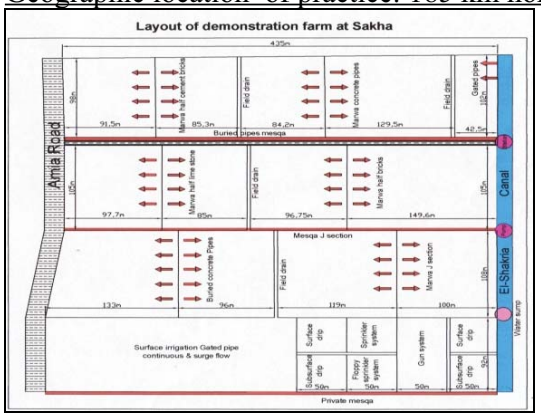
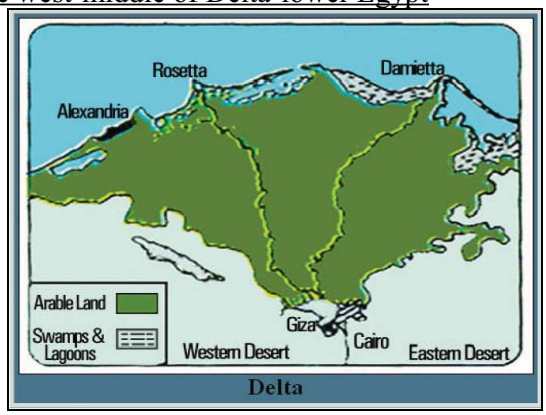
12. ANNEXES

ANNEX 1: (List of Selected BP sites of CMI and PPMI)

Irrigation-Sakha

Date of Visit" 23 October 2007	Category: Consider BP of research activities of CMI or PPMI
Name of Site: Sakha Research Station (Kafr El Sheikh -Lower Delta Egypt)	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map of Site
Geographic location of practice: 185 km north of Cairo, in the west-middle of Delta-lower Egypt	
	
(GPS) Coordinates: GPS readings is 31 06 20.41 N and 30 56 15.7 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc. The station is about 20 Hectares, and serve the research activities for water and land new design project for old land in Egypt, no. of beneficiaries about 35, the area called Sakha (name of the village) in Kafr El-Shiekh Governorate, no gender are presented in the area, overall population of the village 5000 person	
Characteristics of the area: The area has 1 branch canal and 3 sub-branch canals with 9 tertiary canals. The area mainly old land (clay soil) with some practice of modern combined soils (for research purposes),	
Climate (ADZ) + Description: semi-coastal climate area with fertile soil -clay. This agro- ecological zone represents the greater majority of cultivated lands of the Nile Valley, as well as, most of the reclaimed desert lands, mainly, on the western and eastern fringes of the Delta in addition to relatively limited areas at on fringes of the Valley in Upper Egypt.	
Average annual rainfall (mm): the rain in Egypt is minor, for this north side the average annual rains is about 65-75 mm	
Months of Short Rains: December	
Months of Main Rains: December-February	
Mean annual ref. crop Evapotranspiration (mm): about 1400-1600 mm	
Predominant soil type: Clay	
Topography: The Site is inside the Nile Valley system that extends from the Mediterranean shores of the Nile Delta to the North till Aswan in the south over an area extending from 22 - 32 latitude North under arid and hyper-arid conditions.	
Slope: Almost flat, with minor slop about 5-6 cm/km	

Erosion: no	no erosion
Period of year during which used: allover the year	
Period of year during which benefits utilized: allover the year	
Water Source: (Storage on river) Fresh Nile water from El-Shakria canal and pumped into the site	
Irrigated area: (Total annual and then by season (ha)) 20 Ha, and is used allover the year	
Method of water abstraction: (Pumped; gravity; artesian - Influences the pattern of supply and cost of irrigation water). Improved surface irrigation by pumping (one lifting unit) from the main water source ; with different methods of water delivery to farms; either lined Ditches of pipelines (for testing purposes)	
Water delivery infrastructure: (Open channel; pipelines; lined; unlined - Influences the potential level of performance.) mixed method (for research purposes) unlined open channel for 50% of the area and other 50% using the pipelines in the sub-branch canals	
Type of water distribution: (Demand; arranged on-demand; arranged; supply orientated - Influences the potential level of performance.) Supply oriented (controlled by the one-lifting pump) and also for the duration of opening the used valves. For rotation between sub-branches	
Predominant on-farm irrigation practice: (Surface: furrow, level basin, border, flood, ridge-in-basin; Overhead: rain-gun, lateral move, centre pivot; drip/trickle - Influences the potential level of performance). Part of the area is used surface irrigation, and other used the lateral move sprinkler system for the research purposes, the performance of the system is good with good results of crops production comparing with un-improved sites	
Major crops (with percentages of total irrigated area): (Sets the agricultural context. Separates out rice and non-rice schemes, monoculture from mixed cropping schemes). The main activities are test different rice crop varieties (as the area is mainly for rice cultivation) and the plan is to introduce new varieties for rice that safe water (the main water consumption in Delta), other crops is tested in summer like cotton. In winter, the only crops is wheat and barely	
Average farm size: (Important for comparison between schemes, whether they are large estates or smallholder schemes). The site could be considered as Small Scale farm and BP for CMI with other interference from public government for testing new planting criteria or water supply method.	
Type of management: (Government agency; private company; joint government agency/farmer; farmer-managed - Influences the potential level of performance). Government agency (Agricultural Research Center-Soil and Water Institute) and some support of private sector for testing purposes	
Technical Description: (Please describe in about 250 words the background of the irrigation development, how it is used, how it achieves its objectives and its main purpose - For local markets; home consumption; regional or national markets; export. As said before, the proposed irrigation development consist of new water delivery system from the main source (one lifting PS strategies, semi-automated system, , water allocation according to cropping patterns) and new activities on-farm level (lining of ditches, valves, rotations...), also the use of crop machinery. One of the main target of the site is to fulfill the local market and other farmers regarding the best type of rice to be cultivated and the duration/demand of water.	
Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, some studies were carried out for the purpose of testing different kinds of rice in the area, effect of land leveling, seeds, method of irrigation, effect on groundwater water level to prevent the sea water intrusion from the Mediterranean sea on Kafr El-Shiekh (the main constraint of using rice crop in the north Delta of Egypt)	
Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The introduced techniques could be used in any part of the old land in Delta (mainly where rice is cultivated), the north part of Delta is facing problems of high groundwater table, and using these techniques will	Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application, May be the cost of the new technique for the local normal farmers, and the public sector needs to participate for

<table>
<tr><td>help to overcome these problems</td><td>applying this new methods, also the local government needs to be involved.</td></tr>
<tr><td>Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin, as said, all the old land in Egypt could be benefit from these new methods, (only the constraints of funds), other areas in the Nile Basin that could be benefit from this new techniques (e.g. any areas with heavy soil, and to minimize water logging in the soil where it cultivate rice or any other consumed water crop.</td><td>Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. Increase of cultivated land
Improving agriculture practice.
Increasing crops yields.
Increasing on farm irrigation efficiency and water saving.
Increasing economic return from crops practice.
Improving drainage condition and soil properties.
Improving environmental condition.
Saving time& farm labor and increase income return.
Overcome the problems caused by diseases.</td></tr>
<tr><td colspan="2">Other Sites where used: The same criteria of cultivation are used in other place in Damanhour where it face the same major problem (water logging and sea water intrusion)</td></tr>
<tr><td>Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) this new design criteria are costly, one Hectares cost about $2500 for work implementation on branch and tertiary levels-on-farm level. The O&M of the system is also concern, the WUAs is fully recommended for this new criteria.</td><td>Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other. The site is managed by local staff (belongs to ARC) special staff for maintenance is available with sufficient financial support from the Gov.</td></tr>
<tr><td>Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. The technology is saving water and gives new method of cultivation of rice, so it helps to improve the net return to farmers.</td><td>Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). Until now the formation of the WUA in the area in general are fine but the performance of these WUA is faring from place to another. Until now the link with Local government is not defined on the main canal level.</td></tr>
<tr><td>Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: The local small/large farms and some private sector agencies how ask for these services for the benefit of the combinative in the open market for rice crop.</td><td>Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.), Lowering water table was targeted and the issue of minimize water losses (which case many environmental</td></tr>
</table>

Who are the main beneficiaries	problems as well) were targeted. The method of cleaning the system is considered and how to get red of it. beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). This is a research place and many training programs were developed for the purposed of method of cultivation, method of watering and period of planting... also the best way to operate the system.	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). The site received support from the Agricultural Research Center (experts and technician, also the staff of the Water Management Research Institute are involved.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). The hole area of Delta is covered for the activities of the Environmental agency for minimize pollution occur from waste of rice, and the result of the activities regarding rice crop is helping. Sustainability economic aspects cultural environmental aspects technical	Social/Cultural acceptability: The results of the site activities are available to all, direct contact with local leader in the area to use these facilities, also sometimes, the experts could advice local farmers for the best use of their land and best crop rotation in the area.
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this et. As mentioned the main purposes is to manage the existing rice cultivation, so the activities match the need of the local farmers also any other relative place in lower delta (where water logging is a problem)	Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.)., Some time shortages of water in the main canal is a constraints for the new pumping system, also the spare parts of the valves is not easy to found (centralize as Gov, situation), the high cost for bigger areas need to be overcome.
Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice), the introduced new operational strategies based on the local water availability and the dominant crop (rice), so if these condition are the same in other site it could be used. Mild hot summer and surface	What is potential for applying all/parts of initiative elsewhere?

irrigation method are the only possible constraints to apply this cultivation of rice technique.	
	(Score from 1 to 10 on list below with 10 being highly applicable)
	I [8] Transfer of practice to another group/culture/land-use system, etc.
	II [6] Easy to transfer the practice, but with minor adaptations for local conditions
	III [3] Transfer possible, but significant modifications/prerequisites to consider.
	IV [3] Difficult to transfer the practice. Need experienced support.
	V [ ] It would be impossible to transfer the practice. Too site specific.
	Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.) , at the moment the government encourage the farms to use the new irrigation methods, mainly in the new reclaimed land, the legislation for the operation of the WUA need to be faster and the link with local government. need more adoption.

Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reason, All activities in the site could be best practice, as it gives some new cultivation criteria and method of irrigation that can be used in either old or new land (e.g. short variety of rice crop that minimizes the use of water with high yield (about 7.5 ton/ha) more than the normal yield in other places in the same region (about 7.5 ton/ha), also the use of modern surface irrigation to minimize water losses. If the construction cost could be covered the return of the practice will be very good.

Contact Organization: (For further information; site visits' etc)

Type of organization:	Contact person: Dr Samir Abo Soliman
[*] government organization	Contact details: Director of Soil, water and Land Research Institute, Agricultural Research Center Cairo, Egypt, also regional office in Sakha-main road beside the University-Kafer ElShiekh--Egypt
[ ] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[ ] other:	

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)

Planning: It was very good to listen from farmer to the problems they faced in their lands regarding water logging and shortages of water in summer time, so in this station they tried to solve these problems and introduce this new cultivation criteria.

Design: The reason for choosing this site as BP for water/irrigation and land activities because of the station introduce the following possible cooperation's with local Gov. and farmers with new design criteria:

- the system give a complete control system for supplying water to the private canal (sub-branch) by

installing the one-lifting pump station for full controlling the water use at farm level either by using open-channel or pressurize pips.

- The good example for operating the system by cooperation to help the local Gov.
- the activities of the site is documented and easy to observe, so any other site can easy review the work and understand/decide the possibility for using this new design criteria.
- the Site is trying to observe the problem of the region and try to give some alternative for operation It is planned not to use drainage water in the process, so in the design of the system, only one source of water is used and the capacity of the pump unit is designed not to exceed the maximum paned v

Construction: Photo of the site. One lifting pump-sum from the main canal and storage facilities

Implementation: The implementation was carried out by local gov. with donation funds from International and research budget

O&M : a schedule plan for O&M is considered , The local staff who are responsible for this using the local fund which may be not available all the time.

Beneficiary involvement: In this existing place no beneficiaries are involved but only supervise the process to use it in their lands

Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). One the main target is to advice the local farmer with best crop rotation and duration of rice to get best economic return. The station is linked with local government and the existing WUAs in the area to transfer information's.

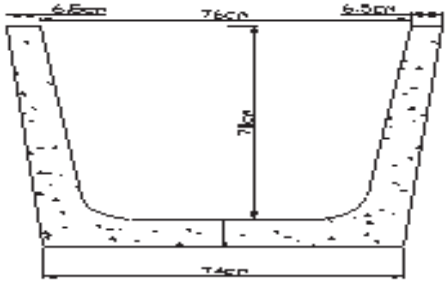
Other Remarks or observations: Good contact with Local farmers to know their needs. Land preparation process

Contact person completing form: Dr Gamal Elkassar, Head of M&E Dep. WMRI

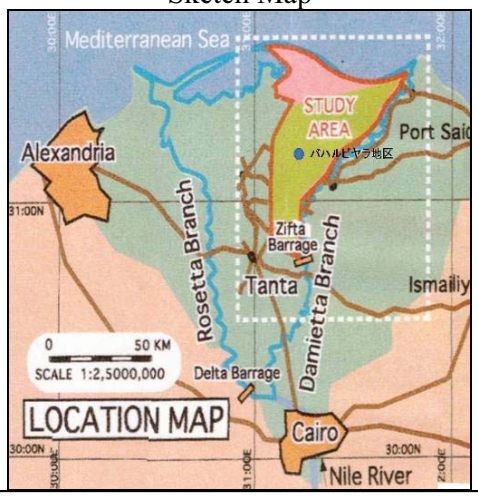
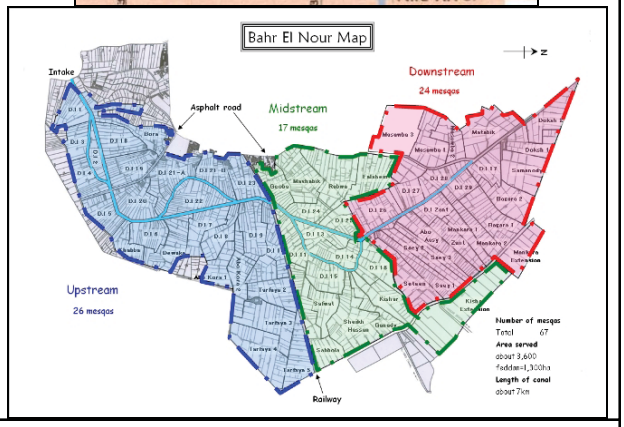
Contact details: 5 floor Water Management Research Institute WMRI, National Water Research Center, NWRC. Kanater - Cairo Egypt

Observation well

On Farm flow measurement



Irrigation-Bahr El Nour

Date of Visit: 27-28 October 2007	Category: Large Scale of PPMI
Name of Site: Bahr El Nour Command Area	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map  

Geographic location of practice:
The site is located in the East part of Egypt about 200 km from Cairo to the North, at the North part of Delta (Lowe Egypt), the main practice is large farming for different crops, the use of old irrigation system was dominant but after the current project's activities the site could be considered as one the pioneer places for BP of farming in Delta using the criteria of Continuous flow (not rotation system)from the main water source.

(GPS) Coordinates: 31 12 19.2 N, 31 26 30.1 E

Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc Bahr El Nour Canal Area: 1500 Ha
Length of delivery canal: 7 km
Number of sub-branch: 67 (tertiary canal)
Number of beneficiaries: 300, from them 15 women, with about 2,600 households
(Related town: Biyala, East Kafr El Sheikh Governorate)

Characteristics of the area: The site is located in the downstream of the irrigation system in Egypt, and suffers from influence of drainage water and sewage water in the irrigation system. In the meantime, shortages of water lead the beneficiaries to use some of these water for irrigating their farms which deteriorating the crop yields. All of these criteria's make the local government to ask for fund to change the entire irrigation and agricultural and operation system by international donation by JICA-Japan.

Climate (AEZ) + Description: (Sets the climatic context - Arid; semi-arid; humid tropics; Mediterranean - Influences the types of crops that can be grown). humid tropics, the dominant crop for such climate are rice and cotton in summer and wheat and vegetable in winter		
Average annual rainfall (mm) about 50-55 mm/year		
Months of Short Rains: December	0	
Months of Main Rains: December-February		
Mean annual ref. crop Evapotranspiration (mm): about 1500-1700 mm		
Predominant soil type: Light clay soil with some places of alluvial sandy soil		
Topography: Flat area (normal old land in the Nile delta)		
Slope: flat and about, 6-10 cm/km		
Erosion: no Erosion		
Period of year during which used: allover the year		
Period of year during which benefits utilized: allover the year		
Water Source: (Storage on river; groundwater; run-of-the river; conjunctive use of surface and groundwater - Describes the availability and reliability of irrigation water supply). (Single point pumping station with low pressure pipeline) (Automatic downstream water level control gate etc.) To apply continuous flow in the branch canal		
Irrigated area: (Total annual and then by season (ha)) about 1500 Ha that are used for cropping 2 times in the calendar year		
Method of water abstraction: (Pumped; gravity; artesian - Influences the pattern of supply and cost of irrigation water). Improved methods for the efficient and effective implementation of the IIP (main and branch canals) based on full scale farmer participation are verified in the project area.		
Water delivery infrastructure: (Open channel; pipelines; lined; unlined - Influences the potential level of performance.) Open Channel. (lined) with improved sub-branches and lifting pumps		
Type of water distribution: (Demand; arranged on-demand; arranged; supply orientated - Influences the potential level of performance.) arranged; supply orientated (Upstream Control from the main source due to water shortages), for this reason an automation control system for water supply was installed.		
Predominant on-farm irrigation practice: (Surface: furrow, level basin, border, flood, ridge-in-basin; Overhead: rain-gun, lateral move, centre pivot; drip/trickle - Influences the potential level of performance). Improved surface irrigation, practice of land leveling and machinery		
Major crops (with percentages of total irrigated area): (Sets the agricultural context. Separates out rice and non-rice schemes, monoculture from mixed cropping schemes). 35 %Rice, 25& cotton, 20% maize in summer. Some times, the rice cultivation exceeds to reach 50%!. In winter, 35% Wheat , 30 % Clover, and 25% vegetable		
Average farm size: (Important for comparison between schemes, whether they are large estates or smallholder schemes). smallholder schemes for farming (about 0.5-1.2 Ha/person)		
Type of management: (Government agency; private company; joint government agency/farmer; farmer-managed - Influences the potential level of performance). Government agency with fully assistance of WUAs in different levels (main canal, tertiary, on-farm)		
Technical Description: (Please describe in about 250 words the background of the irrigation development, how it is used, how it achieves its objectives and its main purpose - For local markets; home consumption; regional or national markets; export. The main construction work for improvement were the automatic control structures in main canal, and one-lifting		

point from the canal to the sub-branch (the operation responsibilities by operators from WUAs with their own funds), these activities makes the site to be considered as BP in PPMI. Also the following fields are considered:

1. Field 1. Improvement of Irrigation Facilities: Implementation method for improvement of irrigation facilities is improved.
2. Field 2: Farmers' Water Management Organization (WUAs & Federation of WUAs) Formulation method for farmers' water management organization is improved.
3. Field 3. On-farm Water Management. Appropriate methods of on-farm water management are introduced.

Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, available water supplies irrigation area or number of people supplied with water etc.). A complete study for all project's component were carried out with the consultants and the assistance of local government staff from both MWRI/MALR and proposed WUA from the early stage of the project.

Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The introduced techniques are very useful to be used in areas where fresh water could be satisfied (as the technique needs good allocation of the required water from the main source, also where good controlled drainage water could be managed.	Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application. The reason for choosing this site as BP is the idea of using new irrigation and cultivation techniques with the same time, formation of WUA in different levels and involve them in the system operations, nut some limitation could be found: the need for more support to farmers and WUA to get proper place and building; It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc. Insufficient O&M (Operation and Maintenance) training Lack of cooperation among organizations concerned Delay in applying continuous flow Failure in increasing the effectiveness of new irrigation facilities

Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. Some places in Egypt are very close to this site (mainly in the old land in Delta) also, the on-farm operation experience is a very good example for other places where there is a need to be operated by local farmers, with self-tuning criteria (funds, institutional, legislation). May be some pace in Sudan can be benefit from this technique!.	Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. The output of this BP site is clear; some of these results encouraged other places to cope the techniques (economic return to farmers). Also the outcome of water saving and re-distribution of rice cultivation enable MWRI for its rule in the main system.

Other Sites where used: Some Places in West Delta are using this technique in small scale but the performance of the operation of WUA in this site is ideal. May some fund support is needed to transfer this BP techniques (infrastructures and formation of WUA is costly), and some assistance from private sector are needed.	
Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) this new design criteria are costly, one Hectares cost about $3500 -$4000 for work implementation on main, branch and tertiary levels-on-farm level. the O&M of the system is also concern, the WUAs is fully recommended for this new criteria, the need for local self-fund are recommended (either from government. support or donations), some of the results of the project's impacts are giving as comparison between results of the site before and after improvement.	Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other organizations, etc). The operation of the system is in the responsibilities of WUA, the site got long experiences in the field of O&M, the problem now is sustainability of services after the JICA project finished its activities in 2005. The WUA, and BCWUA got their bank accounts and organize activities with MWRI and MALR.
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. Some of the results for economic return are given with some yield analysis comparing the results before and after improvement,	Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). The strong formation of WUAs (elected with representation of women) in different level in project area support the operation of the system, each sub-branch canal and each main canal got a committee for its operation with full cooperation with the local government (even there are Gov. representative in each committee). Other users of water are represented in the operational committee (industrial, drinking..)
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: All project's activities were carried out with full cooperation with WUA in different levels also the local government were presented and day-to-day management could be noticed.	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.). The planning and design of the site activities are ideal for environment, also the cooperation of farmers and their fund support to clear and maintained of canal system help the town to gain the benefit of this new practices, only the issue of sustainability after the previous fun of JICA finished, and how WUA will manage to be fully responsible for

Who are the main beneficiaries	such hard work. beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The farmers received three kinds of training : operational management of WUA, operation and maintenance of pumps and water distribution plan (valve schedule) at their on-farm activities output The leaders of farmers obtain the necessary knowledge to manage their WUAs and to play a leadership role. Farmers can operate and maintain the facilities properly by themselves and their sense of ownership is increased. To foster the farmers' awareness of water management through making their own distribution plan.	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc. Insufficient O&M (Operation and Maintenance) training and funds (as these fund comes from donations and local staff, the Gov. is not interfering these activities), information about gape still there, the need to cover this shortcoming is recommended.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). The site is ideal concerning this topic, the management operational committee take the necessary action to prevent any pollution to the system with full cooperation from local Gov. with their facilities Sustainability economic aspects cultural environmental aspects technical	Social/ Cultural acceptability: The results of the site activities are well known to all, direct contact with local leader in the area and the facilities of local Gov. are available, also sometimes, the experts could advice local farmers for the best use of their land and best crop rotation in the area.
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.).	Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). Insufficient consensus building among member farmers

<table>
<tr><td>Monitoring regarding water management and operational management of WUAs and WUF was conducted, results of BP for the benefit of farmers could be noticed</td><td>It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc.
Lack of cooperation among organizations concerned
Delay in applying continuous flow
Failure in increasing the effectiveness of new irrigation facilities
1. Shortage of water in the main system. 2. Water quality issue</td></tr>
<tr><td rowspan="8">Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice;)
Monitoring regarding water management and operational management of WUAs and WUF was conducted.
Training leaders of WUAs and WUF</td><td>What is potential for applying all/parts of initiative elsewhere?</td></tr>
<tr><td>(Score from 1 to 10 on list below with 10 being highly applicable)</td></tr>
<tr><td>I [6] Transfer of practice to another group/culture/land-use system, etc.</td></tr>
<tr><td>II [4] Easy to transfer the practice, but with minor adaptations for local conditions</td></tr>
<tr><td>III [4] Transfer possible, but significant modifications/prerequisites to consider.</td></tr>
<tr><td>IV [3] Difficult to transfer the practice. Need experienced support in places where shortages of water</td></tr>
<tr><td>V [1] It would be impossible to transfer the practice. Too site specific.</td></tr>
<tr><td>Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.) at the moment the government encourage the farms to use the new irrigation methods, mainly in the old lands in Middle/western Delta, the legislation for the operation of the WUA in main canal system need to be faster and the link with local government. Need more adoption.</td></tr>
<tr><td colspan="2">Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reasons why and provide any Conclusion and Recommendations). All activities in the site could be best practice, as it gives new operational and cultivation criteria and method of control water for irrigation that can be</td></tr>
</table>

used in either old or new land also the use of modern surface irrigation to minimize water losses, the control/automation system in the main canal is ideal and save water also control the area cultivated with rice. If the construction cost could be covered the return of the practice will be very good.

Contact Organization: (For further information; site visits' etc), Bahr E-Nour District, East Kafr El-Shiekh Egypt

Type of organization:	Contact person: Director of East Kafr El-Shiekh Directorate, Irrigation Sector-Egypt
[√] government organization	Contact details : East Kafr El-Shiekhs town beside Government Building-Egypt
[ ] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[ ] other:	

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)

Planning: Participation in Planning (2) Project Cycle Management (PCM) Method was applied analyzing the problems in workshop with the member farmers.
The farmers attended observation visit for the areas during implementation and also where it was already constructed.
output

Farmers can see what the difficulties are confronting them and can recognize the advantages of the project in solving them.
Farmers feel more involved in the project through participation in the workshops.
Farmers can open their minds and communication with the farmers could be improved.
Participation in Planning (2) Project's facility plan was sufficiently explained to the member farmers.
Walk-through in the mesqa with the farmers and cooperation was conducted.
output

Through their participation in making the plans for their mesqas, the farmers' awareness of the facilities is strengthened and farmers' sense of ownership is increased.
By reflecting farmers' needs in the facilities, friction with farmers is reduced and modification of const

Design (Automation from main canal supply and One lifting point criteria to irrigation canals), The reason for choosing this site as BP for water/irrigation and land activities because of the project introduce the following new criteria: 1) new operational rules for water abstraction from the main water course (First principal canal from the Nile) by using the Automated canal structures with full calculation of water needs for different purposes. 2) the system give a complete control system for supplying water to the private canal (sub-branch) by installing the one-lifting pump station for full controlling the water use at farm level. 3) The good example for operating the system by the local farmers by formation of WUAs in different operational levels of the system, they have their own bank account for different activities and full cooperation with local Gov. 4) The activities of the site is documented and easy to observe, so any other site can easy review the work and understand/decide the possibility to implement

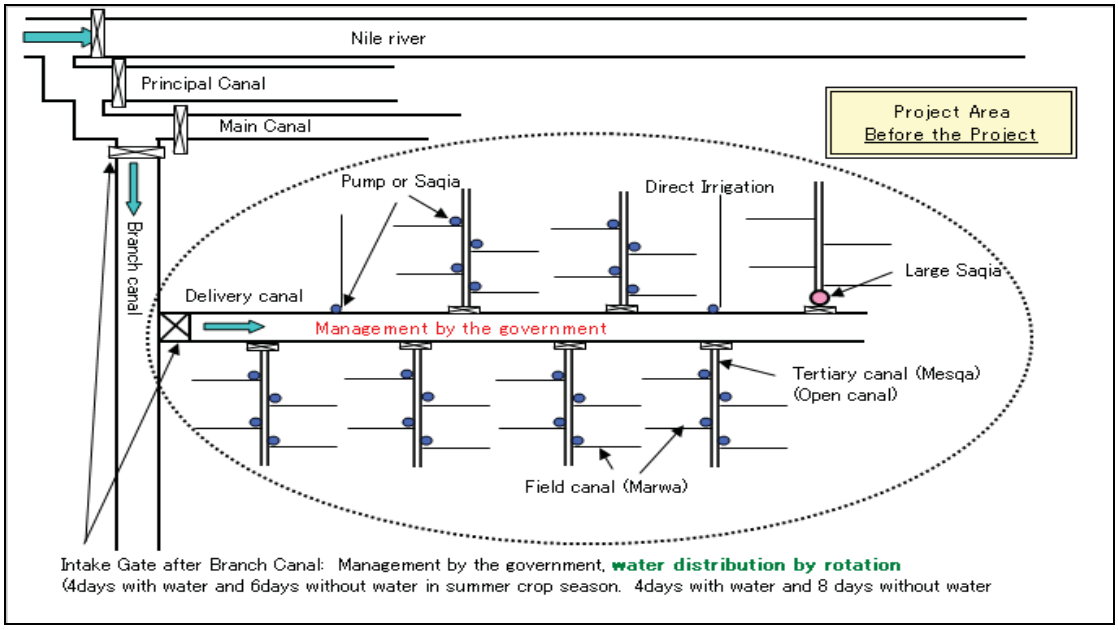
Construction
Implementation Project-type technical cooperation of JICA . The implementation was carried out with local contractor with the supervision of international/national experts. It takes longer time than planned. The performance of the system now is fine, but the need for continuous training mainly for the operation is strongly recommended.
O&M: Still the problem of satisfying the budget for this activities, so Insufficient O&M (Operation and Maintenance) training (as observed from farmers, who are responsible for these tasks). The local government. needs to facilitate some fund and participate for the major O&M activities.
Beneficiary involvement Training leaders of WUAs (Regular activities of the WUF and WUAs such as holding meetings, solving problems were supported through workshops and on-the-job training (JOT)). Monitoring regarding water management and operational management of WUAs and WUF was conducted. A WUF as well as the WUAs were established concurrently before construction of irrigation facilities was started. Construction was started after more than 2/3 of farmers agreed.
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). One the main target is to practice with the local farmer the best crop rotation and duration of different crops to get best economic return. The site is linked with local government and the existing WUAs in the area to transfer information's and to solve any conflict.
Other Remarks or observations: main Obstacles and Challenges

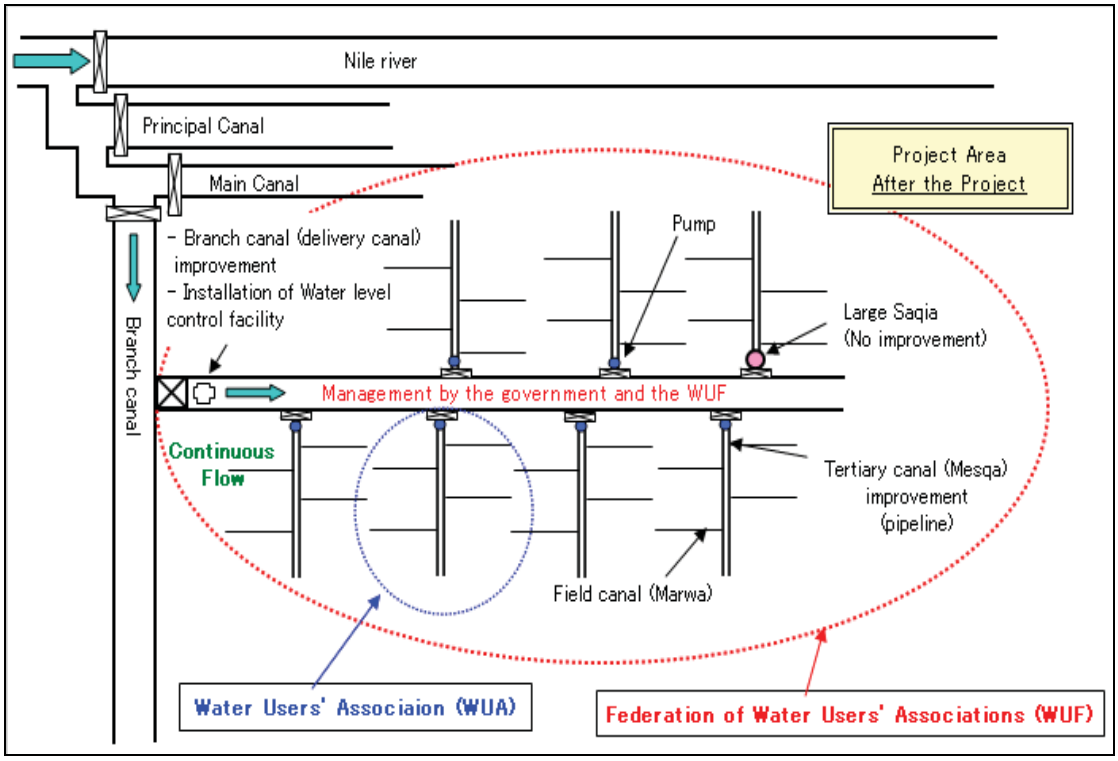
Obstacles
Lack of a constructi system
Pump problems
Lack of a communi
Obstacles
Opposition campaig project by minority farmers
Huge number of ille intakes
Some Gov. staff do importance of farm
Obstacles
Lack of a constructi system
Pump problems
Lack of a communi

Contact person completing form: Dr. Gamal ElKassar

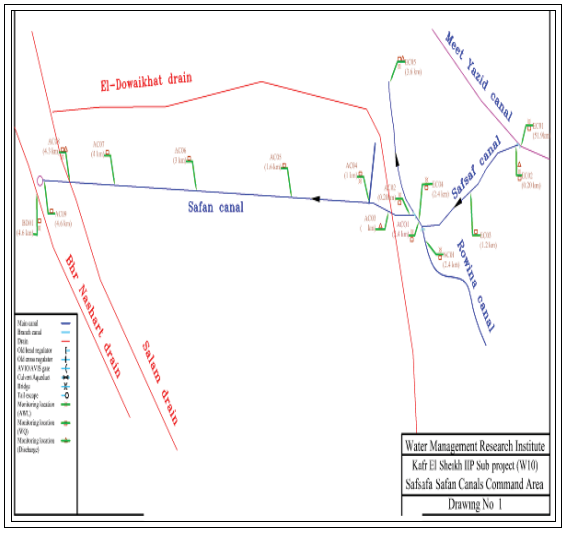
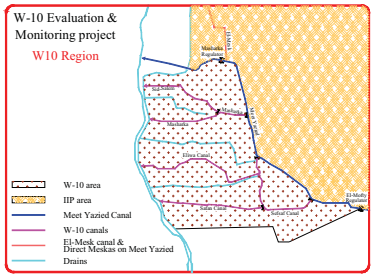
Contact details 5 floor Water Management Research Institute WMRI, National Water Research Center, NWRC. Kanater - Cairo Egypt

Main New Design Criteria (Construction and Operation)		


Nile river
Principal Canal
Main Canal
Project Area
Before the Project
Pump or Saqia
Direct Irrigation
Branch canal
Large Saqia
Delivery canal
Management by the government
Tertiary canal (Mesqa)
(Open canal)
Field canal (Marwa)
Intake Gate after Branch Canal: Management by the government, water distribution by rotation
(4days with water and 6days without water in summer crop season. 4days with water and 8 days without water


Nile river
Principal Canal
Main Canal
Project Area
After the Project
- Branch canal (delivery canal)
improvement
- Installation of Water level
control facility
Pump
Branch canal
Large Saqia
(No improvement)
Management by the government and the WUF
Continuous
Flow
Tertiary canal (Mesqa)
improvement
(pipeline)
Field canal (Marwa)
Water Users' Associaion (WUA)
Federation of Water Users' Associations (WUF)

Irrigation-W10 area

Date of Visit: 22 October 2007	Category: Medium Scale CMI
Name of Site: El-Sefsafa village-West Kafr El-Shiekh	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map of Site 
Geographic location of practice: Area: 650 hectare Length of delivery canal: 10 km Number of meskas: 5 (meska: tertiary canal) Number of beneficiaries: 3,600 households (Related town: Biyala, Kafr El Sheikh Governorate)	
(GPS) Coordinates: 31 06 20.41 N and 30 56 15.7 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc El-Sefsafa Canal, No. of WUA = 13 members with 2 women in the committee Number of beneficiaries: about 3,600 households	
Characteristics of the area: village in old Land in the Nile Delta, to test some new design criteria and operations in main , branch and Sub-branch canals	
Climate (AEZ) + Description: (Sets the climatic context - Arid; semi-arid; humid tropics; Mediterranean - Influences the types of crops that can be grown).long hot summer months and mild winter 10-35 °f respectively. Wind speed 350-380 km/day (winter) 280-300 km/day (summer).	
Average annual rainfall (mm) 50mm/year	
Months of Short Rains:	December
Months of Main Rains:	January
Mean annual ref. crop Evapotranspiration (mm): about 1600 mm	

Predominant soil type:	clay
Topography:	sample of old land of Nile delta, about 3-3.5 m above see level
Slope:	Almost flat
Erosion:	no erosion
Period of year during which used:	all the year
Period of year during which benefits utilized:	all the year

Water Source: (Storage on river; groundwater; run-of-the river; conjunctive use of surface and groundwater - Describes the availability and reliability of irrigation water supply). (Storage on river)

Irrigated area: (Total annual and then by season (ha)) The hole catchment is about 6500 feddans

Method of water abstraction: (Pumped; gravity; artesian - Influences the pattern of supply and cost of irrigation water). Improved methods for the efficient and effective implementation of the IIP based on full scale farmer participation are verified in the project area.

Water delivery infrastructure: (Open channel; pipelines; lined; unlined - Influences the potential level of performance.) Open improved Channel. With introduced of new BP of automation of water structures at main level and improvement of merwa (ditches)

Type of water distribution: (Demand; arranged on-demand; arranged; supply orientated - Influences the potential level of performance.) arranged; supply orientated (Upstream Control)

Predominant on-farm irrigation practice: (Surface: furrow, level basin, border, flood, ridge-in-basin; Overhead: rain-gun, lateral move, centre pivot; drip/trickle - Influences the potential level of performance). Improved surface irrigation, with introduced of lining of ditches and use of valves for merwas

Major crops (with percentages of total irrigated area): (Sets the agricultural context. Separates out rice and non-rice schemes, monoculture from mixed cropping schemes). Rice in summer with about 70% and cotton in winter 40%

Average farm size: (Important for comparison between schemes, whether they are large estates or smallholder schemes). smallholder schemes, 0.5 ha/person

Type of management: (Government agency; private company; joint government agency/farmer; farmer-managed - Influences the potential level of performance). Government agency make the infrastructures and farmer-managed irrigation and operation

Technical Description: (Please describe in about 250 words the background of the irrigation development, how it is used, how it achieves its objectives and its main purpose - For local markets; home consumption; regional or national markets; export . many indicators were used for M&E activities in this BP site like • Discharges of pumps - • Cropping patterns - • Irrigation costs - • Pump characteristic. - • Consumption of electric for w/10 region. • Consumption of diesel for IIP region. - • Costs of Consumption. - • Land saving.

Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, available water supplies irrigation area or number of people supplied with water etc.). Meska Monitoring Study (MMS): MMS is the main component in the current study. Three main categories will be compared in this component, which are old design criteria on IIP1, new design criteria in W/10 without Marwas improvement, and new design criteria in W/10 with Marwas improvement. Also, some Meskas that have direct discharge will be selected for investigation. Many indicators that can cover all characteristics related to Meska design criteria will be considered in that component.	
Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. This new practices in different system levels is very useful for testing these new design criteria's to be up-scaling in other places in old land for water saving strategy	Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application: as we heard from farmers the following could be mentioned: Insufficient consensus building among member farmers It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc. Insufficient O&M (Operation and Maintenance) training Lack of cooperation among organizations concerned Delay in applying continuous flow Failure in increasing the effectiveness of new irrigation facilities
Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. Any area in old land with problems of water logging and interference of sea water in the water system. Some places in Egypt has the similar situation (lower part of the country near see water, and where they cultivate rice) and also in other places in Nile basin countries	Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. Meskas Monitoring Study (MMS) is the key component

	in the current Monitoring and Evaluation Program (M&E) of the Irrigation Improvement Project (IIP). The development objectives of the new Integrated Irrigation and W10 region was conducted to test new design criteria that could be implemented in IIIMP project. W10 project serves 6150 feddan on Meet Yazied canal between EL-Mofty regulator (Km 50.2) and El-Masharka regulator (Km 59.5). It mainly consists of three branch canals and two sub-branched canals.
Other Sites where used: This is a test site for the new design criteria's,, to be implemented alter in wider areas of IIIMP Project in old land, only some practices in certain level can be found separately in each site; for example Bahr El_Nour represent the control structure in Main canal, and other present on-farm activities, only this site where you can find activities in the 3 main operation levels from the Nile until the farms! so, the site could be given as a pioneer fro BP	
Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) . At the moment the WUA has an account (recently) and about 23000 LE is available. Some of these funds is donation from private sector and from IIP project MWRI. The implementation period of this new system is about 2 years and to test the outcomes in 3 seasons, so the decision now is to wait until the evaluation team finishes their mission. Some the preliminary results are given in the presentation and report.	Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other organizations, etc). The farmers are responsible for operating the system with some assistance from the Local. Gov. some funds were allocated. They started to make bank account and collect money from the farmers, the issue of Cost recovery in power and work fine
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for	Water User Association or User Group: (Provide details

humans or livestock. The positive results could be noticed regarding minimizing the cost of irrigation and the time of applications for different crops (see the given tables in reports), also the return of unit of water and land improved using the introduced new design criteria such as: (using small pump unit to increase operation time and irrigate at night!, new lifting gates-automations, new valves and lining of ditches, scheduling of irrigation within and between Meskas ect.)	of the type of organization, how it works and elects members, number of members and all other pertinent details).To diagnoses the various aspects of performance of Water Users Associations that has been established under IIP. To provide feedback to IIP about the factors affecting WUA performance, and their implications for the WUA formation process. Formation of the work team • Setting relevant criteria for selection of a representative sample of WOks for the exploratory survey • Collection Of basic data of the WUAs for the selection prass • Selection of the targeted WUAs of the exploratory survey. • Selection 3 in kafr El-shikh. • Selection of a sample mesqas in each branch canal.
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: Cropping patterns for all fields on the selected Meskas from farmers. Pump operating hours were collected using the fixed hour meters and the pump operators. Pump operation time and field irrigation time were collected from farmers and pump operators. Pump repair and maintenance costs based on seasonal basis to calculate the irrigation cost and collected from pump operators. Fuel consumption of selected IIP Meskas pumps that collected from pump operators. Electricity consumption for all W10 was collected from electric tables at pump stations. Who are the main beneficiaries	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) beneficiary involvement demand based interventions

Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The farmers received three kinds of training : operational management of WUA, operation and maintenance of pumps and water distribution plan (valve schedule) at their mesqa. Merit and output The leaders of farmers obtain the necessary knowledge to manage their WUAs and to play a leadership role. Farmers can operate and maintain the facilities properly by themselves and their sense of ownership is increased. To foster the farmers' awareness of water management through making their own distribution plan.	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc. Insufficient O&M (Operation and Maintenance) training Information about gape is given in the remaining presentation.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). Sustainability economic aspects cultural environmental aspects technical	Social/ Cultural acceptability: The site got small WUA for the canal
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.). • Cropping patterns for all fields on the selected Meskas from farmers. • Pump operating hours were collected using the fixed hour meters and the pump operators. • Pump operation time and field irrigation time were collected from farmers and pump operators. Pump repair and maintenance costs based on seasonal basis to calculate the irrigation cost and collected from pump operators. Fuel consumption of selected IIP Meskas pumps that collected from pump operators. Electricity consumption for	Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). Insufficient consensus building among member farmers It results in delay in construction, lack of cooperation among farmers on water management, low collection rate of O&M fee etc. Lack of cooperation among

all W10 was collected from electric tables at pump stations. Training leaders of WUAs and WUF Monitoring regarding water management	organizations concerned Delay in applying continuous flow Failure in increasing the effectiveness of new irrigation facilities 1. Shortage of water in the main system. 2. Water quality issue
Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice;) Monitoring regarding water management and operational management of WUAs and WUF was conducted. Training leaders of WUAs and WUF	What is potential for applying all/parts of initiative elsewhere?
	(Score from 1 to 10 on list below with 10 being highly applicable)
	I [√] Transfer of practice to another group/culture/land-use system, etc.
	II [√] Easy to transfer the practice, but with minor adaptations for local conditions
	III [√] Transfer possible, but significant modifications/prerequisites to consider.
	IV [ ] Difficult to transfer the practice. Need experienced support.
	V [ ] It would be impossible to transfer the practice. Too site specific.
	Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.)
Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reasons why and provide any Conclusion and Recommendations). 1. Field 1. Improvement of Irrigation Facilities. Implementation method for improvement of irrigation facilities is improved.	

2. Field 2. Farmers' Water Management Organization (WUAs & Federation of WUAs). Formulation method for farmers' water management organization is improved.
3. Field 3. On-farm Water Management. Appropriate methods of on-farm water management are introduced.
4. Field 4. General Project Management. Project activities and results are introduced to governmental staff properly.

Contact Organization: (For further information; site visits' etc)

Type of organization:	Contact person: Dr. Gamal ElKassar
[√] government organization	Contact details National water Research Center - Water Management Research Institute
[ ] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[ ] other:	

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)

Planning: The site is planned to be fully controlled and monitored during this testing period, NWRI of MWRI and ARC of MALR is working in the site in parallel to find some solid results to be used in wider scale later on during the national project of IIIMP for the coming 7 years

Design. Examples of new BP activities (flow measurement, timing, electric supply control, ect.)




Construction

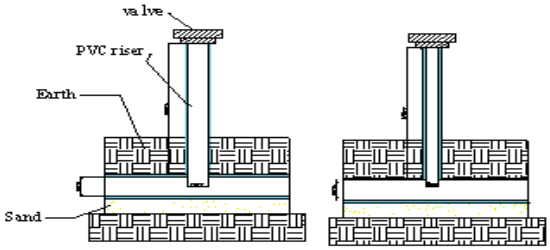
Implementation : Many new structures in each operation level were instilled using the available fund and formation of WUA is running, some reports are available for M&E from WMRI fro all activities (some of these activities are given in the presentation, and reports from BP)

O&M : As heard from farmers; Insufficient O&M (Operation and Maintenance) training are needed, also some funds and donation from private sector and companies in the region, NOW , the Local Gov. and beneficiates are looking for a private company to prepare for site

training and maintenance of this new devices.
Beneficiary involvement Training leaders of WUAs (Regular activities of the WUAs such as holding meetings, solving problems were supported through workshops and on-the-job training Monitoring regarding water management and operational management of WUAs was conducted. A WUF (Water User Federations-large scaling of organizations) as well as the WUAs were established concurrently before construction of irrigation facilities was started. Construction was started after more than 2/3 of farmers agreed.
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). It very clear that the BP results could be noticed for all expected benefits (mainly the economic return for farmers) and also testing the efficiency of Rice crop to save water and labor. Marketing Issue is considered for selecting the best cropping patterns and rotations between crops, (one of the benefits of WUA)
Other Remarks or observations: Some the introduced techniques and devices need to be reviewed for the Egyptian farming skills, and costing to be more successful and sustainable. In the meantime, training issue should be considered.
Contact person completing form: Dr. Gamal ElKassar
Contact details National water Research Center - Water Management Research Institute

Main New Design Criteria (Construction and Operation) at farm level

Surface PVC pipes

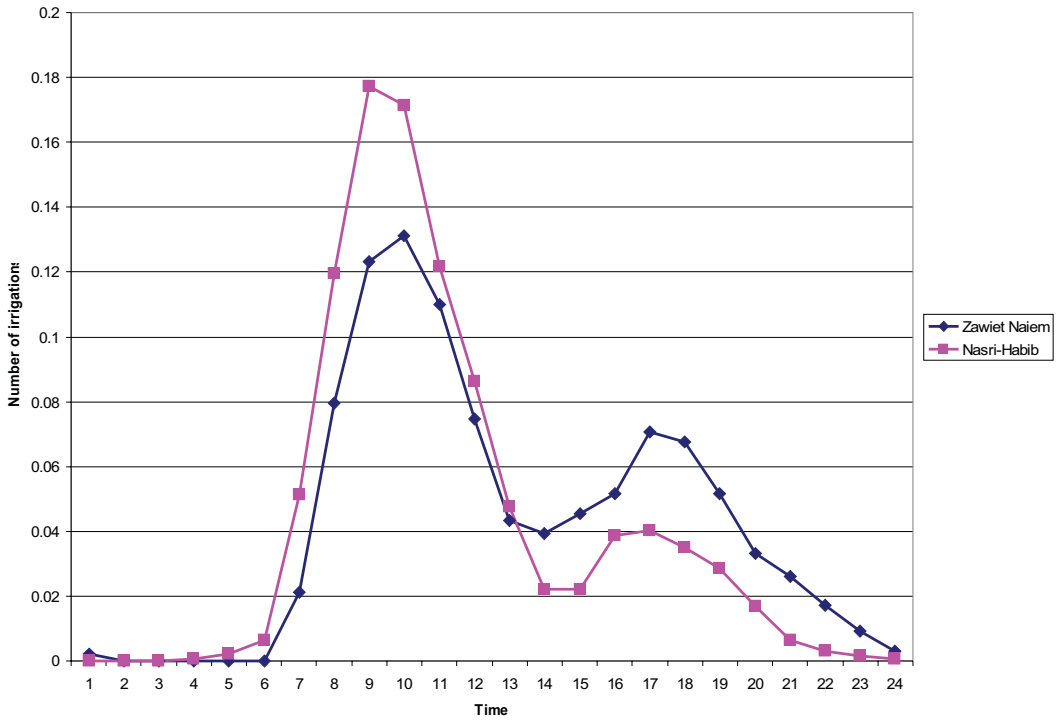


Low pressure buried pipeline

Testing and calibration of Farmers pumps (to ensure of water delivery and water right

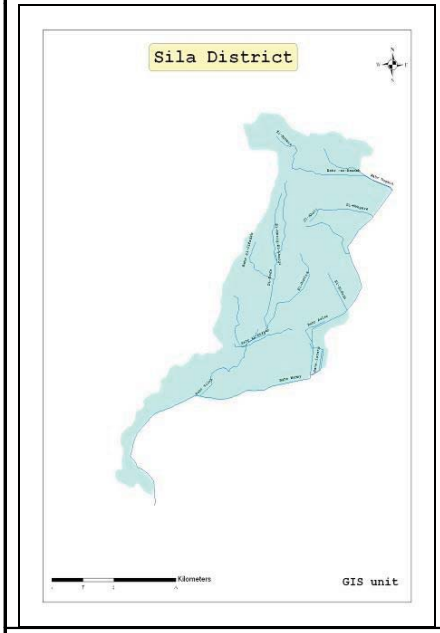
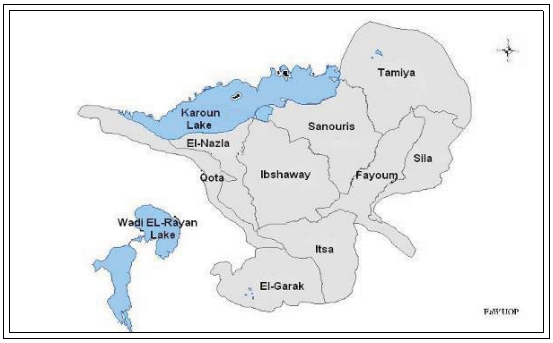
Use of new harvesting technologies

Resul



Meeting of farmers with District staff to test operation of new valves

Irrigation_Sila

Date of Visit: 4 November 07	Category: Large Scale PPMI
Name of Site: Sila District (Fayoum- Egypt) 	Either water Harvesting; Community Irrigation or Private Public Irrigation Sketch Map of Site 
Geographic location of practice: is located in the western desert 90 km to the South-west of Cairo, the capital city of Egypt.	
(GPS) Coordinates: 29 18 38 N, 30 55 22 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc. The district covers about 10000 Ha. , number of farmers and householders more that 40000, the operating WUA is 15 members with 3	

women representing the sanitary use of water and cultivation activities, also social activities. The district (group of many small villages) is an example between other district in the Governorate of fayoum for its BP activities (using of water and lands)
Characteristics of the area: The governorate is basically an oasis, surrounded by desert in all directions except for the South-east direction where it connects to the Bani Suef governorate. The site represent the conditions of environmental problem that could be faced by excess of drainage water and increase of water flow the natural lake of "Qaroun" (protected area) and place where many activities of fish farming
Climate (AEZ) + Description: Mainly Arid region, General management concern: • irrigation by gravity • drainage to lake Qarun • water quality • Environmental activities
Average annual rainfall (mm): max. of 35 mm/year
Months of Short Rains:
Months of Main Rains:
Mean annual ref. crop Evapotranspiration (mm):
Predominant soil type: Clay Soil
Topography: The available land resources in this zone are of weak characteristics and low resilience with wide spread physical, biological and chemical limitations. Most of these resources are located in a closed fragile ecosystem which is isolated from the Nile Valley System.
Slope: Steep slope
Erosion: Some places face problems of erosion, so the use of weirs in the irrigation system is common to reduce water velocity
Period of year during which used:
Period of year during which benefits utilized:
Water Source: Controlled Surface Water. Water resources are mainly that of the huge Nubian sandstone aquifer that extends with varied thickness under the majority of the area of the Western Desert. This major water resource is of excellent qualities in most areas. The renew-ability of such resource received many investigations with the majority of conclusions confirming a non-renewable or very slowly renewable water resource.
Irrigated area: 10 000 ha
Method of water abstraction: Gravity, and main water parameters: shallow and stagnant groundwater; inflow of surface irrigation water;
Water delivery infrastructure: Control weirs with lined canals with good infrastructures and rotations between farmers (weir control system)
Type of water distribution: On Demand System
Predominant on-farm irrigation practice: Surface Irrigation with small ditches for water rotations

Major crops (with percentages of total irrigated area): Summer (Rice 5-10% only for testing purposes, Cotton, Maize) Winter (Wheat-Vegetable)	
Average farm size: 0.5 Ha	
Type of management: Governmental Management with assistance of Water user associations	
Technical Description: (Please describe in about 250 words the background of the irrigation development, how it is used, how it achieves its objectives and its main purpose - For local markets; home consumption; regional or national markets; export. As mentioned the site is an example for contributions of the BP agriculture production to the local market. The good link between farmers and local gov, is encouraging them to present new varieties of crops (testing) the cultivation process (some local farms used as pilot area by local gov.). Rice cultivation is newly introduced in the Government!! which make the MWRI worry, so the Sila BP site is testing these new cultivation criteria for proposing new cultivation process (wide furrows) and minimize water supply to its fields, and shorter period of cultivation , with new harvesting technique, (WMRI present and monitoring this activities, during is national 1st workshop for EWUAP. Dr Elkassar was responsible for such evaluation for the last 3 years)	
Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, available water supplies irrigation area or number of people supplied with water etc.). The site was selected to test the participatory management approach in the irrigation and cultivation practices, also to test the new technique of irrigation management transfer (project by Dutch Gov, in 2002), the implementation of some infrastructures and formation of WUAs in different levels to end with District water Board DAB, that is in power now for the operation of the system. Some of this report is available (if needed).	
Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The BP (operation of WUA and DAB) is successful, and many positive outcomes to farmers. The committee is responsible for the operating bout 10 000 Ha and organize different activities with other agencies in the District (large scale) with other use of water rather than irrigation of lands (the committee got representatives for municipal and industrial agencies)	Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application. May the limitation of Funds and donations from private sector. In some occasion (as heard from farmers) some major work are needed, but the available fund with the associations (bank account) is not enough. Also some training for workers (using new techniques of cleaning of irrigation system) is needed.
Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. The introduced BP operation of irrigation system is useful to be used in other places in Egypt and other Nile basin countries where different stakeholders are involved, with limited sources. Also the site give good example for ensuring target cropping patterns and controlling cultivation of staring crop (like rice), such as the condition of free market cropping patterns,. This is a major	Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. The BP activities achieve its targets to control water use and sharing information and techniques with local Gov. MWRI, also make rotation and scheduling of water delivery. Also the system is under cost recovery criteria and well managed between both parties.

constraint of the MWRI to introduce such crop with high consumption of water in this region.	
Other Sites where used: Some site (in smaller areas) could be found in lower Egypt where IIP activities, the other given BP site in Menya is other example of WUA for different criteria.	
Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) . The site is in the begging process of the practice of feel-funded, and already open bank account. For the civil structures and small distribution weirs the gov. and the project's funded cover these costs but the maintenance now is fully covered by the farmers!!!	Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other organizations, etc). The farmers arrange between them these activity and there is special group for each activity, some funds are available and some other support from local districts of MALR, and MWRI
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. Good and positive impact could be noticed and the most obvious results is the gender participation in such rural area!!, General and private meetings are held regularly	Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). The Elected WUA and DAB is a good and pioneer example in Egypt! With fully responsibility of such large scale system and cooperation with other government. and non-government. sectors. (sample of such formation and numbers are given in bani Ebad Site)
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users. How and why are they involved in the practice? Actual level of beneficiary involvement under operation: Regular meeting for different sub-committee member for each activities (group for agricultural and other for irrigation and other for civil work and other for social activities ect.,) which consider pioneer in such PIM strategy.	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) The introduced new operational technique (PIM) was proposed by MWRI through the previous Dutch project, as an example in such rural area that face some ecosystem problems and the assistance of farmers is essential to sustain such issue. The scale of activities are large comparing with other similar WUAs in Egypt, here we are working in District level, which covers lots of WUA and BCWUA. The proposed institutional arrangement is successful and encourage the farmers to accept other new farm techniques suggested by Gov.

Who are the main beneficiaries	beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). All beneficiaries asked to got more training mainly in operation and decision making process and linkage with higher levels	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). The site get many benefits from the previous project's activities, many new activities are recommended to extent the services for the district, some assistance from the irrigation and agricultural engineer are given.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). The association got a very good contribution in this field to protect the environment Sustainability economic aspects cultural environmental aspects technical	Social/Cultural acceptability: Many social activities and small parties are organized, with regular meetings
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.). Many advantages could be considered within the district not even in water and land use, but also for the current situation for protected the environment and the ecosystem in the region that was safer from different problem comparing with neighborhood districts, the level of awareness at farmers is high, that help to introduced other new activities (proposed either by MALR, MWRI) and local Gov. for operating or maintaining the site, and the issue of cost recovery system.	Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). Some of restrictions for such BP is the limitation of Funds and lack of technical training for the organization levels and also the most important issue is the legislation needed to issue the proposed Law (need to be finalize from the Egyptian Parliament) and this take time.
Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or	What is potential for applying all/parts of initiative elsewhere?

<table>
<tr><td rowspan="8">transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice;) . For scaling up such activities much arrangement are needed before starting like, training and reforming some institutional activities within the local Gov. and private sector. At the moment, 5 other places are suggested to introduce these BP techniques in Operation of irrigation and agricultural system with the scale of District level. Also we could add that , now the MWRI is thinking to up-scale this idea to be for the Directorate level (that cover 8-11 District) to form what we can call: Directorate Water Board, or congress board for water with the hole Gov. level!!, and they choose fayoum Directorate to trest this new level of Decentralization within the coming years!!</td><td></td></tr>
<tr><td>(Score from 1 to 10 on list below with 10 being highly applicable)</td></tr>
<tr><td>I [10] Transfer of practice to another group/culture/land-use system, etc.</td></tr>
<tr><td>II [4] Easy to transfer the practice, but with minor adaptations for local conditions</td></tr>
<tr><td>III [8] Transfer possible, but significant modifications/prerequisites to consider.</td></tr>
<tr><td>IV [5] Difficult to transfer the practice. Need experienced support.</td></tr>
<tr><td>V [2] It would be impossible to transfer the practice. Too site specific.</td></tr>
<tr><td>Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.). The need to finalize the proposed Law for operation, to fasten the process of decision and arrangement between different parties. The farmers all the time say we do need to know our right, amount of water, fertilizer, any think that provided by Local Gov. and leave us to operate our system)</td></tr>
<tr><td colspan="2">Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reasons why and provide any Conclusion and Recommendations). The Site could be introduced as BP for the operated system at the moment, WUAs involvement, and the quality of activities running comparing with other places in the same level. The only need to legislate such actives with the framework of the Gov. and fund support at the begging of practices with training!</td></tr>
<tr><td colspan="2">Contact Organization: (For further information; site visits' etc)</td></tr>
</table>

Type of organization:	Contact person: Eng. Issam Barakat, Dr. Gamal El-Kassar
[*] government organization	Contact details: MWRI, Fayoum Water Users Association Project, and NWRC, WMRI, Kanater Egypt
[ ] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[ ] other:	

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions). Giving the farmers responsibilities and rights and organizing of operation will assist the introduced BP actives (PIM, and Irrigation management Transfer)

Planning: The Integrated Water Resource Management Concept into institutional arrangements, which are based on water user participation and which are widely valued by all stakeholders involved. The scope for practical institutional building at all levels is considerable, starting from the mesqa and branch canal up to main and sub-regional level.
The study identified an apparent need for strengthening of water users associations Existing water user associations lack important management skills such as planning, prioritizing of works accounting and financial management

Design: new activities at farm level and main water distribution systems that could support the new operational rules to involve the farmers in O&M

Construction; some new weir for water distribution and some administrative buildings for the required places of District Gov. Staff and WUA, DAB formations

Implementation: Formation of new organizations of farmers and linking it with the framework of the MALR and MWRI, and drafting the required Law for operations

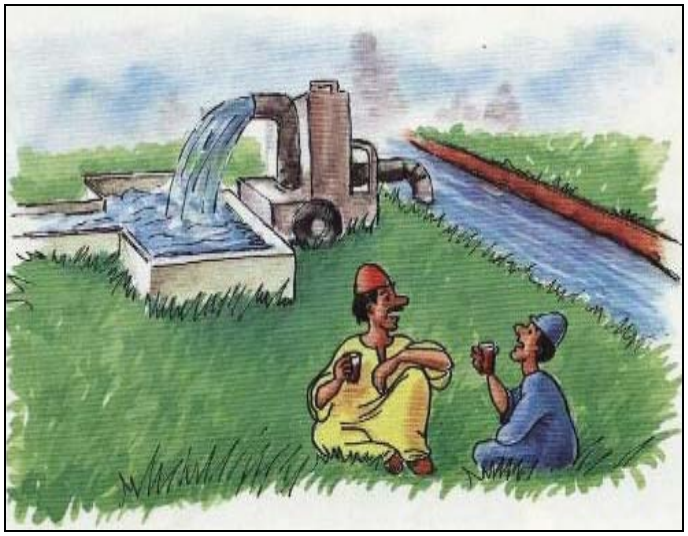
O&M : team of such activities are running with some assistance from District engineers, and available financial support from Local Gov.

Beneficiary involvement: this is the introduced BP activities

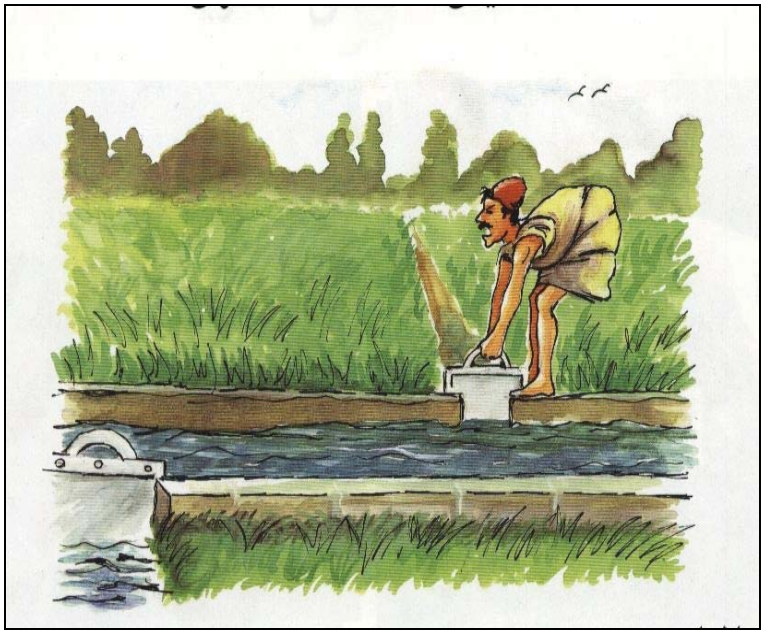
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). Lots of arrangement and benefits from this activities and when farmers meet regularly they raise different issues in other fields and could solve such problems.

Other Remarks or observations: The good and successful other issue is that the operational Committee WUA invites other leaders from different agencies to their meeting (monthly one) to raise some issue that make public sound in the District and try to solve it instead of writing letters for complaining! and this practice is ideal and found support from local Government.

Contact person completing form: Dr Gamal Elkassar
Contact details: NC_EWUAP, WMRI, NWRC Kanater Egypt



Old Practice: Surface Irrigation



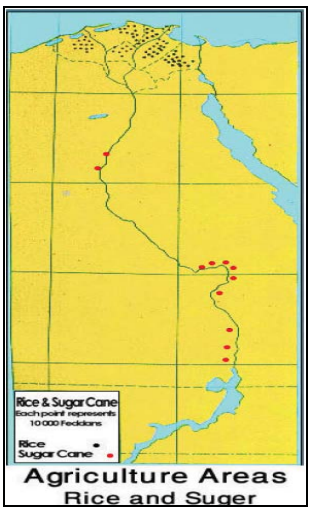
New Practice: Controlling Irrigation System

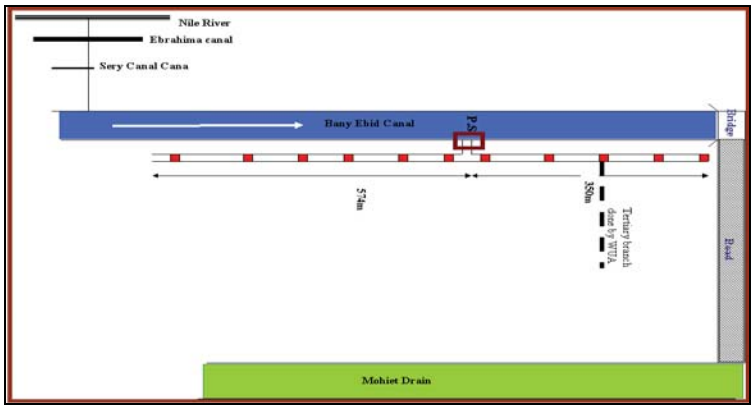
Solving problem on the field (meeting with District Engineers)

Irrigation-Bani Abad

Date of Visit: 21 November 2007	Category: Small-Scale CMI
Name of Site: Babi-Ebad Village- Sub-branch No. 41Menya Upper Egypt	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map of Site

Geographic location of practice: Area: 40 Ha.
Length of delivery canal: 0.897 km
Number of mesqas: 11 (mesqa: tertiary canal) using elevated concrete Meska
Number of beneficiaries: 120 from them 16 women





(GPS) Coordinates: 30 57 32.9 N, 31 14 46.04 E

Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc the site is considered one the BP example for WUA that serve about 2000 households

Characteristics of the area: Old land in upper Egypt that present different cultivation method rather than in Delta area

Climate (AEZ) + Description: (Sets the climatic context - Arid; semi-arid; humid tropics; Mediterranean - Influences the types of crops that can be grown). The site in the Nile valley AEZ. The Nile Valley system is one of the most ancient agricultural systems in the world. It represents the most fertile lands in Egypt and probably in the whole region. It is also the most densely populated area in the Middle East region. Agricultural products are highly diversified and intensive cropping system is practiced all year around. Despite the high significance of this sub-zone to food security, trade balance and economics, yet it has been the subject of several desertification factors and processes through the last few decades.

Average annual rainfall (mm): the area is not in the zone of rain max. of 10 mm could be expected

Months of Short Rains:	0

Months of Main Rains:	Jan.
Mean annual ref. crop Evapotranspiration (mm):	1900 mm/year
Predominant soil type:	Heavy clay soil
Topography:	The Nile Valley system extends from the Mediterranean shores of the Nile Delta to the North till Aswan in the south over an area extending from 22 - 32 latitude North under arid and hyper-arid conditions.
Slope:	flat land
Erosion:	no
Period of year during which used:	all the year
Period of year during which benefits utilized:	all the year
Water Source: (Storage on river; groundwater; run-of-the river; conjunctive use of surface and groundwater - Describes the availability and reliability of irrigation water supply). Fresh Nile water, pumped to sub-branch canal	
Irrigated area: (Total annual and then by season (ha)) 40 Ha	
Method of water abstraction: (Pumped; gravity; artesian - Influences the pattern of supply and cost of irrigation water). Improved methods for the efficient and effective implementation of the IIP based on full scale farmer participation are verified in the operation, self-financed	
Water delivery infrastructure: (Open channel; pipelines; lined; unlined - Influences the potential level of performance.) Open improved Channel (private canal).	
Type of water distribution: (Demand; arranged on-demand; arranged; supply orientated - Influences the potential level of performance.) arranged; supply orientated (Upstream Control)	
Predominant on-farm irrigation practice: (Surface: furrow, level basin, border, flood, ridge-in-basin; Overhead: rain-gun, lateral move, centre pivot; drip/trickle - Influences the potential level of performance). Improved surface irrigation, by some BP activities on-farm level and cultivation process	
Major crops (with percentages of total irrigated area): (Sets the agricultural context. Separates out rice and non-rice schemes, monoculture from mixed cropping schemes). Cotton, Sugar-cane in summer and Vegetable and Wheat in Winter	
Average farm size: (Important for comparison between schemes, whether they are large estates or smallholder schemes).smallholder schemes, between ,5-1.5 Ha/farmer	
Type of management: (Government agency; private company; joint government agency/farmer; farmer-managed - Influences the potential level of performance). Government agency at branch level by full operation of the system at sub-branch and on-farm level by farmers (committee as given blow)	

<table>
<tr><td colspan="2">Technical Description: (Please describe in about 250 words the background of the irrigation development, how it is used, how it achieves its objectives and its main purpose - For local markets; home consumption; regional or national markets; export. The reason for selecting this site as BP is that it represent the self-managed operation by farmers for O&M, and good contact between farmers and local Gov. • In fact better infrastructure, which include water supply in large, is required to support
This agricultural-production market development. At this stage still the traditional decision makers thinking dominate and individuals (beneficiaries) seeking quantity rather than quality. Such life style some how also limiting efforts of water supply source development.

So far there is no charge/regulation to control arid environment damage in general. It is also easier to control environmental impacts through setting environmental regulation that has alternative mitigations that could be strict to control pollution</td></tr>
<tr><td colspan="2">Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, New technique for farming where NO Rice is cultivated, water saving is an option and protection of ecosystem with good practice of health conditions</td></tr>
<tr><td>Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. Good economic impact for farmers and experience of cropping patterns fully controlled by farmers. One of the activities by farmers was to construct a deep wall and pitching their meskas for about 170 m (stone) protects the farms from seepage and the cost was self-finance. Also to make new farm road.</td><td>Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application , may Problems legislation and support of Private sector (investment) will assist the operation to be more successful. Some training for farmers (mainly the operators of the new system will be great)</td></tr>
<tr><td>Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. This BP could be easily implement in other site in Egypt (like Meddle Egypt area) and the new lands, Full O&M is achieved in this site so other places in the Nile Basin could be benefit from these experiences (Uganda, Sudan..)</td><td>Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. Meskas Monitoring Study (MMS) is the key component in the current Monitoring</td></tr>
<tr><td colspan="2">Other Sites where used: These activities of self-managed and new practice in water use and cultivation are used in other areas in Delta, but introducing it in upper Egypt is essential for water saving and farmer participation</td></tr>
<tr><td>Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) Good example of financing the site by collecting fees from beneficiaries and strong Cost-recovery system. The WUA contacted the</td><td>Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government. The site is operated maintained and monitoring by farmers with some assistance by local Irrigation and agriculture Engineers</td></tr>
</table>

local agricultural bank for supplying new pumps for their Meska and they bay the installment from their budget.	
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. Good practice of different human activities for daily and running requirements	Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). Example of strong formation of WUA (elected) with women participation
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: free Cropping patterns for all fields, using given water supply (using rotation system for irrigated water as an example of BP). One of the samples of BP in the site they got a bank account with about 35000 LE (collected from farmers) for different O&M activities. Who are the main beneficiaries	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) Some accepted conditions and better than other places in the region beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The farmers received three kinds of training : operational management of WUA, operation and maintenance of pumps	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). The gov. support the implementation of the BP system and it is now operated by farmers (costs recovery system), some basic training were given but still some support for this practice.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). Good example of cleaning the irrigation system by themselves and control any rubbish and agriculture waste into the system (no support from the Gov!) Sustainability economic aspects cultural environmental aspects technical	Social/ Cultural acceptability: Weekly meeting for the WUA and monthly meeting for the all members of the site, which is considered as social activities more better than other places
Advantages: (Strengths of the approach	Disadvantages: (Constraints that restrict its

<table>
<tr><td>adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons. The target is achieved of WUAs and involvement in operation and financing</td><td>effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). May some fund support will help and some mis-operating the new pump unit (more training for operators)</td></tr>
<tr><td rowspan="8">Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice. It is recommended to up-scale this practice in other site in the region and in other places in Delta (self-managed activities)</td><td>What is potential for applying all/parts of initiative elsewhere?</td></tr>
<tr><td>(Score from 1 to 10 on list below with 10 being highly applicable)</td></tr>
<tr><td>I [10] Transfer of practice to another group/culture/land-use system, etc.</td></tr>
<tr><td>II [9] Easy to transfer the practice, but with minor adaptations for local conditions</td></tr>
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<tr><td>V [2] It would be impossible to transfer the practice. Too site specific.</td></tr>
<tr><td>Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.)</td></tr>
<tr><td colspan="2">Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reason. Example of operational committee of the site (Selected staff from the farmers). A meeting was hold for the WUA for the site in the present of

Char Members
Kamal Abd El Gawad Abu Omar Head of Mesqa
Sami Salem ElSalhy Vies-deputy of Mesqa
Wahba Ahmed Mansour Treasury
Mohamed Abd El Hady Secretary
Members
1. Abd ElGalil Selim
2. Ibrahim Atia Shara
3. Wahba Ahmed Mansour
4. Iman Sasmi Meslehy
5. Abd El Glil SelimIbrahim Ahmed</td></tr>
</table>

6. Abd ElGhani Mohamed
7. Yousef Amr ElSalhy
8. Helmy Mostfa ElSalhy
9. Kamal Abd El Gawad Abu Omar
10. Sami Salem ElSalhy
11. Wahba Ahmed Mansour
12. Mohamed Abd El Hady

Repres

Contact Organization: (For further information; site visits' etc)	
Type of organization:	Contact person: Eng Issam Barakat
[ ] government organization	Contact details : WUA project MWRI
[*] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[ ] other:	
Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)	
Planning: New technique of delivery water system to farm level and use the power of involving and operating by farmers	
Design: Elevated improved Meska with modern delivery water system to farms, fully operated by farmers. The idea to satisfy water need from fresh water rather than using low quality water	
Construction	
Implementation: The Local. Gov. implement the BP site and the operating committee (WUA) are responsible for all activities in the site (technical & financial)	
O&M Insufficient O&M (Operation and Maintenance) training is recommended for pump maintenance and irrigation scheduling between meskas	
Beneficiary involvement Training leaders of WUAs (Regular activities of the WUAs such as	

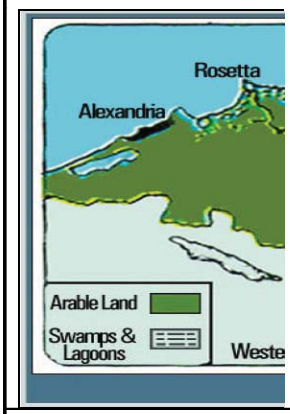
holding meetings, solving problems were supported through workshops and on-the-job training Monitoring regarding water management and operational management of WUAs
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). Strong support from local Gov. and link with local market
Other Remarks or observations: The farmers help the district engineer for different king of activities in upper system level (branch and main) canals like flow measurement and collecting samples cropping patterns,
Contact person completing form: Dr. Gamal ElKassar
Contact details National water Research Center - Water Management Research Institute

Cooperation and rotation

Intake of the delivery canal

Required for WUA Training

Irrigation Dina Farm

Date of Visit: 5 December 2007	Category: Medium Scale Irrigation (new irrigation, agriculture and livestock technologies)
Name of Site: Dina Farms (Private Sector)	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map of Site 
Geographic location of practice: The farm is located in the (Cairo-Alexandria High Way) in the new Reclamation Lands of West Desert	
(GPS) Coordinates: 30° 54' 09.63 N and 29° 55' 26.8 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc. Like a small village for about 1000 workers for the company, many activities are included such as" Sports and Tourist Village • A site of 40 Acres including a stadium that can accommodate 20,000 spectators. • A professional football (soccer) team playing in the premier top division league in Egypt. • 24 Luxurious Private Villas built inside the farms    	
Characteristics of the area: 10,000 acres (about 4400 Ha). Dina Farms exists as a demonstrative integrated project comprising a model community for integrated desert agriculture built on	

progressive scientific and technological foundations comparable to the successful other schemes in countries of Europe and America.
Climate (AEZ) + Description: The are classified as No. 4 (Western Desert, Oases and Southern Remote Areas) , so all the characteristics of this AEZ could be exist (as given in the report). 1. flat to heaving sandy soils. 2. • saline groundwater • all surface water from Nile. This ecological zone is characterized by hyper-arid climatic conditions with rare rainfall and extreme temperatures. The winds over the western desert in north western or northern direction extend from the Mediterranean over the western desert with fallen speed.
Average annual rainfall (mm) the area (like other western area not a rainy area so max. of 50 mm/year of rains could be expected)
Months of Short Rains: Jan. Feb.
Months of Main Rains: Dec. Jan
Mean annual ref. crop Evapotranspiration (mm): about 1700 mm
Predominant soil type: Sandy soil
Topography: The site is almost flat (prepared as BP). The general areas of west desert could be classified as follows" The Western Desert extends from the southern boarders towards the Northwest Coastal areas in the North, is a massive plateau with a general slope towards the north
Slope: flat (about 8-15 cm/km)
Erosion: no erosion
Period of year during which used: all the year (depending on groundwater)
Period of year during which benefits utilized: All year around
Water Source: Ground water
Irrigated area: 4400 Ha.
Method of water abstraction: Ground water wells for serving Drip and sprinkler Irrigation systems using center pivot
Water delivery infrastructure: With over 42 Center pivots and more than 1000 acres Under Drip Irrigation systems, Dina farms is one of the largest farms in Egypt. Crops, Fruits and vegetables are amongst those that it grows
Type of water distribution: sprinkler Irrigation system with a high modern distributaries system
Predominant on-farm irrigation practice. New irrigation system (sprinkler-central pivot) with new practices for farming (planting& harvesting) and use of fertilizers.
Major crops (with percentages of total irrigated area): Apricots, Date palm ,Mangoes,Peaches,Strawberry,Apples,Grapes,Olives,Tangerines,Banana,Lemons,Oranges,Tangerines Vegetables: Green Beans ,Lettuce, Onions& garlic ,potatoes, Spring Onion ,Organic Onion
Average farm size: different plots for each crop an average site for each is about 5 ha.
Type of management: Private sector. Dina Farms was founded in the late 1980s by a prominent Egyptian figure who was devoted to the development of the Egyptian desert land. For its first 10 years, Dina Farms was shaped by its founding president Mr. Hussein Osman who wanted to create a model farm based on high standards of management and technological practices to contribute to the national economic growth and good character of the future sustainable development of Egypt and the region.

<table>
<tr><td colspan="2">Technical Description: With over 42 Center pivots and more than 1000 acres Under Drip Irrigation systems, Dina farms is one of the largest farms in Egypt. Crops, Fruits and vegetables are amongst those that it grows. Exports fruits vegetables, Dairy. From the beginning, our ultimate target has been the achievement of Egypt's self-sufficiency from food to meet the needs for agrarian and animal food production for local consumption as well as global exporting.</td></tr>
<tr><td colspan="2">Technical Details: This strategy would save a lot of foreign currency that we spend annually for food imports as well as saving many hygiene and hazard problems associated with the imported food. An example is the mad cow disease as well as the foot and mouth disease. For this reason we planned our scheme to be completely integrated in terms of agricultural and animal production from the very start of our planning. Its financial returns were satisfactory while at the same time it solved the problems of meat and dairy products with reasonable prices for the local consumption.</td></tr>
<tr><td>Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. Any other new land in the western part of the country where groundwater could be used. Also where available private sector could be involved (need more funds for infrastructures). In the Nile basin countries, it could be used in many areas where surface runoff id not available for development and when depending in other source like groundwater wells (long dry season regions)</td><td>Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application. Suitable soil for new practice of irrigation method (not recommended for old heavy lands), also the need for self-managed system, so it full recommended for private sector to be engaged. Skill labor is needed, with modern operation and maintenance system.</td></tr>
<tr><td>Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin</td><td>Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. The site gives a very good example for private investment in agricultural practices. The manager said" Over and above this important target, our objective has been to make available agrarian and animal food production that would meet the needs for local consumption and for exportation that would wide open the doors for the Egyptian products to penetrate international markets."</td></tr>
<tr><td colspan="2">Other Sites where used: There are many other areas along the Alexandria-Cairo Desert road where you can see such private farms, also the same farm started in the south area (Toshka) lands, only the different is the selected farm is the oldest in Egypt. They said" Dina Farms belongs to Dina for Agriculture Investments Company, a member of the Osman Group (OG). The group is considered as one of the largest and most repute
farm corporations in the Middle East whose history goes back to the early 1950s. "</td></tr>
<tr><td>Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter</td><td>Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts</td></tr>
</table>

of water stored or per ha irrigated, beneficiary contributions, etc.) IN this regards it is believed that as private sector, the project is successful. The mentioned that "While at the same time would provide satisfactory profits and returns for investors in the field. This objective dictated our selection of strategies providing for our agricultural, animal production, commercial, and agro-industrial schemes in a single integrated project."	requested, any assistance and support received from Government or other agencies. Self-managed system with a good example of powder plant in Egypt.
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. They said" Its products of white cheese, Edam, Gouda, Cottage and yogurt,. are highly favored by consumers. Our skimmed milk factory is considered as the first plant of this sort to be established in Egypt and the Middle East on the basis of the most modern technology in this industry."	Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). Example of strong company (private sector)
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: The site is well known in Egypt and Manu other small, private and Gov. agencies contact them for experience exchange (as BP in agriculture project with good contact with local and foreign market) Who are the main beneficiaries	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). Special trading programs are organized for the staff (national and international in different fields)	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). Good like with local market and other maintenance companies, also the farm got it own O&M staff
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits	Social/Cultural acceptability: the farm got a sport team who was part of the league of Egypt and got a well equipped stadium

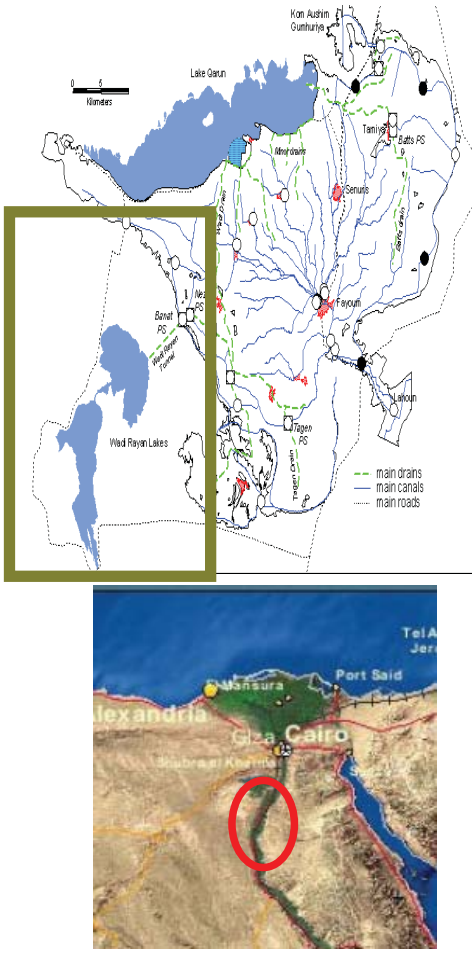
<table>
<tr><td colspan="2">achieved in terms or water availability, reduction in erosion, vegetative growth etc). Another good example of environmental protection conditions in the region.

Sustainability economic aspects
cultural
environmental aspects
technical</td><td></td></tr>
<tr><td colspan="2">Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this et</td><td>Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.).</td></tr>
<tr><td colspan="2" rowspan="8">Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice</td><td>What is potential for applying all/parts of initiative elsewhere?</td></tr>
<tr><td>(Score from 1 to 10 on list below with 10 being highly applicable)</td></tr>
<tr><td>I [10] Transfer of practice to another group/culture/land-use system, etc.</td></tr>
<tr><td>II [7] Easy to transfer the practice, but with minor adaptations for local conditions</td></tr>
<tr><td>III [4] Transfer possible, but significant modifications/prerequisites to consider.</td></tr>
<tr><td>IV [5] Difficult to transfer the practice. Need experienced support.</td></tr>
<tr><td>V [6] It would be impossible to transfer the practice. Too site specific.</td></tr>
<tr><td>Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.)</td></tr>
<tr><td colspan="3">Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reason. The site is considered BP as the private sector is fully control and finance the activities with new techniques for the three main activities (irrigation, agriculture and livestock)</td></tr>
<tr><td colspan="3">Contact Organization: (For further information; site visits' etc)</td></tr>
<tr><td>Type of organization:</td><td colspan="2">Contact person: Mr. Hussein Osman</td></tr>
<tr><td>[ ] government organization</td><td colspan="2" rowspan="2">Contact details: Dina Farm, Cairo-Alex. Desert road Km. 45</td></tr>
<tr><td>[*] private organization</td></tr>
</table>

[ ] NGO &/or CBO [ ] international agency [ ] other:
Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)
Planning: Dina Farms belongs to Dina for Agriculture Investments Company, a member of the Osman Group (OG). The group is considered as one of the largest and most repute farm corporations in the Middle East whose history goes back to the early 1950s. The main target is to create a model farm based on high standards of management and technological practices to contribute to the national economic growth and good character of the future sustainable development of Egypt and the region.
Design: example of other production: Milk powder plant • Capacity of 150 ton per day • The first and only powder plant in Egypt and the middle East * Our dairy products • Yogurt • Butter • Gouda • Edam • White cheese
Construction: With over 42 Center pivots and more than 1000 acres Under Drip Irrigation systems, Dina farms is one of the largest farms in Egypt. Crops, Fruits and vegetables are amongst those that it grows.
Implementation: The development of Dina Farms started with the reform and cultivation of 1,500 acres close to the end of 1987. Planning our work was based on our previous tremendous national experimental scheme in Salhya, and our experiences gained during our visits to newly desert development farms in southern states of the USA, which are to some extent similar to our deserts
O&M : The farm got its own staff of O*M, well trained staff for different required field
Beneficiary involvement. Private company with more than 2000 householder benefits from the project
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc).
Other Remarks or observations: on Summary: • 4000 milking cows to reach 10,000 cows in the near future. • Selection from the World's best breeds of the high genetic, high producers U.S. Holstein. • Artificial insemination frozen semen from Holstein Bulls of the Best 100 I.E. Bulls in the U.S.A and Canada. • Average milk production is 110000 liters per day. • The leading milk producer in the country. • Fattening station comprising 2000feed lot herd.
Contact person completing form: Director of General Public affairs in the farm with Dr Ahmed Talaat WMRI
Contact details: Dina Farm, Cairo-Alex. Desert road Km. 45

ANNEX 2: (List of Selected BP sites of WH)

WH-Wadi Rayan

Category: Water Harvesting-Agriculture drainage water	Date of Visit: 26 Oct. 07
Either water Harvesting; Community Irrigation or Private Public Irrigation	Name of Site: Wadi El-Rayan-Fayoum
Sketch Map of Site	
Geographic location of practice: it lies in the Western part of Meddle Egypt, south El-Fayoum Governorate.	
(GPS) Coordinates:, 29 18 38 N, 30 55 22 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc The site is environmental protected, with small village near by the site, and about 2000 Householders and the major activities is fish farming beside cultivation	
Characteristics of the area: The area is within the Protected area of Fayoum Governorate, which face a high level of water levels in the nearby Lakes (Qaroun and Rayan) due to the cultivation are in the region and its drainage water goes to these lakes. The site is environmental protected and any increase of the stable water level in the lakes affect the wetlands and the living inhabitant in the lakes.	
Climate (AEZ) + Description: . The site in the Nile valley AEZ, that described in the report, the region got long hot	

summer months and mild winter 10-40^{oC} respectively.		
Average annual rainfall (mm), max. of 80 mm/year		
	December	Months of Short Rains:
	January	Months of Main Rains:
Mean annual ref. crop Evapotranspiration (mm): 1700 mm/year		
	Sand	Predominant soil type:
Topography: Western part of South ElFayoum and has rugged mountainous topography and steep slop areas		
Steep slope about 50-90 cm/km		Slope:
Erosion: some erosion could be found in rural places where no cultivations		
	winter season	Period of year during which used:
	winter season	Period of year during which benefits utilized:
Water Source: shallow and stagnant groundwater; inflow of surface irrigation water from the Nile;		
Cultivated area: the target area will reach 3500 Ha mainly (Rice + Vegetable)		
Technical Description: (Please describe in about 250 words the background of the practice, how it is used, details of how the site is used, its components, how it achieves its objectives and its main purpose - For example if it is used for drinking water, or the watering of livestock and community drinking, or irrigation etc.) the main objective is managing the available and limited water resources. to satisfy the sustainable development for the Wadi and to ensure availability of drinking water with acceptable quality for the communities living in the region and for Agriculture and for Fish farming. The proposed techniques was t give new activities for farming to capture as much as from the drainage water to the cultivation for special crops, and other main new activities in the site (fish farming) to use the low quality of water for this practices		
Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, available water supplies irrigation area or number of people supplied with water etc.). in Wadi El-Rayan development study (1976) by Jica, This study discovered the problem that faced the site from the high water tables in the lakes and some places suffered from Water Logging and the minor cultivation in the area which affect its crops.		
Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application. The site is using irrigation by gravity system, (Steep slops), and its drainage water goes to lake Qaroun , the issue of water quality is well concern in the site due its environmental conditions, So the introduced BP activities was proposed and lots of Environmental activities	Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The outcomes from these new activities is well known to all in the site mainly the fish farming activities which raised the economic returns to beneficiaries. Also the improvement of water quality and quantities that flow to the lake comparing with the previous values.	
Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general	Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used	

strengths of the practice and whether it has in fact achieved what it set out to do. The used activities help in using the available drainage water for different purposes to (cultivation tolerant crops) or fish farming) . Also to protect the lake from flowing excess water that raise its water levels. Also the farmers gains from this new practices.	within the Nile Basin. The given BP activities could be useful for similar places where soils are affected by high groundwater table and excess of drainage water (water logging) and where now fresh water available for new practices, and the need for using low quality of water either for cultivation or fish farming.
Other Sites where used: The same technology regarding use of low quality water (mainly sewage water) are used around Cairo for special cultivations after treatment. Some places In Sinai the soil safer from high salinity, so the decision was to use fish farming to improve the soil and to wash salts from the soil. Using of drainage water for irrigation is very common in Egypt by mixing with fresh water.	
Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other organizations, etc) The site is operated by Gov, staff with some assistance of some NGO and farmers, still there is no organization of the site, but the group of fish farming are very powerful and support all activities. Also, lots of benefits to farmers encourage other inhabitance to live in the site.	Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) . We could not find the total cot of the introduced BP , by the cost covers construction of feeding canal for the fish farming area. All costs were covered by international donations,
Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). The Local Gov. MWRI and fayoum Gov. thinks of formation of WUA for the site to sustain and operate the new practices after completion of works (cultivation and fish farming), this target is in the process now with some available fund from the on-going Dutch Project in the Gov.	Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. As said before, the outcome of the site is clear and the farmers get lots of benefits, also the other benefit is for the lake Qaroun where water level goes done and the quality of water become better
Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) Environmental concerns and increasing scarcity of water resources and the aim for sustainable development, require to look into the wider consequences of water resources management options and emphasize the importance of the studies at basin level. It is important to take into account that water management techniques alone cannot solve water scarcity problems, sound policies need to be formulated and implemented to improve water management and increase water use efficiency.	Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users. How and why are they involved in the practice? Actual level of beneficiary involvement under operation: Other activities in the site is supply enough drinking water to the villages that were created for practicing the new activities a and the Gov. support these activities and also, some other stakeholders get benefits from all of these new practices like some small industrial activities and livestock.

beneficiary involvement demand based interventions	Who are the main beneficiaries
Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). The planned activities is to cultivate about 2000 Ha, for the first phase and to extent the area to cover 3500 Ha, also to reach 300 Ha of Fishfarming, now the gov, is supporting the community with different other activities to encourage them to extent their work and some funds are allocated from the previous project, for training and maintenance works.	Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). This is one of the main issue that is needed for the coming period, still the power is in the hand of Gov. but to sustain the work it should be operated and maintained by farmers; so the Local Gov. is planning to start this training by cooperation of the Dutch project.
Social/Cultural acceptability: is experiencing Small-scale tourism development. About (1000 Feedan for fishing and 8000 for agriculture). Still this activities not are targeted, only few practices. The one which is very successful is tourists activities in the region, a very nice and natural view, Fayoum area is most famous of its farming and beautiful site from long time, and it is protected (some water falls) and different living organism. Also other places where you can find springs (natural water) and many people believe in its power. economic aspects Sustainability cultural environmental aspects	Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). The total available agriculture drainage water about 200 million m^3 per year, and one of the target is to balance the water of the Lake (quantity and salt balance-quantity). This mount of water is targeted to cultivate certain crops to gain some benefits and protect the ecosystem of the lake. technical
Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). Until now the operation of the site is in the hand of Local Gov. and transferring these activities to farmers is needed for sustainability, we do not know if this will be successful and the fund needed for such needs (mainly formation of WUA).	Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.). Use of such low quality water to cultivate and fishfarming at this rule site is very advantages, and the return for beneficiaries is obvious. Also it helps to make new community in the site (the site is very far to get fresh Nile water for any activities, so only harvesting of the available water is a must).
What is potential for applying all/parts of initiative elsewhere?	Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice;) . It is already planned to extent and up-scaling the practices in the site (according to fund available and interest of farmers). In the meantime, this BP of Water Harvesting could be used in other places in Egypt (mainly in the protected areas like Nasser lake, or at the places nearby the coast) to protect the cultivated lands from high salinity and water logging)
(Score from 1 to 10 on list below with 10 being highly applicable)	
I [8] Transfer of practice to another	

group/culture/land-use system, etc.	
II [4] Easy to transfer the practice, but with minor adaptations for local conditions	
III [5] Transfer possible, but significant modifications/prerequisites to consider.	
IV [2] Difficult to transfer the practice. Need experienced support.	
V [1] It would be impossible to transfer the practice. Too site specific.	
Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.) . The rules and regulation for the use of sources of the site is there, but still some mis-using of these sources (water, land) could be found. So the need to strong regulation and penalties are recommended,	

Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reasons why and provide any Conclusion and Recommendations). The introduced example is for WH activities by harvesting/capturing the suitable water and reuse of agriculture drainage water for new cultivation and fish-farming to protect Qaroun Lake (Protection region). Also balancing both quantities and qualities of water interring the lake. The Site is a tourism place and BP should take into consideration the sustainability of this practices, (an income input for residence of the site).

Contact Organization: (For further information; site visits' etc)	
Contact person: Eng Yaser Abd El-Nabi, or Dr. Gamal El-Kassar	Type of organization:
Contact details Central Directorate of Fayoum Gov. or WMRI	[√] government organization
	[ ] private organization
	[ ] NGO &/or CBO
	[ ] international agency
	[ ] other:

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions)

Planning: The target is to use drainage water for cultivation and new practice of fishfarming, so, the plan include land preparation and arrangement for low quality water, also, construct new canal for conveying flow to fish farm areas and arrangement with private sector.

Design : As in the planning part, the design include some infrastructures for this target, also for the purposes of the new community, the design of new drinking water supply unit was included.

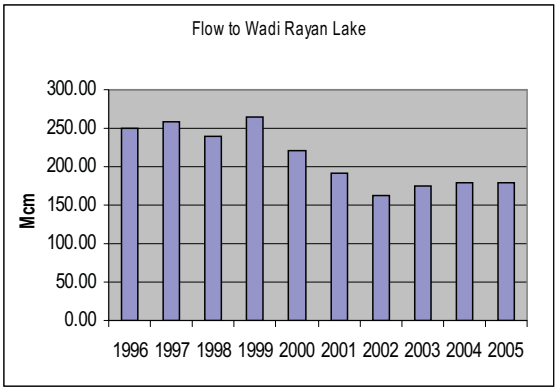
Construction: The government support the constructor of the new structures with the available fund from the international agencies, the participation of farmers were limited during this stage.

Implementation . - Until now the operation and activities is full controlled by the Gov. MWRI, some assistance from the local farmers and fisheries.
- The project support the fish farming in the area and encourage the cultivation of new crops that sustain the saline water
- It is planned to establish some industrial activities in the area with the beginning of this new community

O&M Insufficient O&M (Operation and Maintenance) training. This task now is under the supervision of Gov. staff and implemented by private sector for fishfarming and farmers for the new site of cultivation,
Beneficiary involvement: This activity is under preparation and planning for formation of WUA is underway.
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). The management tool has three parts. The first for tourist (this issue could be noticed easily). The second is management for agriculture (new land has been added to the region, and farmer's income increase), the third for fishing (the result is very clear and there are many new farmers apply to join this practice).
Other Remarks or observations: It is important to support this new activity in such remote area for WH to improve the living conditions, and water saving for cultivation and fishfarming.
Contact person completing form: Dr.Gamal El-Kassar
Contact details National Water Research Center - Water Resource Research Institute (WMRI) -Egypt

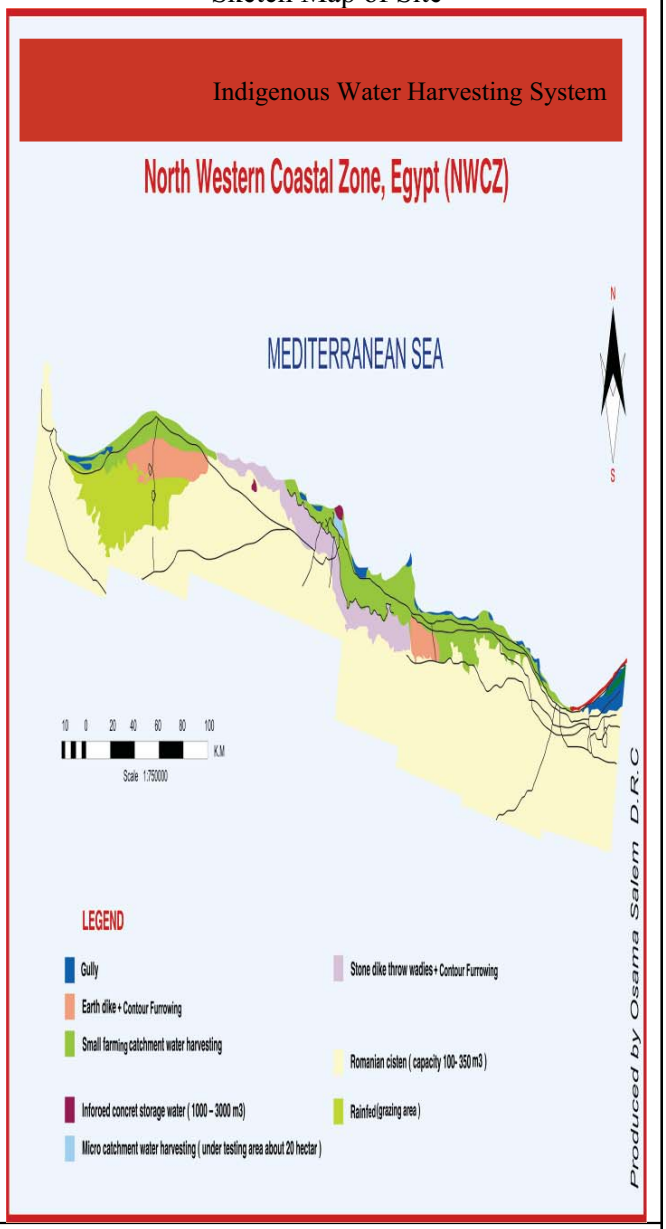
Legend for Water harvesting schemes in this site		
1. Open Pond - excavated in natural conditions (Qaroun lake)		
	2. Water Ponds	
	3. WH for fishing and new community	
4. Runoff Water Harvesting (Agricultural/Homestead Use)		
5. Agricultural drainage water harvesting (diversions) for small scale irrigation		
	6. Spate Irrigation	
7. Recharge Structures (diversion canal water to fishfarming)		
8. Water harvesting Measures/ Soil and Water Conservation		

Sample of the old living organism in the area (protected Site)



canal for flowing the available drainage water to Fish farming (300 Ha)

Aum Ashtan

Date of Visit: 24-25 Oct. 07	Category: Water Harvesting- rainwater
Name of Site:*Um Ashtan- Matrouh*	Either water Harvesting; Community Irrigation or Private Public Irrigation
	Sketch Map of Site 
Geographic location of practice: The study area lies in Wadi Umm Ashtan, Marsa Matrouh Governorate between longitude 27o 00` 00\\ & 27o 02` 30\\ East and latitude 31o 17` 20\\ & 31o 22` 20\\ North.	
(GPS) Coordinates: 30 22 50 N, 27 22 37.8 E	
Description of the Community: (Including no of beneficiaries; gender groups; number of households; names of villages; overall population; etc1. The site is considered for the BP activities for rain fed irrigation and cultivation of new lands, international agencies support	

this project and make detail study and mapping; classification was performed for the study area, and the image data subjected the necessary geometric correction. About 3000 householders are benefited from the activities, lot of women are working in the area.

Characteristics of the area: rangeland, rocky and Sabakha area; They represent the costal area of western desert in Egypt.

Climate (AEZ) + Description: long hot summer months and mild winter 10-30°c respectively. The Northwest Coast of Egypt forms a belt about 20 Km deep, which extends for about 500 Km between Amria (20 Km west of Alexandria) and El Salloum near the borders with Libya.

Average annual rainfall (mm) 134 mm/year	
Months of Short Rains:	Nov. December
Months of Main Rains:	Jan. march

Mean annual ref. crop Evapotranspiration (mm): 1800 mm/year

Predominant soil type:	Quaternary

Soil types and properties are highly influenced by geomorphic and pedagogic factors. The main soil units could be summarized as follows:
• Coastal monolithic sand dunes.
• Soils of the lagoon depressions

Topography:	Mountain areas with some places are flat for cultivations

Slope: some places are steep for about 50-100 cm/km

Erosion:	
Period of year during which used:	rainy season
Period of year during which benefits utilized:	winter period

Water Source: Water resources are mainly that of rainfall, groundwater resources are limited and usually of low quality especially with respect to varied salinity content

Cultivated area: mainly wheat, with some barseem (for livestock)and vegetable

Technical Description: (Please describe in about 250 words the background of the practice, how it is used, details of how the site is used, its components, how it achieves its objectives and its main purpose - For example if it is used for drinking water, or the watering of livestock and community drinking, or irrigation etc.) The plateau is considered to be the catchment area, whereas the piedmont plain and the coastal zone represent the collecting basin of runoff. The high areas are dissected with several tight and deep wadis, especially in the eastern part. All of these wadis allocated in suitable rainfall belt. Many depression areas with small size are distributed in the piedmont and coastal plain, the runoff and fine sediment collect and consist small water harvesting farms (Figs, olive, and grapes). The obstruction dike can be conducted in the wadis to decrease the runoff speed for helping the penetration of water in the soil profile and increasing the soil depth by the sedimentation. Remote sensing

Technical Details: (Describe the studies that were carried out before implementation, any design manuals or guidelines that were used for implementation, Relevant Reports and Design Data used in Designs, and any major calculations made including runoff, available water supplies irrigation area or number of people supplied with water etc.).Different types of geology constructions are covered the northwestern Coastal zone of Egypt. Libyan plateau has a dominant on most area, Two hundred eighteen wades rip the plateau, each one represent a watershed area which determine by water divided line. . The local farmers exploited limited area of this zone by carrying out different types of indigenous water harvesting systems, i.e. water spreading systems for cereal area, hattya (small farming water harvesting system) for cultivating fruit trees and gully system for vegetable crops…etc. About 10000 Km2 from Alexandria to Sallum City are covered by rainfall ranged between 150-80 mm yearly as average.	
Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The result of the BP are clear and cultivation of new crops are fine, the farmers gained from this activities and their income improve, also the Gov. encourage the extent of such activities and arrange for special training for sustainability.	Limitations: Describe the conditions or situations where it does not perform well and conditions that will restrict its wider application. The application is fine and its outcomes are clear only the number of farmers need to be increase in such ruler area!, also the maintenance of the system is costly for farmers (as heard from them) after running out the available funds from the project. Technical training are needed and to form strong organization WUA for the site.
Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. The given practices for WH could be used in all other villages in the western coast of the country where available rains in rainy season, only limitation is some funds and organization of farmers.	Effectiveness: (Describe whether it has achieved its objectives, how well it has done and the general strengths of the practice and whether it has in fact achieved what it set out to do. The used BP techniques are the best way for this area (no other water sources), the farmer's gains lots and the living standard in the community improved. The situation would be better if more farmers participated in the operation and improve other use of water like livestock and private farming.
Other Sites where used: Some of this practice are used in smaller scale in nearby villages (farmers use their own WH system for rains); (example of these activities are given in the report), and in the flowing parts.	
Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) . No figure about the cost of the introduced WH techniques, (international funds), but is seems to be costly, also the farmers said there is some limitations for	Operation and Maintenance arrangements: (Who manages, operates and maintains the works, how this is funded, contributions levied per user, percentage of payment received against amounts requested, any assistance and support received from Government or other organizations, etc). The need for formation of proper Water User Association for site operation, at the moment these activities is the responsibility of the local Gov., the farmers are worker with the local Gov. but more training are needed.

O&M and more training is needed.	
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock). The benefits of this BP site are clear and the farmers are happy with these results. The site has no other source of water rather than this rain source, some other practices such as livestock and Poultry are there.	Water User Association or User Group: (Provide details of the type of organization, how it works and elects members, number of members and all other pertinent details). As said before the need for formation of WUA; to diagnose the various aspects of performance of Water Users Associations that has been established within other areas;. To provide feedback to the project about the factors affecting WUA performance, and their implications for the WUA formation process. Formation of the work team • Setting relevant criteria for selection of a representative sample of Works for the exploratory survey • Collection Of basic data of the WUAs for the selection process • Selection of the targeted WUAs of the exploratory survey.
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: The beneficiaries are the population of the region which will provide water to serve farmers in irrigation, as well as providing water for drinking and industry, will improve the economy of that region Who are the main beneficiaries	Enabling Environment: (Policies, design standards and manuals that made the concept possible, where the community obtained the idea, was it demand based or introduced by Government or private sector initiatives, etc.) Environmental concerns and increasing scarcity of water resources and the aim for sustainable development, require to look into the wider consequences of water resources management options and emphasize the importance of the studies at basin level. It is important to take into account that water management techniques alone cannot solve water scarcity problems, sound policies need to be formulated and implemented to improve water management and increase water use beneficiary involvement demand based interventions
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The project's staff started to prepare some training program for more maintenance and cultivation. It is planned to organize some meetings with engineers in the site for work arrangement and awareness.	Extension support: (Details of any extension services provided and whether any help is given in assessing annual O&M needs and preparing costs and how the community has benefited from this). Assistance from project staff are started to produce O&M manual and required training.
Environment benefits: (Whether it has been completed as part of part of watershed development or integrated	Social/Cultural acceptability: No specific activities different than other place, only the regular meetings with themselves or project's staff which considered

management approach, how it fits in, visible benefits archived in terms or water availability, reduction in erosion, vegetative growth etc). The situation in the site is much better than other similar villages with no such new practices regarding the environmental issue, the awareness in the site is acceptable one farmers help in different activities for cleaning the site. Sustainability economic aspects cultural environmental aspects technical	as a new activities.
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.). The given BP is the only way to get fresh water in the site, the situation now is much better that before and lots of new activities could be found.	Disadvantages: (Constraints that restrict its effectiveness, the risks involved in its developments, the conditions under which it will not work or have reduced impact etc.). No specific disadvantages could be found, only the limitation of financial support for new WH and the training needs.
Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice ;) . The only limitation in the site is available funds, scaling this BP of WH is costly and also need assistance from farmers, these constraints are limiting the process. If these conditions are managed lots of benefits could be gained to the region. The Gov. and local leaders are working now to sustain the current activities and to extent its benefits.	What is potential for applying all/parts of initiative elsewhere?
	(Score from 1 to 10 on list below with 10 being highly applicable)
	I [8] Transfer of practice to another group/culture/land-use system, etc.
	II [4] Easy to transfer the practice, but with minor adaptations for local conditions
	III [5] Transfer possible, but significant modifications/prerequisites to consider.

	IV [7] Difficult to transfer the practice. Need experienced support.
	V [1] It would be impossible to transfer the practice. Too site specific.
	Other specific remarks: (e.g., agreements, regulations, provisions regarding Intellectual Property Rights, etc.) The need for WUA to assist the current operation and also still some mis-using of (water, land) could be found. So the need to strong regulation and penalties are recommended,

Best Practices: (Why this site/ case is considered to be a successful best practice; express this success in qualitative or quantitative terms; whether all or only part of the practices of the site can be considered best Practice - name them and give reasons why and provide any Conclusion and Recommendations). Small Farming, Cereal location, Pant species, tree age and housing in watershed area of Wadi um Ashtan were surveyed for the site as BP in March 2001 .

Plant Flora dominating in Wadi Um Ashtan was studied. 32 pointed were surveyed by using Geographical information system sensitively. This data were computerized and analyzed. There are seven earth dikes and eleven stone dikes inside Um Ashtan site

Contact Organization: (For further information; site visits' etc)

Type of organization:	Contact person: Dr. Mohamed Abd El-Motaleb
[√] government organization	Contact details Water Resource Research Institute-NWRC-Cairo Egypt
[ ] private organization	
[ ] NGO &/or CBO	
[√] international agency	
[ ] other:	

Lessons learnt: (at various stages of the realization of the works, describe any lessons learnt that would improve upon future similar interventions). The traditional cultivation of Olive tress for example will not succeed, so after many trials the project use the given planting techniques (desert areas- and need certain variety of trees; the farmers their know these ways)

Planning: The planning include the following items: Small water basins, and Small land catchment, with some Road and Contour ridges

Design

Construction: Different activities and small water structures and rain measurement were installed

Implementation: I would like to give some of the findings of the local farmers were used; There are also many new cisterns that have been excavated in the last forty. They are also the cemented

constructed water reservoirs in the areas not suitable for cisterns excavation; in friable soils.
Cisterns: The cisterns are constructed below ground at the lowest level of a collection basin or of a small stream to entrap surface or stream runoff.
Cisterns are excavated near the houses within the primary farm unit. The excavation is done with chisels and hammers or other hand tools in hard to rocky soils. Care is taken not to fracture the surrounding rock and to avoid cracks or fissures in the cistern's walls.

Concrete Reservoirs: These cemented water reservoirs are constructed in the areas not suitable for cisterns excavation; in friable soils. These reservoirs are excavated and encased with concrete or masonry walls. The floor is made of concrete and reinforced concrete is used for the covering. The cover is sligh

O&M: Insufficient O&M budget and training are needed. Monitoring regarding water management and operational management of WUAs is essential.

Beneficiary involvement: Only the current activities are training for farmer's leaders and the need fort formation of WUA.

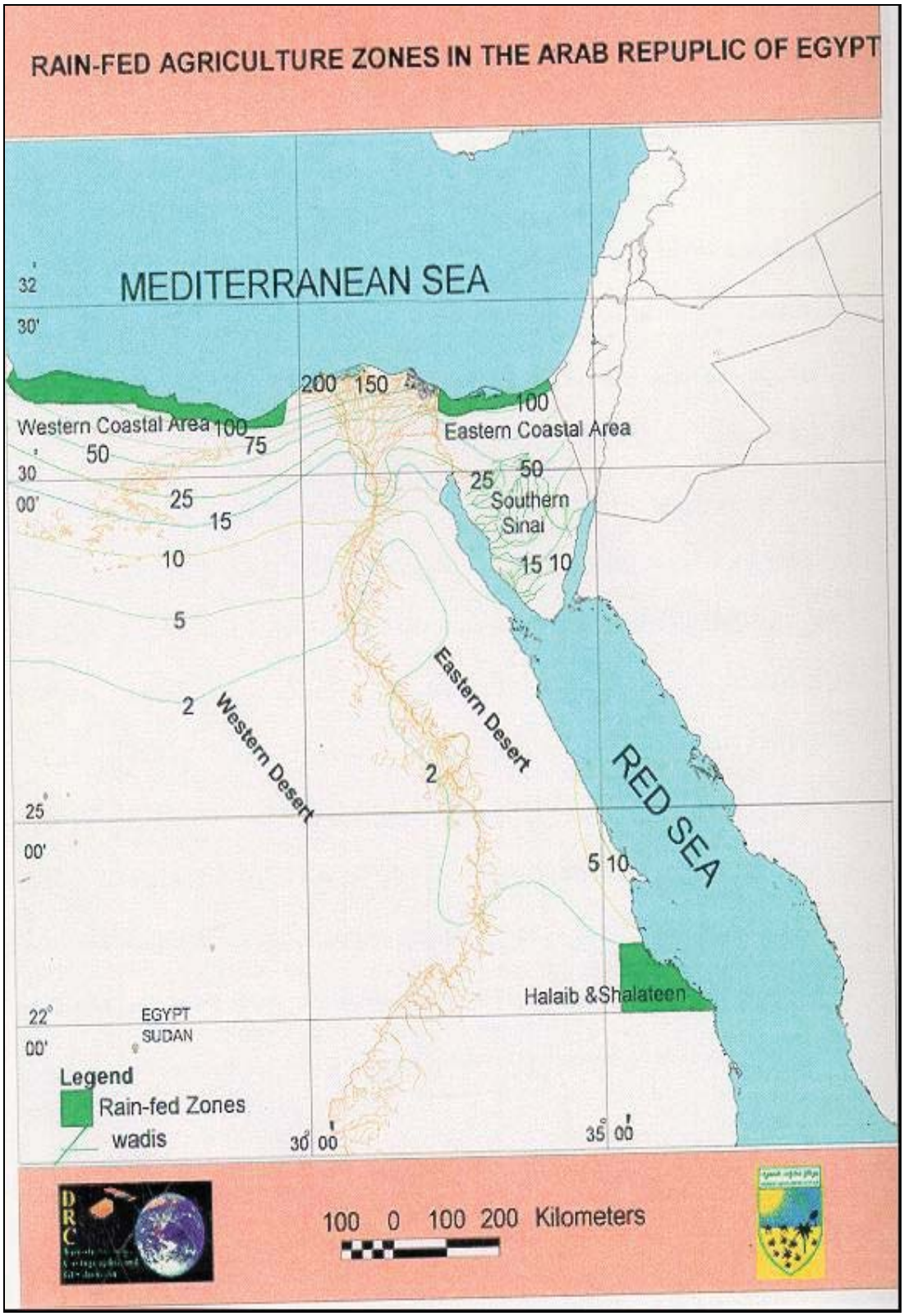
Realization of benefits: Such as markets; achieving better returns - crop selection &/or market linkages etc). The management tool has two parts. The first is the assessment procedure, in which various water resources are assessed. The second is management strategy formulation, which enables practical management options to be identified and considered once the effects have been assessed.

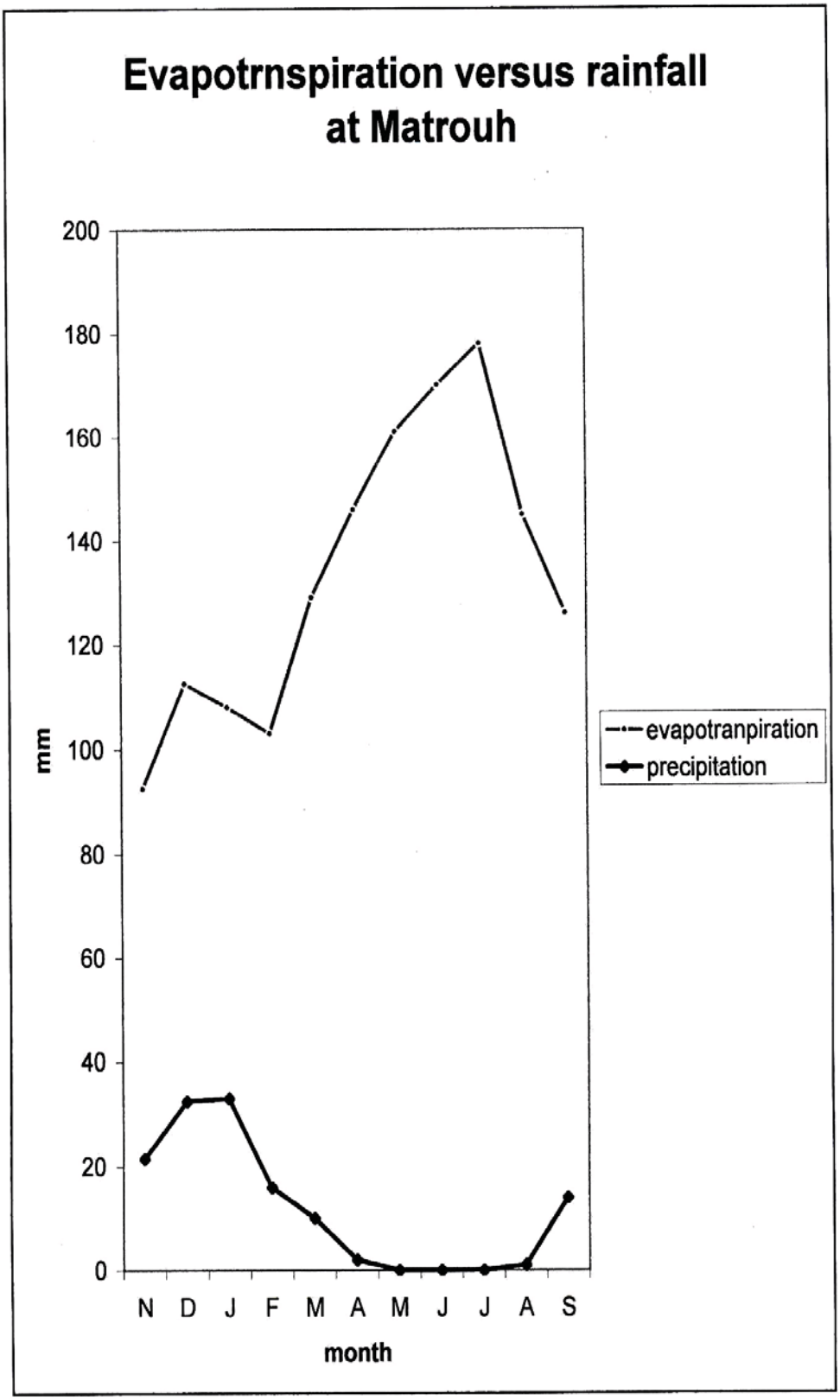
Other Remarks or observations: The Bedouins in the region use two different kinds of earthen reservoirs. The first are lined reservoirs build according to engineering principals and utilizing materials from outside the region, e.g. concrete, or iron. These kinds of reservoirs are extremely expensive and are usually built by the local administration of Matrouh governorate. The second kind of reservoirs is what Bedouins call "Nashou". These are established cisterns under the surface of a plateau. Because of the topographical soil conditions, the selection of a suitable place for building such a cistern is of great importance. The Bedouins have sufficient experience in this. Material and labor are of primary concern when selecting a water-harvesting farming scheme. For most Beduins (people lives in Egyptian Desert), keeping livestock is not only a source of income, but a way of life. Farmers' prestige is closely correlated with the size of their herd.

Contact person completing form: Dr.Gamal El-Kassar and Dr. Mohamed Abd El-Motaleb

Contact details National Water Research Center - Water Resource Research Institute (WRRI) -Egypt

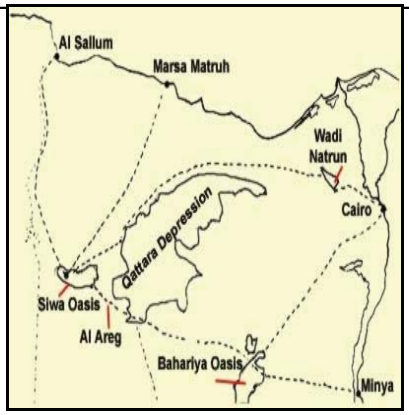
Legend for Water harvesting schemes in the site	
1. Open Pond - excavated in natural conditions	
2. Crescent shaped dam/Water Ponds/Pans systems	
3. Small Dam - earth embankment	
4. Spring Development and other uses	
5. Runoff Water Harvesting (Domestic Use)	
6. Runoff Water Harvesting (Agricultural/Homestead Use)	
7. Rock and other surface catchment systems	
8 River water harvesting (diversions) for small scale irrigation	
9. Spate Irrigation	
10. Recharge Structures	
11. Water harvesting Measures/ Soil and Water Conservation techniques on arable rain fed lands	
Typical WH Practice by Cistern	


RAIN-FED AGRICULTURE ZONES IN THE ARAB REPUPLIC OF EGYPT
MEDITERRANEAN SEA
32
30'
200
150
100
Western Coastal Area
100
75
50
Eastern Coastal Area
30
00'
25
50
25
Southern
Sinai
15
10
15
10
5
2
Western Desert
Eastern Desert
2
RED SEA
25
00'
5
10
Halaib &Shalateen
22
00'
EGYPT
SUDAN
Legend
Rain-fed Zones
wadis
30 00
35 00
100 0 100 200 Kilometers
DRC


Evapotrnspiration versus rainfall at Matrouh
200
180
160
140
120
100
80
60
40
20
0
mm
N D J F M A M J J A S
month
evapotranpiration
precipitation

WH-Siwa Oasis

Date of Visit: 8-9 November 2007	Category: Water Harvesting (Groundwater activities)
Name of Site: Siwa Oasis	



Sketch Map of Site

(GPS) Coordinates:(29°00’ to 29°18’ E and 30°52’ to 20°38’N).	
Average annual rainfall (mm). 60 m m/year	
Months of Short Rains:	November-December
Months of Main Rains:	Annual rainfall is about100 mm with a maximum of 25 mm in January
Mean annual ref. crop Evapotranspiration (mm): about 1700 mm/year	
Slope:	almost flat area with some water springs
Period of year during which used:	summer season
Period of year during which	all the year

benefits utilized:	

Cultivated area: The target area is about 4000 ha.

Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The current cultivation in the site is matching the target plan for extension, the farmers gain from this BP work and raise their income, other main activities also is going on. The main concern of drinking water is solved now.

Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. The used practices could be used in places where groundwater table is affecting the root zone of crops and water logging in the soils, some places Egypt safer from the same problems (lower Egypt in old lands), and in the Nile basin countries may be places like Sudan and coastal zones around lake Victoria in Uganda and the coast in Tanzania.

Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) The total projected cost of this BP activities in the last 10 years reach about 22 Million US$, for installing about 120 Groundwater wells, still some of them flowing with no control, (springs), some more works are needed for controlling some wells and the main problems of drainage water and high water tables in some spots (water logging) . At the MWRI- Groundwater Sector, is planning to establish some new wells according to the current Drainage Water Research Institute NWRC

Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. One of the aim target of this BP activities for water logging problems is to protect the current and well established cultivation of Palm-Trees in the Oases, The date crops in the place is well known in the country, as a results of this BP the situation now is fine and the yield of this crop is improved, with the income of the farmers as well.

Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users? How and why are they involved in the practice? Actual level of beneficiary involvement under operation: many activities are carried out by farmers (all the workers are from the site), also other stakeholders assess in achieving the target of the works. Yes still no legal formation of the organization, but the process is going and may in the next few months they will play their role in the site more effectively.

Who are the main beneficiaries	beneficiary involvement demand based interventions

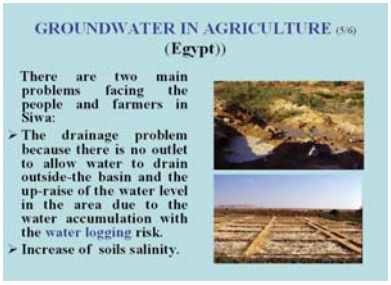
Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The project's staff started to prepare some training program for more maintenance and cultivation. It is planned to organize some meetings with MWRI and MALR engineers in the site for work arrangement and awareness; (during the formation of WUA)

Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved

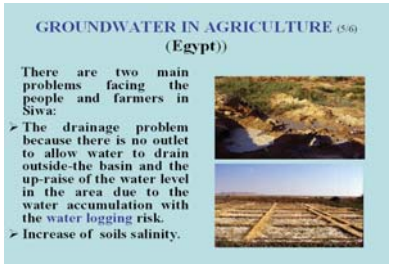
in terms or water availability, reduction in erosion, vegetative growth etc). The output of the BP activities in the site is clear, and its environmental impact is positive. Environmental concerns and increasing scarcity of water resources in the site (groundwater) and the aim for sustainable development, require looking into the wider consequences of water management options and emphasizing the importance of the studies at basin level.	
Sustainability	economic aspects cultural environmental aspects technical
Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons. The advantages of this BP are very clear and the cultivation situation is improving. The number of farmers using the site is increasing and their income improved. The date-palm yield is back to normal (as heard from the farmers).	
Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of these practices. This issue is very important and needed by beneficiaries; the only limitation is funds and required training for operators of the Groundwater wells. The area is wide and lots of places can be used for the same BP of Water harvesting. The social activities is improving in the site and supporting these practices.	
Contact Organization: (For further information; site visits' etc)	
Type of organization:	
[√] government organization	Contact details: NWRC Kanater Cairo Egypt.
[ ] private organization	
[√] NGO &/or CBO	
[ ] international agency	
[ ] other:	
Contact person completing form: Dr.Gamal El-Kassar	

Legend for Water harvesting schemes of the Oases	
1. Manage the open Ponds from the natural springs conditions	
2. Sub-Surface irrigation,	
3. Surface drainage system	
4. groundwater Well - shallow	
5. Spring Development for other uses	
6. Runoff Water Harvesting	
7. small stream water harvesting (diversions) for small scale irrigation	

8. Spate Irrigation	
9. Soil conservation	
Detailed Map of the Oasis	
•Surface spring	
Collection of Spring Waters	
	(Ref. DRI study 2004)
Example of high water table by Time	



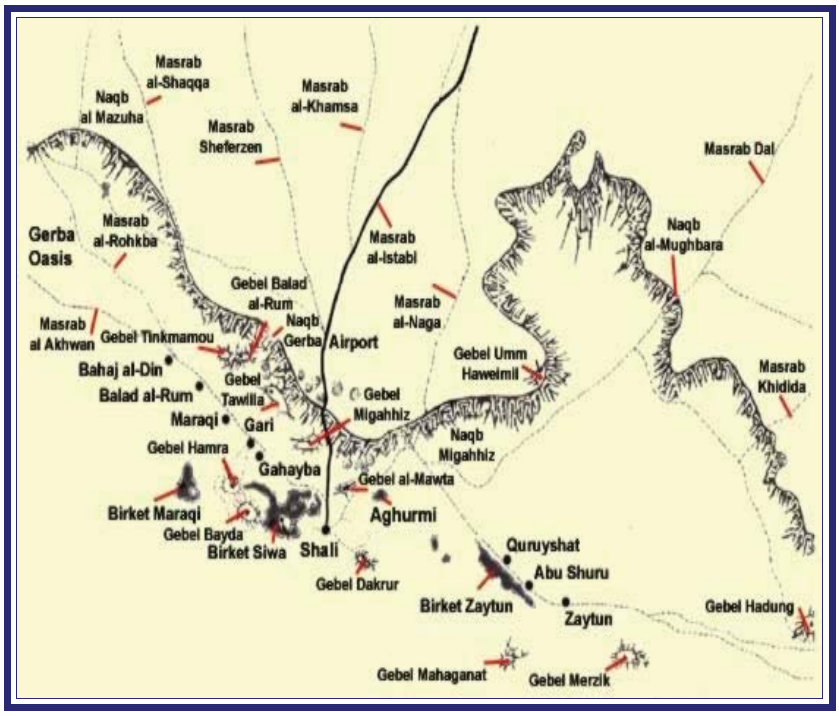
Salinity problem



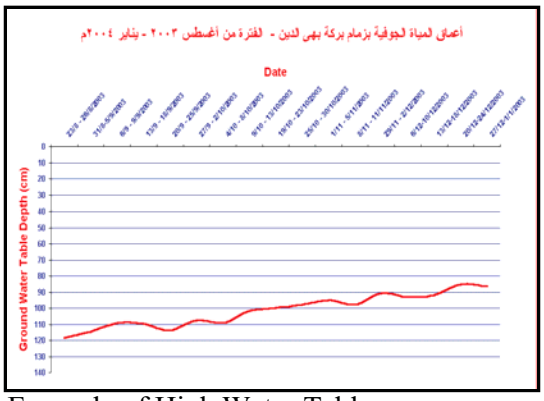
Drainage Problem

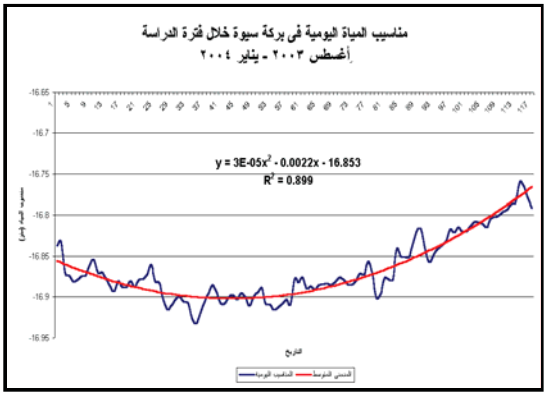
Surface spring

Collection of spring Waters



Detailed Map of the Oasis





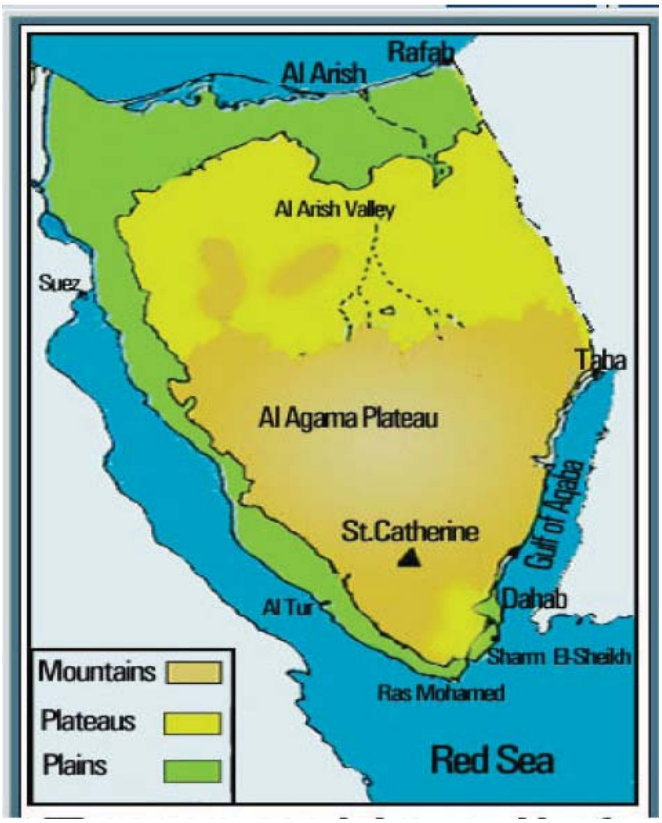
Example of High Water Table

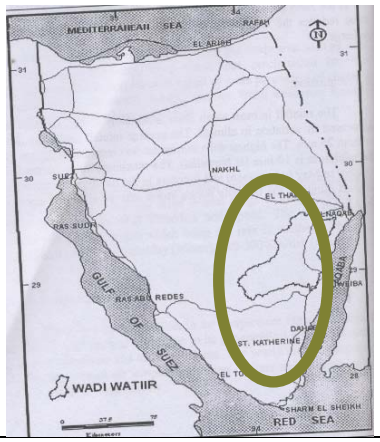
WH-Wadi Watiir

Date of Visit: 11-12 November 2007

Name of Site: Wadi Watiir

Sketch Map of Site





Geographic location of practice: it lies in the northeastern part of south Sinai.

(GPS) Coordinates: 28 04 25 N, 34 07 08 E

Characteristics of the area: rangeland, rocky and Sabakha area

Average annual rainfall (mm).150 mm/year	
Months of Short Rains:	March-April
Months of Main Rains:	April-May
Mean annual ref. crop Evapotranspiration (mm): 2000 mm/year	
Predominant soil type:	rangeland, rocky and Sabakha area
Slope: about 6-170 m/km (very steep)	
Period of year during which used:	Summer season
Period of year during which benefits utilized:	all the year
Cultivated area: The target area is about 900 ha.	
Useful in: Describe the types of area where it can be used, the conditions where it produces good results, Sites of applications, etc. The given BP would help to gain an insight into hydrology of the entire area of South-East Sinai and this is costly. Construction of dams is recommended on suitable sites along some basins to retard runoff at the same time to permit passage of collected water to feed the reservoir. Use different methods of water management techniques which considered of reliant significant to the region such as surface water storage, groundwater management, precipitation (rainfall,) enhancement, evaporation reduction, rainwater harvesting, flood control and artificial recharge.	
Geographical extent of use: The areas of the study country where it is found and the sort of areas where it could be used within the Nile Basin. The given practices for WH could be used in all other villages in Sinai and the coast of the Red Sea, where flood occurred frequently in a very storm rainy season, only limitation is some funds and organization of farmers.	
Cost: (If possible, and applicable, please indicate the total budget for the best practice, the sources of funding, the implementation period, the total cost and cost per cubic meter of water stored or per ha irrigated, beneficiary contributions, etc.) . *The socioeconomic indicators of agricultural development relating to rainwater harvesting techniques should be considered. These indicators include the land tenure system, land management, cropping patterns, farm income and sources of farm revenues, the gross margins of selected agricultural products and livestock, animal nutrition management, and the rate of profitability of farm production.*	
Benefits: (Estimate the returns achieved from the site if involves irrigation or costs saved in getting water if water for humans or livestock. The Bedouins are experienced in selecting the most appropriate water catchments areas for collecting rainwater. As would reasonably be expected, the area they select as a catchment's does not permit the water to infiltrate into the soil, is cleared of all vegetation, shaped, and smoothed. Beneficiary decides the size of catchment's area and storage tank on the basis of their personal experience in the past.	
Stakeholders and beneficiaries: (Who are the main initiators, actors, stakeholders, beneficiaries and users. How and why are they involved in the practice? Actual level of	

beneficiary involvement under operation: The beneficiaries are the population of the region which will provide water to serve farmers in irrigation, as well as providing water for drinking and industry, will improve the economy of that region

Who are the main beneficiaries	beneficiary involvement demand based interventions

Training support: (Details of any training carried out before, during and after construction and how the community has benefited from this). The project's staff started to prepare some training program for more maintenance and cultivation. It is planned to organize some meetings with engineers and WRRI staff in the site for work arrangement and awareness.

Environment benefits: (Whether it has been completed as part of part of watershed development or integrated management approach, how it fits in, visible benefits achieved in terms or water availability, reduction in erosion, vegetative growth etc). The total ground water production which can be made available from the existing unused in Wadi Watiir area can provide a total of 1700m^3/day and 2400 m^3/day for dr*inking and irrigation purposes, Respectively. The future water demand in Wadi Watiir area was 10500m^3/day, will required by the year 2017 (6500m^3/day for drinking and domestic and 4000m^3/ day for irrigation) (WRRI study in 2005).*

Sustainability	economic aspects cultural environmental aspects technical	

Advantages: (Strengths of the approach adopted, how well it fits into the community and meets its needs, is it affordable and reliable, will the community continue to operate, maintain and use it after outside assistance has gone and reasons for this etc.). Farmers have increasing awareness of the problems entailed in overgrazing, of the need to strengthen the vegetation cover, and to intensify work against soil erosion. Windbreaks and plantations of fruit trees have increased. The trend toward increasing crop yields in conjunction with diminished use of chemical fertilizers indicates the success of human efforts to sustain productivity.

Scaling Up: (Are there specific conditions or obstacles which make it impossible to replicate or transfer the practice elsewhere - e.g., a specific climate or specific cultural beliefs or social relations which are important for the success of this practice;) . The only limitation in the site is available funds, scaling this BP of WH is costly and also need assistance from farmers; these constraints are limiting the process. If these conditions are managed lots of benefits could be gained to the region. The Gov. and local leaders are working now to sustain the current activities and to extent its benefits.

Contact Organization: (For further information; site visits' etc)

Type of organization:	Contact person: Dr. Mohamed Abd El-Motaleb
[√] government organization	Contact details Water Resource Research Institute

[ ] private organization	
[ ] NGO &/or CBO	
[ ] international agency	
[√] other: Research activities WRRI	
Contact person completing form: Dr. Mohamed Abd El-Motaleb, Dr.Gamal El-Kassar	
Contact details National Water Research Center - Water Resource Research Institute (WRRI) -Egypt	
Legend for Water harvesting schemes in The site	
1. Open Pond - excavated in natural conditions	
2. Crescent shaped dam/Water Ponds/Pans	
3. Small Dam - earth embankment	
4. Sub-Surface drainage	
5. Roof Water Harvesting (Domestic Use)	
6. Runoff Water Harvesting (Domestic Use)	
7. Runoff Water Harvesting (Agricultural/Homestead Use)	
8. River water harvesting (diversions) for small scale irrigation	
9. Spate Irrigation	
10. Water harvesting Measures/ Soil and Water Conservation techniques on arable rainfed lands	

Land preparation on the site

Problem of Flooding on the site (before starting the activities of BP!)