Gender Issue and Water Management in the Mediterranean Basin, Middle East and North Africa

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Summary

This article aims to investigate some aspects of the social process related to water resources management and gender relations. Given that gender and water management are interrelated issues exposed to a growing attention at the international level, it is therefore necessary to identify relations between the academic literature, the institutional framework and the field-based research. This document has been inspired by the Nostrum DSS project (Network on Governance, Science and Technology for Sustainable Water Resources Management in the Mediterranean), a Co-ordination Action funded by the European Commission, which involves eighteen partners from the North and South shores of the basin. As the scope of the project is to disseminate Best Practice Guidelines for the design and implementation of Decision Support System tools (DSS) to identify optimal water resources management regimes, this article is proposing an analysis of a particular geographical and social frame related to the social actors involved in the project, but there are no connections between the paper and the project itself. To create a network between science, policy and civil society is one of the main objectives of the project in order to reach an improved governance and planning in the field of sustainable water management. Therefore, to investigate gender sensitivity in some areas of the basin shall provide a clue. This overview of academic and institutional background refers to a particular geographical and cultural area, the Middle Eastern and North African region.
In the first section lies the theoretical background, that has been extrapolated from international organisations guidelines and scholars' publications. The second section is specifically focused on the Egyptian geographical context. The first paragraph presents a review of the guidelines suggested by international organisations related to policies on gender and water, as parts of the changes that the global scenario has recently been facing, with the shift from the micro level to the macro level. The second paragraph then describes the side effects of these overspread trends, which are identified in their missing relations with the social context of the intervention. The third and fourth paragraphs introduce the issue of women's role in water management in the Middle Eastern and North African Regions, while highlighting relations between women's involvement in the public sphere and the role they cover in local communities organisations. The proportion of the political representation faced by women in this region is also discussed, tackling their overspread participation in agriculture and their unrecognised working status. The fifth paragraph of this paper will discuss a case study in Egypt, concerning an initiative promoted by international donors and the government aimed at increasing community participation in the design and management of irrigation canals. The case study gives a concrete sample to discuss plusses and problems of women's participation in *water users organisations*, synthesising many of the theoretical issues that have been raised in the first three parts of this article.

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Summary

1. Changing scenario in gender and water policies

The past few decades have seen a changing emphasis on the role of women and gender relations in water. Early policies and interventions adopted a welfare approach, however, since the mid-1980s, a new policy consensus on water resources management was formulated at a number of international meetings focusing in particular on the need to ensure the efficiency and effectiveness of water supplies. This was partly in response to a changing macroeconomic climate that favoured economic adjustment and a reassessment of the role of the State, and to the perceived failures of previous supply-driven government provisions to meet the needs of the poor. Over the past decade, the policy context for water resources has profoundly changed. Early on, the emphasis of policy makers was on planning the physical provision of water resources through the identification, design, appraisal, and implementation of projects. In the Nineties the emphasis has shifted to the task of managing water resources systems. The key idea is that the state ceases to be a provider of water resources, and instead promotes and facilitates, creating and enabling environment for others to provide and use water resources. The policy focus has shifted from projects to programmes, from the micro level to the macro level. The emphasis is on creating a sector for water-related activities by the establishment of a framework by governments and external donor agencies in which communities can themselves construct, operate and manage improved facilities (Cleaver: 1995). The unifying framework for planning and managing water resources is now given by Integrated Water Resource Management (IWRM), as described by the UNDP toolkit on Gender and Integrated Water Resources Management (IWRM) (Andersson: 2000). It defines IWRM as a cross-sectoral policy approach to respond to the growing demands for water in the context of finite water supplies. International policy statements announcing this new approach do refer to the importance of women in water management, but many scholars and social organisations are concerned that these references are simply tacked on to policies, and in fact, do very little to enhance women's powers.

As the United Nations Division for the Advancement of Women says (DAW: 2005), policy makers, analysts, international organisations and governments have nowadays sought consensus on principles to guide the setting of priorities, policymaking and the elaboration of specific initiatives in water resources management. Key points in policy include:

- Water should be treated as an economic, social and environmental good;
- Water policies should focus on the management of water and not just the provision of water;
- Governments should facilitate and enable the sustainable development of water resources, including a regulatory framework;
- Water resources should be managed at the lowest appropriate level;
- And finally there should be recognition that women play a central role in the provision, management and safeguarding of water (DAW: 2005).

In the European Commission sectoral policy on water management (http://europa.eu.int/comm/development/body/theme/water_en.htm), the importance of water resources is mentioned as one of the focal areas of support for development strategies, both as a productive resource and development factor and as a factor in regional integration. Sustainable development of natural resources is one of the guiding principles referred to in the mandate. A set of guidelines for water resources development cooperation were draft in 1998, this work touches on the different groups of water users, from the perspective of integrated resource management.
Moreover, one priority of the sectoral policy concerns public information on the value of water and the involvement of local communities, women in particular, at all levels of project preparation, management and maintenance, in close collaboration with health services. Participatory structures and gender issues are mentioned as priorities.
From Dublin (1992) to Rio (1992), to Den Hague (2000) and Johannesburg (2002), commitments on gender and water were taken into account in the international summits on the development and environment agenda.
Since the World Summit on sustainable development was held in Johannesburg (2002), the United Nations Commission on Sustainable Development had its first policy setting session. The aim of the meeting was to decide on concrete policy options and actions to be taken to achieve the goals and targets related to water, sanitation and human settlements contained in Agenda 21 (Rio 1992), the Programme for the Further Implementation of Agenda 21 and the Johannesburg Plan of Implementation. On March 22nd 2005, the International Decade for Action "Water for Life"[2] was launched. The assembly recalled proposals for a public information strategy and a communications plan for awareness-raising and provided some recommendations for action to be taken during the course of the decade. Increasing the participation of women in decision-making on water and sanitation was one of the issues on the table at the preparatory meeting for the Commission on Sustainable Development, in addition to its being a key focus of the Water for Life Decade.
"We need to free women and girls from the daily chore of hauling water, often over great distances. We must involve them in decision-making on water management. We need to make sanitation a priority. This is where progress is lagging most", stated United Nations Secretary-General Kofi Annan.
A gender-sensitive approach was also recommended as a guideline in the Water for Life decade, for that reason UN agencies are collaborating with Gender and Water Alliance[3] that was formally established in June 2000 to promote gender mainstreaming in all aspects of water resources management.

[2] The United Nations General Assembly, in December 2003, proclaimed the years 2005 to 2015 as the International Decade for Action 'Water for Life'. The primary goal of the 'Water for Life' Decade is to promote efforts to fulfill international commitments made on water and water-related issues by 2015. These commitments include the Millennium Development Goals to reduce by half the proportion of people without access to safe drinking water by 2015 and to stop unsustainable exploitation of water resources. At the World Summit in Johannesburg in 2002, two other goals were adopted: to aim to develop integrated water resource management and water efficiency plans by 2005 and to halve, by 2015, the proportion of people who do not have access to basic sanitation.
[3]GWA is an international network, it is governed by a steering committee and it is an associate program of the Global Water Partnership, it is quoted by the UN-DESA Assembly Report (March 22, 2005) as a network of over 300 organisations and individuals around the world, offering information and knowledge sharing initiatives.

UNDP defines gender mainstreaming as: “Taking account of gender concerns in all policy, programme, administrative and financial activities, and in organisational procedures, thereby contributing to a profound organisational transformation. Specifically… by bringing the outcome of socio-economic and policy analysis into all decision-making processes of the organisation, and tracking the outcome. This includes both the core policy decisions of the organisation, and the small every-day decisions of implementation.” (Andersson: 2000)
In addition to that, the Millennium Development Goals (MDGs), adopted at the Millennium Summit at the UN in 2000, included goals to “Promote Gender Equality and Empower Women” (goal n. 3) and to “Ensure Environmental Sustainability” (goal n. 7).
Moreover, in 2003, the Inter-agency network on Women and Gender Equality established the Inter-agency task force on Gender and Water, with the Department of Economic and Social Affairs division for Sustainable Development as task manager.
Although there have been relevant efforts towards women involvement in water policy, actions taken by international agencies are mainly concerning sanitation and household consumption. If the water sector has accepted the need for an inclusive partnership approach, it can be useful to consider a wider inclusion of women in every aspect of IWRM. (GWA 2003)
In the context of the Mediterranean region, this paper will investigate the state of the art of women involvement in water policies and the impacts of this process on the social tissue. In fact, rhetoric approach to gender in water management is receiving increasing recognition globally, yet local policies and practices are a more difficult task to address.
It can be useful to investigate how gender roles and norms are affecting water policies at local level in their multi-faceted dimension, and, on the other side, how policies could affect gender relations in water management.

1.1 A knowledge-centred perspective

The core task of this paper shall be to address an analysis of gender dimension and water management in the development process. There is a conceptual path which will be followed when talking about gender in water management, and it comes from the idea that civic engagement and political participation are mainly influenced by access to knowledge (Privitera: 2001).
This perspective will address some assumptions that are presented as determinants for the low inclusion of women in the decision-making process on water management in the Mediterranean region, and especially in those areas where water resources and women participation in the public sphere are both critical tasks.
The discourse concerning gender aspects in water management in the North Africa and Middle East (MENA), needs to be investigated trying not to oversimplify different fields of influence. Following three main frameworks – cultural, institutional and socio-economic – it would be possible reach the core task of this work, namely to investigate if water management and decision-making process in water management are mainly a matter of power-sharing.
As awareness seems to be the main tool to reach some relevant changes in power relations, this work aims to show that gender constraints in the public sphere arenas are

strongly interlinked with the gender gap in Natural Resources Management, more specifically, in water management.
The MENA region is the geographical area where the linkages among those issues will be investigated, choosing Egypt as a case study. This choice has been made as Egypt is described as a positive exception in the institutional behaviour in women inclusion in development units (Liao: 2004). Clarifications on these statements will be provided in the last section of this work, where a case study from the Egyptian area of Fayoum will be presented.
Some questions nonetheless arise as we look at the region, where, despite the fact that international institutions are calling for a better inclusion of women in the public sphere, women's exclusion from the political arena is a matter of fact (Moghadam: 2004).
Instead of stressing the point of the importance of women's contribution for the achievement of a more sustainable natural resources management, and leaving behind the perspective of the so called eco-feminism (Shiva: 2003), we adopt here a socio-cultural perspective. Moving from the sociological assumption of political participation as a matter of knowledge-sharing and rational dialogue, we will try to point out if the gender dimension in water management could be considered as a matter of political choice in the development process.
Even though international agencies and donors are emphasising the need of a better inclusion of women in decision-making and management in Natural Resources Management, this issue is still underrepresented at regional and national level.
Given this sensitive frame, the ultimate aim of the Nostrum DSS project is to bridge the gap between policy makers and researchers with respect to the use of DSS tools as instruments for improving governance for IWRM in the Mediterranean basin, in order to provide policy makers with a set of tools based on an integrated approach for solving different emerging national and transboundary problems in water management. However, DSS potentialities are often not exploited because of a lack of interaction between policy makers and researchers: on the one hand, researchers are often not responsive to the needs of policy makers, on the other hand policy makers have a tendency not to use scientific information for the formulation of water resources management policies. For these reasons, the final outcome of the Co-ordination Action is a set of Best Practice Guidelines for the design, development and implementation of useful DSS tools for IWRM. These Guidelines are being developed with the active involvement of the relevant decision makers and stakeholders in the different stages of the project, which is now in its second year.
During the first year of the project, policy makers and stakeholders have informed the scientific community with their knowledge and needs through the compilation of National Reports and ad hoc questionnaires. During the second year the information acquired was then employed to develop a fist draft of Nostrum DSS Guidelines and a feedback from the policy sphere on the draft guidelines is being collected through the involvement of decision makers in local workshops. Among the issues raised during the local meetings, language problems have been highlighted as a relevant issue to increase the communication process between policy makers, researchers and the civic society spheres.
EU projects on gender and water management are looking at awareness and information-sharing as the main tools to implement the so-called gender mainstreaming in water management. The slow process of changing policies and practices in WM is though drawn by multiple actors, one of these, the scientific society, does not always

take into account cultural and social constrains inevitably linked in new policies designing water management.
A European Commission research *"Increasing impact of the EU's international S&T cooperation for the transition towards sustainable development"* outlines the need of building a "knowledge society" when talking about operating in international cooperation projects. The research talks about "lowering the access barrier to knowledge for all the citizens" as an "overriding need", however, "it remains a major challenge" (EU: 2005).
How is it possible to talk about gender mainstreaming in water management if women can barely dare to take part in the political scenario? May a better inclusion in water resources management enhance a process for a wider participation of women in the political arenas?

2. The impoverished understanding of the social world

As this article aims to investigate potentials and biases of gender aspects in water management in the Mediterranean region (focusing on MENA region), it is necessary to approach this issue through some prior considerations. For this purpose, Frances Cleaver perspective on gender issues in water management could be adopted as a mean to achieve a more comprehensive approach (Cleaver: 1995, 2003). After her studies on community water management, she developed a sharp vision on the mainstreaming of gender dimension in water management projects, which tries to get rid of the optimistic oversimplification which is generally provided by states, international institutions and donors.
On the other hand, women and water are seen as a controversial issue in which NGOs, institutions, and donors are lamenting a dramatic lack in literature and understanding. In the last years renewed effort has been put in the development of new indicators and methodologies to understand the complex world of the interrelations that are linking gender and water management and their potential outcomes for a more equitable and effective management of the resource.
In her unenthusiastic think-piece on the progress with gender and water initiative, Francis Cleaver (2003) draws a clear picture of the risks that are occurring when gender approach to water comes from an oversimplified analysis of reality. The main point of her statement is a concern on the risk of a misconsideration of the social world in which the gender relations are embedded.
Our purpose is to define a pattern of meaning in which gender dimension can be better understood, so we will first try to remove some common sense statements that have been describing women as the gatekeepers of community knowledge and so the most eligible representative of the local people rights over water resources.
As Cleaver suggests, there are almost three different parameters to consider when talking about gender and water: culture, social relations and institutions. Of course, these dimensions are interlinked in a net of mutual influences.
Cleaver suggests that the disappointing progress with gender and water initiative can be partly attributed to an impoverished understanding of the social world, in particular to static and oversimplified models of institutions, cultural norms and social relationships.

This lack of understanding of the social dimension can lead to well-meaning gender approaches to water merely reproducing stereotypes and perpetuating essentialist myths about the nature of women's role in water resource management. Then, she suggests that little real progress will be made until there is recognition of the importance of detailed and contextualised social understandings, the dynamic nature of culture, the workings of structure and agency in social relationships and the complex evolution of institutions.

As international cooperation agencies are beginning to point out (WEDO: 2003), the water sector is a rich source of myths about gendered interests and roles. For example there is an often repeated assumption in the water sector that women make better treasures of water committees than men. This untested assumption seems to be based on the idea that women are generally more reliable and trustworthy, more community-minded and less likely to "drink the money" than men.

Gender myths have led also to such ideas about the desirability of community management, the inevitably empowering effects of participations and the certain link between paying for water and improved sustainability.

Gender approach to water use and management has a rather short history. It started in the 70's with a more general emphasis on the role of gender in development.. While gender has only very recently become a concern in irrigation and environmental water management, the drinking sector has for many years been characterised as the women's sector. In the emerging consensus on the need of participatory and integrated natural resources management (Bonn 2000, Kyoto 2003) women are additionally seen as primary managers of water because of their greater natural interest in this, and related to this, their greater reliability (in maintenance, meetings, payments). But is this true, or is this another myth?

According to current international policies, then, a prototype rural woman water user, 'traditionally' responsible for fetching domestic water for her family, should also become involved in planning and decision-making about the management of integrated water resources, raising funds and contributing other resources for the construction of new supplies. Through membership of water user associations and groups, she should play a part in the maintenance of water supply infrastructure and in regulating the distribution of water. As a consumer she is empowered to exert sufficient pressure to demand a good service from water suppliers. Poverty targets could be met through efficiencies achieved in the management and distribution of irrigation water which enable her to increase productive output; a possibility enhanced by the release of her time through the supply of improved domestic water supplies closer to home. Building on her productive roles this woman also assumes primary responsibility for financing and constructing household latrines and ensuring that the family adopt safe water-related hygiene practices (Cleaver: 1995).

A considered effective approach to gender might call for a critical analysis of the constraints imposed on women's participation by social structures, the gendered division of labour, hegemonic social identities and norms and the distribution of social, political and economic privileges, yet such a complex analysis is often missing.

Despite these examples and the gendered rhetoric of many water policy statements: "involving both women and men and meeting the needs of both women and men is the new gender focus of water projects" (GWA: 2003), these are often poorly translated into practice.

At best, a gendered approach is interpreted as the participation of men and women (in the interest of equity and project efficiency), while many projects remain that have no specific concern for gender at all. However, some of the fundamental shortcomings in approach to gender and water are caused by obstacles in practical implementation.
Many researchers are lamenting that the water sector is dominated by technical disciplines, which often forget to investigate the existing social norms that are living below water uses and practices. These observations are also linked to the difficulties of promoting a truly gendered approach (or any socially informed approach) within the requirements of a model of project management focussing on the speedy and cost-efficient meeting of quantifiable targets. As a result of the oversimplified structures of the social world, gender relations are misconstrued, often resulting in the perpetuation of gendered disadvantage.
The main point is that access to resources should not be seen as a merely functionalistic matter.

2.1 The social world, symbolic meaning and cost-benefit ratio

Besides policies over water management two different dimensions of the resource should be considered – its ethical value and its social and political value. Many international organisations are complaining about the lack of data and quantitative indicators to the gender dimension in water management, but a simple statement lies behind that: a shared vision of water does not yet exist. In recent times three different meanings have been assigned to water. It has been described as a need, as a right, and as an economic good. Obviously, those definitions are followed by further implications in terms of equity of distribution, policy-making, and inclusion-exclusion patterns in the decision-making process.
Which meaning should be given to natural resources is still an uncertain matter. Debates on social relations around water management and water uses are part of the building of a shared vision. However, through resources management, power relationships can be maintained or challenged, throughout policies over water resources, water bodies, streams, rivers, irrigation schemes, the social structure is always produced and re-produced. In this way water management is a means to maintain or transform the political asset.
In the development debate on natural resources, the rise of human rights discourse does represent a new perspective in management and policy planning. The perception of poverty is changing and also the strategies to overcome it; the need-centred approach is being replaced by a rights-centred approach (Sachs: 2003). For a rights-centred approach, poverty stems not so much from a lack of money as from lack of power. Instead of figuring only as people in need waiting for handouts, the poor become citizens who are marginalised because of their lack of rights, property, income and political influence, and this applies especially to women. From this perspective, water management and the policies related to it become a matter of power-sharing.
Through international agencies meetings, however, the idea of water as a basic human need is being overshadowed by the notion of water as a commodity.
In fact, in the last decades, emerging sectoral programmes focus on quantitative analysis and formal structures. The key quantity has become the price of water and the key formal structures are markets and meetings. In fact, through markets of various types

users pay for water, through meetings of various types users and providers take decisions (Cleaver: 1995). The new system of water resources management can thus be summarised as revolving around cash and committees.
Both cash and committees might be thought to be gender-neutral instruments. But closer examination reveals that both tend to be influenced by gender bias in various forms. In general, women tend to have less access to cash than men. In many geographical areas, it can be observed that talking about water for domestic consumption and irrigation schemes, presents a shift in the management (Shiva: 2003). It is a widespread reality that while irrigation replaces rain-fed agriculture and the market comes to play a relevant role in the crops production, then, irrigation schemes management are often run by the male members of the community.

2.2 Culture

Culture means not only the production of a particular society, but the whole amount of meanings which are living within a particular group of people and which are embedded in their relationship with natural and socio-economic resources. When talking about water culture we are including a wide range of aspects determining the uses of those resources by communities and at the same time which are producing and reproducing social behaviours among people.
When referring to water management, there is an established behaviour among donors and international institutions that often leaves aside the specific norms within a culture. There is a widespread tendency to think that through modernising influences (particularly development projects) it is possible to overcome traditional barriers to women's participation in water management. Hence, this tendency immediately collapses in its unilinearity.
In the water sector it is generally assumed that the formalisation of women's right to water (often associated with their rights to land) will overcome the problems of inequitable access shaped by tradition and culture. We will consider this further later on, when talking about institutions, where cultural approach has the objective to point out the negotiated nature of access to resources.
It should be noted that a common assumption which sees cultural norms as a barrier for projects implementation is double blind. While a technocratic approach shall see it both as a potential or a constraint, it is possible to have a more thorough overlook by exploring this dichotomy.
Whilst much project literature reports the impeding of women's participation by prevailing cultural norms, it simultaneously suggests that a number of socially sensitive decisions, like water tariffs, should be left to the community, their customs and traditional systems of authority. This is enormously problematic, as documented by many projects where a common theme is the centrality of traditional cultural norms as a rationale for continued inequity of participation (GWA: 2003).
Despite this recognition, the definition of culture as a constraint is narrowly limited to a concern with those norms which inhibit women's full participation in public decision-making.

2.3 Social relations

Rules and social norms, embedded in everyday life activities related to water management, are almost invisible without a deep field research, but come to light as determinant constraints when governments or international agencies are implementing new policies on the ground. Considering gender in water management it should be borne in mind that there are social and cultural aspects in water-related activities that cannot be ignored or underrepresented. In rural areas, the gathering of women around water sources is a major social activity and any changes to the provision of water supply will directly affect the social pattern of the community.
The functional bias of many projects means that both livelihoods and social relations are narrowly conceived in gender and water approaches.
Many people working on gender and water have adopted the idea that gender is about working with men and women and this is commonly asserted in policy statements (GWA: 2003). However, there is a problem in such a narrow conceptualisation of this and in its translation into practice. More practically, seeing gender relations as just inequitable power relations between men and women, allows ignoring other unequal social relations.
This approach aims to discuss the point that water sector is and remains highly stereotyped, although development projects on water management are supposed to change both behaviours and concepts in water uses and water users.
For example, pastoralists are seen to be concerned mainly with water for cattle, farmers with irrigation water and women with drinking water. Perhaps, more significantly, intricate webs of reciprocity with neighbours and patrons shape people's willingness to publicly participate in, or to question dominant norms of water management.

2.4 Institutions

Cleaver (1995) highlights three problems in mainstream thinking about water institutions. Again, myths abound about the nature of gendered participation in institutions and decision-making. These clusters around the common assumption that participation in water resource management is emancipatory and empowering for women and leads to more gender-equitable outcomes. Such participation is generally channelled through involvement in user groups, irrigation associations and water management committees. There is an emerging literature criticising an over optimistic faith in formal institutions and an associated neglect of informal institutions. This literature suggests the need to focus on institutional processes and patterns of inclusion and exclusion (rather than just on institutional form and membership) and on the dynamic and negotiated nature of institutional evolution.
Mosse suggests, as a result of his work on water in southern India, that finding the right spaces in which the project should work was a matter of balancing the need for authority with independence from patronage. He suggests that projects work was more effective when it left existing structures intact and found informal context for innovation [Mosse] (Cleaver: 1995). However, information about the extent to which men and women are variously able to exert influence and forward their interests through old and new institutional structures is surprisingly lacking. Cleaver suggests the existence of an intimate and dynamic relation between modern and traditional

institutions, formal and informal ones, and that decision-making and community management cannot be understood without a consideration of this complex process.

3. Why the focus on irrigation in MENA

Very few studies about gender, poverty alleviation and water have been conducted in the MENA region, the reason of that behaviour has been described as a weak effort to integrate the economic role of women into water resources planning (World Bank: 2005). Women are not seen as significant decision makers even with respect to domestic water use and sourcing. A World Bank analysis (2005) stresses the point that the time women spend fetching water for domestic use is not considered productive time, indeed, women's strategic interest in water is seen as associated with their reproductive role. The focal point that is taken into account is, therefore, time saving in water collection as it improves hygiene, nutrition and childcare.
On the other hand, the literature presents several positive impacts when attention is paid to gender issues in water resources management and irrigation projects, such as:

- Recruiting community organisers;
- Promoting and ensuring membership of both women and men in water users associations and thereby facilitating the payment of water fees;
- Actively encouraging women to assure leadership roles.

There are also studies on water demand management in the Middle East and North African Region (MENA) which demonstrate that decentralisation and participatory irrigation management can have adverse effects on women if gender analyses are not conducted (Liao: 2004).
Our concern in irrigation has several meanings: power relations in irrigation are strictly connected with power relations over land control, moreover, irrigation schemes might have to meet claims of use laws and social norms among the users community. Irrigation will then give us a concrete example of the negotiation process, where connections among formal and informal institutions are becoming necessary, as water users associations or community boards need to be recognised by bureaucrats
MENA is the most water-scarce region in the world, with the lowest volume of annual renewable water resources, as well as the lowest amount of renewable water resources on a per capita basis (Liao: 2004). Agriculture represents 80% of water consumption in the MENA region, such percentage puts irrigation improvement as a priority in the development agenda for water management.
In the development literature, gender and water have been always described as interlinked issues regarding the reproductive role of women. Health education has been an important entry point for women's participation in water projects. Although measuring the effects of good water and sanitation on health is methodologically complex, there is some evidence that when there is significant improvement in a community's level of water and sanitation, the impact on health can be substantial.
Because women are mainly categorised as providers of clean water to the household, which might make them walk long distances every day, studies show that the usual benefits of improved domestic water supply projects include improved hygiene,

nutrition and childcare, as a result of time saving in water collection (World Bank: 2005).
Although it is considered quite acceptable that gender plays an important role in water consumption and sanitation, its implications on the irrigation schemes have not been so far investigated.
International cooperation policies have focused mainly on food security and sanitation, while the productive role of women has been treated as an invisible task.

3.1 Water and gender in the Mediterranean region

There are some leading assumptions that are pushing donors and agencies to adopt a gender approach in several water-related projects, especially in the developing countries. These are trying to demonstrate that ensuring both women and men participation enhances project results and improves the likelihood of sustainability.
In the Mediterranean region, and particularly in the arid, developing countries, water scarcity is very real, with implications for social, ecological order, regional peace and food security. Management of available water resources is therefore a priority. Recognition of the need of integrated water resources management is growing, which requires attention to the human aspects of the use, development and management of water resources. For that reason a major attention to gender priority is growing, which is now advancing in most countries of the region. Nowadays, the so-called "mainstreaming" of gender issues in water resources and the irrigation sector is a top priority on the agendas of international organisations. Gender awareness in sectoral planning means:

- Undertaking that actors in the sector be differentiated by gender.
- Understanding that policy instruments have different implications for men and for women.

However, in spite of the emerging positive policy intentions, a detailed gender analysis demonstrates clearly the existing gap between the formulated policies and their conversion into concrete actions to be implemented on the ground. The conversion of gender policy into practice is proceeding, and the will to change is growing nationally and regionally, but at a very slow rate.
Such a delay in integrating gender concerns in water resource management and irrigation is the result of lack of analytical tools and appropriate concepts, lack of a comprehensive conceptual framework and appropriate implementation plans, besides the absence of gender performance indicators and above the weak roles of irrigation institutions and agencies.
The analysis also highlights the presence of several imposing severe negative factors that impact and slow down gender implementation policies (Hamdy: 2005).
As discussed below, many of them are related to the irrigation schemes, design and implementation.
It is a matter of fact that in most of the Mediterranean countries, and particularly the developing ones, the majority of sectoral projects funded either locally or by external donor agencies and organisations, to date, still exhibit difficulties with the ability to sufficiently incorporate gender into their activities and implementation. Factors accounting for this situation are many, including the fact that gender planning is treated

as marginal and not a mainstream activity in the water sector. It has been observed by the Mediterranean Agronomic Institute of Bari (CIHEAM) that, among the gender and water interventions in the Mediterranean area, managers and technical staff are not aware of the importance of applying a gender-sensitive approach to project implementation (Hamdy: 2005). Several factors may compromise projects' effectiveness and their ability to integrate gender concerns, such as:

- No desk officer is usually specifically tasked with the responsibility of overall coordination and overseeing of gender issues in programmes, the assumption being that any female staff on the team can handle gender issues sufficiently.
- Lack of knowledge of women and men's role in the water management sector.
- Inadequate number of female project staff on projects. For instance, village women's involvement in areas where they would always meet with male staff is limited.
- Time, duration and location of training often fails to take women's needs into account and visual and training materials are developed without any consideration to gender indicators.

There is a need of information and guidelines that have to be designed to help development organisations, government, donors and civil societies concerned with water management to develop gender policies appropriate to their organisational context.

CIHEAM, now participating in the GEWAMED project, "Mainstreaming Gender Dimensions into water resources development and management in the Mediterranean Region", together with other institutions, universities and NGOs from all around the Mediterranean, proposes a four-step process in order to promote the inclusion of gender issues in capacity-building programs and integrating them in the ongoing cooperative projects implemented in several developing countries of the region,.

The first step concerns information flows in two directions – that is, incoming and outgoing information. Incoming information implies the disaggregating of relevant data in male and female, firstly to identify the different needs of men and women, and, secondly, to study the differential impact of IWRM interventions on men and women: "Information and communication must be considered as shared responsibility and an interactive process" (Hamdy: 2005). As an output, communication about gender relations and water management might be the critical tool that should be implemented in order to ensure a long-lasting engagement among the civil society.

The second step is represented by consultation, advocacy and decision-making through the involvement of both men and women in planning and implementing IWRM interventions on the basis of their skills and the contribution, rather than on the basis of what is considered appropriate by gender.

The third step is based on promoting gender sensitivity by context-specific sex disaggregated data and gender analytical information and a clear understanding of women's and men's priorities.

The fourth step is to promote gender-sensitive organisations and it is directed to develop the skills, knowledge and commitment of the staff involved in management and implementation as well as addressing and understanding issues of gender differences and inequalities within the organisations themselves.

3.2 Women and improved irrigation system, a shift in the economic asset

It is well known that in the entire Mediterranean area women are very important actors in the farming system. They participate in nearly all the productive process and share equally with men all the work in the field. The general rule is that women take on the more traditional production practices including spate irrigation, they are especially important in working beside men to keep small canals working properly.
In spite of their traditional role, if irrigation systems are improved, it is not guaranteed that women will benefit equally like men, especially if their activities beyond household water provision remain invisible to policy makers and planners. Case studies in irrigated agriculture show that neglect of women's water and land use for domestic and productive purposes resulted in wrong plans and design and unwanted negative socio-economic impact later on (World Bank: 2005). For example, the neglect of fundamental management issues in large irrigation schemes can affect women and households negatively.
Furthermore, income from irrigated crop production would often go to men, a shift in land use from rain-fed to irrigated crop production could have the twisted effect of raising crop yields but reducing household food security. For this reason it has been argued that, contrary to the eco-feminist approach, women often have less interest than men in conservation measures, because their rights of access to land and common property resources are often less secure or long-standing. Regarding this issue, a World Bank report (2005) argues that incentives may be required to engage women participation in land improvement measures, and a similar argument might be advanced about water conservation and related measures.
Moreover, potential and ability to participate in community organisation and water users associations is often linked with social and economic norms which reinforce unequal participation patterns between women and men and result in unequal decision making.

3.3 Decentralisation and Participatory Irrigation Management

Given the critical link between agriculture, poverty reduction and water demand management in the MENA region, and the inevitable trend towards the shrinking availability of water for agriculture in the future because of competing demands from urban and industrial uses, it is critical for agriculture to use the available water at the highest efficiency possible.
Case studies from the region clearly demonstrated that decentralisation and the transfer of irrigation management from the centralised government authority to local water users associations increase water use efficiency from 30 to 50%. This does not mean necessarily a reduction in the amount of water used, but it can mean better social equity, where tail-enders on the water system receive water regularly.
In the MENA region, there is very little data available on the amount of land owned by women. However, reports indicate that land owned by women is rare, throughout the region. Even where women own land, women's plots are typically smaller than men's and remain under the control of male family members [Cotula](Liao: 2004).
In the second part of this paper a case study in Egypt will be discussed, concerning an initiative promoted by international donors and the government aimed at increasing community participation in the design and management of irrigation canals.

In the Egyptian case study there is a clear evidence that women and men have different perceptions of the irrigation canals and that, although women's work and responsibilities were tied to canal maintenance, their needs were not taken into account when the canal was upgraded.
Formal criteria for the inclusion of women in such an organisation often coincide with traditional cultural norms, which may dictate the appropriateness of female participation in water users' association meetings. In the MENA region particularly, cultural norms indicate that women should not interact with (non-related) men in the public sphere. Prevailing stereotypical ideas about the gender division of labour may also constrain female participation. Despite documented high rates of female participation in the agricultural sector, it is still not widely perceived that women are farmers in their own right and thus, there is no need for them to participate in water users associations meetings. From the field studies it can be observed that there is a common perception that women are busy with other, appropriately female activities. At the same time women do not allow themselves to break social rules to take part in water organisations meetings, as previously said.

4. Gender issues in the public sphere

Scholars and organisations do agree that the changing economic circumstances in the MENA region do have an impact on women's organisational activities (Moghadam: 2004). Women's voluntary associations that meet for economic, social, religious and educational purposes, have a well-established historical presence in every country in the region. In recent years, however, in some places, locally formed non-governmental organisations have increased in number, stepping in to support women and the family where the state no longer guarantees employment or has failed to provide social services.
Examples include Islamic charitable societies that provide day care for working mothers, and food and income subsidies for families in need, especially in Egypt, Algeria, and Palestine. In addition, international development aid institutions (United Nations, World Bank, U. S. Agency for International Development) have funded a myriad of development-oriented organisations and projects specifically for women, which offer opportunities to establish research and development projects that in turn employ women on the local level or support women entrepreneurship. However, international funding for women's organisational projects has not been an unmixed blessing, as the project sometimes benefits only an educated elite (Posusney, Doumato: 2003).
Some scholars suggests that women's organisational activities in the region have been especially encouraged in the post Gulf-War era, while until now, in many countries, organisations cannot function without a permit from the government, in addition, an organisation may acquire government approval but be subject to arbitrary closure.
Cross-national research suggests that countries with a higher degree of religiosity, such as Arab countries, are less likely to be egalitarian, modernised or democratic [Norris] (Moghadam: 2004).
Women participation in the civil society is strongly linked with cultural and social norms and moreover with social awareness and engagement trends of a country.

Social relationship, power structure and social change are formally and informally shaping women's participation in development issues, such as resources management, and political participation in the decision-making process.

There are different opinions about the growth of Islamic feminism, however, the purpose of this document does concern social patterns and dynamics of inclusion and exclusion in the political scene and potentials of women's participation in local organisations, hence, historical frames of feminist movements in the Arabic countries will not be investigated.

By the Eighties, with the ruralisation of the cities, the model of the Iranian Islamic revolution and the failure of the governments to satisfy their people's heightened expectations for better standards of living, significant sectors in all Middle Eastern society became more conservative and the Islamism phenomenon became part of the political landscape. Posusney and Doumato (2003) define Islamic feminism as a discursive, forward-looking movement generated by women to rationalise their activism and employment outside their home, not as a product of changing economic opportunity or emulating the western cultural model, but as a product of a true, indigenous Islamic heritage. Moreover Moghadam (2004) describes the phenomenon as part of what has been variously called Islamic modernism, liberalism and reformism, so to say, a transnational effort to marginalise patriarchal culture.

The 1994 Conference on Population and Development which took place in Cairo and the 1995 fourth World Conference on Women which convened in Beijing created a favourable environment that allowed for the proliferation of Arab Women's organisations and women-led NGOs. Whereas the period from the Fifties to the Seventies saw women involved almost exclusively in either official women's organisations or charitable associations, the Nineties saw the expansion of many types of women's organisations.

Arab-Middle Eastern feminists have risen in an uncomfortable ground, as they have had to contend with neo-patriarchal states, patriarchal Islamic movements, and religious-based family law.

Despite Islamic feminists demand, family law has remained particularly resistant to feminist attempts at reform. And, in every country in the region, except Turkey, Muslim family law still remains in force (Moghadam: 2004). Recognition of cultural and political constraints is a necessary, even critical component of understanding the impact of globalisation on women in the Middle East. It should not be surprising that in the Middle East there is a significant disparity between men and women in terms of their level of education, income, and labour force participation rates, since everywhere in the world these rates are higher for men. What is surprising, and what confirms the importance of factoring culture and politics into economic analysis is that disparity between men and women is significantly greater in the Middle East than in the rest of the developing world.

Employment statistics indicate that women's employment rates in MENA are the lowest in the world, although female labour force participation in MENA is increasing faster than in other regions. The greatest increase in female employment appears to be occurring in the informal sector. By economic sector, agriculture remains the largest employer of women.

4.1 Women's engagement in the political arena in Egypt

The World Bank and the National Council of Women in Egypt have been drawing an assessment in 2003 on the overall status of women in Egypt.
Key points of the report which should be highlighted in order to understand gender aspects of irrigation policies and practice are:

- While many laws in Egypt have provided for equal opportunities and equality before the law, discriminatory provisions still exist under certain laws, in effect reducing and compromising the status of women.
- Women's participation in the political and decision-making process is not commensurate with their numerical weight in society.
- With respect to education: the female illiteracy rate is still 51% and gender inequalities persist as far as access, attainment and training are concerned.
- Increased participation of women in the labour market can be viewed as a more productive use of human resources and a large contribution to economic growth; increasing women labour force participation rates is an important goal, but policy makers also need to be aware of the importance of women out of the market.

Related to legal constraints for the activity of civil society groups and NGOs, the Egyptian government has been especially notorious in this respect. In 1991, it shut down the Cairo-based Arab Women's Solidarity Association because of its opposition to the Gulf War, in 1999 it closed down the Ibn Khaldoun Center for Development Studies along with its magazine, *Civil Society*, and subsequently imprisoned its founder. In addition to that, in 2003 it refused an application by the New Women Research Center for registration as an official association. The efficiency of international pressure, however, is evident in the outcomes of such cases. The director and founder of the Ibn Khaldoun Center for Development Studies was finally released from prison in 2003, his center reopened and the magazine restarted. Moreover, following a massive petition campaign by transnational feminists, the New Woman Research Center received official recognition as an NGO. (Moghadam: 2004)
From a research held by the Egyptian Center for Women Rights (ECWR) during Local Councils (basis which produces members for the parliamentary councils) elections in 2002, it has been pointed out that there seems to be a positive relation between education and interest in public work . Moreover, there are sensitive effects of the political and legal environment in which public work is practiced. In Egypt, it has been observed that political participation often decreases both the freedom and personal safety of an actor, as the system is still moving slowly towards democracy.
ECWR suggests: "A democratic, free, legal and political atmosphere helps to increase women's and men's political participation in directing public affairs. A major move towards increasing women participation in public affairs cannot succeed without a democratic political atmosphere in which they can participate, thus decreasing the security cost of public work." (ECWR: 2002 p.32)
The statement above presents a conceptual frame to introduce the core topic of this paper, women's inclusion in water management organisations in Egypt. An overview of the factors which are influencing women's participation in decision-making positions is thus required. There are two main theories which attempt to draw a scheme of the factors which influence women's participation in the public sphere.

The first one is that women's political participation will never improve unless political participation of the whole society improves. This can be done by decreasing the negative aspects of doing political work in Egypt, such as by lifting the restrictions on the freedom of a political participant stipulated by the martial law or other laws.
The second one states that cultural factors are the real obstacle to women's political participation. This claims that the lack of women participating in the public work is due to the cultural heritage of society; specifically to the attitude of the family and the community.
As mentioned above, data gathered during a workshop held by ECWR, in April 2002, to prepare women to stand for the elections of the elected councils, shows that there is a positive relationship between the promotion of education generally and the interest in public work and women's political participation.
Furthermore, among the 28 women who attended the program, a high percentage of participants were members of boards or directors of NGOs (64.19%). This indicates an interest in the surrounding society which suggests that both education and previous engagement in civil society organisations represent sensitive indicators of women's potential involvement in decision-making activities at the political level.

4.2 Women's labour force in Egypt

Economists from international agencies and scholars do have a firm concern regarding the vulnerability of women in the labour market of this country. Several factors contribute to the vulnerability of women in the market, among which a widespread tendency to discriminatory employment conditions, lack of childcare and transportation, the dilemma of maternity leave, women's status as unpaid workers, lack of representation in trade unions. Furthermore, it should be considered that Egypt is the most populous Arab country, and it has always played the role of economic trendsetter in the region.
Recognition of gender segmentation of the labour market highlights three socio-economic factors responsible for the male bias in economic policies (Nassar: 2003):

1. the sexual division of labour
2. non recognition of unpaid work
3. women's responsibility within the household

Data collection factors that are affecting the underreporting of female participation rates in economic activities have been pointed out by Nassar (2003). Among them a single aspect can be highlighted which is strongly related to gender bias in agriculture, and more precisely, with irrigation:

- Neglect of female's activities in agriculture as active work.

Policy guidelines which are recommended by scholars' address:

- Conducting periodic, gender-sensitive surveys. It has to be stressed that studies are needed to provide information about the extent and characteristics of women's contribution to economic activities.
- Establishing self-employed women's associations (SEWA).
- Implementing safety nets programs.

Most of all, increasing the awareness of the importance of women's contribution in economic activities. In the view of the Egyptian Center for Women Rights, especially regarding rural areas, productive employment for women should be regarded not only as the condition for the survival of their household, but also as an extension of their role and status in the society.

5. Women and Irrigation in Egypt

In order to give a frame for the inclusion of the gender dimension in the Egyptian water users organisations it is necessary to give an idea of the institutional functioning of irrigation in this country.

In the past two years of Nostrum-Dss Co-ordination Action, several efforts have been made to encourage partners to involve local decision makers and stakeholders in order to share valuable experiences in a bi-directional ways. The strategy implemented was consolidated by the participation of local decision makers and stakeholders in several on-line E-conferences. Furthermore at the Tunisian and Egyptian workshop a brief questionnaire was compiled to collect the feedback of local decision makers and stakeholders.

Then, it has been possible to present some preliminary exploration of the answers received, as part of the objectives of Nostrum *Workpackage 6* (Bringing Science and Policy for Integrated Water Planning). According to the considerations of the authors on gender and water policies, the interviewed stakeholders believe that despite some overspread sensitivity to the gender issue, the institutional policies do not devote special attention to this problem. In fact, water management is not believed to differentiate between participants on a gender basis. However, in Egypt there are networks advocating for women's participation in the decision-making process over water management. No formal restrictions to women's participation in the water management process exist, and the level of intervention they have in the different water-related groups is considered reasonable. Nevertheless, when asked about roles women play in these associations, stakeholders say they are more related with administrative aspects or daily water uses.

As previously said for the wide countries of the MENA region, Egypt is characterised by a high consumption of water for irrigation (almost 77% of all water supplies in 2000) and the main source of water is represented by the Nile River, which is the source of almost all the fresh water in the country.

The irrigation system has always been managed by the central governmental authority which has always had the full control of the whole water supply management. From 1999, the state agency in charge is the Ministry of Water Resources and Irrigation (MWRI), the previous Ministry of Public Works and Water Resources.

MWRI is the only body authorised and responsible for planning, construction, operation, maintenance and rehabilitation of the entire irrigation and any control structures. MWRI is also responsible for human resources development not only related to its staff but also to water users (Nawar: 2004).

At farm level, the distribution of water has always been managed by the communities and/or groups of the concerned farmers who share the property of the canals. On that point, the legislation of Egypt introduced a legal basis for the establishment of NGOs only in 1964. Law no. 32 stated for the first time the establishment of associations and

private unions, although, as discussed above, non-governmental organisations and civil associations are still facing problems of recognition by the government.

The irrigation system in Egypt is shaped by an articulate scheme which delivers water from the Nile to the canals until the end users. There are five grades of water delivery canals which divert water from the river basins to the fields. Each principal canal with its sub principal canals feeds a number of command areas. Water is distributed within each command area by main canals and a number of branch (secondary) canals. These canals supply water directly or through some distributary's canals to the privately owned tertiary canals: *mesquas.* These private *mesquas* are owned by concerned water users who are responsible for their operations and maintenance. It is moreover necessary to specify that there is a clear distinction in the functioning of tertiary canals, and the upper level canals. *Mesquas* aim to deliver water to the farms for irrigation purposes only, while other water canals deliver water to diverse economic and social activities.

By the end of the Seventies, Egypt shifted to the path toward the decentralisation of irrigation due to several factors, which have both structural and political bases.

The government started to focus on integrated water management in 1977, when the Egyptian water use and management project took off with a seven-year project carried out by the Water Management Research Institute and the National Water Research Centre. The project implemented several structural and non-structural measures to improve irrigation efficiency, to support water-saving efforts and to involve water users in water management and in operation and maintenance. Furthermore, the project recommended the Ministry to provide well-trained professionals to help transferring responsibilities of the system's management to the farmers.

By 1993 the liberalisation of the agricultural sector was completed, removing governmental control on farm input and output prices. As a side effect of these liberalisation policies in agriculture, a growing demand of water resources followed, imposing more pressure on the limited water resources and their management. For better efficiency and cost recovery strategy, the Government chose to require a greater involvement of the end users in water management.

The main approach of irrigation water delivery in Egypt is based on rotation. Management of a water rotation system requires full cooperation and collaboration between farmers and stakeholders in order to ensure equity, fair distribution and allocation of water in addition to the efficient use of resources.

The improvement of the whole system considered the fact that all canals until the level of main and secondary canals and the tertiary canals off-takes are public property, and are managed by the MWRI, that serve, finally, the private tertiary canals (*mesquas*). It considered also that the tertiary and field ditches, *marwas*, are private properties and subject to the farmers' authority. This included the creation of Water Users Associations (WUAs) as part of an Irrigation Improvement Project (IIP) that began in 1981. Moreover, in 1992, an Irrigation Advisory Service (IAS) was initiated in order to work with WUAs. These associations did not have a legal identity until 1994, when the irrigation and drainage law was amended to allow for establishing WUAs at *mesquas* level.

This policy of MWRI is seen as a step in the path toward the decentralised management of the irrigation and drainage system, somebody considers it as an indirect and proper way to extend the control of formal irrigation management to a lower level which was a fully private affair in the past.

At community base level, it can be said that there have been mainly two steps of development towards decentralisation in the water management sector.
The first concerns decentralisation through transfer of all responsibilities and most authorities at the lowest local level, including improvement of the irrigation system at the tertiary canal level (*mesqua*).
The second concerns decentralisation of most responsibilities and some authorities at the secondary level of local canals. This includes the establishment of Water Boards at that level through the Water Board Project, started since the mid Nineties.
As an effort toward decentralisation at secondary canals level, in 1994, in Fayoum, the Fayoum Water Management Project (FWMP) started an Egyptian-Dutch Development Co-operation Program to enhance users' participation.
The participation of water users in water management at secondary canal level appeared to be necessary to increase the effectiveness and efficiency of the irrigation system. On an experimental basis, participatory organisations in the form of Local Water Boards have been established in ten pilot areas. It should be noted that water users' participation at the level of secondary canals is a new concept in Egypt. As a consequence, there is still neither a clear policy, nor definite legislation in this respect. However, this pilot project included gender-focused activities, in the representation of women in six Water Boards (Ahmed Eman: 2003?).

5.1 Gender component of the Fayoum Water Management Project

The gender component of the FWMP focuses on motivating and supporting female water users to participate in the newly established water users organisations.
Users organisations are essential to manage the Fayoum Irrigation System (FIS), which is a gravity irrigation system with a proportional distribution which delivers water from the Nile River through the above-mentioned canal system.
The Fayoum Governorate is located in North Western Upper Egypt, 90 km Southwest of Cairo, the area is only 30.48% of the whole Fayoum area, it is surrounded by desert from three sides (north, west, and south). It has a very specific nature because of its geographical and topographical characteristics as a depression with a closed drainage system and the altitude of about 60 m below the sea (Nawar, Salah: 2004). For ages the water of the Nile has been used to enable agriculture practices in a large depression. Nowadays a total area of 181,000 hectares is under cultivation.
The irrigation scheme provides a continuous flow in the canals, which makes the system in the Fayoum to a certain extent unique.
The main and secondary canals are considered public property and have so far been managed by the Irrigation departments. Tertiary canals are private property and farmers have first responsibility. Informal organisations at this level have been in existence for many decades, with operation and maintenance carried out and financed by the farmers. These organisations have proven to be generally effective with respect to conflict management. Analyses showed that the majority of problems and conflicts concerning water management appear at secondary canal level.
Both men and women, in fact, have access to the secondary canal system. The water of this canal is a public property and it is used for a wide variety of purposes. In the first place the water is of crucial importance for the agricultural production in Fayoum,

which could not take place without it. Women have access to the irrigation water but they play a certain invisible role in irrigation.
Distribution of water in Fayoum is based on the *mutarfa* system, an ancient tradition. In fact, *mutarfa* is used in the area to give each farmer his right in irrigation timing according to his ownership.
The irrigation groups (*munawabas*) use the rotation (*mutarfa*) system for water delivery in the tertiary irrigation units. In this rotation system, the weekly water flow is proportionally divided among the plots.
The operational rules of the *mutarfa* system have been developed into a local institution where all water users have internalised rules in use and exercise social control, ensuring rules respect within the community of users. Some communities have slightly modified the system, but generally formal and informal leaders are reluctant to make any changes to the system. The owners of large holdings receive their time-fixed water duty (*tarfa*) individually, and the owners of smaller plots have, predominantly, formed groups. The members of these *tarfa* groups receive their water duties in consecutive time. Farmers with wide experience in water management (*Sheikh el Taraf*) lead these groups and take care that the water is most efficiently distributed to the plots of the group members.
The involvement of women in the irrigation system is generally not recognised by men, there is a common assumption that women help their husbands, and in cases of women-headed household a cousin, a brother or son is said to be irrigating. However, at field level, it appears that women do own or hire land, cultivate lands and irrigate the fields themselves. Even though women usually do not own the land they cultivate and irrigate, they are left with the full responsibility of cultivation and irrigation, especially when the men migrate to other countries.
The particular nature of the Fayoum Irrigation System (a close water management system, meaning that there is no outflow) makes it a sink for the saline drainage water and, moreover, it makes water budgeting and pollution control more important, compared to the irrigation system in the other areas of Egypt.

5.2 Female-headed households

In the Fayoum Governorate, there is a considerable number of de facto female-headed households. As explained above, male migration to Arabic countries and commuting to Giza and Cairo are two common features, in the Fayoum Governorate (IDRC: 2004). In 1998 a data analysis from the FWMP showed that women in Fayoum were controlling 17% of the land and that 20% of the farming households were female-headed. In spite of this, female-headed farming households were owning smaller holdings than male-headed farming households.
This point has two consequences which are determining a huge gap between male and female farmers in Fayoum.
Among the 27 interviewed women who head their households, four respondents (15%) are married and their husbands work outside the Fayoum Governorate. They do not commute and therefore the households are de-facto female-headed. The other 85% are widows and they are middle-aged and old women.

Female-headed households avoid planting labour intensive crops, and they prefer planting food crops to secure the subsistence needs of the family, while male farmers plant more high-value crops, have much lower labour costs and their yields are generally higher. This statement is confirmed by field research where a high percentage (74%) of the women interviewed said they have more problems to manage their farms than male farmers (IDRC: 2004)
Female-headed households are therefore subsistence farmers and when they urgently need cash, they may even offer their land for sale. Therefore the female-headed households with small farms are considered a vulnerable group at village level, as they can easily be marginalised through market forces.
Furthermore, the respondents mentioned that female farmers are in a disadvantaged position in comparison to their male colleagues due to their limited access to information on innovative agronomic and water management practices. Male farmers have more time to collect information about new cultivation techniques from their colleagues and agricultural extension workers.

5.3 Women's view on equity in water distribution

Within the FWMP, women who are members of the board pointed out the importance of water users' membership, stressing that the board's main tasks are to establish fair water distribution, maintain and rehabilitate the system and help farmers to solve their problems concerning water distribution (Eman: 2003). Women interviewed in the first phase of the FWMP project said to consider the water distribution within the tertiary units as fair, as the weekly water supply to the tertiary units is proportionally distributed between the water users. However, they considered the water distribution in the primary and secondary canals as the cause of the inequity in water discharges. The data of the water distribution study confirm the scepticism of female farmers concerning the water distribution among the secondary canals.
Female participants did also express the feeling that, even though they have similar options to men to manipulate the water flow to their plots, they do not have the heart to break the operation rules and take irrigation water from downstream farmers.
In summary, trust of female farmers in the fairness of the water distribution declines moving up the hydraulic hierarchy. Water distribution data confirm the opinion of female farmers that the water duties in the head reaches of the canals are higher than in the tail reaches. Lower water duties in the tail reaches intensify the struggle for water in the secondary canals. The female respondents have an unambiguous opinion about the fairness of the *mutarfa* system, defending it straight out.

5.4 Women and participation in Water Users Organisations

In FWMP, during January 2001, some female members of local boards who are currently inactive and do not attend the meeting any longer gave as explanation:

- Their husbands do not agree that they attend meetings at night
- The water board offices are too far from their homes to get there at night
- They have little idea of what they should do as female representatives in the board

The same women, when asked about the type of problems that could be better handled by women, reported several problems like dealing with water pollution, birth control and family planning, representing other women and cleaning the environment.
The pilot project in the Fayoum Governorate is clearly drawing some features of gender aspects of women participation in Local Water Boards.
Although women use water for agricultural production and household purposes, there seems to be a general assumption that their needs concerning water management can be addressed by men.
Opinions varied concerning female representatives in the board. Some indicate that women should be heard and participate in the boards and others, especially members of boards that have never had female members, feel it is not very useful to have women in the board.
The female farmers are generally interested in the water boards' effort in integrated water management and in participating in the meetings of the water boards. However, social norms are influencing their behaviour. For example, female farmers have problems to attend the meetings of the water boards when these take place in the evening, because in the evening women have family obligations and dislike leaving their homes. In addition, the female representatives in these water boards feel that these meetings are not conducted efficiently. In their opinion too much time is used for minor private matters so that little time is left for important public issues.
To overcome problems related to night irrigation, some female-headed households managing smaller farms have joined the local *taraf* groups, that provide them with protection to receive their water duty. These *taraf* groups also introduce some flexibility in the *mutarfa* rotation system, which is a strong local social institution. The *taraf* groups have the potential to modify the *mutarfa* system without changing the principle of proportional distribution and this perfectly suits female farmers needs, as they are interested in possibilities to receive their water duty during the daytime.
There is a further disadvantage in gender inclusion in water boards which is connected to social relations: villagers perceive it as a positive discrimination of women.

Conclusions

From a knowledge-centred perspective, which we chose for this article, civic engagement and political participation are linked to access to information (Privitera: 2001). Women's involvement in the decision-making process on water management, however, seems to be a complex and underrepresented issue to tackle, especially in the MENA region. For this reason an effort has been made to identify links between theoretical approach and empirical data.

Concerning the MENA region, this review shows that gender topics in water management are scarcely addressed in institutional policies, and in the Nostrum DSS analysis of stakeholders' needs and expectations, the same issue has been pointed out, in spite of the potential role women could play to improve education and to increase awareness about water problems within the community of users.

As mentioned above, the scientific community agrees on a few points, the dynamic nature of culture, complexity of social relations, static and oversimplified nature of

institutions, as boundaries to consider while talking about gender and water. Those burdens can be challenged as the social actors start to improve the information-sharing process among the different spheres of society.
Increasing communication among the different actors of the public arenas has also been suggested by a first draft Nostrum DSS Best Practice Guidelines as an option to overcome conflicts and difficulties among policy makers, researchers and final users. Those Guidelines are the main final expected outcome of the project and have been designed after the second year of project implementation.

Civil society, policy makers and researcher have been taken into account in the Nostrum DSS project as interlinked actors. For this reason, the main efforts have been directed at involving stakeholders and having their feedback over all the stages of the Co-ordination Action.
On the other side, theoretical statements and field research do not match in terms of the relevance social components give to education and access to knowledge. An important issue that has been pointed out by the Egyptian case study is that, within a country where female illiteracy is 51%, employment and political endorsement are perceived by women as more powerful tools than education to enhance their participation in the water management process.
The introduction of women within the water management process, not only in their domestic role, could represent a challenge to power hierarchy and cultural structures. In the MENA region, those boundaries to the enhancement of women in the public sphere are maintained by several factors. Among them, the overspread non recognition of an institutional role for NGO's and civil society organisations.
In the Egyptian case study in Fayum, however, it is possible to highlight some representative features of the relationship between gender and water in MENA.
First of all, confirming that production of knowledge is a virtuous process, among the several factors which can be considered critical indicators to describe gender relations in local water users associations, women do not attribute a relevant role to education. Employment and institutional recognition are seen, on the other hand, as key points. Although the educational level does affect women's participation in the higher political level, it is pointed out by the FWMP that the level of *education* for women is not necessarily relevant to make them represent the community of users.
As mentioned above, women's role in water management is related to the cultural and social aspects of the national and regional context and to the process of social changes, which is not predictable.
However, as highlighted in this document as in the stakeholders' analysis of the Nostrum DSS project, inputs in information-sharing can enhance the discourse on social (and gender) aspects of water management policies and practices among institutional, governmental, scientific and civil society arenas. In a positive scenario, communication among the actors shall lead to a more comprehensive and discursive public participation in the decision-making process.

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