



MRRD - RuWatSIP



Draft
report

TECHNICAL PAPER:

A SHORT END OF PROJECT REPORT OF NATIONAL CBIC TRAINING ACTIVITIES FROM MAY/2012- DEC/2015

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1. Contents

1.	CAPACITY BUILDING OBJECTIVES	3
1.1	Report objective:	3
1.2	Capacity building objectives	3
2.	FOCUS ORGANIZATIONS	3
2.1	Focus training participants	3
3.	TRAINING STAFF/ PERSONNEL	3
4.	TRAINING PROGRAM DEVELOPMENT	4
4.1	Key documents/ tools planning	4
5.	IMPLEMENTATION OF TRAINING PROGRAM	5
5.1	Training course outputs and reports	5
5.2	Training organizers, and resources.	6
5.3	Training program facilitation.	8
6.	TRAINING TOPICS	8
6.1	Need for data quality control system for trustworthy data.. . . .	9
7.	CAPACITY BUILDING FOR GROUNDWATER SECTOR.. . . .	10
8.	INTRODUCING NEW TECHNOLOGY.	10
8.1	Solar stills	11
8.2	Membrane filtration	11
8.3	Well Logger Equipment	11
9.	LIST OF TRAINING COURSES	11
10.	TRAINING OUTPUTS	12
11.	SUSTAINABILITY OF CAPACITY BUILDING PROGRAM AND/OR PROJECT COMPONENTS	12
11.1	The project.	13
11.2	In conclusion:	14

1. Capacity building objectives

1.1 Report objective:

To present a summary document of the planning and management of the training activities under the HGS project and well as listing of methods, documents and training material developed for capacity building under the project.

The the document should provide an overview of documents, methods etc., but all the information can be studied in detail and in full on the web www.norplan.af. Most of the information is listed under the training menu, and list of list of photos, documents, videos seen on the welcome page.

1.2 Capacity building objectives

The main objective of capacity building under this project is to provide methods, skills and expertise for Afghans working in the water sector to be able to survey groundwater resources, collect and analyse data and prepare professional hydrogeological maps, reports and documentation so that MRRD and other key organization can effectively develop water supply services for Rural Afghans in need of safe and potable water supplies.

2. Focus organizations

This project is focused on capacity building in MRRD as the project owner and key sector leader and focal point for rural water supply development which greatly depend on groundwater as the main water source.

MEW was also key focus as being responsible for both surface and

groundwater management in Afghanistan. The training program was anchored in other key institutions and organization including universities and polytechnics, local and international NGOs, Geological surveys departments, other government organizations, UN organizations all in need of information of groundwater information and data. Also water sector organizations using MIS/ GIS systems participated in the training program. (see detailed training program reports on list of organizations and participants)

2.1 Focus training participants

In order to develop the training program, training needs assessment were conducted both at provincial and national levels.

Key professional staff were:

- Hydro geologists
- Geophysicists
- Water Engineers
- GIS and MIS experts
- Field survey personnel
- Water laboratory personnel
- Trainers/ lectures

3. Training staff/ personnel

Main activities of National training expert which carried out during 2012-2015:

- National training expert/ coordinator
- Training course organizer
- Presenter/Co-presenter
- Facilitator of all training courses
- Facilitator of national conference/ seminar/Workshops
- Representative and presenter of NORPLAN project in different conference/workshop at national level
- Translator of core training courses documents and methodology of GW surveys

- Facilitator and mediator of drilling and pumping test operation of Faryab province

4. Training program development

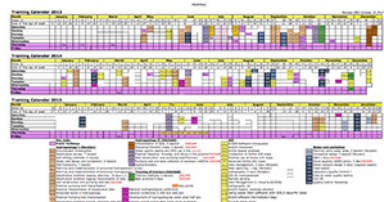
The training program was discussed and outlined during the inception phase outlining about 25 training courses with an estimated 800 course participants. During the planning period the training program was more detailed based on the training need assessment, discussion with water sector stakeholders during the bridging workshop before the training program started.

4.1 Key documents/ tools planning

The list of planned training courses shown on the web under the training menu. The web list provide overview over courses titles, course number, , course summary sheet, course agenda, invitation letter, and other documents issues in advance of the course (like tutorials). Many sector staff have been using this list to learn more about planned courses.

4.1.1 Training Calendar

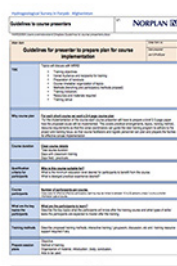
The training calendar was very important tool visualizing the training plan, for coordinating international experts, local experts as well as being a good tool for documentation of implemented courses.



The training calendar (http://www.norplan.af/DocumentsHGS/Doc_training/Training_Calendar_2013_2015.pdf) was continuously updated

on the web for all sector stakeholders to use.

4.1.2 Training guidelines for presenters



The course trainer/ presenter were provided with the list of courses, training calendar and guidelines to the presenters how the course needed to be prepared and what documentation and information had to be prepared in advance such as Course Summary Sheet, and Course Agenda.

4.1.3 Training Course summary sheet. (TCSS)



The course summary sheet (TCSS) name the course, objectives, target group, duration, presenter(s) and key topics and skills to be transferred. It is brief and very useful for presenters, course organizers and course participants. The TCSS is presented on the web showing list of training courses.

4.1.4 Course agenda



Before the start of any course, the training agenda had to be prepared as shown in the web. The Agenda could also be attached to the course invitation letter.

4.1.5 Course invitation letter.

An invitation letter was issued before each training course. MRRD or Norplan on behalf of MRRD circulated the letter outlining required background of participants and suggested number of participants from



the different organizations. In addition, the National training expert followed up the invitation with the invited organizations to assure appropriate participation.

Since most courses were interactive with practical training, the number of participants for each course was tried to be limited to between 15 to 20 persons.

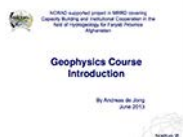
5. Implementation of training program

5.1 Training course outputs and reports



All presentations and documents used and presented during the training courses are listed on the web for all to see and download. (see web, training menu- reports). Here presentations, (training material), tutorials, list of participants, and course photos are presented. On the same page, links are there for more detailed printouts from database on course participants, benefactor organizations etc.

5.1.1 Developed training material



All the powerpoint presentations and training material used were made available to the participants and published on the project web page. In some cases where the documents were large, CD discs were prepared and distributed to the participants because slow internet would otherwise make the downloading from the web difficult and time consuming. On the CD discs were also included good and

relevant reference books and articles which are freely available on internet.

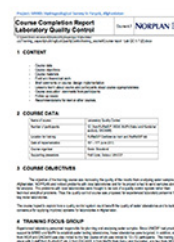
5.1.2 List of participants



The list of participants is good for showing which organization sent participants, male/ female participants, position and background of the participants.

All the participants details and courses attended was added to a database

5.1.3 Course completion report



At the end of each training course a course completion report was prepared. The report included information about the course, date run, participants, and evaluation of the course with recommendations for later courses and topics which needed more time, repetition of topics new topics. This was sometimes the case particularly where the basic knowledge of use of key data software like excel and access was needed.

5.1.4 Participants course evaluation



On the web report list we have also included the participants evaluation of the training courses. This would highlight the participants view, of the relevance and duration of the training courses. The participants score and comments are presented. This can be useful for later repeats of the different courses but also for revision of training needs assessment.

In additional to individual course evaluations, an overall score for all the

courses are shown under the training progress menu on the web.

5.1.5 Course photographs



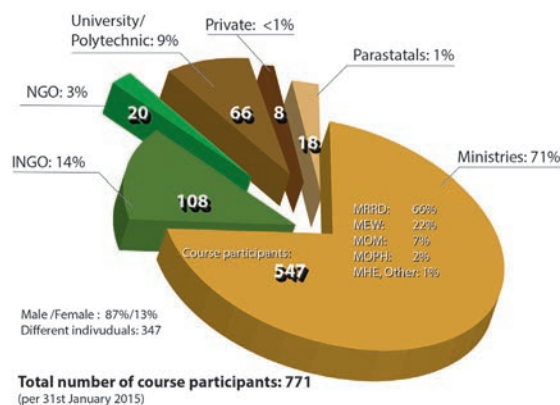
From all the courses, photographs were taken and presented. These turned out to be quite popular. The visual documentation using photos were also quite effective to communicate

to outsiders how the courses were implemented and facilitated.

5.1.6 Training output reports / database printouts

From the project web page, many reports

WHO HAS BEEN TRAINED?



from the training program can be downloaded. (See [norplan.af/ progress/training](http://norplan.af/progress/training) sub menu). From this side pdf reports from list of courses, participants per course, names of participants, participating organizations etc can be downloaded.

About 830 course participants attended the courses with about 380 different persons from about 45 different organizations.

5.2 Training organizers, and resources.

5.2.1 Organizations and partners in training

NORPLAN has organized the training program in consultation with MRRD and sector stakeholders. Dr. Stoveland was overall responsible with Prof. Eqrar organizing or coordinating the training program, invitations and follow up with participants.

Norplan organized more than 30 of the training courses while DACAAR handles training courses in the provinces and training of trainers and social mobilization courses at DACAAR HQ in Kabul. Key contact in DACAAR for the was Azim Barat. Many of the DACAAR training courses have been organized previously and are rerun on demand by the WetCentre at DACAAR.

For some of the training courses staff from RuWatSIP, MRRD has been involved as co-trainers working closely with international experts.

Senior experienced staff from MEW assisted with practical training of soil analysis, sieving analysis and demonstration of drilling and drilling equipment.

A number trainers and co-trainers come from Kabul University, Kabul Polytechnic and from other private universities in Kabul. Many of the local staff participating in the training courses will have full access to all the training material as would thus in many instances be able to re-run the training course using developed training materials and methodologies.

5.2.2 Key trainers

Of the international experts David Banks handled development of methods for hydrogeological surveys and preparing of Water Atlas and provincial hydrogeological

surveys.


Andreas de Jong handled training in geophysical investigations, drilling methods, well design, and development, testing and training in the use of new well logging equipment. Andreas de Jong also covered GIS , cartography and online ArcGIS utility tools and maps.














Dr. Svein Stoveland covered conceptual design for water supplies, quality control systems for water testing laboratories and basic chemistry for laboratories.

	Dr. Svein Stoveland. Project team leader and trainer for water engineering, quality control systems for water testing and conceptual design , water supplies
	Sen. Hydrogeologist David Banks. Trainer of survey methods, hydro chemistry, hydrogeological surveys, sampling methods, and water atlas, reporting. Aquifer capacity evaluation
	Sen. Hydrogeologist Andreas de Jong Key trainer covering most courses for geophysical investigations, well design, well logging, GIS, online ArcGIS, Cartography and data capture
	GIS expert Frank Haugan POn the job training at initial phase of project for GIS-MIS design and system solutions

5.2.3 National trainers and Co-trainings

We have listed below the local staff involved in the capacity building program. For continuity and sustainability, the local experts involved in the training could repeat many of the training courses since most of the training materials would be available to all trainers and training organizations. Below is the list of key local experts involved.

	Prof. Naim Eqrar. Professor at Kabul University. National Training expert. Presenter and co-presenter in most Norplan training courses.
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	Prof. S. Zarinkhail. GIS expert to handle data management and preparation of databases, ArcGIS maps, and training coordinator for GIS- MIS activities under the project.
	Prof. Noor Ahmad Akhundzadah. Dean at Env. dept. at Kabul university. Co-trainer in hydrogeolgy and geophysics courses
	Eng. M. Hassan. An experienced senior hydrogeologist from DACAAR. Supervisor of data collection in the field for hydrogeological surveys, Presenter and co-presenter in hydrogeology, GPS, Water Quality courses.
	Prof. M. Najaf. Professor at Kabul Polytechnic University. Presenter of training course in hydrogeology.
	Eng. Atta. Presenter in training courses in data management covering Excel.
	Eng. Jawid. Working in DACAAR and working closely with Eng Hassan. Support in training courses, demonstrating water quality testing using field kits. Support for analysis of geophysical data in courses and for Water Atlas.
	Lecturer M. Iqbal, GIS expert and trainer in GIS courses. Lecturer at Maiwand University
	Abdul Munir. Very experienced expert in MIS/ GIS. Used to work in MRRD, now in MAIL. Backstopping institutional adviser and supprt to GIS training courses.
	Eng. Azim Barat is DACAAR WET Centre part time trainer who is faciltator and trainer at DACAAR courses run for NORPLAN
	Eng Pervaiz A. Maseri. Presenter in training course for use of total station surveying equipment. Associate Professor at Kabul Polytechnic University.
	Dr. Barat. GIS expert, lecturer at Maiwand University. Presenter at several training courses at the project.
	Eng. Jalil. Senior hydrogeologist at MRRD, RuWatSIP. Attending and participating in training courses. Provided expert support in hydrogeoloigcal and geophysical training courses
	Eng. Ali Poya. Senior hydrogeologist at MRRD providing support as co-trainer for many of the hydrogeological courses presented by Andreas de Jong.

	Eng. Naqibullah Abrar. Deputy team leader, in NORPLAN, providing logistical and technical support for courses. Directly involved in Quality Control training courses as co-trainer
	Eng. Yousuf. Vice dean of Hydrogeology department in MEW. Partly presenter and co-trainer for training course in well drilling methods and provided demonstration of soil testing in MEW soil lab (sieving analysis)
	Eng. Ehsan Bayat. Working at NCA. Senior hydrogeologist. Participated and co-trainer in one course in hydrogeology.
	Assoc. Prof. Shekeb Shamal is DACAAR WET Centre part time trainer who is responsible for facilitation of Social Organization and O&M of Rural Water Supply training workshops (Kabul University)

Two screens, video projector and loadspeaker was provided for the project for the training sessions. The wall mounted led screens were particularly useful and the video projectors and speakers were useful for showing training videos in the RuWatSIP conference room and in other training facilities without fixed wall screens.

The computers were essential for training in data management using excel and access software. It was also important to have the computers for ArcGIS training and online GIS utility training.

Key software licences were procured for the project.

Fortunately, some of the expensive software programs had student access for free license for shorter periods which allowed for all having hands on training on most programs on their own laptop computers.

5.3 Training program facilitation.

5.3.1 Training venues

Most of the training courses were arranged as follows:

- Conference room RuWatSIP or main conference hall at MRRD
- Conference room at MEW
- Training hall at DACAAR
- Training hall at DACAAR in Faryab and Daccaar office in Mazaar.

Most of the training rooms could accommodate at least 20 participants.

5.3.2 Training equipment

For many of the training courses, computers were needed. The project has procured 7 laptop computers for use of the course participants. Since many of the course participants were asked to bring their own computers, this arrangement worked well.

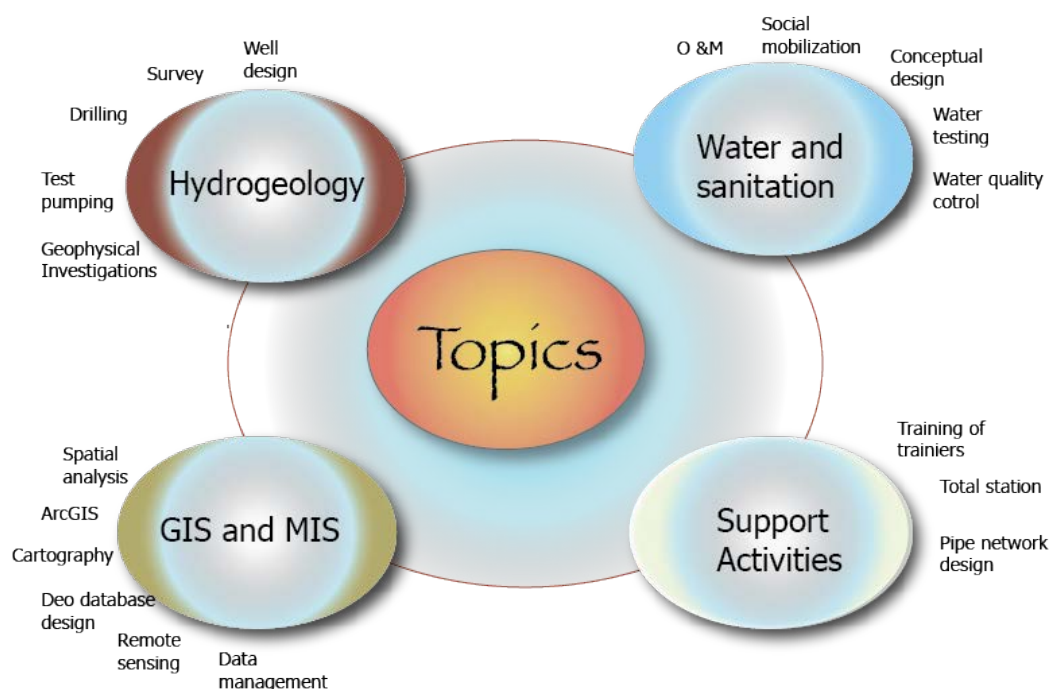
5.3.3 Participant support-allowances

A support team provided stationary, lunches and organized the payment of travel allowances for course participants throughout. Staff from Faryab were invited to the courses and a two to four persons attended many of the courses. The training logistics support officer Naseer organiser logistics support together with Habib from

6. Training topics

The key topics for the capacity building is highlighted in the illustration below. the key focus was learning methods to map the hydrogeology or groundwater groundwater resource using professional methods from desk studies, collection of existing data about water resources, field surveys, exploratory drilling and more.

After the data has been collected, data

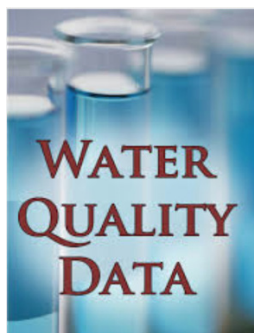


needed to be cleaned and analyzed. Once analyzed the data has to be presented in reports and on maps so that other professionals including water engineers could use the information to find and develop sustainable water supply services effectively.

The figure above show the main topics covered by the training courses.

6.1 Need for data quality control system for trustworthy data.

As the project developed it became apparent that quality control of hydrogeological data was not satisfactory. The general attitude is that volume of data means more than data quality. When analysing existing hydrogeological data from existing water points and when checking data from water testing laboratories, it was noted that few if any validated or checked the trustworthiness of the data. This became a problem particularly for testing of water samples. In order to address this



issue, owners of the key water testing laboratories in Kabul was gathered to discuss or develop a consensus whether there was a problem or not. Under the focal point of ANSA (standardization organization in Afghanistan) meetings and training workshops were organized to find a way of establishing a classification system and a laboratory classification system for water testing laboratories. The photo below is taken from one of the may meetings

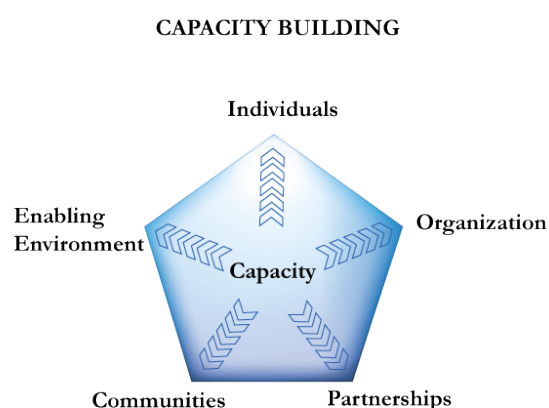


arranged at ANSA with key stakeholders from MRRD, MOPH, MEW, AUWSSC, GIZ, DACAAR, private laboratories and supporting donors including UNICEF, WHO. Norplan assisted with providing 3 training workshops with focus on how to organise quality control for water testing laboratories in Afghanistan. Unfortunately, the project could not provide sufficient support to make the system operational. Additional support is needed. The project did however, generate a

clear consensus of the need for all laboratories to establish a national quality control system and a laboratory quality control system. It is hoped that this can be incorporated in a new project in the near future supported by any sector agency.

7. Capacity building for groundwater sector.

As the illustration below indicates, capacity building means more than just



building up the skills in one person. For the desired impact to be achieved, many sector organizations need to be trained and made aware of effective approaches, tools, standards and information exchange. It is also important to strengthen partnerships between organizations whether these are government institutions, training establishments, NGOs or private sector. Equally important is the enabling environment for the capacity building to make any impact.

With the enabling environment, it is essential that the senior management of water sector organizations are aware of new technology and methodologies and allow its staff to apply new techniques for improved efficiencies. Without this support and understanding from senior management, changed behavior as a result of the training will at best be only marginal.

Also donor coordination is important for a coherent water sector development.

So for a broad based information to most sector actors linked to groundwater mapping and data management, coordination and capacity building was effective by information during the may training courses, though the information through the project web page and through information sharing in national conferences such as:

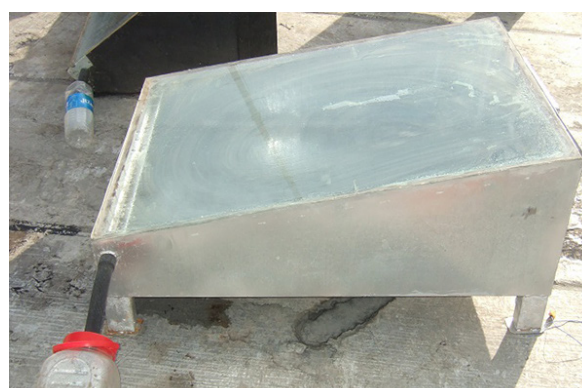
- National groundwater conference
- National GIS Conference
- Conceptual design for water supply coverage in urban and rural areas

As a result of work at the different levels, information, awareness of groundwater resources and its need for mapping and protection and how this can be done is now well presented to the Water Sector In Kabul.

8. Introducing new technology

The project introduced use of new software such as online ArcGIS utility but the project also presented some technology for testing for possible wide scale use in Afghanistan such as:

8.1 Solar stills



Solar stills were tested as a possible technology for very remote, hot rural areas with saline groundwater like in northern Faryab. The test were conducted together with NCA. NCA is now planning to field test the developed prototypes.

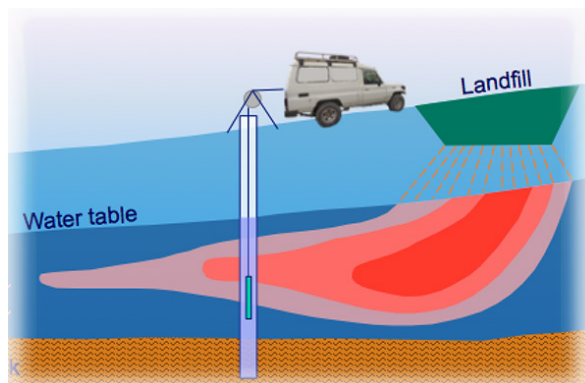
8.2 Membrane filtration

The membrane filtration unit was introduced for treatment of surface waters with bacteriological contamination and surface waters with solids. The units are mobile, can operate without power supply and are very appropriate for emergency water supply. The unit produced very high quality water free from bacteria and absolutely clear and attractive for drinking.



8.3 Well Logger Equipment

Well logging equipment was acquired under the project and a second hand land cruiser was rebuilt as purpose build for the GeoVista logging equipment at Toyota in Kabul. MRRD geophysicists and

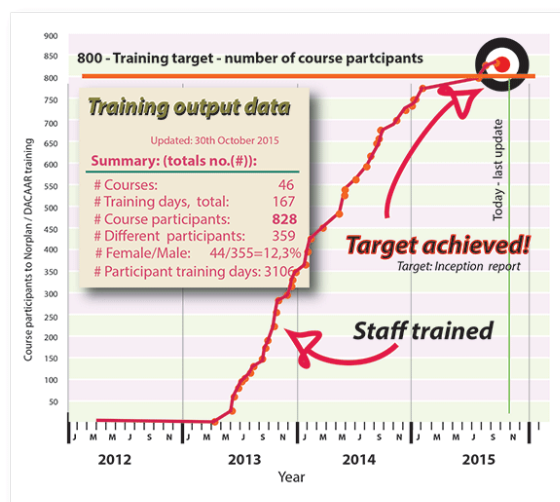


hydrologists have been trained in the use of the equipment using test boreholes as MRRD and MEW. DACAAR has procured similar equipment and MEW also have well loggers. Now there is a possible forum for use of this equipment in Afghanistan to check existing wells and to explore more of groundwater and geological formations in Afghanistan for more accurate resource mapping.

9. List of training courses

HYDROGEOLOGY COURES:

- 1.1.1 Groundwater investigations
- 1.2.1 Geophysical Surveys
- 1.3.1 Well drilling methods
- 1.4.1 Water well design
- 1.5.1 Well hydraulics
- 1.6.1 Hydrochemistry, interpretation of data
- 1.7.1 Planning and implementation of Provincial hydrogeological surveys
- 1.7.2 Planning and implementation of Provincial hydrogeological surveys



- 1.8.1 Geophysical borehole logging, planning and operating equipment
- 1.9.1 Geophysical borehole logging interpretation of data
- 1.10.1 Well construction and pumping tests
- 1.11.1 Practical Pumping Test Interpretations
- 1.12.1 Practical Geophysical interpretations (Working on Faryab Data)
- 1.13.1 Advanced topics in hydrogeology
- 2.3.1 GPS reading and Water Quality Testing, -in the province
- 2.4.1 Geophysical Investigation and Siting-practicals-in the province
- 2.5.1 Drilling methods and Well Construction -in the province
- 2.6.1 Test Pumping and Data Collection -in the province (Mazaar)
- 2.6.2 Test Pumping and Data Collection -in the province (Faryab)

TRAINING METHODS

- 3.1.1 Training of trainers methods

GIS- & DATA MANAGEMENT

- 4.1.1 ArcGIS Software Introduction
- 4.2.1 ArcGIS Databases
- 4.3.1 ArcGis Spatial analyses
- 4.4.1 Introduction to online GIS maps
- 4.5.1 Practical Use of Online Maps
- 4.6.1 Advanced online GIS Maps
- 4.7.1 Data Management 2, (Excel & ACCESS, Summary of 4.12/4.17)
- 4.8.1 Data Capture
- 4.9.1 Introduction to Cartography
- 4.10.1 Introduction to GIS for Hydrogeologists
- 4.11.1 GIS- Remote Sensing
- 4.12.1 Data Management 2
- 4.13.1 Cartography II
- 4.14.1 ArcGIS Spatial analysis II

- 4.17.1 Data Management MS ACCESS,
- 4.19.1 ArcGIS Software Intermediate

WATER SUPPLY - ENGINEERING

- 5.1.1 Planning water supply using water atlas
 - 5.2.1 Conceptual design for of sustainable water supplies (seminar organised instead)
 - 5.3.1 Planning and implementation of O&M for rural water supplies
 - 5.3.2 Planning and implementation of O&M for rural water supplies
 - 5.4.1 Social aspects of Water and Sanitation, WASH policy, gender issues
 - 5.4.2 Social aspects of Water and Sanitation, WASH policy, gender issues
 - 5.6.1 Training in use of total-station for water/ wastewater, network survey
 - 5.7.1 Laboratory Quality Control
 - 5.8.1 Water Testing using field kits
 - 5.9.1 Autocad Civil 3D
 - 5.10.1 Quality Control for Water labs
 - 5.10.2 Quality Control for Water labs.
- Key: Regular font : completed courses
Italic font: courses not completed in 2015

10. Training outputs

- Training more that 850 course participants in 45 courses
- Involved 355 different individuals in capacity building training program
- Involved 46 different organizations in the training program covered by 45 courses
- Planning and design of 30 short training courses with new training materials.
- DACAAR assisted in implementation of additional 15 complementary training courses in Kabul, Maymane and in Mazaar.
- Engaged local co-trainers (prof. lecturers, local experts for course rerun
- - Developed about 25 training videos for many technical subjects for later use
- Established a training coordination framework for all key organizations involved in groundwater mapping.
- Established training coordination of water sector actors making use of

GIS tools for project reporting and information exchange.

- Demonstrated to all course participants the benefits of information and documentation sharing using project web page. (norplan.af)

11. Sustainability of capacity building program and/or project components

The project can perhaps be likened to a factory producing an number of products, Although the factory as such may not survive, most of the products may grow and develop as planned and thus leave a positive overall legacy. This may also be the situation when looking at the Capacity building project implemented with MRRD over the last four years.

11.1 The project.

The NORAD funded project focussed on capacity building within hydrogeology and groundwater mapping. The purpose was to build local expertise and the second purpose was to assist MRRD to be able to continue groundwater mapping nationwide to cover needs for groundwater information.

With the current financial situation in Afghanistan it is not possible that the Government can take over and scale up the \$5 million project without external funding



The ultimate test: Will the project result in groundwater mapping for all provinces in Afghanistan?

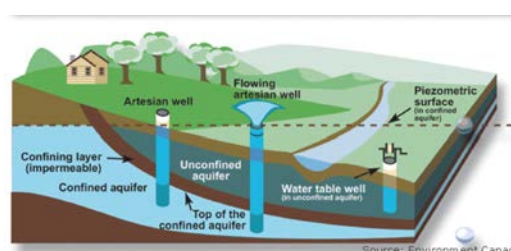
support. The project which used one province Faryab as a pilot province, showed that much resources would be needed to scale up nationwide groundwater mapping to cover all provinces.

The project found also that some provinces already had much hydrogeological data. Some provinces had as much data / metadata from as from over 5000 registered water points which could relatively easily be used to build hydrogeological maps for that province after validating the data. Other provinces, have hardly any technical records and surveying those would require a sizable project framework and resources.

What one could hope for is that other up-coming projects can make use of components of the project and continue groundwater mapping in other areas of Afghanistan making use of the methods, systems, skills and report formats developed under the HGS project.

Other project components of which may continue to benefit

11.1.1 Capacity building: Hydrogeology



- Desk study methods
 - Available if user choose to make use of it
- Sampling and field survey method
 - Available if user choose to make use of it
- Water Atlas (text book example)
 - Available, likely to be used in parts as example, and as text book at training institutions.

- Geophysical methods and data interpretation
 - Available if user choose to make use of it
- Well logging using GeoVista logging equipment.
 - Available if user choose to make use of it. Needs financial resources/ budgets to operate and maintain it.

11.1.2 Capacity building: GIS- MIS

- Design / templates for Hydrogeological maps
 - Available if user choose to make use of it
- Methods for data capture and cleaning
 - Available if user choose to make use of it

11.1.3 Training / capacity building

- Training materials, powerpoint presentations, training videos tutorials
 - Available if user choose to make use of it. Likely to be used in training institutions and by local trainers/ co-trainers invited to train other students/ staff
- Training of local trainers to repeat short courses (local experts)
 - Important results for continuity/ sustainability. Some courses already re-run

11.1.4 Water Sector coordination

- Conduct national groundwater conference
 - Consensus reached ffor national groundwater mapping.
 - Consensus built to coordinate work
 - Agreed need to prepare national action plan to plan better groundwater mapping and management.
- Conduct national GIS conference
 - Consensual reached for need for professional GIS users to meet regularly. UNEP may take initiative to lead development of professional forum.

11.1.5 Make use of modern IT tools.

- Use of project web page
 - The feedback from users of web page has shown that information sharing is valuable. On average 85 visited the page each day.
 - A very effective way to share technical and project information of all sector stakeholders ina transparent manner.
- Publish/ disseminate all training material
 - A very effective way to share information to all organizations in Afghanistan interested in developing the water sector in Afghanistan.
 - Techncaill information can be shared at no costs to the users.
- Design/ training and present online hydrogeological maps
 - The project have demonstrated the benefit for online maps.
 - The project has exposed that discussions are needed for organizations to agree to release and share information more freely and to use agreed standardized formats.

11.2 In conclusion:

Much of the methods developed under this project is available for the water sector to use. The universities and polytechnics will most likely use the material. Some of the training NGOs may also use the same material including the training course materials and course designs.

The project trained a number of local resource persons who also actively participated in the project. These key resource persons can in most cases continue the training making used of approached and materials and thus make some of the key capacity training sustainable.

The training of 355 persons will have benefits though the hands on training.

Knowledge will benefit Afghanistan whichever organization they work under. It is to some extent in the hands of the senior manager to facilitate for the effective use of new approaches and methods to be applied in Afghanistan.

International organizations and donors can also stimulate to facilitate for adaptation of good professional information gathering and mapping of the vital groundwater resources in Afghanistan.

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