

# Water Management: Prospects on Effective Role for Saudi Women

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**Abstract**— Stressing on the central role women play in provision and managing water, this paper aims to analyze the current situation of Saudi women and prospects of an effective role that she would contribute to water management in Saudi Arabia. The data was collected from various national and international resources such as Statistics of Saudi Ministry of Economics and Planning, Saudi Ministry of Water and Electricity, Saudi Statistical Year Book of the Central Department of Statistics and Information 2015, FAO statistics, in addition to UN and UNEP reports. The study shows that, the number of Saudi males and females are almost equal per 2015 population data for Kingdom of Saudi Arabia. Nevertheless, when it comes to labor force mismatch between them is observed with higher opportunities for males. The study shows that, the labor market does not cope with the steady increase in the number of Saudi females that graduated from Saudi Universities during 2000-2013. On the other hand, females are receiving more employment opportunities in Services, Engineering and Business Director sectors by 2015 compare to 2005. Nevertheless, their contribution is far below males. Although they contributed in Business Director jobs effectively compared to Services and Engineering jobs, but still less than half of that acquired by males. Furthermore, the study indicates that 2% is the level of empowerment of Saudi women. It is very low percentage compare to other Gulf Corporation Council states that hits 23%, while the international standard reached 53% and that for developed countries is 76%. The study recommends investment in further education for females by providing more opportunities for females to receive Ph.D. and fellowships from local and international institutes to give significant impact on quantity and quality of female postgraduates and contribute significantly on high rates of employment among females. Hence, they would have great opportunities in the labor market and reflect positively in narrowing the gap between the output of higher education and labor market and lead to achieving empowerment of Saudi women in water profession sectors. Saudi women should be involved in making decisions concerning the management of water as a precious resource. She should be part of decision-making and strategic planning in managing risks such as floods and droughts as well protecting the environment and precious resources. She should be involved and empowered in water and sanitation programs as acceptors, users, managers, and new technologies diffusers.

**Index Terms**— Education, Employment, Empowerment, Saudi Women, Water Management.

## 1. INTRODUCTION

Arid climate, high temperatures, limited water supplies; and scarce fresh water are prominent features of the ecosystem of Saudi Arabia [1]. Water is an essential element for every human-being; for growing crops, maintaining livestock, personal hygiene, personal consumption, cooking, washing and house holds' every day maintenance and more. Access to water is extremely different from country to another, as it also differs inside a country. It could be through pipes inside homes, or from a well 30 minutes away. No matter the standards set by a country, access to clean drinking water and proper sanitation are key human rights. Otherwise, people are forced to rely on unsafe sources of water that highly increases the risk of preventable, communicable diseases [16].

By 2025, half of the world's population will be living in water-stressed areas [14]. The lack of access to water has major impacts on human's wellbeing. Either it is the case of water insecure person or living in water scarce areas, lack of access to safe drinking water or sanitation has massive health impacts. WHO and UNICEF on their final Millennium Development Goals (MDG) progress report released 2015 and reviewed November 2016 stated that, "access to adequate water, sanitation and hygiene is critical in the prevention and care of 16 of the 17 neglected tropical diseases, including trachoma, soil-transmitted helminths and schistosomiasis.

Such diseases affect more than 1.5 billion people in 149 countries, causing blindness, disfigurement, permanent disability and death" [16]. Although this progress report showed 15% increase in the world's population accessing improved drinking-water source since 1990, there are 663 million people still rely on unimproved sources and at least 1.8 billion people uses drinking water sources contaminated with faeces. As contaminated drinking water is estimated to cause 502,000 diarrheal deaths each year.

Shortage of water affect human nutrition and daily requirements of food as well. Each of us drinks from 2 to 4 liters of water every day, however most of the water we drink is embedded in the food we eat. Producing 1 kilo of beef for consumes 15, 000 liters of water while 1 kilo of wheat consumes about 1, 500 liters of water [14]. Celebrating 2012 Water Day, United Nations mentioned that, more than 7 billion people to feed on the planet and 2 billion are expected to join by 2050. Water is becoming an increasingly rare commodity, and factors such as population growth, poor management and climate change are making water management and allocation more complex.

The per capita available water in the Arab World decreased from 3430 m<sup>3</sup> in 1960 to 1250 m<sup>3</sup> in 2000 to 876 m<sup>3</sup> in 2010 with expected further decline to 500 m<sup>3</sup> by 2050 [5]. These figures reflect a current serious threatening situation for water security in Arab World bearing in mind 1000 m<sup>3</sup> is the estimated water poverty line. In Gulf Cooperation Council, desalinated water is invaluable in fulfilling the demands of water. However, any disruptions of water supply would have direct consequences on the political and social stability in the region [13]. Furthermore, Hanady [8] detected a negative relationship between supply of water and the cost of production of desalinated water between 2000

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and 2014 in Saudi Arabia. Her study shows a negative relationship between demand for water and per capita gross domestic product for the same period which indicates future threatening situation of water and food security in the region.

Clean water and good sanitation everybody's business. Nevertheless, Special needs of women are rarely considered in implementation of water projects and sanitation. Although women in developing countries, especially rural areas, are the water provider, director, responsible for daily water collection and the one who decides how to use water inside homes. They are almost absent from the professional sector of water. Absence of women in advisory and policymaking levels may be due to gap of education levels, type and curricula that accessible by females and/or other factors. Elmulthum [3] stated that, upward trend of women education is not accompanied by higher employment opportunities for females. They added that, women have very rare opportunities to decide upon pivotal issues related to them and their society because of limited opportunities to assign them in policymaking positions.

Consulting woman in many problems such as local sources, good site, design of units is priceless, as women's knowledge and experience with water is dated centuries back and gifted to her to play her nature role. The Inclusion of woman in water programs will reflect positively on protecting precious water resources, next generations' rights for water resources and sustainability. As awareness is growing of the importance of gender approach to water supply and management issues, women can play central role in provision, management and safeguarding water. Internationally, role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources [15].

This paper focuses on effective role that Saudi women can play on water management emphasizing positive policies for inclusion and empowerment of them at various levels of water programs, decision-making and implementation.

## 2. METHODOLOGY

Secondary data was gathered from various governmental agencies. Data concerning education was obtained from Saudi Ministry of Education. In addition to, data from Saudi Arabia Central Department of Statistics and Information, Saudi Ministry of Economics and Planning, Saudi Higher Education Statistics Center and Saudi Arabian Monetary agency. Descriptive and quantitative statistics analysis were employed focusing on effective strategies to involve Saudi women in water management policies. Correlation developed to show level of education among females and its relation to employment and labor market. The study also analysis level of empowerment of Saudi women and her involvement in decision making and strategic planning.

## 3. RESULTS AND DISCUSSIONS

### 3.1 Women's Education

Number of males and females are more or less equal from birth to 70 years old as shown in Figure 1 below that depicts

population of Kingdom of Saudi Arabia by Gender in 2015. However, when it comes to graduates from Saudi universities between 2000-2013, Figure 2, mismatch between them is observed with higher opportunities for females.

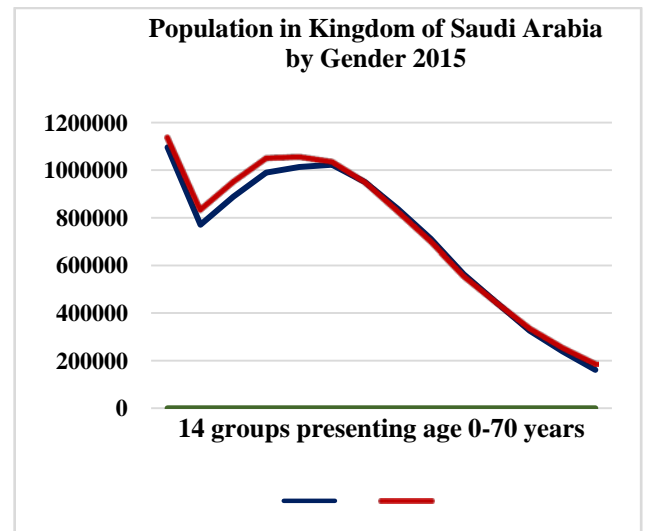


Fig. 1. Kingdom of Saudi Arabia Population by Gender, 2015 [2, 11]

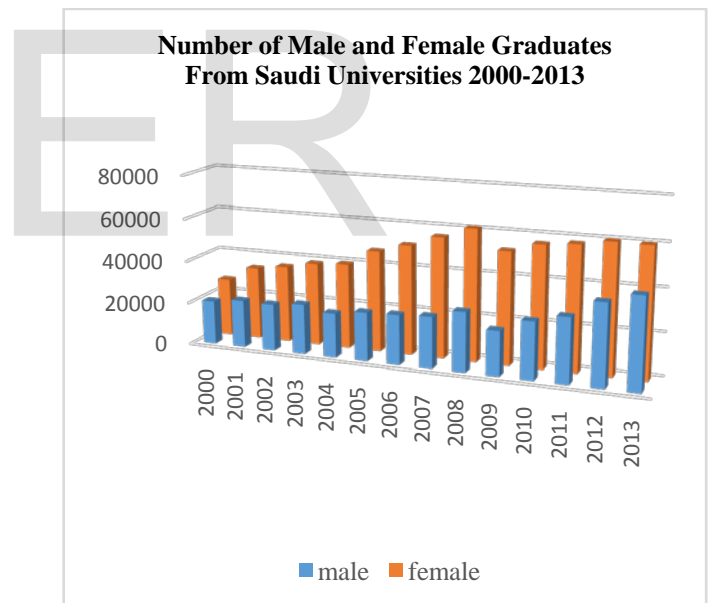


Fig. 2. Number of Male and Female Graduates from Saudi Universities 2000-2013 [12]

On the other hand, Figures 3 below, summarized levels and stages of post-graduate for government and private educational institutes in Saudi Arabia in 2014- 2015 academic year. It shows that, there is a gradual increase on the number of females joining postgraduate studies recently compared to that previously graduated. Nevertheless, postgraduates' opportunities are dominated by male.

Generally, there is a considerable increase in the number of females that registered for postgraduate studies compared to that either graduated or newly accepted. The figure depicts that, number of females that registered for High Diploma is

25% more than registered males. Nevertheless, the graduated females that earned Doctorate or fellowship is quite below number of males. Although the registered females were increased compare to previous year, the gap between genders is considerable, as it is more than 52%. On the other hand, the situation is worsening for new intake. A general drop is recognized with 58% gap between them.

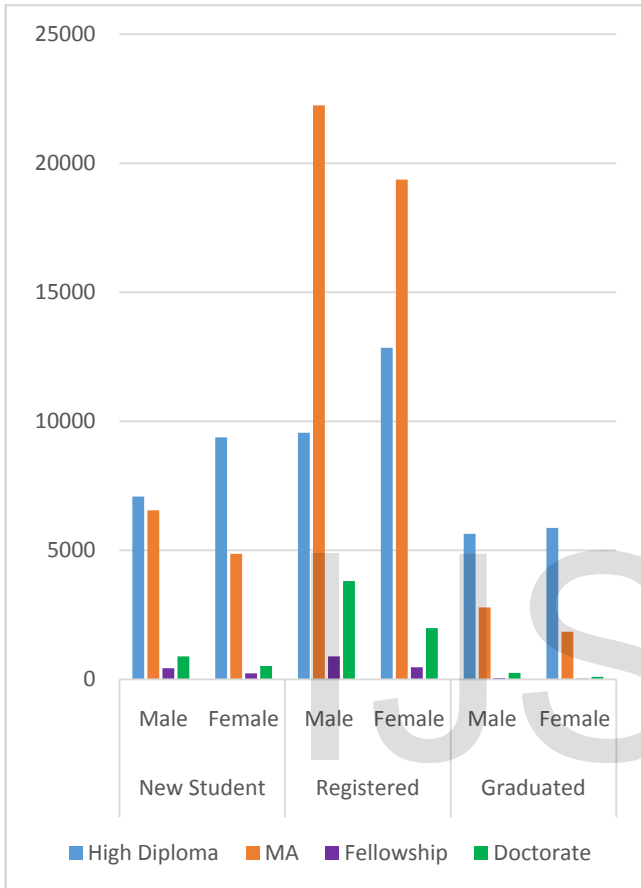


Fig. 3. Statistical Summary on Post-Graduates Levels from Government and Private Educational Institutes in KSA, 2014-2015 [12]

Investment in further education for females by providing more opportunities to receive Doctorate and Fellowships from local and international institutes is expected to have a significant impact on quantity and quality of female postgraduates. Hence, they would have great opportunities in the labor market and reflect positively in narrowing the gap between the output of higher education and labor market which is one of the commitments declared by Saudi Vision 2030[7].

### 3.2 Women's Employment and Labor Market

Although the study confirms that Saudi female graduates are more than male, the employment rate of females is far below that for males from 2000-2015 as shown on the figure 4 below. Average unemployment rate in Saudi Arabia for

females and males during this period is equal to 26.65 and 7.15 respectively. Creating employment opportunities would give the increasing number of female graduates' prosperous chances of attainment jobs and hence, reduction of unemployment rate for females. This irreversibly relation reflects poor contribution of females to labor market, which is confirmed by Figures 5 and 6 that show Saudi employment by sex between 2005- 2015 in private sector in Services and Engineering jobs respectively.

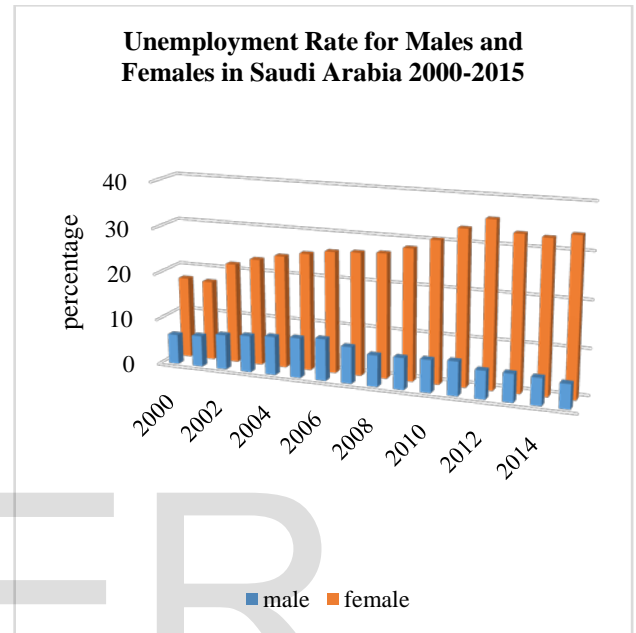


Fig. 4. Saudis Unemployment Rate by Sex, 2000-2015 [10]

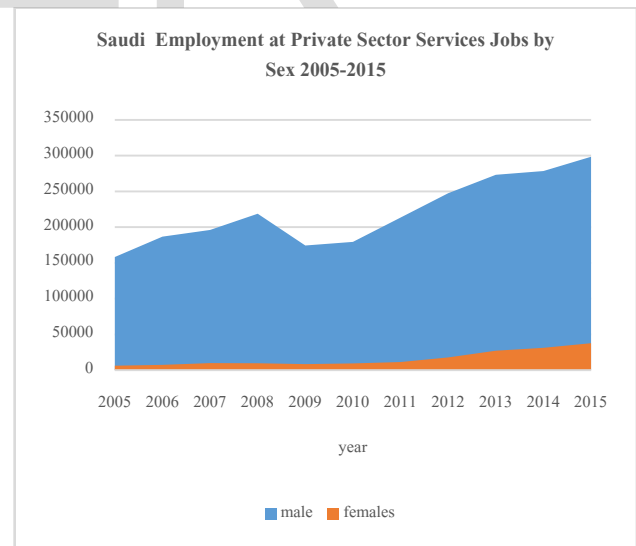


Fig. 5. Saudi Employment at Private Sector Services Jobs by Sex 2005-2015 [10]

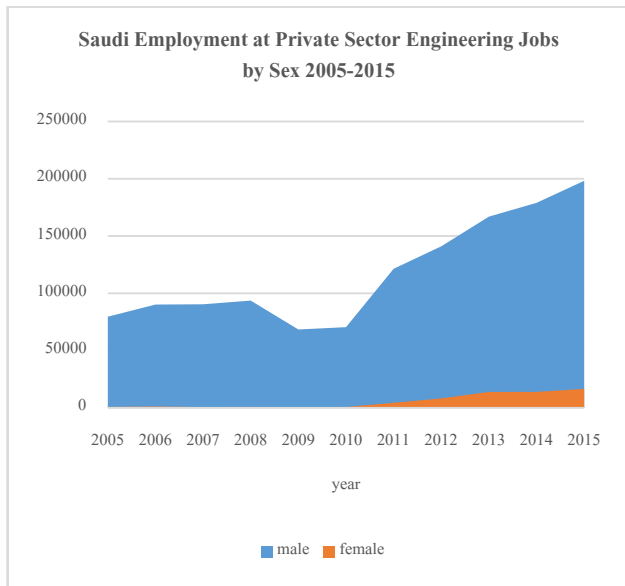


Fig. 6. Saudi Employment at Private Sector Engineering Jobs by Sex 2005-2015 [10]

Figures 5 and 6 above, confirm Elmulthum [4] findings that mentioned, “the highest average proportion of graduates from 2000-2013 was Humanity Sciences specialties graduates. While the lowest proportion was from industrial and architectural engineering specialties”. The study results shown in figure 6, indicates that Saudi female contribution to Engineering jobs is zero till 2010 with a very minor increase until 2015. Which is confirmed by Elsayed [6]. In Saudi Arabia, there is only two governmental universities that offers engineering programs for females. Out of 24 Saudi governmental universities there is only one Engineering Program for females. It is Biomedical engineering program, which is recently accepted female candidates in 2010. Moreover, other Engineering programs that relates to water studies such as Environmental, Civil, Sanitary Engineering programs are not yet offered for females. Such Engineering programs are essential, distinguished and unique program ensuring strategic plan and decision making in water management field and encourages empowerment of women. Moreover, it will play a vital role in reducing the gap in engineering profession and contribute to the cultural construction of the Saudi nation supporting 2030 Saudi Vision for empowerment of Saudi women.

### 3.3 Women’s Empowerment

Focusing on empowerment of Saudi women, selected jobs were studied and analyzed. Figure 7 below, depicts Saudi female employment in business directors, services, and engineering sectors. The figure shows that females are receiving more employment opportunities with slow rate in both services and engineering sectors. However, in business directors the rate is considerably high, which could be attributed to the increase of number of female graduates from relative multi-disciplines [4]. Nevertheless, females’ contribution is far below males as confirmed by figure 8 beneath. Although the gap between them is narrowing

gradually from 2005 to 2015, females’ contribution is less than half (50%) of that acquired by males.

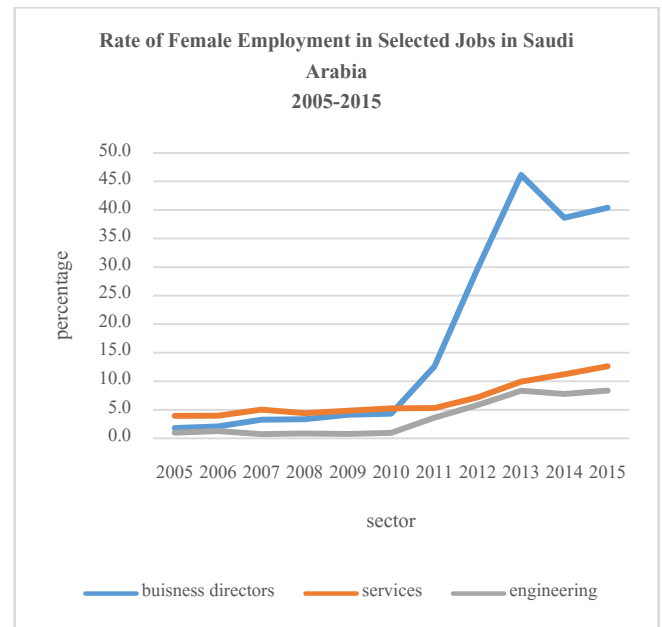


Fig. 7. Rate of Saudi Female Employment in Selected Jobs between 2005-2015 [10]

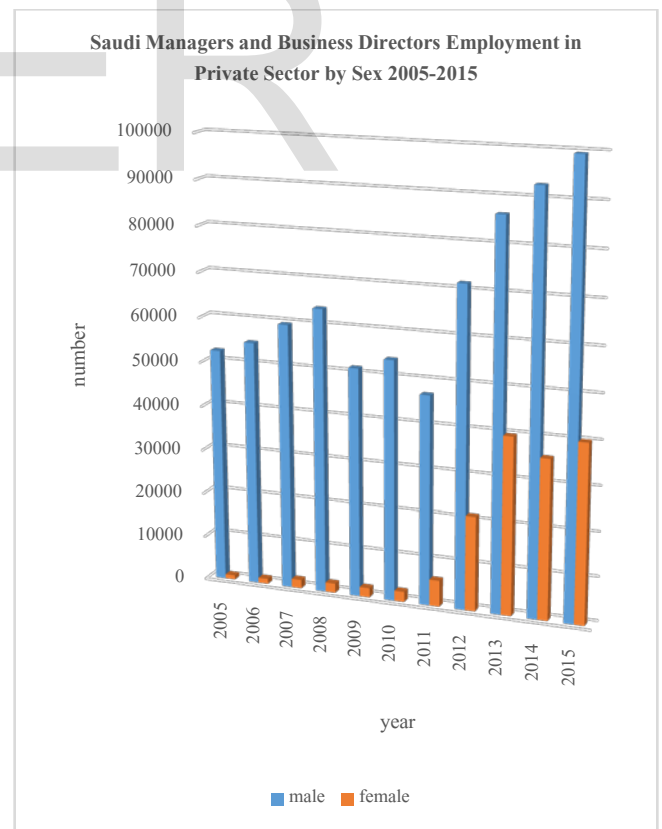


Fig. 8. Employment of Saudi Managers and Business Directors in Private Sector 2005-2015 [10]

Woman has a central role in the provision and water supervision, as she saves and uses water as patron of our

living environment. Women involvement and empowerment in institutional organization for development and management of water resources is essential. Gender equality and women's empowerment by supporting them in education, health, economy, community participation and involve them in development processes is obligatory. Nevertheless, 2016 Meeting of Gulf Corporation Council Women Leaders: Management Development, shows that Saudi empowerment is very limited compare to international standards [9]. The representative and Director for Institute of Management at Female Branch mentioned that: "According to Saudi Social Development Indicator, Saudi women empowerment is only 2% compare to other GCC states that hits 23%". She added that, the Saudi women empowerment is far below the international standard that reaches 53% with a 22% increase in developed countries that reaches 76%. This confirms that, Saudi women are almost absent from the professional sector of water, advisory boards as well as strategic planning and policymaking levels too.

### 3. CONCLUSION AND RECOMMENDATION

The study concludes that, although the number of Saudi males and females are almost equal per 2015 population data for Kingdom of Saudi Arabia, when it comes to labor force mismatch between them is observed with higher opportunities for males. The study shows that, the labor market does not cope with the steady increase in the number of Saudi females that graduated from Saudi Universities during 2000-2013.

Although females are receiving more employment opportunities in Services, Engineering and Business Director sectors by 2015 compare to 2005, their contribution is far below males. Females are contributing in Business Director jobs effectively compared to Services and Engineering, but it is still less than 50% of that acquired by males.

Qualified female graduates have a tangible impact on Saudi society and hence greatly contribute to achieving 2030 Saudi Vision goal to increase contribution of females in the labor market and hence empower them [7]. Therefore, the study recommends investment in further education by offering more opportunities for females to receive Ph.D. and fellowships from local and international institutes which will significantly impact the quality of female postgraduates and contribute efficiently on high rates of employment among females. Hence, they would have great opportunities in the labor market and reflect positively in narrowing the gap between the output of higher education and labor market and lead to achieving empowerment of Saudi women in sectors that deal with water profession.

Furthermore, the study shows that 2% is the level of empowerment of Saudi women. It is very low percentage compare to other GCC states that hits 23%, while the international standard reached 53% and that for developed countries is 76%. Saudi women should be involved in important decisions concerning the management of water as a precious resource. She should be part of decision-making and strategic planning in managing risks such as floods and

droughts as well protecting the environment and precious resources as water.

The study recommended immediate actions to involve and empower Saudi women in water programs as follows:

- Disseminating of information on best practices and technology on freshwater to women through directed specialized education.
- Support women as a scientist in different water disciplines as societal prosperity and responsibility in equal proportion.
- Increased participation of women in water management which is an ethical approach and imperative for sustainability and productivity of water projects and social development.
- Adopt women contribution and leadership in water provision, sanitation services and maintenance.
- Generation of Gender Advisory Board to shoulder coordination between different authorities and institutions to involve women in water management, studies and researches.
- Attain women right for broad public access to information and opportunity to participate in decision-making.
- Empowerment and participation of women in technological decisions to increase efficiency and implementation of decisions which would generate a sense of ownership and commitment to her community.

The study concludes that, inclusion of women as adviser, planners, scientists and engineers in all axes from academic to governmental services is a necessity will reflect positively on achieving 2030 Saudi Vision goals towards empowerment of Saudi women.

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