Republic of Nicaragua

FY2022 Ex-Post Evaluation Report of
Japanese Grant Aid Project
"Project for Improvement of Educational Facilities in the Madriz and Nueva Segovia Departments"

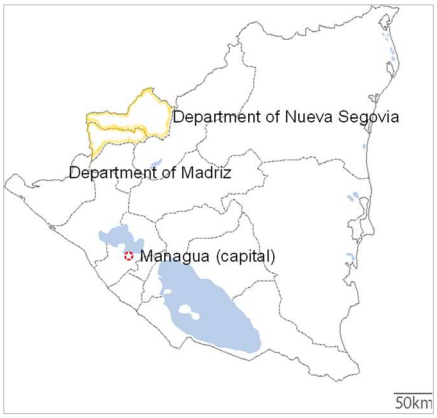
External Evaluator: Junko Noguchi
Foundation for Advanced Studies on International Development

0. Summary

This project was implemented to improve the learning environment where students can learn safely and securely in two northern departments of Nicaragua, by rebuilding and expanding basic education facilities, thereby contributing to improve access and quality of basic education in the target areas. The project was relevant with Nicaragua's development policies, which have emphasized the development of school facilities to foster human resources and improve the quality of basic education, as well as with the needs for school facilities in the target departments. Japan's assistance policy toward Nicaragua also emphasized the importance of improving the quality of basic education, including developing facilities; therefore, the project relevance and coherence are high. Although the project cost was within the plan, the project period significantly exceeded the plan due to two unsuccessful bids; therefore, efficiency of the project was relatively low. The student registration was slightly below the target due to external factors, but the project provided a safe and secure learning environment for students. In addition, it was confirmed that teachers, students, and parents have become motivated and that the methods of conducting classes were improved, although the toilets and kitchens have not been utilized for their original purpose in some schools. Thus, it can be said that effectiveness and impact of the project is high. Regarding sustainability, there have been some minor financial challenges in operating and maintaining facilities the project developed, but the prospects for improvement and resolution are high. Therefore, sustainability of the project effect is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description



Project Location (Prepared by the External Evaluator with the Map Provided by JICA)

A School Constructed by the Project (Photograph Taken by the External Evaluator[1])

1.1 Background

In Nicaragua, although the net enrollment rate in primary education (six years) was relatively high at 89.1% (2013), the rate in secondary education (first three years and second two years) was much lower at 50.6% (2013). The high repetition and dropout rates majorly impeded human resource development. The Government of Nicaragua, in its *Strategic Plan for Education* (2011-2015), had identified as one of its priorities the rehabilitation and expansion of school facilities, along with improving the quality of basic education. According to the plan, there was a disparity between urban and rural areas regarding educational services, and the lack of classrooms in rural areas and the high percentage of school facilities that required rehabilitation and repair were identified as impediments to improve access to education. In the Departments of Madriz and Nueva Segovia located in the northern part of the country, the classroom shortage and the deterioration of existing school facilities were particularly pronounced.

1.2 Project Outline

The objective of this project is to improve the learning environment where students can learn safely and securely in two northern departments of Nicaragua, by rebuilding and expanding basic education facilities, thereby contributing to improving access and quality of basic education in the target areas.

Grant Limit / Actual Grant Amount	1,267 million yen / 1,234 million yen
Exchange of Notes Date / Grant Agreement Date	June 2015, May 2019 (Amendment) / June 2015, January 2018 (Amendment 1), May 2019 (Amendment 2)

[1] Photos inserted in this report were taken by the external evaluator in February 2023, except for the photo 10 which was taken by the local consultant.

Executing Agency	Ministry of Education (MINED)
Project Completion	November 2019
Target Area	Departments of Madriz and Nueva Segovia
Main Contractor	Tokura Corporation
Main Consultants	Mohri, Architect & Associates, Inc., Yachiyo Engineering Co., Ltd.
Preparatory Survey	May 2014 to May 2015
Related Projects	"Project for Rehabilitation of School Infrastructure in the Departments of Rivas, Boaco and Chontales" (Phase 1: 2005, Phase 2: 2006), "Project for the Rehabilitation and Equipment of the Scholastic Centers in the North Region of Nicaragua" (2008), "Project for Improving the Learning of Mathematics in primary education phase 2" (2012-2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Junko Noguchi, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: August 2022 to October 2023

Duration of the Field Study: February 12 to February 25, 2023

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance/Coherence (Rating: ③[3])

3.1.1. Relevance (Rating: ③)

3.1.1.1 Consistency with the Development Plan of Nicaragua

The *National Human Development Plan* (2012-2016) stated that classrooms and equipment were important to the teaching process as part of the education sector policy and that active school and community participation was required to maintain school facilities. The succeeding *National Human Development Plan* (2022-2026) similarly identified constructing and rehabilitating schools and classrooms as one of the education system's goals leading to human resource development. The *Strategic Plan for Education* (2011-2015), a development policy for the education sector, also prioritized rehabilitating and standardizing school facilities, along with improving the quality of basic education. Although a succeeding plan to this plan was under preparation at the time of the ex-post evaluation, in October 2022, the Ministress of Education stated that improving school facilities would be included in the

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ④: Very High, ③: High, ②: Moderately Low, ①: Low

coming plan as well.[4]

In light of the above, Thus, both at the time of ex-ante and ex-post evaluation, the development of school infrastructure was identified as one of the policy objectives of the national development plan to improve the quality of education included, and the same is true for the education sector plan. Thus, the project is consistent with Nicaragua's development policy.

3.1.1.2 Consistency with the Development Needs of Nicaragua

The Departments of Madriz and Nueva Segovia are located in the upper reaches of the Coco River in a mountainous region with elevations ranging from 300 meters to 1,400 meters, and the topography is rugged. Many schools are located on sites where erosion cliffs are immediately approaching or on sloping sites, and many schools in the target area were at risk of damage from the inflow of sediment and muddy water from slopes and streams into the school sites; collapses; and falling rocks. Furthermore, at the time of project planning, many classrooms were buildings made of bricks or concrete blocks reinforced with concrete frames, buildings of blocks made of soil and mortar around them (Photo 1), or temporary wooden buildings. Because of the lack of classrooms, classes were sometimes held in the vacant spaces of neighboring houses or on vacant lots. Even at the time of ex-post evaluation, about 30% of the 9,105 schools nationwide needed immediate maintenance (Photo 2).[5]

Photo 1. A Classroom Used before the Project (Madriz)

Photo 2. Open-Air Class at the Time of Ex-Post Evaluation (Nueva Segovia)

The net enrollment rates in primary education in the Departments of Madriz and Nueva Segovia in 2013 were 83.4% and 80.1%, respectively, while the net enrollment rates in secondary education were 46.5% and 40.8%, respectively. Both educational levels were below the national average (primary education: 89.1% and secondary education: 50.6%). In both departments, net enrollment in primary education had been declining since 2011, and there should have been more classrooms to accommodate those who should have been enrolled. At the time of ex-post evaluation, secondary enrollment in both departments had improved since

[4] Statement on the national television program. TN8 website, https://www.tn8.tv/nacionales/ano-escolar-2022-y-metas-educativas-2023-en-nicaragua/ Accessed on March 8th, 2023.

[5] Interview result of MINED.

the time of the project planning, but primary enrollment was declining.

Table 1. Net Enrollment Rates in Primary and Secondary Education in Madriz and Nueva Segovia

(Unit: %)

		2011	2012	2013	2020	2021	2022
Primary	Madriz	85.6	81.2	83.4	78.0	78.4	77.9
	Nueva Segovia	88.1	83.7	80.1	74.7	74.5	72.3
	National Average	93.6	90.8	89.1	92.2	92.6	92.5
Secondary	Madriz	42.9	44.2	46.5	52.5	54.8	53.8
	Nueva Segovia	38.8	40.4	40.8	45.8	46.5	44.3
	National Average	46.4	47.9	50.6	57.1	58.5	58.9

Source: Preparatory Survey Report, Questionnaire answer of MINED.

Thus, the project is consistent with Nicaragua's development needs in two northern departments of Nicaragua, as was the need for expanding the school facilities and a safe environment with reduced risk of disaster at the time of both ex-ante and ex-post evaluation.

3.1.2 Coherence (Rating: ②)

3.1.2.1 Consistency with Japan's ODA Policy

In the *Country Assistance Policy for the Republic of Nicaragua* (2013), the basic principle (general objective) was "stable economic development through reduction of poverty and disparity." One of the priority areas was, "social development for the poor population and regions," which aimed to contribute to improve the quality of primary and secondary education, including maintaining facilities, to support the poor population in rural areas and other regions. Another priority area, "environmental conservation and disaster prevention," stated that support would be provided in the area of disaster management, including disaster risk reduction and response to disasters, utilizing Japan's knowledge and expertise. This project aimed to create a safe and secure learning environment for Nicaraguan students, incorporating the perspective of disaster prevention, it is consistent with Japan's ODA policy at the time of ex-ante evaluation.

3.1.2.2 Internal Coherence

In Nicaragua, improving the academic achievement of mathematics in primary education was an urgent issue, and the Japan International Cooperation Agency (JICA) implemented the "Project for Improvement on the Quality of Mathematics Teaching in Primary Education" (PROMECEM) (2006-2011), through which textbooks for students in Grades 1 to 6, teaching guides for teachers, and teaching plans for the "Mathematics and Teaching Methods" course were developed. In PROMECEM Phase 2 (2012-2015), efforts

were made to improve the teaching skills of mathematics instructors at teacher training schools (Normal Schools). Although the development of school facilities under this project and the efforts of PROMECEM Phase 2 complement each other to improve the quality of and access to education, no specific collaborative activities were planned or implemented.

3.1.2.3 External Coherence

The target area of the project is located in a mountainous region with poor accessibility, and little support from other partners had been implemented. Although overlap with other partners' projects was avoided, no particular collaborative activities aimed for synergistic effects were planned.

In light of the above, the project is relevant with the Nicaraguan development policies and needs. Additionally, it is consistent with Japan's ODA policy. Therefore, its relevance and coherence are high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

3.2.1.1 Outputs of the Japanese Side

(1) Facility Construction and Equipment Procurement

Under the project, construction and rehabilitation of school facilities in basic education; procurement of educational furniture such as desks, chairs, and whiteboards; and awareness-raising activities on disaster prevention were conducted in the Departments of Madriz and Nueva Segovia.

The original plan included constructing 109 classrooms in 32 schools, but the actual number of constructed classrooms in 28 schools was 97 (24 classrooms in 11 schools in Madriz and 73 classrooms in 17 schools in Nueva Segovia) (Table 2). Four schools were excluded because of the expected shortfall in construction costs due to soaring construction prices. According to the project consultant, the price hikes were beyond what had been anticipated at the time of planning,[6] and the number of target schools had to be reduced to fulfill the design criteria and implement the project within the grant amount.

The detailed design resulted in changes to the layout of the classroom buildings and toilet booths, as well as changes to the exterior construction (retaining walls, filling, and cutting). These changes were in response to the shape and size of each site and to ensure flow lines and did not directly affect the learning environment. In addition, the installation of building

[6] For reference, according to World Bank Data, the annual inflation rate for consumer prices in Nicaragua was 6.0% in 2014, 4.0% in 2015, 3.5% in 2016, 3.9% in 2017, 4.9% in 2018 and 5.4% in 2019, indicating a high level of price inflation.

entrance ramps was cancelled at 15 schools. This was due to the lack of sufficient space to install sloping ramps.

Table 2. Outputs of the Japanese Side (Facility Construction): Plan and Actual

	Plan	Actual
School Facility (Construction/expansion)	32 schools, 109 classrooms (44 classrooms / 65 classrooms)	28 schools, 97 classrooms (41 classrooms / 56 classrooms)
Principal's Room	2 rooms	2 rooms
Teachers' Room	2 rooms	2 rooms
Building Area	7,368 m^2	5,605 m^2
Construction Area	8,465 m^2	7,386 m^2
Storage/Kitchen	20	18
Toilet	33 (92 booths)	28 (76 booths)

Source: Project Completion Report, interview result of the consultant.

Procurement of educational furniture and equipment was conducted as planned in the 28 schools where facilities were constructed (Table 3). Regarding desks and chairs for students, 5% of the total was modified to the specifications for left-handed students at the request of MINED.[7]

Table 3. Outputs of the Japanese Side (Procurement of School Furniture): Plan and Actual

	Plan	Actual
Electricity equipment	18 (18 schools)	16 (16 schools)
Desk and Chair for Student	2,210 (31 schools)	2,010 (27 schools)
Table for Preschool Student	75 (18 schools)	69 (16 schools)
Chair for Preschool Student	300 (18 schools)	276 (16 schools)
Whiteboard	188 (32 schools)	168 (28 schools)
Bulletin board	113 (32 schools)	101 (28 schools)
Cabinet with Door	113 (32 schools)	101 (28 schools)
Cabinet without Door	16 (3 schools)	16 (3 schools)
Table for Teacher	108 (32 schools)	98 (28 schools)
Chair for Teacher	108 (32 schools)	98 (28 schools)

Source: Project Completion Report.

(2) Consulting Services

Consulting services such as detailed design, bidding and construction contract assistance, and construction supervision were implemented as planned.

[7] Interview result of DGIE.

(3) Capacity-Building Program (Soft Component)

Disaster preparedness awareness-raising activities to raise disaster preparedness awareness were implemented as planned, to improve the ability of school personnel and students to evacuate and respond to disaster risk aversion on their way to and from school in the event of a disaster (Table 4).

Table 4. Implemented Activities (Capacity-Building Program)

	Major Activities	Activity Results
Output 1	● The poster on integrated disaster prevention was prepared. ● Seminars for capacity development on disaster preparedness (description of target disaster types by school) were implemented.	● Participants understood the seminar contents and were highly satisfied. In particular, they gained a better understanding of what to do during a disaster and evacuation.
Output 2	● Seminars and workshops on disaster preparedness facilities and evacuation (explanation of how to develop an evacuation drill plan, and a school-specific evacuation drill implementation form) were implemented. ● Evacuation drills were conducted.	● Evacuation drills were conducted based on the prepared evacuation drill implementation forms and scenarios. In some cases, roles of first-aid teams and the like were added to the forms/scenarios, and maps of evacuation routes and risk locations were added.
Output 3	● Posters and leaflets on the risks of going to and from school were prepared. ● Water level gauges indicating the prohibition of going to and from school (crossing the river) were installed (3 schools). ● Workshops on river crossing during high water were implemented.	● Water level gauges enabled objective decisions to make on whether to cross the river. The students' understanding of the risk of disasters on their way to and from school was improved.

Source: Project Completion Report (Capacity-Building Program).

In light of the above, the outputs of the Japanese side were mostly produced as planned.

3.2.1.2 Responsibilities of the Nicaraguan Side

The responsibilities of the Nicaraguan side were implemented as planned, except that the electricity connection work was implemented after the project was completed (Table 5). Electricity was planned to be installed at six schools (all in Nueva Segovia) where electric lines had reached the front road of the site at the time of the preparatory survey. The connection work was done at two of these schools within the project period, but for the other four schools,

the work was not completed until February 2022, more than two years after the project was completed. The delay was because the National Electricity Transmission Company was proceeding with the electrical work according to their plan, which delayed the assignment of the planning period for the target municipalities.[8]

Table 5. Responsibilities of the Nicaraguan Side: Plan and Actual

	Plan	Actual
Before the Construction work	Securing the site (completion of registration).	Implemented as planned.
	Land clearing and development work.	Implemented as planned.
	Removal of above- and below-ground obstructions.	Implemented as planned.
	Obtaining construction permits.	Implemented as planned.
	Securing access roads for construction vehicles.	Implemented as planned.
During the Construction work	Securing storage for construction materials.	Implemented as planned.
	Application and construction of temporary electric power for construction.	Implemented as planned.
	Electricity connection work.	Completed after the project.
	Installation of municipal water supply (securing water supply).	Implemented as planned.
	Procurement of equipment.	Implemented as planned.

Source: Questionnaire answer of MINED, interview result of the consultant.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The planned total project cost was 1,293 million yen (Japanese side: 1,267 million yen, Nicaraguan side: 0.26 million yen). The actual cost was 1,266 million yen (Japanese side: 1,234 million yen, Nicaraguan side 0.32 million yen), which was within the plan (ratio against the plan: 98%). Expenditures on the Nicaragua side included removing existing structures, land development work, tree trimming, and electricity connection work.

3.2.2.2 Project Period

According to the plan at the time of ex-ante evaluation, the planned project period from the signing of the grant agreement to the completion of construction work was 25 months (July 2015 to July 2017). The actual period was 53 months (July 2015 to November 2019), which significantly exceeded the plan (ratio against the plan: 212%). The reasons for exceeding the

[8] Questionnaire answer from the Department Delegation of Nueva Segovia.

plan were two unsuccessful bids, repeated detailed designs, and construction delays due to political unrest in the country in 2018 (period for the detailed design and bidding/contract: 8 months planned and 27 months actual. Construction period: 16 months planned and 23 months actual).

In light of the above, the project outputs were mostly produced as planned. Regarding the input, although the project cost was within the plan, the project period significantly exceeded the plan. Therefore, efficiency of the project is moderately low.

3.3 Effectiveness and Impacts[9] (Rating: ③)

3.3.1 Effectiveness

3.3.1.1 Quantitative Effects (Operation and Effect Indicators)

(1) Number of Registered Students at School

The project aimed to develop a safe and secure learning environment for students. In this project, each target school site's vulnerability to a disaster was assessed during the preparatory survey, and based on the results, disaster prevention measures were taken, including isolating classroom buildings from the cliff slope; installing retaining walls, sediment catchment facilities, and drainage facilities; and raising school building foundations. In addition, design standards were followed to meet the MINED's facility design standards, which were prepared considering disaster prevention. Therefore, a "safe and secure environment" was interpreted as classrooms that the project developed and those which were judged to be continuously usable at the time of the preparatory survey. The number of students registered in the target schools was used as a quantitative indicator.

Table 6 shows the target and actual number of registered students at the target schools. The total students who registered in the regular class of pre-school, primary and secondar education was 4,651. Excluding the number of the students which had no registered students in secondary education and thus no target figure was set in the preparatory survey, the total number was 4,278, which is slightly below the target of 4,538 students. The first reason for this is presumably due to the migration and moving of students' families, both nationally and internationally. The number of Nicaraguans migrating out of the country has been increasing every year, and the rate of increase has been growing.[10] According to MINED, this may also be because it has been permitted for students to change from attending the normal shift (Monday through Friday) to attending the Saturday shift to receive education flexibly according to their or their families' convenience, as some families seasonally move to engage

[9] When providing the sub-rating, Effectiveness and Impacts are to be considered together.

[10] According to the UNHCR database, the total number of refugees and asylum-seekers in 2014 was 2,298, and it has increased rapidly since 2019: 71,245 and 236,983 in 2019 and 2022, respectively. The average annual increase during this period was 73.0%.

in agricultural work. For students who move to other areas, information on them before their move is transferred to the Department Delegation of MINED in the new area. It should be noted that this registration figure is the number of students enrolled at the beginning of the school year and does not include students registered or transferred in the middle of the school year; therefore, the actual number of registered students may be higher. If the number of the students who registered in the Saturday class for the Youth and Adult (JYA), the total number of the registered students in 2022 was 5,039.[11]

Table 6. Registration of Students at the Target Schools

(Unit: persons)

	Baseline	Target	Actual value			
	2014	2022	2019	2020	2021	2022
		3 years after completion	Completion year	1 year after completion	2 years after completion	3 years after completion
a) Pre-school	409	540	478	504	511	477
b) Primary Education (Regular)	2,711	2,335	2,623	2,599	2,548	2,537
c) Primary Education (JYA)	NA	NA	0	16	13	7
d) Secondary Education (Regular)	1,578	1,663	1,255	1,377	1,765	1,637
e) Secondary Education (JYA)	NA	NA	364	372	332	381
f) Secondary Education (with target values)	1,578	1,663	862	1,014	1,378	1,264
Total (a+b+c+d+e)	NA	NA	4,720	4,868	5,169	5,039
Total (a+b+d)	4,698	4,538	4,356	4,480	4,824	4,651
Total (a+b+f)	4,698	4,538	3,963	4,117	4,437	4,278

Source: Data provided by MINED.

Note: The target value was recalculated for 2022 because the project completion was delayed for two years. Originally, the target value for 2019 was calculated based on the average increasing rate of registered students from 2010 to 2013.[12] The target figure for 2022 was recalculated based on this increasing rate as well. The target value was less than the baseline value because the number of registered students was decreasing in some municipalities. Both the target value and the actual values included data from the 32 originally planned schools. Registered students on the Saturday shift were not counted. JYA stands for the Youth and Adult class in the Saturday shift. The total (a+b+d) is the sum of the number of pre-school, primary, and secondary education students registered in regular classes that do not include Saturday classes. The total (a+b+f) counts only the number of students registered in schools where a target for the number of secondary education students was set at the time of project planning. In order to match the schools counted at the time of planning and at the time of ex-post evaluation, the total (a+b+f) was compared with the target value in the ex-post evaluation.

[11] The baseline figures confirmed in the Preparatory Survey did not include the number of students registered in Saturday shifts. Therefore, it is not possible to make a simple comparison.

[12] The rate of increase or decrease in the number of registered students varies slightly by municipality and education level. For example, according to the Preparatory Survey report, the minimum increasing rate in the number of students in pre-school education was calculated at 0.87 in the municipalities of Quilalí and Wiwilí of Nueva Segovia, while the maximum 1.09 in Telpaneca of Madriz. At the primary level, the minimum was 0.94 in El Jícaro of Nueva Segovia, and the maximum was 1.00 in San Juan de Río Coco, Telpaneca, and Totogalpa of Madriz. At the secondary level, the minimum was 0.89 in Telpaneca of Madriz, and the maximum was 1.05 in Murra of Nueva Segovia.

Although data on the number of migrants moving out of the target municipalities could not be confirmed, it can be inferred that the project had a certain effect on children from non-migrating families, because the migration was considered to have much exceeded the expected decrease in the number of registered students in 2014.

(2) Utilization of School Facility

Regarding the utilization status of the facilities, classrooms, and educational furniture, they were being utilized in all schools except one where the number of students significantly decreased more than planned. In that school, the number of registered students in 2014 decreased from 548 to 349 in 2023, and the vacant classrooms were being used for multipurpose functions such as for teachers' offices, library, and storage. Three unused toilet booths were being used for storage. The number of students decreased because the school was built in a new location away from the center of the municipality, and the students who used to attend the old school registered in another school.[13]

In addition to classrooms, the project constructed a kitchen/storage space and toilet booths. In all schools, the kitchen/storage space was being used to store food for school meals, but the sinks and stoves for cooking were not being used. The reasons for this were that there was no water running to the sink, and the students' parents in charge of cooking brought their food from home.[14] It was stated that it was more convenient for each parent to cook at home while caring for smaller sons and daughters and doing other household chores. The kitchen stove the project introduced was a mesh-type stove similar to those used for barbecues, but the parents were not accustomed to using it for cooking, and some commented that it required a lot of firewood and that it was dangerous for younger students to approach the kitchen because it did not have a door.

Photo 3. Storage (Nueva Segovia)

Photo 4. Kitchen Stove Introduced by the Project (Madriz)

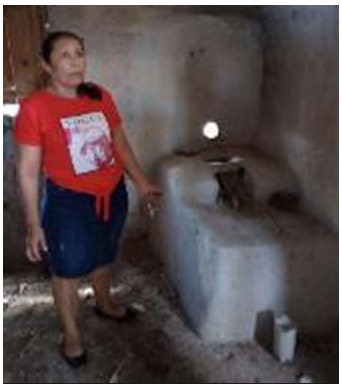


Photo 5. Generally Used Stove (Madriz)

[13] Interview results of school principals.
[14] Interview results of teachers and parents.

The toilets were equipped with an equal number of booths for boys and girls as a gender consideration. In 15 of the 26 schools, the use of booths was segregated by gender.[15] In other schools, they were separated by grade, or teachers and students used them separately.

Box 1. Utilization of Toilet Booths

The Interviews conducted with teachers and students during the field survey to confirm the actual use of the restrooms revealed that some toilets were not being utilized much. In the preparatory survey, it was assumed that excreta would be pumped once a year to maintain them, but none of the toilets had accumulated enough dirt to be visually confirmed. Male students often urinate outside without using the toilets. A few students seemed to be more accustomed to using the old toilets (which had a simple hole and no seats). In addition, students, especially in the lower grades, gave examples of reasons for not using the toilets more often: "I am afraid of falling into the hole," "I am afraid of the private room that can be locked," and "I am afraid because the toilet booth is far away from the classroom (where teachers are out of sight)" (Photo 6).

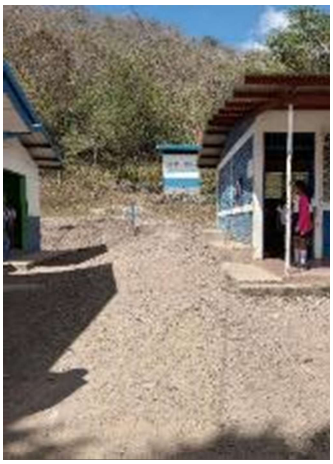


Photo 6. Toilet Booths Seen Backward, far from the Classroom Building (Madriz)

According to the female students, they do not have a problem with sharing the same toilet with male students as long as it is kept clean. Regarding their menstrual periods, a female student answered that "If I go to the toilet before leaving home and wear a napkin for long periods, there is no problem in not going to the toilet at school (in the morning session). My mother tells me to do so."

Source: Developed by the interview results with school principals, teachers, and students.

Photo 7. Toilet Booths which Used to be Utilized Before (Madriz)

Photo 8. Toilet Booths Constructed by the Project (Nueva Segovia)

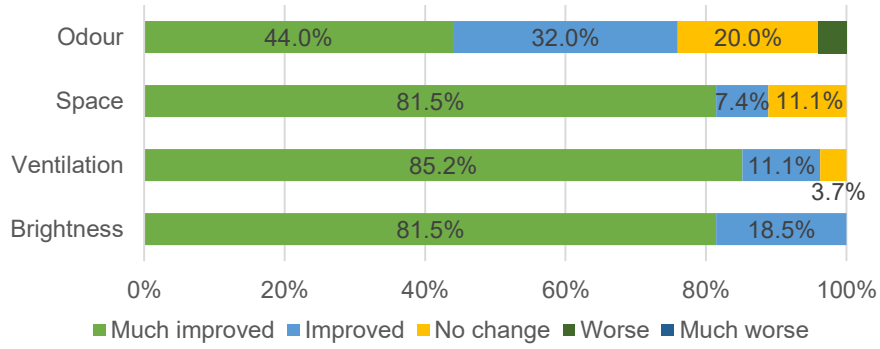
[15] Interview results of school principals.

3.3.1.2 Qualitative Effects (Other Effects)

(1) Improvement of the Learning Environment

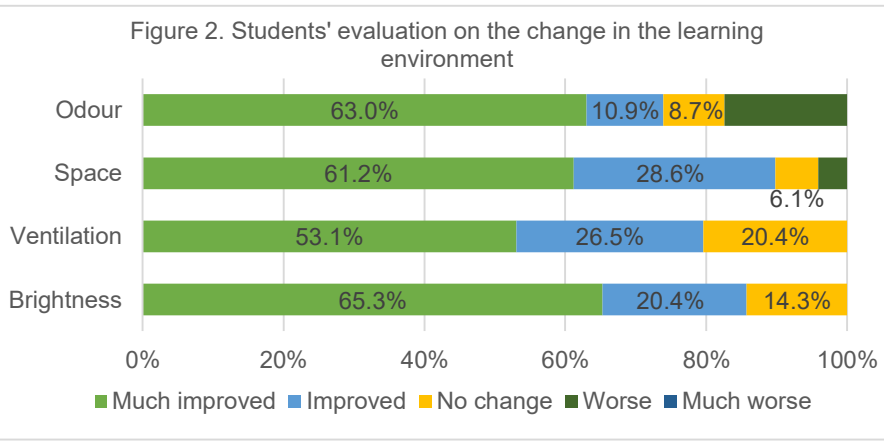
In the interviews with all of the target schools at the time of ex-post evaluation,[16] the majority of teachers indicated that the brightness, ventilation, space, and odor from the toilets had improved, as shown below (Figure 1). All respondents answered that brightness had "improved much" or "improved." For ventilation, space, and odor, 96.3%, 88.9%, and 76.0% respectively responded "much improved" or "improved." The relatively low rating for odor from the toilets may be due to the proximity of the classrooms used by the responding teachers to the project toilets or the old toilets. For the students, their ratings for brightness, ventilation, space, and odor from the toilets were lower than those of the teachers (Figure 2), but still, 85.7%, 79.6%, 89.8%, and 73.9% of them responded "much improved" or "improved," respectively.

Figure 1. Teachers' evaluation on the change in the teahcing environment



Source: Interview results of teachers.

Figure 2. Students' evaluation on the change in the learning environment



Source: Interview results of students.

When asked about the changes in the learning environment, teachers answered that, compared to the classrooms before the project, "it can be sheltered from rain and wind," "the

[16] A school principal, a teacher, one to six students (52 total, including 25 females), and one to six parents were interviewed at each of the 28 target schools.

temperature can be controlled by opening and closing the windows," "whiteboards can be placed on the walls and teaching materials can be posted," "it is not someone else's house, so we do not have to worry about it," "the floor is cleaner," "it is wider," "partition panels can be used to separate classrooms for different grades," and "students have desks and chairs." Other significant changes for students and parents were the "better look" and "having a school in the community."[17] Besides, the school now has space for physical activities on the grounds, allowing students to practice for physical education exercises and sports competitions with other schools.

Photo 9. Classroom Spacious Enough for the Teacher to Monitor Student Learning (Nueva Segovia)

Photo 10. Well-Equipped Classroom with Enough Space for Multigrade Teaching (Madriz)

In addition, a past ex-post evaluation of the school facility development project pointed out that some whiteboards and toilets were too high for younger students, but in this ex-post evaluation, the majority of schools responded that these heights were appropriate.[18] The height of whiteboards differs between preschool and primary classrooms, and if classrooms are appropriately assigned according to grade level, presumably the height should not be a problem (Photos 11 and 12).

Photo 11. Whiteboard Placed Relatively High (Madriz)

Photo 12. Whiteboard Enough Low for a Preschool Student (Madriz)

(2) Sensibilization of Disaster Reduction

Each school, each year, prepared the "School Safety Plan." The plan specifies the school's

[17] Interview results of school principals, teachers, students and parents.
[18] Interview results of school principals and teachers.

disaster risks, evacuation routes, and evacuation sites. In the preparatory survey, the lack of specific recognition of disaster risks was pointed out as a problem. However, in the interviews conducted during the field survey for this ex-post evaluation, in most schools, school principals, teachers, students, and parents recognized common risks such as falling trees due to strong winds and dangerous river crossing due to rainfall. Evacuation drills are regularly conducted per the "School Safety Plan." Besides teachers and students, parents, and, depending on the nature of the evacuation drills, the Health Ministry branch office and the fire station also participate in the drills. Students' families also have the "Family Response Plan" that identifies hazardous areas at home, on the way to school, and in the school.

Thus, it can be confirmed that awareness of disaster prevention among teachers, students, and parents has taken root. Teachers who participated in the seminar conducted under this project commented that their experiences of disaster prevention in other countries were helpful, that they recognized the importance of preparation, and that the evacuation drills were enhanced. According to the Technical Unit of Network for Disasters (UTED) of MINED, this was the first time that training on disaster management was directly incorporated into a facility development project. However, even before the project was implemented, the "School Safety Plan" had been prepared and evacuation drills had been conducted under MINED's direction. However, these improvements in disaster awareness might not have been the result of this project.

3.3.2 Impacts

3.3.2.1 Intended Impacts

First, regarding the improved learning environment, teachers' classroom management has been improved. They have become more positive in terms of their attitudes and feelings, as conveyed in the following comments: "The atmosphere has improved," "I can teach more comfortably because the classes are not affected by the weather," "I am more motivated in class," "I pay more attention to my students," and "The walls allow me to concentrate without outside noise." Additionally, they have had specific changes, as the following answers show: "I can use the whiteboards to draw pictures and draw diagrams," "I can do exercises in motion in a larger space," "I can give more interactive lessons," "The teaching method has been diversified," "I can store teaching materials in the cabinet with a lock," "The partitions make it easy to conduct multigrade teaching," "I can use audio-visual materials because there is electricity," and "I don't have a sore throat because I don't use chalk."[19]

Second, students' participation in the class has also changed. School principals, teachers, parents, and even the students all commented that: "the desks and chairs are comfortable, so I can concentrate in the class," "my concentration and motivation have increased," "I have more

[19] Interview results of school principals and teachers.

respect for the new, clean school," "I have more motivation to take classes," "I can now use the tablet," and "I can learn to read and write on the whiteboard." In addition, comments such as "registration has increased with the new school," "attendance has increased," "I like school more," "I have a positive attitude toward school," and "parents feel safer sending their preschool children to a safe classroom," suggest that the new school is a major motivator.

It had been assumed that an improved learning environment would improve the dropout problem in the long run. In both departments, the dropout rate for primary education increased in 2020 but has been decreasing since then. The dropout rate for secondary education similarly increased in 2020 in Madriz and then began to decline, while in Nueva Segovia it decreased in 2020 and then began to increase. In contrast, as previously mentioned, migration in and out of the country has a significant impact on school registration. In addition, river flooding due to rainfall, infectious diseases, and so on, and in secondary education, there are cases of female students dropping out of school due to pregnancy and male students not enrolling because they are expected to be workers.[20] Thus, it is difficult to verify the contribution the project made because there are many factors other than facilities and equipment that cause students to drop out of school.

Table 7. Dropout Rate in Primary and Secondary Education in Madriz and Nueva Segovia

(Unit: %)

		2019	2020	2021	2022
Primary	Target schools in Madriz	9.2	12.5	10.7	8.0
	Average of Madriz	4.5	8.1	5.1	4.6
	Target schools in Nueva Segovia	10.3	15.1	1.7	5.4
	Average of Nueva Segovia	7.1	10.9	2.9	1.7
Secondary	Target schools in Madriz	18.4	18.0	5.8	16.0
	Average of Madriz	8.4	11.6	10.9	9.5
	Target schools in Nueva Segovia	15.4	7.5	15.7	14.1
	Average of Nueva Segovia	10.7	10.8	5.3	5.7

Source: Calculated with data provided by MINED (number of registered and completed students).

3.3.2.2 Other Positive and Negative Impacts

1) Impacts on the Environment

This project was classified as Category C based on the JICA Guidelines for the Confirmation of Environmental and Social Consideration (April 2010) for sensitive sectors because it was judged to have minimal undesirable impacts on the environment. The project had no environmental impact.[21]

[20] Questionnaire answer of MINED, interview results of the Department Delegation of Nueva Segovia and school principals.

[21] Questionnaire answer of MINED, interview results of school principals.

2) Resettlement and Land Acquisition

There was no resettlement or land acquisition in the project.

3) Gender Equality

As previously mentioned, the project constructed an equal number of separate toilet booths for male and female students as a gender consideration. However, only about half of the toilets were being used as intended. In interviews with school principals and teachers, there was no recognition that the use of gender-segregated toilets would promote female students' school attendance. There were no complaints from female students about the non-use of gender-segregated toilets.[22] In some schools, male and female students have used separate toilets to encourage them to use the toilets without making them dirty, recognizing that they are their toilets. In several schools, there were instances of male students misbehaving by opening the door of the toilet booth when a female student was in the booth. Accordingly, two female students go to the toilet together, and while one student is using the toilet, the other student is outside watching. Many answered that the toilets in the project have doors and no gaps in the walls, so they can use the toilets safely, and that they can now go to the toilet alone.

4) Marginalized People

Children with disabilities are enrolled in either a special education school in each department or a regular school nearby, depending on the type and degree of disability. Otherwise, some children with disabilities study at home using MINED's home learning materials. In some of the schools visited during the field survey, several students with autism, hyperactivity, physical paralysis, low vision, hearing loss, and language disabilities have been enrolled. Some students use crutches or wheelchairs. As previously mentioned, in some schools, ramps were not installed as planned. In the areas where there were steps, siblings or classmates provided support. Any instances could not be confirmed in which equitable participation was impeded within the school facilities.

5) Social Systems and Norms, Human Well-Being and Human Rights

Any impact could not be identified as those related to social systems, norms, people's well-being, or human rights.

6) Unintended Positive/Negative Impacts

First, the improved school facilities have motivated parents to register and send their

[22] Interview results of female students.

children to school.[23] In addition, parents have become more united with each other, and they have been more cooperative in cleaning and maintaining the school facilities.

Second, the Directorate General of School Infrastructure (DGIE) of MINED evaluated the site assessment form used in the preparatory survey[24] for its usefulness in providing compact information (a single sheet of paper along with photos) on the vulnerability of school sites to disasters.[25] DGIE has since used the form.

Third, the kitchen has not been used for cooking, but utilized as a serving area for school meals. Previously, pots and dishes had been placed directly on the ground, but by placing them on the shelf top for serving, the sanitary environment has improved.[26]

Fourth, in the majority of schools, the facilities the project developed have not been used for anything other than school classes, but in some cases, they have been utilized for community activities such as polling stations and meetings with the Ministry of Health and the police.[27]

The project has improved the learning environment. Although student registration was slightly below the target due to some external factors, a safe and secure learning environment has been developed for students to learn. This improvement has contributed to the motivation of teachers, students, and parents, as well as to better class management. In contrast, in some schools, toilets and kitchens have not been utilized for their expected purposes. Thus, this project has mostly achieved its objectives. Therefore, effectiveness and impacts of the project are high.

3.4 Sustainability (Rating: ③)

3.4.1 Policy and System

As previously mentioned, one of the priority areas of the *National Development Plan* (2022-2026) is "human resource development for national development from the national education system," and in this connection, the construction, repair, and expansion of schools and classrooms are listed with specific target values. The *Strategic Plan for Education* (2022-2026) was scheduled to be released around July 2023, and the Minister of Education stated in the media that the development of educational facilities would continue to be one of the priorities in the plan. The same confirmation was also obtained from DGIE, and thus it is judged that there are no issues regarding policy and institutional aspects, including the future prospect.

[23] Interview results of school principals and parents.
[24] Joint Venture (Mohri, Architect & Associates, Inc., Yachiyo Engineering Co., Ltd.) (2015) *Preparatory Survey Report of Project for Improvement of Educational Facilities in the Madriz and Nueva Segovia Departments*, Annex 9.
[25] Interview result of DGIE.
[26] Interview results of parents.
[27] Interview results of school principals and parents.

3.4.2 Institutional/Organizational Aspect

DGIE oversees the development and maintenance of school facilities. Since 2017, DGIE has been implementing the Program of Beautiful, Clean, and Safe Schools (Programa Escuelas Bonitas, Limpias y Seguras: BLS), part of which includes identifying hazardous areas and evacuation routes and cleaning and maintaining schools.

MINED has Department and Municipal Delegations that monitor school facilities. DGIE had 109 full-time and one temporary staff in the headquarters office and 30 full-time staff in the Department Delegations (school infrastructure coordinators in 20 administrative zones and school inventory coordinators in 10 departments) at the time of ex-post evaluation.[28] In addition, there were 221 fixed-term construction personnel (engineers, architects, bricklayers, carpenters, electricians, plumbers, welders, and so on) for all departments and regions.[29] Of these, the school inventory coordinator and the school infrastructure coordinator of the Department Delegations visit schools to check the condition of classrooms and educational furniture. Each month, approximately 15 days are spent monitoring, but it has been difficult for one coordinator in each department to handle all the schools.[30] However, each school communicates with the municipal office via phone. Problems with facilities can also be reported with attached photos, and there seems to be no problem in sharing information about school facilities in this way. Parents routinely cooperate in maintaining school facilities. The frequency and division of roles for maintenance are determined, although they vary across schools, such as sweeping classrooms and hallways, wiping with water, cleaning toilets, and so on.[31] In the field survey for the ex-post evaluation, many cases were observed in which mothers who brought their younger students to school were staying at the school, observing classes or cleaning the facilities (Photo 13).

Photo 13. A Parent who Sweeps Hallways (Nueva Segovia)

The communication route in case of problems in the maintenance of school facilities has been clearly defined. Teachers ask for parents' repair work or consult with the Municipal or Department Delegation of MINED.

Teachers for the additional classrooms the project developed have been allocated as planned.

[28] Questionnaire answer of MINED.
[29] Questionnaire answer of MINED.
[30] Interview result of the Department Delegation of Nueva Segovia.
[31] Interview results of school principals and parents.

Box 2. Organizational Structure of School Disaster Risk Management

In Nicaragua, following the devastation of Hurricane Mitch (1998), the National System for the Prevention, Mitigation, and Attention to Disasters (SINAPRED) was established in the Office of the President in 2000, and national efforts for disaster management were initiated. In MINED, as with other institutions, UTED has been established in the central, department, and municipal offices, and it has overseen mainstreaming disaster management. Specifically, UTED at the central level provides notices and information on disaster management, and UTED at the department and municipal offices conduct training for school principals and teachers.

At the beginning of each school year, the school principal and teachers identify the school's disaster risks and update the "School Safety Plan." The plan identifies on a map the hazardous areas (power lines, trees, ditches, and so on) in and around the school, and describes evacuation methods and routes to safe zones in the event of a disaster. Based on this plan, evacuation drills are held once every two months at each school, and four times a year under MINED's direction, evacuation drills are held simultaneously throughout the country. After the evacuation drills, a report is made to the Department Delegation with photographs. In each school, school safety sections are appointed (first aid section, evacuation section, fire control section, psychosocial section, and public safety section).

Source: Written based on the questionnaire answer of MINED, Department Delegations of Madriz and Nueva Segovia, and interview results of school principals.

In light of the above, the demarcation of roles among MINED, schools, and parents in facility maintenance and management has been kept clear. The number of personnel in charge of monitoring school facilities assigned to the Department Delegations of MINED has not been sufficient, but communication via phone has supplemented this. Regarding disaster risk management, each school has a "Safety Management Plan" and regularly conducts evacuation drills. Based on these, it is judged that there have been no problems in the institutional/organizational aspect in maintaining and managing the facilities by the project as a safe environment.

3.4.3 Technical Aspect

Each year, DGIE has conducted training on the BLS program, including how to maintain school facilities. As an online or in-person training, the trained personnel of the Department Delegation share the training with the Municipal Delegation personnel. Apart from this, there has been training dedicated to maintaining facilities. In March and April 2022, DGIE conducted online training for school principals nationwide, introducing them to the maintenance manuals. DGIE has planned the same training for 2023.[32] Two manuals for school principals and teachers have been printed and distributed, 10,800 copies and 10,700 copies, respectively, and both have been available for download from MINED's website.[33] However, when teachers were asked

[32] Interview result of DGIE.
[33] Documents prepared by MINED. MINED (2022) *Programa Escuela Bonitas, Limpias y Seguras*.

about the contents of the manuals during the ex-post evaluation survey, many answered that they did not know or did not remember them.

At each school, parents have managed to clean facilities, make simple repairs to furniture, install and repair fences, mow school grounds, and clean drains without technical difficulties.[34] As part of daily maintenance, each school has been provided with cleaning tools and supplies each year. When these tools and supplies are insufficient, teachers sometimes purchase them at their own expense or parents bring their own.[35]

Box 3. Technical Backup for School Disaster Risk Management

At each school, appointed school safety sections are responsible for conducting activities in the event of a disaster or during the evacuation drill. The responsibilities of the school safety sections are specified in the manual, *Guidebook for the School Security*, which the school principal presents to the section students. The manual also explains how to prepare the "School Safety Plan" and how to conduct evacuation drills.

As part of its annual plan, and through UTED, MINED has provided training to education supervisors in the Department Delegations or school principals nationwide on school safety (e.g., developing the "School Safety Plan," establishing the school safety sections in the school, and so on). After receiving the training, school principals explain its contents to their teachers. In addition, for example, students in the first aid section of the school safety sections can participate in training the Ministry of Health conducted in cooperation with the fire department, and students in the fire prevention section may participate in training the fire department conducts.

Source: Prepared based on the interview results of UTED of MINED and school principals.

In light of the above, operating and maintaining school facilities have been conducted without problems by the school principals, teachers, and parents. Training on maintenance and management has been conducted every year, and manuals have been available, although they have not been fully disseminated. Therefore, it is judged that there have been no problems in the technical aspect.

3.4.4 Financial Aspect

MINED's budget has been increasing slightly since 2019 (Table 8). Of this total, the budget for infrastructure investment has also increased slightly, while the budget for infrastructure maintenance has decreased from the year of project completion, with repeated increases and decreases. The Department Delegations of MINED have not had a budget specifically for maintenance and management.

[34] Interview results of school principals.
[35] Interview results of school principals and parents.

Table 8. National Budget and MINED's Budget

(Unit: million Córdova)

	2019	2020	2021	2022	2023
National Budget (Plan)	91,686.6	100,821.4	129,408.0	106,961.3	129,395.3
MINED Budget (Plan)	14,227.8	14,478.6	14,959.8	15,327.2	15,868.1
Infrastructure Investment	717.6	789.6	854.6	872.5	984.3
Infrastructure Maintenance	285.8	134.3	418.3	148.4	138.9
Personnel Cost	9,266.5	9,342.8	9,658.3	10,074.1	11,013.9
Others	3,957.9	4,211.9	4,028.6	4,232.2	3,731.0
MINED Budget (Disbursed)	13,937.8	14,427.9	14,768.4	13,786.0	NA

Source: Questionnaire answer of MINED.

Note: The disbursed amount of 2022 was as of December 20.

In Nicaragua, each municipality allocates 5% of its budget to the education sector.[36] The details of the expenditure (constructing facilities, maintaining facilities, and so on) are determined by the local education councils established in each municipality (in the case of municipalities, the council is composed of representatives from the municipal office, Municipal and Department Delegations of MINED, and so on). However, schools that were constructed recently are not eligible for this expenditure, such as the target schools in this project.[37] In 2022, 11 schools in nine municipalities in the Department of Madriz submitted budget applications for operation and maintenance, among which four schools in three municipalities were selected. In 2023, the budget allocations to the municipalities have increased, with four new classrooms planned in three municipalities and 10 school facility repairs in six municipalities.[38] In the Department of Nueva Segovia, the budget addressed the repair of seven school facilities in four municipalities. In the Municipality of Jalapa, a budget of one million Nicaraguan Cordoba was spent to paint the exterior walls and repair the roof and doors of one school, and two classrooms were installed in two schools each.[39]

The maintenance budget for the project had been supposed to include repainting the exterior walls after 10 years of project completion, which the municipality's budget and the budget of MINED headquarters would handle. Pumping waste from the latrines has not yet been implemented, but no specific plans have been determined regarding the cost of approximately USD 150 per pumping.

The school does not collect and manage cash from parents. Whenever there is a need to spend money on maintenance, the parents form a committee and collect cash from each family

[36] Besides the education section, 5% and 7.5% of the budget are allocated to the environment sector and the water sector, respectively.
[37] Interview result of the Department Delegation of Nueva Segovia.
[38] Interview result of the Department Delegation of Madriz.
[39] Interview result of the Department Delegation of Nueva Segovia.

in a non-compulsory manner for community water, hiring a security guard, and repairing drains, as examples.[40]

In light of the above, the facility maintenance budget of MINED has been on a decreasing trend and has not been fully distributed to the education sector from the municipal budget. However, daily maintenance of school facilities has not required a large budget, and there is a prospect of budgetary provision for exterior painting after 10 years of project completion. It is judged that there have been no major problems in the financial aspect.

3.4.5 Environmental and Social Aspect

No negative environmental and social impacts or risks have been reported to MINED or confirmed during the interviews at the schools. Presumably, they are not likely to occur in the future.

3.4.6 Preventative Measures to Risks

The precondition for the project implementation was that "the land registration of the target schools be done by the Nicaraguan government." This was implemented as planned and did not represent any risk to the project implementation. In addition, risks related to the operation and maintenance of the school facilities were not identified, including possible future risks.

3.4.7 Status of Operation and Maintenance

The status of operation and maintenance of the facilities and furniture the project developed is shown in the table below.

Table 9. Maintenance Status of the Facility and Furniture Developed by the Project

(Unit: Number of schools)

	Observation Point	No problem	Some problems but functioning	Major problem and not functioning
Classroom	Crack in Exterior Walls	28	0	0
	Leaks from Ceiling Boards	27	1	0
	Crack in Floor Tiles	22	6	0
	Problem with Door Fitting	28	0	0
	Missing Window Plates	15	13	0
	Problem with Window Fitting	24	0	4
	Problem with Electric Light	2	0	14

[40] Interview results of school principals.

Toilet	Dirt in Toilet Bowl	14	12	0
	Accumulation of the Waste	26	0	0
	Problem with Door	16	10	0
Furniture	Problem with Cabinet Key	17	11	0
	Problem with Desk for Teacher	14	12	2
	Problem with Desk/Chair for Student	0	28	0
	Damage in Whiteboard	28	0	0
Others	Drainage Ditch Clogging	25	2	1
	Damage in Drainage Ditch	19	9	0
	Damage in Bulletin Board	27	0	0
	Damage in Stove Brick	14	2	0
	Theft/Damage in Water Level Gauge	0	0	3

Source: Observation during the field survey.

Note: Inspection of electric lights was conducted in 16 schools where the electric system was installed. Additionally, toilets and water level gauges were inspected in 26 and three schools, respectively, where the toilet booths and water level gauges were constructed.

Photo 14. Missing Window Plates (Nueva Segovia)

Photo 15. Graffiti on the Desk (Madriz)

Photo 16. Facility Maintenance Poster Developed by the Project (Nueva Segovia)

Direct observation of classrooms, toilets, furniture, and so on during the field survey revealed that all schools have been generally maintained in good condition with few problems that would affect classes or school attendance. The following are common problems observed.

- Missing glass plates in windows: In 13 of the 28 schools, a part of the glass plates was missing. The reasons for this were breakage due to students' carelessness or natural fall. Parents paid for the damage their children's carelessness caused. None of the schools have left the windows in a damaged condition. In four schools, some of the window fittings were stuck and the glass plates could not be opened or closed.
- Cracks in floor tiles: Cracks were found on classroom floors at six schools. This was because the floor tiles were floating and cracked due to voids in the substrate and desk legs

had damaged them. Similar problems had been found and repaired during the defect inspection conducted from November to December 2020, but those found in the ex-post evaluation are new problems.

- Leaks from ceiling boards: There was a leak in only one school, and there were three schools with damp marks on the ceiling panels.
- Problem with lightning: Of the 16 schools with the installed electrical system, 14 schools did not have electricity connected to the lighting fixtures, thus, lights were not on. This was due to incomplete construction of connections at the site and lighting fixtures not being installed (or replaced).
- Dirt in latrines: Twelve of the 22 schools had latrines that were noticeably dirty and had a strong odor. None of the schools had a buildup of filth inside the fixed latrines. Although the pumping of waste had been expected every year, no schools have implemented or planned to implement such pumping. Ten schools had door fittings that were not in good condition and were difficult to open and close.
- Graffiti on the student's desk: There was graffiti on the desks in all schools, although to varying degrees.
- Drainage ditch: Cracks were found in three schools, and rainwater and mud were likely to accumulate in nine schools.
- Water level gauges: There were no gauge at all three schools; floodwaters had washed away one, a construction vehicle had destroyed one (Photo 17), and one was damaged or stolen due to mischief. However, neighbors and school principals have communicated via phone and no river passing has been allowed while the water level was rising. There are plans for DGIE to install them again in the three schools.

Photo 17. River where the Water Level Gauge Had been Installed in the Front Side (Nueva Segovia)

In light of the above, slight issues have been observed in the financial aspect, however, there are good prospects for improvement/resolution. Therefore, sustainability of the project effects is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project was implemented to improve the learning environment where students can learn safely and securely in two northern departments of Nicaragua, by rebuilding and expanding basic education facilities, thereby contributing to improve access and quality of basic education in the

target areas. The project was relevant with Nicaragua's development policies, which have emphasized the development of school facilities to foster human resources and improve the quality of basic education, as well as with the needs for school facilities in the target departments. Japan's assistance policy toward Nicaragua also emphasized the importance of improving the quality of basic education, including developing facilities; therefore, the project relevance and coherence are high. Although the project cost was within the plan, the project period significantly exceeded the plan due to two unsuccessful bids; therefore, efficiency of the project was relatively low. The student registration was slightly below the target due to external factors, but the project provided a safe and secure learning environment for students. In addition, it was confirmed that teachers, students, and parents have become motivated and that the methods of conducting classes were improved, although the toilets and kitchens have not been utilized for their original purpose in some schools. Thus, it can be said that effectiveness and impact of the project is high. Regarding sustainability, there have been some minor financial challenges in operating and maintaining facilities the project developed, but the prospects for improvement and resolution are high. Therefore, sustainability of the project effect is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

<u>To inform the pumping of sewage from fixed latrines.</u>

Although none of the schools had a large accumulation of waste in the fixed latrines, it will be necessary to pump out the waste in the future if the latrines are used for a long period. However, the need for pumping and the information on pumping companies were not well known. It is recommended to DGIE to disseminate information on waste pumping companies to each school through the Department Delegations, including the cost and budgetary source of the pumping.

<u>To take actions on defects in the facilities.</u>

It is recommended to DGIE that the defects in the facilities observed in this ex-post evaluation be prioritized in terms of their impact on the learning environment and that they should be repaired sequentially.

4.2.2 Recommendations to JICA

The JICA Nicaragua Office has conducted monitoring of the completed projects. For this project as well, it is recommended to monitor not only the status of operation and maintenance of school buildings (classroom buildings) but also the status of utilization and maintenance of kitchens and fixed latrines and then share the results with MINED.

4.3 Lessons Learned

Specifications of the Latrines

Concerning latrine specifications, the experience of prior projects led to introducing fixed latrines (those that are used semi-permanently, with periodic pumping of waste). However, most schools were not aware of the difference between this type of latrine and mobile latrines (those that are landfilled and newly constructed elsewhere when waste accumulates), and there was no maintenance plan for pumping. Fixed latrines, which can be used for a longer period than conventional latrines, are environment friendly and suitable for the financial cooperation scheme; therefore, they were introduced in this project, in agreement with MINED at the time of the preparatory survey, although they are not widely used in Nicaragua. When planning to introduce fixed latrines not only in Nicaragua but also in other areas where they are not common, the consultant should confirm the actual utilization and maintenance status at the target schools of the previous projects, which had been in place for a certain period since the project completion, during the preparatory study, and they should ensure that a concrete maintenance plan (contact information of the pumping company, costs, and so on) in the target area is presented. It is desirable that the consultant discuss with the Ministry of Education to ensure each municipality, without unification within the project, can select the latrine specification.

Location of the Toilet Building

While some students said they felt safe using the toilet because they were equipped with latrine seats and locked doors, others said they were afraid to go alone because the building was located far away from the classrooms in schools where the toilet building was located out of sight of the classrooms. Many younger students are not yet accustomed to using latrines. Toilets are located downwind of the classrooms to consider odor, but it is desirable to reflect the usability of the students (especially the younger grades) as much as possible.

Ensuring Safety and Security in Both Tangible and Intangible Aspects

In this project, the school sites' vulnerability to natural disasters was assessed, and various disaster prevention measures were planned as to reduce disaster risks. This has helped to ensure further the safety and security of the school facilities and enhance teaching methods and motivation for students and parents. In addition, training for teachers and parents on disaster risk management was planned and implemented to ensure further safety and security. In projects to improve facilities such as schools, from the disaster prevention perspective, a disaster risk assessment of the site should be conducted in the preparatory survey and necessary measures (tangible measures) should be included in the design to enhance the facility's safety. It is also effective to improve the capacity of relevant personnel for disaster prevention (intangible

measures) to enhance the safety of the facility and promote its use.

(End)