

Country Name	Project of Social Inclusion through the Incentive to Produce Oleaginous Plants for the Generation of Bio-diesel in the State of Rio Grande do Norte
Federative Republic of Brazil	

**I. Project Outline**

Background	<p>In Brazil, an advanced country of the introduction of bio-fuel, the likelihood of poverty reduction through the oleaginous plants production was focused in 2005. The system of “Social Fuel Stamp” was enacted to promote purchase of oil seeds and crude oil produced by small-scale family farmers, and benefits for the farmers were expected, such as the proper use of uncultivated fields, crop diversification, and the securing of stable income generation sources. Western area of the State of Rio Grande do Norte is located in a semi-arid area called <i>Caatinga</i>, and the cropping season for the farmers without irrigation system is quite limited. In the past, those farmers generated income from cotton cultivation. However, as they faced the situation with insufficient and unstable cash income, the improvement of their farming, including introduction of new cash crop, was indispensable for them.</p>				
Objectives of the Project	<p>Through development of strategies for oilseed crops production and establishment of diversified utilization chain of processed products of oilseed crops, establishment of diversified farming model, recommendation of distribution routes for oilseed crops and processed products, establishment of cooperatives and support for their management, and preparation of manuals on oilseed crops, the project aimed at establishing a model of Bio-diesel-fuel (BDF) production chain and diversified farming system including oilseed crops for small-scale family farmers by cooperatives in the target area, and thereby contributing to promotion of BDF production chain and processed products of oilseed crops for small-scale family farmers and improvement of livelihood of small-scale family farmers through the oilseed crop cultivation.</p> <ol style="list-style-type: none"> <li>Overall Goal: Bio-diesel-fuel (BDF) production chain and processed products of oilseed crops for small-scale family farmers are promoted and income of small-scale family farmers is improved through the cultivation of oilseed crops.</li> <li>Project Purpose: The model of BDF production chain and diversified farming system including oilseed crops for small-scale family farmers by cooperatives is established in the target area.</li> </ol>				
Activities of the Project	<ol style="list-style-type: none"> <li>Project Site: Western area of the State of Rio Grande do Norte</li> <li>Main Activities: 1) Development of strategies for oilseed crop production and establishment of diversified utilization chain of processed products of oilseed crops, 2) Establishment of diversified farming models, 3) Recommendation of distribution routes for oilseed crops and its processed products, 4) Establishment of cooperatives and support of their administration, 5) Preparation of manuals on oilseed crops, etc.</li> <li>Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> <p>Japanese Side</p> <ol style="list-style-type: none"> <li>Experts: 4 persons</li> <li>Trainees Received: 8 persons</li> <li>Equipment: Oil extraction equipment at an oil extraction plant in Marcelino Vieira, Sprinkler irrigation system, PC, etc.</li> <li>Local expense: cost for project activities</li> </ol> </td> <td style="width: 50%;"> <p>Brazilian Side</p> <ol style="list-style-type: none"> <li>Staff Allocated: 15 persons</li> <li>Land and facility: office space in Secretary of Agriculture, Livestock and Fishery</li> <li>Local expense: cost for the construction of an oil extraction plant in Lucrecia</li> </ol> </td> </tr> </table> </li> </ol>			<p>Japanese Side</p> <ol style="list-style-type: none"> <li>Experts: 4 persons</li> <li>Trainees Received: 8 persons</li> <li>Equipment: Oil extraction equipment at an oil extraction plant in Marcelino Vieira, Sprinkler irrigation system, PC, etc.</li> <li>Local expense: cost for project activities</li> </ol>	<p>Brazilian Side</p> <ol style="list-style-type: none"> <li>Staff Allocated: 15 persons</li> <li>Land and facility: office space in Secretary of Agriculture, Livestock and Fishery</li> <li>Local expense: cost for the construction of an oil extraction plant in Lucrecia</li> </ol>
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Project Period	April 2009 – April 2015 (Extension: April 2013 – April 2015)	Project Cost	(ex-ante) 310 million yen, (actual) 496 million yen		
Implementing Agency	State Secretary of Agriculture, Livestock and Fishery (Secretaria de Estado da Agricultura, da Pecuária e da Pesca: SAPE), Technical Assistance and Rural Extension Corporation (Empresa de Assistência Técnica e Extensão Rural: EMATER), Rio Grande do Norte Agriculture and Livestock Research Corporation (Empresa de Pesquisa Agropecuária do Rio Grande do Norte: EMPARN)				
Cooperation Agency in Japan	Chuo Kaihatsu Corporation, Agri Energy International Limited				

**II. Result of the Evaluation**

1 Relevance
<p>&lt;Consistency with the Development Policy of Brazil at the Time of Ex-Ante Evaluation and Project Completion&gt;</p> <p>The project was consistent with Brazil’s development policies of “National Program of Biodiesel Production and Utilization” (2004) promoting the utilization of BDF and “Social Fuel Stamp” (2005) accelerating the purchase of oil seeds and crude oil from small-scale family farmers by refining enterprises at the time of ex-ante evaluation, and also, “National Program of Biodiesel Production and Utilization” (2004) and “Four-year plan” (2012-2015) prioritizing agriculture at the time of project completion.</p> <p>&lt;Consistency with the Development Needs of Brazil at the Time of Ex-Ante Evaluation and Project Completion &gt;</p> <p>The project was consistent with Brazil’s development needs of the comprehensive improvement of farming including introduction of cash crops in the western area of the State of Rio Grande do Norte where small-scale family farmers’ cash income was insufficient and unstable.</p>

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was consistent with Japan's ODA policy<sup>1</sup> for Brazil, focusing on the five priority areas including agriculture, based on the top-level agreement between the President of Brazil and the Prime Minister of Japan when the President Lula visited Japan in May, 2005.

<Appropriateness of Project Design/Approach>

During the project implementation, the State of Rio Grande do Norte had suffered from unprecedented droughts. According to EMPARN's data, the rainfalls in the state for the period between 2012 and 2017 reduced by 63% compared to the average between 1992 and 2018 and decreased by 36% on average for the six year. This brought about a catastrophe for the agricultural production across the whole state regardless of farming methods. It was confirmed that oilseed crops for BDF (especially, sesame) selected by the project have been continuously produced since the project completion even though experiencing such severe abnormal weathers, and the production contributed to an increase in the income of small-scale family farmers while the model of BDF production chain aimed by the project had not been established during the project. Therefore, the approach of the project is considered appropriate to support the small-scale family farmers.

Also, in order to take countermeasures against the above-mentioned unexpected serious droughts and secure the security of local people's living, it was necessary to have products which are less affected by weather and can contribute to the livelihood of the small-scale family farmers in the target area of the project. Small livestock and beekeeping, which were introduced by the project for diversifying farming among the small-scale family farmers, were able to meet the local needs, and it can be concluded that the modification of the project approach was appropriate.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was not achieved by the time of project completion. Through the project, small livestock (sheep), beekeeping and food processing, which are less affected by drought, were incorporated into a farming model, and the model was introduced by the model farmers (Indicator 1). However, although experiments on effective use of the sub-products of an oilseed crop (sesame) were carried out and a plan on the effective use of the sub-products by the model farmers was examined, the plan was not introduced to the model farmers due to the more severe droughts than the ones in the ordinary years (Indicator 2). Since oilseed crops were not able to be produced due to the severe droughts, the oilseed crops were procured from the external sources and a demonstration farm, and processed products by using the procured oilseed crops were sold on a demonstration basis (Indicator 3). However, in terms of recommendations on adaptable oilseed crops to the State of Rio Grande do Norte, the activities were limited to implementation of its related tests and research at EMPARN and the demonstrative farms, and oilseed crops to be introduced considering economic viability were not proposed (Indicator 4). No oilseed crop production was not realized by cooperatives organized by the small-scale family farmers (Indicator 5).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The Project Effects have been partially continued since the project completion. It was confirmed that the diversified farming models introduced by the project has been still effective at the time of ex-post evaluation since the model farming became a new income source for the model farmers. In addition, the fact has stimulated interests of other small-scaler family farmers in the model and introduction of the diversified farming models have been promoted by them. Regarding effective use of sub-products of oilseed crops that was not introduced during the project implementation, the cooperatives have extracted oil from sesame supplied by the model farmers, and the residuals have been utilized as livestock feed by the model farmers since the project completion. Oilseed crops (sesame) produced by the model farmers and the small-scale family farmers, and oilseed products (sesame oil) processed by the cooperatives have been continuously sold. Also, as for oilseed crops suitable to the State of Rio Grande do Norte, sesame, moringa, and cotton were proposed after the project. Moreover, the oilseed crop production by the cooperatives and small livestock (sheep) and beekeeping introduced by the project have been continued. Furthermore, the number of the member farmers of the cooperatives established by the project has increased from 26 to 44 in the Lucrecia Agricultural Cooperative (COAFAL) and from 26 to 52 in the Marcelino Vierira Agricultural Cooperative (COAAF) from the ones at the time of the establishment.

"Strategic Plan for Diversified Development of Agricultural Farmers in Semi-Arid Area" prepared by the project has been continuously utilized. EMPARN has used the Strategic Plan as a guidance for production by small-scale family farmers across the state for preparation of EMPARN's manuals. Also, Brazilian Agricultural Research Corporation (Empresa de Pesquisa Agropecuaria do Rio Grande do Norte: EMBRAPA) has used the Strategic Plan in research on mixed planting including sesame cultivation in order to attain social inclusion through promotion of participation of small-scale family farmers in production activities.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been partially achieved at the time of ex-post evaluation. There are 26 small-scale family farmers who use the oilseed crops (sesame) introduced by the project in various manners. Although their average income had experienced a decrease from 300 reais per kg in 2015 to 120 reais per kg in 2017, it significantly augmented to 500 reais per kg in 2018. In addition, those farmers have not only improved their income by the production and sale of sesame but also expanded their income resources by processing the produced sesame.

<Other Impacts at the time of Ex-post Evaluation>

Some positive impacts were observed at the time of ex-post evaluation. In the State of Rio Grande do Norte, a male-dominated atmosphere was seen before starting the project. However, the establishment of the cooperatives by the project has brought about the women's participation in production processing and marketing activities in the markets, and their participation led good results. As a result, women's position has been empowered. The head of COAFAL has been a woman. Also, international organizations including the World Bank (WB) and the United Nations Development Program have focused on improvement of poverty in the western region of Brazil in the "Development and Governance Project in the State of Rio Grande do Norte" (2013-2019), a loan project funded by WB. COAFAL and COAAF of the project were incorporated into the loan project as models of their project activities. From the viewpoint of the cooperatives, the WB project has benefited them for their marketing since the WB project has been establishing a system collectively selling the targeted

<sup>1</sup> Ministry of Foreign Affairs "ODA Databook" (2007)

products from all the cooperatives in the state at the markets located in large cities. It is expected that the cooperatives organized by the project will have access to the markets in the large cities where they were not able to access by their production capacities. In addition, the number of the small-scale family farmers producing small livestock (sheep) and beekeeping other than the oilseed crops introduced by the project has increased from 3 in 2015 to 8 in 2018 for small livestock (sheep) and from 8 in 2015 to 28 in 2018 for beekeeping. Furthermore, the project brought about the additional income of the small-scale family farmers though income from each product has slightly fluctuated from 500 Real in 2015 to 900 Real in 2018 for small livestock (sheep) and from 6,125 Real in 2015 to 2,520 Real in 2018 for beekeeping

<Evaluation Result>

The project realized the expected project effects after the project completion and contributed to the improvement of the livelihood of small-scale farmers though the Project Purpose had not been achieved during its implementation. Therefore, the effectiveness/impact of the project is fair.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results																																																																											
<p>(Project Purpose) The model of BDF production chain and diversified farming system including oilseed crops for small-scale family farmers by cooperatives is established in the target area.</p>	<p>(Indicator 1) Diversified farming models are introduced at model farmers.</p>	<p>Status of the Achievement: achieved (continued) (Project Completion) • Small livestock (sheep), beekeeping and processed food, which are not less affected by drought, were incorporated into the farming model, and the model was introduced by the model farmers. (Ex-post Evaluation) • Sesame, small livestock (sheep) and beekeeping have been produced by the model farmers and the small-scale family farmers.</p> <p>[Production of sesame]</p> <table border="1" data-bbox="770 786 1522 976"> <thead> <tr> <th rowspan="2">Farmer</th> <th rowspan="2">No. of farmers producing sesame</th> <th rowspan="2">Rate of farmers producing sesame</th> <th colspan="4">Average production of sesame (kg per a farmer)</th> </tr> <tr> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Model farmers</td> <td>26</td> <td>59</td> <td>10</td> <td>7</td> <td>7</td> <td>7</td> </tr> <tr> <td>Small-scale family farmers</td> <td>10</td> <td>100</td> <td>10</td> <td>7</td> <td>7</td> <td>7</td> </tr> </tbody> </table> <p>Note: the total number of the model farmers (44), the number of the small-scale family farmers interviewed (10)</p> <p>[Production of small livestock (sheep)]</p> <table border="1" data-bbox="770 1106 1522 1296"> <thead> <tr> <th rowspan="2">Farmer</th> <th rowspan="2">No. of farmers feeding sheep</th> <th rowspan="2">Rate of farmers feeding sheep</th> <th colspan="4">No. of sheep per a farmer</th> </tr> <tr> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Model farmers</td> <td>4</td> <td>10</td> <td>8</td> <td>8</td> <td>8</td> <td>8</td> </tr> <tr> <td>Small-scale family farmers</td> <td>4</td> <td>100</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> </tbody> </table> <p>Note: the total number of the model farmers (44), the number of the small-scale family farmers interviewed (4)</p> <p>[Production of beekeeping]</p> <table border="1" data-bbox="770 1426 1522 1666"> <thead> <tr> <th rowspan="2">Farmer</th> <th rowspan="2">No. of farmers joining beekeeping</th> <th rowspan="2">Rate of farmers joining beekeeping</th> <th colspan="4">Average production of honey (kg per a farmer)</th> </tr> <tr> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Model farmers</td> <td>4</td> <td>10</td> <td>8</td> <td>8</td> <td>8</td> <td>8</td> </tr> <tr> <td>Small-scale family farmers</td> <td>4</td> <td>100</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> </tbody> </table> <p>Note: the total number of the model farmers (52), the number of the small-scale family farmers interviewed (17)</p>	Farmer	No. of farmers producing sesame	Rate of farmers producing sesame	Average production of sesame (kg per a farmer)				2015	2016	2017	2018	Model farmers	26	59	10	7	7	7	Small-scale family farmers	10	100	10	7	7	7	Farmer	No. of farmers feeding sheep	Rate of farmers feeding sheep	No. of sheep per a farmer				2015	2016	2017	2018	Model farmers	4	10	8	8	8	8	Small-scale family farmers	4	100	10	10	10	10	Farmer	No. of farmers joining beekeeping	Rate of farmers joining beekeeping	Average production of honey (kg per a farmer)				2015	2016	2017	2018	Model farmers	4	10	8	8	8	8	Small-scale family farmers	4	100	10	10	10	10
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	<p>(Indicator 3) Oilseed crops of the model farmers and processed products of the model cooperatives are sold on the experimental basis to related companies and individuals.</p>	<p>Status of the Achievement: partially achieved (continued) (Project Completion)</p> <ul style="list-style-type: none"> <li>Due to the droughts, oilseed crops as a raw material were procured from external sources and the demonstrative farm. Demonstration sales of the processed products were carried out.</li> </ul> <p>(Ex-post Evaluation)</p> <ul style="list-style-type: none"> <li>Sesame has been sold by the model farmers and the small-scale family farmers.</li> <li>A processed product of sesame (sesame oil) has been sold by COAFAL.</li> </ul> <p>[Sales of sesame]</p> <table border="1" data-bbox="770 367 1525 557"> <thead> <tr> <th rowspan="2">Farmer</th> <th rowspan="2">No. of farmers selling sesame</th> <th rowspan="2">Rate of farmers selling sesame</th> <th colspan="4">Average sales of sesame (Real per 1 kg)</th> </tr> <tr> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Model farmers</td> <td>26</td> <td>59</td> <td>700</td> <td>700</td> <td>800</td> <td>800</td> </tr> <tr> <td>Small-scale family farmers</td> <td>10</td> <td>100</td> <td>700</td> <td>700</td> <td>800</td> <td>800</td> </tr> </tbody> </table> <p>Note: the total number of the model farmers (44), the number of the small-scale family farmers interviewed (10)</p> <p>[Sales of sesame oil by COAFAL]</p> <table border="1" data-bbox="770 685 1525 824"> <thead> <tr> <th rowspan="2">Cooperative</th> <th rowspan="2">No. of cooperative selling sesame oil</th> <th rowspan="2">Rate of cooperative selling sesame oil</th> <th colspan="4">Average sales of sesame oil (Real per 1 kg)</th> </tr> <tr> <th>2015</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>COAFAL</td> <td>1</td> <td>100</td> <td>7,800</td> <td>6,500</td> <td>3,120</td> <td>13,000</td> </tr> </tbody> </table>	Farmer	No. of farmers selling sesame	Rate of farmers selling sesame	Average sales of sesame (Real per 1 kg)				2015	2016	2017	2018	Model farmers	26	59	700	700	800	800	Small-scale family farmers	10	100	700	700	800	800	Cooperative	No. of cooperative selling sesame oil	Rate of cooperative selling sesame oil	Average sales of sesame oil (Real per 1 kg)				2015	2016	2017	2018	COAFAL	1	100	7,800	6,500	3,120	13,000											
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oilseed crops for small-scale family farmers are promoted and income of small-scale family farmers is improved through the cultivation of oilseed crops.	products.	increased in 2018 (a 160% increase compared to 2015).			
		[Average income of small-scale family farmers (Real per kg)]			
		2015	2016	2017	2018
	300	250	120	500 (160%)	
	(Indicator 2) The number of means for small-scale family farmers to gain income increases by introducing oilseed crops and making diversified use of their processed products.	(Ex-post Evaluation) partially achieved • The know-how of sesame production introduced by the project has been utilized, and sesame oil has been adopted as an income source.			

Source : Terminal Evaluation Report, Questionnaire and Interview with EMPARN, COAFAL and COAAF

### 3 Efficiency

The project cost and period considerably exceeded the plan (ratio against the plan: 160% and 152%, respectively). It was because some planned activities were not able to be implemented within the original project period and the attainment of the Project Purpose became difficult due to the droughts occurred in the three consecutive years. The situation required additional cost and extension of project period. The outputs were produced as planned. Therefore, the efficiency of the project is low.

### 4 Sustainability

#### <Policy Aspect>

The “Multi-year Plan” (2016-2019) promotes sustainable pastoral agriculture production, and “Promotion of Family Farming Products Purchases and Solidarity Economy” (No. 10.536/19) also does the production of oilseed crops and their oil. The project has been endorsed by the policies, in that it aimed at disseminating and promoting diversified farming models focusing on oilseed crops as well as BDF production chain.

#### <Institutional Aspect>

[Dissemination and Promotion of diversified farming models and BDF production chain]

There have not been any major changes in the institution for dissemination and promotion of the diversified farming model and the BDF production chain. UMARIZAL of EMATER has played the following roles: 1) provision of technical instructions to farmers, 2) introduction of national policies, 3) promotion of farmers’ participation in dissemination activities. 10 staff members are deployed to UMARIZAL of EMATER. According to EMATER, the staff has performed their activities as members of the cooperatives and contacted the target farmers of the project in a good manner so that the number of the staff is considered sufficient.

Communication and Business Section of EMPARN has provided supports related to agricultural techniques in cooperation with EMATER. According to EMPARN, 22 staff members have been deployed to the Communication and Business Section, and the number of the staff has been sufficient. They perform their dissemination and research activities without any major problems through collaborations with EMBRAPA and EMATER.

#### [Cooperatives]

COAFAL and COAAF were established by the project. The cooperatives have contributed to the enhancement of members’ productivity and empowered women’s status. They have continued their activities even at the time of ex-post evaluation as they have been targeted for the WB loan project as mentioned above. COAFAL and COAAF reported that the number of registered members were 44 and 52 respectively. Since they have sufficiently implemented their activities, they considered that the number of the members has been enough.

#### [Operation and maintenance of equipment such as oil extraction machine]

The equipment (oil extraction machine, refining machine) provided to COAFAL by the project has been continuously maintained on a monthly basis, and they have been well functioning. Also, the equipment (work desk, centrifuge, honey cylinder) provided to COAAF by the project has been cleaned and maintained on a regular basis along with honey harvest season, and their conditions have been good. The reason why the equipment has been in good conditions is the equipment not requiring special maintenance.

#### <Technical Aspect>

[Dissemination and Promotion of diversified farming models and BDF production chain]

EMATER has sustained the knowledge and skills necessary for dissemination and promotion of the diversified farming model and the BDF production chain. In the background, EMATER has endeavored to sustain and improve their staff’s technical capacity by technical transfer by the external lecturers through technical discussion meetings, study sessions, and refresher training activities.

EMPARN has maintained the knowledge and skills necessary to provide agricultural technical support. In the background, their researchers have been striving to maintain and improve their abilities by participating in external research groups, seminars and internal trainings.

#### [Technical support for small-scale family farmers and cooperatives]

As mentioned above, EMATER has played a major role in provision of technical support for small-scale family farmers and cooperatives. According to EMATER, the knowledge and skills necessary for the technical support have been maintained through participation in local trainings and workshops, holding of monthly events, routine field visits, and visits by farmers.

#### [Use of manuals]

The manuals (Manual on an oil crop cultivation using irrigation, small livestock (sheep) production manual, beekeeping manual, food processing manual, manual on establishment of cooperatives) prepared by the project have been continuously used by COAFAL and COAAF since they are useful to extend the project effects.

#### [Operation and maintenance of equipment such as oil extraction machine]

Since COAFAL and COAAF have regularly provided equipment management trainings to members of the cooperatives and their family members, they have had the knowledge and abilities necessary for the operation and maintenance of the equipment such as oil extraction machine.

#### <Financial Aspect>

[Dissemination and promotion of the diversified farming model and the BDF production chain]

The budget for the implementing agency

The budgets of EMATER and EMPARN for dissemination and promotion of the diversified farming model and the BDF production chain have been allocated by the state government and the federal government every year. According to EMATER and EMPARN, their budgets have been sufficiently secured because they have carried out their activities without any major problems. In addition, since their activities introduced by the project have been incorporated into the loan project funded by WB, their budget has been in the upward trends. It is expected that the budgets will be secured in the future.

Organization	2015	2016	2017	2018	2019	2020 (Plan)
EMATER	210	145	278	160	373	340
EMPARN	100	100	100	100	100	100

[Cooperatives]

Both COAFAL and COAAF have gained their revenues from charges to the members when they purchase products and request marketing of their products. As their revenues have exceeded the necessary expenses for their operations, they have sustained their sufficient financial positions for their operation. In addition, because the activities of the cooperatives have been incorporated into the WB's loan project, it is expected that their financial status will be sustained in the future.

Financial balance of the Cooperatives

Organization	2015	2016	2017	2018
COAFAL	50	102	15	42
COAAF	60	70	15	100

<Evaluation Result>

Therefore, the sustainability of the effects through the project is high.

### 5 Summary of the Evaluation

The project did not achieve the Project Purpose aiming at establishing the model of BDF production chain and diversified farming system including oilseed crops for small-scale family farmers by cooperatives by the time of project completion. However, since the project completion, the diversified farming model introduced by the project has been practiced by some of the farmers, and the project has partially achieved the Overall Goal aiming at promoting BDF production chain and processed products of oilseed crops for small-scale family farmers and improving their income through the cultivation of oilseed crops. As for the efficiency, the project cost and period considerably exceeded the plan due to the droughts.

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

### III. Recommendations & Lessons Learned

#### Recommendations for Implementing Agency:

- As a result of interviews with the cooperatives and farmers in the target area, the diversification of farming introducing oilseed crops, small livestock, and beekeeping has been progressing. However, the results of interviews with the state agencies including SAPE, it was confirmed that information at the local level has not always transmitted to these agencies in a prompt way. In order to develop and sustain the project effects, it is necessary to promote further contacts between the state government and the small-scale family farmers. To attain this, it is recommended that the needs on the field be readily communicated to the state government through strengthening site visits and observation of the activities by local extension workers, cooperatives, and farmers by the leaders of the state government including EMATER.
- Various manuals were prepared to promote and disseminate the diversified farming model introduced by the project. Even at the time of ex-post evaluation, due to their effectiveness, the manuals have continued to be utilized by the cooperatives established by the project. Taking the situation into account, they are likely to be useful to other farmers and cooperatives. In order to continuously expand and disseminate the project effects, it is recommended to disseminate the manuals using a network the state government has.

#### Lessons Learned for JICA:

- The project introduced sesame as an oilseed crop for BDF at the time when the severe droughts occurred. In case where it is impossible to use such crops for BDF, it can be used for food. Therefore, it was useful to establish the diversified farming model. Also, the project introduced small livestock and beekeeping which were able to contribute to diversifying farming of the small-scale family farmers who are vulnerable against risks but were not directly linked to BDF in order to ensure the security of livelihood of the local people. On the other hand, on the project design, the Project Purpose contained a model "diversified farming for small-scale family farmers", and the Overall Goal aimed at enhancing the income of the farmers through the cultivation and processing of oilseed crops and the dissemination of BDF production chain, which limited its activities to the outputs related to BDF. This constrained further diversification of farming of the farmers for improvement of their income and moreover retarded the progress of activities and the production of the outputs due to the droughts. In a case of implementation of a project aiming at supporting vulnerable small-scale family farmers in high risk areas where agricultural production is severely affected by droughts, it is essential to scrutinize the applicability of crops (oilseed crops) for highly cashable specific purposes to target areas and consider project components, which can flexibly respond to and manage any risks, in order to operate the project with flexible responses to the risks. Also, it is desirable to design a project to cope with negative impacts by weather and other factors during the project implementation. In addition, it is recommended to incorporate a farming, which can be a safety net and is less affected by droughts, into a project component from a perspective of "diversified farming".



Sesame cultivation and cultivated sesame



Meetings by members of cooperatives