability Risks

The sustainability of the results of PAF is based on the involvement of various actors: MAPM's technical services, beneficiaries operating at the level of the different links in the value chain of the target fruit tree sectors, panel of the relevant professional organizations...

perimeter are ex officio members. Upon constitution of an AUEA in an irrigated perimeter on the initiative of users or of the State in consultation with users, the law and its implementing decree give the latter the authority to participate in investment, operate and maintain the hydro-agricultural infrastructures, distribute and manage irrigation waters.

4.2.2.1. Operation of the National Agricultural Advisory Office (ONCA)

The National Agricultural Advisory Office (ONCA) was created as part of MAPM's reorganization; its mission is to pilot, coordinate and monitor the implementation of the agricultural advisory strategy at the national level.¹¹ As such, it is responsible for training, mentoring, supporting and providing technical assistance for the farmers and their professional organizations, supporting the actions undertaken by the other agricultural development actors and acting as an interface for training and research. At the local level, ONCA has under its tutelage the Advisory centers which replace the CTs in DPA's areas of action and CMVs in those of ORMVAs. In its capacity as a public institution endowed with legal personality and financial autonomy, ONCA will be able to issue calls for tender to establish contracts with research firms as for the TC-5A and TC-5B. Except that at the end of PAF on September 15, 2013, this new institution which was created on January 16, 2013, was not yet operational. Its organization chart was under preparation and its structures were not yet established. However, in the light of their current capacities, the beneficiaries and their professional organizations cannot adopt and apply all the good techniques and practices recommended by PAF after its completion, if the institutions under MAPM and in particular ONCA, do not implement an operational and effective oversight mechanism. It is equally important to capitalize on the significant achievements made in expertise, know-how and working tools throughout implementation of the project.

4.2.2.2. Operation of the GIE Monitoring and Development Support Units (USGAV)

Another unit, the GIE monitoring and development support unit (USGAV), which reports to MAPM's Division for the development of production sectors, was created to support the GIEs. In this context, MAPM transferred UGP's personnel to this new unit. But at the end of PAF, it was not yet operational. The action plan of this unit is based on three major axes: *organization* of farmers' co-operatives to be integrated into the GIEs, *training* of all actors, *mentoring and expertise input*. It is however difficult, as is, to comment on the capacity of this unit to undertake the tasks entrusted to it. It will all depend on the quality of institutional supports that may be available to it, the motivation of its human resources and mobilization of available financial and material resources¹².

If they are not operational, neither ONCA nor USGAV will be able to ensure transition after the end of PAF. The GIEs and co-operatives which could take over, with the support of DRAs, were also not operational at that time.

¹¹ ONCA is governed by law 58-12 promulgated by Dahir 1.12.67 of 4 Rabii I 1434 (January 16, 2013).

¹² To date, this unit has no power and no resources. The executives working at the unit, who have accumulated undeniable experience, are waiting to find opportunities elsewhere. In the absence of motivation and satisfactory working conditions, there is a serious risk that this unit will undergo a real hemorrhage in its valuable human resources.

4.2.2.3. OPA and GIE Operation

Beyond PAF, the sustainability of the results of its activities and of their effects on the beneficiaries at the level of the target perimeters and sectors lies, for a very substantial part, in the efficient operation of OPAs (AUEAs, Other associations, Cooperatives, GIEs) established and/or supported by the project: technical knowledge and

Although their number has considerably increased and their capacities have been undeniably improved thanks to the support of PAF, and although they have the essential elements for their existence (establishment of legal status and rules of procedure, holding of general meetings, bureau/board meetings, legal and financial recordkeeping,...), a significant proportion of OPAs were recently established and are not yet fully operational or active. So that the training they received does not appear to have generated the expected effects at the moment.

For co-operatives which are not yet established, the process for granting the approval remains very long; which may pose an obstacle for the program's sustainability since participants might lose interest if procedures are slow and results are not immediate. However, DRAs could build on the effort made by the project with ODCO to process applications for approval quickly. Draft law n° 02-11 reforming law 24-83 (determining the general status of cooperatives and ODCO's missions) will reduce regulatory burdens and creation times (the average duration to be granted approval is 1.5 year starting from the date on which the constituent general meeting was held).

Since the goal is that these OPAs work together in their perimeter to support the farmers for all the technical gang in order to deliver a quality production to the GIEs for its processing, it is very important that MAPM ensures that these OPAs are made operational. Also, the lack of mentoring for the OPAs which are not yet constituted as co-operatives or GIEs poses a risk for the project's success to be concentrated on a small proportion of the target population. However, the adoption of the new law (n° 02-11) would make it possible for legal persons to join the co-operatives which would enable farmers to integrate strategic expertise and resources to solve the difficulties discussed. The same law is innovative in that it authorizes co-operatives to be converted to limited companies¹³.

One of the axes recommended by PAF, as regards professional organization downstream the target sectors, was the support for cooperative constitution and structuring in “Groupements d'Interet Economique” (GIE). But the self-aggregation process *is still in an embryonic stage, thus requiring an*

¹³ Joint-stock companies could then have greater access to financial resources. Commercial banks grant credit facilities more readily to joint-stock companies. In addition, joint-stock companies can raise funds from public savings by issuing shares and thereby increase their capital. Joint-stock companies also have an advantage related to the integration of skilled human resources. Even if they are not farmers, some investors may purchase shares and access governance bodies to provide their know-how in good governance.

outreach support program. Indeed, the assessment of GIEs carried out at the completion of PAF reveals three contrasting situations: i) pre-operational GIEs that need to be supported to be set up as a model and reference for other GIEs, II) GIEs formed but requiring to be strengthened through the integration of new members, III) identified GIEs that need to be supported for their constitution and operationalization. One of the actions to be undertaken however proves to be common to these three categories of GIEs: managerial capacity-building required to carry out the tasks underlying their creation (producer aggregation, unit supply and management, marketing, transparency of procedures, democracy, etc.). The major risk that must absolutely be avoided is to see units built and equipped but non-functional. In fact, the return on investment of the capital allocated to the downstream activities in the target sectors will inevitably rely on the success of the self-aggregation model and therefore, on the operationnality and autonomy of GIEs. Moreover, the operationnality of GIEs to ensure operation of the units made available to them will be largely based on their financial autonomy. Already during the tripartite financial package adopted for the implementation of the Catalyst Fund, the release of GIEs' contribution (quota) caused serious problems. This reveals that the mobilization of the working capital necessary to the operation of the units created, in turn, is likely to generate other problems for which it is important to start planning now for solutions to internalize them. There are indeed two major imminent risks if no action is taken: i) GIEs are likely to be transformed into service providers, which is incompatible with their reason for being, and II) the monitoring and supervision program proposed by environmental impact studies may not be implemented.

4.2.2.4. Adoption of Improved Crop Husbandry Techniques

In the upstream target sectors, PAF set itself the goal of introducing the improved crop husbandry and harvesting practices, by providing training, mentoring and technical support services for farmers, through contracts TC-5A and TC-5B. Crossing the results from the various evaluations carried out as part of the project shows a mixed evolution as to the farmers' adoption of improved technical practices that have been recommended to them through the training received. In rain-fed areas, the impact assessment for PAF conducted under contract ME-2 concluded that the adoption of improved practices in crop husbandry techniques has increased, in particular in the perimeters where there were demonstrations and among the farmers who took part in the training, in particular with regard to the pruning, impluvium construction and use of vibrators for harvesting. However, the same evaluation also concludes, through observations on olive tree plots from a sample of farmers who attended the training, that even if a farmer has adopted the techniques, he/she has not necessarily applied them on all of its trees. While tillage work and basins have been adopted on more than 90% of trees, phytosanitary treatments, impluvia and reasoned tree-beating harvest have only been adopted on approximately 70% and pruning on 60% of trees only. In PMH and oasis irrigated areas, while the rate and level of adoption of a number of techniques by the farmers trained are indicative of encouraging beginnings in this area, the changes made remain however partial and fragile and well below the

targets set. There are many reasons why the new techniques have not been adopted by the farmers trained. There is of course the case of orchards whose legal status (undivided legacy) and/or location (on hillside and/or remote plots) make it difficult or impossible for the farmers using them to apply the recommended techniques on these lots. For some, the reason is the lack of skilled workers. But the most common reason given by those involved is their lack of resources to acquire the tools and materials necessary to do so. This relates to the issue of their economic access to the recommended technologies. Indeed, the estimates conducted as part of the economic research (TC-5A and TC-5B) highlighted significant working capital relating to the costs of the new technologies disseminated. Given the precarious financial conditions of the majority of target farmers, the working capital necessary to help them adopt new technologies and/or apply improved practices requires specific actions during the after-project. Solutions could be sought in the setup of the contract-programs between GIE-MAPM and Credit Agricole du Maroc (CAM). In the absence of efficient solutions to this financing issue, farmers' failure to adopt the recommended technologies and best practices to increase production and improve quality is likely to heavily compromise the sustainability and capitalization of capacity-building achievements. In order for national production to increase significantly, the government must ensure that the mentoring of farmers is continued all the while targeting some a greater number of them.

4.2.2.5. Operational Capability of the New Units for Processing the Target Products

PAF has been an important opportunity for the development and upgrading of the basic infrastructure and facilities for the processing and valorization of fruit tree products (olive, date, almond and fig) in the target areas. Considerable budgets were mobilized for the construction of 12 valorization units (olive, almond, date and fig) under TC-5A, 7 packaging units under TC-6B and 20 modern olive crushing units under the Catalyst Fund. However, at the project closure, almost all of these units is still at the stage of construction and/or acceptance of equipment. Crushing unit construction for example only started in the first quarter of 2013, and the installation of their equipment will only start after constructions are completed, which is scheduled for August 2013. They will therefore only be able to become operational after the end of PAF, while GIEs have only recently been formed. Also, the new practices could not be sufficiently applied and well established for those involved. Some practices did not even have the opportunity to be tested (steam hydration), due to the absence of the necessary means and in particular to the delay in the start-up of the new units which had all the necessary means. Eventually only the existing units were used for testing these practices. Hence the challenge of quickly putting the new units into operation to avoid the risk of losing the important technological capital which they represent. MAPM must therefore encourage contractors and equipment suppliers to accelerate the pace of achievements by complying with the budgets within the shortest possible period

of time¹⁴. It must also continue monitoring and controlling the construction sites and ensuring equipment acceptance and installation. On the other hand, it is essential to provide the necessary technical support for GIEs during the after-project, through the use of expertise, to assist them in making the units made available to them operational.

4.2.2.6. Upgrading of Existing Crushing Units

Another action that is equally important for sustainability of the project results was the adoption by the existing private crushing units of a business plan for their upgrading. Their pre-audit process and assistance by TC-5A in the development of these plans has improved their knowledge compared to the national and international standards. But with the introduction of the Catalyst Fund, their interest in the upgrading has fallen significantly owing to the fact that they are not eligible for this fund while GIEs are. Given the scope of the work and resources necessary to upgrade themselves, most of the units concerned were demotivated to do so. This lack of motivation is a problem: most units, although they are in a situation of non-compliance with the new environmental legislation, do not have the resources or willingness to upgrade themselves.

4.2.2.7. Upgrading of existing date valorization units

One of the main tasks under contract TC-5B was to support the upgrading of the already existing valorization infrastructures with a view to promoting the upstream and downstream integration of these units. During project execution, the TC-5B team mentored the existing units on the technical, managerial and commercial aspects and was responsible for preparing the necessary documentation so that they can start their upgrading and meet all obligations in terms of product quality management. During project implementation, all demonstration activities (receipt, sorting, fumigation, packaging, etc.) as well as sales tests were carried out within and with these units. But at the end of the project, none of them could yet start the certification process for its quality system to bring it into line with NM HACCP and regulatory requirements. The TC-5B team developed the special conditions necessary to establish the preconditions (standardization of infrastructure and equipment) for this process. These special conditions were presented to APP/UGP and ANDZOA for financing of the measures. The total investment was estimated at MAD 2 million.

4.2.2.8. Risks Associated with the Competitive Behavior of the Informal Commercial Players ("middlemen")

At this stage, the trade in agricultural produce remains generally dominated by the prominence of informal middlemen. Through their important economic flexibility (possession of capital, means of transport, market information, loyal customer networks, etc.), these informal actors ensure trade

¹⁴ Force est de constater que la récolte 2013 a été ratée en raison d'une rupture dans le budget et dans l'assistance technique. C'est une opportunité ratée pour renforcer la durabilité du projet.

between production basins and the various markets (wholesale, retail, souks, agribusinesses), therefore playing a leading procurement role. Not taking account of this category of operators in the self-aggregation model was already a critical gap in the design of PAF. Implicit in the model developed around GIEs was that the supply of the processing and/or raw material packaging units (olive, date, almond, and fig) would be directly ensured by the farmer members. However, in a majority of target areas, in particular those with rough terrain and difficult access, the financing of transport and market sale operations poses insurmountable problems for small farmers, which strengthens middlemen' stranglehold over their harvests. The underlying assumption of the promotion of the self-aggregation model by PAF is that with the start-up of the valorization units, and thus of a new player (GIE), the preexisting commercial links between producers and middlemen will change: instead of handing over harvests to middlemen, producers would deliver them to GIE units.

Modern distribution channels: an alternative to middlemen' control?

"The studies carried out, in particular on trade-related aspects, motivated the TC-5B team to focus in particular on the modern distribution channels. These channels exclusively market foreign dates and this with a substantially growing tendency. The quantities marketed through these circuits represent 5000T/year. These circuits place emphasis on quality and collaboration methods but they offer the great advantage of not being at all dominated by "traditional" merchants who are difficult to deal with in more traditional channels. The future managers of the new units therefore will be able to deal directly with the representatives of the modern channels without going through middlemen. Also, given the requirements of modern channels in terms of quality and product homogeneity they represent an excellent basis for improving the level of work in the sector."

Source: TC-5B, Final Report, Final Version, September 2013

In the face with this new situation, two significant risks should be taken into consideration during this critical post-completion phase of PAF. The first is inherent to the farmers themselves: it is far from clear that as soon as the units will be commissioned, small producers will automatically give up their current business practices and the relationships they had with middlemen. Indeed, multiple engineering and research works and various evaluations from previous or ongoing projects have all concluded that relationships between small producers and middlemen are very often more than purely commercial. Middlemen provide small producers with working capital on credit, helping them gain access to cash to cover production costs and even the family consumption expenditures. This strengthens, if need be, the great importance that should be attached to solving the financing issue of the large mass of target farmers for PAF. The second risk is linked to the middlemen who will certainly develop competitive strategies against GIEs, with a view to safeguard their interests. This is an unavoidable risk which deserves to be examined very closely to protect the units installed from suffering the hardship of undersupply and seeing their rationale shatter. Similarly, middlemen' integration into the unit supply strategies, through contractual relationships with GIEs, deserves consideration. Isn't it time to "formalize" the informal intermediary profession so as to make it a key partner in improving the performance of the value chain for agricultural products? Especially as middlemen have, since their existence, practiced aggregation and therefore gained a valuable knowledge and expertise in the field that it would be regrettable not to harness and develop.

Chapter 5. Lessons Learned and Recommendations

This chapter puts into perspective the final evaluation results for PAF with the idea of building on the experience gained and capitalizing on its achievements in favor of future programs and projects, in particular the Green Morocco Plan. The purpose of this chapter is two-fold. On the one hand, proposing a series of lessons and teachings from the experience of PAF in fruit tree sector development in rain-fed, PMH and oasis areas for their internalization into future programs and projects. Also, identifying the key sustainability factors of the results and effects achieved by project activities on beneficiaries, the aim being to enrich the processes for the productive capitalization of achievements.

5.1. Lessons Learned from the Experience of PAF

5.1.1. Recitals

5.1.1.1. Alignment of the Intervention with Sustainable Territorial Development

The strategic orientation of PAF aiming to diversify agricultural productions, reduce their volatility through the strengthening of fruit tree breaks, and increase the value added of fruit tree sectors to the benefit of small farmers is a relevant lever for contributing to local development and poverty reduction in the target areas, in particular, and in rural areas in general. However, this strategic vision of PAF could have been more articulated with the dynamics and strategies in the area of territorial development. Given the scope of its activities and their structuring potential on local economies, the implementation of the project would have benefited from relying on strong territorial roots *and broader institutional support* involving, in addition to operators in the target sectors, other local key players such as territorial authorities. The intervention of PAF was, in principle, to form an integral part of the development vision for each target territory in the direction of ensuring increased consistency and convergence with the action plans provided for in the community development plans which are concerted strategic planning documents as regards territorial development. In the same way, one of the lessons from the assessment of project intervention downstream from production is that it is quite as important to integrate the processing of agricultural raw materials as other dimensions, in particular those related to logistics in terms of *road infrastructure*, means of transport and *distribution infrastructure* whose implementation falls within the scope of other ministerial departments. In the future, the institutional set-up of similar and same scale programs and projects was to *include the ministerial departments and all other institutional players involved for a collective ownership of the intervention*, the pooling of skills, *the sharing of accumulated experience*, *the pooling of resources*, *all in favor of the provision of a structuring intervention of benefit to the socio-professional categories and target territories*.

5.1.1.2. Adequacy of the Approach, Options and Choices with the Implementation Contexts

Certainly, the objectives set by the project in terms of improved income and poverty reduction are perfectly suited to the needs of beneficiaries. And while some interventions such as hydro-agricultural developments and date tree tuft cleaning, for example, received very broad endorsement and social acceptance, others have had limited support, *to say the least*. This is particularly so for the *creation of new fruit tree orchards* in rain-fed areas where the “miracle” solution built around olive trees did not receive everyone's support. There were also perimeters where the population collectively rejected this type of intervention. This is also true for farmer *training*, which has not been as successful as expected, in the various areas of project implementation. Despite the advocacy efforts deployed by the agents of MAPM's field offices and provider teams, only half of the expected number of farmers was trained and the recommended best practices were only partially adopted by a small number of them. Consequently, the achievements made by these two interventions rank them among the least effective and efficient of the project and reflect their *inadequacy to meet the needs of all farmers* in the target perimeters.

This type of counter-performances stems primarily from an *original inconsistency in the approach* adopted by the project designers and mechanically spread by all stakeholders in its implementation: *adoption of an approach by the offer of an action plan pre-established, whose principles posted for its implementation (territorialization of the interventions, participation of the recipients) concern a paradoxical approach! In other words, wanting to carry out a program of predetermined actions all the while pretending to adapt these same actions to the specific features of territories and needs of the target beneficiaries!*

The supply-based approach used by the project implies that, when establishing its action program, it was assumed that, at the level of each of its three intervention areas (Rain-fed, PMH, Oasis), *the target perimeters were supposed to be homogeneous and the beneficiaries' needs identical in these areas*. Accordingly, it would seem therefore logical to advocate for the same technical option and solution for establishing the new plantings in rain-fed areas, for the same training modules for all olive growers in PMH areas and for other same training modules for date tree growers in oasis areas. These assumptions are called into question by the counter-performances of these two types of actions, in particular.

This original inconsistency in the project approach was reproduced throughout project implementation, and its impact was amplified by other sources of counter-performance which the evaluation of services provided by the technical assistance (TC-1A and TC-1B) and technical support companies (TC-5A and TC-5B), in particular, has revealed, namely: I) ambiguity and inconsistency in the terms of reference of these providers; II) insufficient capitalization of lessons and teachings from pre-Fruit Tree Productivity project previous experiences; III) complexity and cumbersome procedures

for procurement and supervision of the execution and acceptance of services; iv) highly restrictive nature of the expected duration for project execution.

Certainly, the contribution of the *preliminary feasibility studies* is important for preparing and implementing the interventions. But their *major gap is to not have deepened paramount aspects in assessing the status of perimeters*, especially: I) the production systems used and the importance that livestock breeding holds in the local economy; II) the alternatives that may be promoted as regards fruit tree orchard expansion, in particular the choice of the species to be developed and their appropriateness for the existing production systems, and their social impact; III) the financial capacity of beneficiaries to bear the costs of certain project actions (creation of new olive crushing units under the CF initiative, upgrading of existing olive crushing units and date packaging units, adoption of good crop husbandry techniques by the trained farmers). By imposing a constraining schedule for their delivery, these studies often took the form of a simple verification of the eligibility criteria instead of an in-depth diagnosis of the various components of the territory and their interactions.

Both the preliminary feasibility studies and training programs did not build on past experiences in this field. This capitalization would have enabled to provide beneficiaries with a training program more suited to their needs and avoid addressing topics they had previously received. However, the model proposed for managing the units created for date valorization is innovative, but it deserves very close monitoring in the post-project period.

At an operational level, the implementation on the ground of the project's global approach has remained heavily dependent on the individual appreciations of the firms involved. Whether at the level of the preliminary feasibility studies or of training, mentoring and technical support services, the homogenization and standardization of approaches, procedures, services and deliverables have confirmed the rather formal nature of the territorialization principle in a program of pre-established actions. Similarly, the speedy routes established around the couple “company involved - small group of members of the professional organization” have confined the participation principle to its lowest level. These “biases” show that the internal inconsistency of the project approach remained insurmountable despite the guidelines documented in the terms of reference of the technical assistance and technical support service companies, repetitively assigning to them to ensure that their interventions are adapted both to the specific features of each perimeter and the needs of its beneficiaries. However, the fact remains that if the project's operational management had introduced a monitoring system (Procedures Manual, traceability system), it would certainly have contributed to facilitate communication, coordination and collaboration between the various stakeholders and therefore to harmonize their interventions.

Several contractors proved insufficiently equipped with human, material and managerial resources to deliver quality services within the expected time limits. Especially since, to facilitate the hiring and piloting work, the project management of the project has chosen the option of contracts into significant lots bringing together several perimeters. An option that certainly benefited larger companies but was unable to fully ensure its quality. Under the pretext of time pressure, project contractors massively used subcontracting. And in order not to jeopardize the continuation of work at the level of all perimeters from a single lot at the risk of not completing them before project closeout, *several incomplete and/or poor services* were thus delivered.

One of the significant innovations provided by PAF is the systematic outsourcing of technical assistance services, including training, mentoring, and technical support services for farmers and their professional organizations. This option is completely relevant given the complexity, scope and short duration of the project, on the one hand, and the shortage of capacities of MAPM's external services, on the other. Except that when the preliminary feasibility studies were launched in the project's intervention perimeters and in the absence of pre-established mechanisms for piloting and orchestrating the shared implementation of tasks with technical assistance, the involvement of MAPM's field offices has remained tentative. The important additional workload upon their responsibility as part of the project was lacking additional human, material and financial resources. But gradually, and under the leadership of UGP, synergistic links between the teams of the technical aid and the staff of MAPM's field offices started to take place in various perimeters, resulting in *the formation of interdependent and operational teams in certain locations*. For these perimeters, agreements and group work have generated significant benefits in terms of quality and timing in the implementation of actions. As regards technical assistance, this type of large-scale partnership opens up a positive perspective that should be promoted as part of future projects and programs, provided that the appropriate solutions are provided for the various problems which the assessment of the experience of PAF has enabled to identify.

5.2.2. Lessons

The evaluation of the performance and impact of PAF points to lessons that deserve to be taken into account when designing and implementing similar future programs and projects.

a. Implementation approach

The most important thing in this area is to ensure an approach which is irreproachable in its internal consistency, endorse its principles, have them respected and cover the costs for it. Proponents of *the approach by the supply-based approach* must particularly bear *the social cost* resulting from the possible exclusion of certain social categories from the intervention territories. Those who advocate *the supply-based approach* must rather bear its *financial cost*: This is the cost for having the principles

of inclusion, territorialization and participation respected; that's how the ownership and sustainability of achievements can be guaranteed. *The problem is when is to want to take advantage of both approaches!*

b. Nature of actions and structuring over time

In relation to the effects induced, actions can be classified into two main categories: those with immediate or very short term effects, (hydro-agricultural developments, tuft cleaning) and those whose effects manifest much later (rain-fed olive tree orchards, in-vitro date plant transplanting in oasis areas). And while the four actions, all of which were entirely financed by the project, focused on the productive capital to increase its value and production, the two corresponding categories differ in one key aspect: the first seeks to improve the existing situation while preserving it; the second seeks to do the same, but rather by addition or substitution.

This analysis provides a different perspective of the significant success met by the hydro-agricultural development and tuft cleaning actions with tufts with the beneficiaries, with respect to the other two. It suggests that the lesson in this is: whether the approach used is based on supply or on demand, the priority given to the programming of actions with very short term effects can be used as an effective lever for increasing beneficiaries' support and social acceptance of the project.

Through the in-vitro date tree plant transplanting operation, the project showed that the traditional nature of the intervention environment does not necessarily make it an environment closed to innovation, provided that the technology transfer process is conducted with the required mentoring.

c. Outsourcing, contractualization, partnership

When well-managed, (public-private) mixed partnerships enable the pooling of skills and *sharing of experience and their mobilization at the service of beneficiaries* by making quality services that meet their needs available to them.

The effectiveness of service contractualization is measured by the vigilance with which the design, content and duration of contracts should be prepared and their adaptation according to the nature of interventions, to the agro-ecological, economic and social specificities of the target territories. It is also measured by the *proven material, human and managerial capacities* of partners. The higher the organizational capabilities of contractors, the more effective and respectful of the practices regarding social and environmental responsibility they are. Hence the need for a company referencing and classification work in order to clarify in advance whether they have their own capacities.

The project experience also suggests reducing the *size of the lots being the subject of the contracts*. A typical case is that of TC-5A, because of the vast geographical area to be covered and especially of the

considerable diversity of its implementation contexts in agro-ecological, technical, economic, social and cultural terms).

d. Training of beneficiaries

The content of the training delivered by PAF were ambitious and at the same time too technical for the target participants who were unable to understand certain concepts. *The educational approach* should include more practical training sessions rather than classroom theoretical training. *Both the content and approach* should be adapted to the level of skills and capacities of the various beneficiary categories. *The relevance of achievements does not guarantee that they have been adopted by the beneficiaries; they still need to have the resources to do it!*

The implementation of mass training programs (for reasons of economies of scale) is not necessarily the most appropriate option. It may, in fact, prove to be much less effective and extremely more expensive than a *more customized training provision where quality clearly outweighed quantity considerations*. At an equivalent cost, a longer training with less beneficiaries and better support, would generate a more compelling and sustainable momentum for change. Every *facilitator* should therefore be responsible for a more restricted geographical area, thus providing a *more intensive and customized mentoring and support*.

5.2. Recommendations for Capitalizing on the Achievements of the Experience of PAF

The evaluation of the performance and impact of PAF indicates that overall, the results recorded have been rather mixed. The ultimate goals it had set in terms of improved production, productivity and agricultural income of beneficiaries were not achieved upon project completion. However, we cannot but recognize that its intervention period is of short duration. Consideration of this situation permits an accurate assessment of the importance and scope of project achievements, but also of the stakes and challenges ahead to ensure the durability and sustainability of its achievements. It is in this context that the present evaluation developed its strategic recommendations, built around thematic axes.

5.2.1. Securing the productive capital

In all the rain-fed areas targeted by the project, climate hazards are an important risk factor which will strongly influence the future supply of raw materials necessary to increase the substantial downstream capital investment. In other words, the sustainability of downstream achievements will depend to a large extent on the security provided to the newly planted productive capital. However, the evaluation revealed the fragile nature of its sustainability because of the damage caused by the herds and the lack of maintenance and security for which beneficiaries are responsible. The Sustainability of the new

plantings thus requires negotiation and establishing arrangements and compromise solutions to manage conflict between the beneficiaries and the other players in their territories. It also recommends to continue to provide support and accompaniment for OPAs so as to reinforce their credibility and for farmers to adopt the recommended practices and ensure the expected production in quantity and quality.

5.2.2. Financing of value chain players

It is here about the financing which the categories of players targeted by the project were to mobilize, either for the very implementation of its action plan, or for valuing the achievements they were delivered. Like other programs and projects, PAF experienced the consequences of not having taken these issues into account and included the measures necessary to at least mitigate its effects. Whether it be the creation of the new GIE processing and valorization units, upgrading of existing ones or adoption of the recommended crop husbandry techniques by the farmers trained, the financial contribution of all players involved was largely lacking. Upon project completion, the situation may be represented as follows: creation of the new: unfinished; upgrading of the old: pending; adoption of good practice, uncertain! This completely corresponds to the hasty manner in which many works and services were delivered and approved and whose quality suffered.

This situation explains the sense of disbelief that has pervaded the completion stage of the project, and which the evaluation mission has identified among contractors but more so among beneficiaries. The substantial investments made recommend a fast and robust engagement to maintain the dynamics which the project had the merit of initiating.

As evidenced by the estimates made as part of the economic research conducted by TC-5A and TC-5B, the adoption of good technical practice by the farmers requires substantial working capital which is unaffordable for them. To help those who have the desire but not the capacity to do so, solutions may be sought for them with CAM group's Finance Corporation for Agricultural Development - Tamwil El Fellah, through the tripartite contract-program arrangement (CAM/GIE-MAPM). GIE involvement in this arrangement is likely to enhance its credibility and that of its constituent co-operatives, and would be an additional source of incentive and motivation for farmers to participate.

A new player which PAF allowed to emerge in the organizational landscape of its intervention zones should benefit from a strong interest: this is the service co-operatives *which the young people* trained by the project have taken the initiative to create. This dynamics is perfectly consistent with the goal which PAF had set to dedicate training sessions specific to the category of sons and daughters of men/women farmers and rural youth: preparing the upcoming generation of farmers and a skilled workforce in the target territories and perimeters. These co-operatives should benefit from a financial incentive for the acquisition of equipment and materials needed to ensure proper service delivery. The

date tree tuft cleaning operation abandoned in oasis areas is one example. The competent authorities should focus on in these issues and develop the strategies and action plans to remedy them, when appropriate! It could become an opportunity that should be seized to develop a promising market for the mechanization of operations and agricultural work.

Concerning the *new processing and valorization units*, they were almost all still in the construction and/or equipment reception phase at project closure, and bringing them quickly into operation to dissipate the risk of waste is the main stake involved. For this purpose, three conditions at least should be met: work and equipment completion and reception, provision of working capital for GIEs (steps were taken with the CAM, but had not yet produced results at the end of the project), appropriate technical support (quality, proximity) for the technical ownership of the commissioning of the units.

As for *the existing date processing and valorization units*, the project made them benefit from training activities in order to develop their technical, managerial and commercial capabilities. They also benefited from substantial technical support with the aim of upgrading them (business plan and SPC development...), but given the scope of the work and the means required, the majority of them renounced it. In this case, MAPM's services should support these units in the search for alternative financing sources: national agencies, bilateral co-operation, credit agencies...

5.2.3. Capacity-building for value chain players

Overall, the various categories of beneficiaries are positive about PAF, which confirms the relevance of both its targets and activities. While this positive assessment represents, in itself, an important point for project assets, it does not guarantee the durability and sustainability as of its achievements. In fact, their ownership by the beneficiaries has not been fully achieved for a series of objective reasons beyond their control: short period of project intervention, delays in the implementation of actions, mismatch between the options and solutions suggested and the specific features of the territories and needs of beneficiaries, issue of their financial capacity, inadequate activities dedicated to building their capacities,...

Upstream from production, the project's intervention is based on the assumption that *farmer training* on improved crop husbandry techniques would lead them to adopt them, enabling them to increase their production and consequently their agricultural income. Upon project completion, this assumption has proved flawed. Only half of the expected number of farmers was trained and the techniques learned were only partially adopted. While the second counter performance has to do with the issue of the financial capacities of the beneficiaries trained, the first one is to be considered rather as an indicator of non-adherence for a large proportion of the targeted farmers to the training delivered by the project and thus of its inadequacy to their needs due, inter alia, to the standardization of its content (modules).

Consideration of the counter performances recorded, of the production potential which is still to be enhanced and of the margins of progress which the developments carried out by the project objectively enable to expect, recommends to make training, mentoring and technical support for producers one of the highest priorities of the post-Fruit Tree Productivity Project phase. The action plans in these fields will have to capitalize on project achievements and draw out the lessons and teachings learned. These programs should be designed, developed and implemented according to the following guiding principles: quality rather than quantity services, customized rather than mass outreach services, demand-based rather than supply-driven services, a practice-focused training engineering tailored to the capacities of its clients. These principles have as a corollary professional trainer and technical adviser staffs, diversified training programs and flexible implementation. This calls for the prior conduct of analysis-diagnosis studies for the practices and dynamics used in the various types of territories and farms, together with research and development activities for purposes of action (illegible word).

Through the TC-1A and TC-1B activities, and especially the TC5-A and TC5-B providers, PAF made considerable efforts to create *professional agricultural organizations*, which the TC-5A and TC-5B providers helped develop and become operational. Under that rationale, the approach of PAF relied upon these organizations to contribute to the proper conduct of the interventions over the life of the project, and upon their future capacity to play an active role in preserving and perpetuating the achievements during the post-project period. While OPAs have fulfilled overall their first mission, their situation upon project completion didn't predispose all of them to achieve their second mission. Indeed, few were fully operational and active so that the training received can generate the expected impact. A technical support should therefore be available to them to consolidate their representativeness, build their capacities to develop activities in the service of their members and improve their governance.

Downstream from the target sectors, one of the innovations of PAF was the design and implementation of a self-aggregation model through support for the formation and/or strengthening of co-operatives and their structuring into *economic interest groupings* (GIE). But upon project completion, this process had not yet generated the expected results and since groupings were no longer able to fully carry out their mission (producer aggregation, unit supply and management, marketing...). In addition to the quick start-up of the new processing and valorization units which they are responsible for operating and managing to the risk of remaining non-functional or turning away from their fundamental purpose, the GIEs are seriously in need of an outreach support program centered on managerial capacity-building.

The first major challenge for the newly trained farmers and GIEs involves the marketing of products. This challenge also relates to the GIEs' autonomy to develop markets (commercialization and marketing activities). The training received cannot provide them with the capacity needed in those

areas. They therefore need to recruit marketing specialists and sales representatives to reason their commercial approach (market actions; business practices and logo positioning; design; packaging, labeling; product range) and develop a negotiation and contractualization approach. This represents a cost which will have to be borne while expecting a return on investment. This is a challenge in the face of the financial limitations related to the youth of GIEs and co-operatives. It is therefore imperative that future government programs assist co-operatives and GIEs to develop this marketing aspect. In parallel, GIEs can expand their use of platforms such as Maroc Taswiq which are positioned in regional products and have a modern distribution network, with a store network on the national territory and a website for international marketing.

The upgrading of the *existing processing and valorization units* also remains problematic. In addition to their support for acquiring the means to implement the business plans which PAF helped them develop, it is critical to provide them assistance to comply with law n°28-07 on the health security of food products, and law n°10-95 on water.

In addition to the roles and responsibilities of the players who have benefited from the interventions of PAF both in the upstream and downstream target fruit tree sectors in the sustainability of its achievements and of their effects, the latter will depend more on the qualifications of *the entity which will take over* to provide the necessary services and on *the will of the government entities* in charge of financing and ensuring the implementation of upcoming activities. In the current institutional landscape, ONCA should play a crucial role through an operational and effective mentoring mechanism, and by capitalizing on the expertise, know-how and working methods and tools bequeathed by PAF. One of the major positive impacts of PAF lies, indeed, in the training of a human capital experienced in the piloting, planning, operational management, oversight and monitoring-evaluation of project activities. A large capital pool which is extremely useful in terms of knowledge management and sharing (databases, scientific productions, procedure manuals, training guides, technical references,...) was also produced as part of the project. Therefore it is important to develop a specific program devoted to knowledge management and sharing for the benefit of the training, research and development and agricultural supervision facilities, of ongoing large-scale agricultural projects and of projects in other activity areas. The implementation of this recommendation is likely to substantially reinforce the institutional impact of PAF

The large amount of studies, data and factual information gathered from the preparation phase of PAF up to its final evaluation is a valuable source of reference in all the perimeters targeted across the country. PAF has clearly triggered momentum, the effects and impacts of which will be felt well beyond its end and which will also have an impact beyond its intervention territories. This recommends designing and putting in place a mechanism or even an *observatory* for the monitoring and evaluation of this momentum and which could be used as a provider of analysis-diagnosis studies

recommended to help define farmer's training and technical support needs, in particular, and identify the relevant topics for research and development activities.

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Appendix 1. Survey Design Adopted by Area and Beneficiary Category

1.1. Survey of farmers in irrigated areas

In PMH areas, the number of perimeters used as a sampling frame was 26 (out of 65). From these perimeters, 11 were selected, one of which was drawn twice (upstream Chichaoua). Within each one of these 11 perimeters, a sample of 30 farmers was drawn at random, out of a total 360 (representing a sampling rate of 1.5%) (Table A1).

In oasis areas, oasis perimeters were stratified according to MAPM's services, into two categories depending on whether or not irrigation was regulated. The sampling frame initially comprised 12 perimeters from tranches 1, 2 and 3, and then was adjusted downwards to 9 sample perimeters only.

1.2. Survey of farmers in rain-fed areas

Given that the young orchards planted by the project under olive and almond tree expansion activities have not yet generated effects and impacts on the beneficiaries at the time of the evaluation, the qualitative method, based on focus groups and semi-structured interviews, was used. With an aim of collecting a broad range of point of views and opinions and of covering as much of the diversity of field situations as possible, the sample perimeters for evaluating the rain-fed olive and almond tree expansion activities, were selected according to the same procedure as used for the sampling of perimeters in PMH and oasis areas.

For the two species concerned (olive and almond tree), the stratification criterion selected was the agro-ecological area. Five agro-ecological areas were identified by MAPM's services, including consideration of the altitude, nature of the soils and rainfall variables. These are the pre-Riffian low hills, the Western pre-Riffian high hills, the Eastern pre-Riffian high hills, the Middle Atlas Piedmont and the high Atlas Piedmont (Table A3).

The target population consisted of all the perimeters having met the eligibility criteria set by the project for the rain-fed olive and almond tree expansion areas of the 2008, 2009, 2010 and 2011 tranches. In the case of olive trees, this population contained 231 perimeters, distributed according to the agro-ecological areas selected (Table A4). For almond trees, the perimeters selected were mainly located in the Eastern high hills; nearly 80% in the province of Taza, and the remainder in the province of Al Hoceima.

The population actually observed for the sampling in these areas, consisted of 100 perimeters for olive trees and 12 for almond trees: only the perimeters delivered to the beneficiaries, excluding the perimeters of tranche 2011, were selected (Tables A5 and A6).

Table A1. Contact information and number of farmers from the sample perimeters in PMH areas

Water resource	Tranche	LOT	Contract	Province	Commune	Company	Perimeter	Area (ha)	Number of farmers	
									Total	Sample
Mixed	2	9	TC-3B2Bis	Figuig	Béni Tadjit	CAPEP	Béni Tadjit	1,232	699	30
	2	6	TC-3B2	Errachidia	Aghbalou Nkerdous	BEN MIMOUN	Aghbalou amont	583	329	30
Perennial	2	7	TC-3B2	Béni Mellal	Dir El Ksiba	BEN MIMOUN	Ait Ouirrah	750	254	30
	1	1	TC-3B1	Chichaoua	Ait Hadi, Sidi Bouzid and Chichaoua	SNCE	Chichaoua Amont	2,775	1,880	60
	2	9	TC-3B2	Khénifra	Ouaoumana	BEN MIMOUN	Ouaoumana	800	1,354	30
	3	8	TC-3B3	Khénifra	Oum Rabia	MTPM	Tanafnite	288	120	30
	1	2	TC-3B1	Bouлемane	El Orjane et Rmila	SOGETRAMA	Outat El Haj El Orjane	2,100	1,105	30
	3	6	TC-3B3	Essaouira	Ezzaouit and Meskala	SNCE	Tiyout	100	110	30
Seasonal	2	5	TC-3B2	Al Haouz	Ghmat et SA Ghat	SNCE	Ghmat	3,300	1,316	30
	2	4	TC-3B2	Al Haouz	Tahanaout-Tamazozt	SNCE	Ourika	2,000	1,300	30
	2	8	TC-3B2	Errachidia	Z. S. Hamza M'Zizel Sidi Ayad	MTPM	Rich	1,739	1,085	30
Total								15,667	9,552	360

Table A2. Contact information and number of farmers from the sample perimeters in oasis areas

Irrigation	Tranche	LOT	Province	Contract	Commune	Company	Perimeter	Area (ha)	Number of farmers	
									Total	Sample
Regulated	1	4	Zagora	TC-3B1	-	STAIP	Draa	9,072	7,164	120
	2	8	Errachidia	TC-3B2	Aarb Sebbah Ziz	BEN MIMOUN	Jorf	920	814	60
Not regulated	1	3	Tinghir	TC-3B1	Tinghir, Todgha Soufla, Todgha Oulia and Taghzoute	SNCE	Todgha	2,090	3,424	60
	1	3	Errachidia	TC-3B1	Ferkla Oulia	SNCE	El Khorbat	1,200	260	60
	2	8	Figuig	TC-3B2Bis	Bouanane Chouatar	CAPEP	Bouanane	509	355	60
Total								13,791	12,017	360

Table A3. Distribution of provinces according to agro-ecological zones in rain-fed areas

Agro-ecological zones	Provinces
Pre-Riffian low hills	Fès, Moulay Yakoub, Ouazzane, Sidi Kacem, Taounate, Taza
Eastern pre-Riffian high hills	Al Hoceima, Jérada, Berkane, Oujda Angad, Taounate, Taourirt, Taza
Western pre-Riffian high hills	Chefchaouen, Larache, Taounate, Tétouan
Middle Atlas piedmont	Béni-Mellal, Khénifra, Séfrou, Taza
High Atlas piedmont	Azilal, Al Haouz, Chichaoua, Essaouira

Table A4. Distribution of olive tree perimeters by agro-ecological zone and tranche

Agro-ecological zones	2008	2009	2010	2011	Total
Pre-Riffian low hills	10	26	54	37	127
Western pre-Riffian high hills	5	13	26	15	59
Eastern pre-Riffian high hills	1	6	6	2	15
High Atlas piedmont	0	3	11	3	17
Middle Atlas piedmont	4	6	3		13
Total	20	54	100	57	231

Table A5. Characteristics of olive tree sample perimeters in rain-fed areas

Agro-ecological zone	Zone	Tranche	DRA	DPA/ORMVA	Province	Rural commune	Perimeter	Area (ha)	Nb beneficiaries	Contract work	Company
Low hills Pre Riffian	Zone 2	2008	Fès-Boulemane	Fès	My Yacoub	Od Mimoun	Chaâbate Laâraâra	598	234	TC-3A-P	Daghmi
	Zone 1	2009	Tangier-Tetouan	Chefchaouen	Ouazzane	Masmouda	Bab Ward	580	541	TC-3A-1	Ahouzi
	Zone 2	2008	Taza-Al Hoceima-Taounate	Taounate	Taounate	Bouadel	Faytoura	274	720	TC-3A-P	Daghmi
	Zone 2	2009		Taounate	Taounate	Jbabra	Kouassem Od Addou	924	378	TC-3A-1	Sellam Azzouz
	Zone 3	2008		Taza	Taza	Jbarna	Khandaq Senhaja	300	291	TC-3A-P	Daghmi
	Zone 3	2009		Taza	Taza	Béni Frassen	Ahl Zawia	290	400	TC-3A-1	Taïbi
	Zone 3	2009		Taza	Taza	Béni Lent	Mkarcha	600	230	TC-3A-1	Taïbi
	Zone 3	2010		Taza	Taza	Béni Frassen	Bab Dagghbar	320	140	TC-3A-2.1	Boughlala
Western pre riffian high hills	Zone 2	2010	Taza-Al Hoceima-Taounate	Taounate	Taounate	Ourtzaggh	Slass	819	460	TC-3A-2.1	Boughlala
	Zone 1	2009	Tangier-Tetouan	ORMVAL	Larache	Tatoft	Tamtayech	636	420	TC-3A-1bis	Daghmi
	Zone 1	2008		Tetouan	Tetouan	Ben Karriche	Bni Oussine	298	191	TC-3A-P	Daghmi
Eastern pre riffian high hills	Zone 2	2009	Taza-Al Hoceima-Taounate	Taounate	Taounate	Rghioua	Maussatou	163	360	TC-3A-1	Sellam Azzouz
High Atlas Piedmont	Zone 4	2010	Marrakech-Tensift-Al Haouz	Marrakech	Al Haouz	Abadou	Tamda	137	247	TC-3A-2.2	Ornos
	Zone 4	2009	Tadla Azilal	Azilal	Azilal	Sidi Yaakoub	Ait Maalla	293	483	TC-3A-1	Ornos
Middle Atlas Piedmont	Zone 4	2009	Tadla Azilal	Beni Mellal	Beni Mellal	Ait Oum El Bakht	Sidi Maadane Titi	881	380	TC-3A-1	Ornos

Table A6. Characteristics of almond tree sample perimeters in rain-fed areas

Tranche	DRA	DPA/ORMVA	Province	Commune	Perimeter	Acreage (ha)	Nb of beneficiaries	Work contract	Company
2009	Taza-Al Hoceima-Taounate	Al Hoceima	Al Hoceima	Tifarouine	Igarouanou	540	440	TC-3A-1bis Almond tree	Boughlala
2009		Taza	Taza	Ajdir	Tazmacht	600	520	TC-3A-1bis Almond tree	Ouenzar
2009				Bourded	Feddane Touhou	170	125	TC-3A-1bis Almond tree	Ouenzar
2010				Ajdir	Tizi Nador	240	112	TC-3A-2.3	Taïbi

Survey of the professional agricultural organizations (OPA) in irrigated areas

Of the 142 AUEAs that benefited from the training courses under TC-1B, 61 were selected as sample perimeters: 39 in the 11 perimeters in PMH areas and 22 in the 5 perimeters in oasis areas. However, the real number of AUEAs listed in these same perimeters amounted to 42 and 55 respectively that is a total of 97. It is this number that was used as a sampling frame for choosing the sample for the AUEA survey. As for co-operatives, the processing of the information from TC-5A and TC-5B helped identify 36 co-operatives formed in PMH areas and 54 in oasis areas, representing a total of 90 co-operatives. The latter were taken as a sampling frame for choosing the cooperative sample (Table A7).

Table A7. Number of OPAs in all of the sample perimeters in irrigated areas

Zone	Number of AUEAs	Number of co-operatives	Total OPAs
PMH	42	36	78
OASIS	55	54	109
Total	97	90	187

AUEAs in irrigated areas were drawn as follows: A total of 54 AUEAs (representing a sampling rate of 55.7%), including 25 in PMH areas and 29 in oasis areas (representing sampling rates of 59.5% and 52.7% respectively). As for co-operatives, a total number of 47 was drawn (or an overall sampling rate of 52.2%), including 22 in PMH areas and 25 in oasis areas (or a sampling rate of 61.1% for the first ones and 46.3% for the second ones) (Tables A8 and A9).

Table A8. Number of OPAs surveyed in the sample perimeters in irrigated areas

Zone	Number of AUEAs	Number of co-operatives	Total OPAs
PMH	25	22	47
OASIS	29	25	54
Total	54	47	101

Table A9. Sampling rate of OPAs in the sample perimeters in irrigated areas

Zone	Number of AUEAs	Number of co-operatives	Total OPAs
PMH	59,5%	61,1%	60,3%
OASIS	52,7%	46,3%	49,5%
Total	55,7%	52,2%	54,0%

Survey of valorization units

For olive crushing units, consultant ME-2 responsible for assessing the impact of olive-tree rehabilitation in rain-fed areas had conducted the reference survey in 2011, a follow-up survey in 2012 and a final survey in 2013, with 128 crushing units targeted by the upgrading sub activity as part of the

Fruit Tree Sector Services activity. For date valorization units, seven units having received support and technical assistance from the project for their upgrading (Table A10).

Table A10. Date valorization units upgraded

Province	Name of unit
Zagora	Annakhil
	Toumour Tinzouline
	Toumour Al Assala/Tagounite
Errachidia	Unité Zriguete (périmètre d'Aoufous)
	Unité Al Kawtar (périmètre d'Erfoud)
Tata	Unité Taskala
	Unité Afra

Survey of economic interest groupings and women's organizations

In rain-fed areas, a sample of 7 of the 20 GIEs benefiting from the Catalyst Fund was selected (Table A11).

In oasis areas, the survey targeted the stakeholders and managers of the seven GIEs associated with the seven date valorization units (Table A12).

For the pilot projects introduced for women's organizations, 14 co-operatives in 13 different perimeters were selected. This sample covered all sectors involved in the assessment (olive, almond and date trees) and the various pilot project areas (Table A13).

Table A11. Characteristics of the GIE sample benefiting from the Catalyst Fund for the projects for creating new modern crushing units.

GIE	Province	Number of beneficiaries	Number of members	Numbers of women members	Number of affiliated cooperatives	Name of co-operatives	Number of olive-growing perimeters	Total olive-growing acreage (ha)	Annual olive production (in T)
Tahadi Al Alfia	Boulemane	2,333	487	170	10	Al Anouar, El Fajr, El Khadra, R'mil, Annour, Azzitouna, Essaada, Achorouk and Azzohour	2	2,980	5,000
Abaynou Olives	Chichaoua	2,800	566	133	14	Essania, Zbairia, Tajoujt, Elbouzidia, Rguiguia, Ettah, Zouhour, Nouasser, Tiouizi, Tougasse, Alislah, Taouenza, Agafay and Al Bouchra	2	2,000	5n646
Zouyout Chiadma Mogador	Essaouira	945	162	6	5	Tiyout, Ain Lahjer, Sidi Bounouar, Assalam and Al Ahbab	12	4,595	6,982.5
Zoyout Oued Ourika	Al Haouz	1,660	121	0	5	Oued Ghighaya, Bassin Ourika, Bassin Ghmat, Tazitounte and Bassin Tamazzozt	4	3,000	5,738
Oguouy Lkhir	Khenifra	1,265	337	56	6	Aseklou, El Kheir, Ait Lbio, Al Moustakbal, Chbouka and Tanafnite/Tiklit	8	1,933	4,297
Olea Jabalia	Taounate	2,022	157	83	8	Al Amal, Nahda, Bouadel, Ain Hamra, Al Baraka, Salah, Rajaa and Al Izdihar	13	3,387	5,000
T'souli	Taza	1,632	160	1	9	Sebt Lakdim, Al Falah, Ennour, Barakat Ahl Zaouia, Zitouna, Fath Asroutou, Bab Houara, Al Ikhlas and Mtioua Nabat	8	2,165	2,797

Table A12. Some GIE characteristics at the newly built date packaging units

Name of GIE ^(*)	Province/Locality	Number of co-operatives	Number of beneficiaries	Year of incorporation
Ghriss Ferkla Amagha	Errachidia (Goulmima)	6	501	2011
Toumour Wahat Aoufous	Errachidia (Aoufous)	11	785	2011
Difat Ziz	Errachidia (Erfoud)	15	5,400	2012
Wahat Tarnata	Zagora (Tarnata)	7	1,700	2012
Wahat Tamezmoute	Zagora (Tinzouline)	3	1,800	2012
Mezguita-Agdez	Zagora (Agdez)	3	900	2012
Tigzmert	Tata (Akka)	5	610	2012

(*) The specific names of these GIEs will be verified on the field.

Table A13. Some characteristics of the sample of female organizations selected for the interviews

Zone	Sector	Province	Perimeter	Co-operative	Heading of project	Address	Nb of women members
Rain-fed	Almond tree	Taza	Tighezzatine	Tighezzatine	Almond crushing and valorization unit	Gzenaya Janoubia	69
	Olive tree	Taounate	Laazib Ain Amlalou	Al Amal	Olive canning unit	Douar Laazib, CR Bouadel	50
PMH	Olive tree	Boulemane	Tassa	Azzouhour	Crushing unit	Douar Tassa, CR El Orjane, Cercle Outat Lhaj	84
Oasis	Date tree	Zagora	Draa (Fezouata palm grove)	Moustakbal Draa	Sorting, storing and packaging unit associated with a crusher	-	30

Appendix 2. Protocol for Data Collection Tools Used As Part of the Evaluation Mission

In-situ data collection at the level of the sample perimeters with the various categories of project beneficiaries was ensured through the deployment of four methods: surveys referred to as quantitative, interviews referred to as semi-structured, focus groups and field visits (Table A14).

Table A14. Summary of the data collection protocol with the various categories of beneficiaries by project activity/intervention zone

Respondent/Target			Collection method	Project activity/Intervention zone					Total
				Rehabilitation of existing olive, almond and fig tree orchards in rain-fed areas	Rain-fed almond tree expansion	Rain-fed olive tree expansion	Olive Tree Irrigation and Intensification in PMH irrigated areas	Date Tree Irrigation and Intensification in oasis areas	
Farmer			Survey				360	360	720
			Interview	●	●	●	●	●	●●●●●●
OP A	AUEA		Survey				25	29	54
			Interview				●	●	●●
	Co-operative	With VU (D)	Interview					7	7
		Without VU	Survey				22	25	47
			Interview		●	●	●	●	●●●●●
		Female	Interview	2			1	1	4
	GIE	With CF (O)	Interview	2			5		7
		Non CF (D)	Interview					7	7
Multiple			Focus group	1	4	15			20
Perimeter			Visit	●	●	●	●	●	●●●●●●

OPA: Agricultural professional organization

AUEA: Agricultural water user association

GIE: Economic Interest Grouping

VU: Valorization unit VU (D): Date valorization unit CF (O): Non-CF (D) Olive crushing unit benefiting from the Catalyst Fund

: Date VU not benefiting from the CF