

INTRODUCTION

Recent scientific and technological developments, global population growth, and various environmental issues, have further increased the importance of agriculture and natural resources in the world. The high growth rate of global population, particularly in developing countries, has transformed food production and security to one of the critical and humanistic issues. Consequently, attention to agriculture sector and natural resources is considered now as one of the most effective measures for poverty eradication in developing countries.

The Islamic Republic of Iran is located in one of the most arid regions of the world, with an average annual precipitation of 250 mm, just about one third of the world's average. The total area of the country is 165 million ha, of which about 37% are arable lands. Agriculture is mainly practiced by the rural population, which constitutes about 35 % of the total population. Due to a variety of limitations, particularly water scarcity, only 18.5 million out of the 37 million ha is currently under cultivation, of which 8.5 million ha (46%) is irrigated and the rest is rainfed. Irrigated agriculture consumes 93% of the total renewable water resources of the country, which consists of 54% groundwater and 46% surface water. Despite climate aridity and water scarcity, the agricultural sector is one of the most important economic activities in Iran. This sector accounts for about 18% of GDP, 25% of employment, 85% of food supply, 25% of non-oil products and 90% of raw materials used in agro-industry.

The long term development plans of the water sector are towards reducing the share of groundwater in the consumption of total available water resources, while at the same time, increasing the share of surface waters. Therefore, for the purpose of increasing the water productivity and appropriate utilization of available water resources

in the country, utilization of wastewaters and unconventional water resources, as well as, water recycling and recirculation, has been considered as major policies in water and agriculture sectors. In addition, extension of modern technologies, such as pressurized irrigation systems (drip, sprinklers, etc.), in one million ha of lands during the next decade is in the agenda.

In order to develop appropriate policies and to coordinate between country's socio-economic plans, environmental protection goals and the achievements of 1992 Earth Summit in Rio, the government of the Islamic Republic of Iran has established "The National Committee for Sustainable Development", whose members are the fully authorized representatives from different ministries and organizations in the country. Its secretariat has been placed in the Department of the Environmental.

Considering the main topics that has been set by UN for evaluation in the 16th session of the Commission on Sustainable Development (CSD), the government of Islamic Republic of Iran made the efforts to collect and gather the necessary information according to the format proposed by UN, with the help and cooperation of relevant organizations and ministries (especially Ministry of Agricultural Jihad, Ministry of Energy, Department of the environment, Ministry of Foreign Affairs and Ministry of Housing and Urban Development). Each one of the main topics, which consists of Agriculture, Rural development, Land, Drought, Desertification and Water resources, with the exception of Africa, has been considered in three aspects:

- A. Strategies and Plans
- B. Constraints and Challenges
- C. Solutions and Recommendations

This report has been edited and finalized by N. Pourang, G. Amini, L. Sarabian, R. Farsa, F. Khorsandi, G. A. Memari and S. Zahedi.

AGRICULTURE

Strategies and Plans

A. Strategies

1. To provide and enhance the country's food security by reliance on the production from domestic resources and emphasis on self sufficiency in major agricultural products
2. Quantitative and qualitative enhancement of agricultural and marine products for the purpose of providing food security and expansion of exports.
3. To increase production of protein products from animal and fishery resources for the purpose of providing quality nutrition for the population
4. To increase forage production, particularly maize, soybeans and fish powder.
5. Regulation, development and implementation of the macro strategic policies for the development of water resources in the country
6. Allocation of water for economic purposes by considering the unit of production per unit of water used
7. Revision of water demand management instead of water supply management
8. Creation of competitive water markets
9. Revision of the water allocation procedures for profitable production units
10. Encouragement of public participation in the execution of water related projects
11. Recycling the byproducts of the sewage treatment plants and water recirculation
12. Improvement of irrigation networks
13. To change the water utilization methods
14. Artificial recharge of aquifers in potential areas

15. Promotion of water saving activities and appropriate water use among agricultural water consumers
16. Development and implementation of utilization systems, participation of non-governmental sectors (water right holders and landowners), and establishment of water consumers cooperatives
17. To employ experts and benefit from entrepreneurs in water and agriculture sectors, with the priority given to rural settlers
18. To increase water use efficiency, water productivity and the area of irrigated lands
19. Construction of small dams
20. Construction of large reservoir dams
21. Enhancement of water transportation, delivery and distribution networks
22. Construction of pump stations, designed according to the technical and engineering standards
23. To support the formation of agricultural production cooperatives and other natural resources, soil and water consumers cooperatives
24. To support the development of conversion and supplementary agro-industries with the purpose of reducing waste production
25. To prevent excessive use of chemical fertilizers and pesticides by promotion of organic fertilizers and biological pest control methods
26. Promotion of sustainable natural resources management, improvement of grazing management in the rangelands, and protection of the livestock genetic diversity
27. To regulate the nomadic migration affairs based on the grazing capacity of the rangelands
28. To subsidize natural resources lands and to manage the exploitation of natural resources

29. Rectification of nomadic settlements, as well as, preservation and enhancement of their economic capacities
30. To increase the share of insurance industry in reimbursement of damages imposed by unexpected disasters
31. Expansion of insurance coverage to at least 50% of all the agricultural products
32. To benefit from the technical services offered by private and cooperative sectors
33. To raise the income and livelihood levels of the rural communities and farmers, and to eradicate poverty
34. Revision of the laws and regulations for the purpose of removing the monopolistic obstacles, enhancement of the competitiveness, and encouragement of the participation of public, NGOs and professionals in cultural affairs and activities
35. Management of water use by measuring the water consumptions in agriculture sector
36. Cooperation with regional research centers for the purpose of the exchange of experiences and achievements, as well as, joint research activities on the subjects of regional importance, particularly on the topics of desertification, drought and underground resources

B. Plans

1. Implementation of the five-year development plans in water sector, with the purpose of controlling exploitable water resources, and providing the necessary water for agricultural productions and food security
2. Rectification of the water allocation procedures for economical activities

3. Enhancement of water demand management instead of water supply management, creation of competitive water markets, and revision of the water allocation procedures for profitable production units
4. To draft a comprehensive national water development plan, and to set the long, medium and short term programs for the implementation of the country's 20-year development plan
5. Promotion of privatization and reduction of government's tenure and role
6. Execution of water delivery projects from areas with ample supplies of water to areas with water scarcity
7. To provide adequate and low cost drinking water for low income families in rural and urban areas
8. Reduction of water consumption by adoption of appropriate technologies and necessary rectifications
9. Improvement of the irrigation networks by changing the utilization methods, such as development of pressurized irrigation systems
10. Artificial recharge of aquifers in potential areas
11. Implementation of the watershed management projects and beneficial utilization of flood waters
12. Implementation of the appropriate reforms and revisions in the Water Law, as well as, urban management rules and regulations (e.g. disposal of surface water and wastewater, development of cities in areas with limited water reserves, etc.)
13. Investment in fundamental soil and water conservation activities, as well as, expansion of irrigation and drainage networks

14. Implementation of water saving policies, and promotion of appropriate water use from streams and rivers, irrigation networks, pump stations and deep and shallow wells, that are based on the appropriate agricultural water utilization pattern
15. Implementation of utilization systems, participation of non-governmental sectors (water right holders and landowners), and establishment of water consumers cooperatives
16. To grant large land areas within natural resources areas, that has economic values and potential for reclamation and agricultural production
17. Supporting the development of conversion and supplementary agro-industries with the purpose of at least doubling the production of such commodities as compared to present status
18. Implementation of rangeland management programs through rightful nomads, and land grants in nomadic territories to migrating families, under the framework of "Settlement Rectification of Nomads Program", with emphasis on the preservation of their rights
19. Granting permit to the customary beneficiaries and their economic cooperative establishments, to take advantage of the reclaimable rangelands in their territories or land areas within their winter and summer migration routes, for agricultural purposes in a way that their livelihood is maintained above the poverty line
20. Insurance coverage of at least 50% of all the agricultural products and the producers by utilizing the technical services of private and cooperative sectors
21. Renovation of present orchards and conversion of suitable marginal and slope lands to new orchards by providing low cost inputs, for the purpose of the exports expansion

22. Establishment of "Farmers Income Security Fund" with financial participation of government and the farmers, for the purpose of supporting and securing the income and livelihoods of the farmers
23. Promotion of the income and livelihoods of the farmers and rural settlers, and poverty eradication through enhancement of appropriate production infrastructures, diversification and development of complementary activities, particularly small and converting industries and modern services, with emphasis on the reformation of the commodity pricing systems
24. Establishment of an appropriate supply, distribution and consumption system for food commodities, for the purpose of attaining food security and enhancing the quality of food basket in the country
25. Expansion of cooperation with member countries of the Economic Cooperation Organization (ECO), in the areas of plant and animal quarantine, agriculture and pest control
26. Regional cooperation within ECO, in the areas of education and exchange of experts and students

Constraints and Challenges

1. Absence of a coherent national policy framework for sustainable agriculture
2. Shortage of budgets and funding
3. Insufficient infrastructures
4. Low production per unit of land area
5. Lack of adequate mechanisms for comprehensive and integrated management of annual crop productions

6. Lack of efficient and effective presence of private sector in providing services and production inputs
7. Low agricultural technical knowledge and skills
8. Insufficient research, education and extension activities
9. Small and scattered production units
10. High wastage and product losses
11. Limitations in the production and effectiveness of some vaccines and biological substances
12. Risk of epidemic diseases from neighboring countries, and inadequacy of the quarantine system
13. Absence of adequate model for appropriate utilization of wastes and fertilizers
14. Pressure on demersal fish stocks
15. High maintenance costs in the management of fishery ports, and low financial capability of the fishery cooperatives
16. High bank interest rates
17. Weakness in the administrative infrastructures for the approval of some of the projects
18. Existence of social problems in land ownerships
19. Inadequate awareness of the stakeholders from the existing laws and regulations
20. Lack of cultural awareness about the use of agricultural insurance
21. Incomplete implementation of "Comprehensive Soil and Water Law"
22. Unbalanced investments, and concurrent evaluation and implementation phases of the soil and water projects, with due attention to complete water cycle
23. Increased greenhouse gas emissions and consequent climate change, and damages to agriculture sector from different aspects.

Solutions and Recommendations

1. Timely and adequate allocation of national and provincial funds
2. Providing the resources, industries, infrastructures and inputs for the expansion of cultivated land areas and production of horticultural crops
3. Utilization of new technologies for increasing the yield per unit area of land
4. Comprehensive and integrated management of annual crop production
5. Planning and adopting appropriate measures to maximize the number of farms that benefit from farm advisors and consultants
6. To direct and use experienced and progressive farmers for advancement and promotion of extension goals, technical trainings and administrative goals
7. Allocation of necessary credits for strengthening the financially weak institutions
8. Education, training and capacity building of the human resources
9. Formation of the Rural Development Workgroup under the Provincial Planning and Development Commission
10. Development of an agricultural information transfer system
11. Quality improvement of crop products and reduction of wastes and losses
12. Improvement of genetic management
13. Establishment of appropriate quarantine systems
14. Justification of provincial authorities for the implementation of projects, through expert meetings and inspection of the projects
15. Clarification of the laws and regulations for land ownership
16. Raising the awareness of the stakeholders about the current laws and regulations
17. To promote the use of agricultural insurance

18. Balancing the investment, and set the appropriate time table in the evaluation and implementation of the soil and water projects, with due attention to complete water cycle
19. Expansion of regional cooperation regarding the adaptation to climate change

DESERTIFICATION

Strategies and Plans

A. Strategies

1. To destock livestock from forests, and to rectify the condition of Caspian forest settlers
2. To adjust the number of livestock according to the grazing capacities of the rangelands, by reducing the number of grazing livestock and modification and/or cancellation of the grazing permits
3. To promote agro-forestry, cancel tariffs on wood imports and intensification of the efforts to combat wood smuggling
4. To expand the green spaces and reforestation areas, and to control the desertification hot spots
5. To expand watershed management in all areas
6. To implement the flood spreading activities in urban and rural areas for the purpose of promoting the forested rangelands, conversion of desert areas to agricultural lands and recharge of the aquifers
7. To extend the coverage of the fuel supply system to rural people, nomads and forest settlers, for the purpose of reducing the demand for wood fuel
8. To encourage the participation of rural councils and local organizations in forest and rangeland protection activities
9. To expand bilateral cooperation with Food and Agriculture Organization (FAO) for the purpose of technology transfer, receipt of modern technologies, conducting workshops and cooperation with Desertification Convention secretariat

B. Plans

1. Exploitation of the country's natural resources should be within their potential capacities. An important step towards achieving this goal is to plan for sustainable use of natural resources, by implementation of such projects as "Destocking Livestock from Forests", "Rangeland Improvement", "Natural Resources Boundary Delineation", "Animal Genetic Resources Protection and Breeding" and "Fuel Supply to Rural and Nomadic Populations".
2. Expansion of the participation of rural councils and local mobilization forces in forest and rangeland protection activities
3. Expansion of the watershed management in all areas
4. To implement the flood spreading activities in urban and rural areas for the purpose of promoting the forested rangelands, conversion of desert areas to agricultural lands and recharge of the aquifers
5. Implementation of the watershed management projects and beneficial utilization of flood waters
6. Implementation of the projects for artificial recharge of the aquifers

NOTE: Strategies and plans for water topic are presented in the first section.

Constraints and Challenges

1. Shortage of budgets and funding
2. Insufficient infrastructures for the promotion of investments in development of desert areas, such as expansion of ecotourism
3. Lack of coordination between relevant organizations and agencies
4. Insufficient attention to the desert issues by the provincial planning and development commissions

5. Consideration of the policies and the National Action Plan in the macro planning for the country
6. Enhancement of the scientific, research and education centers in desert areas
7. Lack of attention to indigenous knowledge
8. Inadequate attention to the biological diversity of the desert areas
9. Inadequate cultivation systems and land use
10. Inadequate knowledge about the inherent potentials of the desert environments
11. Inadequate expansion of the desert control awareness
12. Economic and cultural poverty of the rural communities in desert areas
13. Potential dangers of frequent droughts with relatively long duration
14. Reduction in the quality of water resources
15. Incompatibility of the sectoral development programs with natural capacities of the water resources
16. Environmental consequences of water resources development programs
17. The relationships between different components of water resources management are unclear.
18. Occurrence and negative consequences of global warming and climate change

Solutions and Recommendations

1. Timely and adequate allocation of national and provincial funds
2. Development of tourism and ecotourism projects by local and rural communities
3. Expansion of coordination and cooperation between relevant organizations and agencies
4. To accelerate the implementation of the National Action Plan for Combating Desertification, with emphasis on the enhancement of land management for the

purpose of preventing land degradation and raising the level of public awareness about desertification phenomena

5. Utilization of indigenous knowledge and its integration with modern technologies
6. To consider and identify the biological diversity of the desert environments, and establish an information center in this regards
7. Improved cultivation systems and utilization of land and water resources
8. To raise the level of understanding about the potentials of desert areas, such as renewable energies, and to strengthen the cooperation with other countries about desertification topics
9. To raise the level of education and awareness about the significance and means of desertification and its control
10. Improvement of the livelihood and economic condition of the local communities by development of compatible activities
11. To supply and provide fuel to the villages that are under the threat of desertification
12. To enhance the participation of local communities in planning, preparation, implementation and supervision of the projects for combating desertification
13. Capacity building in the country for combating desertification and drought, by preparation and implementation of comprehensive and preventive programs
14. Implementation of small scale water projects in areas under the threat of desertification
15. Increasing the water use efficiency in agricultural lands
16. Ratification of appropriate laws for legal protection of environmental and natural resources preservationists and conservationists
17. To organize and enhance the basic information and statistics about the condition of natural resources in the country

DROUGHT

Strategies and Plans

A. Strategies

1. To prepare and compose the guidelines and programs for confronting water crisis and drought
2. To prepare and indite the implementation plans for drought management
3. Coordinated management of livestocks and rangelands, and rectification of the nomadic communities
4. To apply modern technologies, such as water desalination techniques, in the areas with water scarcity and high drought potential
5. To strengthen the local water markets
6. To develop the networks for the measurement of water consumptions in agriculture sector
7. To enhance local water management and establish appropriate utilization systems

B. Plans

1. To conform cultivation schemes in different areas with their water capacities and facilities
2. Development of the networks for the measurement of water consumptions in agriculture sector
3. To enhance the legal basis of water issues in accordance with the managerial and technological developments

NOTE: Strategies and plans for water and some of the agricultural topics are presented in the first section.

Constraints and Challenges

1. Potential dangers of frequent droughts with relatively long duration
2. Concentration on the crisis management instead of the risk management policies
3. Lack of adequate coordination among the relevant organizations and agencies before and during the drought
4. Absence of a drought early warning system
5. Absence of an appropriate drought data bank
6. Negative consequences climate change on the frequency of drought occurrence

Solutions and Recommendations

1. Enhancement of the country's capacity to combat drought, by preparation and implementation of comprehensive and preventive programs
2. Implementation of the risk management policies and ratification of the programs for confronting drought
3. Coordination among relevant organizations and agencies before and during the drought
4. Establishment of the drought early warning systems, and taking advantage of the experiences of other countries, with due consideration of the regional conditions
5. Establishment of a comprehensive drought data bank

LAND

Strategies and Plans

A. Strategies

1. To subsidize the natural resources lands and adequately manage the exploitation of natural resources
2. To expand education and extension by the use of technical services offered by the private and cooperative sectors
3. Expansion of applied agricultural researches on prevention and/or mitigation of land degradation
4. Improvement and expansion of public awareness systems, and expansion of earth science data basis
5. Protection and utilization of the country's biological diversity
6. To prevent the excessive use of chemical fertilizers and pesticides
7. Reduction of environmental pollutants, particularly for the protection of the country's natural resources and water resources

B. Plans

1. To increase the accessibility of the investors and entrepreneurs to the necessary information about land resources
2. To accelerate the implantation of the action plans for the protection and utilization of the country's biological diversity, and establish the appropriate coordination between the relevant organizations for the purpose of identifying the biological diversity indices of the country

3. Implementation of utilization systems, participation of non-governmental sectors (water right holders and landowners), and establishment of water consumers cooperatives
4. To grant large land areas within natural resources areas, that has economic values and potential for reclamation and agricultural production
5. To promote the use of organic fertilizers and biological pest control methods
6. To reduce the pollutions by the production units

Constraints and Challenges

1. Lack of sufficient laws and regulations for land grant
2. Shortage of budgets and funding
3. Inadequate information about land ownerships and lack of data bank
4. Insufficient awareness of the farmers about the beneficial outcomes of some of the projects
5. Inadequate cultivation systems and land use
6. Gradual land use changes of good agricultural lands due to construction of buildings, and consequently, their omission from the production cycle

Solutions and Recommendations

1. Ratification of adequate laws for land grant
2. Allocation of adequate budget at national and provincial level
3. Adequate information transfer and education of the farmers about the beneficial outcomes of some of the projects
4. Improvement of the comprehensive land resources data bank

RURAL DEVELOPMENT

Strategies and Plans

A. Strategies

1. To devise policies, plan, direct and monitor the rural development issues
2. To enhance the economical, social and cultural development of the Islamic Republic of Iran
3. Rectification of nomadic settlements, as well as, preservation and enhancement of their economic capacities
4. To expand fishing activities, such as the development, maintenance and improvement of fishing ports
5. Preparation of the necessary grounds for implementation of "Education for All" program
6. Enhancement of the health and living standards
7. To enhance the education and training opportunities for all the rural and nomadic communities
8. Enhancement and strengthening of infrastructures for environment and natural resources
9. To expand the general and specialized environmental educations
10. To support the investments in the environment and natural resources sectors
11. Improvement of the appropriate infrastructures for environmental activities
12. To prevent excessive use of chemical fertilizers and pesticides by promotion of organic fertilizers and biological pest control methods
13. Comprehensive waste management in the country

14. Collection, transportation, recycling and disposal of all wastes through hygienic and environmentally friendly technologies
15. Development and expansion of the comprehensive social security system, in terms of comprehensiveness, pervasiveness and effectiveness
16. Fair distribution of incomes and implementation of tax policies
17. Determination of poverty line
18. Complete coverage of the population under absolute poverty line
19. Coverage of people in between absolute and relative poverty lines, as well as, to follow-up and record regularly the consequences of socio-economic plans on the condition of the poverty line and the number of population under the poverty line
20. Employment, capacity building, enhancement of social participation and education of vocational and living skills
21. To enhance the participation of NGOs and charity organizations in poverty eradication programs, identification of the orphans and the families under the poverty line, and implementation of social, financial and cultural support for the aforementioned people by the responsible organizations and institutions within the social security system
22. To provide adequate, healthy and nutritious food
23. To guarantee health care and treatment services
24. To provide free rehabilitation and low cost housing
25. To provide free education for all the under 18 year old population of the country
26. To provide legal support and social counseling and assistance, for the purpose of defending the individual, family and social rights of the poor

27. Local capacity building and participation, based on the fundamental needs of the development programs, and the necessities of the local communities for social services
28. To enhance the productivity and livelihood of the nomadic and rural communities, and create job opportunities
29. To increase the coverage of social insurances, with special emphasis on the nomads, villagers and urban employees
30. To provide special insurance for the working women who are in charge of supporting the family, and people without a guardian, particularly children
31. Basic health care insurance for all the population in the country
32. Expansion of supportive activities with the aim of enabling the people that are under the protection of supportive organizations and institutions, to acquire insurance coverage
33. Enhancement of the psychological health and hygiene, expansion of social assistance services, strengthening the family foundation and enhancing the capabilities of the vulnerable people and social groups
34. Development and extension of the spirit of joy, happiness, hope and social confidence among people, and deepening the religious values and social orders within the society
35. Identification of socially vulnerable hot spots in urban areas and city outskirts
36. Social supports, health care services, assistance, social and legal counseling, as well as, supported employment programs
37. Preliminary prevention of social impairment

B. Plans

1. Providing the necessary facilities and infrastructures for the expansion of fishing activities, such as development, maintenance and improvement of fishing ports
2. Organization and mobilization of the unloading centers for small fishery catches and enhance the productivity of fishery ports with the purpose of quality improvement, increasing the added value of the catch and expansion of NGOs participation
3. Promotion of the income and livelihoods of the farmers and rural settlers, and poverty eradication through enhancement of appropriate production infrastructures, diversification and development of complementary activities, particularly small and converting industries and modern services, with emphasis on the reformation of the commodity pricing systems
4. To compose educational programs for the enhancement of health and healthy living standards
5. To provide appropriate facilities for alleviation of educational deprivation by expansion of boarding schools, central dormitories, long-distance education programs; to provide food, transportation and health care to the students and to cover other expenses of the boarding schools
6. Development and expansion of educational, recreational and athletic places relative to the genders
7. Preparation and implementation of the necessary programs for the extension of pre-school and kindergarten education, particularly in bilingual areas
8. To promote the use of organic fertilizers and biological pest control methods
9. To devise special programs for employment, capacity building, social participations, and education of vocational and living skills, particularly for the very low income population of the country

10. To provide legal support and social counseling and assistance, for the purpose of defending the individual, family and social rights of the poor
11. Local capacity building and participation, based on the fundamental needs of the development programs, and the necessities of the local communities for social services, by creating motivation for the development of small scale projects, that are proportional with local capacities
12. To design necessary procedures for enhancing the productivity and income of the villagers and nomads, by creating job opportunities (particularly during the agricultural off-season), increasing their participation and providing different interest free loans for job development
13. To increase the coverage of social insurances, with special emphasis on the villagers, nomads and urban employees that are not yet under insurance coverage
14. Implementation of the strategies for the enhancement of cross-sectoral cooperation and management system of the social impairs in the urban areas and city outskirts
15. To revise the curriculums of the public education programs, and forecast the necessary social educations
16. Implementation of educational, publicity and extension programs at all social levels, for the purpose of education, extension and deepening the culture of work and social order, understanding the importance of time and its practice in all kinds of activities

NOTE: Strategies and plans for water and some of the agricultural topics are presented in the first section.

Constraints and Challenges

1. Absence of a coherent national policy framework for rural development
2. Shortage of budgets and funding
3. Lack of complete coordination among different organizations and agencies for achieving the goals
4. Constraints within the insurance laws
5. Inadequate information about land ownership and lack of data bank
6. Inadequate development of tourism in rural areas
7. Insufficient public awareness about wastes and residues
8. Insufficient number of specialized and skilled manpower in rural areas
9. Occurrence of global warming and climate change, and its negative consequences on rural development

Solutions and Recommendations

1. Allocation of funds from national and provincial sources
2. Preparation of the ground for cultural awareness and raising the trust in insurance
3. Cooperation of the experts from nomadic communities, local people, police forces and etc., for collection of vital statistical data
4. To improve the geographical data bank of the rural areas
5. Establishment of the tourism development cooperatives
6. Implementation of consistent and integrated educational and publicity programs for enhancement of public awareness
7. Implementation of "Healthy City, Healthy Village" programs, by consideration of fundamental needs of development

WATER RESOURCES

Strategies and Plans

A. Strategies

1. To compose four five-year development programs for the water sector, with the purpose of controlling the exploitable water resources, and providing the necessary water for agricultural productions and food security
2. Regulation, development and implementation of the macro strategic policies for the development of water resources in the country
3. Regulation, development and implementation of the government's general policies in regards to comprehensive and integrated water resources management
4. Implementation of water rule
5. Implementation of comprehensive and integrated water resources management in the watersheds
6. To prepare the general water balance data at watershed subunits
7. To prepare the capability and constraint geographic maps of the country's water resources
8. Allocation of water for economic purposes by considering the unit of production per unit of water used
9. Campaign against water crisis and drought plans
10. Revision of water demand management instead of water supply management
11. To create competitive water markets
12. Execution of water delivery projects from areas with ample supplies of water to areas with water scarcity

13. To implement the sewage disposal programs in urban and rural areas, and increased sanitary protection of the waters in susceptible areas
14. To prevent excessive and illegal exploitation of groundwater resources
15. To change the utilization status of the well waters in damaged areas
16. To purchase and shut down the wells, and reimburse the losses to the owners
17. Reduction of water consumption by adoption of appropriate technologies and necessary rectifications
18. To recycle the byproducts of the sewage treatment plants and water recirculation
19. Improvement of the irrigation networks by changing the utilization methods
20. Artificial recharge of aquifers in potential areas
21. Implementation of the watershed management projects and beneficial utilization of flood waters
22. To apply modern technologies, such as water desalination techniques, in the areas with water scarcity and high drought potential
23. Implementation of the appropriate reforms and revisions in the Water Law, as well as, urban management rules and regulations (e.g. disposal of surface water and wastewater, development of cities in areas with limited water reserves, etc.)
24. Fair distribution of the shares of communal surface water resources
25. Cultural education on the reduction of water consumption
26. Environmental assessments

B. Plans

1. To progress towards the implementation of the water rule
2. To devise necessary programs and actions for implementation of comprehensive and integrated water resources management in the watersheds

3. To assess the water shortage level at different locations and in different water years
4. Allocation of water for economic purposes by considering the unit of production per unit of water used
5. Preparation and regulation of the protocols for combating water crisis, and drought program
6. Water demand management instead of water supply management, and creation of competitive water markets
7. Promotion of privatization and reduction of government's tenure and role
8. Implementation of the public participation in the execution of the projects
9. Execution of water delivery projects from areas with ample supplies of water to areas with water scarcity
10. To draft a comprehensive national water development plan, and to set the long, medium and short term programs for the implementation of the country's 20-year development plan
11. To supply adequate and low cost drinking water for the vulnerable populations in the urban and rural areas
12. To provide the water requirements of the cities, towns, and the townships around the municipal areas
13. Implementation of the sewage disposal programs in urban and rural areas, and increased sanitary protection of the waters in susceptible areas
14. Replacement of the old, clogged and worn-out water delivery and distribution pipelines in different parts of the cities
15. Reduction of water consumption by adoption of appropriate technologies and necessary rectifications
16. Recycling the byproducts of the sewage treatment plants and water recirculation

17. Improvement of the irrigation networks by changing the utilization methods, such as development of pressurized irrigation systems
18. Artificial recharge of aquifers in potential areas
19. Implementation of the watershed management projects and beneficial utilization of flood waters
20. To promote the production of hygienic bottled drinking waters, and issue the necessary operation permits to the private owners of such water resources
21. Preparation and issuance of water title
22. Implementation of the appropriate reforms and revisions in the Water Law, as well as, urban management rules and regulations (e.g. disposal of surface water and wastewater, development of cities in areas with limited water reserves, etc.)
23. Consideration of the international protocols and fair distribution of the shares of communal surface water resources
24. Establishment of International Center for Urban Water Management and International Center on Qanats and Historic Hydraulic Structures (in Iran), and cooperation with the neighboring countries, such as Afghanistan and Tajikistan, for water resources development projects
25. Cooperation with international financial agencies, such as World Bank and Islamic Development Bank, for procurement of the funds, participation in the environmental health development programs (sewage disposal), as well as, irrigation and drainage networks, particularly in resource poor areas
26. Cooperation with international research and development agencies, such as UNESCO, FAO, UNDP and JICA, for water development projects and environmental assessments

27. Expansion of cooperation with Caspian Sea Environment Program (CEP) and Regional Organization for the Protection of the Marine Environment (ROPME) in the Persian Gulf and Sea of Oman about fishery
28. Regional cooperation with the member countries of CEP for monitoring and control of the Jelly Fish
29. Expansion of cooperation with Caspian Sea neighboring countries for the protection of Sturgeons, and scientific and technical cooperation with Convention on International Trade in Endangered Species (CITES)
30. Efforts to devise regional cooperation plans and exchange of information about the cross-border diseases
31. Implementation of educational and cultural programs about the reduction of water consumption, such as seminars, technical workshops and short term courses, and establishment of extension officers for water consumption reduction
32. Implementation of the obligatory environmental impact assessment in the water resources projects, and identification of the best practices and experiences

Constraints and Challenges

1. Rapid population growth in municipal areas, and consequent reduction of per capita water share, increased water consumption, increased demands above the natural capacities of the water resources, development of the city outskirts and rapid dissemination of municipal water contamination
2. Excessive urban expansion and increased unexpected water consumptions
3. Excessive expansion of the industries and cities, particularly around the rivers and aquifer recharge areas, and lack of necessary facilities for industrial wastewater treatment

4. Reduced quality of the drinking waters due to ecological and environmental changes and disposal of wastewaters and garbage, and inadequate and uncoordinated growth of the relevant facilities
5. Negative impacts of natural disasters on the quantity and quality of the water resources, and increased public demand for better quality water, in spite of the quality decline of the water resources
6. Inappropriate spacial and temporal distribution of water resources, and its inconformity with population patterns and structure
7. Lack of a comprehensive system for water management in the urban areas
8. Unsanitary disposal of wastewaters in some urban and rural centers
9. Shortage of facilities for the measurement of agricultural, industrial and urban pollutants in water resources
10. The potential danger of sudden biological and chemical contamination of the urban water resources and pipelines
11. Possibility of the destruction of the facilities and plants due to intentional or unintentional, natural or unnatural activities, such as war, earthquake, explosion, fire and sabotage, particularly in the cross-border waters
12. The pollution of agricultural waters by different types of industrial, urban and agricultural wastes and residues
13. Application of inappropriate types of chemical fertilizers and pesticides, and their consequent contamination of water resources
14. Excessive use of water in agriculture sector, low productivity and low water use efficiency
15. Inadequate management of water consumption, particularly in agriculture, urban and industrial sectors, and the necessity for revision of the consumption pattern

16. Constraints in the disposal of agricultural, urban and industrial wastewaters at different locations, and contamination of the environment
17. Draw down and contamination of groundwater resources in and around the municipal areas
18. Excessive water use and lack of public attention to the guidelines and regulations of groundwater extraction
19. Inadequate services and industry supports in the water sector
20. Ineffectiveness of the water and sewage tariffs
21. Absence of economic perspective towards the water in the country
22. Ineffective use of facilities, and the necessity for increased productivity and or economic return of water

Solutions and Recommendations

1. To implement the Comprehensive Water Plan, as well as, the long, medium and short term programs for the implementation of the country's 20-year development plan (the third and fourth five-year national development plans and the 20-year vision of the Islamic Republic of Iran)
2. To implement the development policies of the country's water resources, which are approved by the cabinet
3. Provision and enhancement of the health, with emphasis on improvement of the drinking water and wastewater sanitation, and adequate access to safe and clean water by all people
4. To devise appropriate administrative policies and programs, in regards to communal waters with neighboring countries, inappropriate water use for agricultural production and low water productivity rate

5. Fundamental structural rectification and implementation of integrated and comprehensive management of the water resources
6. Expansion of programs for appropriate water use, by raising the public awareness, and with the purpose of increasing the public participation in agriculture, industrial and services sectors
7. Increasing water consumers awareness by distribution of the necessary guidelines and information
8. Increasing the productivity of the available resources and facilities in the health care services, water distribution, education and other sectors, particularly agriculture
9. Addressing the role of research and extension in sustainable development, and to use the experiences of other countries that are in similar situations, with paid due attention to regional conditions
10. To promote the integration of environmental considerations into economic activities of the country
11. Planning and enhancement of the management, based on the principles of environmental protection and sustainable development, for rational development and sustainable use of inland and sea water marine stocks, with the purpose of benefiting from the potentials of fishery and aquaculture, and
12. Effective campaign against drought in the country
13. To provide clean and healthy water for nomads and villagers in the small and scattered populated areas
14. Participatory management of the services, by strengthening the local institutions and agencies for the implementation of the sanitation and water programs
15. Protection of environment and sanitation through coordinated management of water resources, as well as, solid and liquid wastes

16. Alleviation of the potential hazards to public health, control of the water born diseases, and reduction of the potential outbreak and spread of diseases under emergency conditions in towns and villages
17. Due attention to rural and low income areas of city outskirts
18. Reduction of water consumption by adoption of appropriate technologies and necessary rectifications, recycling the byproducts of the sewage treatment plants and water recirculation
19. Preventive measures for the control of water pollutants
20. Enhancement and development of cross-sectoral cooperation
21. To increase and expand the facilities and instruments for the identification and measurement of water pollutants