

## **Applying Life Cycle Thinking to International Water and Sanitation Development Projects: An assessment tool for project managers in sustainable development work**

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The United Nations Millennium Development Goals have called the issues of water and sanitation to the forefront of international development efforts. Engineers and other development workers are answering this call in increasing numbers. Yet, in order to achieve these goals it is necessary to overcome the historically low sustainability rates of development projects. This paper presents a logical framework for breaking down and analyzing the factors that affect sustainable development of water and sanitation projects.

It identifies five sustainability factors that are common throughout development literature and the policies of international aid organizations: socio-cultural respect, community participation, political cohesion, economic sustainability, and environmental sustainability. A life cycle thinking approach is chosen to assess how the sustainability of a project can be affected at each stage of its life. Five stages are identified to represent the life of a development project: needs assessment, conceptual designs and feasibility, design and action planning, implementation, and operation and maintenance.

Using the defined sustainability factors and life cycle stages, an assessment tool is developed in the form of a matrix. The matrix allows the sustainability factors to be assessed individually at each stage in the life cycle. A series of guidelines for each matrix element are given as a method for scoring the sustainability of a project. The guidelines were derived from best practice approaches to effective international development and personal experience during two years as a water and sanitation Peace Corps volunteer in Mali, West Africa. The proposed sustainability matrix allows development workers to evaluate the strengths and weaknesses of their projects during each of the five stages of the project life. Use of this framework will assist engineers and other development workers in implementing sustainable project approaches.