

I. INTRODUCTION

1. This methodological note is divided into three sections. The first section provides a brief account of the entire Millennium Challenge Corporation funded programme with particular attention given to the Fruit Tree Productivity Project¹ in terms its strategy, logical framework, its components, expected result, its area of intervention, the targeted population and its implementation arrangements.
2. The second section presents the scope, objectives and design elements of the assignment including the data collection and analysis methodology along with the expected outputs and timetable. A tentative outline of the final report is also included.

II. BACKGROUND INFORMATION

A. IDENTIFYING INFORMATION

A.1 MILLENNIUM CHALLENGE COMPACT

3. On August 31, 2007, the Government of Morocco (GoM) and the Government of the United States of America, represented by the Millennium Challenge Corporation (MCC), signed a grant agreement (GA), the Millennium Challenge Compact MCC (The Program). The goal of the Program is to reduce poverty through economic growth by increasing productivity and improving employment in sectors with high growth potential, namely, the agriculture, handicrafts, and small-scale fishing sectors. Its interventions are intended to support activities affecting the local, regional and national economies and aim at accelerating economic growth by encouraging private investments, increasing employment and income whilst expanding domestic and export markets.

4. The Program targets urban and rural areas where significant employment opportunities through full utilization of under-exploited rich natural resources have not been exploited to their full potential. The Program's implementation was managed by the Agency of Partnership for Progress (APP), which was established as stipulated in the GA. APP had the legal status of public organization with managerial autonomy. It is administered by a Strategic Steering Board presided over by the Prime Minister. The Program is composed of five projects with a total cost of USD 697.5 million: (i) Fruit Tree Productivity (USD 338.7 million), (ii) Small-Scale Fisheries (USD 120.1 million), (iii) Artisan and Fez Medina (USD 95.5 million) (which includes the Functional Literacy and Vocational Training Activity), (iv) Enterprise Support (USD 42.6 million); and (v) Financial Services (USD 42.6 million). The remaining funds (USD 58 million) will be used for program implementation and monitoring and evaluation. The implementation arrangements of each project has been worked out in accordance with Implementing Entity Agreements, concluded between APP and the concerned implementing entities. The Fruit Tree Productivity project's share in the total cost represents nearly 48%

5. **A.2. FRUIT TREE PRODUCTIVITY PROJECT²** (This section will be beefed up to provide a brief and concise summary of the FTTP and included in the delivery 2 and, to the extent possible, actual data will be reported)

DEVELOPMENT CONTEXT

6. The development strategy and approach of Fruit Tree Productivity Project (FTTP) are fully aligned with the strategy thrusts of the ambitious Maroc-Vert programme which call for: (i) competitive upgrading of the agricultural sector in a perspective of modernization and integration into the world market and the creation of wealth across the whole value chain; (ii) greater optimization and sustainable management of natural resources. Furthermore, the objectives of FTTP are also full harmonized with those of the 2020 Strategy for Rural Development in Morocco which stress the need for (i) increased agricultural production; (ii) increased opportunities for agricultural employment and income; (iii) halting of the process of environmental degradation of human origin; and (v) improvement in education and professional training for men and women in rural areas.

¹ This assignment is concerned with the extension sub-activity of FTTP

² See Appendix 1 for FTTP basic information

B. PROJECT APPROACH AND OBJECTIVES³

7. The FTTP was designed to contribute to the Program's global goal aiming at reducing rural poverty by stimulating growth, increasing productivity and improving employment in the agricultural sector. Specifically the goal of FTTP is to accelerate economic growth of rural economy and alleviate rural poverty particularly for subsistence smallholders who practice traditional rain-fed agriculture (mainly cereals).

8. The specific objective is to increase agricultural income and reduce its variability. Specifically, it aims at: (i) reducing water needs in agriculture by moving from high water-use, low-value cereal grains to low water-use, high-value commercial fruit tree species; (ii) reducing volatility in agricultural production and farm revenues by expanding the area of commercial tree species that produce more stable yields and can better handle moisture stress; (iii) protecting the natural resource base by eliminating wheat production from hillsides, and replacing it with trees that reduce erosion and conserve the soil; (iv) replacing cereals (particularly wheat for which Morocco is not competitive on the international market), with commercial tree crops, where there lies a natural competitive advantage; and (v) establishing organized linkages between small-holders and high-value markets.

9. Since this assignment is concerned with the rainfed fruit tree expansion sub-activity, the word "Project" will refer to the expansion sub-activity of the Fruit Tree Productivity Project (FTTP), while the acronym FTTP will be used to refer to the entire Fruit Tree Productivity Project.

C. PROJECT ACTIVITIES⁴

10. To achieve the above goal and objectives, a set of interrelated components and activities were proposed, each of which has a set of expected outputs and outcomes which were planned to contribute to sustainable impact on farmers' income and livelihood.

These activities include:

- a. The rehabilitation of existing rain-fed fruit tree plantation and the expansion of fruit tree production by the establishment of new plantations;
- b. Olive Tree Irrigation and Intensification;
- c. Date Tree Irrigation and Intensification;
- d. Fruit Tree Sector Services.

11. The first activity is composed of two sub-activities. The first is the rehabilitations of existing rainfed fruit tree plantations while the second, the main concern of this assignment, deals with the expansion of rainfed fruit tree plantations. The second and the third activities are not dealt with in the present assignment. The fourth activity, which was designed to provide critical support for the entire FTTP, will have indirect impact on the Project, and therefore an imputed share of its total cost will be included in total cost of the Project.

12. The expansion of fruit tree sub-activity was envisaged on approximately 120,000 ha (this area was reduced to 82,000 Ha after the re-scoping of the FTTP, which took place in 2010). The development works under the expansion sub-activity include the creation of new plantations accompanied by appropriate soil and water conservation works (as deemed necessary).

13. The fruit tree sector support services activity has been designed to ensure successful consolidation of the existing complementarities and synergies between different activities of FTTP. The specific sub-activities include training to producers, producers' organizations, water users associations, and to small processing firms on a variety of production-related aspects in addition to managerial, and accounting practices. This activity also includes applied research, support to the

³ See appendix 3 for the logframe of FTTP

⁴ See appendix 1 for detailed description of FTTP.

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development of market information for agribusinesses and a pilot project to promote gender mainstreaming in the value chain of fruit tree production.

14. To revitalize early investment in the targeted value-chains that will enhance FFTP's benefits to farmers and assure sustainable market linkages, a Catalytic Fund (CF) was established to provide grant funding to partly compensate businesses for the perceived risk of building commercial relationships with Project farmers. The CF was set up to complement FFTP supply-side efforts through a Public Private Partnership (PPP) to develop business linkages with producers and promote processing into higher-value finished products (higher quality olive oil). The CF offers a 50% subsidy to new olive crushing units constructed and equipped by an Apex producers' organization. The remaining 50% is co-financed as follows: A 10% subsidy from the Agricultural Development Fund, a 30% bank loan from the Credit Agricole du Maroc (CAM) and 10% contribution from beneficiaries.

D.THE PROJECT AREA AND TARGET GROUP

15. The Project area was selected according to a rigorous criteria which takes into account a set of key socio-economic and agro-climatic parameters, the most important of which include:

- High incidence of rural poverty;
- Average annual rainfall;
- Soil conditions;
- Size and location (mostly smallholdings located on hillsides where traditional rainfed traditional cereal cultivation is prevalent).

16. While the total project area of FFTP spreads over 25 provinces, the area concerned with the Project (Expansion sub-activity) extends over 158 perimeters in 17 province where, according to the original project document, 100,000 Ha were to be planted with olive trees, 15 000 with figs trees and 5000 with Almond trees. Fruit tree expansion activities were earmarked for regions where rainfall is higher than 350 mm, namely, the Pre-Rif, and the Northern and Western watersheds of High Atlas. These two regions are further divided into five homogeneous sub-regions (by soil type, topography, and rainfall. (Table 1)

Table1: Homogeneous sub-regions with suitable ago-climatic conditions. ⁵		
Sub-region	Average rainfall	Main provinces
Les bases collines pré-rifaines	500-700mm	Sidi Kacem,Taza,Taounate, Fes My Yakoub
Les hautes collines pré-rifaine orientales	350-500mm	Al Hoceima, Jerrada,Taourirt, Berkane, Oujda Angad, Taza
Les hautes collines pré-rifaine occidentales	500-800mm	Larache, Tatiuan,Chefcheoun,Taounate
Piémont moyen Atlasique	450-650mm	Sefrou, Khnifra, Bni Mellal and south of Taza
Piémont haut Atlasique	350-450 mm	Azilal, Haouz, Essaouira and Chichaoua.
* Taza province is split between three distinct rainfall zones.		

17. About 86% of plantations under the expansion sub-activity fall mostly within areas where average annual rainfall exceeds 450 mm, and only 14% fall in areas with average annual rainfall less than 450 mm but above or equal to 350mm.

18. The target group of the extension activity consists of poor smallholders practicing mainly cereal cultivation. The average size of their land holdings is about 3 hectares; the majority are fragmented and eroded due to their location – in sloping areas- and to the inappropriate agricultural practices. Yields of cereals are low and highly variable

⁵ Compiled from the working papers of TC-1A

C. PROJECT COSTS

19. The total cost of FFTP at appraisal was estimated USD 340 million, the project implementation period was set at five years excluding a pre-implementation period six months. The project's effective implementation started in October 2008. The expected completion date of the Project is Sept 15, 2013 and the closing date of the grant account is scheduled for the end of calendar year, 2013.

20. As of 30 June 2013, a total USD 105.5 million⁶ was committed for the development works under the Project of about 62 897 Ha. The total disbursements amounted to USD 87.7 million and a total area of about 28 000 Ha was planted, maintained and turned over to the beneficiaries. The average per hectare cost of development works is USD1959/Ha, and the average cost per beneficiary is about USD 5500. (The final estimates will be included in the final report.)

D. IMPLEMENTATION ARRANGEMENTS (to be verified and acronyms spelled out)

21. The Ministry of Agriculture and Marine Fisheries (MAMF) has the overall responsibility for project implementation, the implementation arrangement include the following:

- a. Project Strategic Steering Committee (PSSC) is chaired by the Secretary General of the MAMF, its members include the directors of the key departments of the MAMF who are directly associated with project implementation. The coordination of the project implementation is the responsibility of APP, which reports directly to PSSC.
- b. The PSSC is supported by four specialized technical committees, namely: (i) Scientific, Research and Training Coordination Committee; (ii) Monitoring & Evaluation Committee; (iii) Procurement Committee and (iv) Environment Committee. All of these entities are an integral part of the Project Management Unit (PMU).
- c. The effective coordination of the project's implementation is the responsibility of the PMU.
- d. Effective physical implementation of project activities are carried out by public and/or private service providers.
- e. Field implementation support and supervision are delegated to the regional and provincial services of the MAMF in particular to the DRAs', the DPAs' and ORMVAs'.

E. TARGETS AND BENCHMARKS AND EXPECTED RESULTS⁷

22. The result-oriented logical framework as outlined in the design document of the project provided a list of key outputs, outcomes and objectives, along with the associated indicators. The M&E plan stipulated a comprehensive list of quantitative and verifiable indicators together with expected targets and baseline benchmarks. A Baseline survey was conducted in 2010. (Not included).

23. Direct beneficiaries of the Rain-fed Olive, Almond and Fig Tree Expansion sub-activities are estimated at approximately 27,000 households.

24. The original (2007) Ex-ante Internal Economic Rate of Return (IERR) for the rainfed expansion sub-activity was estimated at about 19.3 % within 25-year time horizon. In 2010, the project was re-scoped as a result of a significant increase in the per hectare cost of development

⁶ This excludes amounts committed and disbursed from GoM financing.

⁷ See appendix 4 for key targets of relevance to this assignment

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works estimated at about 54 % of the original cost estimates. The revised IEER was estimated about 13%

G. MAJOR AMENDMENTS

25. The project was re- scoped in 2010 when it became clear that the costs of contracts for planation works were much higher than the estimates in the project's original design document particularly for the expansion of fruit tree planting in rain-fed areas sub-component, due primarily to considerable amount of Soil and Water Conservation works that was required but not accounted for. It was decided to maintain the irrigated olive intensification and rehabilitation component unchanged, and partially reduce the size the fruit tree expansion sub- activity from the original target of 120,000 Ha to 80,000 Ha of which 62,000 Ha was programmed for funding by MCC and the remaining 18,000 Ha for funding by the GoM.

III. THE ASSIGNMENT

A. SCOPE & RATIONALE

26. The Terms of Reference (TOR) of this mission are concerned primarily with one specific sub-activity of the FTTP - the extension of fruit tree plantations to the hillside areas dominated by traditional cultivation of cereal crops under rain fed condition.

27. The specific objectives of this mission are to: (i) estimate expected yields of tree plantations completed under the expansion sub-activity; (ii) estimate expected fixed and variable costs, and gross margins; and (iii) update the economic analysis, and the IERR.

28. The rationale and scope of this assignment was motivated by the following:

- a. The fact that most (if not all) of the plantations that have been completed (including those that have already been delivered to the farmers) have not entered into the production stage. In fact, the first tranche completed in 2009 will enter into mature production stage only in 2014, and those that will be completed in 2013 will mature production only in 2019;
- b. The significant reduction of the area to be planted under this subcomponent due to the project re-scoping;
- c. The importance of this component in terms of its share in total cost and its number of beneficiaries who are considered among the poorest among the entire population targeted by the Program; (To be verified)
- d. The need to verify and/or modify the assumptions used in the estimation of the expected agricultural income and IERR given the availability of accurate development costs and refined estimates of some key indicators;
- e. While calculation of (IERR) is an indicator assessing the economic viability of the project at the national level, farmers are more concerned with the financial viability, liquidity and food security aspects. These will also be explored.

29. It should be stressed here that impact assessment is concerned not only with project's impact on income of the beneficiaries, but also its impact on their physical assets, their human and social capital, their food security, as well as the project's impact on environment, policy environment and institutions.

30. The cause-effect logic as depicted in the logframe of the FTTP shows that improvement of farm income depends on sustainable increase in yields, and stable domestic and international prices. Increase in yields depends not only on reliable and timely rainfall but also on the agricultural practices used. Stability and diversification of farm income, on the other hand, would depend largely on farmers' access to reliable information, effective processing, and marketing services and support (value chain).

B. DESIGN CONSIDERATION

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31. According to The TOR, the mission is expected to fine tune estimates of the expected yield, fixed and variable costs and gross margins in the “with” and “without” project situations. The “without” project situation assumes that the farmers will continue throughout the presumed economic life of the project (20 years) to cultivate traditional rainfed cereals and legumes and rear small ruminants. The “with” project situation, on the other hand, entails transformation from traditional cereal cultivation into planting of fruit trees, accompanied with series of supporting activities, which include implementation of Soil and Water Conservation works, training on the use of improved agricultural practices, and the timely and reliable access to information and markets. The estimated incremental income stream under the “with” situation, would serve in updating the IERR, which together with net income will be used as proxies for the likely expected impact of the project on its direct beneficiaries.

32. Intercropping is an essential food security coping mechanism and will be carefully analyzed by the mission so as to incorporate appropriate cropping pattern(s) in the calculation of the Gross margin, net income and IRRs.

C. DATA COLLECTION AND ANALYSIS METHODS.

33. The data collection⁸ process will engage three different sources. Firstly, official records, publications, reports, thematic studies and all other relevant project-produced documents will be consulted. Second, focus group discussions with project beneficiaries and non-beneficiaries will be convened, and, finally direct field observations will be conducted.

C.1 Focus Groups

34. Three categories of focus farmer groups will be selected and interviewed. Each group will be composed of eight farmers. The farmers will be selected using purposeful sampling. A total of eight to 10 focus group sessions will be convened. (Table 2, Table 3)

Group ID	Category of Focus Group	Selection criteria and characteristics of Focus groups
G1	Project beneficiary groups	<ul style="list-style-type: none"> • Farmers covered under tranche 2008, and 2009 and whose plots were handed over to them in 2011; • Farmers' land holdings should be between 3 and 5 Ha. • Farmers should not be from the same village • Focus group size will be limited to 8 farmers • Maximum 150 minutes per session, preferably after the break of the fast and before the last prayer ; • The number of questions will be around 6, each of which will be allocated 25 minutes discussion time.
G2	Non-beneficiary groups.	<ul style="list-style-type: none"> • Farmers with land holdings situated on foothills, practicing traditional cereal cultivation and where the size of the holding remains 2-5 Ha. • 10 Non- participant farmers preferably from different villages, • Maximum 150 minutes per session, preferably after the break of the fast and before 3ichaa prayer; • The number of questions will be around 6 to 8 each of which will be discussed allocated 20 and 30 minutes
G3	Farmers who benefited Groups from similar projects in the past financed by other donors and or GoM	<ul style="list-style-type: none"> • Farmers having land holding between 2 and 5 Ha and well established fruit tree plantation under similar agro-climatic conditions • Maximum 150 minutes per session, preferably after the break of the fast and before 3ichaa prayer; • The number of questions will be around 6 with 25 minutes each.

35. Focus groups will be selected from the same perimeters that will be visited by the consultant. The perimeters will be chosen from the first batch of perimeters on which development work was initiated in year 2008 and delivery of planted areas to the farmers was concluded in 2010 and

⁸ See appendix 5 for more details.

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2011. This choice was purposefully adopted to reflect to the extent possible the post-project completion situation in terms of adjustment of farmers to new environment, appreciation of the project interventions, degree of commitment to perform periodic maintenance of the SWC works and adoption of improved practices etc. These can only be observed or elicited under such circumstances. The selection of the perimeters will also reflect the five agro-climatic zones mentioned above, trees planted by type and varieties. The table 3 below was not completed in time for this version.

Table 3: Mission's fieldwork itinerary				
Province	Perimeter	Expected Arrival Date	Duration	Tasks to be completed
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G1 • Focus group G3 • Direct observation • Discussion with technical staff and consultants
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G1 • Focus group G2 • Direct observation • Discussion with technical staff and consultants
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G1 • Focus group G1 • Direct observation • Discussion with technical staff and consultants
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G1 • Discussion with technical staff and consultants
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G1 • Discussion with technical staff and consultants
TBD	TBD		Two working days	<ul style="list-style-type: none"> • Focus group G2 • Focus group G3 • Direct observation • Discussion with technical staff and consultants

36. The questions, to be discussed, will be limited to six questions, each of which will be allocated a maximum of 25 minutes. The number of questions was kept small to allow ample time for discussion on each. There will be no tape or video recording, the moderator be assisted by an experienced staff from the field implementation unit. Discussions will be conducted in conversational Moroccan language. The six questions will be selected from among the list below depending on the focus group category.

37. For example questions related to expected olive production and productivity, use of agricultural inputs, relevance of improved agricultural practices and the expected impact of value chain measures on olive and olive products value added, are likely to generate rich discussion and invaluable information in G2 Focus Group. Questions related to coping strategy, satisfaction with the project intervention, and in particular the project approach, technical assistance and post completion services will be most useful in G1 Focus groups. The tentative list of issues/question is arranged following the objective hierarchy of the project include:

- Coping strategies before the tree productions reach an acceptable production level;
- Degree of satisfaction with the plantation and the farm development works;
- Practicality and usefulness of improved agricultural practices (as promoted by the project);
- Farmers' responsiveness to the value chain;
- Farmers' expectations regarding production, and income;
- Farmers' perception of and satisfaction with cooperatives' role and services;
- Labor availability and constraints;
- Would farmers recommend other non-participants to take part in a similar future project?

C.2 Direct Observations

38. Direct observation is an important part of the fieldwork; it will provide first hand information regarding the consultation process involving the project, the beneficiaries and the contractors that was put in place before, during, and after the implementation of the development work, specifically : (i) participation process of farmers during the planting phase; and operation and maintenance phases and the relationship between the contractors and farmers; (ii) The degree of farmers' satisfaction with the quality and quantity of the completed works; and (iii) the issues that are likely to arise after the hand over , particularly with respect to sustainability of the plantations and in particular the water and soils conservation works.

39. The farmers' parcels to be visited will be selected from among the selected perimeters listed in table 4. These parcels fall into four categories:

- 1- Parcels that have been ceded to farmers and in which works (development and maintenance) have been completed in line with the agreed technical specification;
- 2- Parcels in which all the development works have been completed but have not been handed over to farmers as yet;
- 3- Parcels of non-participant farmers that share common characteristics (before project) with project participants;
- 4- Fully developed tree plantation parcels that were developed by other projects.

C.3 Informants' interviews

40. This exercise will consist of a series of consultations and interviews the purpose of which include, but is not limited to the following:

- Clarification of issues that have been identified during focus groups discussion and from direct observation visits;
- Validation of information collected through different process, particularly quantitative data.

C.4 Secondary sources

41. The quantitative data required will be collected from reliable sources such as the official statistical year books, the M&E database, the central and provincial agricultural authorities, periodic PMU's and APP's supervision and follow-up reports; Baseline survey of 2010 of 2010, follow-up impact surveys for 2011, 2012 and 2013⁹; thematic studies of the value chain of table olives and olive oils; and technical parameters of the extension and technical assistance offered. MCC guidelines, appropriate publications and statistical records related to development work of MCC, USAID, WB, FAO, IFAD, and other bilateral and multilateral donors would also be consulted as needed.

C.4 Analysis

42. Qualitative/quantitative data generated and validated from different sources would be employed for the following exercises:

- a. Fine tune the yields estimates of olives and almonds, labor requirements and input use;
- b. Elaborate cropping patterns, crop and typical farm budgets;
- c. Postulate educated hypotheses regarding the adoption rate, family consumption of olive products (food security) and sales as table olive and or/as olive oil;
- d. Assemble the actual direct and indirect investment costs by year, by perimeter by agro climatic zones and by type of plantations. "With" and "Without" soil and water conservation costs and "With" and "Without" indirect investment costs;

⁹ Will also be consulted if made available to the mission

- e. Specify different scenarios for calculations of Financial and Economic IRRs.

43. The key and critical variables that influence fruit tree expected revenue include yields, relative prices, and technology adoption rate. These will be treated as stochastic variables. The respective probability distribution of yields and relative prices will be elicited using available time series data while that of the adoption rate of improved practices will be elicited through Focus Groups, informants' discussions, findings of impact surveys, and widely used practices in similar projects. Risk analysis using Monte Carlo simulation techniques will be attempted to calculate the expected NPV and corresponding IERR

44.

45. Financial analysis of representative farms would also be attempted, to assess the direct impact of the project on expected farmer's income, liquidity, and assets. The IFRR will be calculated for these representative farms.

D. TIMETABLE FOR TASKS AND DELIVERABLES

46. The duration of the mission is 44 working days to be completed by the 5th of September 2013. The main deliverables are the methodological note to be finalized by July 13th 2013, and the assessment report together with working papers by 5 September 2013.

47. To ensure the successful implementation of the fieldwork, direct observation visits would be carried out in the morning session and preferably before midday, discussions with informants will be during the afternoon preferably 2 hours before the break of the fast. All focus groups interviews would be organized after Iftar and before Al Achaea prayer.

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