

Summary of Terminal Evaluation

1. Outline of the Project		
Country: Nicaragua		Project title: Chagas' Disease Control Project
Issue/Sector: Public Health– Other Infectious Diseases		Cooperation scheme: Technical Cooperation Project
Division in charge: Human Development Department		Total cost (estimated at completion of the Project): approximately 380 million yen
Period of Cooperation	(R/D): From Sep. 1, 2009 to August 31, 2014 (5 years)	Partner Country's Implementing Organization: Ministry of Health (Ministerio de Salud: MINSA)
		Supporting Organizations in Japan: None
		Other relating cooperation: PAHO, JOCV
1-1 Background of the Project		
<p>Chagas' disease is an infectious disease transmitted by blood-sucking insects of the genera <i>Triatoma</i>, <i>Phodnius</i> and <i>Panstrongylus</i>, and widely spread in Central and South America. It is estimated that over 7.5 million people are infected and the Pan American Health Organization (PAHO) claims that it is the second serious tropical disease after malaria. Under the circumstances JICA started researches on Chagas' disease through Tropical Disease Control Project in Guatemala in 1991, and has implemented technical cooperation projects in Guatemala, Honduras and El Salvador.</p> <p>In Nicaragua, according to PAHO 2005 data, at least 50 thousand people are infected by Chagas disease out of a population of 5.14 million. The insect tends to inhabit in houses made of mud walls and dry straws; therefore, the poor who tend to live in such houses are at risk of infection and high infection is concentrated in the northern areas.</p> <p>Requested by the Government of Nicaragua, "Chagas' Disease Control Project" was commenced in the northern five prefectures (Nueva Segovia, Madriz, Matagalpa, Jinotega, Esterí) applying the knowledge and experiences acquired in the other countries. Having MINSA as the implementing institution, "continuous control of the infection by the insects" was set as the project purpose and the Project has been under implementation from Sep. 2009 to Aug. 2014. The Project is focusing on capacity building in the following 4 fields: 1. Capacity of conducting surveys (serological and entomological), 2. Capacity of operating and managing spraying (Attack Phase), 3. Capacity of operating and managing surveillance systems (Surveillance Phase), and 4. Community's Capacity of prevention.</p>		
1-2 Project Overview		
(1) Overall Goal		
Vectorial transmission of Chagas disease is interrupted in the Project-targeting 5 prefectures.		
(2) Project Purpose		
Vectorial transmission of Chagas disease is controlled on a sustainable basis. in the Project-targeting 5 prefectures.		
(3) Outputs		
1. MINSA's capacity of conducting surveys integrated/coordinated between entomological and serological is strengthened.		

2. MINSA's capacity of operating and managing spraying is strengthened.
3. MINSA's capacity of operating and managing surveillance systems is strengthened.
4. Community's capacity of prevention of Chagas disease is empowered.

(4) Inputs

Japanese side:

JICA Expert: A total of 5 long-term and 15 short-term experts; Training in Japan: 7 C/Ps (Individual & Group)

Provision of equipment: A total of 93.9 million yen

Japan's cost expenditure: 79.9 million yen

Cambodian side:

Counterpart: A total of 7 persons (headquarter, MINSA), and many others (in the 5 prefectures)

Local Cost: Energy expenses and personnel costs, etc. (approximately 17.5 million yen in 2012/2013)

Provision of land and facilities: Office spaces for Japanese experts in the headquarter and Esterí, MINSA)

2. Evaluation Team			
Members of Evaluation Team	Kyo HANADA	Team Leader	Senior Advisor, JICA
	Tomomi YAMADA	Coordination & Planning	Health Division 4, Human Development Department, JICA
	Yoshihito KASHIWAZAKI	Evaluation & Analysis	Consultant, A&M Consultant, Inc.
	Fusako YAMAWAKI	Interpreter	
	Perla Elizabeth López	Evaluation & Analysis	Department of Foreign Cooperation, MINSA
	Vanessa Alcira Molina	Evaluation & Analysis	Department of Planning and Development
Period of Evaluation	From Feb. 9 to Mar. 3, 2014	Type of Evaluation: Terminal Evaluation	

3. Results of Evaluation

3-1 Achievement

(Output)

Output 1: Indicator 1-1 “proportion of the target municipalities identified in an evidence-based manner (>90%)” has been achieved; 100% of the target municipalities were chosen according to evidence such as record of vector infestation. Indicator 1-2 “elementary school children’s sero-prevalence rate is obtained in fixed-point monitoring communities” will be achieved; blood sampling has been conducted with only the ELISA test remaining.

Output 2: As for indicator 2-1 “100% of R.prolixus (R.p.)-infested communities are sprayed based on the provisional guidelines in the target municipalities”, R.p. has been found in San Ramon municipality in Matagalpa in February 2013, and the community and the surrounding communities have been sprayed. Regarding indicator 2-2 “100% of high risk T.dimidiata (T.d.)-infested communities are sprayed based on the provisional guidelines in the target municipalities”, a total of 15,051 households have been sprayed from January 2011 to June 2012, and 30,384 households and estimated 37,461 households have been sprayed

utilizing the counterpart fund of the Grant Aid Scheme. Regarding indicator 2-3 “impact of attack phase intervention is estimated by domestic infestation rate of T.d.”, the infestation rate of T.d. has decreased dramatically after the attack phase; in 58 communities of 4 municipalities in Hinotega, the infestation rate decreased from 23.8% at baseline survey (January to July 2010) to 4% after the first spraying (May to July 2013). The similar tendency was observed in other districts.

Output 3: Regarding indicator 3-1 “all target SILAIS report the number of cases of Chagas disease to MINSA and the number of cases is publicized in the monthly epidemiological bulletin”, the patient registration rate to the MINSA epidemiological information system has risen from 45% in 2011 to 99% in 2013. Also, data up to the 17th week of 2013 has been uploaded in the epidemiological weekly bulletin. Regarding indicator 3-2 “all pilot municipalities of the surveillance system continuously report the number of vectors captured for 24 months” has been achieved; all 7 target municipalities reported the number of houses which reported vectors for 24 months. Regarding indicator 3-3 “response rate in pilot municipalities of the surveillance system (target: 70%)”, the average response rate between January to June 2013 was 74.4% but it improved to 100% between July to December 2013. As for indicator 3-4 “pilot municipalities of the surveillance system fulfill the criteria of the monitoring and supervision checklist”, the result of the monitoring and supervision conducted in February 2013 fulfilled the standard value of 80%. Regarding indicator 3-5 “technical supervision to the municipalities by MINSA or SILAIS is conducted semiannually”, SILAIS has started to conduct technical supervision on the surveillance system to the municipalities from late 2013. Also, information was shared by MINSA to the municipalities in the surveillance workshops conducted semiannually. Regarding the expansion of the surveillance system to regions other than the pilot municipalities, which was proposed in the mid-term review, it has been expanded to 49 municipalities by December 2013.

Output 4: Regarding indicator 4-1 “% of municipalities which conducted the campaign for submitting vectors in project target districts (objective: 70%)”, the campaign has been conducted in 81.6% of the municipalities in 2012 and in 100% in 2013. As for indicator 4-2 “% of municipalities practicing housing improvement/living improvement in the pilot municipalities of the surveillance system (objective: 50%)”, the % was 57.1% in December 2013. As for household improvement, it is also conducted in municipalities other than the pilot municipalities.

(Project Purpose)

As explained above, the Project has already produced a variety of outputs in terms of field studies, vector control and promotion, therefore, it is expected that the Project Purpose will be achieved by the completion of the Project through practice of the scheduled activities. On the other hand, a part of the indicators cannot be found out until the completion of the second insecticide spray and its efficacy evaluation.

Indicator 1 “Domestic infestation rate (<5%) of T.d. in the project target municipalities” & 2 “number of communities with R.p. infestation in the project target municipalities”: It is still early to assess the achievement level as the second insecticide spray is on-going.

Indicator 3 “Coverage of surveillance system in the surveillance system pilot municipalities (objective: 100%)”: Achieved. The coverage of the surveillance system in the pilot cities has already reached 100% in December 2013.

Indicator 4 “% of municipalities which introduced the surveillance system in the project target districts (objective: 50%)”: Achieved. A hundred percent of the targeting cities (49/49) have introduced the surveillance system tested in the pilot cities.

(Prospective for Overall Goal)

It is still too early to assess the achievement.

Indicator 1 “Sero-prevalence rate of under 16 years old ($\approx 0\%$): The positive rate of under 3 years old can become close to 0 in 2017. As for children between 4 and 15 years old, the positive rate will not become close to zero even if the halt of the infection is achieved since the positive rates of these children in 2017 reflects those between 1 and 12 years old at the end of the Project (2014).

Indicator 2 “Domestic infestation rate of T.d. ($<5\%$): It is anticipated that Indicator 1 for Project Purpose "Domestic infestation rate of *T. dimidiata* in target municipalities of the baseline survey. ($<5\%$) " is achieved and the surveillance system is functioning in the target prefectures.

Indicator 3 “Number of communities infested with R.p. ($=0$)” It is anticipated that Indicator 2 for Project Purpose "The number of communities infested by *R. prolixus* in target municipalities of the baseline survey. ($=0$) " is achieved and the surveillance system is functioning in the target prefectures.

3-2 Summary of Evaluation Results**(1) Relevance:** Very High

The Overall Goal of the Project is consistent with both the development policy of the Government of Nicaragua and the Japanese Country Assistance Policy for Nicaragua. The Project has been applying the knowledge and experiences derived from the similar projects implemented in Guatemala, Honduras and El Salvador in the past, which gained the ascendancy of Japanese skills in the control of Chagas' disease. In addition, the Norm and Work Manual prepared by the Project were approved by MINSAs as a ministerial ordinance, which enabled Chagas' disease control modeled upon the Project to extend nationwide.

(2) Effectiveness: High

Two out of the four indicators for Project Purpose have not been achieved yet but expected to be achieved towards the end of the Project. Moreover, the Project is keeping a close relationship with PAHO as well as JOCV members (one each for the 5 prefectures), which have produced considerable outcomes in terms of extension, education and prevention at the community level.

(3) Efficiency: High

All the activities except "Activity 3-8 Administration of surveillance system on acute cases" are either achieved or expected to be achieved, which demonstrates appropriate conditions for achievement of the Outputs. Furthermore, the Project could practice a large number of activities in a relatively short period by exploiting the knowledge and experiences from the similar Chagas' disease projects in the other countries, which proves the efficiency of the Project. In addition, the community volunteers from ordinary residents have been supporting the project activities and playing an important role in Chagas' disease control at the community level without any payment. They are the media between the Project/MINSAs team and the residents and the Project could not have produced such a number of outputs without their presence.

(4) Impact: High

1. The Norm and Work Manual produced through the Project Activities were approved by MINSAs as a ministerial ordinance, which enabled Chagas' disease control modeled upon the Project to be extended nationwide.
2. Agriculture cooperation and credit unions have built deeper understanding in Chagas' disease control

through financial supporting the housing/living improvement activities.

3. Construction companies also joined the workshop on housing improvement and came to apply the technologies recommended by the Project to their daily work.
4. The utilization of schools as a venue for enlightenment activities produced a cooperative relationship with the Ministry of Education.
5. The information on the Project has been transmitted to the public through a variety of media such as academic papers, websites, newspapers TV and radio.
6. Improvement of the housing conditions apt for insect infestation brought tidiness and order at home and also lifted up men's awareness, which urged them to help housework.

(5) Sustainability:

- 1) **Political aspect:** High. The Norm and Work Manual being formulated by the Project and approved by MINSA are very significant and provide a firm ground for Chagas' disease control.
- 2) **Institutional aspect:** Relatively high. Nationwide practice can be expected making use of institutional capability of MINSA although the person in charge of Chagas' disease is also responsible for other several diseases comprehensively. Additionally, the capacity for continuation of the project activities is well acknowledged as strong coordination and communication between the local health officers and residents is strongly coordinated
- 3) **Financial aspect:** Continuous efforts are necessary. MINSA is expected to capitalize the budget for procurement of insecticide and running costs for equipment on the short-term ministry plan after 2015 with continuous efforts to secure budget. The support from companies, NGOs' cooperation and municipalities as well as PAHO is anticipated to sustain.
- 4) **Technical aspect:** High. A wide variety of skills have been transferred. The Nicaraguan colleagues have developed the capabilities to cope with difficulties as they have been practicing management skills to locate the issues and find their solutions through the project workshops and routine works.

3-3 Factors that helped the implementation of the Project

A variety of institutions and organizations such as PAHO, the Ministry of Education (schools), community networks (health volunteers), NGOs, and JOCV participated in the project activities. They supported the smooth implementation of the project.

3-4 Factors that impeded the implementation of the Project

Some cities and prefectures have sometimes had various inhibiting factors (shortage of personnel and budget, epidemics of dengue fever, etc.), however, most of them are inevitable problems in any working place. It will be a challenging issue to practice Chagas' disease control comprehensively with other disease control schemes since some problem on the leadership and management has been observed at the central level of MINSA.

3-5 Conclusion

The relevance of the Project was confirmed to be very high as the Overall Goal is consistent with the Nicaraguan development policy as well as the Japanese assistance policy and also satisfies the needs of the target areas and groups. Especially, it is significant that the Norm and Work Manual were formulated by the Project and approved by the MINSA. Moreover, the results of the study regarding achievement of the Outputs

and Activities prove high effectiveness and efficiency of the Project which has produced a variety of outputs out of relatively small inputs by utilizing the existing community networks, coordinating with multiple institutions and applying lessons from the past experiences. Various positive impacts produced through the multi-institutional coordination and promotion activities based at schools have also been observed and the Overall Goal is expected to be achieved if the fixed-point serological survey and nationwide implementation of surveillance system are put in practice. The sustainability is considered high from the political and technical aspects, and nevertheless, continuous efforts to secure leadership, management capacity and budget are necessary from the institutional and financial aspects.

3-6 Recommendations

(For the Project)

1. Establishment of a system to secure the sustainability of Chagas' disease control
A system to secure the sustainability of monitoring and evaluation according to the Norm and Work Manual should be established.
2. Promotion of the second insecticide spray and evaluation of its efficacy
At the terminal evaluation several indicators were not available due to delay of the second insecticide spray. Therefore, the achievement of Outputs and Project Purpose should be clarified by implementing the evaluation of its efficacy properly after the second spray.
3. Nationwide practice of the surveillance system for acute patients
In terms of "Activity 3-8 Administration of surveillance system for acute cases" the surveillance system is expected to be in action according to the Norm and Work Manual.
4. Completion of serological survey
The seroprevalence in the high-risk areas should be illustrated by refining the system concerning the serological study in order to establish the grounds for the fixed-point observation.

(For the Ministry of Health: MINSA)

1. Nationwide promotion of the trainings on the Norm and Work Manual
In terms of the nationwide trainings on the Norm and Work Manual commenced in January 2014, the Directorate of General Education and Investigation of MINSA should be responsible for monitoring the progress and distribution of materials, and moreover, cope with any problem encountered collaborating with the Directorate of General Vigilance of Public Health.
2. Capacity development for sustainable activities
The MINSA should establish the system described in "Recommendations for the Project 1", and monitor and supervise the activities based on the Norm and Work Manual coordinating with the related institutions (the other Directorates of MINSA, PAHO, JICA Nicaragua Office, etc.) .
3. Improvement of serological diagnosis
The reproducibility of the results of the ELISA detecting anti-T. cruzi antibodies has been recognized somewhat unsatisfactory. The kit is prepared by the CNDR and expected to be a major diagnostic tool

to facilitate the detection of chronic cases economically. Therefore, the quality of the kit as well as the existing diagnostic system are ought to be improved with cooperation of PAHO in order to secure the reliance of the results satisfying the international standards.

4. Allocation of sufficient budget

Sufficient budget ample for the activities according to the Norm and Work Manual should be capitalized and secured.

5. Strengthening of responses for patients

The Directorate General for Health Services in MINSA should strengthen responses for Chagas-positive patient including diagnosis and treatment.

3-7 Lessons Learned

(For Chagas' disease control projects)

1. The Chagas' disease control became one of the routine works of MINSA as the administration staff of each level such as the directors of the SILAISes and municipal health centers have been involved in the Project Activities, which contributed to raising its sustainability.
2. Nationwide application and sustainability of Chagas' disease control were secured through the formulation of the Norm and Work Manual by the Project and their approval as ministerial ordinance by the MINSA.
3. Standardization of the various formats facilitated the comparison and analysis of the data, which has activated the competition between the regions. Eventually, the surveillance system was extended and the monitoring for improvement of the data quality practiced.
4. The relationship with the community networks has been deepened by the ESAFC taking charge of management of vector surveillance system, which resulted in the establishment of Chagas' disease control at the grass root level.
5. A number of stakeholders (the Ministry of Education, NGOs, churches, etc.) have been involved in the promotion activities as primary schools were set as a venue for them. In addition, the activities for housing improvement also captured the support from municipalities, NGOs and private companies and contributed to not only Chagas' disease control but poverty reduction.
6. The utilization of flow charts (illustrated work flow) in the Norm and Work Manual enabled all the related personnel to comprehend the procedures and details on Chagas' disease control.
7. The Project could make the most of the knowledge on Chagas' disease control built up in JICA through a lively exchange of ideas and information with the project experts and colleagues involved in the past JICA projects in the other countries, which have been running for a long time in Central America. In addition, the coordination with the ex-trainees on living improvement led to efficient implementation of the Project, which resulted in shortening of the project period and effective production of the Outputs.

(For general technical cooperation projects)

1. It is important to select a base for extension and enlightenment activities by expecting the ripple effects of the direct target groups and schools are considered to be one of the most effective sites.
2. Under an existing health system, the endeavors to take project activities into the routine works of the health medical personnel by documentation will lead to improvement on financial sustainability.
3. Pilot sites for extension of project outputs are recommended to set several as one of the measures to activate the drive for the activities by applying elements of competition.
4. The works and services of the public sectors tend to be vulnerable to political decisions in Central America. Therefore, the establishment of disease control programs in schools and communities is a key to secure its sustainability as they are less subjected to the politics.