

FRESHWATER AND SANITATION COUNTRY PROFILE
THE ISLAMIC REPUBLIC OF IRAN

Decision-Making

Programmes and Projects

Status

Capacity-Building, Education, Training and Awareness-Raising

Information

Research and Technologies

Financing

Cooperation

Decision-Making: Ministry of Energy is responsible for water supply, distribution, and conservation. Ministry of Health and Medical Education is in charge of supervision and quality control of drinking water from the physical, chemical, biological and bacteriological aspects from its source to consumption points. These two ministries by their well-trained and the experienced personnel, laboratories and facilities could apply the existing national and international standards to hopefully attain their objectives.

Programmes and Projects : *Water and sanitation:* National strategy to control the quality of drinking water is adapted to improve national health level by training required human resources for water, wastewater and environmental health laboratories and research activities. This has been done with using more than 500 bacteriological and about 200 chemical laboratories (the number of private laboratories and 100 soil and water laboratories from other sectors to be established within next year are not included). Furthermore, protection and promotion of health, improvement of wastewater network, and access to safe and sufficient drinking water for people in accordance with the existing standards are emphasized based on sustainable development principles. The basic objectives are:

Other main policies and strategies are:

- Supporting healthy environment through sound and coordinated management of water resources and wastewaters
- Strengthening the local government to provide community services (regarding water & health) and to support implementing agencies
- Taking appropriate financial measures for a better management of existing investments and utilizing reasonable and appropriate technologies
- Adopting fundamental reforms through sound and coordinated methods.
- Raising awareness among people through necessary guidelines and distribution of sufficient information about water
- Implementation of Water Comprehensive Plan with short, middle and long term programs (the Third and the Fourth National Development Plan)
- Implementation of National Policies related to development of Water resources(the Approval of Council of Minister-18 Articles)
- Implementation of appropriate reforms and revising the law about water, urban management rules and regulations(e.g. the disposal of surface water and wastewater, the development of cities in areas with limited water reserve & etc.).
- Reduction of water usages through applying appropriate technologies and necessary reforms, wastewater treatment and recycling water.
- Reduction of waterborne diseases in the emergency conditions in the rural and urban areas
- Paying attention to rural and low income areas and marginalized cities
- Prevention and controlling water pollution
- Development and strengthening intersectoral collaboration
- Increasing productivity of existing resources and facilities in health services, water distribution system, public education, etc.
- Strengthening the role of research in development and taking advantage of the experiences of countries with similar regional conditions in related fields.
- Designing policies to provide the required funds for public education, planning and implementation.
- Incorporating environmental considerations in the development programs in accordance with the national economic goals.
- Strengthening the management and planning of sustainable utilization of sea and domestic water resources for fishery and related activities.

The topics of proposed national strategies are:

- Macro management
- Water Resources Management

- Consumption Management
- Economic Value
- Quality Control
- Water Supply Costs
- Water Exchange
- Land Use Planning
- Interbasin Water Transfer
- Management of Structure
- Watershed/Basin compositions
- Risk Management
- Urban Water Distribution
- Public Training
- Shared Waters
- Information Management
- Preservation of Historic Hydraulic Structures
- Interdepartmental Management

Waste Management: Carried out actions and programs are:

- During past years, one of the reasons for ineffective waste management was shortage of planned funds for this sector. Since 1999 the Ministry of Interior allocated some financial facilities for municipalities to improve landfills conditions. For example, a special fund for studying and executing of hygienic land filling, recycling and garbage collection was earmarked. This fund was increased in the following years and it is also applied to training municipal managers.
- The Ministry of Interior and the Department of Environment have proposed the solid waste management bill. Regarding solid waste management, lack of a clear law, is considered a major problem. Thus, in coordination with related ministries and institutions, a bill called Waste Management Act was proposed to the Parliament. Ratification of this bill will pave the way for responsible agencies to provide detailed regulations and to execute them effectively.
- Compiling and executing regulations and codes for landfill locations, garbage collection and disposal of industrial and hospital wastes, are other efforts in this sector.
- In order to achieve regional patterns as well as a comprehensive plan for solid waste management in Iran, feasibility studies for recycling were undertaken in the whole country. The results of these studies determined the justified recycling projects in different provinces.
- Many initiations are under consideration for private partnership in recycling projects and also to provide public education and promote green consumerism for citizens (especially for children).

Status: *General:* Islamic Republic of Iran located in west Asian region with 1,648,149 square km area. The country has common boundaries with Turkmenistan, Azerbaijan and Armenia in north; Turkey and Iraq in west; Pakistan and Afghanistan in east; and also Persian Gulf and Amman Sea in south. According to the latest census data, Iran had a population of 60056 thousands in 1996 including 36818 thousands urban population (61.3 percent) and 23238 thousands rural population (38.7 percent). Estimates show that Iran's population will be around 70 million in 2006, with about 47.3 million (67.2 percent) urban population.

In the last three decades, Iran faced many incidents which all caused lots of changes in the distribution of population, centers of living and implementation of related national programs. Islamic revolution of 1979 in Iran had transformed all previous ineffective and improper political and economic policies. For instance, because of new system's great attention to the poor, having a suitable home in Islamic Republic was considered a basic right of the society

and attempts were made to meet human needs in areas such as sanitation and natural resource protection.

In 1980, Iran became involved in an imposed war, which lasted for a long period of 8 years affecting all socio-economic programs, destroying lots of residential and economical units as well as urban-rural infrastructures such as sanitation and water supply installations. In addition, regional crises like conflicts in Afghanistan and Iraq has resulted in many destructive impacts on Iran such as the influx of immigrants and its respective environmental effects.

Despite all these difficulties, three five-year national plans were implemented since the revolution (in addition to the five national plans carried out before the revolution). Now the country is at the outset of its Fourth National Plan as part of a 20 year long term plan called Vision 2025. Fortunately, this Vision provides a 20 year program which for the first time, addresses valuable components of sustainable development in areas like human development, sanitation and water supply.

Water management: Water management has a long history in Iran. Since centuries ago with implementation of the river-bed treatments (in Karoon and Karkheh), diversion dams (Karoon, Korr, Zayandeh Rud,...), construction of reservoir dams over the Korbali River, Shesh Taraz, Tabas, Kashaf Rud, Saveh,... and construction of more than 30,000 Qanats, access was provided to attainable water resources. Beside these infrastructures, the traditional regulations have been written as guidelines over the portal of the grand mosques, public squares and occasionally as portable hand written guidelines. Also, the portable hand written guidelines of "Sheikh Bahaei" and "Amir Kabir" about dividing the water of Zayandeh Rud and Karaj Rivers have been used until recent years. In these handwritten guidelines, the "Mirab" was assigned as the water distribution manager and the people and/or villages were considered as the beneficiaries. With this background we can nominate the Iranians as the pioneers of participatory management of water resources considering the role of beneficiaries in the Middle East.

As was indicated above, in the past centuries, management of water resources was accomplished at the community level (local Governance) for Qanats and rivers. In the recent years, however, the management of water resources in the framework of urban potable water, water supply and the operation of large projects has been carried out at the national level (National Governance). For this reason, different issues of water resources management such as quality and quantity conservation, planning for water allocation for agricultural uses, industry and drinking water issues have faced with complexity at the local, regional and national levels. Since these issues have roots in the past history of Iran, the integration of water management has been considered as one of the big challenges for the government.

With the implementation of three National Social and Economic Developmental Plans and considering two five years plans before the Islamic Revolution, 80 large dams have been constructed with the total capacity of 27 billion m³, which could have controlled and regulated of 33 billions m³ of renewable surface water per year. Regarding the ground water exploitation, utilization of new excavation technologies, has reduced the important role of Qanats gradually as the results of the increasing usage of deep and shallow wells. It is estimated that there are about 500,000 deep and shallow wells and almost the same amount of hand excavated open wells with the capacity of 59 billion meters in the country. However, uncontrolled excavated wells and inappropriate usage of the existing wells have resulted in water depletion and water draw down. Lack of sufficient recharge of ground waters have caused serious damages and have adversely affected the water resources in the country. In many regions, serious draw down of water level and decreasing of well discharges, acidification, water intrusion and worse than that, land depletion due to over exploitation of aquifer have made extra pressures to these kinds of water.

The water pollution often is due to lack of sanitary collection and disposal of solid waste, urban and industrial wastewater(including all kinds of pollutants), pesticides and chemical agricultural substances. These pollutants consist of several kinds of disease factors and harmful mineral and organic materials, which their identification, separation and treatment from water, is very difficult and expensive. Therefore, it is essential to take appropriate measures to prevent the water resources from pollutants, especially in the event of draughts and shortages of water. Since disposal of human excretas and industrial wastewaters in the developing countries by unsanitary conditions is the major factor to decrease the quality of water, it is highly recommended to improve the water quality by taking advantage of the existing technologies for wastewater treatment.

From the quantity point of view, the total utilization of ground and surface waters is about 92 billion m³ ; 94 percent of which goes to agricultural usage (around 85 billion m³) and 7 billion m³ for drinking and industries. At present, more than 96 percent of the cities have access to safe water supply system. Generally, Water resources pollution (springs, rivers and ground waters) are serious threats to human health, especially when the polluted resources are to be used for drinking, domestic and washing purposes, or even for irrigation and agricultural food products.

It is projected that up to the year 2021, the access to available water should be as large as 103 billion m³. It means that agriculture usage will exceed to 95 billion m³ and drinking and industrial water to 8 billion m³ respectively. The portion of usage of surface waters will extend from 46 to 54 percent while ground waters decrease from 54 to 46 percent. In other words, about 103 billion m³ out of 120-130 billion m³ renewable water is to be considered for the next 25 years Development Plan.

The following table illustrates the status of water:

Average precipitation in the country	400 billion m ³
Evaporation, percolation and transpiration	270 billion m ³
Run-off	130 billion m ³
Recharge to ground water tables	38 billion m ³
Exploitation from the ground water tables	59 billion m ³
Surface water acquisition	33 billion m ³

As it is indicated in the above table, the total capacity for water development resources for future is about 12 to 15 billion m³ . Regarding the population growth and decreasing agricultural lands, the water supply and food products will be Iran's two major challenges in the future. In this context, the following issues are to be considered:

- Prevention of losing water in agricultural and urban water sectors
- Increasing water efficiencies
- Changing the consumption patterns
- Renovation and remedial actions of urban water supply networks
- Recycling and treatment of waste and used water
- Utilizing the uncommon waters
- Prevention of water resources pollution
- Prevention of water aquifer depletion
- Increasing of infiltration rate
- Artificial groundwater recharge operations
- Water delivery from far resources to draught region
- Regulated plans for draught combating
- Water supply in crisis conditions

Most importantly uncontrolled population growth and the draught could increase the problems of water shortage and lack of fresh water resources. Hence, the government should take actions to deal with those who do not obey the existing laws and regulations.

Challenges in the field of water:

- The decrease in the quality of water because of environmental and ecological changes, disposal of solid wastes and wastewaters, and lack of sufficient equipments
- The increase of the population and per capita consumption of water
- Difficulties in the provision of safe drinking water for villagers in the small community centers
- Uncontrolled usage of water
- Unsanitary disposal of wastewater in some urban and rural areas
- Lack of appropriate consumption patterns of water and shortage of adequate plants and infrastructures to face with crisis during draught
- Lack of sufficient facilities for measuring the agricultural, industrial and urban pollutants in the water resources
- Pollution of rivers and ground water resources in the cities especially because of uncontrolled expansion of industries over the ground water tables
- Uncontrolled consumption of water for agricultural production and low water efficiency
- Lack of economic consideration for water
- Poor draught combating at the national level
- Limited financial resources for water supply (potable, agricultural and industrial)
- Lack of integrated water management in the urban areas
- Lack of services and supporting industries for water
- Lack of financial self-adequacy and economical vision for water management system as there is in the private sector
- Pollution of water resources used in agricultural sector due to the variety of sewage disposals from industrial, agricultural and urban sectors
- Necessity for recycling and reusing wastewaters for agricultural usage
- Lack of adequate consideration to water economy for agricultural usage
- Improper water usage in agricultural production and low operation rate.
- Lack of consideration to the rate and type of water consumed in agriculture from water economy aspects
- Lack of coordination between existing laws, regulations and their operational methods related to water.
- Shortage and lack of coordination in codes, regulations and their executive methods about water in relation to agriculture and commerce
- Inappropriate utilization of pesticides and chemical substances and discharging the pollutants into the water resources
- International tensions and conflicts arising from trans-boundary rivers

Challenges in the field of sanitation:

- Decrease of potable water quality as a result of ecological and environmental changes and wastewater disposal and insufficient growth of equipments
- Increase of population and total and per capita volume of water consumption
- Provision of healthy water for nomad tribes and rural population in small and dispersed settlements
- Non-optimum water consumption for hygienic use
- Inhygienic disposal of sewage in some urban and rural centers
- Inadequate water consumption patterns and shortage of installations and infrastructures to face with crises in drought periods
- Shortage of test facilities for measuring agricultural, industrial and urban pollutants in water resources

- Contamination of rivers and underground water resources in cities particularly as a result of unregulated industrial expansion on water tables

Waste Management: Approximately 40,000 tones of waste is produced daily in Iran. Seventy percent of this amount is organic materials and the rest are dried and non-organic materials. Municipalities are responsible for solid waste management in urban areas and until recently there were no waste management in rural areas. Recycling is only carried out in small amount in metropolitans and recently in few small cities. In some cities separation of wastes from their source is exercised. The waste collection and disposal method in most of human settlements are traditional.

Composting is the conventional method of recycling projects in many cities, which is often done through old technologies. Recently, in few large or small cities, composting projects with new technologies have been undertaken.

Estimates shows that in Iran, generally 90 percent of all produced wastes are sent to land fills and only 10 percent are recycled, of which 8 percent are disposed by composting.

Future Constraints: The following cases can be mentioned as present constraints to improve solid waste management in the country:

- Inadequate equipments for dried and wet waste collection
- Financial bottlenecks of municipalities and high cost of solid waste management and recycling.
- Lack of sufficient awareness of some authorities and communities to participate in the solid waste management programs.

In order to tackle these problems, some solutions have been presented as below:

- Providing facilities for private sector in order to encourage their partnership in recycling activities. In this regard, the financial support of public sector and expansion of privatization in this field are parts of state policies in the 4th National Development Plan.
- Determining long term and mid term objectives in the 4th National Plan to decrease the production of solid waste to a certain level.
- Assessment of municipalities' environmental performances and monitoring their allocated funds in this sector.
- Execution of legal bill of Solid Waste Management and attempting to introduce related guidelines: a) to decrease the volume and weight of buried waste, b) to increase recycling portion, c) to separate at source, d) to reduce the costs, e) to manage the hazardous solid waste disposals, f) to promote public participation.
- Establishment of regional level management for solid waste in Iran

According to agenda 21 and Johannesburg Plan of Implementation, the following activities are to be targeted and executed to resolve solid waste problem of human settlements in Iran:

- Reduction of solid waste to a minimum per capita
- Recycling of solid waste and development of cost effective recycling methods
- Increase of the proportion of solid waste disposed through environmental friendly methods
- Expansion of the coverage of the collection services and the hygienic disposal of solid waste in the rural areas

Capacity-Building, Education, Training and Awareness-Raising : For efficient management of water supply and its health aspects at national, regional and local levels and for better utilization of investments, a sufficient number of experts must be trained in this field. To achieve this objective, countries should emphasize on human resource development

based on the current and future needs. Also, they should provide appropriate training programs for women about environmental protection; and economical and sustainable use of water.

For prevention of water pollution and implementation of treatment operations and sanitary disposal of wastewater in order to avoid waterborne diseases, producing scientific training programs through utilization of mass media (especially radio and television) is essential.

Information: No information available.

Research and Technologies No information available.

Financing: Allocation of needed funds from the national and the international financial resources for completion of facilities and development of equipments for identifying water pollutants is necessary.

Cooperation: No information available.

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