



DPRK SECTOR REPORT: WATER AND ENVIRONMENTAL SANITATION

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- SECTOR OVERVIEW
- SECTOR ANALYSIS
- SECTOR STRATEGY
- IMPLEMENTING THE STRATEGY
- SECTOR OBJECTIVES
- UNICEF
- IFRC
- CESVI
- CONCERN
- TRIANGLE GH
- GERMAN AGRO ACTION
- FURTHER RESOURCES
- LAWS AND REGULATIONS

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WATER AND ENVIRONMENTAL SANITATION
SECTOR OVERVIEW

The objective of this report on the Water and Environmental Sanitation (WES) Sector is to provide an overview of the sector, and outline current programme activities. The report will outline the major problems in the sector, and describe the humanitarian strategy that is basis for the response.

In 2002, the WES programme has expanded considerably compared to previous years. In 2001, micro-level activities were targeted to the most vulnerable groups of the population. Most projects focused on providing inputs to institutions (hospitals, nurseries, baby homes, and orphanages) rather than the emergency rehabilitation of water and sanitation systems.

During the formulation of the 2002 CAP, this strategy was reviewed. It was recognised that the situation had improved in institutions, and would need to continue if the needs were to be met. At the same time, it was assessed that the programme was not reaching all of the targeted groups for two reasons. First, because attendance rates at institutions were declining and secondly because very few institutions provided 24-hour care, which exposed vulnerable groups to unsafe water once they had left the institution.

UN Consolidated Inter-Agency Appeal for DPRK
Summary of Requirements and Contributions in the
WES Sector - 1997 to 2002

Year	Requirements (US\$)	Contributions (US\$)	% Funding
1997	1,000,000	1,489,222	148.92%
1998	3,719,360	3,551,704	95.49%
1999	5,356,520	11,742	0.22%
2000	4,315,000	235,480	5.46%
2001	2,498,736	312,503	12.51%
2002	4,770,000	2,981,749	62.51%
Total	21,659,616	8,582,400	Avg.54.18%

With strong donor and government support for more sustainable programmes in the sector, agencies decided to broaden the approach in 2002 by targeting whole communities rather than individual institutions. Agencies recognised that humanitarian action was limited and could not be expected to address the wide-

ranging problems in the sector. However, it was assessed that well targeted programmes, based on a sound analysis, could alleviate some of the problems caused by unsafe water and sanitation.

Although there is still room for improving operating conditions, increased leadership by the MoCM and a desire by FDRC for more sustainable solutions, has enable some non-emergency programmes to be implemented. This will provide **1.6 million people (7.2 per cent of the population)**, with improved access to safe water and sanitation.

WES FUNDING OVERVIEW

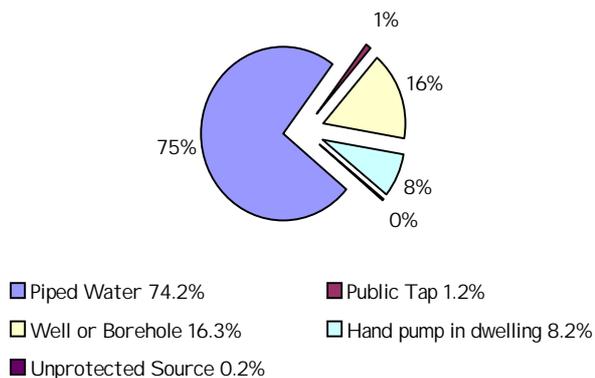
- 62.5% WES CAP activities have been funded.
- US\$2.9 million has been received for CAP activities. Major donors include ECHO (US\$2,415,750), UK (US\$377,142), and Sweden (US\$188,857).
- ECHO also allocated US\$1,080,000 to GAA and US\$722,350 to IFRC for complementary activities outside the CAP.
- ECHO is also considering funding UNICEF in the WES sector after the withdraw of the NGO CAD.
- Total sector funding **US\$4,784,099**.

WATER AND ENVIRONMENTAL SANITATION SECTOR ANALYSIS

A near absence of investment in the country's water and sanitation infrastructure for a number of decades has meant that an increasing number of Koreans are at risk from water borne diseases and illnesses associated with an inadequate supply of water and poor sanitation. With more than 65% of DPRK's population living in urban areas, the risk of a serious outbreak of water-borne diseases is significant. The Government has reported a decrease in daily water production per capita from 304 litres per day in 1994, to less than 289 litres in 1998. Water production is measured at the treatment station and does not reflect water lost due to leaking pipes. Field observations and discussions with Ministry of City Management (MoCM) indicate that production levels have continued to decline since then.

The results of the 1998 Multiple Cluster Indicator Survey showed that 74.3% of households received their drinking water from piped sources. A DPRK Government report, which was presented at the 5th Ministerial Consultation for the East Asia and Pacific Region in May 2001, revealed a significantly worse situation. The report stated that piped water supply reaching the population had fallen from 86 per cent in 1994 to 53 per cent by 1996. This supports field observations by agencies that it is increasingly more difficult for the MoCM to produce and supply potable water through existing water systems.

*Main Sources of Drinking Water
Multiple Cluster Indicator Survey September 1998*



The MoCM, which is responsible for water and environmental sanitation, has stated that they face serious difficulties in producing and supplying potable water. Whilst the MoCM states that the sector is a high priority for the Government it does not have the resources to adequately address the problems without international assistance. Essential spare parts and equipment for pumping stations, chemicals for purification, materials and equipment for pipeline rehabilitation and maintenance, metering and measuring equipment for water quality control are only available if funded by external aid.



Pumping Station, Thongchon County, Kangwon Province (CESVI)

In September 2001, the MoCM distributed a paper *Obstacles in Production and Supply of Safe Potable Water & Assistance Priorities* to resident humanitarian organisations implementing programmes in the sector. The paper outlined the major obstacles for the production and supply of potable water. The production of safe water was difficult due to a shortage of materials for the maintenance of the system and purification of drinking water. The paper highlighted the fact that Government factories were no longer able to supply spare parts for water treatment facilities, which has led to a breakdown of equipment.

Similarly, factories that used to regularly supply water purification chemicals now only do so on an irregular basis. Recurrent power shortages and aged equipment means that water-pumping stations are barely able to supply adequate quantities of water to many urban populations.

This shortage is compounded by the high rate of water loss through old leaking pipes and the poor awareness of the importance of water conservation among the population. The MoCM stated that the Snowy Mountains Engineering Corporation assessment of the Pyongyang water supply system estimated that over 50% of water produced was lost due to leaking pipes. In addition, regular droughts and deforestation have led to a decrease in surface and underground water sources in many rural areas.

Much of the water available for the population is of inadequate quantity and quality. High levels of contamination, caused by breakdown of sewage systems and leaking pipes (sewage and water pipes are often laid in the same trenches), coupled with a lack of Government resources, is the primary cause of the poor water quality. A chronic shortage of metering and tools to measure water quality and quantity makes it difficult for authorities to locate and repair causes of water contamination.

Fuel shortages mean that very few households can boil water before use. Urban areas, which generally rely on piped water, are at a significantly higher risk of water borne diseases than rural areas. Both the MoCM and the humanitarian community support this assessment.

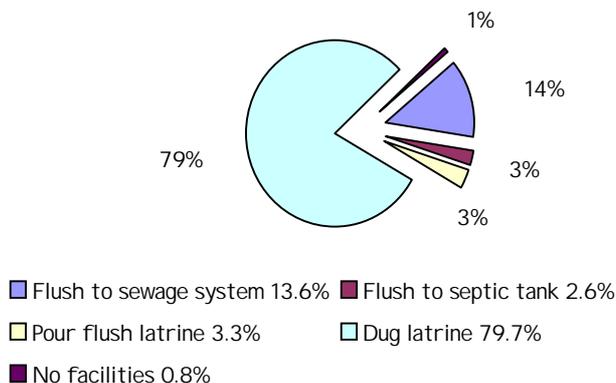
UN Agencies and NGOs report that it is still generally difficult to undertake water quality tests. It is the Government's preference for water testing to be undertaken by local technicians where possible and only if that testing relates to the implementation of the project.

When water quality results have been made available to the humanitarian community, results are often considered unreliable, as they are generally inconsistent with field observations by international staff. This was supported by an IFRC evaluation of their three-year water and sanitation programme, 1999 to 2001, which reported that whilst water testing was being undertaken at the community level by local authorities, there was a reluctance to share this information with international agencies. When the information it was shared, they differed considerably from field tests.

According to the 1998 Multiple Cluster Indicator Survey, 79 per cent of toilets in the country are "dug latrines" and therefore "open," allowing leakage, overflows, and transmission of vector-borne diseases (see graph below). In urban areas latrines are built next to residential housing facilities and pose a significant health risk to the population.

Similarly, the poor sanitation environment in many schools and other institutions means the risk to health is high. The breakdown of the water and sanitation systems has resulted in a heavy burden of diarrhoeal diseases, especially for children. UNICEF estimates that diarrhoea morbidity is above 20% among children under five due to consumption of contaminated water and unhygienic practices.

*Main Type of Toilet Facility
Multiple Cluster Indicator Survey September 1998*



Although no new countrywide data has been made available since 1998, it is estimated that the extent of the diarrhoeal problem is similar to that in recent years and a major contributing factor to the large numbers of child deaths and the high rate of malnutrition nationally. Diarrhoea is the leading cause of illness among children and the leading cause of hospitalisation.

UN agencies and NGOs have reported reluctance from some sections of the Government to allow work on sanitation activities. This has been a consistent concern of international agencies. The MoCM has stated that the Government does support sanitation activities. However, because the overall Government strategy is to increase food production some authorities may wish to see humanitarian assistance directed to food production rather than sanitation. The use of human waste for agriculture is widespread due to shortages of fertilisers and could pose a major health hazard unless it is treated before being used as fertiliser.

Families have felt the impact of the deterioration in water and sanitation systems with the heaviest burden falling on women. Household coping mechanisms have resulted in women spending more time carrying water from source to home, washing clothing outside of the home, often in rivers, and taking responsibility for ensuring that water is fit for family consumption. This has meant increased time for collecting wood for fuel to boil water. During periods of drought, school children have been mobilised to collect water, often carrying it significant distances.

In September 2001, the MoCM, with the support of UNICEF and the FDRC, established Government-led sector strategy coordination meetings. Whilst these meetings will only initially be held a few times a year, the coordination of humanitarian and rehabilitation assistance with Government sector priorities is regarded as a ground-breaking step forward in improving the targeting of humanitarian assistance. The most recent MoCM meeting, which was held in April, covered a wide range of technical and equipment standardisation issues.

An effective response is constrained by the lack of knowledge and skills. At the household level water conservation and basic hygiene and disease prevention practices need to improve. At the local level villagers are not usually able to dig safe wells because of lack of experience in well construction. Water technicians are not familiar with modern water quality testing methods. County, provincial and national water authorities do have the knowledge and experience to work with international agencies in the implementation of water and environmental sanitation projects. However, a lack of exposure to recent external developments in low cost water and sanitation technologies, as well as up-to-date project management techniques, is evident.

SECTOR STRATEGY

As stated in the sector overview, during the formulation of the 2002 Common Humanitarian Action Plan in September 2001, agencies reviewed previous strategies of targeting whole communities rather than individual institutions within that community. Agencies had assessed that well targeted aid programmes in the sector, based on a sound analysis of the situation, could alleviate some of the problems caused by unsafe water as well as improving the lives of many Koreans

One important lesson learned in 2001, was that strategies for improving the water and sanitation situation at the community level must be based on a sound analysis of the specific situation in that community. Some water treatment stations and piped systems are still functional and supply of spare parts and chlorinating chemicals is appropriate. In other communities, water treatment stations are not functional and supply of materials and chlorinating items are ineffective and should not be supported - alternative approaches must be sought. Possible solutions that could be applied, depending on the assessment, include pumped or gravity feed systems, wells, water containers, or standpipes.

Agencies recognised that training of staff in institutions; local communities and water authorities should be important components of all projects. The need to identify the most appropriate community strategies will give an opportunity for capacity building of managers in city and rural water planning. These essential skills need to be acquired for both effective humanitarian action and for the country's preparation for future development.

In 2002, the priority for the sector is to *improve water and sanitation conditions for the highest-risk populations identified based on the best available information.*

This aim is being achieved by:

- Working within a Government-led strategy and coordination mechanism for the provision of emergency and rehabilitation assistance to the sector.
- Seeking technical input from the MoCM on all project activities.
- Obtaining a detailed Project Agreement with all relevant Government stakeholders detailing respective responsibilities (including authority for the conduct of relevant water-tests).
- Addressing the needs of whole communities (rather than only institutions) wherever possible.

- Targeting high-risk communities by concentrating on delivery of critical inputs rather than increasing the target areas.
- Carrying out sound situation analyses and needs assessments before implementation of activities.
- Integrating water supply, sanitation and hygiene promotion components into all projects.
- Emphasising capacity building (of communities, technical staff and national level decision-makers).
- Include hygiene promotion/disease prevention awareness as a component of all projects.
- Addressing gender differential needs as a priority.

Large numbers of people in DPRK are without access to adequate quantities of safe water or safe latrines. The risk of a serious outbreak of water-borne diseases is felt to be significant and continued humanitarian assistance is therefore essential to avert a crisis.

However, the underlying problems in the sector are huge and widespread and it is beyond the capacity of the humanitarian agencies, with limited presence and funding, to make a sustainable impact on a national scale. At the same time, it should be recognised that the current programme is reaching over 1.6 million people, which is approximately 7.2 per cent of the population.

Environmental Sanitation

The term 'sanitation' is often taken to refer to only the disposal of human excreta. The concept of 'environmental sanitation'... refers to the hygienic disposal of human excreta, solid wastes, wastewater and the control of disease vectors

Chalinder A.,
Water and Sanitation in Emergencies, Good Practices Review 1, Relief and Rehabilitation Network, Overseas Development Institute, London, 1994

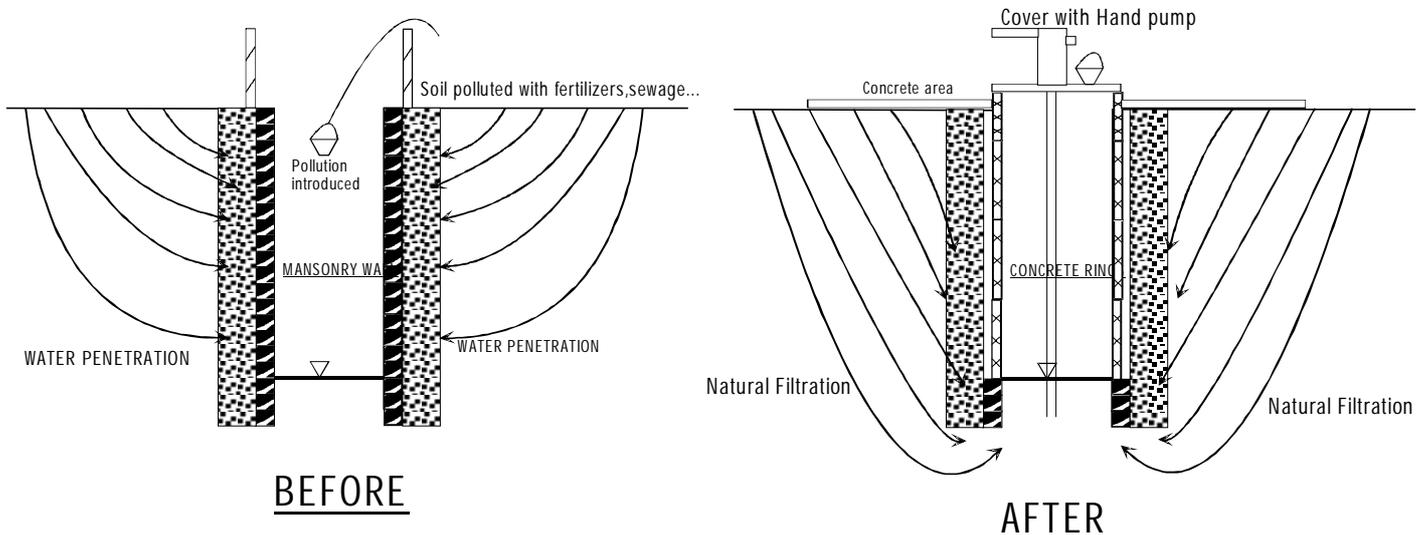
IMPLEMENTING THE STRATEGY - CURRENT ACTIVITIES IN THE WATER AND ENVIRONMENTAL SANITATION SECTOR

In support of the 2002 strategy, six water and environmental sanitation programmes are currently being implemented to improve water and sanitation conditions for 1,602,875 people. Collectively, all projects support the achievement of the operational objectives for the sector, which were developed in September 2001 as part of the 2002 Common Humanitarian Action Plan. These objectives support the achievement of the short-term goal of the CAP.

WATER AND SANITATION SECTOR OBJECTIVES

1. Ensure adequate quantity and quality of water and safe sanitation facilities in 350 Institutions (hospitals, health clinics, children's homes, nurseries/kindergartens, and schools).
2. Ensure adequate quantity and quality of water and safe sanitation facilities in 50 communities in 20 counties.
3. Develop the capacity in 350 institutions, 50 local communities, and 20 local water authorities to be able to plan, implement and monitor water and sanitation systems in their areas of responsibility.
4. Increase the basic hygiene/disease prevention knowledge and practices of all households, caregivers and decision-makers nation-wide. Basic IEC package on hygiene promotion and disease prevention using standard messages and suitable for use by all partners active in the sector developed and disseminated through all available channels.
5. Increase the capacity of the Ministry of City Management to set national water and sanitation policy, plan, monitor and evaluate sector progress.
6. Government-led coordination mechanism for all sector stakeholders adopted and at least two coordination meetings held during the year.

Well Rehabilitation Model Triangle Génération Humanitaire South Pyongan Province



UNICEF - WATER AND ENVIRONMENTAL SANITATION PROJECT

PROJECT SUMMARY TABLE	
Counterparts:	MoCM, Provincial and County Authorities
Budget:	US\$ 1,176,000
Current Funding:	US\$353,747 (an additional Euro 815,000 from ECHO pending)
Location:	Selected childcare institutions in six Provinces and two cities.
Direct Beneficiaries:	3,500 children and the whole population of two Counties (Kowan and Kosan) , 1.2 million people (2 counties)
Indirect Beneficiaries:	Whole population through a strengthened capacity of the MoCM to plan and deliver WES services nation-wide.
Project Duration:	January – December 2002

UNICEF - SECTOR EXPERIENCE

UNICEF has been active in the water and sanitation since 1997. Since then, they have been providing support to children's institutions through the provision of water containers and purification tablets. In selected areas, in partnership with MoCM, they drilled bore wells and installed hand pumps. At the community level UNICEF support has included the provision of chlorine powder, spare parts and materials for water treatment stations, the provision of two drilling rigs and establishment of a drilling team for borewell drilling, provision of water leak detectors and water testing reagents. Since 2001, more than 200 wells have been drilled, this has enabled 200 institutions to have access to safe water.

UNICEF has endeavoured to build the capacity of DPRK through the provision of training on the operation and management of water supply systems, water quality testing, and leak detecting techniques, as well as the construction of sanitation facilities. Study tours abroad for MoCM personnel have been also been undertaken. The Anti Epidemic Stations of the MoPH has been supported with capital equipment and training.

In the WES sector, UNICEF's main government partners are the MoCM and MoPH at central, provincial and county levels.

UNICEF 2002 WATER AND ENVIRONMENTAL SANITATION PRIORITIES

The project will focus on three priorities.

1. Address the immediate water and sanitation problems of a limited number of children's institutions and schools (139) that were targeted in 2001. In some institutions, upgrading of water and sanitation facilities was only partially completed and others have ongoing needs for expendable supplies.

2. A second priority is to develop model approaches to improving county / city water supply and sanitation. There is an urgent need to identify effective, low-cost strategies that can later be applied to other cities / counties when additional funding is available.
3. Most of the several hundred water pumping and treatment stations do not function properly because of the age of pumps, broken distribution pipes or lack of electricity. Some of these water treatment stations are, however, functional and communities receive water supplies through the piped system. If adequate funding is available, a third priority will be to provide chemicals for chlorination of these water supplies.

UNICEF 2002 WATER AND ENVIRONMENTAL SANITATION OBJECTIVES

- Upgrade water supply and sanitation facilities in 39 institutions and 2 counties.
- Support 15 well-functioning water treatment stations with chemicals, spare parts, and materials.
- Conduct technical assessments and develop WES plans for 2 counties.
- Compile standard hygiene/disease prevention IEC package for institutions and communities.
- Train 2 local water management teams and 1 central team in county/city planning.
- Organise 2 Government led meetings of all sector partners during the year.
- Complete an end-year assessment of the WES status in institutions and 2 counties.
- Prepare a WES sector policies and priorities paper for 2002-2005.



INADEQUATE SANITATION - AN OBSTACLE TO GOOD HEALTH

UNICEF considers that adequate quantity of clean water; safe sanitation and hygiene information-education must be provided as a package if impact is to be made in reducing the high child morbidity due to water and sanitation related diseases.

While good progress has been made to increase access to water, considerably less progress has been made to increasing coverage of safe sanitation. This is mainly due to the reluctance of national authorities to allow external agencies to commit scarce resources to sanitation activities, favouring activities in water supply.

UNICEF continues to advocate for increased emphasis on sanitation and a more balanced approach – water, sanitation and hygiene education.

The detailed technical assessments, now underway in the two focus counties of Kosan and Kowon will give UNICEF and the MoCM better information on the sanitation situation and best approaches to increasing safe sanitation coverage.

- Training of 19 provincial and county technicians (including 2 women) in operation, management and maintenance of mini water supply systems.
- Continued operations at 15 water treatment stations and pumping stations in urban areas through supply of spare parts and chlorine to disinfect water.
- 52 new bore wells and hand pumps installed for children's institutions, hospitals, and communities.
- 2,400 boxes of water purification tablets distributed to 38 children's institutions.
- TOR developed and shared with MoCM for comments and one consultant identified for focused county assessment.
- Detailed assessments of WES rehabilitation strategies and plans initiated in two focus counties including on-the-job training in WES planning for MoCM and local authorities.

UNICEF PRIORITIES FOR JULY TO SEPTEMBER 2002

UNICEF ACHIEVEMENTS IN 2002

- Overhauling the two drilling rigs.
- Training of drilling rig teams including rig operators, technicians, and managers.
- Training of 27 provincial and county technicians (including 6 women) in water quality testing and pipe leak detection

- Completion of WES assessments, operational strategies and plans of action for increasing water and sanitation coverage in the two focus counties, Kosan and Kowon.
- Accelerated increase in WES coverage in these two counties through implementation of plans.
- Development and reproduction of IEC materials on sanitation, hygiene for institutions, schools, and communities

IFRC AND THE NATIONAL RED CROSS SOCIETY

PROJECT SUMMARY TABLE	
Counterparts:	DPRK Red Cross National Society
Budget:	US\$ 4,600,000 (US\$ 1,381,195 in 2002)
Current Funding:	US\$ 703,100
Location:	North Pyongan, Chagang, South Pyongan Provinces and Kaesong Municipality
Direct Beneficiaries:	200,000 (600,000 reached in total)
Indirect Beneficiaries:	Whole population
Project Duration:	January 2002– December 2004.

IFRC - WATER AND ENVIRONMENTAL SANITATION PROGRAMME

IFRC has been supporting DPRK since 1995. In 1999, a WES project was initiated with assistance directed to 147 health institutions on a curative basis.

At the conclusion of the 3-year programme most project objectives were reached including:

- Distribution of 4,282 water filters to 1,692 health institutions.

- Rehabilitated water systems in 147 identified health institutions.
- Training of technical staff in 147 institution shad on the maintenance and installation water systems.
- Training of 4 water monitors in the conduct, analysis and reporting of water tests to water users.
- Training of 700 people in health promotion.

IFRC LESSONS LEARNED - 3 YEAR WATER AND SANITATION PROGRAMME

In 2001, IFRC conducted a comprehensive evaluation of a 3-year Water and Sanitation programme (1999-2001). The aim of the programme was to improve the water supply systems in 147 health institutions. Some of the most important lessons learned from the 3-year programme were:

- Lack of available skilled workforce greatly reduced the potential performance of rehabilitated systems. *Therefore, adequate qualified staff should support all projects in order to provide technical assistance and regular follow up.*
- Wastewater and sewage management must be included with an environmental sanitation approach. *Therefore, environmental sanitation should be integrated into all water and sanitation programmes.*
- With limited availability and/or access to reliable hospital statistics, it is impossible to evaluate the impact of improved water and sanitation on the health of the community. *Therefore, a thorough analysis of hospital data should be conducted on a representative sample of targeted villages. This will form the basis for impact analysis.*
- Education and training is a key to improving the health situation in the communities. *Therefore, evaluation on training impact should be done with a pre and post-test on both technicians and health workers.*
- Existing IEC materials are considered old and boring by trainers. *Therefore, new and modern health training tools should be introduced.*

IFRC 2002 PROGRAMME

In 2002, a new programme targeting communities has started with the purpose of improving the livelihood of rural community members. The aim of the programme is to upgrade and assure physical drinking water supplies and sewage management systems were this is applicable and feasible; promote health education on community level as well as technical support capacity enhancement; and strengthen the water and sanitation capacity of the DPRK Red Cross.

The programme has a preventive rather than curative approach and will run over a period of three years. The target groups are rural populations living in Ri-villages or Dong-settlements adjacent to

towns with population averaging 6,000 people. Each Ri or Dong is evaluated individually to identify the most appropriate solution to solve the settlement's problem of drinking water availability and sewage management. Since each system is different, the applied solutions vary from the upgrading of existing water sources, to the rehabilitation of deteriorated water and sewage systems, or the identification of alternative water sources, or the construction of new water and sewage systems.

The beneficiaries of the project are identified vulnerable communities in North Pyongan, South Pyongan, Chagang Provinces, and the Municipality of Kaesong. Directly involved in the project are community volunteers, who themselves are water users, and will assist in the assessments, rehabilitation and installation of water and sewage systems, their maintenance, the conduct of health education, follow-up, and monitoring and evaluation of project activities. An estimated 600,000 beneficiaries in 100 villages is targeted for the entire 3-year period.

Concurrent with the provision of technical assistance, health education on water and sanitation related diseases would take place. Workshops for the training of local technicians to operate and maintain the systems. Since poor sewage management is one of the major contaminants of water sources in the village's settlements; efforts are now being made to improve sewage handling. Regular water testing is conducted to identify other source contaminants (industrial or agricultural) to protect the water source.

IFRC LESSONS LEARNED IN 2002

In implementing the 2002 project, new lessons are already emerging on a technical level. These include:

- Gravity water supply systems are the most effective water systems in DPRK due to the ongoing shortages of electricity.
- It is important to find a reliable water source, ideally water sources up to 50m deep, isolated from surface contaminants. In DPRK, many water sources are in the middle of fields or rice paddies.
- Attention should be paid to training to increase awareness on health issues and on the need to properly protect water sources. Training should also occur at the community level to promote hygiene programmes and maintenance of water supply systems.

CESVI, COOPERAZIONE E SVILUPPO

PROGRAMME SUMMARY TABLE	
Project Title:	1. Rehabilitation of Rural Water Infrastructures and Support to Hygiene and Sanitation Awareness Activities In three Counties in Kangwon Province. 2. Support to the Anti-Epidemic Station of Wonsan
Counterparts:	FDRC, MoCM, MoPH, MoPH Anti Epidemic Department, Wonsan Provincial Anti Epidemic Station
Budget:	US\$878,426
Current Funding:	US\$836,000 (ECHO), US\$188,857 (Sida), US\$21,826 (OCHA) US\$20,600 (CESVI)
Location:	Kangwon Province: Thongchon County: Thongchon Town. Popdong County: Popdong Town, surrounding areas, co-operative farm Up. Chonnae County: co-operative farm Upnongjang Chonnae County: Chonnae Town and 1 village of the co-operative farm Upnongjang. Wonsan City.
Direct Beneficiaries:	67,317
Indirect Beneficiaries:	977,572 (entire population of Kangwon Province)
Project Duration:	March 2002– February 2003

CESVI - WATER AND SANITATION IN KANGWON PROVINCE

CESVI is carrying out three separate but complementary projects as part of its water and sanitation programme in Kangwon Province. All water supply systems targeted by CESVI programme are old and deteriorated through lack of maintenance. The original design capacities appear to have been inadequate for the increased population.

Aged pumps and motors can not deliver the maximum yield and much water is lost in the leaking distribution network. Sometimes the estimated volumes of daily produced water per person are sufficient (40 to 50l), but it is unknown how much water reaches the users. Distribution might be uneven, with some parts of the town with water and others without. The system lacks of flow meters, so information about the yield of the distribution network is difficult to obtain. Electricity is available only during 5-9 hours/day and it fluctuates constantly.

In general, there appears to be no shortage of water sources. Several towns use groundwater from wide diameter shallow wells or from mountains springs. The springs (Popdong) are likely to have good quality water, if the spring boxes are well protected. The shallow wells of the water supply at Thongchon may be free from contamination.

The most problematic location for ground water could be Chonnae, where water is drawn from a limestone cave (this type of aquifer is prone to sewage contamination) and chemical contamination is possible as this is an industrial zone.

At the moment no data on chemical/bacterial contamination of water are available; due to a lack of equipment, consumables and reagents. The anti-epidemic stations can not perform reliable analyses. There are also no data about water borne/related diseases; it is however clear diarrhoea cases significantly increase during the summer due to the use of contaminated water.

Thongchon water system serves 12,000 people out of 24,795. The water source is a shallow well. It has two centrifugal pumps and two booster pumps. The lack of electricity does not let the well accumulate enough water.

Popdong water system was built in 1961 using any available material. It has five water sources and serves 7,530 people out of 8,900.

Chonnae has two water systems serving the town (27,250) and part of a Ri. The water source of the first one is a 5m fracture in a limestone cave with an open 50m² basin, which is not protected. There are two centrifugal pumps: only one works but operates on an irregular basis.

Unpungjang Ri is partially served by Chonnae water system and 2 Ri systems. The first one serves 1,000 people, however it does not reach all users, and the other serves 1,600 people. Both systems collect water from shallow wells. One pump and both motors work poorly.

Up Ri has 3,118 people distributed among seven working teams. Each team has its water supply system, collecting water from small streams. Only one water supply system has a tank. Spring boxes are in very bad condition.

CESVI PROGRAMME AIM

People have access to safe drinkable water in houses and public institutions

EXPECTED PROGRAMME RESULTS

- Enough supply of drinkable water assured;
- Safety of water drunk by people assured;
- New water sources exploited; and
- Exploitation of safe existing water sources enhanced.

MAIN ACTIVITIES OF CESVI

- Rehabilitate 12 water supply systems, adapting them to the increased population.
- Provide new centrifugal pumps with motors.
- Install HDPE and U-PVC/GI pipes with sockets.
- Monitor maintenance and use of rehabilitated water supply systems, new pumps and pipes.
- Ensure water is not contaminated by sewage systems and wastewater infiltration.
- Strengthen technical qualification of local staff.
- Exploit new water sources identified through the accurate hydrological assessment.
- Enhance the knowledge of updated water exploitation techniques.
- Improve reliability of water quality data and its availability at farm, county & provincial level.
- Collect sanitation statistics and make them available at county and provincial level.

CESVI UPDATE ON THE ACTIVITIES

During March and April 2002, several meetings were held in Pyongyang with the MoCM and the MoPH in order to agree on the project implementation strategies and to share technical and operational decisions.

A consultant geologist, Dr. Bruno Petrucci, joined the CESVI staff on 23 March and carried out a detailed hydro-geological assessment (this also involved on the spot water quality checks). During his assessment, Dr. Petrucci worked in the field in close collaboration with the MoCM provincial and county engineers and designers. He had the opportunity to train them in up-dated topographic survey techniques as well as on new pH-meter and conductivity-meter use.



Dr. Bruno Petrucci testing a well at a Co-operative Farm in Chonnae County, March 2002

As result, detailed maps of all water sources and topographic profiles of all pipelines were prepared and all collected data (including water quality ones) were saved in a new database. Based on this data the best solutions for the water supply systems' rehabilitation was defined in agreement with MoCM in May

In April, a database of competent local suppliers was also prepared and a visit to one centrifugal pumps factory and two pipes (U-PVC and PE) factories was carried out in Shenyang (China).

ECHO - EUROPEAN COMMUNITY HUMANITARIAN OFFICE

The ECHO Office in the DPRK has been an instrumental supporter of NGO and IFRC programmes in the sector. ECHO has developed a Letter of Understanding between ECHO and FDRK that provides framework for NGO operations in the sector. In addition, ECHO sponsored a visit by Save the Children (UK) China Office to DPRK in March, as part of its programme to develop the professional capacity of its partners. The purpose of the visit was to identify common opportunities and constraints that confront NGOs when implementing water and sanitation programmes in the region. The discussion was supported by a presentation on SCF's programme in Tibet.

CONCERN WORLDWIDE - RURAL WATER AND SANITATION PROJECT

PROJECT SUMMARY TABLE	
Project Title:	Rehabilitation of Rural Water Infrastructures and Support to Hygiene and Sanitation Awareness Activities In three Counties in Kangwon Province.
Counterparts:	FDRC, MoCM, IPHE (Institute of Public Health Education)
Budget:	US\$890,000
Current Funding:	US\$890,000 ECHO
Location:	Pukchang County, South Pyongan Province
Direct Beneficiaries:	71,000 (5 co-operative farms (11,000) Pukchang Town (60,000) 16,200 nursery, pre-school, school children
Project Duration:	March-November 2002

CONCERN - FOCUS ON PUKCHANG COUNTY

CONCERN had previously undertaken two ECHO funded Water and Sanitation Projects in the DPRK. An evaluation of the latter of these two projects recommended that CONCERN should remain active in the Water and Sanitation sector with an increased emphasis on rehabilitation.

An assessment of the current situation in Pukchang was undertaken in September to October 2001 and the results of this concluded that the existing water systems, both rural and urban, are in a serious state of despair with pumps functioning well below capacity and with losses from pipelines being significant.

Current sanitary conditions are poor with latrines being at best very basic and local schools and clinics seriously restricted in their capacity to improve systems due to a lack of resources.

CONCERN: PROJECT OBJECTIVE

The objective of the project is to improve health and hygiene practices in five rural communities and the capital of Pukchang County through the construction/rehabilitation of water systems and latrines and the dissemination of health information through schools and clinics.

CONCERN: PROJECT OUTPUTS

The planned outputs of the project are:

- The rehabilitation of five co-operative farm water supply systems.
- The rehabilitation of the water supply to schools and hospitals in Pukchang town.
- The construction of 100 latrines.

- The distribution of health educational materials to local schools.
- An improved capacity of the local laboratory to analyse water samples.
- An improved capacity of health staff to promote good hygiene practices.

CONCERN: PROJECT PLAN OF ACTION

The rehabilitation of the water systems will involve the replacement of the existing pumps and pipe networks. The use of pumps in Pukchang is not as complicated as in other parts of the DPRK because Pukchang has a relatively reliable electricity supply due to the presence of a power station in the County.

Current losses from the existing distribution pipeline in Pukchang town are estimated at 10% by local MoCM staff, however this seems a remarkably low estimate considering the age and nature of the pipes. As the total rehabilitation of the town water supply system is well beyond the capacity of the current project, CONCERN will target the water supplies to the hospitals and educational institutions in the town.

The latrine component is an aspect of the project that is still under discussion. However, it is considered an essential part of the project by CONCERN in the improving of sanitary conditions and practices. A final design for the latrines has yet to be agreed but it is intended to construct composting latrines. The benefits of these should be twofold, improving sanitary conditions and improving the quality of fertiliser available for agricultural purposes. As these will be a relatively new type of latrine here, it is intended to approach this component as a pilot project to carefully monitor its full impact.



The existing laboratory has a very well established routine for collection of water samples throughout the county. By providing the laboratory with modern equipment for water analysis and restocking their supply of reagents, CONCERN aims to improve and extend their capacity to carry out their responsibilities.

This is seen as an important component of the project as it facilitates the collection of monitoring data to fully assess the impact of the project. Training of laboratory staff will be required to improve their capacity to operate any new equipment.

The distribution of health education materials shall occur through the local health and educational institutions. Staff from these institutions shall receive training in the use of these materials. Materials to be used for health education include posters, flipcharts, leaflets, and manuals.

The status of the project is that initial designs for the water systems have recently been completed. These need to be reviewed before procurement of materials can begin. Water quality data and health statistics have been requested to establish baseline conditions before project implementation. This data has not yet been shared with CONCERN.

TRIANGLE GÉNÉRATION HUMANAIRE

PROJECT SUMMARY TABLE	
Project Title:	Rehabilitation of Potable Water Supplies Systems and Sanitation Facilities in 8 Cooperative Farms
Counterparts:	FDRC, MoCM
Budget:	US\$689,750
Current Funding:	US\$689,750 ECHO
Location:	South Pyongan Province: Pyongwon, Mundok, Taedong Counties.
Direct Beneficiaries:	45,579 Counties inhabitants (children 12, 972)
Project Duration:	February -November 2002

TRIANGLE GH - PROJECT OVERVIEW

In all the co-operative farms, the water system is about 30 to 35 years old. The system has never been rehabilitated and it is still partially working. The water contained in the main reservoirs is not treated and is presumably contaminated, as well as the water in the wells. The system is composed of a pumping station that pumps the water to a reservoir located in a higher position. Water is then distributed to the beneficiaries by gravity system.

The main distribution pipes are 100mm and 50 mm wide and are made of steel. They are reddish and the loss of water is common all along the way, depriving some parts of the villages of current water and facilitating water contamination. The conditions of the water supply system and the frequent lack of electricity, means that the community must rely on wells for the provision of water. Wells are 5 to 12 meters deep and their internal walls are made of stones, allowing easy infiltration of surface water. They are usually located in the lower part of the villages and are not covered.

The schools and kindergarten do not have direct access to tap water, and have to collect water from a variety of sources.

In the Counties, the water comes from forages that are of 7 to 15 meters deep. A pumping station pumps the water to a middle size reservoir (10 - 50 m3) located in the top of a mountain and then reaches the beneficiaries by gravity force. Salinity rate is very high in this area and has caused much damage to the existing water network especially with strong corrosion of pipes.

The sanitation facilities in institutions are in poor condition and are expose users to a high risk of sanitation-related disease and illnesses. Schools have dry latrines that are usually located outside. These facilities are constructed over a simple pit (cesspool) with the back part open, so that excrements are regularly emptied. In nurseries and kindergartens latrines are inside and usually broken. Alternative functioning systems are usually not available.

**TRIANGLE GH - PROJECT OBJECTIVES**

- To improve quality as well as quantity of water distribution and access to the population of the above mentioned counties
- To significantly reduce water borne diseases
- To improve quality of life for the children in the community schools
- To significantly improve hygiene inside the community health structures
- To sensitise the community people on hygiene issues

The rehabilitation of the main water distribution system is needed to guarantee targeted community institutions access to water.

The installation of taps over the main water distribution pipeline and the rehabilitation of the shallow wells will also benefit the general population.

TRIANGLE GH - PROJECT PLAN OF ACTION

In order to achieve the above mentioned objectives TGH will implement the following activities:

- Rehabilitation and protection of 170 wells: cementing internal walls, construction of covers and margins, providing hand pumps.

- Rehabilitation of the primary network for water distribution and the secondary water distribution system for 32 children institutions and 8 Ri hospitals.
- Construction of taps over the main pipeline for community water distribution points.
- Rehabilitation of collective bathrooms and water tanks inside the targeted institutions.
- Provision of equipment and consumables for water purification: containers and tablets.
- Rehabilitation of 649 school latrines.
- Provision of technical assistance and training for installation/maintenance of the equipment

So far, Triangle G.H. has experienced an excellent working relationship with the community, which has translated into a very good response from the farms technical teams in charge of making the designs of the current water supply systems under guidance of a TGH's expert.

All designs have been completed and estimation of materials and equipment to be purchased has been finalised. In June Triangle completed the majority of the final design and procurement process.

DEUTSCHE WELTHUNGERHILFE/GERMAN AGRO ACTION**PROJECT SUMMARY TABLE**

Project Title:	Water and Sanitation in North Pyongan Province
Counterparts:	FDRC, MoCM
Budget:	US\$1,080,000
Current Funding:	US\$1,080,000ECHO
Location:	North Pyongan Province: Kujang, Unsang, Hyangsang Counties
Direct Beneficiaries:	12-14 co-operative farms, 21,000 persons
Project Duration:	March -December 2002

GAA PROJECT OBJECTIVE

Improvement in health and nutritional status through improved levels of sanitation and access to safe drinking water, within the selected co-operative farms.

GAA - EXPECTED RESULTS

- Safe drinking water supply facilities including gravity systems and wells and sanitation facilities including latrines are operational
- Skills of local staff regarding construction, operation and maintenance of the WES systems improved
- Hygiene awareness of the rural population improved.

GAA - PROJECT ACTIVITIES

Construction Activities

- Rehabilitation of spring water collection facilities such as spring catchment, sedimentation tanks, water collection tanks, distribution tanks and gravity distribution systems to individual households.
- Rehabilitation of wells by concrete in lining and installation of hand pumps including concrete platform, drainage for spilled water direction to small vegetable gardens.
- Rehabilitation of latrines by construction of closed pit holes with armed concrete, elevation of walls and roof.

Capacity Building Activities

- Formation and training of Technical Teams responsible for implementation schedule, design, construction, advice, operation and maintenance, and sensitisation in handling water facilities on household level and water usage. Distribution of handouts and manuals.
- Formation and training of Health Promotion Teams responsible for hygiene sensitisation like keeping a clean environment around households and latrines.
- Formation of and training of storekeepers on County and Coop/working team levels to ensure correct distribution of materials.

Accompanying measures

- Supplying water laboratory equipment and consumables to Water Laboratories on County level and training if requested.
- Implementation of ground water protection zones.

GAA - NEEDS ASSESSMENTS

Fourteen co-operative farms and 47 work teams were visited during the project needs assessment (16,270 persons). Not every work team of a co-operative farm had a water spring for gravity supply, so new co-operative farms are being identified. The houses that can not be supplied by gravity water systems will be supplied by shallow wells.

In 60% of the future water catchments, springs are located in the top of hills. In the other cases, the water source was poor because big areas have to be drained to conduct water to a well or catchment. This water is flowing only in the superficial layers of the soil, so in case of neglecting the water protection zone, contamination will be possible.

On a few construction sites, levelling has to be done to have a precise idea of the difference in height of the spring, tank and length of the distribution system. This is very important to overcome the long distances for supply pipes and the respective friction in the pipes in order to get a yield that is adapted to the households needs. There is no information about the yield of the water sources, although the local technicians insisted that the quantity of water would be enough all through the year. We have to take care also that during the rainy season the superficial water will not flood the water source and its installation.

For protection of catchment areas, a spacious area around the springs would need to be fenced and protected by planted trees without any agricultural areas in the immediate area. GAA assessed that local technicians have not constructed concrete spring catchments with satisfactory technical and hygiene standards. The same applies to shallow wells. Catchments and wells are lined with river stones. The catchment area is not protected, exposed to erosion and contamination.

GAA and the MoCM agreed that project would need to construct tanks and rings with reinforced concrete in order to have a longer lasting system, and facilitate ease of construction. The MoCM would like to investigate the drilling of boreholes as an alternative to the rehabilitation of shallow wells. This is seen as a more hygienic, less costly and faster solution.

GAA considers that connecting of households to a water supply system is preferable than one or distribution points in a settlement. The cost of both solutions is similar, however household connection reduces the workload on women and children as well as increasing ownership of the system.

At County and co-operative level, there was no resistance to the construction of latrines. In fact the opposite, it was very much appreciated. The construction of latrines has to be done around water catchment areas and will be considered as a pilot component of the overall project.

KUWAIT FUND FOR ARAB ECONOMIC DEVELOPMENT

On 3 April 2002, it was announced that the Kuwait Fund for Arab Economic Development would provide US\$ 20,000,000 for the modernisation of Pyongyang water supply and drainage facilities. The total construction cost of the project has been estimated in 50.3 million dollars. The Snowy Mountains Engineering Corporation conducted assessment studies from 1999 to 2001. DPRK will handle the construction under management and supervision of SMEC. No further information is available.

FURTHER RESOURCES - WATER AND SANITATION IN THE DPRK

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- UN Consolidated Inter-Agency Appeal 2002. DPRK
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(List compiled by CESVI Office DPRK)

LAWS AND REGULATIONS ON WATER SUPPLY AND SANITATION

The MoCM has advised that international organisations implementing programmes in the sector should refer to the following DPRK laws and regulations:

- *Law on Municipal Management*
- *Design Standards for Water Supply and Sewerage Facilities*
- *Regulations on the Management of Water Supply and Sewerage Facilities*
- *Quality Standards on Source and Supply of Water*

It should be noted that the DPRK standards for water supply and quality are similar to WHO guidelines and European Union standards.

OTHER GOVERNMENT AGENCIES IN THE SECTOR

The Ministry of Public Health (MoPH) plays an active role in supporting the MoCM in the monitoring of water standards.

Within the MoPH, the **Anti-Epidemic Department** is responsible for monitoring the quality of water supplies. All counties have five water testing stations, which should be able to undertake a variety of water tests. However, they are constrained in their capacity to provide data due to shortages of equipment and consumables.

The MoPH has identified laboratory equipment for water testing, transport for staff to collect water samples and updating in advanced WES technologies as priorities for supporting the MoCM.

The Flood Damage Rehabilitation Committee (FDRC) supports the implementation of water and sanitation projects by acting as a liaison between international organisations and local counterparts.

The FDRC also assists organisations through the provision of logistical support for the movement of relief items within the country. In 2002, they have supported the rehabilitation of water systems at County and Ri-level.

**WHO AND WHERE IN THE WES SECTOR**

AGENCY	LOCATION	COMMUNITIES/ INSTITUTIONS	CONTACT DETAILS
UNICEF	Pyongyang, Nampo, Kaesong cities. North and South Hamgyong, Kangwon, South Pyongan, North Hwanghae Provinces. Kosan & Kowon counties (Kangwon & S. Hamgyong Province)	Selected child care institutions in six Provinces and two Cities. 15 water treatment stations	Mr. Richard Bridle T: +8502-3817150 F: +8502-3817676 rbridle@unicef.org
CESVI	Kangwon Province: Thongchon County Popdong County Chonnae County	Tongchon County: Thongchon Town Sourroundings Popdong County: Popdong Town Sourroundings 1 co-op. Farm (Up) Chonnae County: Chonnae Town 1 co-op. Farm (Upnongjang)	Mr. Federico Paoli T: +8502-3817816 F: +8502-3817816 Cesvi@95777.com
CONCERN WORLDWIDE	S. Pyongan Province: Pukchang County	Pukchang town 5 co-op. Farms (In Pukchang Town the focus will be on 3 hospitals and 63 children institutions).	Mr. Donal O Suilleabhain T: +8502-3817112 F: +8502-3817647 conkorea@public2.bta.net.cn
IFRC	North Pyongan, Chagang, South Pyongan Provinces Kaesong Municipality	Total 100 Ris/ Dongs 38 Ris/Dongs the first year	Mr. Udaya Regmi T: +8502-3814350 F: +8502-3813490 ifrcpk02@ifrc.org
TRIANGLE GH	South Pyongan Prov.: Pyongwon County, Mundok County Taedong County	8 Co-op. Farms (The focus will be on 32 children's institution and 8 Ri-hospitals)	Ms. Silvia Savini T: +8502-3817555 F: +8502-3817555 trangle2@public2.bta.net.cn
GAA	North Pyongan Prov.: Kujang County, Unsang County, Hyangsang County	12 to 14 Co-op. Farms	Mr. Norbert Burger T: +8502-3817250 F: +8502-3817249 gaadprk2@public2.east.net.cn

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More information on the humanitarian situation in DPRK can be found on
<http://www.reliefweb.int>

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