

Name of country	<b>Project for reinforcement of certified seed production and extension system for popular rice (2008-2010 Project)</b>
Republic of Cuba	<b>Project for extension and diffusion of technologies for certified rice seed production in the central zone of Cuba (2012-2016 Project)</b>

**I +Project summary**

Background of the projects	<p>In Cuba, as the amount of production of rice, a staple food, was less than the demand, to increase the self-sufficiency of rice was one of the important policies of the government. In order to improve the sustainable production of popular rice in the central 5 provinces, which occupied 40% of rice field in the country, JICA implemented a technical cooperation for development planning project “The Study on sustainable technical development for rice cultivation in the central area in the republic of Cuba” (2003-2005). As the usage rate of certified seeds was only 27% (2003) in the production of popular rice, which made lower the quality and productivity of rice production, the study suggested that in order to expand its production the introduction of excellent varieties suited to the characteristics of the area was urgently needed and the improvement of system of certification of seeds for popular rice was needed. On receiving the suggestions of the study, a technical cooperation project, “Project for reinforcement of certified seed<sup>1</sup> production and extension system for popular rice” (2008-2010) was implemented. After the project, toward the use of registered seeds, one of the categories of seeds<sup>2</sup>, by more rice farmers, there were challenges of the expansion of production of certified seeds, improvement of technical capacity for seed production of seed production farmers, and improvement of a flow of certified seeds to be distributed to rice farmers. Thus, a technical cooperation project, “Project for extension and diffusion of technologies for certified rice seed production in the central zone of Cuba” (2012-2016) was undertaken.</p>										
Objectives of the project	<p>[2008-10 Project]</p> <p>Though developing a plan of seed production and distribution in order to produce certified seeds, training stakeholders of seed production farms, extension workers, seed inspectors, and leader farmers, conducting training and providing information on the varieties promoted by Grain Research Institute (IIGranos), the project aimed at distributing certified seeds with a plan, thereby contributing to the seed production of excellent varieties by popular rice producers (small scale farmers).</p> <ol style="list-style-type: none"> <li>Overall goal: The producers of popular rice (small scale farmers) use high quality seeds.</li> <li>Project purpose: Use of the certified seeds II is promoted.</li> </ol>										
	<p>[2012-16 Project]</p> <p>Through the production of original seeds, basic seeds, and registered seeds based on the registered seed production plan, implementing training to extension workers, conducting technical training of seed production to seed producers and conducting training to Seeds Inspection and Certification System (SICS) inspectors, in the central 5 provinces, the project aimed at increasing the production of registered seeds by trained leader seeds producers, thereby contributing to increase in the rice production and productivity.</p> <ol style="list-style-type: none"> <li>Overall goal: The rice production is increased by improving productivity in the central zone of Cuba.</li> <li>Project purpose: The amount of certified seeds produced by leader seed producers, who are trained through the Project, is increased in the central zone of Cuba.</li> </ol>										
Activities of the Project	<ol style="list-style-type: none"> <li>Project sites: 5 central provinces (Cienfuegos, Villa clara, Sancti Spiritus, Ciego de Avila, and Camaguey) (Same project sites for 2008-10 Project and 2012-2016 Project)</li> <li>Main activities: <ul style="list-style-type: none"> <li>[2008-10 Project] <ul style="list-style-type: none"> <li>(i) Producing original, basic, and registered seeds, (ii) Elaborating a seed production and distribution plan for producing certified seeds, (iii) Delivering training to extension workers, seed inspectors and leading farmers, (iv) Providing training and information about varieties recommended by Rice Research Institute (IIArroz) (Current IIGranos).</li> </ul> </li> <li>[2012-16 Project] <ul style="list-style-type: none"> <li>(i) Elaborating a rural extension guideline for rice seeds production and extension of rice cultivation techniques (ii) Producing registered seeds based on the production plan of registered seeds, (iii) Delivering training to extension workers, (iv) Delivering training on production techniques of seeds to seed farmers, (v) Delivering training to SICS inspectors.</li> </ul> </li> </ul> </li> <li>Inputs <table border="0"> <tr> <td>Japanese side</td> <td>Cuban side</td> </tr> <tr> <td>[2008-10 Project]</td> <td>[2008-10 Project]</td> </tr> <tr> <td>(1) Experts: 5 persons</td> <td>(1) Staff allocated: 9 persons</td> </tr> <tr> <td>(2) Third country training: 6 persons (Bolivia)</td> <td>(2) Facility and Land: Office space for experts in IIArroz</td> </tr> <tr> <td>(3) Equipment: Computer, projector, portable generator, printer, tractor, harvester, transplanting</td> <td>(3) Local operation cost: Personnel cost, utility cost,</td> </tr> </table> </li> </ol>	Japanese side	Cuban side	[2008-10 Project]	[2008-10 Project]	(1) Experts: 5 persons	(1) Staff allocated: 9 persons	(2) Third country training: 6 persons (Bolivia)	(2) Facility and Land: Office space for experts in IIArroz	(3) Equipment: Computer, projector, portable generator, printer, tractor, harvester, transplanting	(3) Local operation cost: Personnel cost, utility cost,
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<sup>1</sup> To be certify from the levels of Original seed→Basic seed→Registered seed→Certified seed.

<sup>2</sup> Main seed categories include original seed (produced by the original breeder/institute as original seed stock), basic seed (produced from original seed), registered seed (produced from basic seed), certified seed I (produced from registered seed) and certified seed II (produced from certified seed I).

	<p>machine, rice seed adjusting machine, etc.</p> <p>(4) Local operation cost: Field activity costs</p> <p>[2012-16 Project]</p> <p>(1) Experts: 5 persons</p> <p>(2) Trainees received: 5 persons</p> <p>(3) Equipment: Computer, projector, portable generator, printer, seeder, transplanting machine, etc.</p> <p>(4) Local operation cost: Field activity costs</p>	<p>etc.</p> <p>[2012-16 Project]</p> <p>(1) Staff allocated: 16 persons</p> <p>(2) Facility and Land: Project office, rice seed cultivation field (Total 16 ha), storage for project equipment, construction site for post-harvest treatment facility</p> <p>(3) Local operation cost: Fuel cost for harvesting, import tax of project equipment, preparation cost for constructing facilities, utility cost, etc.</p>	
Project Period	<p>[2008-10 Project]</p> <p>Mar. 2008 - Nov. 2010</p> <p>[2012-16 Project]</p> <p>Apr. 2012 - Apr. 2016</p>	Project Cost	<p>[2008-10 Project]</p> <p>(ex-ante) 190 million yen, (actual) 262 million yen</p> <p>[2012-16 Project]</p> <p>(ex-ante) 310 million yen, (actual) 436 million yen</p>
Implementing Agency	Grain Research Institute (IIGranos) (Renamed from Rice Research Institute (IIArroz) since 2010)		
Cooperation Agency in Japan	None		

## II. Result of the Evaluation

### 1 Relevance

<Consistency with Development plan of Cuban government at the time of preparatory study>

The projects were consistent with development policies of Cuba, including the “Strategic Plan 2005” of Cuban Agricultural Ministry aiming to 63% of rice self-sufficiency rate and “Strategic Projection of Various Crops until year 2015” aiming at doubling the rice yield from 2008 to 2015.

<Consistency with Development needs in Cuba at the time of preparatory study>

The projects were consistent with development needs of Cuba for production of popular rice, that is, an establishment and strengthening of seed production and distribution system for diffusion of certified seeds necessary to the introduction of excellent varieties, and improvement of quality and quantity of the registered seeds production.

<Consistency with Japanese aid policies at the time of preparatory study>

The projects were consistent with the Japan’s ODA policies for Cuba at the time of 2008 and 2012<sup>3</sup> emphasizing support for increasing food production as one of its priority areas.

<Evaluation Result>

In the light of above, the relevance of these projects is high.

### 2 Effectiveness/ Impact

[2008-2010 Project]

<Achievement status of Project Purpose at the time of completion of the project>

The Project Purpose was achieved by the time of project completion. 7 tons of registered seeds were produced by the 2008-2010 project.

<Continuation status of project effects at the time of Ex-post evaluation>

The project effects have been continued by the time of ex-post evaluation. The production and distribution amount of registered seeds increased from 7 tons in 2010 to 1,960 tons in 2019. The institutions producing registered seeds are not only IIGranos, but also Territorial Station of Grain Research (ETIG), “El Corojal” business base unit of Artemisa Agro-Industrial Company of Grains (EAIG), and selected seed producers. The institutions distributing registered seeds are IIGranos, ETIG, “Los Palacios” Experimental Station of National Institute of Agricultural Science (INCA), El Corojal, various Credits and Services Cooperative (CCS), which distribute them to more than 30 cooperatives. The reason for continuing project effects is good quality of registered seeds produced by seed producers.

<Status of achievement of Overall Goal at the time of Ex-post evaluation>

The Overall Goal was achieved at the time of ex-post evaluation. In the targeted 5 provinces 100% of rice producers used certified seeds from 2015 to 2019. Certified seeds were used in 90%, 95% and 97% of producing area in the country in 2017, 2018, and 2019 respectively. According to IIGranos, the reasons for the widespread use of certified seeds are good quality of certified seeds, improvement of productivity by using them, and that IIGranos and Agricultural Enterprise Group (GAG) promoted use of certified seeds and diversification of varieties to rice producers in the country.

<Other impacts confirmed at Ex-post evaluation>

At the time of Ex-post evaluation other impact was not confirmed.

[2012-16 Project]

<Achievement status of the Project Purpose at the time of completion of the Project>

The Project Purpose was achieved by the time of project completion. In the targeted 5 provinces the amount of certified seeds produced by the trained leading seed producers was increased, and the total production of certified seeds (Certified seed-I and II) reached to 7,956 tons in 2013, and 9,824 tons in 2014. Although the data for 2015 was not available, it increased to 11,319 tons in 2016.

<Continuation status of the project effects at the time of Ex-post evaluation>

The project effects have been continued at the time of ex-post evaluation. The certified seeds are produced mainly by EAIGs<sup>4</sup>, and the

<sup>3</sup> ODA Data books 2008 and 2012, Ministry of Foreign Affairs, Japan.

<sup>4</sup> While a part of EAIG itself produces seeds, the farmers belong to local producers’ organizations such as Basic Units of Cooperative Production (UBPC),

production in the target 5 provinces was 9,229 tons in 2017, 13,502 tons in 2018, and 9,199 tons in 2019, while the project aimed at 2,000 tons annually by 2015. The reason is that the productivity has been improved in many areas due to the improved quality, quantity and variety of provided certified seeds.

<Achievement status of Overall Goal at the time of Ex-post evaluation>

The Overall Goal was achieved at the time of ex-post evaluation. In the 5 central provinces it is assumed that the average productivity of the certified seeds increased by 15% from 2016 to 2019, after the completion of the project. It is due to that seed producers were able to access to good quality seeds of popular varieties, and in recent years they had access to trainings, technical support, extension system and technology, supported by the government.

<Other impact confirmed at the Ex-post evaluation>

No other impacts were observed at the time of ex-post evaluation.

<Evaluation Result>

From above, the effectiveness and impact of the projects is high.

#### Achievement of Project purpose and Overall goal

Target	Indicators	Achievement
[2008-10 Project]		
Project Purpose Registered seeds are distributed as planned.	7 tons of registered seeds are distributed to UBPC, CCS, CPA and seed producing farmers in the target 5 provinces.	<p><u>Status of achievement: Achieved (Continued)</u> (At the time of completion of the project)</p> <ul style="list-style-type: none"> <li>In August 2010, 7 tons of registered seeds were produced and distributed, in accordance with the Project purpose.</li> </ul> <p>(At the time of Ex-post evaluation)</p> <ul style="list-style-type: none"> <li>Amount of production and distribution of registered seeds increased from 7 tons in 2010, to 150 tons, 800 tons and 1,960 tons in 2019. The registered seeds are produced by ETIG of IIGranos, “El Corojal” business base unit of Artemisa EAIG, and selected seed producers. Registered seeds are distributed from ETIG of IIGranos, “Los Palacios” Experimental Station, El Corojal, and CCS to more than 30 cooperatives.</li> </ul>
Overall Goal The producers of popular rice (small scale farmers) use high quality seeds.	In the targeted 5 provinces by 2015 80% of small-scale farmers producing popular rice use good quality seeds originated from Certified seed II.	<p><u>Status of achievement: Achieved</u> (Ex-post evaluation)</p> <ul style="list-style-type: none"> <li>In the target 5 provinces 100% of producers used certified seeds from 2015 to 2019. The certified seeds were used in 90%, 95%, and 97% of rice acreage of the country in 2017, 2018, and 2019, respectively.</li> <li>Following a policy to increase rice production, Ministry of Agriculture aims at the use of certified seeds by all rice producers and securing sufficient production of certified seeds for it. Based on the above policy, IIGranos and GAG have been promoting the use of certified seeds and the diversification of varieties to all rice producers in the country. As a result, the stakeholders (research institutes, EAIGs, seed producers, etc.) relating to seed production and diffusion recognized the effectiveness of production and diffusion of certified seeds (the use of good quality certified seeds and subsequent improvement of productivity).</li> </ul>
[2012-16 Project]		
Project Purpose The amount of certified seeds produced by leading seed producers, who are trained through the Project, is increased in the Central zone of Cuba.	2.000 tons of certified seeds are produced in the 5 central provinces of Cuba in 2015.	<p><u>Status of achievement: Achieved (Continued)</u> (At the time of completion of the project)</p> <ul style="list-style-type: none"> <li>The amount of production of certified seeds (Certified Seed-I and II) in the 5 central provinces increased to 7,957 tons in 2013, 9,824 tons in 2014, and 11,319 tons in 2016 (the data for 2015 was not available).</li> </ul> <p>(At the time of Ex-post evaluation)</p> <ul style="list-style-type: none"> <li>The amount of certified seeds produced in the target 5 provinces by EAIGs, producers organizations and farmers was 9,229 tons in 2017, 13,502 tons in 2018, and 9,199 tons in 2019. The usage rate of certified seeds in the country increased to 95% and 97% in 2018 and 2019, respectively. By improving the quality of seeds and training the personnel of SICS, the rate of disqualified seeds is about 10% a year.</li> </ul>
Overall Goal The rice production is increased by improving productivity in the central zone of Cuba.	The average yield of certified seeds is increased 15% by 2018 compared with the one at the end of the project in the 5 central provinces of Cuba.	<p><u>Status of achievement: Achieved</u> (At the time of Ex-post evaluation)</p> <ul style="list-style-type: none"> <li>Considering that the average productivity (around 5 t/ha) of the certified seeds from 2016 to 2019 and the one (around 4.04-4.65 t/ha) in the target 5 provinces during the implementation of the Project, an increase of about 15% is assumed to have been achieved.</li> <li>Recently, with the support from the government, producers gained access to trainings, technical support, diffusion system and technology, and the knowledge</li> </ul>

Agricultural Production Cooperative (CPA) and Credit and Service Cooperative (CCS) produce certified seeds. EAIG provides technical extension services, collaborating with ETIG, and agricultural input necessary for the producers’ organizations and farmers to produce seeds. Also, EAIG collects the produced seeds and distributes to local rice producers as certified seeds, after drying and processed accordingly.

and technology of seed producers and institutions have been improved. By the diffusion of seed production technology, the selection and adoption of adequate varieties suited to land conditions have been proceeded, which has promoted the development and seed production of adequate varieties. As a result, seed producers have gained access to good quality seeds of popular varieties.

Source: Report of Terminal evaluation, Answers to the questionnaire to IIGranos, Information provided by GAG, IIGranos, and Japanese experts in charge of current technical cooperation.

### 3 Efficiency

For the 2008-10 Project, although the project period was within the plan (ratio against plan: 88%), the project cost exceeded the plan (ratio against plan: 138%) due to the increase of project cost because of additional dispatch of Japanese experts, etc. For the 2012-16 Project, although the project period was as planned (ratio against plan: 100%), the project cost exceeded the plan (ratio against plan: 135%) due to a delay in the construction of a post-harvest treatment facility and an increase in the construction cost. Outputs of both projects were achieved as planned.

From the above, the efficiency of the overall projects is fair.

### 4 Sustainability

#### <Policy Aspect>

“Rice Seed Production Program” plans annually the planting area, yield and production of certified rice seeds with the objective of assuring the adequate quality and necessary amount of certified rice seeds for the rice production of the country, and “Seeds Policy (2020-2030)” aims for 100% use of certified seeds in all domestic agricultural production by 2030. Increasing rice production for food security and the use and production of certified seeds to achieve it are described as the priorities for Cuba. The undertakings of these Projects are assumed to continuously contribute to realization of the current national policies even after the termination of the Projects.

#### <Institutional/Organizational Aspects>

Based on the achievement of the project in the strengthening of rice seeds production technique, a technical cooperation project “The Project on Improvement of Agricultural Extension System for Grain Production in Cuba” (2017~2022) has been under implementation, with the objective of strengthening the technical extension system for rice, frijol, and corns producers. This project targets grain-producers in 8 provinces including 5 provinces targeted by the 2012-16 Project and Island of Youth special municipality, and its implementing agency is IIGranos as well. In this project, training of trainers (TOT) is provided to extension workers of the ETIG of IIGranos, and then the trained extension workers are expected to develop their activities in alliance with agricultural companies’ technical officers (potential extension workers), technicians of producers’ organizations and cooperating farmers, providing necessary training for them.

The system of production, inspection, distribution and use of registered and certified seeds which was established by the Projects has been disseminated nationwide through extension workers at the time of the ex-post evaluation. In IIGranos, while it had 7 extension officers assigned at the time of the terminal evaluation of the 2012-2016 Project, currently 42 persons in total (25 extension officers and 17 researchers/technicians) are taking roles of research and extension related to rice production, and the number of personnel engaged in the promotion and extension system developed by the projects is considered sufficient. 23 agricultural state-owned companies have 5 extension officers each assigned to implement the extension activity in model farms on a trial basis, and it is planned to extend it to other areas in the future. These companies are considered as participants and beneficiaries of this project. In this project, 250 farmers are selected as cooperating extension farmers, and they are also participants and beneficiaries. The information exchange and sharing are promoted and strengthened among extension workers, between extension workers and producers and among producers.

#### <Technical Aspect>

The specialists and researchers of IIGranos have maintained knowledge and skills related to the rice cultivation through training, self-learning and studying in post-graduate schools. In the above-mentioned on-going technical cooperation project, IIGranos is taking a leading role to deliver trainings to leading seed farmers, and their knowledge and skills are maintained and updated. The manuals and guides prepared by the projects, such as “Manual of agricultural extension for production and diffusion of certified seeds of rice in Central zone of Cuba”, “Field guide for rice cultivation”, “Manual of production of rice seeds”, and “Technical instructions for rice cultivation”, have been used as training materials by IIGranos, other institutions under Ministry of Agriculture and Ministry of Higher education, agricultural companies and producers. The manuals for rice cultivation techniques have also been revised, including the addition of varieties (the current project is also supporting the revision). In addition, restrictions on import of spare parts and financial problems have occurred due to economic sanctions by the US. Although it is difficult to purchase spare parts for equipment provided by this Project, when the provided equipment breaks down, it has been dealt with creatively by using spare parts domestically available.

#### <Financial Aspect>

The financial source of IIGranos includes the budget allocated by the national budget of Financial Fund of Science and Innovation (FONCI), the budget of the agricultural companies allocated by GAG (occupying 60% of the overall budget), and the revenue from the provision of services and the sale of seeds, among others. The budget of IIGranos has increased compared to the one at the time of the project completion. Construction of the training building of IIGranos, which had been suspended, has resumed this year, and measures to reduce necessary budget for activities have been taken, including the cost sharing in kind such as food and venue, with participating agricultural companies and cooperatives.

#### <Evaluation Result>

In the light of above, the sustainability of the effects though the projects is high.

### 5 Overall evaluation

The 2008-10 Project achieved project purpose which aimed at planned distribution of registered seeds and achieved overall goal which aimed at utilization of high-quality seeds by popular rice producers. The 2012-16 Project achieved project purpose which aimed to increase the production of certified seeds by trained leader seed producers in the central 5 provinces and achieved overall goal which aimed to increase the yield of certified seeds and rice production. With reference to sustainability, restrictions on the import of spare parts and financial problems have occurred due to the economic sanctions by the US, which made difficult for them to purchase spare parts, but they deal with it using domestic spare parts. IIGranos has sufficient personnel and technical officers and researchers of related institutions have

maintained knowledge and skills of rice cultivation through training and self-learning. Supported by the on-going project, the knowledge and skills of stakeholders are maintained and updated. With reference to efficiency, the duration of the project for the 2012-16 Project was as planned, but its project cost was significantly exceeded.

Considering all of the above points, this project is evaluated to be highly satisfactory.

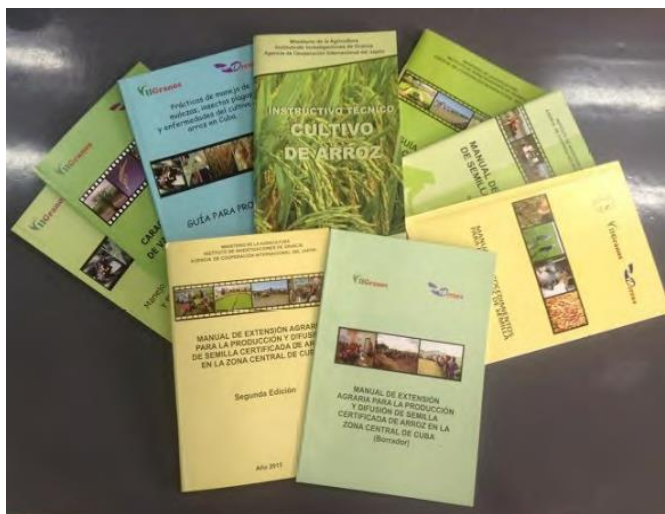
### III Suggestion / learning

#### Recommendations for Implementing Agency:

- It is expected to deliver necessary technical training sustainably by completing the construction of training building of IIGranos to utilize it for future training, and continuing and extending the measures such as partial cost-sharing in alliance with participating companies etc.

#### Lessons Learned for JICA:

- Strengthening of the linkage between the research institutions for seed development and producers is one of the achievements and the lessons of this Project. The ongoing project which follows this Project took up the undertaking of this Project as a model of agricultural extension system. Research institutions on agricultural products other than rice are interested in this Project so that IIGranos have actively exchanged opinions with other research institutions. Also in the policy of agricultural extension being drafted by the government the undertaking of this Project is being referred. (Ex-Director of IIGranos presented the system of agricultural extension based on the experience of this Project in the meeting attended by the President.)
- These projects were highly consistent with the strategy of Cuban government aiming to increase seed production and dissemination for the improvement of self-sufficiency of rice. With the result of implementation of the projects in two phases, 100% dissemination rate of certified seeds in the target 5 provinces (since 2015) and 97% at national level (in 2019) was achieved for rice production. Since it was the first full-scale technical cooperation for Cuba, the cooperation was planned as phase projects in divided period, and set the achievable goal within the each projects. In order to correspond to the policy and needs of the partner country, conducting the analysis of the overall challenges in seeds production, realistic goals that are achievable in a timeframe of single project were set in each phase (phase 1: the planned distribution of registered seeds, and phase2: the increase of certified seed production), which derived self-help efforts of the counterpart institution. The subsequent phase was started after taking a certain period between a phase to another and confirming the independent efforts of the counterpart institution, As a result, the sustainability of the projects was enhanced. The achievement of concrete goals in each phase and sustainable efforts of Cuban side triggered the subsequent phase of cooperation, which led further sustainable and independent efforts of counterpart institution. It is important to have medium- to long-term vision in project formulation and management, conduct adequate project monitoring and target management at each stage, and shift carefully toward a next phase depending on the degree of capacity development of implementing institutions.
- With the extension of production techniques, the selection and adoption of various adequate varieties suited to different land conditions were progressed, and the seed production of adequate varieties was promoted. These made rice producers possible to access to good quality seeds of popular varieties suited to their needs, which promoted the dissemination of certified seeds. In order to extend the seed production from registered seed to certified seed, it was important to have collaboration and communication between research institutions and leader farmers (local exemplary farmers who engage in the certified seeds production) in relation to the development of adequate seeds suited to each area and the extension of seed production techniques. Such communication was promoted through the preparation of learning materials in cultivation practices, training sessions, and the farm demonstration in these projects. By seeking close communication between research institutions for seed development and producers, a positive cycle described above is considered to have arisen. Therefore, it is considered important to strengthen the linkage between the research and the agriculture extension.



Training materials prepared by the project.



Experimental field by leader seed producer (Sancti Spiritus Province)