

# Participation in Practice: Environmental Co-planning in the Seymareh River Basin

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*Received July 28, 2006; revised and accepted September 15, 2008*

**Abstract:** This paper describes the condition, sources of pollution, potential actions and solutions for implementing participatory planning for the Seymareh River from the point of view of non-governmental organizations (NGOs), local community leaders and government agents. The aim of this paper is to explore how environmental problems can provide an information key for planning and developing the management system for the Seymareh River basin. In this regard, the methodology for developing platform was participatory action plan development (PAPD) and involves a series of linked local workshops where different stakeholders participate separately and together to develop a management plan for the common resources they use. As the results show, enhancing public awareness of options for integrated river basin management and developing and strengthening at the local level, as appropriate, research and monitoring capabilities pertaining to the conservation of the Seymareh River basin are determined, especially in relation to environmental health parameters. The availability of finances, generation and availability of information and cooperation among stakeholders were all addressed as challenges to its implementation by participants for effective management (planning) in the Seymareh River basin.

**Key words:** Participatory planning, environment, Seymareh river basin.

## Introduction

The Karkheh River basin is, most notably, the eastern flank of the “cradle of civilization” (ancient Mesopotamia) and forms a boundary between the Arab and Persian cultures. This major river system of western Iran has unique agricultural and hydrological aspects. It also has much in common with other catchments around the world: debilitating rural poverty and land degradation, low water and agricultural productivity, a dry climate, and growing upstream-downstream competition for water (Heydari, 2007). The Symareh River is in the centre of Karkheh basin and it includes the Elam, Hamdan and Kermanshah provinces. The Seymareh River is formed through the joining of the Gamasyab and Karasoo streams

in Kermanshah province. The length of Seymareh River is about 235 kilometres and its debit is 109,000 lit/s. The highest and lowest points of Seymareh sub-basin are 3400 m and 500 m, respectively. The Gamasab, Simakan and Darehshar rivers are the main water sources for the Seymareh sub-basin, which is a rich aquatic resource and its streams irrigate over 30 agricultural fields in the Karkheh basin (Jafari, 1997).

In these fields, there are a few cites and villages that Seymareh river passes through and whose livelihood depends on the river. Consequently, the Seymareh sub-basin as water ecosystem is at risk due to changes in land use patterns over recent decades, especially overgrazing and the conversion of natural pastures to rain-fed cropping that have taken a heavy toll (Rahnmaee, 1997). Also, ninety percent of the upper watershed's rangelands and 70 percent of its forests have been

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significantly degraded. At the same time, excessive use of fertilizers and pesticides is polluting the river water, putting human health at serious risk. Hence the future of the Seymareh river sub-basin and its people's livelihoods clearly depends on more holistic, basin-wide and sustainable management to establish a balance between the existing natural functions of the river system and the developed aspects of the system—fulfilling society's expectations for industrial use, recreation, nature management, and agricultural purposes (Howard, 1997). It is closely related to water resource planning. Planning is a process which seeks solutions to problems and needs or which develops actions that will satisfy goals and objectives. In river basin planning, the objective is to provide a decision maker with alternative recommendations for the use of the basin's land and water resources and this is also the goal of the present research.

## Research Framework and Methodology

The widespread scarcity and increasing pollution of water resources along with the rapid increase of water demand have led to a range of water crises across the globe. Since water cannot be produced in significant volumes within acceptable costs, unpolluted water is a scarce and critical resource. Throughout the world, agriculture, cities, industry, and environment compete for water and the conflict among these different sectors; this conditions, in turn, the relationships between political entities (states, regions, provinces and cities) and their neighbours. It is a general opinion that the solution to these crises has to come from a change in the management paradigm with which water resources have been managed until now. The new point of view must be holistic and the decisions integrated and participatory, so that they enjoy a wide

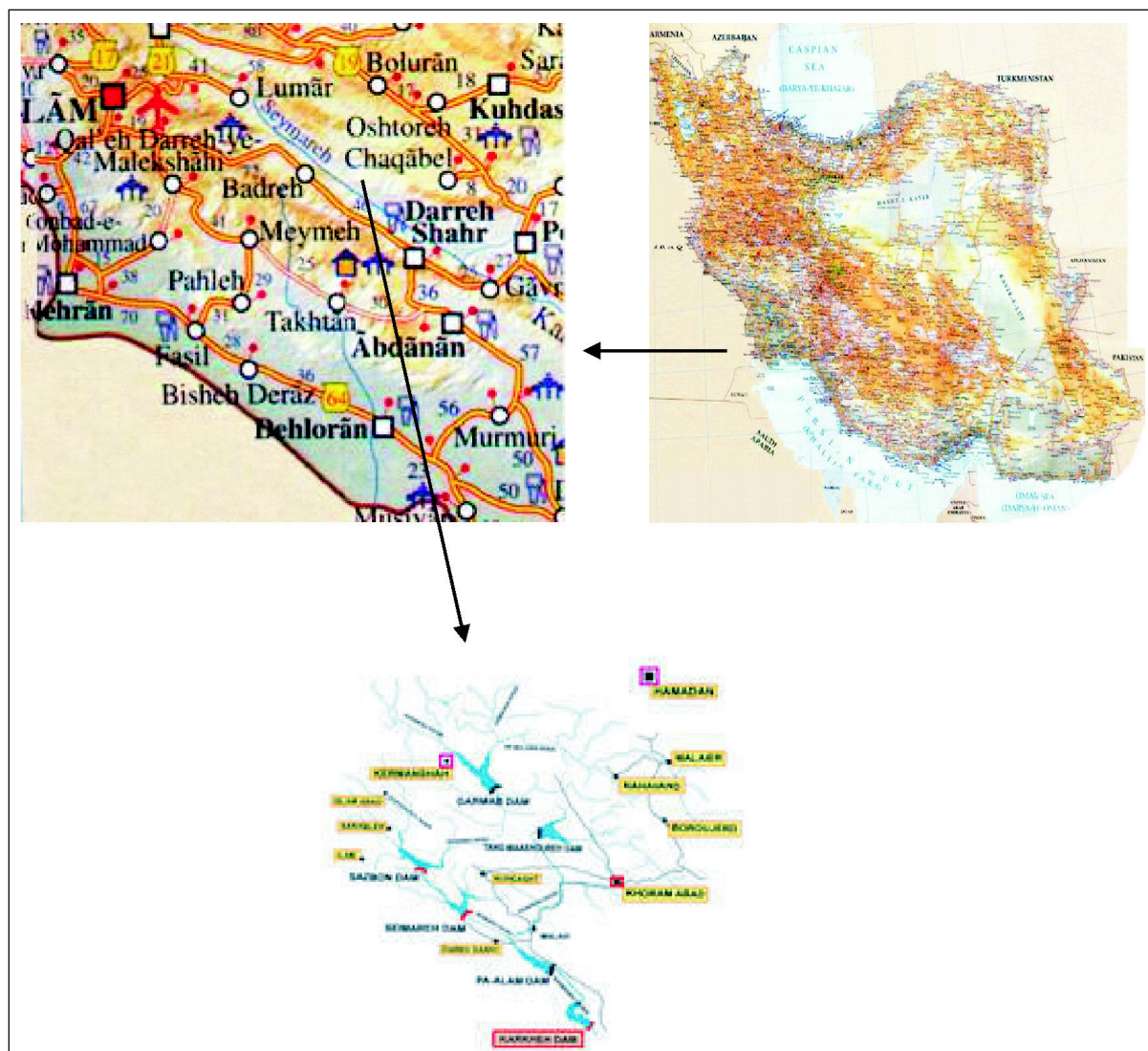


Figure 1: Seymareh River basin.

consensus from among the stakeholders. This management paradigm is contained in the well-known acronym IWRM (Integrated Water Resources Management) recognized worldwide (Castelletti, 2006; Jean-Gabriel Wasson et al., 2003).

In this study regarding integrated river basin management, the key concept is the participation of stakeholders in decision making or other functions of management, notably in water resource planning as one of the basic elements of these integrated approaches (Jaspers, 2002). It is crucial to set up a platform in which all relevant stakeholders are represented. This platform is meant to move away from sectoral approaches and to create environmental, institutional, social, technical and financial sustainability (Jean-Gabriel Wasson et al., 2003). The function of the platform is to serve as a tool for dealing with conflicting interests in the process of water resource planning and the implementation of water development. It can also play a pivotal role in effective conflict prevention and resolution.

This study aimed to develop a platform for sustainable management of river basin of Seymareh. It was expected to identify win-win options; taking into account the interests of different stakeholders which, if implemented, would improve the condition of the resource base and the lives of its users. The methodology for developing this platform was participatory action plan development (PAPD) and involves a series of linked local workshops where different stakeholders participate separately and together to develop a management plan for the common aquatic resources they use (Barr et al., 2000). The method can be characterized as deliberative, inclusive and participatory (Holmes and Scoones, 2000) and is designed to encourage participants to express their views while expressly avoiding domination by locally powerful and vocal people, and thereby to develop a shared framework (Sultana and Thompson, 2004).

The PAPD was originally conceived as a two-stage process comprising a problem census (listing and ranking of problems by different stakeholder groups) followed by stakeholder and plenary planning workshops. However, through application PAPD has now become part of a three-phase process that leads to long-term participatory resource management. Here we characterize seven different stages in the process. These comprise:

1. Stakeholder identification and analysis (through key informants).
2. Problem census (with each individual stakeholder group).
3. Compilation of problem rankings by facilitators (combining stakeholder group rankings).

4. Plenary with stakeholders and local leaders (to review and agree on main problems for solution analysis).
5. Solution and impact analysis (with each individual stakeholder group).
6. Plenary with stakeholders and secondary stakeholders (to present the process, identify feasible solutions, discuss institutional arrangements and next steps).
7. Community organization develops detailed plan to implement solutions agreed in previous stage.

A similar phased approach to community-based resource management has been identified elsewhere; for example, Sultana and Thompson (2004) used with it thirteen different stages for fisheries co-management projects and Jaspers (2003) with a platform for institutional arrangements in integrated river basin management. Such phased processes involve an exploratory phase, an information sharing and mutual learning phase, and an action phase.

The techniques used during the research process were participatory risk (pollution) mapping, group discussion, brainstorming, a problem solving matrix, and an action identification matrix.

The PAPD is fundamentally a stakeholder-based process. In this study, key informant discussions are used to choose the locally relevant stakeholder groups and to this end, non-governmental organization representatives (15), government agents (10) and local leaders (17) participated as analyzers of the participatory action plan development process.

## Results

This stage creates a framework for stakeholders to formulate and develop a common understanding of their problems and potential solutions. Participants identify the constraints on and related to the river basin of Seymareh and share their views on how they may be overcome. This analysis and the top problems were reviewed and validated in the first plenary by representatives of each stakeholder group. Through small group discussions and rankings that were aggregated, the river basin problems were further prioritized so that seven problems could be taken further for solution analysis and action planning (Table 1).

In addition, the cause and effect analyses made by each stakeholder group were consolidated by the facilitators, and those for the agreed priorities were presented in the plenary (Table 1).

Results showed that local managers ranked limited awareness about the environment and the dumping of

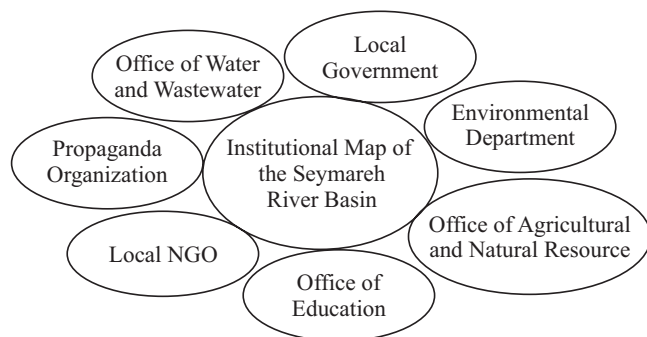
**Table 1: Ranking of the environmental problems in the Seymareh River basin**

<i>Stakeholders problems</i>	<i>Rank</i>			
	<i>Local managers</i>	<i>NGOs</i>	<i>GO</i>	<i>Total</i>
Putting animal carcasses into the river	7	4	6	6
Excessive exploitation of sand and grit of the Seymareh River bed for building purposes	5	5	5	5
Dumping household sewage from the city and industrial wastewater into the Seymareh River	3	6	4	4
Lack of clarity in conservational laws and plans for river basin management	2	2	2	2
Overuse of pesticide and fertilizers by farmers	3	1	3	3
Limited awareness about environment	1	3	1	1
Low water flow	6	7	7	7

Source: PAPD workshop

household sewage from the city as the first and second priorities, while NGO representatives addressed the overusing of pesticides and fertilizers by farmers and limited awareness about the environment as the most important issues. Government agents also prioritized the limited awareness about the environment and lack of clarity in conservation laws for river basin management as the first and second problems. Finally, in summing up the plenary after discussions among stakeholders, it was agreed that in current situation, the limited awareness about the environment and lack of clarity in conservation laws and plans for river basin management are the most important issues that have to be solved.

Following agreement on the priority problems in the first plenary, the separate stakeholder groups again met to spend a day on solution analysis. Three activities are involved in this process. First, a stakeholder and institutional analysis of all other stakeholders affecting the Seymareh River basin is carried out by using a Ven diagram (map) (Figure 2). As seen in Figure 2, local government, the Office of Education, the Environmental Department, the Office of Agricultural and Natural Resources, the Office of Water and Waste Water and the Propaganda Organization have the greatest importance, respectively, in the management of Seymareh River basin.

**Figure 2: Institutional map of the Seymareh River basin.**

Source: PAPD workshop

It is worth noting that their distance from the central issue shows the relative strength of their relationship to that central issue.

Second, a detailed analysis of the actions required for possible solutions to priorities river basin management problems is made, including identification of the objectives and identification of the alternatives (Table 2). According to the results, enhancing public awareness and developing an environmental management plan for the Seymareh River basin were identified. In relation to goals, which represent general problems for addressing the causes and effects, activities (solutions) and actions are defined as specific tasks that need to be carried out to reach these goals. In this regard, a support team member asked the participants what actions they felt ready and able to put into practice. During this brainstorming session an actions identification matrix was used to jot down the key elements of the participants' suggestions and the results of the matrix are shown in Table 2. The findings suggested that the actions—such as organizing workshops and awareness raising campaigns through posters and advertisements in newspapers, magazines and newsletters—proposed by the participants are the appropriate environmental activity for creating ecological awareness. They suggested four workshop categories—villages, cities, hospitals and industries—on such topics as use of land, the importance of keeping the river basin clean for the health of humankind and animals, responsibility for keeping the river basin free from their waste, the effects of pollution on the circle of life in the Seymareh River basin etc.

Regarding the objective of development of an environmental management plan in the Seymareh River basin also, activities included such as forming community-based organization, developing co-management agreements and rules among stakeholders, integrating adaptive governance approaches with more

**Table 2: Problems, solutions and potential action identification matrix**

<i>Problems</i>	<i>'Solutions' and activities</i>	<i>Potential actions</i>
Enhanced public awareness of options for integrated river basin management	Held workshops and organize awareness campaigns	<ol style="list-style-type: none"> <li>1. Publication of posters and advertisements in newspapers, magazines and newsletters</li> <li>2. Train local stakeholders by holding workshops about land use, importance of keeping the river basin clean for the health of humankind and animals, responsibility for keeping the river basin free from their waste, the effects of pollution on the circle of life into the Seymareh River basin.</li> </ol>
Development of an environmental management plan for the Seymareh River basin	Develop community-based organization	<ol style="list-style-type: none"> <li>1. Identify in a preliminary way the institutional actors at stake to participate in nature's resource management.</li> <li>2. Organize the institutional actors and identify their own representatives.</li> <li>3. Organize the first meeting of institutional actors and proposing a set of procedures for the next phase.</li> </ol>
	Negotiate co-management agreements and rules	<ol style="list-style-type: none"> <li>1. Develop a common vision of the desired future.</li> <li>2. Realize the common vision.</li> <li>3. Review the current socio-ecological situation and trends.</li> <li>4. Agree on a strategy towards the common vision.</li> </ol>
	Integrated adaptive governance approaches with more familiar adaptive management exercises	Hold consultation meetings among local agents and governmental managers.
	Learning by doing through participatory implementation, monitoring and evaluation	<ol style="list-style-type: none"> <li>1. Put in operation the co-management plans, agreements and organizations.</li> <li>2. Clarify the entitlements and responsibilities of the institutional actors.</li> <li>3. Identify the main factors with an impact on natural resources and stakeholders, and experimenting with innovations.</li> <li>4. Evaluate co-management plans, agreements and organizations.</li> </ol>

Source: PAPD workshop

familiar adaptive management exercises and participatory implementation, monitoring and evaluation that were proposed by participants.

Third, an assessment is made of the potential impacts of the solutions on all of the main stakeholders identified, thus highlighting feasibility and any challenges faced (Table 3). The Ven diagram is helpful for visualizing a discussion of insider/outsider relationships (WNA, 2005), but it may prove even more useful to go a step further by conducting a candid assessment of the strengths and weaknesses of potential partners in given actions, shown in Table 2 as the "functional matrix". The functional matrix gives an overview of the role that each professional plays in the work process, or the role each actor has in the overall system. The functional matrix was used during

the workshop because it enabled explicit agreements to be made about the roles of the professionals, which often remained implicit. In this regard, according to the opinions of the participants, in a system of co-management for the Seymareh River basin, the local government plays a critical role as the environmental manager and steward of the resources of the Seymareh River basin. Under this conception, participants placed much emphasis on the role of local government as the main generative force for stimulating co-management. This leads to what has been termed 'empowering co-management' (Viswanathan et al., 2003), where the resource users play an active role in setting objectives and creating the knowledge base for resource management and are not just implementing decisions

taken by government. Also, based on the view of the participants, the Environment Department, the Office of Agricultural Natural Resources and the Office of Water and Waste Water can play a significant role in developing and monitoring rules and procedures for the river basin management. As one of the partners, local NGOs working on water issues in the basin and the Office of Education can help to raise awareness among urban and rural residents of the Seymareh River basin concerning the

potential impacts of industrial and agricultural pollution upstream of the area's water supply facilities.

As shown in Table 3, other important partners are the village heads and managers who play a critical role in the implementing and monitoring phases of the action plan because they live closest to and are most familiar with the river.

Finally, participants also pointed out some of the implementation challenges, such as: availability of

**Table 3: Potential partners and challenges in the functional matrix**

<i>Potential partner</i>	<i>What can they offer</i>	<i>Challenges</i>
Local Government	Organizing the institutional actors and identifying their own representatives. Integrating adaptive governance approaches with more familiar adaptive management exercises Clarifying the entitlements and responsibilities of the institutional actors Providing equipment and supplies for when other stakeholders start to work in the river basin. Technical support by a qualified engineer Material and equipment made available at a low price Promotion of cooperation among stakeholders at local level in the river basin.	Limited or Low availability of finances. Lack of local manager's commitment to the Seymareh River basin. Lack of availability of information.
Local NGOs and interest groups (the village heads and managers)	Develop and implement environmental education and awareness programmes to promote sustainable use of river basin resources. Support youth led development efforts Provide a matching sum for the Rotating Fund Enhancing public participation	Lack of support from government offices. Weak finances.
Officials of Education	Training services for children Dedicate teachers as trained resource persons to work with the public in the river basin about ecology and environmental protection. Provide instructional aids, equipment and classes for holding workshops.	Lack of support and information sources.
Environment Department	Support to NGOs and interest groups Prevention and control of environmental degradation caused by pollution and the unsustainable use of inland and marine water resources that threaten human health Promote public participation in the planning and decision-making process related to the river basin management.	Under-funded and under- staffed Staff morale is low, partly due to government inability to pay salaries on time
Agricultural and Natural Resources Office	Training in terracing and inter-cropping Implement, in accordance with national laws and practice, integrated resource management actions using watersheds and river basins as planning units whenever possible. Improve access to appropriate and environmentally sound technologies (fertilizers) and promote the transfer of information on management strategies to accommodate the growing water resource demands resulting from rural and agricultural activities	Many of the personnel do not make sufficient field visits. Staff morale is low, partly due to government inability to pay salaries on time

finances, generation and availability of information and cooperation among stakeholders which must be addressed if effective management (planning) is to be implemented (Table 3).

The final plenary is vital for linking stakeholder groups and their problem and solution analyses with local administration and government. As a follow-up and to develop planning specific to the Seymareh River basin, a participatory planning matrix similar to the one presented in Table 4 drawn on a flipchart that was progressively filled out by the facilitator on the basis of

group suggestions. Table 4 includes what we want to achieve? and prevention and control of environmental degradation caused by pollution and the unsustainable use of lands, and water resources that threaten human health and environmental integrity of these resources into the Seymareh river basin.

Results showed that the key points of the action plan and rules agreed by the participants were:

- establish a community-based organization from all of the stakeholders

**Table 4: Field participatory planning matrices; local NGOs, Government agents and village heads of the Seymareh River basin**

<i>Activities</i>	<i>What do we need for doing it</i>	<i>From where do we get it</i>	<i>Who will do it</i>
Activity 1: Prepare a list of potential people (industrial workers, farmers, student and etc.) for participating in the workshops	Local government licenses	District health centre Office of Agricultural and Natural Resources Environmental Department	Local NGOs
Activity 2: Implement environmental education workshops and awareness programmes	Informants, teachers, engineer, doctors as lecturer and posters, newsletters and pamphlets	Environmental Department, Office of Education, Office of Agricultural and Natural Resources and Local NGOs	Local NGOs in cooperation with local government and village heads
Activity 3: Recognize the primary challenges to the attainment of sustainable management in the Seymareh River basin	Seek to establish, strengthen, and implement, where appropriate, specific programmes, laws and policies to protect public health by ensuring that drinking water is free from microorganisms, heavy metals, and chemical contaminants harmful to human health	Environment Department, Office of Water and Wastewater, Office of Agricultural and Natural Resources	Local government and representatives of local people (members of Parliament and consultants of village and city and representative of NGOs)
Activity 4: Prevent contamination of the river basin	Develop, strengthen, implement, and coordinate at the local level, as appropriate, water resource policies, laws and regulations to ensure the protection and conservation of the river basin	Environment Department, Office of Water and Wastewater, Office of Agricultural and Natural Resources	Environment Department, Office of Water and Wastewater, Office of Agricultural and Natural Resources, manager of village and city and representative of NGOs
Active 5: Promote cooperation at all levels, including through the use of existing transboundary agreements and initiatives, in the conservation, management, and sustainable use of water resources and biological diversity	Exchange of information and experiences on issues related to river basins and sub-basins. Establish a community-based organization from all beneficiaries for exploring the efforts	Local government, manager of offices, representative of NGOs	Local government

(Contd.)



**Table 4:** (Contd.)

<i>Activities</i>	<i>What do we need for doing it</i>	<i>From where do we get it</i>	<i>Who will do it</i>
Activity 6: Promote public participation in the planning and decision-making process related to water resources of the river basin. Promote the integrated management and sustainable development of the river basin environment	Enhanced public participation through education and awareness programmes in schools and local communities		Office of Education, representatives of city and village and local NGOs
Activity 7: Conservation and utilization, in a sustainable manner, of water resources, aquatic resources etc., including in the river basin	Cooperate, in accordance with national legislation and relevant instruments, in the development and improvement of pollution prevention and source reduction programmes for agriculture, aquaculture, and industrial and urban activities, and integrate these efforts into local development strategies	Office of Agricultural and Natural Resources, Office of Water and Wastewater, Environment Department	Local government, local NGOs and city and village managers

*Source:* PAPD workshop

- local government licenses and an appropriate rules framework are major requirements for implementation of any action plan.
- local NGOs, local government, the Health Office and Environment Department have an important role to play in sustainable management of the Seymareh River basin.

### Conclusion

According to these results, it is concluded that concern for enhancing the environmental condition of the Seymareh River basin should be met not only by enforcing or imposing laws and regulations on local residents, but it also has to come from their inner being. This should be achieved by participatory planning in order to involve the key local stakeholders in the management of the Seymareh River basin. In this regard, to improve the services related to the river basin, the governments have to set up a guidance framework for public participation, through the provision of appropriate legislation. The key action items under such a framework should involve: organizing supervisory and coordinating mechanisms for the development of water resources at both national and river basin levels and setting up appropriate systems at various levels for the allocation of water resources between the various types of water

consumer, based on the principles of necessity, priority and fairness. Therefore, in river basin planning, the objective should be to provide a decision-maker with alternative recommendations for the use of the basin's land and water resources.

### Acknowledgement

The authors would like to thank Mr. Mohammadi, head of Environmental Protection Office of Elam Province, whose contribution was essential for leading the workshop and research to a successful end. This study was supported by the Department of Environment, Iran.

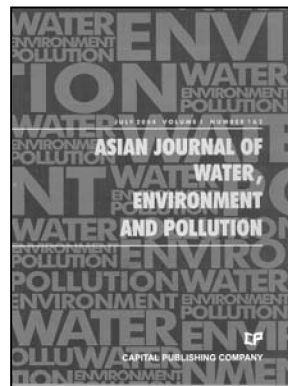
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# Asian Journal of Water, Environment and Pollution



## Aims and Scope

Asia, as a whole region, faces severe stress on water availability, primarily due to high population density. Many regions of the continent face severe problems of water pollution on local as well as regional scale and these have to be tackled with a pan-Asian approach. However, the available literature on the subject is generally based on research done in Europe and North America. Therefore, there is an urgent and strong need for an Asian journal with its focus on the region and wherein the region specific problems are addressed in an intelligent manner. In Asia, besides water, there are several other issues related to environment, such as; global warming and its impact; intense land/use and shifting pattern of agriculture; issues related to fertilizer applications and pesticide residues in soil and water; and solid and liquid waste management particularly in industrial and urban areas.

Asia is also a region with intense mining activities whereby serious environmental problems related to land/use, loss of top soil, water pollution and acid mine drainage are faced by various communities.

Essentially, Asians are confronted with environmental problems on many fronts. Many pressing issues in the region interlink various aspects of environmental problems faced by population in this densely habited region in the world. Pollution is one such serious issue for many countries since there are many transnational water bodies that spread the pollutants across the entire region. Water, environment and pollution together constitute a three axial problem that all concerned people in the region would like to focus on.

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