



LIFE Project Number  
<**LIFE05 TCY/MA/000141**>

**PROGRESS REPORT No. 1**  
Covering the project activities from 01.02.2006 to 31.07.2006

Submission Date  
<**31.08.2006**>

FULL PROJECT TITLE  
**'Design and Application of an Innovative Composting Unit for the Effective Treatment of Sludge and other Biodegradable Organic Waste in Morocco, MOROCOMP'**

#### **Project Information**

<b>Project location</b>	El Jadida, Morocco
<b>Project start date</b>	01/02/2006
<b>Project end date</b>	01/02/2008
<b>Total Budget (€)</b>	637,808
<b>Community Contribution (€)</b>	438,228
<b>Total Project duration</b>	24 months

#### **Beneficiary Information**

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## LIST OF KEYWORDS AND ABBREVIATIONS

### Keywords:

Morocco, Greece, sludge, biodegradable organic waste, waste management, composting, in-vessel, compost, legislation, guidelines

### Abbreviations:

University of Chouaib Doukkali:	UCD
National Technical University of Athens:	NTUA
Regional Office of Agricultural Development:	ORMVAD
Biodegradable Organic Waste:	BOW

# **SECTION I**

## **TECHNICAL REPORT**

## EXECUTIVE SUMMARY

This is the 1<sup>st</sup> progress report of the Life-3<sup>rd</sup> Countries project MOROCOMP with title 'Design and Application of an Innovative Composting Unit for the Effective Treatment of Sludge and other Biodegradable Organic Waste in Morocco', (acronym MOROCOMP) covering the period from 01/02/06 until 31/07/06 which corresponds to the first 6 months of the project implementation.

The beneficiary of the project is the University of Chouaib Doukkali (UCD) in El Jadida of Morocco, while the National Technical University of Athens (NTUA) in Greece and the Regional Office of Agricultural Development (ORMVAD) of El Jadida in Morocco are the partners that participate in the project.

The main objective of the project is to develop an innovative in-vessel composting system for the treatment of sludge generated by Urban Wastewater Treatment Plants (UWWTP) and other biodegradable organic waste (BOW) in Morocco. This composting unit will enable the operators and National Authorities to treat, control and use sludge and other BOW effectively and in consistence with the European Environmental Policy. The project implementation will protect the water-bodies and soil from untreated and uncontrolled sludge disposal in order to promote the protection of public health and the environment. At the same time, the use of treated sludge and other BOW as soil improver will prevent the use of chemical fertilizers and subsequently protect arable land from degradation and the surface and groundwater from groundwater contamination. This composting system will be used as a pilot-demonstration unit for further applications in large-scale plants in Morocco and in European geographical areas with similar characteristics that face similar problems.

The main activities of the project are the following:

- Assessment of the existing situation in the European Union and in Morocco regarding sludge and other BOW generation and management (treatment, reuse and disposal). COMPLETED
- Assessment of the related legislation in the EU and in Morocco concerning sludge and other BOW. COMPLETED
- Review of composting success stories and best practices in the European Union and internationally. COMPLETED
- Design and construction of an innovative in-vessel composting system for treating sludge and other BOW. IN PROGRESS
- Development of sludge and other BOW aerobic composting processes – Optimization of the operation of the demonstration composting system
- Use of alternative effective additives of Mediterranean origin in the composting process
- Determination of the most efficient compost mixture
- Evaluation of the compost products as soil improvers in laboratory and open field applications
- Development of specifications and guidelines covering the area of sludge and other BOW composting, characterization and use of compost as soil improver in large scale
- Examination of alternative uses of the end products
- Assessment of compost market and jobs opportunities in Morocco
- Dissemination of the project progress and results (trips, conferences, workshops, meetings, website, printed material, etc). IN PROGRESS

- Training of the staff of the competent authorities and personnel that shall be involved in the compost production and distribution
- Public information and participation. IN PROGRESS
- Management of the project and reporting to the EC. IN PROGRESS

These actions are implemented by specialized personnel, including project manager, scientific staff, engineers, computer experts and technical staff.

MOROCOMP is implemented in 9 tasks. 7 tasks are technical, 1 task is devoted to the dissemination activities and one to the project management and the reporting to the European Commission. The Tasks are the following:

*Task 1: Assessment of the existing situation in Morocco and in the EU (Start: 01/02/06; End: 1/06/06)*

Task 1 has been successfully completed. It was carried out in 3 subtasks: In Subtask 1 the existing situation in Morocco with regard to sludge and other BOW management was assessed. One (1) report was produced for this sub-task (Deliverable 1 & Annexes 1-5). Subtask 2 examines the existing situation in the EU regarding sludge and other BOW management. Two (2) reports have been produced for this subtask (Deliverables 2 & 3) Subtask 3 reviews composting best practices treating sludge and other BOW in the EU and internationally. One report has been produced for this subtask (Deliverable 4).

*Task 2: Design and construction of an innovative sludge aerobic composting system (Start: 10/04/06; End: 10/10/06)*

Task 2 is currently under progress. In Task 2 the in-vessel composting system is designed and constructed. The design of the system has been completed and the construction of the system now takes place in Greece. A technical description of the system is provided (Deliverable 5).

*Task 3: Development of sludge aerobic composting processes – Optimisation of the operation of the pilot composting systems (Start: 10/10/06; End: 10/04/07)*

Task 3 has not started. It is carried out in 3 subtasks: in subtask 1 complete physico-chemical analysis of the sludge and other BOW used in the process takes place. In subtask 3.2 the development of aerobic composting processes using sludge from WWTPs and other BOW will be studied. In subtask 3.3 alternative aerobic composting processes are developed to optimize the system operation.

*Task 4: Evaluation of compost products as soil improvers (Start: 10/04/07; End: 10/10/07)*

Task 4 has not started. It is carried out in 2 Sub-tasks. During subtask 1, phytotoxicity tests will be developed in order to examine the suitability of composting end products for agricultural application. Subtask 2 involves the examination of the effects of compost characterized by negligible phytotoxicity on yield of selected vegetable cultivations.

*Task 5: Alternative uses of compost – Market opportunities in Morocco (Start: 10/10/07; End: 10/12/07)*

Task 5 has not started. Task 5 examines the potential use of compost products in various sectors with respect to their economic feasibility and their environmental consequences.

*Task 6: Development of guidelines and specifications covering the sludge composting process- Characterization and use of compost as soil improver (Start: 01/11/07; End: 01/02/08)*

Task 6 has not started. In Task 6, the technical specifications concerning the optimum operation of the composting system are determined. Moreover, quality requirements of the compost products used in agriculture, horticulture, private gardening, covered cultures and landscaping are determined.

*Task 7: Dissemination and training (Start: 01/02/06; End: 01/02/08)*

Task 7 is under progress. Task 7 includes all the dissemination and training activities which consist of: the kick-off and the launching event in Morocco (took place at the 9<sup>th</sup> of February 2006 at Morocco), the kick-off meeting of Life Projects in Brussels (took place on the 6-7<sup>th</sup> of June 2006), uploading of project web-site (done) and continuous updating (is performed regularly), organization of training activities and workshops, production of training material and Workshop Minutes, distribution of printed material describing the project and its results (leaflet has been prepared and distributed-Deliverable 8), production of technical papers-publications, publications in the press (Deliverable 9) and organization of an International conference.

Task 8: Management (Start: 01/02/06; End: 01/02/08)

Task 8 is under progress. Task 8 involves the project management activities. The Steering Committee and the management team have been formulated during the kick-off meeting at the 09/02/2006. The Action Plan was endorsed by all the Competent Authorities by the end of March 2006 (deliverable 10). The reporting to the European Commission is performed through progress reports, the interim and the final reports.

#### DELIVERABLES

According to the project's proposal the list of all deliverables which are required is provided in the Table below:

Task No.	Deliverables
Task 1	<ul style="list-style-type: none"> <li>• Report on the existing situation in Morocco regarding the production and management of sludge and other biodegradable waste <b>(Deliverables 1 &amp; ANNEXES 1-5)</b></li> <li>• Report on the existing situation in EU in connection to sludge and other biodegradable waste and the related legislation <b>(Deliverables 2-3)</b></li> <li>• Report on sludge and other biodegradable waste composting practices and success stories in EU and internationally <b>(Deliverable 4)</b></li> </ul>
Task 2	<ul style="list-style-type: none"> <li>• In-vessel composting system <b>(technical description – Deliverable 5)</b></li> </ul>
Task 3	<ul style="list-style-type: none"> <li>• Report on the physicochemical analysis of sludge, other biodegradable waste and additives</li> <li>• Report on the optimum operating conditions for the compost unit</li> <li>• Report concerning the evaluation of compost products (level A)</li> </ul>
Task 4	<ul style="list-style-type: none"> <li>• Report on the phytotoxicity tests - Evaluation of compost products (level B)</li> <li>• Report on the effects of compost on the tested cultivations - Final evaluation of compost products (level C)</li> </ul>
Task 5	<ul style="list-style-type: none"> <li>• Report on the alternative uses of compost</li> <li>• Report on the market opportunities for the compost products</li> </ul>
Task 6	<ul style="list-style-type: none"> <li>• Technical specifications about the optimum operation of compost units</li> <li>• Technical specifications concerning the quality and compost products and their possible uses</li> <li>• Development of guidelines concerning the requirements for compost uses</li> <li>• Manual for physicochemical compost analysis</li> </ul>
Task 7	<ul style="list-style-type: none"> <li>• Complete set of training material and minutes from workshops</li> <li>• Printed material describing the project and its results</li> <li>• Website describing the project and its outcomes</li> <li>• Proceedings from the International Conference</li> <li>• Technical papers-publications</li> <li>• Minutes of kick-off meeting in Morocco <b>(Deliverable 6)</b></li> <li>• Minutes of the kick-off meeting of Life Third Countries Projects in Brussels <b>(Deliverable 7)</b></li> <li>• English and French Leaflet <b>(Deliverable 8)</b></li> <li>• Publications in press <b>(Deliverable 9)</b></li> <li>• International conference proceedings</li> </ul>
Task 8	<ul style="list-style-type: none"> <li>• Endorsed action plan <b>(Deliverable 10)</b></li> <li>• 1<sup>st</sup> Progress report</li> <li>• Interim report</li> <li>• 2<sup>nd</sup> progress report</li> <li>• Final report</li> </ul>

## TECHNICAL DEVELOPMENT

This section documents the progress which has been made during the first 6-month period of the project's implementation (from 01/02/2006 until 31/07/2006) regarding each of the tasks which are in progress or have been completed.

### **Task 1: Assessment of the existing situation in Morocco and in the EU**

*Start date: 01/02/2006 End date: 01/06/2006 Duration: 4 months*

The Deliverables of Task 1 have been successfully completed. This Task aimed to provide the following output:

- Assessment of the existing situation in Morocco regarding the production and management of sludge and other biodegradable waste
- Assessment of the existing situation in EU in connection to sludge and other biodegradable waste and the related legislation
- Review of best practices and success stories of composting of sludge and other BOW in the EU and internationally

The following Deliverables have been produced in the framework of Task 1:

- Deliverable 1: Evaluation of the Production of Sludge and other BOW in Morocco
- Deliverable 2: Assessment of the existing situation and the related legislation in EU in connection to sludge management
- Deliverable 3: Assessment of the existing situation and the related legislation in EU in connection to other BOW
- Deliverable 4: Review of best practices and success stories of composting of sludge and other BOW in the EU and internationally

Deliverable 1 also includes the following Annexes:

#### Annex 1:

Production of Sludge from Wastewater Treatment Plants in Morocco

Production des boues des stations de traitement des eaux usées au Maroc

#### Annex 2:

Sewage Sludge production in Morocco

Production de boues de curage au Maroc

#### Annex 3:

Production of biodegradable organic waste generated by the food industry in Morocco

Production des déchets organiques biodégradables par l'industrie agroalimentaire au Maroc

#### Annex 4:

Examination of the residues of timber processing and the waste of slaughterhouses of red meat in Morocco

Les Résidus de Transformation du Bois & les Déchets des Abattoirs de Viandes Rouges au Maroc

## Annex 5:

Evaluation of the production of agricultural residues in Morocco

Evaluation de la production des résidus agricoles au Maroc

The assessment of the EU situation regarding sludge and other BOW and the success stories were carried out by the National Technical University of Athens (NTUA) based on the NTUA experience and prior work, based on information from the European Environmental Agency and from Eurostat and on Reports of the European Commission. This was complemented by several other relevant bibliographic references and internet sites. In addition, for the report on success stories various operators of specific sites were contacted to provide information on their composting site. Also, well-known construction companies were contacted (i.e. GICOM, BTA, Herhof, Orgaworld and others) in order to provide information on the composting facilities that they have designed and constructed.

The assessment of the Moroccan situation was based on the collaboration of UCD with ORMVAD and by contacting several relevant Moroccan authorities in order to obtain the required information. Under the framework of this project two site visits are envisaged, one in Germany and one in Switzerland. Since Switzerland has banned the composting of sludge it was decided to perform the site visits in the plants of the company BTA at Munich (Germany) and in the plants of company Herhof at Rennerod (100 km outside Frankfurt). The site visits will take place during the 11-15<sup>th</sup> of September; all necessary arrangements for these visits have been made. It was decided to move the visits from the initially planned dates of April in order to allow for some time for the beneficiary and the Moroccan partner to first evaluate the generation of sludge and other organics in their country. Furthermore, more time was allowed in order to select interesting sites that will maximize the transfer of know-how. Once the site visits have taken place, a description of each site will be added in Deliverable 3.

The indicators for Task 1 are the following:

- Number of bibliographic sources used in the reports > 150
- Total number of bibliographic sources used which are more recent than the year 2000 (in order to assess how up to date this information is) > 70
- Number of Moroccan competent authorities from which valuable information was taken concerning the existing situation in Morocco related to composting, number of other projects (National and European) the findings of which were used = 15
- Number of relevant websites utilized > 50
- Number of success stories considered = 40
- Number of companies involved in composting that were contacted > 15
- Number of operators of plants that were contacted > 30

## **Task 2: Design and construction of an innovative sludge aerobic composting system**

*Start date: 10/04/2006 End date: 10/10/2006 Duration: 6 months*

Task 2 is currently under progress. The design of the composting system has been completed as scheduled on the 20<sup>th</sup> of July of 2006. The design has taken into consideration the following factors: use of state-of-the-art in-vessel composting technology, minimization of environmental impacts and risks to public health, compliance with European Union environmental legislation and policy and production of a high quality compost that can be marketed. The NTUA team is now concentrating in the construction of the in-vessel composting system. Most of the required material for the construction has been ordered in order to avoid delays during the construction phase. A technical description of the in-vessel system designed by NTUA is attached (Deliverable 5). It is envisaged that Task 2 will be completed on time and that the composting unit will be constructed until the end of the Task. The site where the in-vessel composting system will be installed has already been determined and it belongs to ORMVAD.

According to the proposal, a planned trip of the Greek team to Morocco should have taken place on the 10/07/06 for monitoring the installation of the composting system. This trip was set early because it was originally envisaged to perform part of the system assembling in Morocco. However, during the actual implementation it was realized that it is more efficient and less time consuming to perform all the necessary assembling at the premises of NTUA and to ship the whole unit to Morocco. Therefore, this trip will be performed in mid October. According to the proposal the beneficiary and the Moroccan partner should make two visits to Greece which were initially scheduled on the 10/06/06 and on the 19/09/06. However, it was decided to move the 1<sup>st</sup> meeting at a later stage of the program for the following reason: at the same time period (9<sup>th</sup> of June 2006) a project meeting was held in Morocco within the framework of the Euro-Mediterranean project MEDAWARE. The expenses of this meeting were covered by the MEDAWARE project. Therefore, the 1<sup>st</sup> trip of the Moroccans to Greece has been arranged for the 21-24<sup>th</sup> of September. The 2<sup>nd</sup> trip is planned to take place in winter its aim being to focus more on the laboratory processes required to assess the quality of the end compost.

The following Deliverable has been produced in the framework of Task 2:

Deliverable 5: Technical description of the Composting System

Tasks 3, 4, 5 & 6 have not started yet.

### **Task 7: Dissemination and training Activities**

*Start date: 01/02/2006 End date: 01/02/2008 Duration: 24 months*

Task 7 is currently under progress. The kick-off meeting and the launching event were held at the Faculty of Sciences of El Jadida of the University of Chouaib Doukkali (UCD) of Morocco on the 9<sup>th</sup> of February 2006. The events were well-attended with 15 relevant organizations participating, including:

- The Ministry of Regional Planning, Water and Environment
- The Ministry of National Education, Higher Education, Managers training and Scientific Research

- The Ministry of Interior
- Mr. K. El Hariry who is Member of the Moroccan Parliament and
- Two journalists

Professor M. Kouam, President of UCD and Prof Y. Boughaleb Dean of the Faculty of Sciences in El Jadida performed opening speeches and welcomed all participants. Introductory speeches were also made by Professor O. Assobhei of UCD and by Professor M. Loizidou of the National Technical University of Athens (NTUA). Professor O. Assobhei briefly presented the project and then each partner (UCD, NTUA and ORMVAD) presented the activities, interests and current status of their organization. Professor Loizidou (NTUA) made a presentation on solid waste management in the EU. The Steering Committee was set up by representatives of the participating organizations. In the last section of the kick-off meeting, each Task was presented in detail, with emphasis on the required actions, the deliverables, the responsibilities of each partner per Task and the time schedule of each task. The kick-off meeting received high publicity; three articles were published in the Internet informing the public of the kick-off meeting and the project:

- Actualities in El Jadida – Arts and Culture  
[http://www.eljadida.ma/actualite\\_news\\_el\\_jadida/les-fauconniers-lekouassems-d-ouled-frej-s-ouvrent-sur-l-europe-a128.html](http://www.eljadida.ma/actualite_news_el_jadida/les-fauconniers-lekouassems-d-ouled-frej-s-ouvrent-sur-l-europe-a128.html)
- L'Economiste <http://www.leconomiste.com/article.html?a=68648>
- AllAfrica <http://fr.allafrica.com/stories/200602130356.html>

So far, the MOROCOM project objectives and expected results have been disseminated through 5 articles: the Moroccan Times (English), L' Economiste (French) and Liberation (French), El Jadida (French), and in the Arabic newspaper Saout Nass. Furthermore, MOROCOMP was presented in the University newspaper that is published every 6 months. In Deliverable 9 all the articles are given.

Two web-sites have been uploaded for the project since March 2006; one at the premises of the beneficiary ([www.ucd.ac.ma/morocomp](http://www.ucd.ac.ma/morocomp)) and one at the premises of NTUA ([www.uest.gr/Morocomp](http://www.uest.gr/Morocomp)). These sites are regularly updated in order to accurately present the progress of the programme.

Furthermore, the MOROCOMP project is mentioned in more than 30 web-sites (found through Google search). Some indicative websites are the following:

<http://www.rusibis.com/eol/journal/news.asp?dir=actu&ar=2239>

[www.uest.gr/Morocomp/Journal%20Liberation.pdf](http://www.uest.gr/Morocomp/Journal%20Liberation.pdf)

[www.moroccotimes.com/paper/article.asp?idr=2&id=12982](http://www.moroccotimes.com/paper/article.asp?idr=2&id=12982)

[www.uest.gr/Morocomp/L'economiste\\_2\\_newspaper.pdf](http://www.uest.gr/Morocomp/L'economiste_2_newspaper.pdf)

[www.uest.gr/Comwaste](http://www.uest.gr/Comwaste)

[www.magharebia.com/cocoon/awi/xhtml1/en\\_GB/features/awi/newsbriefs/general/2006/02/20/newsbrief-03](http://www.magharebia.com/cocoon/awi/xhtml1/en_GB/features/awi/newsbriefs/general/2006/02/20/newsbrief-03)

[http://www.environmentalhealthnews.org/archives.jsp?sm=fr15%3Bexposurepathway14%3B5Sewage\\_sludge13%3BSewage+sludgem8%3Bcoveragem8%3Bcoverage](http://www.environmentalhealthnews.org/archives.jsp?sm=fr15%3Bexposurepathway14%3B5Sewage_sludge13%3BSewage+sludgem8%3Bcoveragem8%3Bcoverage)

[http://www.eljadida.ma/actualite\\_news\\_el\\_jadida/les-fauconniers-lekouassems-d-ouled-frej-s-ouvrent-sur-l-europe-a128.html](http://www.eljadida.ma/actualite_news_el_jadida/les-fauconniers-lekouassems-d-ouled-frej-s-ouvrent-sur-l-europe-a128.html)

A leaflet presenting the project objectives, actions and expected results was prepared and distributed (Deliverable 8). One version was prepared in English and was distributed in Greece and one version was prepared in French and was distributed in Morocco.

Finally, the NTUA set-up a stand at the Exhibition that was organized by the Committee of Environment of the Hellenic Parliament and the Municipality of Athens (Syntagma Square, Athens) from the 3<sup>rd</sup> to the 5<sup>th</sup> of June 2006 (from 9.00 a.m. until 9.00 p.m. each day) in the framework of the World Day of Environment, where the personnel of the NTUA distributed dissemination material (leaflets) and had discussions with the public related to the MOROCOMP and other European projects that are implemented by its working group (more than 5000 people visited the stand of the NTUA).

The following deliverables which are related to Task 7 are attached:

Deliverable 6: Minutes of the kick-off meeting and of the launching event in Morocco

Deliverable 7: Minutes of kick-off meeting of the Life-Third Countries Projects in Brussels

Deliverable 8: Printed leaflet (French & English version)

Deliverable 9: Publications in Newspapers

The indicators for Task 7 so far are the following:

- Number of participants in the launching event = 15 organizations
- Number of times the project web-site has been updated = 6
- Number of other web-sites in which the project is mentioned > 30
- Number of articles where the project was published = 5
- Number of visitors in the project web-site > 600

Task 8: Management

*Start date: 01/02/2006 End date: 01/02/2008 Duration: 24 months*

Task 8 is under progress. During the kick-off meeting in Morocco on the 9<sup>th</sup> of February 2006, the Steering Committee was formulated. In the Table below the name and organization of each member of the Steering Committee is given. Furthermore, during the kick-off meeting the management team was formulated consisting of members of UCD, NTUA and ORMVAD. The Steering Committee discussed the Action plan of the project. The Action plan was endorsed by all the institutions that participate in the Steering Committee by the end of March 2006 (Deliverable 10). A second meeting took place between NTUA (Prof Loizidou & Mr. Malamis) and UCD

(Prof Assobhei & Prof Mountadar) in Marrakech of Morocco on the 9<sup>th</sup> of June 2006 during the International Conference on Sustainable Water Management, Rational Water Use, Wastewater Treatment and Reuse organized in the Framework of the Euro-Mediterranean program MEDAWARE. During this meeting the quality of deliverables of Task 1 was discussed as well as the indicators that must be used. Furthermore, the beneficiary was informed by the NTUA on the progress of the design of the composting system and a discussion was made on various details concerning the design (aeration system, material used for the system etc). UCD provided their suggestions according to their needs and became more familiar with the technology under development The next management team meeting has already been arranged and it will take place in Athens of the 21-24<sup>th</sup> of September in Athens. During this meeting the final design of the composting system will be presented by NTUA at its laboratory premises. The following Deliverable related to Task 8:

Deliverable 10: Endorsed Action Plan

### **Members of the Steering Committee**

<b>Name</b>	<b>Organisation</b>
M. Kouam	President, University Chouaib Doukkali
A. El Hattab	Director of Sciences, Ministry of National Education, Higher Education, Executives Training and Scientific Research
A. Moulid	Director of Regional Office of Agricultural Development of Doukkala
K. El Hariry	Member of Moroccan Parliament
Y. Boughaleb	Dean of Faculty of Sciences El Jadida
A. Sahibi	Chief of the Cooperation Division, Ministry of Regional Planning, Water and Environment
M. Loizidou	Professor, National Technical University of Athens
O. Assobhei	Professor, Faculty of Sciences of El Jadida
S. Bakkas	President, Association ANDALOUS
N. Brine	Regional Inspection of Doukkala Abda, Ministry of Regional Planning, Water and Environment
K. El Moutai	Vice President, Association ANNAMAE for Self-employment
M. Fekhaoui	General Secretary, Moroccan Association of Limnology
M. Lahlou	Ministry of National Education, Higher Education, Executives Training and Scientific Research
M. Mountadar	Professor, Faculty of Sciences of El Jadida
M. Rafrafi	Regional Office of Agricultural Development of Doukkala (ORMVAD)
K. Zourarah	President, Association GREPEN

## Members of the Management Team

<b>Name</b>	<b>Organisation</b>
O. Assobhei	University Chouaib Doukkali – Co-ordinator
M. Mountadar	University Chouaib Doukkali
A. Aajjane	University Chouaib Doukkali
J. Amine	University Chouaib Doukkali
S. Etahiri	University Chouaib Doukkali
M. Kabil	University Chouaib Doukkali
M. Loizidou	National Technical University of Athens
S. Malamis	National Technical University of Athens
E. Kapetanios	National Technical University of Athens
M. Rafrafi	Regional Office of Agricultural Development of Doukkala
B. Droussi	Regional Office of Agricultural Development of Doukkala

## SUBMITTED DELIVERABLES

Deliverable Number	TITLE	Project Task
1	Production and Management of Sludge and other BOW in Morocco; Production et gestion des boues des stations d'epuration des eaux et des déchets organiques biodégradables au Maroc	<b>1.1</b>
ANNEX 1	Production of Sludge from Wastewater Treatment Plants in Morocco; Production des boues des stations de traitement des eaux usées au Maroc	
ANNEX 2	Sewage Sludge production in Morocco Production de boues de curage au Maroc	
ANNEX 3	Production of biodegradable organic waste generated by food industry in Morocco Production des déchets organiques biodégradables par l'industrie agroalimentaire au Maroc	
ANNEX 4	Examination of the residues of timber processing and the waste of slaughterhouses of red meat in Morocco; Les Résidus de Transformation du Bois & les Déchets des Abattoirs de Viandes Rouges au Maroc	
ANNEX 5	Evaluation of the production of agricultural residues in Morocco; Evaluation de la production des résidus agricoles au Maroc	
2	Assessment of the existing situation and the related legislation in the EU in connection to sludge management	<b>1.2</b>
3	Assessment of the existing situation and the related legislation in EU in connection to other BOW	<b>1.2</b>
4	Review of best practices and success stories of composting of sludge and other BOW in the EU and internationally	<b>1.3</b>
5	Technical description of the in-vessel composting system	<b>2</b>
6	Minutes of the kick-off meeting in Morocco	<b>7</b>
7	Minutes of the kick-off meeting of Life-Third Countries Projects in Brussels	<b>7</b>
8	French and English leaflet	<b>7</b>
9	Publications in Press	<b>7</b>
10	Endorsed Action Plan	<b>8</b>

## PROJECT MANAGEMENT

The beneficiary of the project is the University of Chouaib Doukkali (UCD) which is solely legally and financially responsible for the Project implementation and Project Management.

The project partners are:

National Technical University of Athens, Greece (NTUA) and

Regional Office of Agricultural Development of Doukkala (ORMVAD)

In the covered period of this Progress Report, the Steering Committee met once during the kick-off meeting that took place the 09/02/06 at Morocco, while the Management team met twice (in the kick-off meeting and on the 9<sup>th</sup> of June 2006). The overall remarks were that the project's implementation is progressing as scheduled, with no significant delays, and the foreseen deliverables are according to the project's approved time schedule. The working group of the beneficiary is in regular contact with the working groups of the partners in order to organise their tasks, discuss the progress on their field of activities and find suitable solutions when problems arise. The project's management structure has not changed since its formulation and is running smoothly.

The responsibilities of the beneficiary and the two partners are outlined below:

The University of Chouaib Doukkali (UCD) is legally, technically and financially responsible for the project implementation. UCD organized the kick-off meeting and has produced the reports that assess the existing situation in Morocco with respect to sludge and other BOW management and related legislation. UCD has also provided remarks on the design of the composting system, according to its needs. In the future tasks UCD is responsible for performing complete physico-chemical analysis of the sludge and other BOW that will be used in the composting unit and for the identification of the sites of the open field experiments. Furthermore, UCD in collaboration with NTUA and ORMVAD will operate the composting unit. UCD will perform most of the chemical analysis required for the compost end product and for the leachate and will aid in the development of phytotoxicity tests for compost evaluation. In addition, UCD is responsible for evaluating and determining feasible compost markets in Morocco and for the organization of all project meetings taking place in Morocco (management team and Steering Committee meetings). UCD will also participate in the site visits to Germany. Finally, being the project beneficiary, UCD is responsible for all dissemination and training activities such as the creation and updating of a project web-site, organization of workshops, training events and an International Conference, the development and distribution of printed material, publications in technical papers as well as for the Management of the project and the reporting to the European Community. UCD continuously mobilizes all relevant Moroccan organizations in order to increase the project's impact.

The **National Technical University of Athens (NTUA)** is mainly responsible for developing certain technical tasks of the project. In particular, NTUA has designed the in-vessel composting system and is responsible for its construction, its installation in Morocco and the start-up operation. Furthermore, NTUA is responsible for developing

alternative composting processes and optimizing the composting system operation. The latter shall be performed in close collaboration with UCD and ORMVAD. Moreover, NTUA is responsible for the development of guidelines and specifications on sludge composting processes and for the characterization and use of compost as soil improver through the conduction of phytotoxicity tests and by supervising the conduction of open field experiments. NTUA has arranged the site visits in Germany and is responsible for the organization of all project meetings held in Greece. To this purpose, NTUA will provide the necessary staff, i.e. senior technical manager/scientific and technical responsible, experienced researchers and engineers, technical staff, computer experts, secretariat support, etc.

The **Regional Office of Agricultural Development of Doukkala (ORMVAD)** actively participates in the site visits in Germany, in all project meetings and has ensured land within its premises for the installation of the composting system. Furthermore, ORMVAD has contributed significantly in the drafting of the reports related to the examination of the existing situation in Morocco with respect to sludge and other BOW. ORMVAD will facilitate the development of the project since the composting system will be installed in its premises.

### **Reporting the meetings of the Steering Committee**

Within the reporting period of this progress report (01/02/06-31/07/06) 1 meeting of the Steering Committee took place. The meeting took place during the kick-off meeting. The issues which were discussed have been described earlier.

### **Report appointment of new staff and changes to new staff**

The project's management structure has not changed since its formulation.

# ASSESSMENT OF THE PROGRESS

## Comparison of the Actual Project Implementation with the proposed work plan

Most of the Activities of the MOROCOMP project have been carried out as planned. In particular:

- The kick-off meeting and the launching event took place in February as planned
- The beneficiary attended the kick-off meeting for Life-Third countries in Brussels
- All the deliverables have been prepared on time and are submitted together with the progress report
- The project website was launched in March and since then it is regularly updated
- Most of the material required for the construction of the composting system has already been ordered
- The Management team and the Steering Committee were formulated at the kick-off meeting as planned
- The Action Plan was drafted and endorsed by the relevant Moroccan authorities

There are some deviations to the original work plan. These are the following:

- The site visits will take place in 2 locations in Germany (Munich and close to Frankfurt). There will be no site visits in Switzerland, as the country has banned the composting of sludge. The site visits will take place in the 11-15<sup>th</sup> of September 2006 and did not take place in April. It was decided to move the visits to allow for some time for the beneficiary and the Moroccan partners to first evaluate the generation of sludge and other organics in their country. Furthermore, more time was allowed in order to select interesting sites that will maximize the transfer of know-how.
- The 1<sup>st</sup> trip of the Moroccan team to Greece will take place on the 21-24<sup>th</sup> of September. This trip was planned to take place in June. However, it was decided to move the 1<sup>st</sup> Moroccan trip to Greece for September since a meeting in Morocco already took place in June in the framework of an International Conference. This resulted in some cost savings as all travel expenses were covered by the program MEDAWARE. Also, it was concluded that the two trips of the Moroccan partners to Greece were too close to each other (only 3 months difference) in a 2-year program. It is envisaged that it is better to spread them out and perform one on September and the other one later on.
- The trip of NTUA to Morocco for the installation and start-up of the composting system will take place in October (not in July as it was planned). This change occurred because it was decided that it is more efficient to construct the whole in-vessel reactor in Greece and then ship it to Morocco. Therefore, the trip must be performed in October. In the proposal this trip was scheduled to take place earlier, since part of the construction of the system was planned to take place in Morocco.
- All the construction activities will take place in Greece. This is more efficient and facilitates the NTUA team in its construction task. Initially, certain construction activities were planned to take place in Morocco.

The above deviations from the originally planned schedule are minor and have been made after cautious consideration in order to maximize knowledge exchange and to minimize the total project expenses.

### **Evaluation of how well the project is going**

The project is progressing well without considerable delays or problems. The cooperation and the internal communication among the project partners are effective and are working according to the roles assigned in the project proposal and the kick-off meeting. As mentioned earlier, some deviations from the planned schedule have been made. However, these are minor and have been made in order to maximize knowledge exchange, minimize delays and the total project expenses. Therefore, they will not adversely affect the proceeding actions.

### **Problems encountered**

Up to now, no problems have been encountered in the project implementation. All the deliverables have been prepared on time, while some outstanding actions (i.e. site visits) have already been arranged to take place in September.

## **FUTURE PLANNING**

This Section describes the future planned activities-tasks for the next 6 months until the 01/02/07.

### **Task 1: Assessment of the existing situation in Morocco and in the EU**

*Start date: 01/02/2006 End date: 01/06/2006 Duration: 4 months*

This Task has been completed. The only issue which is pending are the site visits to the composting facilities which as mentioned earlier have been arranged to take place on the 11-15<sup>th</sup> of September in Munich and in Frankfurt.

### **Task 2: Design and construction of an innovative sludge aerobic composting system**

*Start date: 10/04/2006 End date: 10/10/2006 Duration: 6 months*

This Task is planned to be completed on time on the 10<sup>th</sup> of October 2006. As mentioned earlier the design of the composting system has been completed. The construction of the composting system will take place in September in the premises of the laboratory of NTUA. The in-vessel composting system will be completed on time and it will be shipped from Greece to Morocco. Arrangements for the transportation of the system to Morocco have already been made. It is estimated that the transportation of the in-vessel system from the port of Peiraias (Greece) to the port of Casablanca (Morocco) will take 10 working days. The composting system will be installed in land that is owned by ORMVAD. The land is enough not only for the in-vessel system, but also for the curing process that will take place afterwards. The trip of the Greek team to Morocco will take place in October, in order to monitor the installation of the composting system.

The 1<sup>st</sup> trip of the Moroccan team to Greece will take place on the 21-24<sup>th</sup> of September 2006. During this visit, the final design of the composting system will be presented by NTUA to the Moroccan partners. Furthermore, the Moroccan team will visit the laboratory premises of NTUA.

### **Task 3: Development of sludge aerobic composting processes – Optimisation of the operation of the pilot composting systems**

*Start date: 10/10/2006 End date: 10/04/2007 Duration: 6 months*

During Task 3 the start-up of the composting process will take place. As soon as the in-vessel composting system is installed, the start-up process will begin with the collaboration of all partners. The required laboratory analysis for the input waste material (sludge and other BOW) will take place in the premises of UCD. Furthermore, the daily operation of the composting system will be performed by UCD in collaboration with ORMVAD personnel that will assist in the manual activities. NTUA will provide expertise for optimizing the system's operation; furthermore a trip of NTUA to Morocco will take place in order to assist at the initial stages of the operation of the composting system. The system optimization will take place by varying parameters such as the reactor residence time and the additives to be used in the composting process.

### **Task 7: Dissemination and training**

*Start date: 01/02/2006 End date: 01/02/2008 Duration: 24 months*

The following dissemination and training activities are foreseen for the period from 01/08/06 until 31/01/07:

- Continuous up-dating of the web-site to include the progress of the project
- Formulation of the 1<sup>st</sup> workshop and the 1<sup>st</sup> training session addressed to Moroccan competent authorities. This is planned to take place on November 2007. The Competent Authorities will be informed early enough by UCD and ORMVAD about this event.
- Formulation and distribution of the 2<sup>nd</sup> and 3<sup>rd</sup> set of printed material that will describe the progress of the project so far. The 2<sup>nd</sup> set will be prepared as soon as Task 2 is completed so that pictures of the in-vessel composting system are included. The 3<sup>rd</sup> set will be prepared on February 2007, presenting the whole facility and pictures from its operation.
- A technical paper will be produced by NTUA concerning the system design
- The Steering Committee will be informed about the project progress
- Efforts will be made to continue the project dissemination in newspapers and in articles on the Internet.
- Dissemination of the project in other web-sites

### **Task 8: Management**

*Start date: 01/02/2006 End date: 01/02/2008 Duration: 24 months*

The following activities of Task 8 are foreseen for the period 01/08/06 until 31/01/07:

- Meeting of the management team in Greece on the 22<sup>nd</sup> of September
- Preparation and submission of the interim report
- Meeting of the management team and of the Steering Committee in mid October in Morocco during the trip of the NTUA team for the installation of the composting system.