

Summary of Terminal Evaluation

I. Outline of the Project	
Country: Burkina Faso	Project title: Improving Sustainable Water and Sanitation Systems in Sahel Region in Africa: Case of Burkina Faso
Issue/Sector: Water and sanitation	Cooperation scheme: The Science and Technology Research Partnership for Sustainable Development Program (SATREPS)
Division in charge: JICA Global Environment Department	Total cost: 479 million Japanese Yen (as of Jan. 2015)
Period of Cooperation	<p>(R/D): 2010/3/1-2015/2/28 (5 years)</p> <p>Partner Country's Implementing Organization: Ministry of Agriculture, Water Resources, Sanitation and Food Security (MARHASA)¹, The International Institute for Water and Environmental Engineering (2iE)</p> <p>Supporting Organization in Japan : Hokkaido University, Tokyo University, Kochi University of Technology, National Institute for Land and Infrastructure Management, Fuji Women's University</p>
<p>1. Background of the Project</p> <p>The government of Burkina Faso has focused on water and sanitation as one of its priority issues as part of the "Strategy for Growth and Sustainable Development (SCADD) 2011-2015," which was developed in December 2010. One of the goals of the plan is to improve the living environment, which includes access to safe drinking water for the poor.</p> <p>In addition, in 2006, the government developed the National Program for Water Supply and Sanitation (PN-AEPA), with the following objective: "by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation will be reduced by half in comparison with 2005." This is based on target 10 from the 7th Goal of the Millennium Development Goals (MDG).</p> <p>Despite these efforts, currently only 79% of the population is able to access improved water sources (WHO/UNICEF Joint Monitoring Program (JMP) Report 2012), and the water access has also large regional disparities. The water supply rate is low in rural areas where residents consume drinking water from rivers and puddles. This also causes many water-borne diseases such as Guinea worm and diarrhea. In addition, only 17% of the population is able to access to the improved sanitation facilities that have been built (JMP Report 2012). This rate is significantly below the Sub-Saharan Africa average, and the low access to improved sanitation increases the occurrence of the above-mentioned water-borne diseases.</p> <p>When discussing the introduction of water supply and sanitation facilities to provide safe drinking water and lessen the aforementioned problems in this country, one must consider the following: these sanitation facilities must be robust in order to withstand regular use in harsh environmental conditions; they must be low cost; and they must be maintenance free, because the low income population in the Sahel region cannot afford to maintain these facilities once they are installed.</p> <p>Under these conditions, the joint research Project between the Japanese universities—represented by Hokkaido University and 2iE—began in March 2010, and continued through February 2015. The Project develops and tests the new systems for drinking water supply, wastewater reuse and excreta treatment, based on the concept "Do not collect" and "Do not mix" in the urban and rural areas of Burkina Faso. The Project also aims for capacity building of researchers through the joint research.</p> <p>2. Project Overview</p> <p>(1) Project Purpose</p> <p>The sustainable water and sanitation system that are adapted to the socio-economic and environmental contexts of the Sahel region is developed and demonstrated based on the concept "Don't mix" and "Don't collect", and the preparation of its implementation is accelerated by capacity building and socialization.</p> <p>(2) Outputs</p>	

¹The Project was initially requested by the Ministry of Agriculture and Irrigation (MAH). However, the title of the ministry has changed several times since 2013 due to reorganization. The ministry later became known as "the Ministry of Water, Hydraulic Facilities and Sanitation (MEAHA)." MEAHA then merged with "the Ministry of Agriculture." In October 2014, amidst political turmoil, the ministry was modified a third time, and is presently entitled "the Ministry of Agriculture, Hydraulic Resources, Sanitation and Food Security (MARHASA)."

- Output 1: The water supply and sanitation system that is suitable for rural areas of the Sahel region (rural model) is developed.
- Output 2: The grey water reuse related model is developed among the water supply and sanitation systems adapted to the urban areas of the Sahel region (urban model).
- Output 3: Personal capacity on development and research, and maintenance of the water supply and sanitation systems are improved.
- Output 4: The social system, including research and partnership programs for the introduction of the new water supply and sanitation system is proposed.

(3) Inputs (at the time of evaluation)

Japanese side: Total cost 479 million yen

Japanese Experts: Short term: in total 106 persons/times, Long term: 3 persons

Equipment: sample analysis equipment, demonstration plant and equipment, etc.

Local cost: 536,725,564FCfa (about 121 million yen)²

Training in Japan: 12 persons

Burkina Faso side:

Counterparts: 9 persons

Project office space in the 2iE and MARHASA

Some burden of labor costs of researchers to participate in the Project

II. Evaluation Team

Members of Evaluation Team	Yukihiko EJIRI	Team Leader (JICA)
	Tadashi KAGEYAMA	Cooperation Planning (JICA)
	Haruo ITO	Evaluation Analysis (ICONS Inc.)
	Kyo OKAWA	Interpreter 1 (JICE)
	Naoko HIRAMATSU	Interpreter 2 (JICE)
Period of Evaluation ³	2014/10/25-2014/11/7 2014/12/6-2014/12/19	Type of Evaluation: Terminal Evaluation

III. Results of Evaluation

III-1. Kenyan Component

1. Project Performance

1-1. Input and Activities

The Project plans activities under Outcome 1 to Outcome 4, and most of those activities have been implemented as originally planned, although delays in the implementation of some activities have been identified due to the evacuation of Japanese experts from April to July 2011 (because of security deterioration). There have also been delays in the contract processes with the local consultants and the construction company, and as delay in the procurement of equipment.

1-2. Outputs

Output 1: The water supply and the sanitation system that is suitable for rural areas of Sahel region (rural model) is developed.

Indicator 1-1: The composting toilet with the material cost of 100 Euros has been developed as a trial in Japan. However, this toilet has not been realized in Burkina Faso and has not tried in the pilot families.

Indicator 1-2: The total material cost of the grey water treatment unit and its interface installed in pilot families reached 124 Euros.

Indicator 1-3: The French versions of the draft manual for the use of compost, urine, and grey water were developed and it is expected to be completed before the end of the Project.

Indicator 1-4: The water filtration systems with the ceramic membrane filtration and the filtration system, which can be developed in Burkina Faso, have been proposed.

Output 2: The greywater reuse related model is developed among the water supply and sanitation systems adapted to the urban areas of Sahel region (urban model).

² 1FCFA = 0.226 yen (as of 14 Dec. 2014)

³ The first field survey of the evaluation was interrupted due to the political change that occurred in Burkina Faso during the initial period of the evaluation; therefore, the field survey was implemented in two stages.

Indicator 2-1: A grey water treatment plant with a high rate algal pond was built in the 2iE Kamboinsé campus.
Indicator 2-2: Technical transfer of the maintenance for the urban model to a 2iE technician is required. The current maintenance technician is a temporary staff person, hired by the Project. The technical transfer is expected to be completed by the end of the Project.
Indicator 2-3: The evaluation reports of experimentation (in laboratory and field) have been developed. The English version of the draft manual was developed, and the manual is expected to be completed by the end of the Project.

Output 3: Personal capacity on development and research, and maintenance of the water supply and sanitation systems are developed.

Indicator 3-1: For the rural model, the Project has trained one local engineer who is familiar with the composting toilet and grey water treatment system. Additionally, one or two local craftsmen in each pilot village will be trained before the end of the Project.
Indicator 3-2: Workshops about the use and maintenance of the rural models were implemented: three times for the entire village, six times for pilot families, and once for pilot farm families.

Output 4: The social system, including research and partnership programs for the introduction of the new water supply and the sanitation system, is proposed.

Indicator 4-1: Based on the accumulation of research results over the last five years, a number of papers have been written. In addition, there have been presentations from academic conferences, which have also been implemented.
Indicator 4-2: Regarding the rural model, the prediction of revenue increases and use of micro credits were simulated by applying the developed business model. The business model for the peri-urban areas should be proposed before the end of the Project.

1-3. Project Purpose

The water supply and the sanitation system adapted to Sahel region are developed and tested based on the concept of "Do not mix" and "Do not collect," and the introduction of the system is accelerated.

Indicators 1, 2: The performance comparison charts of the traditional water supply system and guidelines, and the proposal for the introduction of the water supply system have already been drafted, and those documents will be completed before the end of the Project.
Indicator 3: Four papers by 2iE researchers as first authors have been published in journals with impact factors.
Indicator 4: There is an operation and maintenance situation with the rural families that needs to be addressed. The pilot families have neglected, broken, composting toilets. Furthermore, the filters of grey water treatment units have not been cleaned and it has been observed that untreated grey water has overflowed into surrounding soil.

2. Summary of Evaluation Results

2-1. Relevance: Fairly high

The project purpose has been consistent with the needs of the government of Burkina Faso and the counterpart research institution (2iE). However, the water supply and sanitation sector has been excluded from the priority sectors of the Japanese cooperation strategy with Burkina Faso since 2012.

2-2. Effectiveness: Fairly high

The project purpose "developing and testing the water supply and the sanitation system adapted to Sahel region" and its indicators have almost been attained. However, as rural models in pilot families have not been fully functional, the necessity for further improvement of essential techniques has been confirmed for future social implementation. On the other hand, each Output has contributed to attaining the project purpose. Moreover, high achievement has been identified in the capacity development of the researchers, which was an important part of the Project. Above all, the effectiveness of the Project is evaluated as fairly high.

2-3. Efficiency: Middle

The training in Japan presents precious opportunities for 2iE researchers to understand the principal technologies which are developed by Japanese researchers. However, even now, the composting toilets have repeatedly broken and been enhanced. Furthermore, in regards to the water supply system, the technical transfer to counterparts and the experimental ceramic filter devices and solar heat have not yet been provided. Therefore, the effective use of the inputs of those principal technologies remains as an issue to be

solved.

2-4. Impact: Middle

The positive impacts on research and human resource development were identified. However, the social implementation of the project results, which will become more important in the scheme of SATREPS, has many issues that need to be solved. The development of principal technologies has remained at the pilot level. Therefore, the developed technologies in the Project have not attained the desired level of dissemination to other areas.

2-5. Sustainability: Middle

The Project will remain a priority for the government of Burkina Faso, and continuous research by the young researchers trained for the Project is expected. In addition, improvement of principal technologies and materialization of the business model as it relates to the technical aspects, and securing a sufficient budget are issues that remain.

3. Factors that Promoted Realization of Effects

3-1. Factors concerning the Planning

None

3-2. Factors concerning the Implementation Process

Counterpart training in Japan has been an important opportunity for 2iE researchers, in order to promote the understanding of each technical aspect of the Project. In addition, the career development supports by attending the PhD course at Hokkaido University and the participation of international academic conferences have contributed to promoting the active participation of researchers to the project activities.

4. Factors that Impeded Realization of Effects

4-1. Factors concerning the Planning

None

4-2. Factors concerning the Implementation Process

- The compost is restricted in its use only in the experimentation farm of the 2iE campus. It is restricted there because the Project has focused on developing the inactivation technology of pathogenic microorganisms based on the recommendation of MARHASA, as people's health and safety is a priority in reusing compost with the pilot families.
- At the beginning of the Project, the field activity plan of Japanese researchers and the terms of reference (TOR) of short-term experts were not sufficiently shared with the researchers of 2iE, so the coordination between both parties was difficult. However, the situation has been greatly improved. Furthermore, the departure of the sociologist recruited and trained by 2iE for her studies at Hokkaido University was sudden, and this vacancy had some negative impact on the project activities.

5. Conclusion

It was confirmed that the Project has positively influenced the training of young researchers, improved the research environment, and helped to accumulate research findings through the development of principal technologies in 2iE. As a whole, the activities have been implemented smoothly, and most of the fixed indicators will be achieved before the end of the Project. However, the Burkina side is expected to continue their activities as improvements on principal technologies are still needed for proper social implementation. Concerning the five evaluation criteria, relevance and effectiveness are evaluated as "fairly high," while efficiency, impact and sustainability are graded as "middle."

6. Recommendations

6-1. Before the end of the Project

(1) Completion of project activities

The remaining activities, such as installation of improved composting toilets, finalization, and disseminating manuals and reports should be completed.

(2) Establishment of the operation and maintenance system for the rural model

Technical transfer of responsibilities to selected local engineers and distribution of manuals should be

implemented regarding the improved model of the composting toilets. Moreover, after explaining to pilot families that they will be charged with the repair costs of composting toilets and grey water units after the end of the Project, the Project should confirm whether the families wish to continue using those facilities. In the event they refuse the upkeep, the Project should take measures to remove those facilities from pilot families.

(3) Establishment of the operation and maintenance system for the urban model

The person in charge of facility operation and maintenance in 2iE should be trained on the introduced urban model. In addition, 2iE should consider the necessary expenses to cover the operation and maintenance costs for the urban model after the end of the Project.

6-2. After the Project Ends

(1) Continuation of research on principal technologies for social implementation

Concerning composting toilets, grey water treatment units, water filtration systems, and the urban model, the remaining issues for the future social implementation should be improved continually.

(2) Concretization of the business model

Concretization of the business model should be promoted with comprehension of the life styles and needs of farmers through social study, identification and securement of facilitating organizations, formulation of the value chain, and cost estimation including installation cost of principal technologies.

(3) Continuous advocacy to the government of Burkina Faso

In order to demonstrate the accumulated experiences and principal technologies of the Project in relation to the national policy and programs, advocacy to policy-makers in the government of Burkina Faso should be continued through international conferences and report presentations. It is especially necessary for the social implementation of urban and rural models, to raise the awareness of the key persons within the government of Burkina Faso. This will be done by sharing about the Project during regular informational meetings.

7. Lessons Learned

(1) Selection of counterpart organizations which promote social implementation

The counterpart organization of the Project, 2iE, is not a domestic research institutions but the international research institution, 2iE. As the main organizational purposes of 2iE are research and development, not dissemination, it was difficult having 2iE play the role of coordinator between other related governmental organizations for the future social implementation. Furthermore, the active involvement of the related government organizations was not observed because they were not main actors on the Project. If the SATREPS scheme aims to promote social implementation in the future, the counterpart organizations should be selected from national or public universities or related governmental organizations of recipient countries, not from the international research institutions alone. Moreover, the Project Director should also be selected from those related government organizations. It is not an issue to have an international research institution involved in the project activity as a counterpart organization, but careful consideration should be given before selecting an international research institution as the single counterpart.

(2) Ensuring feedback of the findings from the Mid-term review

It was identified that results and recommendations from the Mid-term review have not been sufficiently shared among concerned parties of the Project, and only partial feedback of the review has been completed. This was partially because of the lack of sufficient monitoring of Mid-term review recommendations by JICA. Thus, JICA needs to monitor and support the Project activities in order to encourage steady feedback for the results and recommendations required for the Mid-term review.

8. Follow-up Situation

N/A