Chapter 4
Participation in Water Management in Iran

Lena Horlemann and Parisa Jafari Berenji

4.1 Introduction

The abundance of public attention and debates focusing on the issues and challenges related to public participation in Iran shows how this issue has become central in recent years (Namazi 2000; Afrasiabai 2003; Bradley 2007). Public participation in the process of decision-making and management has become more important in Iranian public debates after the Islamic Revolution in 1979. While the constitution calls for "the participation of the entire people in determining their political, economic, social and cultural destiny" (Chap. 1 Art. 3), at the same time it states that the final decision is taken by the highest clergy. Despite its increasing importance over the last years, there is no common perception of how participation of social actors should influence decisions and management and particularly, how participatory decision-making can be embedded and thus institutionalized in the centralized political and decision making structure of Iran (Bradley 2007). After the election of Khatami in 1997, a time perceived as promoting 'greater freedom' for Iran's citizens, Namazi (2000, p. 13) stated:

> Iran faces daunting challenges in its drive for more participation of all citizens, civil society development and NGO empowerment. The process of political change faces serious obstacles and hurdles. In the absence of the culture and tradition of political participation, the process of change entails ebbs and flows and is far from smooth.

According to participatory management approaches, an effective participatory process should involve interaction between social actors and decision-makers at multiple levels of decision making. Stakeholder participation as a main element for sustainable environmental and water management allows comprehensive and reflexive definitions of problems and incorporation of underestimated points of

L. Horlemann (✉) • P. Jafari Berenji
inter 3 GmbH Institute for Resource Management, Berlin, Germany
e-mail: horlemann@inter3.de

S. Mohajeri, L. Horlemann (eds.), *Reviving the Dying Giant*,
DOI 10.1007/978-3-319-54922-4_4

view (see Global Water Partnership GWP 2000; Mostert 2003; Pahl-Wostl et al. 2007; Kirschke et al. 2016). Based on the participatory management approach, stakeholder participation can take place at various levels. But one of the main ideas is the inclusion of all relevant stakeholders, i.e. decision-makers, social and economic sectors, and affected people. Stakeholder involvement can be applied in the phases of problem definition, data collection, interpretation of results and development of policy options. Furthermore, participation can facilitate the relation between stakeholders and it can contribute to setting the right priorities and making the process of decision making more transparent. In addition, it helps to avoid narrow or partial examinations, and help not to exclude any of the stakeholders (Nasrabadi and Shamsai 2014, p. 793).

Participation as a process in which stakeholders influence policy formulation, strategy design and management (Yercan 2003) needs to be considered in the socio-political context. In this sense, institutional factors such as political structure and legal framework can affect the process of participation. In the context of Iran, participatory process has been conceptualized in a variety of forms implying different meanings and interpretations which are applied in practice in several ways. A major obstacle seems to be the lack of a participatory tradition and persistent governance structures. Namazi (2000, p. 13) states:

> Old legal and procedural forms [. . .] are still in place. Even worse is the negative attitude of senior officials in the executive, judicative and legislative branches that need to be overcome.

The historical background of water management in Iran shows that the traditional way of water management reliant on local participation management of water distribution and allocation has steadily changed since the white revolution and land reforms (Hosseini Abari 2008, p. 112) launched by Mohammad Reza Pahlavi in 1963. It was a reform from above changing the power structure in rural communities and between rural communities and other levels of Iranian society as well. According to Hosseini Abari (2008), this led to a "governmentalisation" of water management meaning that the central government became the main responsible body to provide and manage public needs including water resources, and the role of local peoples' participation was degraded. Furthermore, water was no longer considered simply a need for people's livelihood but an essential resource for economic means like industrial and agricultural production.

Since political and administrative institutions expanded and government became more centralized, particularly after the 1960s, the government has played a central role in planning and budgeting (Ardakanian 2005), and consequently natural resources have become a property of the state (called nationalization of natural resources). But, since the users of the natural resources are people of regions in which the resources are located, the government has not been able to fully control the use of resources in practice (Bagherian et al. 2009, p. 429).

While the Islamic Revolution of 1979 led to changes in the political and social system through officially supporting and encouraging public participation, a centralized and top-down management structure has still remained, which is also

dominant in water resource management, and evidence shows it has caused several issues and problems in the context of water management and policy design.

4.2 Current Water Management Issues

Evidence shows that one of the main problems affecting the process of sustainable participatory management in Iran is that because of the centralized political structure, there is no efficient cooperation between different sectors and government bodies, which has resulted in a lack of common understanding about the problems, issues and capacities and also conflicts between and amongst decision makers and water users (see Mohajeri et al. 2016). Consequently, in these conditions, most of the important decisions are taken by the highest rank of authorities which in most cases are not accepted and supported by other stakeholders.

Cooperation between the main governmental organizations including the Ministry of Energy and its subordinated organizations, other ministries of water using-sectors, the provincial agricultural, industrial or environmental organizations, is very low and so the decisions are very selective. As a consequence, they can barely be harmonized with decisions and policies taken in other sectors or by other organizations. In addition, decisions and policies are not able to represent the interests of all social groups who could be affected, since they are not part of a participatory integrative process of decision making and management.

Regarding Iranian water management, improving structural aspects of water resource management has been highly considered in regional and national development plans and policies. In this regard, supporting public participation is one of the main orientations of the plans in order to improve water user systems and increase economic efficiency of water (Tahbaz Salehi et al. 2010). This kind of orientation not only indicates the challenges in Iran's water sector, but also acknowledges the importance of the incorporation of sectors including all levels of water organization, stakeholders and water users, and also between private and public sectors in the process of water resource management. It therefore implies that without public participation it is hard to reach the main goals of development plans related to the water sector.

As evidence shows, where participation of water users was ignored, most of the water sector related plans did not achieve complete success (Shahroudi and Chizari 2007). For instance, since water scarcity is the most limiting factor in the agricultural sector in Iran, the issue of water users' participation in irrigation water management has become more important, as the majority of the plans should be implemented by farmers. Consequently, their acceptance and support is essential. Therefore, it is necessary to consider farmers' participation in the processes of policy design including addressing common problems, capacity building, and policy implementation.

Considerable attempts have been made to use local capacities in operating water-related plans. One of the most important, for instance, is to commit operation

and maintenance of irrigation and drainage networks to farmers and to support them by providing financial facilities (Ardakanian 2005). In spite of challenges such as providing economic resources for these types of participatory plans, as experience shows, they could be more successful compared to the plans which have only been managed by governmental sectors.

While important efforts such as providing a legal framework have been made to include public involvement in the process of decision making in recent years, participatory management has not really institutionalized yet in the centralized political structure of Iran. In the water sector, for instance, the aspect of participatory implementation of projects and policies is more important than the participatory policy formulation or decision-making process. Sectorial interests and positions continue to play a main role in these processes. IWRM and participatory water management principles would still need to integrate different concerns and interests from all affected sectors and social groups to identify a common understanding about the problems and challenges.

One of the challenges is the lack of skills required to implement the process of participatory water management in Iran. Thus capacity development is necessary (Nasrabadi and Shamsai 2014) to enhance skills as well as professional and scientific-based knowledge which can be applied in the process of decision-making. Another issue is providing transparency in the communication of participatory process aims, methods and phases among all stakeholders, social and interest groups which is another weakness in Iranian water management. There is a need to enhance the co-learning process of building relations and legitimating decisions (Nasrabadi and Shamsai 2014). It should involve all levels of participation from local level to regional and national levels of decision making and policy designing.

4.3 Participatory Definition of Water Management Challenges

One of the aspects of participation in water management is to involve all relevant stakeholders in the process of definition of water management challenges. Involving stakeholders is an important step to ensure that water management decisions and plans take into consideration all local needs, experiences and interests (Stanghellini 2010). Participatory defining of problems and challenges legitimate decisions made to address these problems and challenges in water management. In a legitimate decision, all stakeholders feel that their input, concerns and expectations have influenced the decision, or they believe that the process of decision-making has been made through a fair, transparent and open process. Such decisions are expected to evoke less resistance and therefore to be implemented more successfully (Carr 2015, p. 397).

In the process of the IWRM Zayandeh Rud project, and with the aim of providing a participatory basis for defining water management challenges from

Fig. 4.1 Stakeholder involvement in the IWRM Isfahan project

the viewpoint of stakeholders, an interactive, participatory workshop was conducted in 2012, involving all relevant stakeholders from national and local government, water, agricultural, industrial and environmental sectors, and academia (see Fig. 4.1).

The development of the workshop methodology had to deal with some challenges: The first challenge was the hierarchical system of decision-making which leaves little space for participation or negotiation across hierarchical levels. And second, the form of decision-making: especially in years of water shortage, decisions over water distribution have been taken on an *ad hoc* basis, in an attempt to balance acute water demands. These decisions, however, have not been based on sound data or a long-term management plan. This has led to severe inter-sectoral and regional (between provinces) conflicts of interest, particularly in the Zayandeh Rud catchment area. Due to the lack of transparent decision-making, feelings of unfair distribution or preferential treatment of individual sectors or regions, and since a lack of water mainly puts the livelihood of farmers at risk, these conflicts can be quite emotional.

These challenges could be resolved by addressing the problems in an open way. First, the problem of hierarchical thinking was discussed with the respective authorities and senior participants. Second, three small discussion groups were formed and participants were systematically chosen from different sectors, hierarchical levels and academia. The discussion groups were then chaired by an independent, unbiased person.

The development and implementation of participatory methods was a time-consuming but worthwhile activity since it built an atmosphere of trust and

willingness to cooperate between the stakeholders and partners. Moreover, it revealed that the stakeholders are well aware of the main reasons behind water management problems and water stress.

During the workshop, the participants were divided into small working groups to discuss and answer the questions of present and future problems and challenges of water management in the Zayandeh Rud catchment. The answers of each group were then presented to the other working groups for discussion.

4.3.1 Joint Problem Definition

The participants defined four issues as the major water management problems in the catchment:

- Lack of integrated management;
- Lack of data (quantitative and qualitative aspects);
- Water resource shortage;
- Drop of water resource quality.

The lack of integrated management was identified by the stakeholders as the biggest water management challenge. According to their views, the main reasons are sector oriented water management, growing conflicts among different sectors, and the lack of cooperation and mutual understanding between stakeholders for solving problems of the catchment. These issues, again, were observed as consequences of increasing mistrust among stakeholders, and sectoral interests pushed by different stakeholders regarding water resources.

The lack of scientific basis for decision making is another issue that was mentioned by the workshop participants as an obstacle to water management. Considering the issue of the lack of data, the lack of integration of data available in different sectors of the region was mentioned as the main challenge for water management. According to the workshop participants the lack of integrated, updated and scientifically gathered data had a negative impact on the process of decision making and development of integrated water management.

Another challenge stated by participants of the workshop was water resources shortages. The measures taken to date, like water transfers from neighbouring provinces of Chaharmahal and Bakhtiari to the Zayandeh Rud, would not be able to alleviate the problem by themselves and might even exacerbate resource conflicts. On the other hand the stakeholders believed that the inter-basin water transfer would increase in future, due to water consumption growth. Growing water consumption leading to overexploitation of water resources was observed by the stakeholders as a great challenge for water management.

The drop in water resource quality is another water management challenges that was identified by the stakeholders. They made a link between the water quantity and quality in the catchment. In this sense, when the water quantity drops, water resources quality is also negatively affected. They emphasized that both groundwater and

surface water had been impacted by pollutant substances which could be an impeding factor for optimal water use. This could also threaten the environment.

Besides the aforementioned issues, during the workshop the stakeholders shared their concerns about the future of water resources and the growth of threatening factors and a worsening of the current situation. Some of the stakeholders were concerned about the negative impacts of the overexploitation of water resources and uncontrolled discharge on the future existence of the Zayandeh Rud river as the major water resource in the Central Plateau of Iran. They believed that the loss of ground and surface water resources could largely affect agricultural sectors and raise local and regional conflicts. In addition, the region would face a severe challenge of losing its strategic industries such as the steel and cement industry. They also anticipated that a loss of clean drinking water would occur due to the increase of harmful ingredients, and could become a threat to peoples' health.

4.4 Participatory Development of a Decision Support System

A decision support system (DSS) is supposed to support scientifically sound, technically robust and unbiased judgments and water management decisions that aim at balancing all water users' current and future interests. This usually means to overcome inter-sectoral conflicts of interests towards water resources. With regards to Iran, or the Zayandeh Rud catchment, these conflicts do not only emerge among individual water users or water user groups, but particularly between their official representatives in respective ministries and other public authorities. The results are an atmosphere of mistrust and a lack of coordination and cooperation. Until today, the Ministry of Energy takes major decisions about water resources management, leading to mostly technological solutions that are rarely agreed on with other key ministries or institutions (Mohajeri et al. 2009), like dam building or water transfers between provinces. Not least as a consequence of these unilateral acts, there were no coherent data or statistics available to be fed into the Water Management Tool (WMT) which was developed in the first stage of the project as a basis of the DSS. The WMT combines the simulation results of three models (MIKE Basin which depicts anthropological impacts on water resources in the catchment area, the groundwater model FEFLOW, and the hydrological model SWAT) and calculates the amount of available water and the supply for each individual user. The WMT will be further developed to a DSS and implemented in the next project stage. Giupponi and Sgobbi (2013) show that for successful DSS development and implementation, not only coherent data are required, but – in a first step – approaches that foster consultation and negotiation among decision-makers.

Experiences with water management tools/DSS have shown that even a careful and practice-oriented development of a model does not guarantee that decision makers will actually use and further develop the model after its implementation

(see for example Jao 2011). In their comparison of different projects that have developed a DSS as a steering tool for an IWRM process, Giupponi and Sgobbi (2013, p. 812) found that "the quality of the tools *per se* cannot guarantee the quality of the process". Based on the opinion that acceptance and ownership of the WMT provide the basis for its successful implementation (Serrat-Capdevila et al. 2011), methods for stakeholder involvement were integrated into the project, and locally adjusted means and methodologies for implementing the tool were already being assessed during its development.

In general, the implementation of a decision support system puts previous forms of decision making into question. In Iran, hierarchical thinking prevails and the Ministry of Energy has the final say in water management decisions. The participative development, maintenance and use of WMT/DSS meant negotiating classical working methods and principles of decision making (Ghanavizchian and Mohajeri 2013).

A major challenge of the project was to identify and harmonize the different interests and expectations of the decision makers towards the WMT. Only if the future users see the benefit and their demands are reflected in the tool, will they support its development and implementation. Even if there had been some experience with models in certain areas, there was still uncertainty regarding WMT's essential functions and exact application.

4.4.1 Workshop on Joint WMT Development

For the purpose of clarification, another participative, culturally adapted workshop session was facilitated, following the same methodology as the first workshop on water management challenges. The results of this interactive workshop were again presented in various rounds to different stakeholders. This led to a fruitful discussion within the region about the establishment of new, necessary organizational units which are supposed to manage the IWRM process in the future.

The aim of the workshop was to clarify three main issues regarding the WMT:

- Advantages and expectations of the WMT,
- The issue of data collection, coordination and validation,
- The question of WMT updating and availability.

With regards to the assumed advantages of the WMT and the stakeholders' expectations of the tool, two main points were mentioned. First, stakeholders expect that the prediction and identification of their decisions' consequences will be improved. Second, this will help them to optimize their decisions. Since the tool is fed with scientific as well as socio-economic data, it is capable of analysing the impact of certain water allocation measures on water rights. While the tool is able to visualize how and where decisions may lead to changes in the catchment, it is also helpful in raising awareness of the different facets of water management among the stakeholders. Furthermore, it can assist in taking decisions about new technologies

or the location of new industries. Eventually, the WMT may lead to a decrease in social, regional and sectoral conflicts about water resources in the region.

Regarding the question of who should be responsible for data collection and coordination, some critical points have to be addressed. First, up to now data are collected within individual sectors and there is no culture of sharing data. Second, in this atmosphere of mutual mistrust the stakeholders have to accept the actual data that are fed into the WMT. Two proposals were discussed in this regard. The first proposal suggested that an independent committee consisting of experts of the respective regional organizations or sectors should be in charge of collecting the data. Being independent, the committee should at the same time be autonomous enough to be capable of collecting the required data, and it should have the actual mandate to claim due data from defaulting stakeholders. The second proposal suggested that a professional entity, i.e. the Isfahan Regional Water Company, should be responsible for data collection and coordination.

However, the collection and management of data does not only require a capable and acceptable organization. For providing valid data, standards for the measurements and for the data themselves have to be set. This may also require the introduction of new technologies and data collection techniques. Moreover, it was stated that questions of capacity building, adjusted legislation, feedback mechanisms and financing have to be further elaborated on.

The last question that was discussed in the working groups was about the responsible entity for WMT updating and its further development. New (social, environmental, political) trends and developments in the catchment have to be detected and translated into valuable data. The WMT has to be further developed accordingly. Here, three possible organizational solutions were discussed as well: transferring the tasks to a commission, an independent company or consultant or to the Isfahan Regional Water Company.

Some of the workshop participants proposed the formation of a commission consisting of representatives of the important regional decision-makers and users of the WMT as a DSS. This commission would have the task of obtaining from relevant sectors the necessary data, information and proposals for further WMT development as well as managing and monitoring their implementation. They expressed their hope that the formation of a commission would increase confidence in WMT. Transparency regarding the data and information included in WMT also appeared to be an important issue that would in turn increase trust in WMT. The joint decision and development of WMT would at the same time increase the probability and willingness of regional actors using WMT in their decision-making process.

The next proposal concerned the assignment of an independent company or consultant from the private sector for updating WMT. Regional decision makers and users of WMT should mutually decide upon the selection of this company to ensure a successful collaboration with the individual sectors for data and information procurement. The ideas proposed by the experts for an independent, privately-owned company ranged from regional to foreign companies. The role of a foreign company would, however, be limited to monitoring and training an Iranian

company commissioned to obtaining the data and information necessary for updating WMT from the relevant sectors, of drawing up proposals for the further development of WMT and of taking responsibility for the their implementation in WMT. In commissioning an independent, privately-owned company, the hope was that the updating and further development of WMT would be exclusively factual and objective, and in this sense uninfluenced by regional decision-makers' particular interests.

Some of the workshop participants propose transferring the tasks to the Regional Water Company. This proposal had been a consequence of the fact that, as one of the most important regional actors, the Water Board Co. bears the responsibility for the management of water resources and is in possession of more information and data concerning regional water resources than actors in other sectors. In contrast to the two previous proposals, this proposal focused on the responsibility for and knowledge of water resources and not on the independence of the institution to be commissioned. Using this approach could perhaps lead to an efficient form of updating and use of WMT; on the other hand, the acceptance of WMT by other sectors will presumably suffer.

4.4.2 Decision on Possible Organizations for WMT Application

The final decision will also depend on the question of which organization is most likely to be trusted by all parties, and which is regarded as being most capable of balancing all interests. Regardless of the decision how the updating and availability of WMT in Isfahan will be regulated, some of the experts proposed involving the Ministry of Energy in the process. The ideas for including its participation range from organizational support to acting as the monitoring institution and the final legal authority in water management. Calling for the involvement of the ministry reflects the fact that the catchment area of the Zayandeh Rud extends to three neighbouring provinces (Chaharmahal and Bakhtiari, Yazd and Isfahan). Involving the Ministry of Energy as the legally responsible institution over and above provincial boundaries, it was argued, would allow for the establishment of an integrated form of water resource management using WMT as well as the acceptance of WMT as a decision-making tool at the national level.

In 2014, a Coordinating Council for Integrated Management of the Zayandeh Rud Basin, the first river basin organization (RBO) in Iran, was established. It is headed by the Ministry of Energy and the governors of the three provinces Chaharmahal and Bakhtiari, Yazd, and Isfahan, the Deputy Ministers of Energy, Agriculture and Industry, Mines and Trade. The representatives of the agricultural unions in the three provinces are its board members (Supreme Water Council, minutes of the 10th meeting 2013). The RBO is supposed to improve the collaboration and coordination of the main stakeholders of the different sectors and

provinces. The current vision is that the RBO should be the organization that uses the DSS in the future. The final decision will presumably be taken within the second project phase which started early 2015.

References

Afrasiabai KL (2003) The environmental movement in Iran: perspectives from below and above. Middle East J 57(3):432–448

Ardakanian R (2005) Overview of Water Management in Iran. In: Water conservation, reuse and recycling; proceedings of an Iranian-American workshop. The National Academies Press, Washington DC

Bagherian R, Bahaman AS, Asnarulkhadi AS, Shamsuddin A (2009) Asocial exchange approach to people's participation in watershed management programs in Iran. Eur J Sci Res 34 (3):428–441

Bradley M (2007) Political Islam, political institutions and civil society in Iran: a literature review. Middle East Good Governance Fund (MEGGF), International Development Research Centre (IDRC), Ottawa

Carr G (2015) Public participation in river basin management-an introduction. WIREs Water 2:393–405

Giupponi C, Sgobbi A (2013) Decision support systems for water resources management in developing countries: learning from experiences in Africa. Water 5(2):798–818

Global Water Partnership (GWP) (2000) Integrated water resources management. TAC Background Papers No. 4, Stockholm

Hosseini Abari SH (2008) Isfahan as a result of Zayandeh Rud, cultural organization of Isfahan municipality, Isfahan. (in Farsi)

Jao C (ed) (2011) Efficient decision support systems-practice and challenges from current to future. InTech, Rijeka. doi:10.5772/682

Kirschke S, Horlemann L, Brenda M, Deffner J, Jokisch A, Mohajeri S, Onigkeit J (2016) Benefits and barriers of participation: experiences of applied research projects in integrated water resources management. In: Borchardt D, Bogardi JJ, Ibisch RB (eds) Integrated water resources management: concept, research and implementation. Springer International Publishing, Switzerland

Mohajeri S, Horlemann L, Sklorz S, Kaltofen M, Ghanavizchian S, Nuñez von Voigt T (2016) Integrated water resource management in Isfahan: the Zayandeh Rud catchment. In: Borchardt D, Bogardi JJ, Ibisch RB (eds) Integrated water resources management: concept, research and implementation. Springer International Publishing, Switzerland

Mohajeri S, Hempel L, Dierich A (2009) Analysis of the current organizational structure and legal framework of the Iranian water sector. Identification of strengths, weaknesses and challenges for future development, Report for the World Bank

Mostert E (2003) The challenge of public participation. Water Policy 5:179–197

Ghanavizchian S, Mohajeri S (2013) Coping with cultures-conducting participation projects in Iran. In: Schön S, Mohajeri S, Dierkes M (eds) Machen Kläranlagen glücklich? Ein Panorama grenzüberschreitender Infrastrukturforschung. inter 3, Berlin, pp 108–115

Namazi MB (2000) Non-governmental organizations in the Islamic Republic of Iran: a situation analysis, UNDP-Iran technical papers 1, Tehran

Nasrabadi AT, Shamsai A (2014) Participatory developing strategies for water management in South Khorasan province, Iran. Water Resour 41:792–799

Pahl-Wostl C, Craps M, Dewulf A et al (2007) Social learning and water resources management. Ecol Soc 12(5)

Serrat-Capdevila A, Valdes JB, Gupta HV (2011) Decision support systems in water resources planning and management: stakeholder participation and the sustainable path to science-based decision making. In: Jao C (ed) Efficient decision support systems-practice and challenges from current to future. InTech, Rijeka. doi:10.5772/16897

Shahroudi AA, Chizari M (2007) Farmers' participation in irrigation water management in northeast Iran. In: The 4th Asian Regional Conference & 10th international seminar on Participatory Irrigation Management, Tehran, Iran

Stanghellini PS (2010) Stakeholder involvement in water management: the role of the stakeholder analysis within participatory processes. Water Policy 12(5)

Tahbaz Salehi N, Koupahi M, Nazari MR (2010) The investigation of participatory irrigation management in Iran, case study of cooperative water users in Tajan. J Econ Agric Develop 24 (2):205–216. (in Farsi)

Yercan M (2003) Management turning-over and participatory management of irrigation schemes: a case study of the Gediz river Basin in Turkey. Agric Water Manag 62:205–214