
UNIT 4 WATER AND GENDER

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4.1 INTRODUCTION

Water is an important natural resource and required for survival of all form of life on the universe. Water is the necessity in all sectors starting from domestic, industry, agriculture, to navigation. Agriculture is the backbone of the Indian economy and water play a vital role in agriculture as more than 70% water is consumed in agriculture. There is a close relationship between water and human development activities and its plays an important role in human development as it required for various activities of human.

As per United Nations (UN) General Assembly, safe and clean drinking water is a Human Right since, 2010. As per Niti Aayog (2018) report at present, 600 million Indian people faces high to extreme water stress. The safe water is not available to large number of Indian population resulted in about two lakh people deaths every year due to inadequate access to safe water. The situation is continuously deteriorated because projected water demand of the country to be twice the available supply by 2030 leading to severe water scarcity for hundreds of millions people. As per the report of National Commission for Integrated Water Resource Development, MoWR, the water requirement by 2050 in high use scenario is likely to be a milder

1,180 BCM, whereas the present-day availability is 695 BCM. The total availability of water possible in country is still lower than this projected demand, as 1,137 BCM. Thus, there is an imminent need to deepen our understanding of water resources and usage and put in place interventions that make our water use efficient and sustainable

Water is unquestionably having social significance as it plays an important role in social dynamics, including gender roles. Gender roles shape the use and collection of water, which are traditionally associated with women in the agriculture, domestic sphere, and the governance of water resources, which are associated with men in the public, monetary sphere.

In the unit you will learn about importance of water resource in 21st century, role of women in water development, gender Inequities in the water sector, role of water in agriculture etc. Importance of water policies with respect to gender concept and integration of various kinds of water resources will also be discussed.

4.2 OBJECTIVES

After studying this unit, you should be able to:

- Outline the importance of water resources and its importance in 21st century;
- Identify the role of gender and gender inequalities in water sector;
- Acquaint yourself with women issues about water; and
- Justify the importance of water for livelihoods and agriculture.

4.3 SIGNIFICANCE OF WATER IN THE 21ST CENTURY

The main source of water is precipitation that may be rainfall or snowfall. The spatio-temporal variation in rainfall is erratic and very high. In India more than 70% of rainfall is received during July to September and the depth of rainfall is also vary with location to location in the country.

4.3.1 Water Resources

The country total geographical area is about 329 m ha which is 2.4% of the world's land area. The country has only 4% share of world's fresh water to support almost 15% of the world's population. The basic source of fresh water is precipitation in the form of rainfall and snowfall. The entire unending process of circulation and redistribution of water by the atmosphere and the earth is called the hydrologic cycle or water cycle. Hydrologic cycle is defined as the circulation of water from the sea, through the atmosphere to the land and then, often with many delays, back to the sea or ocean through various stages and processes. The complete hydrologic cycle which constantly achieves a balance between the waters of the earth and the moisture in the atmosphere is illustrated in Fig. 4.1.

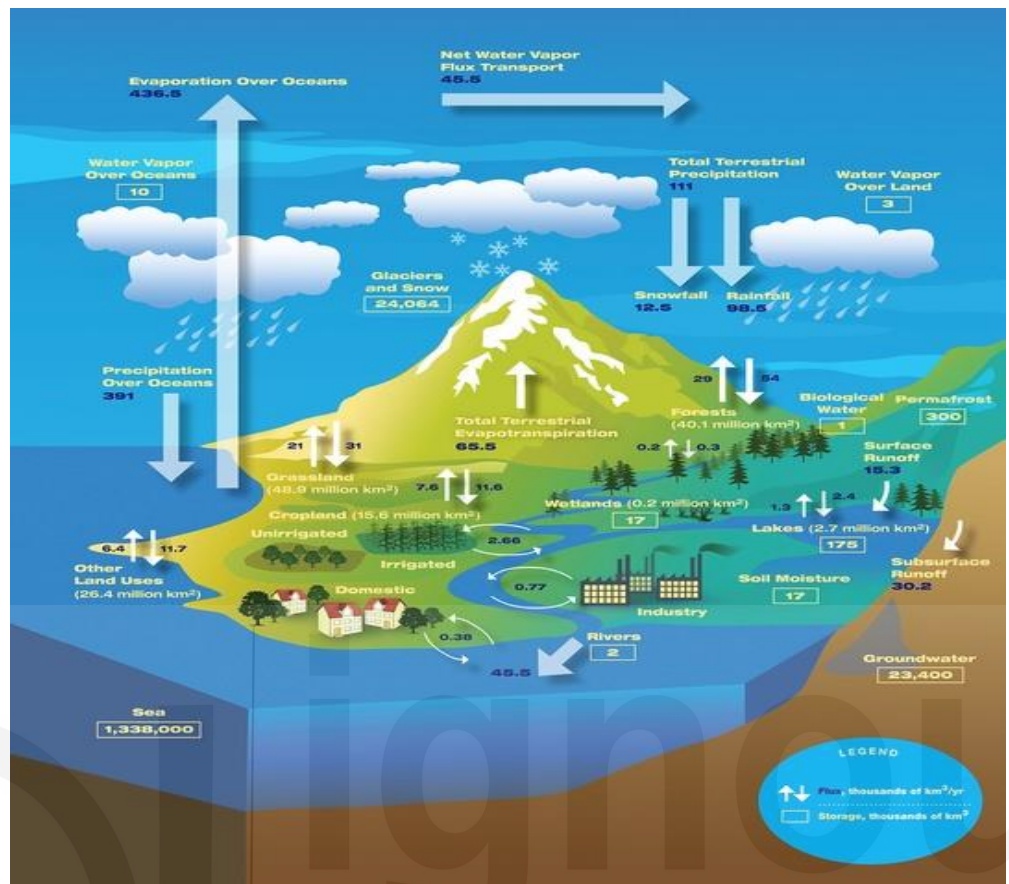


Fig. 4.1: Hydrologic Cycle

Source: <https://search.creativecommons.org/photos/a98decb0-553c-474b-a2f1-232749dc75b3> (CC BY 2.0)

4.3.2 Water Budget of India

Main source of fresh water in the country is rainfall and snowfall which is highly unpredictable and varies with space and time throughout the country. The country receives average 400-million-hectare meter (mha-m) of precipitation annually. Out of 400 mha-m precipitation is augmented by 20 mha-m contributed by rivers following in from the neighboring countries. Net evapo-transpiration losses are nearly 200 mha-m. About 135 mha-m is available on the surface and the remaining portion contribute to recharges groundwater. The land and water resources of India is shown in Table 4.1. The rainfall in India is erratic in nature and is unevenly distributed in time and space resulting in recurring floods and droughts.

Table 4.1: Land and Water Resources of India

Particulars	Quantity
Geographical Area	329 million ha
Flood Prone Area	40 million ha
Ultimate Irrigation Potential	140 million ha
Total Cultivable Land Area	184 million ha

Net Irrigated Area	50 million ha
Natural Runoff (Surface Water and Ground Water)	1869 Cubic km
Estimated Utilizable Surface Water Potential	690 Cubic km
Groundwater Resource	432 Cubic km
Available Groundwater resource for Irrigation	361 Cubic km
Net Utilizable Groundwater resource for irrigation	325 Cubic km

Water Resource India, National Institute of Hydrology. Website: www.nih.ernet.in;

Source: National Institute of Hydrology

India has monsoonal type of climate where more than 70% of rainfall is received during three months (July to September). The highest rainfall in India of about 11690 mm is recorded at Mousinram near Cherrepunji in Meghalaya in the northeast part of the country. At the other extreme, the lowest rainfall barely 150 mm is received at the places like Jaisalmer, in the western part of Rajasthan. Though the annual average rainfall in the country is adequate, nearly three-quarters of the rain pours down in less than 120 days and in 10-12 rainfall events during June to September. The country has a good network of rivers (more than 20 major rivers with several tributaries). Some of these are perennial and some are seasonal. The rivers (Ganga, Brahmaputra and Indus) originated from the Himalayas carry water throughout the year as snow and ice melt that contributes to the base flow during the lean season. The groundwater is also an important source of water for drinking, irrigation, industrial uses, etc. apart from the surface water in the country, it accounts for about 80% of domestic water requirement and more than 45% of the total irrigation in the country.

As per the Ministry of Water Resources, GoI (2000), the annual average water resource potential is 1869 billion cubic metre. The utilizable water resource potential of 1123 BCM comprises among other sources of 690 BCM surface water and 396 BCM groundwater. As discussed, uneven and erratic rainfall, annual per capita water availability in different parts of the country is highly variable and erratic because of water availability in aquifer and varying population density. The water availability is as high as 14057 m³ in Brahmaputra basin in Assam where rainfall is very high and as low as 307 m³ in Sabarmati basin in Gujarat with low rainfall conditions.

At national level, the per capita water availability has shown an unswerving declining trend over the years. Annual per capita water availability was 5200 m³ in 1951 which has declined to 1545 m³ in 2011. Annual per capita water availability is less than the threshold value of 1700 m³ and being declared as a water scarce region of the world as shown in Fig. 4.2. When annual per capita renewable fresh water availability is less than 1700 m³, periodic or regular water stress is experienced. The projected annual per capita water availability in 2025 and 2050 is likely to be 1401 and 1140 m³, respectively which is very close to level of 1000 m³. At this level, water scarcity may begin to affect economic development and human health.

According to a 2018 NITI Aayog Report, almost two lakh people die every year due to inadequate access to safe and good quality potable water and presently about 60 crore citizens of the country face high to extreme water stress conditions. There is an urgent need for adopting water harvesting and conservation measures like rainwater harvesting, preventing pollution, management of surface and groundwater resources etc. It is envisaged that active participation of local people plays a pivotal role in management of this important natural resource.

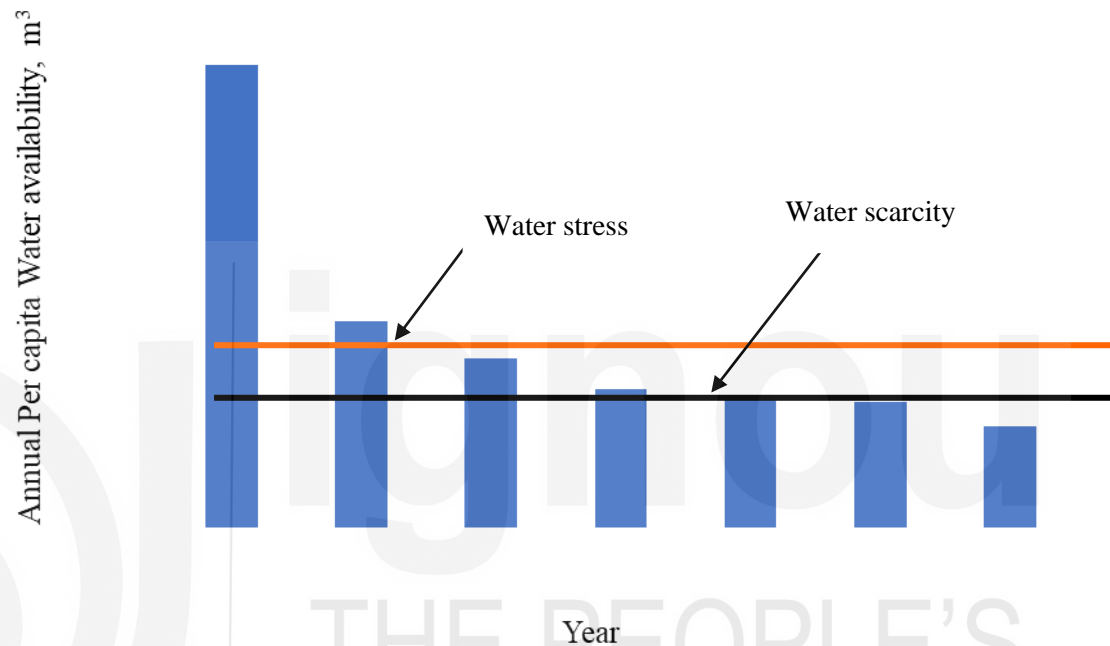


Fig. 4.2: Present and projected per capita annual water availability

4.3.3 Rainwater Harvesting

Rainwater harvesting is important for competing the ever-increasing water demand of various sectors. Rainwater harvesting is defined as the process of capturing rainwater and storing it for efficient utilization and conservation to control its runoff, evaporation and seepage. The rainwater harvesting is the way to harvest, conserve and utilize the excess rainwater in best manner. The excess rainwater can be used for artificial groundwater recharge by modifying the natural movement of surface water or through rooftop rainwater harvesting. The basic purpose of artificial groundwater recharge is to replenish depleted groundwater.

4.3.4 Water Pollution

All kind of pollution that may be air, water and sound are the major concern as it posing severe threat to the environment and consequently human and animal health all over the world.

Water pollution is a major concern all over the world particularly in developing countries. Water pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of water that

may harmfully affect human life or other living species. Water pollution refers to the contamination of water bodies such as lakes, rivers, oceans and groundwater caused by human activities. Water pollution can be classified as surface and sub-surface pollution.

Surface water pollution

Rivers, lakes are the lifeline in most parts of the country but now a days these are get polluted by physical, chemical and biological pollutants. It is our duty to be kept these surface water resources pollution free. Most of the rivers are polluted due to regular release of large quantities of human, animal and untreated industrial and other wastes. Mainly surface water pollution is caused by paper, food processing, electroplating, tanning and metal-based industries. The release of agrochemicals mainly Nitrates and Phosphates from the agriculture are posing serious problem to water quality of lakes, open tanks and other reservoirs. Gaseous ammonia from such water with high pH is hampering the proper development of aquatic fauna i.e. fish.

Subsurface Water Pollution

The subsurface or groundwater is the main source of water in the areas where rivers and lakes are not available. The application of agrochemicals (Fertilizers pesticides and weedicides) are the major source of groundwater pollution. Disposal of untreated effluents from industries and urban sewerage to the underground surface is causing the problem as it reduces the oxygen content. Groundwater is unsuitable for drinking purposes if the quantity of nitrate, arsenic, fluoride and iron content is more than the permissible limits. In urban areas the excessive use of synthetic detergent for washing purposes, produces a lot of foam and pollutes water. The increase in population and industrialization are causing severe stress on groundwater availability and quality. Thus, it is very essential to control pollution for sustainable groundwater resources.

Water is one of the most important building blocks of the ecosystem and seems to be our major issue in the 21st century. The demand of water resources is continuously increased in all the sectors because of continuously increases in population. The quality of surface and groundwater water resources are deteriorated because addition of house hold wastes, untreated effluent from industry etc.

Now, that you are clear about water resources, let us do some exercise.

Check Your Progress Exercise 1

- Note:** a) Compare your answer with those given at the end of unit.
b) Use the space below for your answer.

1. Differentiate between water scarcity and water stress.

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2. What is rainwater harvesting, explain?

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3. What are the various sources of sub-surface water pollution, enlist?

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4.4 GENDER, WATER AND SUSTAINABLE DEVELOPMENT GOALS (SDGS)

It is important to note that gender means all human being, it is not just about women. The transgender and intersex are also included when we are talking about gender, it is not only about ‘men’ and ‘women’. The water is required to all for each and every activity on this universe. Hence, there is an important relationship between gender and water.

Now, let us discuss about gender and water.

As per WHO (2009) gender is a concept that refers to socially constructed roles, behavior, activities and attributes that a particular society considers appropriate and attribute to men and women.

4.4.1 Gender and Water

When we are talking about the water and gender. It means generally gender is associated with unequal access and distribution to water. There are various studies of history, culture, religion and economics that reveal the positions of women and men and reflects the influence religion and cultural aspects. These relations and responsibilities are dynamic and do change over time. However, access to water is not equal to all, it changed with the gender, age, caste etc.

It is fact that women are playing an important part in the domestic activities beginning of the civilization. All the civilizations are moving around the water. There is an important link between women and water. The role of women in water management is crucial.

The involvement of both women and men in the management of water and sanitation and access-related questions has been recognized at the global

level, starting from the 1977 United Nations Water Conference at Mar del Plata, the International Drinking Water and Sanitation Decade (1981-90) and the International Conference on Water and the Environment in Dublin (January 1992), which explicitly recognizes the central role of women in the provision, management and safeguarding of water.

Reference is also made to the involvement of women in water management in Agenda 21 (chapter 18) and the Johannesburg Plan of Implementation. Moreover, the resolution establishing the International Decade for Action, 'Water for Life' (2005-2015), calls for women's participation and involvement in water-related development efforts.

The differences and inequalities between women and men influence how individuals respond to changes in water resources management. Understanding gender roles, relations, and inequalities can help explain the choices people make and their different options.

I think relationship between water and gender is clear. Let us discuss about the sustainable development goals.

4.4.2 Sustainable Development Goals (SDGs)

Brundtland Report published in 1987 in which the concept of sustainable development was appear and warn the negative environmental consequences of economic growth and globalization and tried to find possible solutions to problem caused by industrialization and population growth.

It is important to understand that sustainability development means fulfill the need of present without compromising the requirement and capacity of future generation and ensuring the balance between economic growth, care for the environment particularly natural resources and well-being.

Water is critical input for survival of life on this universe as an input for agriculture and domestic purposes. As we have discussed that the relationship between people (both women and men) and their labour, and water are the equally important. Hence, it is important to develop the water resources on sustainable basis so that it can server present and be available for future.

The 2030 Agenda supports the Human Right to Water and Sanitation by aspiring for all: It says that “A world where we reaffirm our commitments regarding the human right to safe drinking water and sanitation and where there is improved hygiene; and where food is sufficient, safe, affordable and nutritious. A world where human habitats are safe, resilient and sustainable and where there is universal access to affordable, reliable and sustainable energy”.

The main focus of the Sustainable Development Goals (SDGs) is to provide improved water resources that involves building overhead tanks, tube wells, or toilets for drinking and domestic water supply at micro level. The development of mega structures like dams and embankments at the macro level to supply water for irrigation to support agriculture/food production.

Sustainable Development Goal 6 (Goal 6) to 'ensure availability and sustainable management of water and sanitation for all' requires explicit attention to gender equality and social inclusion. Universal access to safely managed water, sanitation and hygiene (WASH) and appropriate management of water resources will only be achieved if the rights of women and marginalized people are fulfilled. Inequality, discrimination and social exclusion can be found within water governance and WASH policies, strategies and access to services.

4.5 GENDER INEQUITIES IN THE WATER SECTOR

Gender equality is the process of being equal to all genders that women and men, transgender, intersex people, girls and boys. It means equal rights, responsibilities and opportunities to all genders. Gender equality is essentially related to the development, and necessary conditions for poverty elevation which ensures men, women and other genders have equal conditions for realizing their full human rights and potentials to contribute to national, political, economic, social, cultural development and to benefit from the results. Gender equality linked with the equal valuing by the society of both the similarities and differences between women and men with the varying roles that they play.

The main focus of gender equality refers to the interests, needs and priorities of all people including all genders from diversified groups (like women from various ethnic minorities and women with disabilities etc.). Gender equality is both a human rights principle and a precondition for people-centred sustainable development. In case of water sector, it link with share contribution, control, assets and benefits of women and men.

In Indian scenario, women have very crucial responsibility towards water. Indian is an arginine country and women are involved in each and every activity of domestic and agriculture. Women are the main force for performing various activities involved in domestic work. Water is required for almost in every activity at home. Hence, Indian women especially in rural areas ensure efficient use of water falls on their domain. In rural areas, sources of water are not available near to home, therefore, women collect water from the long distances with the help of children especially girl child. The women also involved efficient use and management of water at home. The other role of women is to educate their children about best use of water. The knowledge about efficient use of water and its management in daily life is not only save water and also save huge labour involved in collection of water particularly in a mountainous topography.

It is clear that who is responsible for water-related tasks in the household activities. The gender inequalities, roles and relations influence the use of water within households. If there are any water shortages the women again the sufferer in one way or other like use less water for washing in comparison to men.

4.6 FACTORS THAT DETERMINE WOMEN'S ACCESS TO WATER

The role of women is very serious for efficient and effective domestic water supply particularly in rural areas. Therefore, there is a need to ensure the active participation of women at all levels for water supply system and all domestic activities for water management. There are various factors which influence the access of water to women. Following are the few important factors which play a major role is access of water to women:

Internal and External Influence: Family and religious customs are influencing the access of water to women and girls. Efforts to be made to erase any internal and external influence that would hinder their active participation.

Gender awareness: The access to water is also varies with gender, male allowed at all places while women has not allowed at some places. There is a need to sensitize people about gender and equality. Develop gender awareness programmes which builds on the different interests and knowledge of men and women and ensure active participation of women.

Awareness about water: Knowledge about clean sources of water is not readily available with all. There is a need to organize sensitization programme on design and development of water supply system by involving men and women. These programmes need to organize to promote the involvement and inclusion of all members of different community and to ensure a more effective and an inclusive use, and better management of water supplies.

Water supply services: Generally, in the urban area water is supplied through public pipe line system, tankers etc. while in rural areas women collect water from different sources that may be pond, river, well etc.

The above factors may help in achieving the better access of water to women and accept women's involvement and participation in various committees resulted in providing opportunity to learn new skills and leadership to boost their self-confidence.

4.7 WATER IS A WOMEN'S ISSUE

Water is essential for overall development that includes agriculture, economic, environmental and social needs. Hence, right to access to clean and fresh water is the basic right of human being. It is published in various reports that due to increase in population, no improved water supply and the impact were further aggravated particularly in rural areas of the developing countries. A World Health Organization report 2006 pinpointed that about 84 % of the world population was without access to an improved sources of drinking water in rural areas. Water supply is mainly in the form of physical labor to obtain water from rivers/ponds or to lift water from a well and to

carry it a considerable distance from the sources that consumes a significant proportion of the time. Here this is important to reflect and commemorate the incredible role of women in water sector that may be in household activity or agriculture development or progress in industry. Following are the main issues of women and water:

Walking for collection of water: Women and girls spend significant time for collection of water. They walk for long distances for collection of water.

Water-related diseases: The water they work so hard to collect is often dirty and contaminated with deadly diseases. A large number of children and women are dying every year with water-related diseases.

Lack of dignity: Women and girls particular have to wait until it is dark to relieve themselves, causing discomfort and sometimes illness. It can also expose women to the risk of sexual harassment and animal attacks.

Trapped in poverty: In rural areas, availability is very less for clean and safe water for toilets. In India most of the farmers are marginal and have no money for collection of clean water and for construction of toilets. Hence, they are spending huge labour and time for collecting water resulted in less earning money, growing food or caring for their families.

Impact on education: Generally, in rural areas, girls often miss school because they are collecting water or are sick with water-related diseases. Many teenage girls drop out altogether if there are not separate facilities for boys and girls and their hygiene needs are not met.

Involving women in water and sanitation programs: Normally women are not involved in all stages of our water and sanitation programs, including planning, construction and decision-making. Hence it has to be ensured that women should be involved in all programs related to water and sanitization.

Check Your Progress Exercise 2

Note: a) Compare your answer with those given at the end of unit.

b) Use the space below for your answer.

1. Describe the Sustainable Development Goal 6.

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2. What are the main issues of women and water?

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Now, that you are complete the check your progress exercise 2, let us go over to the next section and discuss about the water policy and gender issues.

4.8 GENDER MAINSTREAMING IN THE WATER SECTOR

Gender mainstreaming is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is an approach for making women's as well as men's concerns and experiences an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all spheres so that women and men benefit equally.

Gender equality can be realized with gender mainstreaming. It is making gender concepts and approached as a part of all development policies, programme and processes. Mainstreaming checks that women, men benefit equally and making women's and men's concern and experiences as an integral dimension of design, implementation, monitoring and evaluation of policies and programmes in different water sub-sector such as domestic water supply and sanitation, agriculture, hydropower generation, flood control, river basin management, etc. This includes reviewing the implications of water related strategic action that includes all legislation, guidelines for women and men. The ultimate goal of mainstreaming is to achieve gender equality by transforming policy, procedures and institutions.

4.9 WATER POLICIES AND GENDER CONCERNS

There is an important role of women in water management at various levels that may be in domestic, community, agriculture, industry etc. However, there is less participation of women as compared to men in decision making process i.e. planning an implementation of various water related projects. Government of India has framed three National Water Policies (NWP), first one in 1987, second in 2002 and third one in 2012. Now government has constituted a committee for the formulation of the fourth National Water Policy which is underway. In addition, different states have their own water policies applicable within their political boundary. The water crisis is still there in the country despite multiple water policies.

As per NITI Aayog report, about 600 million in India suffer from severe water crisis; and 40 per cent Indians may not have access to drinking water by 2030. 170 million people live in 66 coastal districts of India spanning 7,500 km. They face the challenge of saline water ingress and contaminated groundwater.

The role of woman in water management can not be undermine. The precise roles of women and their modes of access, women are central to both food production and preparation, as well as to domestic water provisioning. Yet in

planning and decision-making mechanisms on situating water related infrastructure both at micro and macro levels, women are bypassed and social and gender norms and relations are largely ignored. This oversight can potentially end up increasing the work burden (especially for poorer women) and the possibility of conflict, as well as negatively affecting their social status, use of facilities, and infrastructure. This, in turn, contributes to poor household nutrition. While greater involvement of women at all levels of planning, designing, distributing and locating is necessary, this needs to recognise differences within the categories of women and men. Decision-making processes must ensure representation and voice to all stakeholders (who are often in conflictual or dependent relations with each other). Participatory institutions have the potential to address and resolve emergent trade-offs between food and nutrition security, and increased time, drudgery, and conflict. Hence it is necessary that women must be involved in water sector at all levels starting from planning, implementation, execution, evaluation and capacity building.

Women in Planning and Implementation of Projects: Women need to be involved in decision-making, design, implementation, management and maintenance of different projects.

Hygiene Education and Sanitization: Women and girls need to be encouraged for hygiene and sanitization. The training programmes need to be organized for women labour and rural women so that they may give fair share of the time for their hygiene.

Equal Participation: Equal participation of men and women in decision-making on water provision and management must be ensured. This will build women's self-image, make them empowered, and motivate them to participate actively in all community activities.

4.10 WATER FOR AGRICULTURE AND LIVELIHOODS

Water is most precious natural resource on this universe. Importance of water for human well-being and sustainable livelihoods cannot be overstated. Water is an essential input for basic human needs and food security. Water is a very vital natural resource which supports all social and economic activity. It is a fact that without water all sector will be affected like crop cannot grow, functioning of cities cease, all economic activity halts, green forests turn to deserts. Due to increase in demand and competition among various sectors for precious water resource, it is therefore users can no longer guarantee uninterrupted admittance to water supplies. Based on the present availability of water trends, future demands on water to feed the ever-growing population, demand of water for agriculture, more demand of water in real estate, intensive production of goods and to support economic growth will not be met.

Irrigation has always been given sufficient emphasis even in ancient times. Since independence, considerable efforts have been made to increase surface and groundwater potential. In spite of this, almost two-third cultivated area of

the country is still rainfed which dependent on rainfall. Agricultural development in rainfed area is highly unsatisfactory resulting in abject poverty. Due to highly variable and unpredictable rainfall coupled with low level of inputs, rainfed agriculture is confronted with problem of low productivity. The water availability in arid and semi-arid regions both in urban and rural areas particularly during summer is scarce resulting in low cropping intensity and low crop productivity and acute water shortage. Groundwater is over exploited resulted in sharp decline in water table in different parts of the country. It is therefore, imperative that the excess rainfall needs to be harvested, stored, conserved and utilized in an optimal way to augment the water resources to fulfil the growing water demand.

In order to increase food production with available limited water resources, it is essential that the rainfed farming should be developed as a sustainable productive system by adopting watershed management approach. Watershed approach enables a holistic development of agriculture and allied activities in the area taking into account various kinds of land-use based on crops, horticulture, agro-forestry, silvi-pasture and forests.

Watershed management not only deals with reclamation of degraded soils by employing biological and engineering measures but also enhancing crop productivity by a package of water conservation and improved cropping practices. The integrated watershed management comprising of agriculture and allied activities holds the key for long term agriculture sustainability and well-being of the people. The rainfed agriculture in the country covering two-third area of the country is confronted with very low productivity due to erratic rainfall coupled with low levels of inputs. In order to sustain agriculture in the country with available limited water resources and inclusive socio-economic development, it is absolutely essential to enhance productivity in rainfed areas.

A livelihood can be defined as the entire of household activities to obtain the necessary things like food, water, shelter, clothing and health care even education that may often include for survival of life. The main activities for livelihood mainly include crop and livestock production, fishing, hunting, gathering, bartering, and other endeavours and income generating activities (including off-farm work). Livelihoods vary significantly within a country, from rural to urban areas, and across countries. The household is taken as the unit of reference because it is by far the most important institution through which populations anywhere organize production, sharing income and consumption (FAO, 2006).

Check Your Progress Exercise 3

Note: a) Compare your answer with those given at the end of unit.

b) Use the space below for your answer.

1. What is Gender mainstreaming?

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2. Describe the role of water in agriculture.

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4.11 LET US SUM UP

- Water is an important natural resource for sustaining life on the earth, food production, economic development, and for general well being.
- Adequate supply of good quality water is essential for overall development that includes agriculture, economic, environmental and social needs.
- The surface water and groundwater resources play a critical role in different sector.
- The availability of surface and groundwater water in the world in general and India in particular is highly limited.
- Rainwater harvesting is a process of harvesting, collecting and storing rainwater for best utilization of harvested rainwater in all sectors at rural and urban areas.
- As a result of this, food production registered phenomenal increase making the country self reliant. However, due to the ever increasing population, projected water requirement in future for irrigation, industry and domestic use falls considerably short of the available water resources.
- Gender mainstreaming is making gender concepts and approached as a part of all development policies, programme and processes. It checks that all benefit equally and making experiences of all as an integral part of design, implementation, monitoring and evaluation of policies and programmes in all water sub-sector (domestic water supply and sanitation, agriculture, hydropower generation, flood control, river basin management, etc).
- Women play an important role in water management at various levels such as domestic, community, agriculture, industry etc. while participation of women is less as compared to men in decision making process i.e. planning an implementation of various water related projects.
- It is therefore, absolutely essential to optimally utilize available surface and groundwater resources and be particular about rainwater

management. Water pollution in most of rivers and groundwater country needs to be controlled urgently in order to keep our environment healthy and clean.

- There is a need to give equal importance in water sector to all gender and involve women at all levels in the water projects.

4.12 UNIT END QUESTIONS

1. Explain the significance of water resources in the 21st century.
2. Examine the role of gender and gender inequalities in the water sector;
3. Analyze the gender issues in the water sector
4. Examine the importance of water for livelihoods and agriculture.

4.13 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1. (i) Water stress: When per capita annual water availability is around 1700 m^3 , it is considered to be condition of water stress.
(ii) Water scarcity: When per capita annual water availability is less than 1000 m^3 , it is considered to be condition of water scarcity.
2. Rainwater harvesting is the process to capture and store rainfall for its efficient utilization and conservation to control its runoff, evaporation and seepage. Some of the benefits of rainwater harvesting are:
 - It increase water availability
 - It checs the declining water table
 - It is environmentally friendly
 - It improves the quality of groundwater through dilution, mainly of fluoride, nitrate, and salinity and
3. The application of agrochemicals (Fertilizers pesticides and weedicides) and disposal of untreated effluents from industries and urban sewerage are the major source of sub-surface water pollution.

Check Your Progress Exercise 2

1. Sustainable Development Goal 6 is related to Human Right to Water and Sanitation for all: It says that “A world where we reaffirm our commitments regarding the human right to safe drinking water and sanitation and where there is improved hygiene; and where food is sufficient, safe, affordable and nutritious. A world where human habitats are safe, resilient and sustainable and where there is universal access to affordable, reliable and sustainable energy”.
2. Following are the main issues of women and water:
 - Walking for collection of water.

- Water-related diseases.
- Lack of dignity.
- Trapped in poverty.
- Impact on education.
- Involving women in water and sanitation programs.

Check Your Progress Exercise 3

1. Gender mainstreaming is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels.
2. Irrigation has always been given sufficient emphasis even in ancient times. Since independence, considerable efforts have been made to increase surface and groundwater potential. In spite of this, almost two-third cultivated area of the country is still rainfed which dependent on rainfall. Agricultural development in rainfed area is highly unsatisfactory resulting in abject poverty. Due to highly variable and unpredictable rainfall coupled with low level of inputs, rainfed agriculture is confronted with problem of low productivity. The water availability in arid and semi-arid regions both in urban and rural areas particularly during summer is scarce resulting in low cropping intensity and low crop productivity and acute water shortage. Groundwater is over exploited resulted in sharp decline in water table in different parts of the country. It is therefore, imperative that the excess rainfall needs to harvested, stored, conserved and utilized in an optimal way to augment the water resources to fulfill the growing water demand.

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