

A Strategic Response to the Water Crises: Examining the Application of Integrated Water Resource Management in Afghanistan

Najibullah Yamin¹, Kanchana Nakhapakorn², Kampanad Bhaktikul³
1,2,3. Faculty of Environment and Resource Studies, Mahidol University
1. najib_yamin@yahoo.com, 2. enknk@mahidol.ac.th, 3. enpd@mahidol.ac.th

Abstract

This paper presents a part of main findings of the application study of Integrated Water Resource Management (IWRM) in Afghanistan. Qualitative research through in-depth interview with policy, plan and decision makers and secondary data review in the Ministry of Energy and Water of Afghanistan were conducted. Two objectives: examining the application of IWRM in Afghanistan and identification of IWRM principles significance with two questions as: Is the concept of IWRM applicable in Afghanistan and what is the significance of IWRM principles to sustainable water resource management were formulated. This paper only covered first objective of the study. Study results indicated that IWRM concept is applicable and can be a response to the water resources managerial crises in Afghanistan. An IWRM principle such as water prices has already existed and water legal and institutional branches are in developing status in Afghanistan. However, consideration to the environment and stakeholders' participation will be paid. For proper application of IWRM in Afghanistan, it is suggested that; social awareness and institutional capacities should be promoted. Efficient coordination among organisations and consideration to the environmental protection should be prioritized.

Key words: IWRM principles application, legal and institutional frameworks, water crises and Afghanistan

1. Background

The water resources managerial crises (WRMC), disturbances and destroying of irrigation systems in Afghanistan in last three decades of war have led country to more economical, social and political complicated situations. Because of inappropriate water resource management systems, none availability of sufficient amount of water for agriculture activities is a major caused for poverty in Afghanistan. As around 85% of Afghanistan's populations have been doing farming, consequently agriculture can be the backbone of Afghanistan economy (FAO, 2008a). The ever increasing numbers of jobless people in side the country directly depend on less agricultural activities resulted from less availability of irrigation water. Less availabilities of agriculture water being caused by inappropriate management system (UNDP, 2008).

The political and social dimensions of water resources and its distributions can be seen as even more complicated, because water has been crossing geographical boundaries through rivering systems. Political and geographical boundaries have led water users to compete on water distribution, use and ownership. These competitions have been causing social, economic and political conflicts. Evident shows political and social conflicts on water distributions among neighboring countries in many river basins in the world (Mylopoulos and Kolokytha, 2008) including Afghanistan which is in a very important status of trans-boundary water issues. Because it's all five river

basins are international. That is why managing water resources efficiently are of high priority in Afghanistan national development strategy (ANDS, 2008).

Traditionally it is believed in Afghanistan that water resource management means only hydraulic structures. However, hydraulic structure could not be represented appropriate response; and certain it's even considered as a disturbance to the environment, water natural flows and aquatic animals (Savenije and Van der Zaag, 2008). More considerable managerial problems in the water resource sector are:

- Surface, ground and rainfall waters with very little managerial consideration have been using as agriculture and other human activities and development purposes.
- Afghanistan river basins issues are potential for conflicts with riparian countries.
- Less consideration to the environment in water related projects in Afghanistan.
- Several uncoordinated/duplicated ministries represent the most managerial issues.
- Lack of social awareness, and participation on decision, plan and policy level, lack of access to up-to-dates managerial skills and knowledge in terms of WRM. (UNEP, 2003; UNESCAP, 2004; UNDP (2008)

Less coordination among organisations which resulted from fragmented policies caused to overexploitation of water and water resource managerial crises (WRMC). WRMC basically is caused by the ways and policies in which humans mismanage and plan inappropriate governance for water resources (UNEP, 2004). Inefficient and uncoordinated polices for water resource management has defined by Schaefer (2008) as WRMC. These organisations which involved in water resource management in Afghanistan are: Ministries of Energy and Water, Agriculture, Irrigation and Livestock, Rural Rehabilitation and Development, Mining, and Urban Development. As for only one resource such as water, all water related organisations have to formulate their own policies; subsequently there will be several individual and thereupon fragmented policies.

That is why improving management of water resources confirming the extreme need for a process to manage water resources in an adequate and sufficiently way (Blanc, 2007; UN, 2004). As a result within the need and complexity of water resource management humans increasingly recognize the importance of shifting paradigms, from static conventional planning to pro-active, strategic and environmental focused approaches. To response such complexity IWRM has become a worldwide recommended managerial approach (UNEP, 2007). Water resources management is required to respond in an appropriate coherent and strategic way to integrated nature of water.

Since, a starting point of managerial process such IWRM depends on how policies and strategies to the specific approaches are designed (GWP, 2004). On other hand a research could not be able covered all water crises and it has to be precise on a problem in definite place. Therefore, this study designed to response water resource managerial crises by implementation of IWRM in Afghanistan. Based on GWP (2004) firstly IWRM must be acknowledged in policy level therefore qualitative research through in-depth interviews with key plan, policy and decision makers in Ministry of Energy and Water of Afghanistan and reviews secondary data were conducted. Secondary data included Afghanistan Water related law, polices and strategies. Seeing as, the beginning point of IWRM became on policy level and if in

policy level IWRM principle accepted and countries institutions arranged and policies formulated based on IWRM principles, the implementation process will be expected within adequate time.

Therefore, overall objective of the study is to examine the application of IWRM in Afghanistan with regards to the legal and institutional frameworks, and IWRM principles as well as identification of key managerial aspects, and challenges which influencing IWRM implementation. In IWRM principles study covered water prices, consideration to the environment, and participation. More specifically, two objectives are formulated as: 1) to examine the application of IWRM and, 2) to identify the significance of IWRM principles in sustainable WRM in Afghanistan. In order to achieve the objectives of the study, two questions also addressed as: how IWRM has been applied in the MEW of Afghanistan? And what is the significance of IWRM principles to sustainable water resource management?

2. Research Design

2.1 Selection of the Research Method

In this study exploratory and reviewing of secondary data qualitative research is used. Quantitative research was not applicable in this study, because quantitative research aims to achieve knowledge from being capacity of informants and qualitative is searching for gained experiences from knowledge (Creswell 2003; Botti and Endacott, 2008). Qualitative research is preferred because it is an inquiry process of deeply understanding in which researcher explore and analyze views of informants (Creswell, 1998; Neuman, 2004).

Further, there were needs for knowledge which informants acquired from their experiences and based on which they could be able to justice, either the existing approach is better or there is a need for changes to improve WRM in Afghanistan. In addition individuals among existing key officials such as policy, plan and decision makers have different working experience in special fields, ranking in positions and the numbers of respective officials in the MEW have been limited and there also were diversities in points of views and knowledge of respective officials on ministry level. When diversities exist qualitative method is the preferred one (Kumar, 2005).

Face-to-face/on-by-one in-depth interview and secondary data review has been used. Secondary data in this study included water related law, policies and strategies review. In present study in-depth interviews followed by four steps as: first, informants contacted to make an appointment for the interview, second, to give them information, and made sure that they know the purposes of interview and contains of the questionnaire. Fourth, in case informants were not ready for interview to point out another source. Based to the snow ball techniques albeit was possible to go for new sources.

To manage time and keep on right track during interview unstructured questionnaire been used. Unstructured questionnaire is a good guidance and orientation during interviews (Lawn et al., 2002). Two questionnaires for two groups of informants and key informants have been developed. Contains of questionnaires had developed by considering study themes and needed information to achieve the study objectives

2.2 Sample's Type and Size

In the present research parallels with non-random/non-probability sampling purposive (judgmental) and snow balling sampling been used. Purposive and snow balling sampling helps the researcher to looks who can provide the best information to achieve objectives of the study. Purposive sampling aims to look for richness of information (Mander et al., 2006; Creswell, 2003). It means that, if in case some of informants do not have information, they are then asked to identify other richer sources in MEW. Snow balling is a method which follows organisations flow and is a process of selecting a sample using networks.

In qualitative research choosing of sample size depends on researcher and it is based on information which is obtained from individual sources, to achieve study objectives (Kumar, 2005). Thus, MEW's eleven major responsible officials of individual authorized water sectors have been selected as participants. The criteria for selection as participants were their involvement in plan and policy formulations, experiences, and role of positions in decision making.

2.3 Data Analysis

The data were corroborated by multiple readings of the transcripts and considered adequate time. Immediately after each interview field notes were written down. The data of the first interview influenced and gave direction for subsequent data collection, and the themes were supplemented or modified whenever new information emerged. Logical relationships were used to classify and interpret the data. Logical relationships referred to relevancy between responses and research questions and objectives. Additionally, overall consensus on the findings was obtained.

Re-reading of field notes therefore occurred in order to make sure the collected daily information matched research questions and were able to make proper relations between dependent and independent variables. To manage such relationships there are needs for coding the data. Establishing relationship between themes and sub-themes are facilitating to make more understandable texts of qualitative research reports (Baril et al., 2003).

According to Thompson et al., (2004) process of coding can range from minimally interpretative descriptive coding to interpretative pattern or thematic coding. However for Kumar (2005) coding of descriptive qualitative data depend on researcher, whether researcher want to coded data or not but have to go through content analysis. Content analysis further explained is an "analysis of the content of an interview in order to identify the main themes that emerge from the responses given by your respondents" (Kumar 2005). Present research followed the above mentioned idea because the responses in nature are descriptive and qualitative as well. As a result qualitative descriptive data categorized and coded as heading (themes) and subtitle (sub-themes) by considering the study variables and key relevant words. Process of content analysis involved some steps (Kumar, 2005) which considered during data analysis. The steps which applied to the present research data analysis are as the followings:

1. Identification the main themes. These themes become the basis for analyzing the text of unstructured interviews;
2. Classification of the responses under the main themes by re-reading interview transcripts. However, some of the findings were similar enough between the responses of informants to warrant combination of the findings;
3. Integrations or framing of the themes and key words if responses into the text for research report;
4. Documentations from secondary data;
5. Interpretations of the key findings and make them meaningful; and
6. Connecting and inserting of the framed and interpreted data's to the study objectives.

Senge et al., (1999) suggests the application of new approach or changes in an organization, situation can be analyzed through political, economical, technological and socio-cultural (PETS) analyses. To finds out actual situation for applying IWRM in Afghanistan PETS analysis also been applied.

2.4 Data Validity:

Since in present study in-depth interviews conducted and gained information covered through individual informants' knowledge, experiences, perceptions and points of views, it was necessary to validate data by another source. Varies in data sources such as in-depth interview with informants and key informants with their individual knowledge, experience and fields of professionals and MEW related water sector documents altogether and its comparison to with IWRM principles provided triangulation to confirm validity of data.

Mittman et al., (2007) illustrated that; triangulation can be possible through many resources and subjects. In this study four sources were taken to validate the data:

- Characterization of information through their title, experience and knowledge.
- Comparison of water related laws, policies and strategies among each other and to with IWRM principles.
- Adjustment of information from informants and key informants, and
- Trust building. Trustworthiness and honesty of the researcher and informants are significant in quantitative research (Sharon et. al., 2002).

2.5 Ethical Consideration

Parallel with many other researcher McIlpatrick et al. (2006) also suggested that researcher needs to take ethical considerations into account and judge what provisions need to be made for the informants' well-being. In this study four steps were been considered with regard to ethics as the followings:

1. Privacy; the place and time in which interviews were conducted had been chosen by their over all agreement. It was used to been the most convenient place for the interviewees;
2. Confidentially, records and transcripts had been destroyed after completion of thesis. Information not been provided to anyone without subject consent. The names and positions of informants have been not used in texts.

3. Informed consent which was based on Kirk (2007) suggestion in which potential participants gain knowledge through the provision of information they can understand; consent were voluntarily given and the potential participant had the capacity or competence to give their consent.
4. Benefits to the respondents; according to Kumar (2005) “there would have been no progress in the world. Research is required in order to improve conditions. Providing any piece of research is likely to help society directly or indirectly”. In present research the participants were not only providing information, but also they have some direct and indirect benefits like:
 - The informants have a chance to share experience, they are involving in academic research, and they will be empowered to respond from their own feeling, experience and knowledge.
 - The present research conducting on water resources, as water is every one’s business and it is common good, any step to helps this vulnerable resource is a help and benefit for environment, humans being, which includes informants as well.
 - As informants are officials in MEW and present research conducted in same ministry, any recommendation for improvement and managerial supports through this research for water resources management to MEW informants also have shared, because by improving systems, individuals are being improved.

3. Results and Discussion

3.1 Key Managerial aspects and Challenges Influencing IWRM Application in Afghanistan

Key managerial aspects and challenges such as social, political and economic competitions on water resource ownership, and inaccessibility to proper organizational facilities, limitation of technology and data, lack of social awareness regarding water resources management and lack of shared benefits idea are among serious challenges for IWRM implementation in Afghanistan. These challenges could be a kind of disturbance on IWRM implementation pathway and could face implementation process in trouble. It is also possible that these challenges changing situation inverse and negatively toward the IWRM implementation.

Furthermore, lack of appropriate planning, and coordination mechanisms in transboundary level as well as in governmental and non-governmental organizations, weak management and institutional capacities with low level of women participation and mainstreaming gender issues, lack of voluntary participation of communities in water resource management, large-scale rural to urban migration, influx of returning refugees into the urban areas, caused by low income and deteriorating security situation are among special problems of Afghanistan which also can be disputes for IWRM implementation.

As IWRM is a concept it is implementation can be seen as long terms process, thus taking long period of time looks exhausted and on other hand implementation of long terms plans consuming and needs vast amount of budgets. However, instable

economical condition of developing country as well as Afghanistan, that is for long times seems to be an interruption in IWRM implementation. Innovation needs that how to make IWRM concept practically happen. This innovation is depends on the Afghanistan governmental, privet and social systems how they shows their abilities that IWRM concept take place from space to the ground within adequate time and proper budgets.

3.2 Development in Situations toward IWRM Application in Afghanistan

The study first objective: To examining the application of IWRM in Afghanistan.

3.2.1 Legal framework Development in Afghanistan Water Resource Management Sector toward IWRM Applications

Legal framework in this study referred to water related law, policies and strategies. With regards to the given information trough in-depth interview it is realized that greatest achievement of the water sector organizations is the new draft of Afghanistan Water Law (AWL) and formulating of water related policies and strategies such as ground water, resource management, irrigation policies and a strategic policy framework for the water sector. The AWL, aimed for equity in water distributions, sustainable and efficient uses of water, responses to the needs of communities, supports of the Afghan's nation economy, and respects to the water user rights.

However, AWL is still under process, it's approved by Afghanistan Cabinet, now it is in approval status in Parliament. AWL has divided into seven chapters and forty three articles. Respectively each chapter is focused on: general arbitrators, water resource management, river basins organsation structures and their responsibilities, uses and distribution of water, protection of water resources, conflicts resolution, crimes and punishments and individual WR affaires. WRM developing document is covered overall aspects of IWRM such as enabling environment, stakeholder participation, and river basin approach and water economic value. These are all what called IWRM principles.

Actually, promotion in legal framework in terms of WRM in Afghanistan is appreciable. Nevertheless, there will be some more necessary improvement regarding Afghanistan WRM legal framework to take it into account. Because, new legal aspects still not experienced, it is only documents when it goes to the implementation stages then will be cleared how it matches Afghanistan situation. Afghanistan is a country which has been suffered for three decades of war, based of that social awareness in WRM is still low. Social awareness have being consequently important to make situation cooperatively for implementation of legal aspects. Although, by receiving feedbacks for improvement of water legal aspect and take it into account responsibly can be a way to mastering challenges for future better practices.

In an optimistic point of view last development in legal framework will match Afghanistan situation, manage its water resource sustainably and can be a response to

WRMC inside the country and will support trans-boundary cooperation through its comprehensive contains with regard to the river basin approach and IWRM principles. As result considering study objectives through reviewing MEW improved drafted legal aspects in terms of WRM make IWRM application possible in Afghanistan.

3.2.2 Institutional Framework Arrangement for IWRM Application

Institutional framework here referred to the organisations which are involved in water resource management. As several organisations in water sector with their individual policies being faced Afghanistan to water resource managerial crisis. For solution of this problem and to manage water resources efficiently MEW has shifted paradigms from traditional and technical focused approach to a coherent, environmental focused and integrated approach and come up with new developed institutional framework for water resource management. However, the Afghan government not being change/limited several water related organisations in which some of them are duplicated. Although parallels with previous water resource management related organisations for better coordination, cooperation and services has established new institutions such as Supreme Council for Water Affairs Management (SCWAM), River Basin Agency (RBA), Basin Sub Agency (BSA), River Basin Councils (RBCs), Sub Basin Councils (SBCs) and Watershed Agency's Offices (WAO). By being applied new structure of organisation may some of provincial water related organisation will be part of/involved to the new institutions, but in country level organisations which are a cause for WRMC have been remained.

SCWAM aims: firstly, to make coordination/cooperation among ministries and organisations in administration and financial aspects; secondly, it is responsible for approval, editing and development of water related policies and strategies in national level; thirdly it is a policy and decision maker organisation in terms of WRM inside the country as well as trans-boundary water issues; fourthly, monitoring and controlling of water related law and others policies; fifthly, establishing of water Archive. Parallels with SCWAM, new approach in terms of organisational scale in Afghanistan are river basin councils (RBCs) which is the main suggested option of IWRM. Equivalent with RBC there will be also river basin agencies (RBA).

As members of RBC according to the IWRM concepts will be selected by water users. Informants said that in Afghanistan because of social and political complexity can not believe on elected members at this time. They were suspected that, the certainty of election process still goes under question may those people whom were involved direct or indirect in last three decades of social and political conflicts in Afghanistan become a member or chair for RBCs and will make decision how and what ever they want. They believed that may Afghanistan neighboring country for their benefits; during election indirectly support some water user to become a member of RBC. Secondly they assumed that, may the elected members will have not needed capacity to mange RBCs. For these reason RBA is necessary and it is a totally governmental organisation aimed to mange and control RBCs.

It is believed that in Afghanistan WRMC is caused by several numbers of WRM relate organisations. New organisations such as SCWAM, RBC, SBC, RBA and SBA will be added to increase number of WRM related organisations. However, these new organisations aimed to make coordination among previous organisations. For first

few years the coordination will be so complicated. May by experience, and practices, in which feedback will be received from implementations and take it into account, coordination can be improved. On the other hand each country being translated the IWRM concept according to theirs own hydrological socio-culture and economic situations (GWP, 2004) and there is no a blueprint for IWRM in the world to copy it (GWP, 2000). Consequently, it can be a translation of IWRM concept in Afghanistan.

3.2.3 Status of IWRM Principles in Afghanistan

3.2.3.1 Existence of Water Prices

From in-depth interview and reviewed documents it is released that public wealth's including water is free in Afghanistan, but community contributions and taxes have been taken for services. In some projects people have taken part in contributions. Such contributions in water sector including canal cleaning, maintenances of irrigation structures, and labors. On the other hand taxes which are direct price of irrigation water depend on lands economical classification. Irrigable lands classified based on access to irrigation water. These classification involved several types such as 1st 2nd 3rd. If water easily and permanently available (class 1st) for irrigation in this case annual land tax is higher than those which have not access easily or regularly (class 2nd) to irrigation water and so on. These taxes famous among Afghans as land taxes, but in reality it is water taxes or water prices.

In future according to the drafted legal and institutional frame work and IWRM principles there will be many types of fees/charge for water such permit for water services providers and license for ground water utilizations. A water price is a way to mange water demand side. Article number twenty fourth of AWL explains these types of charges such as: RBC by approval of MEW can put fees for water services and collects it in RBC bank account and use it back for water resources developing purpose. Further this article explains water use must be in permit except in cases such as drinking and livelihoods (no more than 5m³ in 24 hour), utilization of water for transportation which must not be harmful for rivers banks and utilization of water to keep fire blinds.

As a result all direct charge/water prices in Afghanistan are including; first taxes through land economic classifications; second licenses; third Permits; fourth, labors for cleanings canals and other maintenances of irrigation systems, fifth, providing local materials for water related projects, sixth, save guarding of water and its systems. These all prices can be water direct prices; however indirect values of water for the environment and ornamental purpose already there are existed. These all shows on economic basis IWRM principles already even before than IWRM concept (1992) in traditional water resource management approach being existed in Afghanistan.

3.2.3.2 Water Resource Management and Environment Concerns in Afghanistan

Study showed that previously there was not Environmental Impact Assessment (EIA) conducted in terms of water resource management projects (UNEP, 2003). Afghanistan is having done feasibility studies before implementation of all water resource projects which included environment. It is planed that EIA will be conducted

before WRM major projects. However, without EIA study Afghanistan all dams built to keep free 10% of streaming water. These 10% of free water is being used as an environmental, drinking, animal husbandry, aquatics and cultures purposes. Actually, damages which occur to the environment could not be solved by 10% free stream water, but considering economic purposes mostly environment aspects have emerged and current environmental degradations all because of that human being not take care of the environment importance.

Result showed there were not enough attentions to the environment previously in Afghanistan. National Environmental Protecting Agency (NEPA) established on 2003. Fortunately article number four of AWL claimed that in future WRM and development will be based on IWRM considering environment protection. On other hand the being used approach in terms of water resource management in Afghanistan was only in technical level. Still there are in Afghanistan no such facilities and academic center to conduct research, provide academic facilities or practices for WRM as well as environment. NEPA has developed environmental law for the first time in 2005. It realizes that in past Afghanistan has not legislation in terms of environment.

Informants argued that, recently EIA become an issue in WRM systems in Afghanistan. Because, Afghanistan still has not have professionals in field of environment to conduct EIA. Consequently, in this case EIA must be conducted by foreign sources and it is difficult to believe honesty of other foreign sources in terms of sensitive project as well as conducting EIA for trans-boundary water issues in Afghanistan. They suspected may whom which they will conduct EIA in Afghanistan their personal/political economy going to be in first priority, and may they will conclude EIA results to the benefits of shared basins countries, thus conflicts on water distributions still remained with them. The benefits which Afghanistan neighbors countries earning from free huge amount of water that are more than that they will spend on the ways which can be benefited them through any activities in terms of water resource management in Afghanistan.

These all uncertainty conditions made situation more worsen and caused for environmental degradation, and there are no reasons to blame who not take care of environment in account in country level. In the future in Afghanistan there will be a competition among politicians, economists and environmentalist. As mostly in developing countries as well as Afghanistan policy and economy are in first stage in practices, it shows once again consideration to the environment will be emerged.

3.2.3.3 Stakeholders Participations in Water Resource Management in Afghanistan

The second principle of IWRM is creating initiatives and real participation that water is a subject in which every one is a stakeholder. Stakeholders are all those people, institutions and organizations that are affected by the actions considered, and are self-regarding rational actors (Castelletti and Soncini, 2006). Real participation when will occur that these stakeholders take place and have rights of share plan, decision and implementation in supply and demand of water. Furthermore, political participation is so required for effective policy implementation. The real participation of stakeholders makes water resource management more effective.

Participation can be a way for the conflict prevention and resolution. The idea behind of participation is to recognize that people are a part of an ecological system.

According to the informants provided information there are no actual participation in plans, policy and decision maker level in terms of water resource management in Afghanistan yet. During AWL drafting, selected representative of water related organisations been participated. There are only community participations in projects implementations, e.g. community participation in emergency irrigation rehabilitation projects (EIRP). Still in Afghanistan water user associations (WUA) not established to be participated regularly in all water resource management affairs. In fact the stakeholder participation still weak in terms of water resource management Afghanistan. Participation as the major aspect in IWRM principles, still it is not in actual practices. It can be improved by applying new developed legal and intuitional frameworks.

3.2.3.4 Willingness for Changes in terms of Water Resource Management

Study showed that there in Afghanistan was willingness for change in terms of water resource management to pay. Situations also were ready to accept an approach to be alternative and produce sustainable water resource management governance. Informants' perceptions and willingness demonstrated that they wanted in policy level an appropriate approach instead of current traditional to manage water resources sustainably. To introduce change in an organisation situation of organisation must be considered. Senge et al., (1999) suggested political, economical, technological and socio-cultural (PETS) analysis for studying organisation situation.

Considering PETS analysis, politically policy makers were ready to accept and apply change as IWRM. All water related documents such as AWL, water resources related policies and strategies have developed based on IWRM process and its principles. Recently worldwide focuses for improving of political situations has been drew attention to Afghanistan development. Economically, Afghanistan is getting better comparing to its past (ANDS, 2008). Even though innovations are needed to be centered more economic sources to the WRM affaires. Based on ANDS (2008) water resource management theoretically is centered in development strategy of Afghanistan.

Technologically, access to technologies already been limited and developed countries are jealous in sharing technology with developing countries. However, they being dumped produced sewages by technological development to the share environment to destroy share wealth such as natural resources including water and earning personal wealth. In a constructive outlook Afghan's new professional generation could be able to better prepare conditions for technical integrations. Socio-culturally, more than 80% Afghan populations are farmers (FAO, 2008b), any activity for improving WRM is acceptable for Afghans and they are willing for such improvement. As a result PETS analysis showed condition positively ready for application of change such IWRM in Afghanistan.

3.2.3.5 Afghanistan Water Resources Managerial Crisis

Diversities in changing patterns in water uses depended on needs for water in different purposes. In Afghanistan, such needs experienced as withdrawals of

huge amount of groundwater without any managerial and legal consideration. Still there are no sufficient data to be basis for future decision making especially in groundwater. Because of lack of efficient management on surface water, uses of ground water in Afghanistan for drinking and irrigation purposes has been required (Vincent et al., 2003). It indicates that the availability of water can no longer be taken for granted and water uses in the immediate future will be governed by increasing scarcity in Afghanistan. Furthermore, recently a managerial challenge in policy level is the scarcity of data to help expertise in decision making regarding instabilities of water resources such as drought, floods, water shortages, including groundwater status.

Study results demonstrated that cultivated land has decreased from 3.3 million ha in the 1970s to approximately 1.8 million ha currently. The reasons behind are instability of water regimes such drought, floods and water shortages, destroyed and poor irrigations systems and water resource managerial crisis (WSPA, 2008). However, the major reason for agricultural land limitation in Afghanistan is water resource managerial crises, because, the average total annual natural storage of water in the form of precipitation is about 165,000 million m³ for the whole country. The total annual surface water volume is of about 57,000 million m³. With approx 65% future uses of that flow in Afghanistan (at the present only 35 %). Average surface water availability per head is roughly estimated at 2280 m³/year, which would be satisfactory if there was not a problem of seasonal time scale and spatial distribution. Still Afghanistan annual mean precipitation is around 620 mm (FAO, 2008b; Favre and Kamal, 2004).

Comparing available water per year per head of Afghanistan with border between drought and normal condition of water availability or normal water poverty lines is defined by 1000m³/years per head and 180mm annual precipitations (Darwish and Al-Najem, 2005; Mohsen, 2007), can be conclude that there is no drought in Afghanistan and water related natural disasters. However, the general and publicized ideas are that; Afghanistan is being suffering from drought. According to this study Afghanistan has been suffering from water related natural disasters is not relevant. The only problem is how to manage water resources efficiently and make decisions for solution regarding water resource managerial crisis. A solution for WRMC can be shifting paradigms from traditional to the strategic approach such IWRM to manage water resources efficient and sustainably.

4. Recommendations

Study came up with possibility of IWRM application in Afghanistan. However, still challenges remained to influence IWRM implementation. For proper application of IWM in Afghanistan the following suggestion should be considered:

- Improve social awareness.
- Enhance water user participation.
- Efficient coordination among water institutions.
- More consideration to the environment protection.
- Develop capacities of water resource professionals and data set systems.

5. Conclusion

This paper provided information regarding study on examining the application of IWRM in Afghanistan. The study conducted on policy level in MEW of Afghanistan. Used method in this study was qualitative research through in-depth interview and secondary data review on legal and institutional framework and IWRM principles. The focused principles of IWRM were enabling environment, participation and water prices. Study showed that water prices existed and legislations and institutions are in developing stages for water resource management. Study come up with possibility of IWRM application in Afghanistan. It is indicated that study first objective as: examining the application of IWRM in Afghanistan, somehow matched. To response water resources managerial crises in Afghanistan IWRM can be an appropriate approach. For proper application of the IWRM concept in Afghanistan it is suggested that to improve social awareness, develop organisations capacities, data collection system and enhance stakeholders' participations. There is a need of efficient coordination among water relate organisations and in trans-boundary level.

6. Acknowledgements

The authors gratefully acknowledge financial support of Thailand International Cooperative Agency (TICA). Kind thanks go to the Faculty of Environment and Resource Studies of Mahidol University, for providing academic facilities in study period.

References

- ANDS, 2008, Afghanistan, Afghanistan National Development Strategy, [Online]. Available at:http://www.ands.gov.af/ands/final_ands/src/final/Afghanistan%20National%20Development%20Strategy_eng.pdf, [Accessed on 2 June 2008].
- Blanc, D., 2007, A Framework for Analyzing Tariffs and Subsidies in Water Provision to Urban Households in Developing Countries avid Division for Sustainable Development, United Nation. [Online]. Available at: http://www.un.org/esa/sustdev/publications/Water_tariffs.pdf. [Accessed on 20 April 2008].
- Botti, M., Endacott, R., 2008, Clinical research 5: Quantitative data collection and analysis, International Emergency Nursing, Volume 16, Issue 2, Pages 132-137
- Castelletti, A., and Soncini, R., 2006, A procedural approach to strengthening integration and participation in water resource planning, *Environmental Modeling & Software*, Volume 21, Issue 10, Pages 1455-1470.
- Creswell, J., 1998, Qualitative inquiry and research design choosing among five traditions, *Sage publication Inc*, The United State of America.
- Creswell, J., 2003, Research design qualitative, quantitative, and mixed methods approaches, second addition, *SAGE Publication Inc*, The United State of America
- Chereni, A., 2007, The problem of institutional fit in IWRM: A case of Zimbabwe's Mazowe catchment, *Physics and Chemistry of the Earth, Parts A/B/C*, Volume 32, Issues 15-18, Pages 1246-1256
- Daniel, W., Greening, R. Barringer, M., 1996, A qualitative study of managerial challenges facing small business geographic expansion, *Journal of Business Venturing*, Volume 11, Issue 4, Pages 233-256.
- Favre, R., Kamal, G., 2004, Watershed ATLAS of Afghanistan, Working document for planners FIRST edition Kabul, FAO.

- FAO, 2008a, Representation in Afghanistan, Regional and sectoral profiles. [Online]. Available at: http://www.fao.org/world/afghanistan/prof_en.htm. [Accessed on 29 January 2008].
- FAO, 2008b, Representation in Afghanistan. [Online]. Available at: http://www.fao.org/world/afghanistan/index_en.htm, [Accessed on 29 May 2008].
- GWP, 2004, Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005 Why, What and How? [Online]. Available at: <http://www.gwpforum.org/gwp/library/TEC10.pdf>. [Accessed on 29 January 2008].
- GWP, 2000, Global Water Partnership, Integrated Water Resource Management, Technical Advisory Committee TAC, GWP publication
- Kirk, S., 2007, Methodological and ethical issues in conducting qualitative research with children and young people: A literature review, *International Journal of Nursing Studies*, Volume 44, Issue 7, Pages 1250-1260
- Kumar, R., 2005, Research methodology, Afghanistan step-by-step guide for beginners, Second edition, *Sage Publication Ltd*, London, ISBN 141291194
- Lawn Sharon, J., Pols Rene, G., James, G., Barber, 2002, Smoking and quitting: a qualitative study with community-living psychiatric clients, *Social Science & Medicine*, Volume 54, Issue 1, Pages 93-104
- Mylopoulos, Y., and Kolokytha, G., 2008, Integrated Water management in shared Water resources: The EU Water Framework Directive Implementation in Greece, *Physics and Chemistry of the Earth, Parts A/B/C*, Volume 33, Issue 5, 2008, Pages 347-353.
- Mander, R., Cheung N., 2006, Issues arising in the planning of a cross-cultural research project in China, *Clinical Effectiveness in Nursing*, Volume 9, Pages 212-220.
- McIlpatrick, S., Sullivan, K., McKenna, H., 2006, Exploring the ethical issues of the research interview in the cancer context, *European Journal of Oncology Nursing*, Volume 10, Issue 1, Pages 39-47.
- Mittman, I., Bowie, J., Maman, S., 2007, Exploring the discourse between genetic counselors and Orthodox Jewish community members related to reproductive genetic technology, *Patient Education and Counseling*, Volume 65, Issue 2, Pages 230-236.
- Neuman, W., 2004, Basic of Social research qualitative and quantitative approaches, Pearson Education Inc
- Savenije, G., and Van der Zaag, P., 2008, Integrated Water resources management: Concepts and issues, *Physics and Chemistry of the Earth*.
- Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., Amith, Bryan., 1999, The Dance of Change, Printed in the United State of America, First edition, Published by Doubleday, Inc, ISBN 0-385-493223.
- Schaefer, M., 2008, Water technologies and the environment: Ramping up by scaling down, *Technology in Society*, Volume 30, Issues 3-4, Pages 415-422.
- Sharon, J., Lawn, G., Pols, G., and Barber, 2002, Smoking and quitting: a qualitative study with community-living psychiatric clients, *Social Science & Medicine*, Volume 54, Issue 1, Pages 93-104.
- UN, 2003, Water for People Water for Life World Water Development Report, *World Water Assessment Programme, Executive Summary*. [Online]. Available at: <http://www.un.org/esa/sustdev/csd/csd12/Background11.pdf>. [Accessed on 23 April 2008].
- UNDP, 2008, Afghanistan, Energy and Environment for Sustainable Development, [Online]. Available at: <http://www.undp.org.af/WhatWeDo/ee.htm>, [Accessed on 16 June 2008].
- UNEP, 2004, Environment for Secure Future Conflict and cooperation, [Online] Available at: http://www.unep.org/AnnualReport/2004/Environment_secure_future_p10-13.pdf [Accessed on 13 January 2008].
- UNEP, 2003, Afghanistan, Post conflict environmental assessment. First published Copyright 2003, published by the United Nations Environment Programme, ISBN 92-1-158617-8, Switzerland.
- UNEP, 2007, Geo Indicators, [Online]. Available at : http://www.unep.org/geo/yearbook/yb2007/PDF/8_Indicators72dpi.pdf [Accessed on 26 April 2008].
- UNESCAP, 2004, Guidelines on Strategic Planning and Management of Water resources, *United Nation Publications*, ISBN: 92-1-120411-9, New York.
- UN, 2004, Agenda 21: Chapter 18 Protection of the quality and supply of fresh water resources: Application of integrated approach to the development, management and use of water resources. [Online]. Available at: <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21chapter18.htm>. [Accessed on 26 April 2008].
- Vincent, W., Rana, B., Tahiri, M., 2003, Afghanistan, An Overview of Groundwater Resources and Challenges, Inc., Washington Crossing, PA, USA, [Online]. Available at: http://www.vuawater.com/vuasite/Afghanistan_GW_Study.pdf [Accessed on 16 June 2008].