

# Doutmenrout Development Project

## DRAFT Proposal

Edited May 2011

### PROPOSAL SUMMARY

<b>Project Profile</b>	Strengthening Douar Doutmenrout's socioeconomic sustainability, empowering local women and reinforcing the community's resiliency to seasonal weather patters, sporadic draught and long-term climate change through the creation of a dedicated, sustainable revenue stream for the local Development Association and women's cooperative, bolstering biological and agricultural diversification through the reintroduction of the Argan tree and enhancing the household and drinking water supply for the community.
<b>Project Site</b>	Douar Doutmenrout, Rural Commune Ait Ouafka Souss-Massa Draa, Tiznit Province Morocco
<b>Proponent</b>	Association Doutmenrout for Development and Cooperation
<b>Authorized Representative</b>	President of the Association: Mohammed Saidi Tel. +212-6-68-06-09-43
<b>Cooperating Organization</b>	<u>US Peace Corps - Morocco</u> <i>Samantha Dinar and David Pesnichak</i> Peace Corps Volunteers in Ait Ouafka Tel. + 212-6-59-35-28-55 Email. <a href="mailto:dinarsclub@gmail.com">dinarsclub@gmail.com</a> ; <a href="mailto:yohodaveo@gmail.com">yohodaveo@gmail.com</a> <i>Naima Oumoussa, Environment Program Assistant</i> Email. <a href="mailto:NOumoussa@MA.peacecorps.gov">NOumoussa@MA.peacecorps.gov</a> <i>Mohssine Tadlaoui, Environment Coordinator</i> Email. <a href="mailto:MTadlaoui@MA.peacecorps.gov">MTadlaoui@MA.peacecorps.gov</a>
<b>Project Dates</b>	As soon as funding is available to May 2012
<b>Total Project Cost</b>	(617,269.72) MAD / (78,934.75) USD
<b>Amount Requested</b>	(200,000 MAD) / (25,575.44 USD)
<b>Co-financing</b>	<i>Community Contribution</i> (in-kind): 105,360 MAD / 13,472.63 USD and (in cash): 85,600 MAD / 10,946.29 USD (From Local Community Charity Channels) <i>(FCIL)</i> (in cash) : (200,000 MAD) / (25,575.44 USD) <i>Department of Water and Forestry</i> (in kind) : 7,500 MAD / 959.08 USD <i>Department of Agriculture</i> (Total) (in kind): 90,013.72 MAD / 11,510.71 USD <i>High Atlas Foundation</i> (in cash): 1,300 MAD / 166.24 USD and (in kind): 3,000 MAD / 383.63 USD <i>ADEREE</i> (in kind): 4,000 MAD / 511.51 USD <i>International American Women's Association</i> (in cash): 2,500 MAD / 319.69 USD <i>INDH</i> (in cash): 100,000 MAD / 12,787.72 USD <i>Peace Corps</i> (in kind) : 18,000 MAD / 2,301.79 USD

## Statement of Need

Due to a tradition of nomadic grazing combined with compounding climate change, the harsh arid, high mountain desert ecosystem in and around the Douar Doutmenrout is experiencing: fewer but more intense rain storms, increasing erosion and soil degradation, decreasing water tables and the ineffective regeneration of erosion controlling vegetation (including Argan). The local agriculture extension centers (CT) and the regional offices of Waters and Forests characterize the area as “marginalized”. There is significant rural poverty in these areas, with an extremely high rate of infant mortality, unemployment and illiteracy. This is aggravated by a livelihood of subsistence farming and fractured family structures.

## Project Response

This project will plant almost 1400 fruit trees including 250 endemic and endangered Argan trees, help stabilize the household water supply through the incorporation of an additional well (to a total of 2 wells for 800 people) to the Douar-wide water supply system and provide 42 cubic meters of additional water storage, increase both local biological and agricultural diversity, help control erosion, and provide revenue for both the local Development Association and the local women’s cooperative. By focusing on basic infrastructure and education, this project will not only bring a necessary solar water pump and piping for irrigation and household water, but it will also provide trainings to men and women in the village on argan trees, solar energy and the use of drip irrigation in conserving water. Through the implementation of this basic infrastructure, this project will directly benefit the health and well being of the entire community in the form of a more secure household water supply that will help people adapt to seasonal and long-term climatic changes. Further, this project, which is strongly supported by the Development Association, focuses on providing social and monetary benefits that will encourage ongoing literacy and other classes to the local women at the Neddi. Because the women of the Cooperative and Neddi understand that they will reap social, monetary and educational benefits from this project, they are hence vested in the success of this project and will play an integral role in both the trainings and implementation. In addition, as this project will aid in the long-term success of the Women’s Cooperative and Neddi it will, in effect, escalate the women’s self-confidence, independence and ability to govern and control their organizations and activities. In the end, rural women and children will not only benefit economically and socially but environmentally as well.

## Goals and Objectives

### Goals:

The goals of the Doutmenrout Development Project, located within the Rural Commune of Ait Ouafka, are as follows:

- 1) The Development Association of Doutmenrout will have developed a sustainable revenue source and will have gained necessary knowledge and skills to design and implement future development projects;
- 2) The Women's Cooperative will have developed a sustainable and local raw material source of argan, almonds, apples and olives to support the activities of the Women's Cooperative and Women's Neddi and will have gained necessary knowledge and skills to maintain and utilize these new resources;
- 3) The local biological and agricultural diversification will be bolstered through the reintroduction of the argan tree;
- 4) The Development Association, Women's Cooperative and general community will be introduced to the basic concepts of climate change and environmental protection; and,
- 5) Solar technology and its benefits will be introduced as apart of the solar pump installation and training to the Development Association, Women's Cooperative and community members in order to encourage this clean, renewable energy in future development projects; and,
- 6) The household and drinking water supply for the Douar Doutmenrout will be stabilized and more resilient to seasonal and long-term climate changes.

### Objectives (outcomes):

These above goals are to be accomplished through the following actions:

- 1) *Installation of a 2.5 hectare orchard which will be serviced by a drip irrigation system.* The revenues from the sale of fruit grown in the orchard will provide the Development Association of Doutmenrout with a dedicated local and sustainable funding stream for future development projects. This orchard is to be comprised of 1 hectare of Apple trees and 0.5 hectares of Olive trees. In addition, all fruit will be available for the women's cooperative to make amlou, argan oil and other income generating products.
  - a) *Drip Irrigation Training.* A training on drip irrigation and maintenance of the new drip irrigation system will be conducted by the Department of Agriculture after the drip irrigation system is installed. The intent of this training, which will be open to all members of the community with special effort made to make it accessible to the women and children, is to educate those who will be maintaining the system in appropriate maintenance techniques. In addition, there will be a focus on how other community members can take advantage of the programs offered by the Department of Agriculture, the benefits of drip irrigation and what to expect from the system once it is operational.
- 2) *Installation of a 0.5 hectare experimental planting of Argan trees serviced by a drip irrigation system.* The re-introduction of the Argan tree will increase both biological and agricultural diversification. If regeneration of the experimental Argan plot is successful, it will encourage future Argan tree planting in the area. In addition, the Argan tree will create a local source of Argan fruit for the woman's cooperative of Doutmenrout to process both Argan oil and amlou, among others. These lucrative products will then be sold for a profit to support the women in the cooperative as well as future expansion projects.

- a) *Argan training.* A training on the planting and maintenance of the new Argan trees will be conducted by the Department of Water and Forests prior to the planting of the trees. The intent of this training, which will be open to all members of the community with special effort made to make it accessible to the women and children, is to educate those who will be planting and caring for these trees in the appropriate planting and maintenance techniques. In addition, there will be a focus on an understanding of what the community can expect throughout the Argan tree's lifecycle.
- 3) *Installation of a solar water pump.* The installation of a solar water pump to move the water from the well to the water storage facility, is not only intended to increase the sustainability of the project by using a technology that will not require monthly bills for electricity, but also to introduce the Development Association and the community to the use of renewable clean solar energy. This will be the first public use of solar energy within the Douar and it will be in a very visible location along the road from Ait Ouafka to Tafraoute.
- a) *Solar water pump training.* This training on the operation and maintenance of this specific solar water pump system will also branch out to the broader benefits of clean renewable solar energy as well as other applications for this technology throughout the community. This training will be open to all members of the community with special attention paid to those members of the Association who will be tasked with the daily operational maintenance of the equipment.
- 4) *Installation of 950 meters of piping from the water storage tank which will connect to the water distribution system within the Douar.* By connecting the water storage tank and well to the household water distribution system, the 790 residents of the Douar will have a more secure water supply system not only through the incorporation of an additional well but also by more than doubling the Douar's water storage capacity. To this end, the additional well and water storage will make the Douar more resilient to seasonal weather patterns, sporadic draught and long-term climate change.
- a) *Climate Change and Environmental Protection Training.* A training on the concepts and practical implications of climate change and environmental protection will be offered to all interested members of the community with special effort made to make it accessible to the women and children. The intent of this training is to educate all interested community members and particularly those members of the community who are active in community development activities to the effects they can expect from climate change and how best to adapt their development activities to preserve the environment and work toward sustainable development.

### Community Description

The Commune of Ait Ouafka consists of 13 douars comprising a total of about 5400 people. The Douar Doutmenrout, located 500 meters from Souk, Ait Ouafka's center called I-xmis, has a population of 790 people. A significant number of the men from these communities seek or have found employment in Morocco's urban areas and abroad. As a result, many families receive outside remittances from men living outside the community. To this extent, 65% of the population in Ait Ouafka and Douar Doutmenrout are women. As a result of this high percentage, women hold prominent roles in the community associations in the area.

The main livelihood in the Douar Doutmenrout and surrounding region is subsistence farming and grazing. Local agriculture is organized on traditional terraces and in lower and flatter ephemeral river valleys, maintained by irrigation canals. Most farmers use natural fertilizers and traditional farming methods. The main productions are cereals (barley) and fruits (especially olive, almond, fig and some apple).

As the local ecosystem deteriorates from erosion and soil degradation, so do the roads and critical infrastructures. This puts even more pressure on the local environment and generates further exodus as families struggle in the face of decreasing incomes, as well as the local community's ability to provide education and inhibits trade and social ties.

### Environmental Description

Douar Doutmenrout is located within the commune of Ait Ouafka, a rural commune located between Tafraoute and Tiznit. Sitting at a little over 1200 m in elevation, Ait Ouafka is on average about 10 degrees cooler than Tafraoute and experiences extreme temperature swings due to its arid high desert ecosystem. Ait Ouafka routinely gets below freezing (0 degrees Celsius or 32 degrees Fahrenheit) in the winter and consistently reaches 44 degrees Celsius (110 degrees Fahrenheit) for the months of July and August. In the summer of 2010, temperatures exceed 52 degrees Celsius (125 degrees Fahrenheit) during the hottest times in the summer.

As is typical of high desert ecosystems, there are few natural large trees in the area. In addition, surrounding Souk and the Douar Doutmenrout, there are few trees of any kind due to centuries of overgrazing and stripping for fuel wood. Due to the lack of trees, specifically Argan trees and other root stabilizing plants, soil erosion and agricultural degradation is the most visible environmental problem. All around the village, there are gullies and ravines. In addition, evidence of collapsed terracing caused by mud slides during heavy rain events are a common site on all hillsides. Erosion in the area is caused from multiple sources: climatic (stronger and stronger rains) and anthropogenic (deforestation and overgrazing).

According to the Initial National Communication to the UNFCCC, annual temperatures are expected to increase between 0.6 and 1.1 degrees Celsius and average rainfall volumes are to decrease by 4% by the year 2020. For the Souss Massa Draa and the Douar Doutmenrout, these climactic shifts will increase the frequency and intensity of draughts while winter rains will become increasingly concentrated within a shorter period of time. This increased drought intensity and shift in rain patterns will further exaggerate the erosion and soil degradation problems facing the region. For agriculture, these climactic shifts will mean a decrease in cereal yields by 50% in dry years and 10% in normal years. In addition, there will be an increase of 7% to 12% in the needs for the water necessary for irrigated crops. Further, according to the UNFCCC, "Given that 33% of the total population and 70% of the poor are expected to live in rural areas in 2020, the agricultural performance will be a detriment for the living conditions of the poorest social strata".

The area also suffers from a lack of natural perennial water sources in the area such as rivers or lakes. As a result, all household and irrigation water is dependent upon underground reserves. In addition, the soil is composed heavily of sand and silt with very little natural humus, so rain water is encouraged to runoff quickly and does not easily soak deep into the soil.

## Organizational Information

### Association Doutmenrout

The mission of the Association of Doutmenrout is to help improve the lives of the people of Douar Doutmenrout, especially the poor, underserved and handicapped. The Association was started in the year 2000 and currently has 48 members with 13 members sitting on the council. At present, twelve of the members are women. Elections are held every 3 years for council members with this year, 2011, being an election year. The current president, Mr. Mohammed Saïdy has led the association for two terms. To be a member, residents should make an annual contribution with a value of 100dh per year. The association has scheduled meetings twice a year and otherwise meets on an as needed basis.

Some previous projects that the Association has completed or contributed to are:

- Providing equipment for the Women's Cooperative of Doutmenrout, including purchasing argan to produce argan oil and amalou.
- Organizing literacy classes at the women's neddi.
- Built a bridge over the river to connect the Douar to Souk L-xmis.
- Provided labor to dig the well which is being used in this project to bring water to the storage tank
- Provided labor to build the storage tank being used in this project for irrigation and drinking water
- Planted olive trees at the school and dormitories
- Fixed the mosque
- Built a home for the Imam of the mosque
- Built a place for both men and women to clean before prayer
- Procured wheelchairs and crutches for handicapped citizens
- Cooperated and collaborated with other associations in the region and province
- Worked with other local communes to get bikes for girls at the local middle school
- Got backpacks and uniforms for both male and female students
- Created a sports club, including a football team with uniforms



In addition to these projects the association has numerous other endeavors they hope to complete in the future including: another well for irrigation, an electric argan and electricity for the women's neddi building.

### Women's Cooperative and Neddi

The mission of the women's cooperative and neddi is to help women improve their lives and their livelihoods. The women's neddi was created in 2001, with the cooperation of the Moroccan government and the Association of Doutmenrout, but was not active until 2009, while the women's cooperative was started in 2003 and also just began regular activities. Although 56 women participate in the club, currently the cooperative is functioning with only the council made up of 11 women. Like the Association of Doutmenrout the cooperative's council holds elections every three years with the next election scheduled for March 2011. This year's election is anticipated to grow the cooperative's



membership by involving more women from the club. Currently the women's club holds literacy classes 6 days a week for four hours per day with a usual attendance of around 30 women. The women at the neddi hope to start a kindergarten in the future for young children with some of the proceeds from the cooperative's earnings. The cooperative is currently producing several products including argan oil, amalou, cakes and candies. With their sales the cooperative keeps a little money for its savings and then divides the rest of the income between the women according to their contributions. As time goes on the women aspire to grow the cooperative, become more self sufficient and prosperous.

## Contributing Organizations

NAME AND CONTACT INFORMATION	ORGANIZATIONAL MISSION / PURPOSE	REQUESTED ROLE	VALUE OF CONTRIBUTION IN MAD (In Cash and In Kind)
Association Doutmenrout for Development and Cooperation President: Mohammed Saïdy Tel: 06 68 06 09 43	To support and coordinate development projects which serve the people of Douar Doutmenrout.	<ul style="list-style-type: none"> <li>* Labor contributions for tree planting, installation of water pipeline and valves and drip irrigation system</li> <li>* Receive training in solar pump maintenance, argan planting and installation and maintenance of drip irrigation</li> <li>* Responsibility for maintaining project components to receive economic and social benefits</li> <li>* Coordination for contribution of apple trees</li> </ul>	190,956 MAD (Total Community Contribution including 85,600 MAD in local community charity contributions)
Womens' Cooperative of Doutmenrout Fatim Saïdy Tel: 06 68 06 09 43	To provide an organizational structure in which interested women residing within the Douar Doutmenrout can earn a living by participating in agricultural value added activities such as the production of amlou, argan oil and baking candies.	<ul style="list-style-type: none"> <li>* Labor contributions supporting installation (i.e. food, tea, water for installation workers)</li> <li>* Receive training in argan planting, maintenance and expectations</li> <li>* Harvesting of fruit tree yields for producing sellable products to receive economic and social benefits</li> </ul>	
Department of Agriculture Taфраoute Hannane Tel: 05 28 80 10 02	<ol style="list-style-type: none"> <li>1. The search for and mobilization of property to extend the agricultural zones and develop high value added crops;</li> <li>2. The encouragement to enhance the value of agricultural products through the setting up of new irrigation systems, the equipping of farms and the packaging and commercialization of products;</li> <li>3. The promotion of agricultural investments and the implementation of partnerships with investors.</li> </ol>	<ul style="list-style-type: none"> <li>* Donation of olive and almond trees</li> <li>* Financial assistance towards drip irrigation system</li> <li>* Training of drip irrigation system</li> </ul>	86,013.72 MAD
Agadir Department of Agriculture	(See Department of Agriculture - Taфраoute)	<ul style="list-style-type: none"> <li>* Donation of apple trees</li> </ul>	4,000 MAD

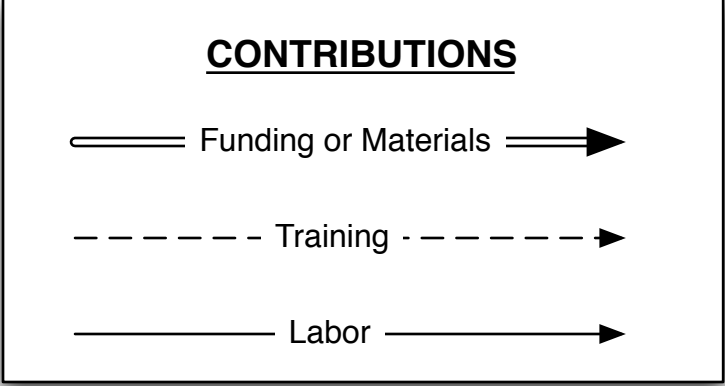
NAME AND CONTACT INFORMATION	ORGANIZATIONAL MISSION / PURPOSE	REQUESTED ROLE	VALUE OF CONTRIBUTION IN MAD (In Cash and In Kind)
<p>High Commissariat for Water and Forests - Tiznit Province Khalifa Salhaoui Tel: 05-28-86-20-77 Email: <a href="mailto:eftiznit@menara.ma">eftiznit@menara.ma</a></p>	<p>1. Develop and implement government policy in the fields of conservation and sustainable development of forest resources, alfa, pastoral activities in the land under the forest regime, and the development of hunting, inland fish and parks and reserves Natural; 2. Coordinating the establishment of institutional mechanisms for the preparation, execution, monitoring and evaluation of government policy in the fight against desertification; 3. Participate in the development and implementation of government policy on rural development.</p>	<ul style="list-style-type: none"> <li>* Donation of argan trees</li> <li>* Argan tree training</li> </ul>	<p style="text-align: center;">7,500 MAD</p>
<p>Agency for Development of Renewable Energy and Energy Efficiency (ADEREE)</p>	<p>1. Conceive and implement action plans in the domains of renewable energy and energy efficiency as well as environmental programs linked to its activities in the sector 2. Coordinate the program of energy audits and ensure its success 3. Propose to the government modifications of the incentive framework for renewable energy and the more efficient use of energy 4. Propose and put in place norms and standards for materials and equipment that consume energy 5. Conceive and implement pilot projects to demonstrate the viability of new solutions for renewable energy and energy efficiency or help their adoption</p>	<ul style="list-style-type: none"> <li>* Solar pump analysis feasibility study</li> <li>* Solar pump training</li> </ul>	<p style="text-align: center;">4,000 MAD</p>



NAME AND CONTACT INFORMATION	ORGANIZATIONAL MISSION / PURPOSE	REQUESTED ROLE	VALUE OF CONTRIBUTION IN MAD (In Cash and In Kind)
<p>U.S. Peace Corps - Morocco Volunteers in Commune Ait Ouafka: David Pesnichak and Sami Dinar Tel: 06 67 55 19 74 Email: dinarsclub@gmail.com</p> <p>Peace Corps - Morocco 2, Rue Abou Marouane Essaadi Agdal, Rabat 10100</p>	<ol style="list-style-type: none"> <li>1. Helping the people of interested countries in meeting their need for trained men and women.</li> <li>2. Helping promote a better understanding of Americans on the part of the peoples served.</li> <li>3. Helping promote a better understanding of other peoples on the part of Americans</li> </ol>	<p>* Coordination and capacity building</p>	<p>18,000 MAD</p>
<p>American International Women's Club</p> <p>Mme Stella Fizazi</p> <p>Email: yayastella@hotmail.com</p>	<ol style="list-style-type: none"> <li>1. To provide financial and other support to those, in Morocco, who are most vulnerable,</li> <li>2. To promote a better understanding of Morocco,</li> <li>3. To unite English-speaking women of all nationalities, especially in welcoming newcomers to our community.</li> </ol>	<p>* Monetary Contribution for transportation of all fruit trees and the purchase of apple trees</p>	<p>2,500 MAD</p>

NAME AND CONTACT INFORMATION	ORGANIZATIONAL MISSION / PURPOSE	REQUESTED ROLE	VALUE OF CONTRIBUTION IN MAD (In Cash and In Kind)
<p>INDH (National Initiative for Human Development)</p> <p>Si Bensellam</p>	<p>The Initiative aims to reduce poverty, precariousness and social exclusion, through actions to:</p> <ul style="list-style-type: none"> <li>- Support to income generating activities,</li> <li>- Capacity building,</li> <li>- Improvement of access to services and basic infrastructure (education, health, religion, road, water and sanitation, environmental protection etc..)</li> <li>- Support for people vulnerable.</li> </ul>	<p>* Monetary Contribution to purchase of water regulation valves, the majority of necessary fencing and fence posts, as well as contributing to the cost of transportation for fencing and water piping.</p>	<p>100,000 MAD</p>
<p>High Atlas Foundation Yossef Ben-Meir, Ph.D. President</p> <p><a href="mailto:yossef@highatlasfoundation.org">yossef@highatlasfoundation.org</a>  </p> <p>Tel: 05 23 32 62 87</p>	<p>1) Promote local community participation in the planning and implementation of socio-economic and environmental projects; and 2) Build knowledge of sustainable development practices through applied activities (including community workshops and training sessions) and through scholarly research both within Morocco and internationally.</p>	<p>* Monetary contribution to purchase of the olive and almond trees (after subsidies from Dept of Agriculture)</p>	<p>1,300 MAD</p>

NAME AND CONTACT INFORMATION	ORGANIZATIONAL MISSION / PURPOSE	REQUESTED ROLE	VALUE OF CONTRIBUTION IN MAD (In Cash and In Kind)
<p>FCIL</p> <p>Mariame Benaddy 21, Rue Abou Derr, BP 8093, Rabat – Agdal, Maroc Tel: 212(0)37671075 Fax: 212(0)37673403</p>		<p>* Funding for solar pump, parts, installation and training</p>	<p>TOTAL FUNDING REQUESTED: (200,000 MAD)</p>



### Project Description

This project will increase the resilience of the local ecosystem by combating erosion and regenerate degraded soils, through the experimental reintroduction of the Argan tree, in combination with other fruit trees. The Argan trees will be planted on an irrigated plot of land owned by the Development Association of Doutmenrout along with other fruit trees in order to determine its regenerative capabilities in the area immediately adjacent to the Douar of Doutmenrout.

Argan trees are endemic to the region but no longer exist near Souk or Doutmenrout. Argan trees exist at both higher and lower elevations surrounding Doutmenrout with the nearest grove being 1.5 kilometers away. However, there is a local belief that Argan trees do not grow in the immediate vicinity due to the cold winter temperatures and strong seasonal winds.

A capacity-building program will be established through trainings on maintaining and installing the solar water pump system, the first in the area, as well as how to grow and maintain the Argan tree orchard, how to maintain the drip irrigation system and how to take advantage of programs offered by the Department of Agriculture, and climate change and environmental protection. In addition, due to the income generating qualities of the fruit trees and the Argan trees, this new 3 hectare orchard, irrigated by drip irrigation, will serve as both a sustainable income source for the Development Association of Doutmenrout and a raw material source (Almond, Argan, Olive and Apple specifically) for the local Women's Cooperative.

Overall, this project will plant almost 1400 trees including 250 Argan trees, help stabilize the household water supply through the incorporation of an additional well (a total of 2 wells) to the Douar-wide water supply system and provide 42 cubic meters of additional water storage, and provide revenue for both the local Development Association and the local women's cooperative. In the end, rural women and children will not only benefit economically, but environmentally, in an area faced with significant land degradation.

This project is supported by the Department of Water and Forests, the US Peace Corps, the High Atlas Foundation, and the Department of Agriculture.

### Project History

This project, which began in 2003 and was partially completed in 2004, was originally implemented as part of a larger tree planting project by USAID, the Peace Corps, the High Atlas Foundation, Marrakech 21, the Agricultural Extension Center CT I4 09 of Tafraout, the High Atlas Regional Office of Water and Forests and the Development Association for Doutmenrout. Coordination of the project halted in 2004, however, due to the loss of personnel.

The infrastructure which was installed in 2004 consists of the following:

- 1) A 42.5 cubic meter max (min 37.5 cubic meter) water storage facility; and,
- 2) 850 meters of water pipeline connecting the well and water storage facility; and,
- 3) A new 25 meter deep water well.

This infrastructure has been dormant and unused for the past seven years due to the high



Water Well and Pump House

cost of completing the project, which is beyond the means of the Development Association of Doutmenrout.

In addition, 450 Olive trees were planted in 2004, 150 of which are currently dead. The remaining 300 Olive trees have stunted growth as a result of the incomplete irrigation component to the project. None of the trees which were planted in 2004 have produced any marketable fruit to date.

**Stats:**

Water Well Well depth - 25 meters

- Static water depth in well - 10 meters
- Dynamic water depth in well - 3 meters
- Inside diameter of well - 2 meters
- Opening diameter at the top of the well 60 cm

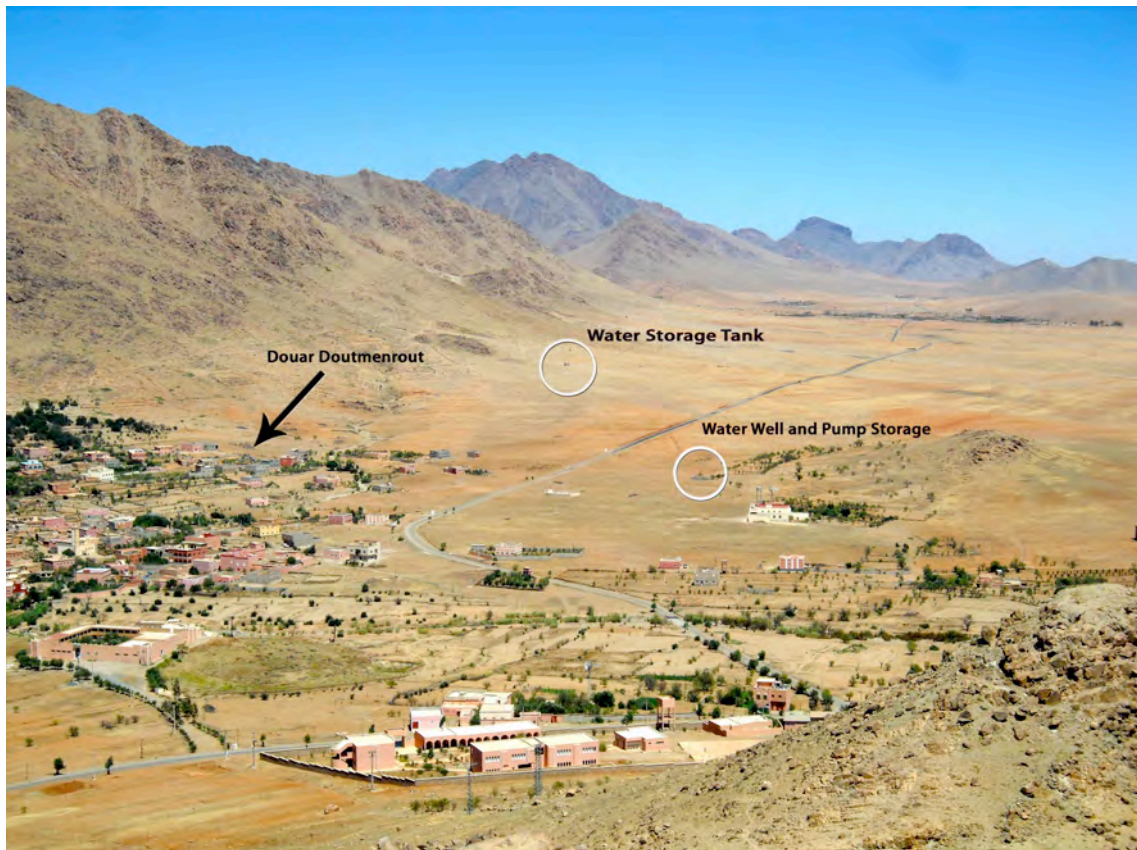
Water Storage Facility

- Storage tank capacity - maximum 42.5 cubic meters (min 37.5 cubic meters)



Pipeline

- Length of pipe from the water well to the storage tank - 850 meters
- Diameter - 63mm PVC
- Elevation change from well to storage tank - 41.5 meters
- Elevation change from water level in well to storage tank input - 56.5 meters



Above: Overview of the Project Area. The above photo shows the existing well and 42 cubic meter water storage tank which were constructed in 2004 and their geographic relation to the Douar Doutmenrout.

## Beneficiaries

Beneficiaries of Doutmenrout Development Project		
Beneficiaries	Number benefited	How benefited
Douar Doutmenrout	790	Household water supply and educational trainings
Association	48	Revenue for future development projects and educational trainings *
Women's Cooperative	11	Raw materials for production of goods and educational trainings *
Women's Neddi	56	Revenue for Neddi projects*
*Note: The association, women's cooperative and women's neddi of Douar Doutmenrout all work cooperatively to share raw materials, funds and all benefit inclusively from mutual projects.		

## Components necessary for project completion

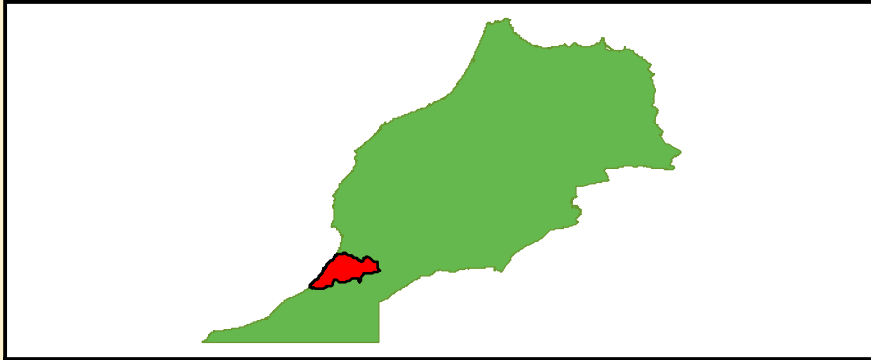
1. *Solar Water Pump and Peripherals.* A pump is necessary to move water from the new water well to the water storage tank. The water would then be gravity fed from the storage tank to the drip irrigation system and the Douar.
2. *Piping.* The piping is in place from the well to the water storage facility. However, an additional 950 meters of piping is necessary to connect the water storage tank to the Douar.
3. *Drip irrigation.* The piping and fittings for the drip irrigation system are necessary to provide water to the trees in the new 3 hectare orchard.
4. *Valves.* Two valves will be necessary within the main pipelines, one between the well and the water storage tank and one between the water storage tank and the connection to the Douar water supply system.
5. *Trees.* Trees are necessary for the orchard. The composition of the new trees necessary are as follows: 500 Apple trees (Doutmenrout Development Association), 150 Olive trees - to replace those which have died since 2004 (Department of Agriculture and High Atlas Foundation), 500 Almond trees (Department of Agriculture and High Atlas Foundation), 200 Argan trees (Department of Water and Forests).
6. *Fencing.* Several hundred meters of fencing is necessary to protect tree saplings from wild pigs that live in the area.
7. *Trainings.* Four formal trainings are planned for capacity-building for both the members of the Development Association, Women's Cooperative and interested community members.
  - a. *Argan tree planting and orchard maintenance.* This training is to be organized by the Department of Water and Forests to train the men and women who will be involved in planting and maintaining the new Argan trees in the appropriate planting and maintenance techniques. This training will be held in Ait Ouafka. This training is to take place prior to planting the Argan trees.
  - b. *Solar pump maintenance and operations training.* This training is to be held in Ait Ouafka for the men and women involved in the daily operations and maintenance of the solar pump and all peripheral equipment. This training is intended to not only train those members of the Association in appropriate maintenance techniques, but is also intended to teach interested participants how the system works and other applications for solar technology within Ait Ouafka. This training is envisioned as being broken into two parts: the first part is to be open to

all interested parties to teach how the solar technology works as well as general maintenance and operations needs; while the second part is intended to be an in-depth training with a smaller group of individuals from the Development Association who will be specifically responsible for the daily operations and maintenance of the technology. This training is to take place just following installation of the solar pump.

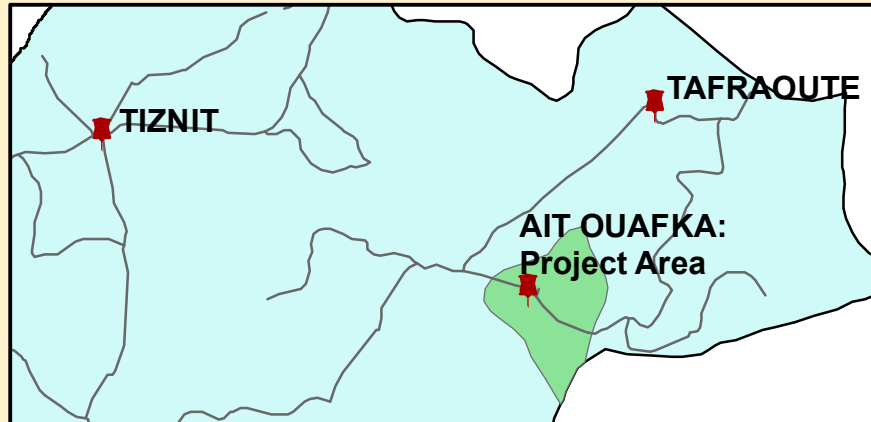
- c. *Drip Irrigation Training.* A training on drip irrigation and maintenance of the new drip irrigation system will be conducted by the Department of Agriculture after the drip irrigation system is installed. The intent of this training, which will be open to all members of the community with special effort made to make it accessible to the women and children, is to educate those who will be maintaining the system in appropriate maintenance techniques. In addition, there will be a focus on how other community members can take advantage of the programs offered by the Department of Agriculture, the benefits of drip irrigation and what to expect from the system once it is operational.
- d. *Climate Change and Environmental Protection Training.* A training on the concepts and practical implications of climate change and environmental protection will be offered to all interested members of the community with special effort made to make it accessible to the women and children. The intent of this training is to educate all interested community members and particularly those members of the community who are active in community development activities to the effects they can expect from climate change and how best to adapt their development activities to preserve the environment and work toward sustainable development.



## Morocco Overview



## Tiznit Province Overview



### Legend

- |                              |                        |
|------------------------------|------------------------|
| Water Storage Facility       | Entranceway            |
| Almond Planting Area         | Existing Pipeline Key  |
| Apple Planting Area          | New Pipeline           |
| Argan Planting Area          | Existing Pipeline      |
| Existing Olive Planting Area | Water Well             |
| Douar Tie-in Valve           | Planting Area Boundary |



# Douar Doutmenrout Irrigation and Drinking Water Project

Mohammed Saïd  
Association of Doutmenrout  
President

Sami Dinar and David Pesnichak  
U.S. Peace Corps Volunteers  
Morocco 2010 - 2012

### Piping and Valves

April 2011 – August 2011

Acquisition and installation of piping and valves to connect water storage facility with Duar water supply system

### Prepare Ground for Tree Planting

September 2011 – November 2011

Dig holes for individual trees

### Drip Irrigation System

October 2011 – December 2011

Acquisition and Installation

### Development of Proposals and Partnerships

October 2010 – June 2011

### Solar Pump

April 2011 – August 2011

Acquisition and installation

### Argan Training

December 2011 – January 2012

### Tree Planting

January 2012 – March 2012

Acquisition and planting of Argan, Almond, Apple and Olive trees

### Solar Pump Training

June 2011 – July 2011

Training on usage, maintenance and operations of solar pump

### Overall Follow-up and Monitoring

February 2012 – May 2012

January 2011

April 2011

July 2011

October 2011

January 2012

April 2012

July 2012

Project Dates

### Monitoring

The monitoring process, to be conducted throughout the continuation of the project, provides the feedback that triggers adjustments to actions, plans and budgets, to ensure that they are realistic and are being adhered to properly.

#### Local Project Committee

The Association Douthmenrout is the community project leader. This committee will meet regularly to make sure the project remains on track. This group will report on the progress of the project and if we are meeting our goals. A Peace Corps Volunteer will be involved in this process and will help with coordination. The Association Douthmenrout will be responsible for reporting on the adherence of the project to the budget and schedule.

#### Involvement of partners

All partners (Association Douthmenrout, Women's Cooperative, Peace Corps and Water and Forest) will meet every three months, to report on the project progress and support the local community association and cooperative.

### Evaluation

Evaluation includes analysis of the information and data collected during the monitoring phase. A review and summary of monitoring results will be conducted annually and recapitulated in an annual report along with final manuals to accompany all installed components.

#### Project Manual

At the culmination of the project installation and training, the Peace Corps Volunteers with the help of the Association Douthmenrout and the Women's Cooperative, will compile an operations and "lessons learned" manual to be used for future reference. This manual will incorporate at least the following components:

1. Solar Pump
  - a. Basic maintenance techniques
  - b. Contact information for future maintenance issues
    - i. Contractor who installed solar system and pump
    - ii. ADEREE office in Marrakech
    - iii. Locally trained individuals
    - iv. Nearest knowledgeable maintenance office
  - c. Owners manuals for equipment installed
  - d. Required regular maintenance
2. Drip Irrigation System
  - a. Basic maintenance techniques
  - b. Contact information for future maintenance issues
    - i. Contractor who provided parts
    - ii. Department of Agriculture office in Tafraoute and Tiznit
    - iii. Locally trained individuals
    - iv. Nearest knowledgeable maintenance and parts office
  - c. Any owners manuals for parts installed
  - d. Required maintenance schedule
3. Argan Trees
  - a. Basic maintenance techniques
  - b. Information on the argan tree lifecycle
  - c. Contact information for future issues
    - i. Department of Water and Forest office in Tiznit
    - ii. Nursery who supplied the trees
    - iii. Locally trained individuals
  - d. Required maintenance schedule
4. Water Pipelines

- a. Basic maintenance techniques
  - b. Contact information for future maintenance issues
    - i. Contractor who provided parts
    - ii. Locally trained individuals
    - iii. Nearest knowledgeable maintenance and parts office
  - c. Any owners manuals for parts installed
  - d. Required maintenance schedule
5. Reporting Requirements for Annual Report to Department of Water and Forest and Peace Corps Rabat
- a. Addresses to send annual report
    - i. Department of Water and Forest
    - ii. Peace Corps Rabat
  - b. Solar Pump
    - i. Current condition (is it functioning properly?)
    - ii. Any problems in the past year
    - iii. Lessons learned in the past year
    - iv. Any support needed
  - c. Argan Trees
    - i. Have any of the argan trees died in the past year?
    - ii. What is the current approximate average height of the argan trees?
    - iii. Have any of the argan trees produced fruit this past year, in bushels? If so, what was the annual yield overall? What was the approximate annual yield per tree, in bushels?
    - iv. If the argan trees have produced fruit, have any trees regenerated?
    - v. Lessons learned in the past year
    - vi. Any support needed
  - d. Drip Irrigation System
    - i. Current condition (is it functioning properly?)
    - ii. Any problems in the past year
    - iii. Lessons learned in the past year
    - iv. Any support needed
  - e. Water Distribution System
    - i. Current condition (is it functioning properly?)
    - ii. Any problems in the past year
    - iii. Lessons learned in the past year
    - iv. Any support needed
  - f. Income Generated
    - i. Has income been generated from the fruit trees in this orchard?
      - 1. Value of overall argan fruit prior to processing produced this year. Value of argan fruit after processing, if applicable (value added)
      - 2. Value of overall almond fruit prior to processing produced this year. Value of almond fruit after processing, if applicable (value added)
      - 3. Value of overall apple fruit prior to processing produced this year. Value of apple fruit after processing, if applicable (value added)
      - 4. Value of overall olive fruit prior to processing produced this year. Value of olive fruit after processing, if applicable (value added)
    - ii. How much overall revenue was generated this year each organization?
      - 1. Women's Cooperative
      - 2. Association Doutmenrout

#### Annual Report

The Association Doutmenrout will report annually on the progress of the project. Specifically, the Association will report on the health of the Argan trees (deaths, difficulties, successes, growth rate and fruit production rate). This report is to be submitted to the Department of Water and Forests and copied to the Peace Corps office in Rabat. See requirements listed above.

## **Sustainability**

- The innovative nature of the project, and the active participation of all members, building on the traditional solidarity practices are strong assets for project sustainability.
- Capacity-building and community tools for further adaptation. The community will have reinforced capacities to manage their ecosystem and resources, protect their land, increase its fertility.
- New products will be available in order to generate a new sustainable income source, which will improve local livelihood and facilitate further project developments.
- Monitoring of the argan will be on-going, to demonstrate the success rate of the argan tree in the local environment and its contributions to the local economy.
- After skills are passed to the community, they will be able to share their experiences and collaborate with other associations.
- A specific focus is made on women, a group that is critical for project sustainability. Women will be active participants in the project activities, including training, which will give them more tools to adapt to the changing socio-economic and climactic conditions. Their contribution will be critical, and they will benefit from the project (capacity-building, income generation, promotion of women's mobilization).

**DRAFT - Total Project Cost and Amount Requested Table (in moroccan dirhams MAD) – DRAFT**

Component	Description	# Units	Cost Per Unit (MAD)	Total (MAD)	Amount Requested from FCIL	Community Contribution		Department of Agriculture contribution	Water and Forest contribution	Peace corps contribution	ADEREE Contribution	INDH Contribution	Other Organization Contribution			
						In Cash (MAD)	In Kind						In Cash	In Kind	Name	In Cash
Component 1	Solar Water Pump and Peripherals	Evaluation Study		4,000.00							4,000.00					
		Pump, Controller, Cables, Installation, Solar Panels, Controller. TOTAL EST per NOOR WEB	1.00	210,100.00	210,100.00	200,000.00	10,100.00									
Component 2	Piping for Household Water System	63 mm PVC Piping		35,000.00			35,000.00									
			1000													
Component 3	Drip Irrigation System	Installation, coordination		31,600.00			31,600.00									
		Transportation	200 km (RT Tiznit)	100% of truck from Tiznit	500.00								500.00			
Component 4	Valves	Piping and fittings		73,813.72			73,813.72									
		Installation, coordination		17,100.00			17,100.00									
Component 5	Trees	Transportation	200 km (RT Tiznit)	100% of truck from Tiznit	500.00		500.00									
		Water regulation valves	2.00	250.00	500.00								500.00			
Component 6	Fencing	Installation, coordination		1,000.00			1,000.00									
		Transportation	(Inc. with Drip Irrigation System Trans)													
Component 7	Trainings	Trees	250.00	10.00	2,500.00				2,500.00							
		Installation, coordination			6,635.00			6,635.00								
Component 8	Solar Pump Training	Transportation	200 km (RT Tiznit)	100% of truck from Tiznit	500.00							500.00				
		Meeting Hall, food, tea, training resources			2,100.00			2,100.00								
Component 9	Argan Training	Training Coordination: Mobilizing, organizing, budgeting and supervising			250.00		250.00									
		Hospitality for experts and trainers: lodging, food, mobilizing, organizing, budgeting and supervising			2,733.33			2,733.33								
Component 10	Fencing	Transportation	200 km (RT Tiznit)	100% of truck from Tiznit	500.00							500.00				
		Provided by Department of Water and Forests			2,000.00				2,000.00							
Component 11	Trees	Meeting Hall, food, tea, training resources			1,050.00		1,050.00									
		Installation, coordination			13,270.00			13,270.00								
Component 12	Olive	Transportation	50 km (RT Tafraoute)	23% of truck from Tafraoute	69.00									IAWA	69.00	
		Trees	150.00	10.00	1,500.00			1,200.00						HAF	300.00	
Component 13	Almond	Installation, coordination			5,000.00			4,000.00						HAF	1,000.00	
		Transportation	50 km (RT Tafraoute)	57% of truck from Tafraoute	231.00									IAWA	231.00	
Component 14	Apple	Trees	500.00	10.00	5,000.00			4,000.00						IAWA	1,000.00	
		Installation, coordination			13,270.00			13,270.00							IAWA	700.00
Component 15	Fencing	Transportation	300 km (RT Agadir)	100% of truck from Agadir	700.00									IAWA	700.00	
		Fencing	2400 Sq. Meters	40.00	96,000.00								96,000.00			
Component 16	Fencing	Fence Posts	600.00	70.00	42,000.00		40,000.00						2,000.00			
		Installation (labor only - Support inc. in tree installation and coordination)			3,000.00			3,000.00								
Component 17	Solar Pump Training	Transportation	200 km (RT Tiznit)	100% of truck from Tiznit	500.00							500.00				
		Provided with Pump Estimate														
Component 18	Argan Training	Meeting Hall, food, tea, training resources			2,100.00		2,100.00									
		Training Coordination: Mobilizing, organizing, budgeting and supervising			250.00		250.00									
Component 19	Argan Training	Hospitality for experts and trainers: lodging, food, mobilizing, organizing, budgeting and supervising			2,733.33		2,733.33									
		Provided by Department of Water and Forests			2,000.00				2,000.00							
Component 20	Solar Pump Training	Meeting Hall, food, tea, training resources			1,050.00		1,050.00									
		Installation, coordination			13,270.00			13,270.00								

Drip Irrigation Training	Training Coordination: Mobilizing, organizing, budgeting and supervising			250.00			250.00								
	Hospitality for experts and trainers: lodging, food, mobilizing, organizing, budgeting and supervising			1,366.67			1,366.67								
	Provided by Department of Agriculture			2,000.00			2,000.00								
	Meeting Hall, food, tea, training resources			1,050.00			1,050.00								
	Training Coordination: Mobilizing, organizing, budgeting and supervising			250.00			250.00								
	Hospitality for experts and trainers: lodging, food, mobilizing, organizing, budgeting and supervising			1,366.67			1,366.67								
	Provided by High Atlas Foundation			3,000.00								HAF			3,000.00
	Meeting Hall, food, tea, training resources			2,100.00			2,100.00								
	Training Coordination: Mobilizing, organizing, budgeting and supervising			250.00			250.00								
	Hospitality for experts and trainers: lodging, food, mobilizing, organizing, budgeting and supervising			2,733.33			2,733.33								
Component 8 Followup and Evaluation	Manual	Printing	5.00	500.00										500.00	
Component 9 Technical Assistance	Argan Trees	Technical assistance for Argan planting (all aspects)		3,000.00				3,000.00							
	Drip Irrigation	Technical assistance for drip irrigation (all aspects)		5,000.00			5,000.00								
	Activities	Technical assistance to Association and Women's Cooperative for activities		8,000.00					8,000.00						
	Development	Technical assistance to Association and Women's Cooperative for capacity building and development		10,000.00					10,000.00						

<b>TOTAL ACTIVITIES BUDGET (MAD)</b>	617,269.72	<b>200,000.00</b>
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<b>TOTAL PROJECT BUDGET AND CONTRIBUTIONS (MAD)</b>	<b>617,269.72</b>	<b>200,000.00</b>	85,600.00	105,356.00	90,013.72	7,500.00	18,000.00	4,000.00	100,000.00		3,800.00	3,000.00
<b>TOTAL PROJECT BUDGET AND CONTRIBUTIONS (USD)</b>	<b>78,934.75</b>	<b>25,575.45</b>	10,946.29	13,472.63	11,510.71	959.08	2,301.79	511.51	12,787.72		485.93	383.63
<i>% of the total budget</i>	100.00	32.40	13.87	17.07	14.58	1.22	2.92	0.65	16.20		0.62	0.49

**USD exchange rate May 2011** 7.82

Funding Gap (MAD) 0.00  
Funding Gap (USD) 0.00

## Contribution of the Community Volunteers and Finances to the Doutmenrout Development Project

Project Activities  (to which persons plan to contribute on a voluntary basis)	Description of the voluntary contribution  (capacities, knowledge, know-how, manual labor, materials, tools, etc.)	Total number of volunteers to be mobilized	<i>Women</i>	<i>Men</i>	<i>Elderly persons (older than 60)</i>	<i>Youth (younger than 25)</i>	<i>People with disabilities</i>	<i>Local</i>	<i>National</i>	<i>International</i>	Number of volunteer days anticipated	Monetary value of the voluntary contribution including labor and materials (enter as co-financing in the budget) (MAD)
Fruit Trees and Fencing	Knowledge of Fruit Trees / Forestry Methods  Labor: digging, measuring, planting, separating trees, driving car, bringing drinking water, cooking food, placing fence posts, installing fencing  Mobilizing, organizing, budgeting and supervising  Tools/Supplies: pick axes, shovels, buckets, fertilizer, food  Local Transport: truck, donkey	55	20	25		10		55			15	40,156
Water System to Douar	Knowledge of water systems and installation techniques  Labor: Digging, measuring, laying pipes, assembling pipes, installing valves, covering pipes once installed, bringing drinking water, cooking food  Mobilizing, organizing, budgeting and supervising  Tools/Supplies: pick axes, shovels, buckets, food  Local Transport: truck, donkey	55	20	25		10		55			15	32,600
Drip Irrigation System	Knowledge of local ecosystem, fruit trees and installation techniques  Labor: measuring, assembling pipes, digging trenches  Mobilizing, organizing, budgeting and supervising  Tools / Supplies: pipes, valves, filters, shovels, cement, small parts and tools  Local Transport: truck, donkey	35	10	15		10		35			5	17,100



Hospitality for Experts and Trainers	Hospitality: housing, food, drinking water Mobilizing, organizing, budgeting and supervising	4	4					4			10	8,200
Training, workshops	Meeting hall, small supplies, food and tea Mobilizing, organizing, budgeting and supervising	4		4				4			10	7,300
<b>Financial Contributions from local charity channels coordinated by Doutmenrout Development Association</b>	Remainder of cost for solar water pump, cost of one km of PCV piping, transportation costs for drip irrigation system, majority cost for fence posts											<b>85,600</b>
<b>Total:</b>		<b>153</b>									<b>55</b>	<b>190,956 dirhams</b>

# ID BAKASSE AHMED

Foreur de puits et Entrepreneur de travaux divers ou Constructions  
Et Vente de matériels Agricoles

Tiznit Le: 03/02/2011

DEVIS N° :01/2011

CLIENT : *Association Dou Timen rout*

N° PRIX	DESIGNATION	U	Q	P.U	PRIX TOTAL
1	Tuyau Ø 63, PN 16 PEHD	ML	1000	35,00	35.000,00
2	Vanne à Bille 2''	U	4	250,00	1.000,00
3	Cornières à hauteur de 2,00m	U	600	70,00	42.000,00
4	Grillage Galvanisé	M2	2400	40,00	96.000,00
TOTAL HORS TVA					174.000,00
TAUX TVA (20 %)					34.800,00
TOTAL TTC					208.800,00

Arrêté la Présente facture à la somme de :

**DEUX CENT HUIT MILLE, HUIT CENT DIRHAMS (TTC)**

**ID BAKASSE Ahmed**  
Foreur de Puits Avec Moteur  
et Vente de Pièces Agricoles  
Lot. Chaabani Rte Guelmim  
TIZNIT

Siège Social : LOT CHAABANI ROUTE DE GUELMIM QI -BP : 2827 TIZNIT 85000-  
FAX : 0528 60 04 81 Tel : 0528.60.18.73 GSM : 0662.25.18.80  
Patente : 49514341- IF : 7942720, RC : 177/5484/ TIZNIT-CNSS: 7025738,  
C.B (RIB): N°: 013.75.001.048.208.625.0013502 B.M.C.I TIZNIT

Estimate for fencing, posts, valves and piping

**PROJET D'INSTALLATION D'UN SYSTEME DE POMPAGE  
SOLAIRE  
AU NIVEAU DU VILLAGE DE DOUTMENOURT  
COMMUNE RURALE D'AIT WAFKA  
PROVINCE DE TIZNIT**

**FICHE PROJET**

**Décembre 2010**

# **FICHE PROJET**

## **INTRODUCTION**

### **Les énergies renouvelables au service du développement local**

La filière solaire photovoltaïque a fait l'objet d'un grand intérêt au Maroc depuis plus de deux décennies, du fait que la technologie et les systèmes photovoltaïques ont pu offrir des solutions répondant aux préoccupations de développement du milieu rural, notamment dans le domaine de l'électrification rurale décentralisée et du pompage d'eau.

En effet, dans un pays disposant de ressources solaires abondantes, les techniques du solaire photovoltaïque ont présenté des atouts considérables avec plus de 40.000 foyers ruraux électrifiés par systèmes solaires photovoltaïques et plus de 500 pompes solaires installées au niveau national.

Le domaine du pompage d'eau, aussi bien pour l'alimentation en eau potable (A.E.P) que pour le domaine de l'irrigation (petite irrigation ou irrigation goûte à goûte), offre un potentiel important pour l'intégration des systèmes de pompage solaire. La technologie est confirmée, et assure les meilleures conditions de fonctionnement et de performances. L'investissement et les coûts des systèmes sont amortissables et n'engendrent que de faibles coûts d'exploitation et d'entretien.

### **OBJECTIF ET CONSISTANCE DU PROJET**

L'Association Doutmenourt pour le Développement et la Coopération et l'Organisation Non Gouvernementale « Corps de la Paix » développent conjointement un projet visant la mise en place d'un service d'alimentation en eau pour satisfaire les besoins du village en eau potable et en d'irrigation destinée aux activités agricoles.

Le projet porte sur l'installation d'un système de pompage utilisant la technologie solaire photovoltaïque au niveau d'un puit appartenant au village, dont les caractéristiques sont détaillées ci-après.

Ce projet s'inscrit dans le cadre des efforts déployés par l'association avec l'appui de ses partenaires, pour contribuer au développement social et économique du village.

## DONNEES TECHNIQUES DU PROJET

### Caractéristique du site et de l'infrastructure existante.

<b>Douar</b>	Douar « Doutmenourte »
<b>Commune rurale</b>	Ait Ouafka
<b>Province</b>	Tiznit
<b>Accès</b>	- de Doutmenroute to Ait Ouaffka: 500 m, - de la Commune Ait Ouaffka à Tiznit : 75 km, - de Tiznit to Agadir: 80 km.
<b>Nombre de foyers</b>	101
<b>Nombre de population</b>	790
<b>Localisation du puits</b>	650 m à partir du village
<b>Forme du puis</b>	Circulaire de diamètre 2m
<b>Profondeur du puit</b>	25 m
<b>Niveau statique</b>	10m
<b>Niveau dynamique</b>	3m
<b>Chateau</b>	Oui
<b>Localisation du chateau</b>	850m à partir du puit, 950 m à partir du village
<b>Dimensions du chateau</b>	Longueur : 5.15m Largeur : 3.18m Hauteur : 2.6m.
<b>Volume maximal</b>	42.5 m <sup>3</sup> (min 37.5 m <sup>3</sup> )
<b>Hauteur du chateau % puit</b>	15m
<b>Canalisation entre chateau et puit</b>	Oui 850m, 63mm de diamètre, en PVC
<b>Besoin d'irrigation</b>	3 hectares : 1.5 Ha d'amandier, 0.5 Ha d'arganier et 1 Ha de pommier

### Caractéristique du système de pompage solaire

<b>Puissance minimale du générateur solaire</b>	4000 Wc
<b>Puissance maximale de la pompe</b>	3500 W
<b>Type de pompe</b>	Centrifuge immergée
<b>Onduleur/contrôleur</b>	Caractéristiques liées au type de pompe solaire
<b>Canalisation</b>	A dimensionner par le prestataire

	technique (fournisseur/ installateur)
<b>Structure de fixation</b>	A dimensionner par le prestataire technique (fournisseur/ installateur)

## **ACTIVITES DU PROJET.**

- ◆ Préparation du cahier des charges pour l'acquisition et l'installation du système
- ◆ Lancement de la consultation
- ◆ Installation du matériel
- ◆ Réception provisoires et définitive des installations.
- ◆ Identification et formation d'un agent d'exploitation du système au niveau du village (personne du village).

## **DUREE DU PROJET**

- ◆ Quatre (4) mois sans compter le délai nécessaire à la mobilisation des financements.

## **BUDGET DU PROJET**

- ◆ 300.000 Dhs

ENGLISH TRANSLATION

PROPOSED INSTALLATION OF A SOLAR PUMPING SYSTEM  
AT THE VILLAGE OF DOUTMENOURT  
RURAL MUNICIPALITY HAS WAFKA  
Province of Tiznit

PROJECT FILE

December 2010  
PROJECT FILE

## INTRODUCTION

### Renewable energy in local development

The solar photovoltaic industry has been great interest in Morocco for more than two decades, the fact that technology and photovoltaic systems have been able to offer solutions that address the concerns of rural development, particularly in the field decentralized rural electrification and water pumping.

Indeed, in a country with abundant solar resources, solar photovoltaic techniques showed considerable assets with more than 40,000 rural households electrified by solar photovoltaic systems and 500 solar pumps installed at the national level.

The field of water pumping, both for drinking water supply (DWS) for the field of irrigation (small-scale irrigation or watering tastes tastes), great potential for integration of pumping systems Sun. The technology is confirmed, and provides the best operating conditions and performance. The investment and system costs are depreciable and generate only low operating costs and maintenance.

## PURPOSE AND CONSISTENCY OF THE PROJECT

Doutmenourt Association for Development and Cooperation and the NGO "Peace Corps" are jointly developing a project to establish a service water supply to meet the needs of the village with drinking water and in irrigation for agricultural activities.

The project involves the installation of a pumping system using solar photovoltaic technology in a well belonging to the village, whose characteristics are detailed below.



This project is part of efforts by the association with the support of its partners, to contribute to social and economic village.

## TECHNICAL PROJECT

Site characteristics and existing infrastructure.

Douar

Douar "Doutmenourte"

Rural commune

Ait Ouafka

Province

Tiznit

Access

of Doutmenroute to Ait Ouaffka: 500 m

of this communication has Ouaffka in Tiznit: 75 km

Tiznit to Agadir: 80 km.

Number of households

101

Number of population

790

Location of wells

650 m from the village

Shape and

2m diameter circular

Well Depth

25 m

Static level

10m

Dynamic level

3m

Chateau

Yes

Location Castle

850m from the well, 950 m from the village

Dimensions of the castle

Length: 5.15m

Width: 3.18m

Height: 2.6m.

Maximum Volume

42.5 m<sup>3</sup> (37.5 min m<sup>3</sup>)

% Height of the castle well

15m

Pipeline between Castle and Well

Yes 850m, 63mm diameter PVC

Need for irrigation

3 hectares: 1.5 hectares of almond, argan 0.5 ha and 1 ha of apple

Characteristic of the solar pumping system

Minimum power solar generator

4000 Wp

Maximum pump power

3500 W

Pump Type

Submersible centrifugal

Inverter / Controller

Characteristics associated with the type of solar pump

Pipeline

In sizing the technical service provider (supplier / installer)

Attachment structure

In sizing the technical service provider (supplier / installer)

## ACTIVITIES OF THE PROJECT.

Preparation of specifications for the acquisition and installation of the system

Launch of the consultation

Hardware Installation

Interim and final reception facilities.

Identification and training of staff operating the system at village level (one village).

## DURATION OF PROJECT

Four (4) months, excluding the time required to mobilize funding.

## PROJECT BUDGET

Dhs 300,000

## DEBIT

Volume d'eau par jour	85,0 t/j
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## CONDUITE

Profondeur de la surface de l'eau	20 m
Hauteur du chateau	15 m
Distance horizontale puits-chateau	800 m
Longueur développée	

## POMPE

Pompe à courant alternatif	non
Fournir Booster	non
Type de pompe	LORENZT

## MODULES

Insolation crête nominale	6,0 h
Puissance des modules	2 600 Wc
Nombre de modules en série	
Nombre de branches parallèles	
Longueur estimée entre panneau et pompe	40 m
Longueur réelle entre panneau et pompe	



Date 16/03/2011

Devis

zone	numéro	année
D	1603	2011

Client	COMMUNE RURALE D'AIT WAFKA
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Qté	Libellés	Unité HT	%TVA	Partiel HT	Partiel TVA
1	<b>Livraison, pose, installation &amp; test d'une pompe photovoltaïque continue</b>				
	Modules au total 2 600 Wc			97 500	19 500
	Supp. inclinable			9 167	1 833
	40 Câble 2x6mm <sup>2</sup>			556	111
	1 LORENZT			50 778	10 156
	40 Câble raccordement pompe, 4X6 (ref SC2N, Immérgée (entre pompe et controleur)			5 000	1 000
	60 tuyau hydraulique, 2' (16 bar), polyéthylène			1 667	333
	1 Accessoires raccord. Pompe			4 167	833
	1 Installation			6 250	1 250
<b>TOTAUX</b>				<b>175 083,33</b>	<b>35 016,67</b>
				<b>HT</b>	<b>TVA</b>

Devis arrêté au montant TTC de : 210 100,00 Dh

## NOOR Web

S.A. au capital de 8'579'500 Dh

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Registre de Commerce N°9415

Identifiant Fiscal N°6502310

Patente N°45322506

TVA N°211451