

Support Information System, data managing on project implementation. Application in Tanzania.

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Water and Sanitation programmes normally involve big amounts of information and several years of implementation; these are facts that justify the need of a proper monitoring. In this paper a Support Information System (SIS) for WatSan programmes monitoring is presented. SIS is based on a database system where relevant data of the programme can be easily stored and processed through user-friendly interfaces. Graphical representation has been included, facilitating the analysis and allowing for a better response on real time while programme is being implemented. The Logical Framework has been used as the starting point to define the tool. Experience has shown that it is crucial to create it with a participatory approach together with professionals working directly on the project. After its application in two programmes in Tanzania it has been seen that the tool allows both for a day-to-day monitoring as well as for a long-term analysis, improving knowledge of the staff working on project implementation, researchers and development planners.

Introduction

Monitoring involves collection, analysis, communication and use of information about a project's progress (EC, 2004). Main purposes may be to enable quick and informed decisions when project's assumptions are not being fulfilled, through a close follow up of the programme; to enable a better quality surveillance of the project implementation; and, through the documentation of the implementation process, monitoring systems can provide inputs for evaluations and enable the extraction of lessons learnt.

It is focused on the implementation of planned activities, being a continuous process that needs the participation of the own staff, and is carried out with the purpose to take immediate decisions about the programme implementation. Instead, evaluation is usually made after project completion or at certain time points (middle of the programme, or some years after to assess long term impact), it is focused on the objectives and strategies chosen, it is commonly made by external consultants and has the purpose of making recommendations about general aspects of the programme.

Evaluations in development programmes frequently presume that activities designed have been correctly implemented. Thus, if results are not achieved, the reasons are found in the incorrect assumptions included in the project formulation. Nevertheless, experience shows that poor implementation of methodologies can be a common ground to explain the low achievement of long term results.

Furthermore Water and Sanitation (WatSan) programmes are usually defined with a long-term perspective (minimum of three years), which frequently mean that the programme will be affected by staff rotation (more than one team will be implementing it). They also involve big amounts of information regarding different areas: socio-cultural, technical, physical, etc. If information is not well recorded and analyzed, the negative impact of staff changes can be important for the project.

Aiming to improve monitoring in WatSan development projects, a new tool has been created which may help in different phases of monitoring: Support Information System (SIS). Its main functions are data

collection and information set out, facilitating the knowledge improvement while the project is being undertaken.

Development of the SIS has been carried out by UPC researchers together with the Spanish NGO Ingeniería sin Fronteras - Asociación para el Desarrollo (Engineering without borders - Association for the Development), who has been implementing WatSan programmes in different rural districts of Tanzania, fostering sustained access to water, proper sanitation and campaigns of hygiene promotion.

Since 2006 this NGO has been working with the European Commission (the latter as the main donor) under the ACP-EU Water Facility programme. This kind of programmes invest a significant amount of money and have long implementation phases, aspects which entail the NGO to implement an appropriate monitoring system as an efficient tool to improve their management.

Its development has been done on two of their programmes, one in Same District (Kilimanjaro Region) and the other one in Kigoma Rural District (Kigoma Region), both of them in Tanzania. In the first one it was defined during programme's pilot phase, expecting tool's use not only then but also for the whole implementation of the following phases done together with the European Commission. On the second one, it has been implemented for phases IV and V. Each of the programmes have a budget between 0.5 and 1 million euros per year, aiming to supply water from 7.000 to 10.000 people per year.

Creation process of the tool needed eight months of work, half of them in the field, from a technician at part-time dedication. The approach used to define the monitoring system followed next steps:

1. Definition of indicators for results and objectives, together with their means of verification (L.F.).
2. Definition of the time frame for the achievement of partial indicators, whenever it is relevant due to the programme length.
3. Definition of the implementation methodologies to be used.
4. Definition of the indicators for the implementation of the activities, others than the final indicators, but that can give information about the grade of achievement of the results.
5. Definition of quality indicators of the process (e.g. stakeholders participation, etc..)
6. Definition of the monitoring sheets and questionnaires to collect the required information.
7. Definition of how information will be processed and analyzed.

In following sections the definition of the tool will be reviewed, as also an analysis of its use, considering both, a day-to-day monitoring and its application for a long-term assessment (mainly on evaluations). Finally some conclusions will be exposed.

SIS definition

Participatory design

As previously exposed, in order to design the SIS it is necessary to start defining the data that should be monitored. Meanwhile the definition of indicators for results and objectives had already been done as part of the Logical Framework Approach (LFA), participation of the end-users of the tool, who have great knowledge of the project, is crucial for the definition of all other aspects needed.

But using the LFA as starting point has other positive aspects than merely having some indicators already defined. Firstly, the knowledge of the LFA gives a complete idea of the programme which shall be monitored. Moreover, such an opportunity on programme monitoring may not forget to collect continuous data to observe the evolution of the indicators there defined.

The best way on defining partial indicators and its timing, as also implementation methodologies, indicators of its activities implementation and quality indicators of the overall process is with the professionals who are going to use the tool. As the NGO had already been working on similar programmes in Tanzania, its prior knowledge was of great worth to fulfill this tasks.

Once indicators definition is done, an analysis on how information shall be collected is the following step. This comprises the creation of forms to collect it, which will share the same structure as the interface used to introduce data to the SIS. This shall be done together with the personnel responsible of its collection to guarantee that information required is accessible, to define which procedure shall be followed to get it and to establish the periodicity of its collection.

Lastly through both sources, the LFA matrix and the personnel, definition of the outputs can be done. This includes establishing which formats are the optimal for indicator's analysis, as also which information is required to facilitate it.

It is important to assume that once the tool starts to be used, modifications and new ideas on what should be monitored will arise, though new possible applications may come up once confidence with the tool is reached. Therefore it is important to have in mind that further development will be required in a short period of time after information is being introduced and first results displayed.

Structure

Structure of the SIS has been defined through specific contents and information that might be collected with it. This division has been done according to the needs of each member of the team, regarding its specific work and its targets. Therefore main parts on this structure are then Water Management, Hygiene Promotion and Sanitation and Technical Aspects. Each of these parts has different forms which may allow the easy and systematic entrance of data, as also they have some outputs defined so that each of them can query the information introduced. Information recorded may help on monitoring either objectives, results or activities of the programme.

Also there is some information which is transversal to all the components of the structure, those previously defined as process quality indicators (such as participation or gender). These topics shall be considered within the monitoring of all activities.

Table 1 shows some of the information collected, outputs the SIS draws with this information, as also what is being monitored (if it is an objective, a result or an activity)

Moreover information collected through surveys (baselines, closelines, census or any other specific survey) done within the programme can be included in the SIS. This may allow an easy analysis of the data collected, as also to define linkages between this information and the one collected on a regular basis.

Lastly is important to remark that this structure allows a quite flexible definition of the software framework, building it up in different modules which allow to use it even in a non-networked environment. Then with a simple procedure data can be compiled in a database to exploit it all together. Nevertheless it is important to guarantee certain connectivity between these modules: for the versions defined in Tanzania this connection is supported by the definition of the administrative structure, which has been introduced previously.

Software framework

The software framework refers to the generic structure that any monitoring tool like the SIS should have, no matter for which kind of programme it would be done. Three different parts should be considered: a database core, a data entrance interface and an information analysis interface.

The first one is the database itself together with the macros needed to operate the SIS. This has been developed with Microsoft Access. The database consists in a partially connected and unconnected structure of data due to the non-networked environments that the NGO is using.

The second component has also been developed with Microsoft Access, since it is friendly to use and has a comprehensive user's help, both features aimed in order to facilitate capacity building of staff and end-users.

Lastly, the analysis interface includes some applications specifically designed to analyze and exploit information kept on the database through a systematic way. This interface has been developed with three different parts: drawing graphics about the evolution of different processes (using Microsoft Excel, which allows an easy manipulation of the data for further analysis by staff and end-users); extracting tables and lists using Microsoft Access; and finally extracting information on a geographic basis (using gvSIG, a GIS open software, see Gilabert and Polo, 2008).

Although the three different types of data analysis are available at different levels, graphics and information displayed by the GIS have been designed mainly for the headquarters, covering mainly objectives and results indicators. Meanwhile tables and lists displayed using Microsoft Access have been planned for personnel working in the field and are principally focused on implementation indicators.

Table 1. Main inputs and outputs of SIS for the monitoring, specifying what type of monitoring do they undertake (either an objective, a result or an activity).

Structure	Topic	Input	Output	Monitoring
Hygiene Promotion and Sanitation	Health	Data from dispensaries	Reduction of morbidity on water related illnesses	Objective
	Sanitation	Latrines demand	Latrines in good working condition and sanitation improvements	Objective
		Latrines construction		
		Baseline/closetline on latrines		
	Hygiene Promotion	Baseline/closetline on hygienic habits	Improvements on hygienic habits	Objective
		Attendance to the PHAST sessions	Rate of population trained	Activity
		Number of sessions done		
	Child to Child	Number of children in Child to Child curricula	Rate of coverage of the Child to Child trainings	Result
		Child to Child activities on schools	Training of the children and improvement at school level	Activity
		School reports on Child to Child		
Technical aspects	Water system performance	Water quality analysis	Water system working properly within Tanzanian standards	Objective
		Incidents on the operation of the system		
		Census		
	Water system construction	Technical aspects of the water supply system	Water system quality	Result
		Attendance to the works	Participation of the villages in the system	Activity
	Operation and Maintenance	Check list on the system maintenance	Maintenance done on a proper way	Result
Water Management	Performance of Water Users Associations	Legalization of the Water Users Entities	Existence of Water Users Entities	Objective
		Accountancy of the Water Users Entities	Cost recovery system functioning	Result
	Performance of Water Users Groups	Registration at Water Users Groups	Acceptance of the programme	Activity
	Water Users Entities capacity building	Type of trainings and contents	Trainings curricula accomplishment	Activity
		Trainings attendance		
Process quality	Participation and gender	Women and vulnerable attendance in meetings	Equity on decision making	Objective
		Assessment on women and vulnerable groups participation		

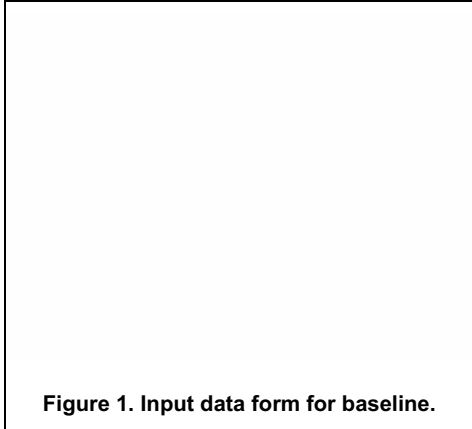


Figure 1. Input data form for baseline.

Figure 2. Input data form for accountancy.

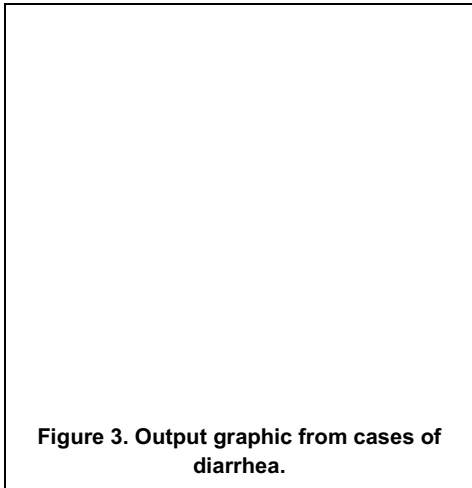


Figure 3. Output graphic from cases of diarrhea.

Works on	Charikabwinda	Muhamba	Kamava	Mumba	Kasuku	Simbo
Work production	95.3%	13.4%	48.6%	8.0%	128.0%	111.3%
Distribution pipes	38.4%	96.1%	46.7%			
Distribution tanks	41.6%	69.3%	50.8%		32.3%	125.5%
OSP	37.5%	62.6%				48.3%
Intake	38.6%	19.6%	29.1%	23.5%	22.7%	22.4%
Main line from intake to villages tanks	30.7%	24.2%	49.4%		78.7%	65.0%
Main line from intake to State tank	14.3%	23.3%	18.0%	31.2%	78.7%	180.0%
Main tank	55.9%	33.6%	32.2%	38.9%	40.9%	43.8%

Figure 4. Output table for attendance to the works.

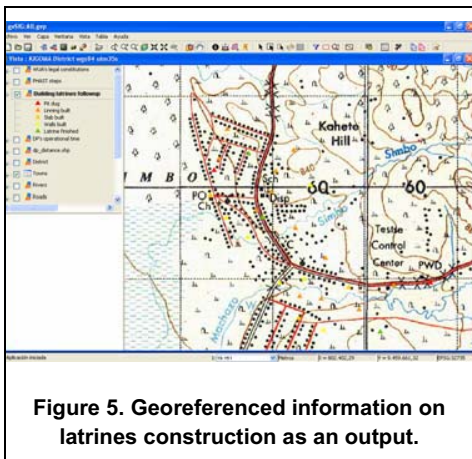


Figure 5. Georeferenced information on latrines construction as an output.

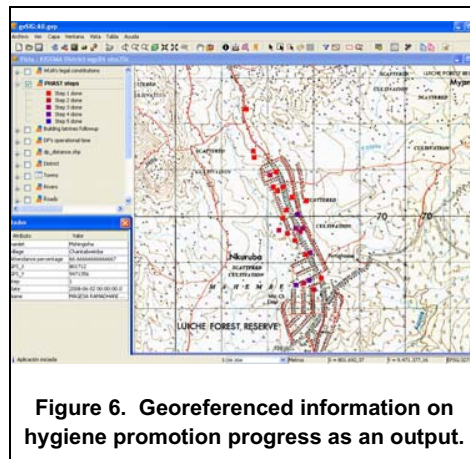


Figure 6. Georeferenced information on hygiene promotion progress as an output.

SIS Use

The use of the SIS entails some opportunities and new habits: the most important is the real time monitoring that it allows, meanwhile activities are being programmed. Furthermore, it allows a long term analysis (on a programme time-scale), while an ex-post analysis of the performance can be made, and therefore some aspects can be improved whenever an activity is aimed to be replicated, enhancing its efficiency. All the data there introduced may not only be used by the NGO, but also by researchers that may help on a deeper analysis.

Six months after its launching some facts of the day-to-day use can be exposed, as also some aspects on a long-term analysis due to the existence of a mid-term evaluation carried out on one of the programmes. Although an analysis of its use for an evaluation has been done and somehow the tool was used for it, evaluation was unfortunately just few months after the launching of the tool, so not all the potentiality the SIS could have was being used.

Day-to-day use: continuous monitoring

Commonly evaluations on programmes' implementation are done usually at the end of them (sometimes also on their mid-term) or further analysis is made when a problem clearly arises. A proper monitoring is hardly being displayed. The SIS makes easier this monitoring, and allows the problem detection from the beginning, when maybe the situation can already be corrected before it really erupts.

After some months on using the tool, the users appreciate its use. Through some interviews to users an evaluation has been done, where they expressed that the use of the SIS has done their job easier, mainly on the reporting process. The most repeated aspects were improvements on the easiness on accessing information which is considered important, and the simplification find out on data collection.

As previously explained, some useful information needed on the work in the field on a day-to-day basis can be displayed, as for example the attendance that beneficiaries have on different activities or the performance they are having on the monetary contributions to the programme. This data, which had to be treated each time before, is now being treated automatically by the SIS.

Also having the forms already displayed, helps the personnel to be concise on the data required, simplifying its collection, being it fix and already known. So the process has been established as a routine, which also is beneficial though now information is always being collected on an orderly way, and kept all together.

An aspect which may remark the importance of the tool in everybody's work is the perception on who is the target user of the tool. Meanwhile at the beginning developers had seen it as a reporting tool which would be more useful for the personnel at headquarters (as a new source of information from the field as also a tool for accountability), on interviews done to the professionals working on the field, they all expressed that the tool is useful for them, meanwhile not all of them seem to appreciate entirely its use at headquarters.

Though benefits arise rapidly, it must be taken under consideration that its implementation requires two different aspects. First of them, a proper training on its use is needed, both, in operating the database and the GIS software.. Secondly, filling up of the database has to be seen as a day-to-day task, though at the beginning results displayed will seem poor, and can cause sort of disappointment due to the initial time spent on the training and the first results. An aspect that has come up as crucial for a correct implementation of the SIS as a regular use tool is the existence of outputs to be used in the field. It can be clearly seen that the personnel mainly introduces information which themselves can later on easily extract, so it is fundamental to define some easy access to the field required outputs. Even would be of great worth to establish some of them as required in monthly reports in order to *force* its use and show how database outputs are improving its usefulness.

Long-term assessment: evaluation

Evaluation is understood both as a tool which may facilitate learning in order to improve future projects, programmes or development policies and as an instrument to spread work done among authorities and population. Then SIS is a useful tool on practicing evaluation, because it facilitates access to information, Its results can be very used for the evaluation of any intervention, allowing the evaluators to consult the objective results achieved on the SIS easily and allowing for a deeper analysis on changes that the action has brought to the beneficiaries and to society.

A classical evaluation has five different components: efficiency, efficacy, impact, relevance and sustainability. Information collected on the SIS may help on all these components, but mainly on measuring efficacy, impact and sustainability.

Efficacy shall be seen as the study of the achievement of the specific objective regarding to the results. As information collected in the SIS has data from both components, specific objective and results, the tool may facilitate its study.

Impact assessment may be supported also by the SIS, as it needs to measure how the objectives, both specific and general, have been reached. Also sustainability evaluation may be helped by the SIS.

Although impact and efficacy are implicit in the SIS because its design uses those aspects of the LFA, sustainability does not have the same chance. Although this, it is quite easy to introduce some information which may help to monitor sustainability as indicators on the appropriation of the systems, management of the system or dynamics of the maintenance once an incident is detected, among others.

From the five different components studied during an evaluation, two of them are still left, efficiency and relevance. Efficiency tries to measure how activities have been achieved according to the supplies used, but the SIS is not collecting full information on supplies. Meanwhile relevance tries to answer if the project was the best action to be done, and although SIS may have some information for it (like baseline and closeline), knowledge needed for that can not be supplied mainly by the SIS.

Besides the described contribution to the classical evaluation on the LFA, SIS also allows another analysis which is not usually done. The close follow up it does to activities implementation may allow to study if the non-achievement of a result is because assumptions were not correct or if it is due to some other reasons related to implementation. If a survey on hygienic habits at the end of the project had not shown a real improvement it could be said that methodology used was not appropriate, but maybe the real problem would be a poor attendance on the trainings and workshops, which could have not been measured if a collection of this information had not been done when the activity was being implemented.

Moreover not only evaluations can be improved by the tool, but also analysis on specific aspects of the intervention strategy that may be interesting in order to improve project implementation whenever replicability is desired, or even it can be a great source of information for researchers in order to enhance impact of different intervention strategies.

Nevertheless, it is important to remark that the tool just keeps and displays information, but besides a proper analysis is needed in order to do a long-term assessment. The tool just aims to improve the access to information and gives support for analysis, but obviously does not analyse the project performance.

Conclusions

The paper presents and analyzes a Support Information System proposal for WatSan programmes. It has been developed and implemented for monitoring two medium-scale programmes in Tanzania (between 0.5 and 1 million euros/year and 7.000 to 10.000 water-supply beneficiaries/year). Both programmes have as a main contribution the Water Facility grant.

The design and implementation of the monitoring tool has been successfully done in eight months, including training of field and headquarters staff. Continuous analysis of reporting processes have been useful to adapt and simplify some aspects of the SIS during this period. Its easiness on data introduction and its multiple interfaces on visualizing the outputs seem to be its strong points.

Examples of the usefulness of such monitoring tool range from the analysis of the spatial performance of PHAST (Participatory Hygiene and Sanitation Transformation, Wood, 1998) promoters, the relationship between the physical location of the family and its hygiene and sanitary habits, the different levels of participation of the beneficiaries in relation to the implementation of the programme where they live, or which neighbourhoods are getting off track on the sanitation improvements. At the same time, more standard analysis can be made, such as relationship among the tribe of origin and the incorporation of new hygiene habits, since data from social census are also included.

Among other aspects which should be studied, there is the possibility to adapt such a tool for the different projects that governments and local authorities do. Now the application has only been developed for an NGO, but its results could be also useful for any civil service, paying special attention to the accountability above mentioned.

Although improvements shall be studied, first version of SIS has shown to be very useful. It does not only collect in a systematic way all the information produced, but also facilitates its analysis, even on spatial representations. Moreover, the presence of information gaps on such programmes is a common situation which hinders the options on strategy evaluation whenever proceedings are needed to be revised. Hence the development of a tool which solves those aspects is considered as an improvement on the monitoring, which may enhance management decision-making. As Bond (1999) states, participation, learning and flexibility are the three key elements required to define the relationship between beneficiaries and management.

Acknowledgements

Authors would like to extend thanks to *Ingeniería sin Fronteras-Asociación por el Desarrollo* (ISF-ApD), and his staff, both in Spain and in Tanzania; without their collaboration this tool could not have been proved. Its development also has been carried out thanks to *Centre de Cooperació al Desenvolupament* of the *Universitat Politècnica de Catalunya* (CCD-UPC) and the *Agència Catalana de Cooperació al Desenvolupament* (ACCD).

References

- Bond, R. and Hulme, D. (1999) *Process Approaches to Development: Theory and Sri Lankan Practice*. World Development 27.
- European Commission (2004) *Aid Delivery Methods (Vol. 1): Project Cycle Management Guidelines*. Brussels, EuropeAid Cooperation Office.
- Gilabert, J.; Puig, C. (2008) *Estudio comparativo de herramientas SIG libres aplicadas a contextos de cooperación al desarrollo*. II Jornadas de SIG libre, Girona.
- Pérez de Armiño, K. et al. (2002) *Diccionario de Ayuda Humanitaria y Cooperación al Desarrollo*. Icaria editorial, Barcelona.
- Wood S, Sawyer R, Simpson- Hébert M. (1998) *PHAST step-by-step guide: a participatory approach for the control of diarrhoeal disease*. Geneva, World Health Organization (unpublished document WHO/EOS/98.3).

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