
SIXTH WATER INFORMATION SUMMIT: BREAKING THE BARRIERS LET WATER INFORMATION FLOW!

**WATERWEB CONSORTIUM AND IRC INTERNATIONAL WATER AND SANITATION CENTRE
SEPTEMBER 9-12 DELFT, THE NETHERLANDS**

2003

ARSENIC INFORMATION CENTER -AN APPROACH FOR RAISING AWARENESS TO GRASS ROOT COMMUNITIES OF NEPAL

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ABSTRACT: Since 1999, about 20,000 shallow tube wells of Nepal have been tested for arsenic contamination by various water and sanitation implementation agencies. Among them 29% exceeds WHO standard (10ppb). Health problems related to arsenic are already visible in some affected villages. Though few steps have been taken to mitigate arsenic in water, lack of mass awareness still prevails. Realizing the need for knowledge sharing and management of arsenic, the Environment and Public Health Organization and the Nepal Red Cross (NRCS) established Arsenic Information Centers (AIC) in five major arsenic affected districts of Nepal. Today AIC is run by two trained Red Cross local volunteers/staffs, who are located at NRCS District Chapter offices. AIC are equipped with arsenic field test kits, IEC material and capacity for assembling and providing various arsenic removal filters. They have become easily accessible resource centers for local citizens and other agencies to obtain guidance and share knowledge about this issue. The local citizens are keen to learn about arsenic and most of them have initiated arsenic testing in their tube wells with the help of AIC. To date these centers have tested more than 2,800 tube wells of the local people and has provided it expertise on mitigation. Today, there is local demand of this type of center at the village level not only for arsenic but also for other water and sanitation-related issues. AIC needs orientation on management skills in future for promotion and expansion as resource centers for knowledge sharing.

INTRODUCTION

Nepal, though is a nation rich in water resources, still needs a lot of effort to provide safe drinking water to its citizens. Planned drinking water supply systems were initiated in Nepal only in 1970 when it addressed the water needs of 4% of the total population. Currently it covers about 78.1% in rural and 92.3% in urban of the total 23 million populations (Shrestha, 2003). Though it is a significant achievement for Nepal, there are still many places of the country where people have to put their maximum effort and time to fetch clean drinkable water.

Water from dugwells, ponds and rivers were the major drinking water source in Terai of Nepal before implementation of improved water supply system. But people were always at risk due to

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water borne epidemic during those days and such diseases were very common. By realizing the fact, government, many national and international agencies started tube well installation program by tapping shallow aquifers. Now, most of the areas of Terai have water supply system through shallow tube well that covers almost 47 % (11 million) of Nepal's total population.

Although this achievement is quite appreciable in the context of Nepal, water quality is yet a major problem. Every year about 44,000 children die and thousands of people suffer from water borne diseases annually (Water Aid, 2001). Studies on water quality of shallow tube well of Terai region started from 1990. However, these tests are limited to few physico-chemical and bacteriological parameters like iron, ammonia, nitrate and coliform. These studies showed that most of the tube wells have high iron content but are bacteriologically safe. There were hardly any considerations for other hazardous chemical that may occur in groundwater. The possibility of arsenic poisoning was realized in Nepal only in 1998 when neighbouring countries, like Bangladesh and West Bengal, India, severely suffered from this problem. Since the source of this problem was natural alluvial deposits made from rivers that drain the Himalayas, the need to test the tube well was felt also in Nepal.

Scenario of Groundwater Arsenic Contamination in Nepal

Studies on arsenic started only in 1999. To date more than 20,000 tube wells have been tested for arsenic from twenty Terai districts. Out of those tested samples, 29 percent exceeded the WHO limit of 10 µg/l and 8 percent exceeded the Nepal Interim Standard of 50µg/l (Shrestha, 2003). The distribution of samples of more than 20,000 tube wells are not uniform in those districts since the investigations were done by different agencies and were limited only to the tube wells installed under their programs. On the basis of present study, some of the districts like Nawalparasi, Rauthat, Kailali can be categorized as a high risk districts where 10 to 18 percent of samples are found above 50µg/l. However, the distribution of arsenic in such affected districts are still not uniform and only a few areas in those districts have high arsenic levels. Therefore, the arsenic problem in Nepal can be said to be more localized and thus needs intensive hydrogeological investigations to determine the exact locations of risk in terms of arsenic contamination. The results indicates that the country is still not in as serious a situation as Bangladesh and West Bengal, India where 25% and 35% of tested tube wells showed more than 50µg/l. However, there is a need for immediate action to tackle the problem since some of the health impact studies already identified several severe arsenicosis patients at 2nd to 3rd stage and many are in the early stage (Shrestha *et.al* 2003)

From all these studies, it has been estimated that about 29% (3.19 million) (Maskey, 2003) of the 11 million people who are consuming tube well water may be at risk with arsenic problem if we consider the WHO standard, and about 8% (880,000) may be at risk of arsenicosis if we consider Nepal Interim Standard (more than 50ppb).

Table.1. Arsenic level at different districts of Nepal as of November 2002

S.No	District	Arsenic ppb			Total Test	As (ppb) Maximum	% of sample above Nepal	% of sample above WHO GV
		0-10ppb	>10-50ppb	>50ppb				
1	Kailai	87	66	34	187	213	18	53
2	Kanchanpur	128	16	9	153	221	6	16
3	Bardiya	386	125	20	531	160	4	27
4	Dang	91	7	1	99	50	1	8
5	Banke	1216	474	31	1721	270	2	29
6	Kapilbastu	2246	235	91	2572	589	4	13
7	Rupandehi	1807	225	46	2078	2620	2	13
8	Nawalparasi	1492	1135	953	3580	829	27	58
9	Parsa	1862	206	52	2120	456	2	12
10	Bara	1725	240	46	2011	254	2	14
11	Rauthat	1011	1191	211	2413	324	9	58
12	Saptari	532	82	14	628	98	2	15
13	Dhanusha	157	43	9	209	106	4	25
14	Siraha	195	54	13	262	107	5	26
15	Sarlahi	345	87	13	445	93	3	22
16	Mahottari	79	10	2	91	82	2	13
17	Sunsari	303	67	2	372		1	19
18	Morong	149	22	2	173	70	1	14
19	Jhapa	462	42	1	505	79	0	9
20	Ilam	0	4	0	4			
	Total	14273	4331	1550	20154		8	29

Source: DWSS,NRCS/ENPHO,RWSSSP/FINNIDA, Plan, NEWAH, RWSSFDB,DEO

Arsenic Mitigation Initiatives

Within this short period of time, present findings have sensitized the decision makers of government, non-government and donor agencies active in water supply sectors. Formation of the National Arsenic Steering Committee (NASC), formulation of the Interim Policy on Arsenic, the production of uniform education and communication materials, the formation of standard arsenic testing protocol and pilot studies of the efficiency of different types of arsenic removal filters are some of the good examples for initiatives in the field of arsenic mitigation. But addressing this problem at grass roots level is yet to done on a large scale. Education on this issue and knowledge on the better management is of utmost importance.

As a partner of this process, the Nepal Red Cross Society (NRCS) taken one of the major steps in investigating this national issue. NRCS is one of the oldest and largest non-government humanitarian organizations in Nepal. It is supported by Chapters in 75 district of Nepal. Some of the major programs that are being implemented by NRCS are Disaster Management, Community Development and Health Care Services. As an implementers of water supply and sanitation improvement in district level, it was the first organization to realize the arsenic problem groundwater of Nepal. Thus, in year 2000, the Drinking Water Quality Improvement Program (DWQIP) in technical collaboration with Environment and Public Health Organization (ENPHO)

and with financial support from the Japanese Red Cross Society was initiated in eleven districts of Nepal where NRCS had installed more than 12,000 public shallow tube well.

From this program, more than 10,000 shallow tube wells has been tested in eleven districts and mitigation has already been started. Distribution of household arsenic removal filters, construction of community level arsenic iron removal plants, testing and provision of arsenic safe tube wells, rehabilitation of dug wells and awareness at district and village levels including establishment of Arsenic Information Centers at arsenic affected districts has been some of the major achievement of this program.

ARSENIC INFORMATION CENTER (AIC)

DWQIP program was formulated only for 3 years from 2000 to 2003 with the financial support of JRCS. It has been well considered that this program should be continued in future because the problems can not be solved within the proposed project time frame. Therefore, establishment of AIC was the one of the major activities of this program which are to continue after phasing out of this project. For this reason, AIC was established in early 2001 in all eight districts (Bardiya, Banke, Rupandehi, Kapilbastu, Nawalparasi, Bara, Parsa and Rauthat). It was established just after getting results of all tested tube wells. The program has trained several local volunteers at district levels and has supported all kinds of technical and logistic support, such as arsenic and other water quality field-test kits, IEC materials on arsenic, mitigation options, furniture and necessary infrastructures.

One of the limitation of this program was to carryout the activities only on the NRCS installed tube wells. It was a condition of the donor, who could not provide more funds, to expand these activities to communities having non-NRCS tube wells. Establishment of AIC has solved this issue to some extent since people using non NRCS tube well can have access to all kinds of information about arsenic including testing facilities at an affordable price if they desire.

NRCS is the first organization in Nepal who has came up with a three-year arsenic mitigation program. It was well understood that this issue will be the major concern in future and all agencies, researchers and local communities may wants to have better knowledge and they also need correct information. Establishment of AIC at district headquarter has some how addressed this issue as well.

Achievements of AIC

As expressed in previous section, water quality testing program is limited to agency owned tube wells. Thus, tube wells that are installed by villagers just few feet away from the agency installed tube wells are not tested. Because of this, people demanded testing of their tube wells and are aware of this issue. Awareness raising program of DWQIP also increased the demand for testing facilities and consultation for safe option. AIC is open to all communities to get service. People have now started to visit AIC and requested testing of their tube wells. In addition, AIC is also providing technical knowledge for the removal of arsenic at the household level. Communities are also informed which communities are most affected one in the district. So far, AIC at the

district level have tested more than 2,800 tube wells from non program areas and educated them to get arsenic safe water. In addition to arsenic testing, AIC has also provided testing facilities for iron and fecal coliform. Similarly, it has become a bridge between the Central Laboratory in Kathmandu and local communities. If someone wants to test their water in the laboratory, then AIC can help them to collect water samples and send to Kathmandu with the necessary preservation.

For the safe water options, AIC is following the guideline of National Arsenic Steering Committee, to advise the people if a tube well is found contaminated with arsenic. Advice like the use of arsenic safe water for drinking and cooking, techniques for rehabilitation of dug wells, and the installation of three bucket and biosand filters are being given by AIC at the district level.

AIC is also becoming a bridge to bring voices of local people to the central level of government. As NRCS/ENHPO is one of the Arsenic Steering Committee member, it is bringing the voices of local people in the Steering Committee regular meeting (once in a month). It is helping to support for some of the high-risk communities.

AIC is also acting as an information collection center from local people and a center to exchange knowledge / experiences of villagers as well as to the district level agencies on water-related issues. One example of the proper utilization of AIC by villagers occurred in the Nawalparasi district where communities from the Kunwar village of Ramgram municipality and the Goini village of Sarawal VDC requested AIC to observe arsenicosis symptomatic cases (people are now getting aware on arsenicosis symptoms due to IEC materials distributed in the village) in their villages. With this information the NRCS/ENPHO study team visited those villages though not included in program area. It was the first incidence reported in Nepal of such a severe case of arsenicosis. Health experts confirmed it. When water quality from those area was tested, the results showed arsenic levels of more than 500 ug/L in most of the samples from the tube wells. Now it has been confirmed that more than 20 percent of adult population in Kunwar village and more than 8% in Sarawal village had arsenicosis related dermatosis with some in advanced clinical stages like melanosis and keratosis. With this identification of the affected villages, immediate alternative options like three bucket system and bio-sand filters were provided to highly affected families.

After spreading awareness of the arsenic issue not only in Nepal, but throughout the world, the country became a focal point for national and international researchers. Those researchers are now first visiting AIC to get first hand knowledge on arsenic of those districts. AIC is guiding them to visit the affected sites and providing the right knowledge.

AIC is also responsible for raising awareness of as many people as possible through the use of various IEC materials. NRCS district chapters and sub district volunteers are best utilized for this purpose and its network is one of the most valuable asset for expansion of its activities. With the help of NRCS district chapters, it is also actively working on raising awareness to grass roots communities as well as to other agencies established at district levels. Today, districts affected with arsenic have arsenic coordination committees that work at knowledge sharing and promoting awareness to combat the arsenic problem at the district level. These committees

consist of district level organizations like NRCS, Water Supply and Sanitation District Offices, Health posts/ Sub Health posts, schools, user groups/committees, Local District Offices, NGOs and CBOs. In addition to this type of work, it is also helping NRCS and other local agencies to conduct school level, household level and community level awareness programs using various approaches such as media-like newspapers, FM stations, television, and journalists to reach as much people as possible in their districts.

Sustainability of AIC

AIC has been established in the NRCS, a well established institution in Nepal in NGO sector. Several thousands of its members are the strength of this institution. It is very well recognized as a neutral body without interference of any kind of political change or problems. Therefore, AIC can easily run for long period under this institution.

For the sustainability of AIC, the program has developed the necessary human resources and equipped it with all the necessary infrastructure to do their tasks. With small fund raising activities. it can sustain its programs without any problem for example testing of arsenic. AIC charges a minimum amount to the villagers to cover the administrative cost as well as amount needed to purchase chemicals for testing. This cost varies from 1 to 1.5 US\$ per test for arsenic, 0.6 to 1.0 US\$ for iron and coliforms. This cost also covers some logistical costs. In addition, several national and international agencies, who are interested to work on arsenic issues, are getting services from AIC that is generating income for overhead costs to sustain the center.

Limitations of AIC

AIC has been a very helpful body in districts with regards to arsenic issue. However, since it is established at the head quarter of district, it is very difficult to expand its services at the grass roots level which is far from the center due to limited resources and facilities. Therefore, several branches of AIC are required to provide its services to grass root communities.

The volunteers and individuals who are involved in AIC are local people and do not have much managerial skill and experience. Thus, the sometimes-volunteer service does not work properly to meet increased demands and provide services efficiently. Therefore, they need training to build up their capacity in several areas. In addition, AIC has other opportunities to expand its services to address many water and sanitation-related issues. For this, the center should be provided with materials published in the local language and it should be strengthened through training, and basic logistic support.

CONCLUSIONS

Good quality water has always been an issue in a country like Nepal. These problems have been addressed for years and this problem has always been a very tough job. It has already been proven that providing water supply system alone will not improve public health status of the people until it is potable. There are several factors that can prevent water contamination before

consumption. Among them are awareness and education which helps in behavioral changes for good practice in water management.

There are lots of educational and information materials related to water and sanitation published by many reputed national and international organizations. However, these materials are only accessible to limited professionals working at the capital of the country. Though water supply and sanitation programs has been implemented in all over Nepal in the last two decades, there is not a single resource center either for district level professionals or to for the grass root levels where they can have access to knowledge sharing. Because of this, they have to rely on the professionals from the Capital or internationals donor agencies for any kind of community level action program. In addition ,to that there is not a single place where they can forward their views and complains.

In this respect, the recently established AIC under DWQIP of NRCS/ENPHO could be a good example of how to fill in the gap. It is one example of a community-based center for knowledge sharing and discussions. The activities carried out by these centers have already been recognized at the district and grass roots levels. By providing modest support, such as improving managerial skills, and providing additional IEC materials in the local language, AIC can extend its activities to address other water and sanitation related issues.

AIC is run by local volunteer/staffs of Nepal Red Cross Society, a wide spread and renowned organization for community development, which is also the source for its strength and sustenance. Since it is already equipped with various water and sanitation improvement and awareness facilities, it definitely can expand its services in wider range of the districts with the help of local people and become the leading autonomous body to raise awareness in villages regarding these issues.

In conclusion, this approach has to be recognized as one alternative for future information dissemination and knowledge sharing among the central and the district levels. It has to be expanded to other districts and needs support to expand its activities in currently established ones.

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