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Innovation Brief
on International Development Services

RWASH sector web & GIS based Management Information System

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The Problem

Nepal has invested substantially in improving rural water supply, sanitation and (water related) health. However, the sector has remained very fragmented and consolidated information at the national level is unavailable, leading to sub-optimal investment decisions.

The link to the MDGs

Nepal faces a major challenge – especially in the rural areas – in meeting the Millennium Development Goals (MDGs) on water supply, sanitation, and (water related) health.
In particular **Goal 3** *(Promote gender equality and empower women),* **Goal 4** *(Reduce child mortality rate), and* **Goal 7** *(Ensure environmental sustainability - Target 3: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation) are related to water supply, sanitation, and hygiene.*

Nepal's Rural Water Supply, Sanitation and Hygiene (RWASH) sector is very fragmented. A multitude of governmental agencies, donors, and local and international NGOs is active in the sector. A coordinated sector wide approach is lacking; stakeholders are not aligned. Each organisation collects and stores its own data. At national level, consolidated information is not available.

As a result, information on the sector is scattered across organisations and is not easily shared between them, while dissemination of information to district levels is absent. Particularly disturbing is that data generally only covers project development, while post-implementation monitoring is not common

practice. Taking into account the often poor operation and maintenance of water supply systems, figures based only on project development are likely to be too optimistic. Optimal budget allocation for new infrastructure, urgent repairs, or local capacity building is impossible.

The Challenge

In view of the above the request of the Government of Nepal was to develop a sector wide Monitoring & Evaluation (**M&E**) framework and a web based Management Information System (**MIS**) and Decision Support System (**DSS**).

The challenge of the present project was to design an information system that would enable collecting information from the local levels and consolidation of this information into a national databank, whilst allowing all stakeholders access to the information via the internet.

Through a participatory process involving all stakeholders we managed to alignment their expectations, procedures and processes. The consortium lead by Euroconsult Mott MacDonald developed a comprehensive set of suitable Key Performance Indicators, designed and implemented the IT solution, and strengthened the capacities of the Monitoring & Evaluation Unit of the Ministry of Physical Planning and Works.

The Solution: Web & GIS based MIS/DSS using Lizard Web

Sustainable introduction of new management tools depends on user friendliness and on how useful the information is that these tools contain and generate.

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The first step in the design process was to determine the **Key Performance Indicators.** Nepal had executed a nation wide survey on the RWSS sector (2005-2008) and although the results showed significant inconsistencies, Euroconsult Mott MacDonald's team was able to build a consistent data warehouse based on the survey data, completed with data on health, education, and population. Taking the data-availability into consideration, the following set of **KPIs** was agreed upon with the main sector stakeholders.

Key Performance Indicators Nepal RWASH sector
1A Percentage of households served with treated water
2A Number of households with access to managed water source
2B Number of households that utilise traditional water source
2C Managed Water Supply Ratio: Percentage of households served with managed water source: 2A / (2A + 2B)
3A Number of months per year water access from piped schemes
4A Percentage of households with Improved functioning toilets
5A Gender representation - Percentage of women on WUSC
5B Hard work for young women - Ratio of Girls to Boys as they progress through school (for three school levels)
6A Under 5 mortality due to diarrhoea
7A Hard work for children - Student enrolment
7B Hard work for children – Student dropout
8A Adequate O&M percentage
8B User Management: # of WUSC meetings/in last 12 months/scheme
8C Functional Scheme ratio: # of households served by *properly functioning* schemes vs. total # of households theoretically served by schemes
8D Scheme age

The second major step was to design **the IT Tool** itself. The design parameters included that it should be cost effective, low maintenance, and flexible for future extensions. The tool should combine GIS and database management functions and configuration to adapt to local circumstances should be easy.

Commercially available web GIS software proved to be too costly for the project, and would require IT expertise that is not widely available in Nepal. This would have seriously endangered the long-term sustainability of the efforts.

The innovative solution was to introduce a GIS based web platform: **Lizard Web**. This platform was originally developed for river basin management by the Dutch company Nelen & Schuurmans, so that the core software components were already available to develop a customised application for monitoring of asset data, suitable for the water supply and sanitation sector.

The solution was presented to the relevant parties in Nepal and after official approval, the customised application was developed.

Main features of the system

The RWASH website contains four distinct sections: map, report, DSS (decision support system), and import.

Registered users from district level authorities, NGOs, etc can upload their latest monitoring data, using predefined formats corresponding with standardised field forms for monitoring at scheme level or ward level. At national level, the RWASH M&E unit validates new data before it is published online. Demographic, health, and education data are uploaded annually by the M&E unit, using data from the Central Bureau of Statistics and relevant

ministries. An inter-ministerial Memorandum of Understanding has been signed to facilitate data exchange.

Information can be retrieved as maps or reports, at any selected geographical level (from ward or scheme level up to national level). Tables can be generated using filters and sorting tools in the DSS section. Maps, reports, and tables can be printed or exported (e.g. to MS Excel®). Some examples are presented below.

Through these functionalities, the system allows the districts, provinces, and national government to take evidence-based decisions regarding their investments in the sector. These decisions not only include new investments, but – significantly – also the budgets required for maintenance and repairs.

Results

The RWSS (Rural Water Supply and Sanitation) sector M&E unit has taken ownership of the Lizard RWSS MIS/DSS application. Trainings are given throughout Nepal, and the application may be extended with urban WSS information. Within Mott MacDonald the application of Lizard functionalities in other projects and in internal business processes is

starting up. A strategic partnership has been established between Euroconsult Mott MacDonald and Nelen & Schuurmans, to develop joint projects in Holland and abroad, such as the World Bank funded Nepal Water Resources Knowledge Base Development project, implemented in Nepal in 2010.

The RWASH system is available on line. Give it a try at http://www.rwash.gov.np/system.
Username: example_lowlevel; Password: test12.

A description of the application is available on request.

You are welcome to contact us:
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Euroconsult / BMB Mott MacDonald
Amsterdamseweg 15, 6814 CM ARNHEM,
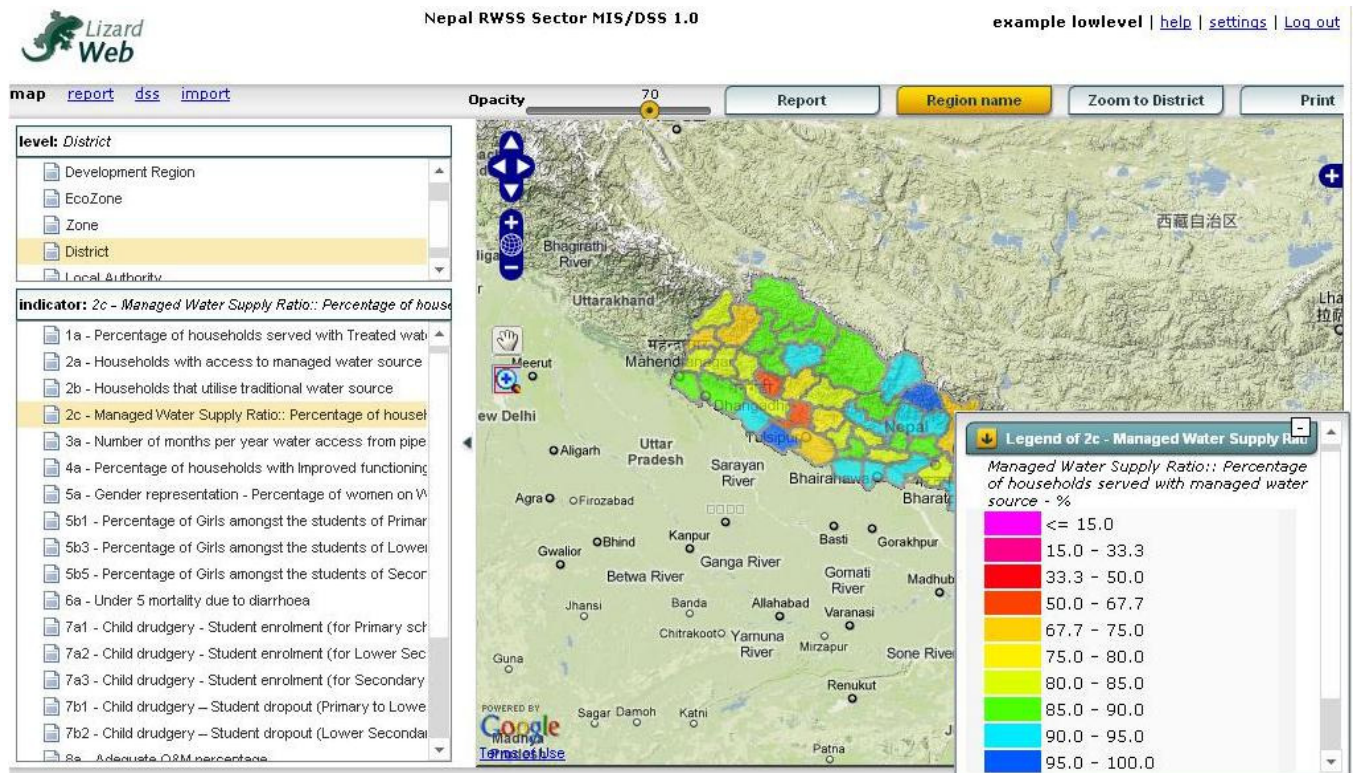The Netherlands. Tel: +31 26 3577111
www.euroconsult.mottmac.nl

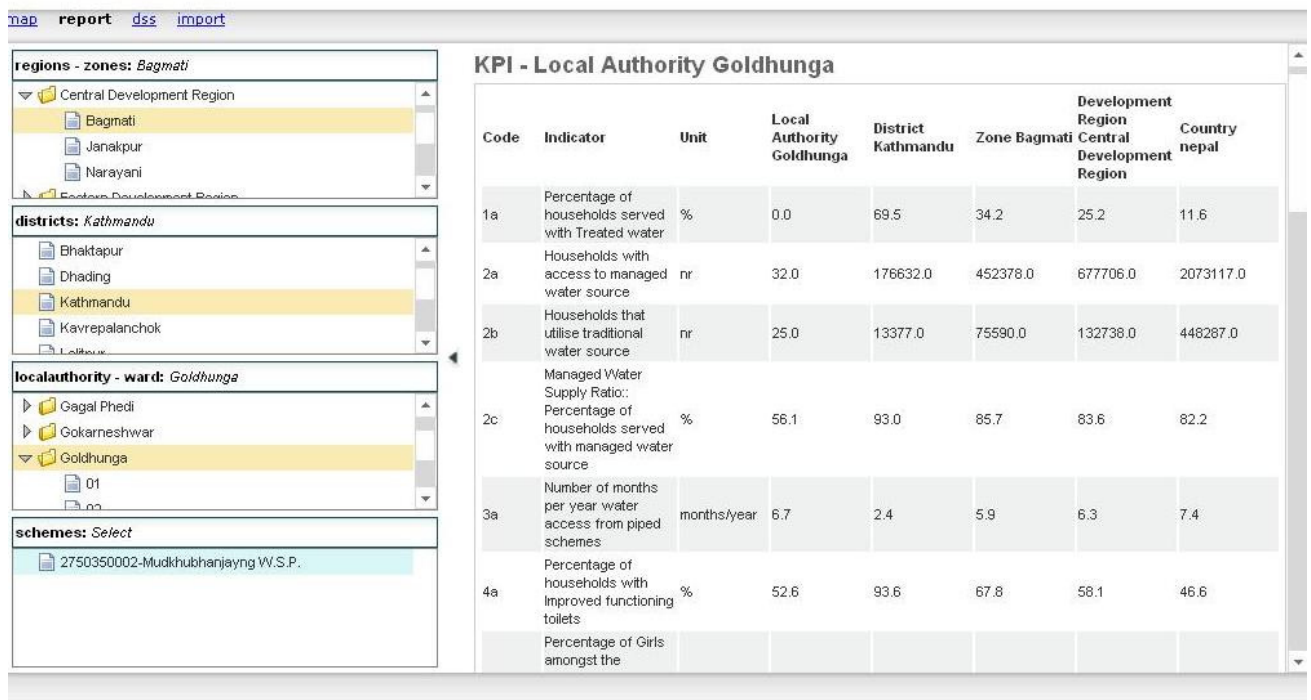*Figure 1: Example map, showing the Managed Water Supply Ratio for all districts*

Figure 2: Example report, presenting KPI values for a selected local authority and all higher
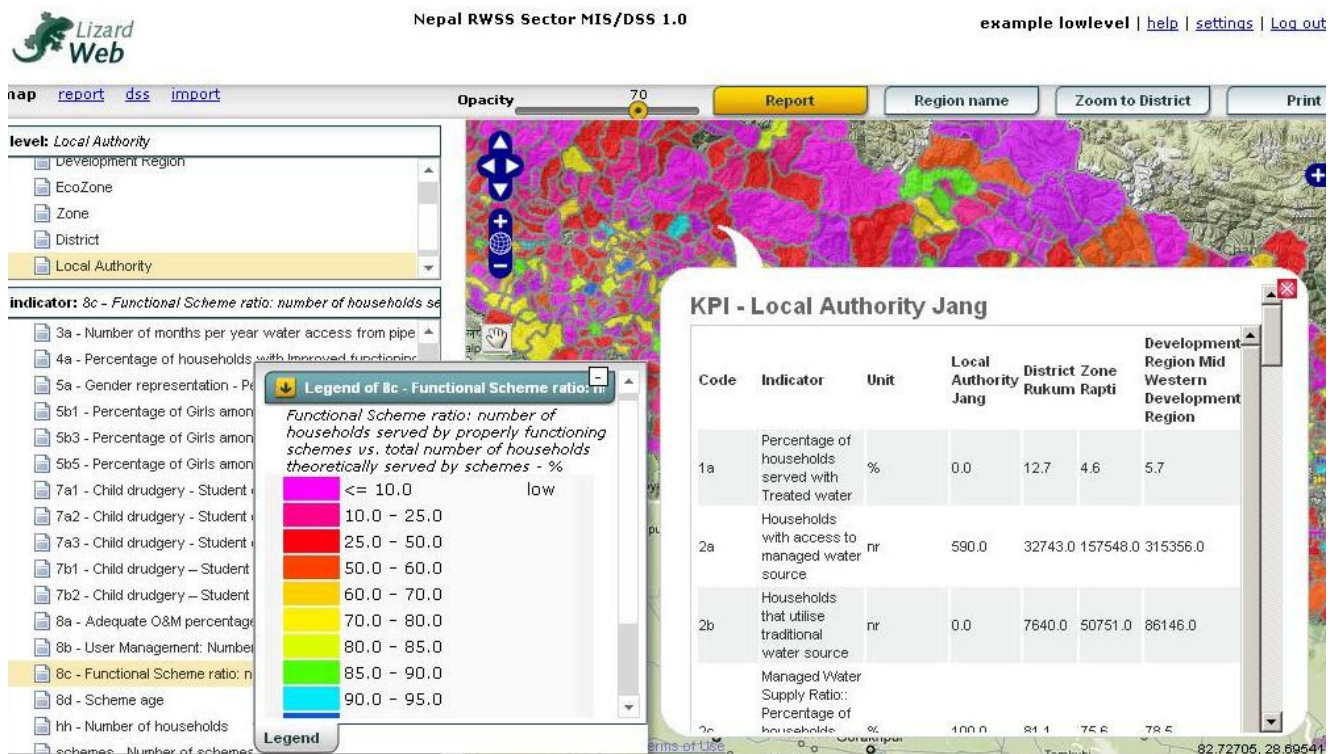administrative levels

Figure 3: Example map, zoomed in at local authority level, presenting the KPI report for a local
authority, dynamically selected in the map