Republic of Zambia

FY2017 Ex-Post Evaluation of Technical Cooperation Project

"Rural Extension Services Capacity Advancement Project

– Through PaViDIA Approach-"

External Evaluator: Satoshi Nagashima, INTEM Consulting Inc.

0. Summary

This project aims to improve the agricultural extension services provided by the Department of Agriculture through improving the extension implementation structures and improving the technologies and knowledge of the extension officers in the target areas, thereby improving the quality of farmers' lives in target areas.

This project was consistent with the development policy of the agricultural sector, the development needs of the agricultural sector before implementation and after completion of the project, and the development policy of Japan before implementation of the project. In addition, although the project purpose had been changed during the implementation period, there is no difference in the direction of aims, and the project plan and approach, etc. were appropriate. Therefore, the relevance is high.

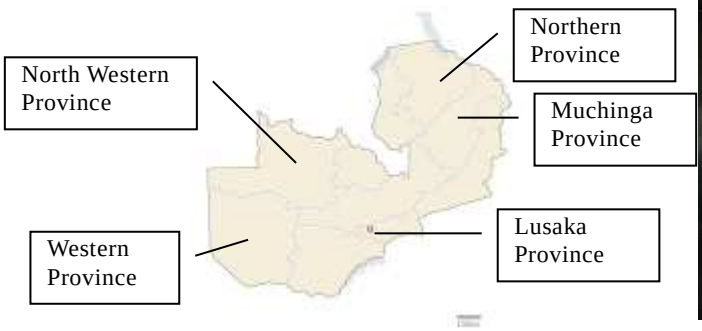
Through implementation of the project, the agricultural extension services have largely improved through improvements in the extension implementation structures and improvement of extension officers' technical abilities and knowledge in the target areas. In addition, the overall goal has been mostly achieved as improvement is observed in socioeconomic conditions of farmers due to the above effects, and the effectiveness and impact are high.

In this project, the project period was as planned but the project cost exceeded the plan, and the efficiency is fair.

Policy and institutional sustainability of this project is secured by National Development Plan and National Agricultural Extension and Advisory Services Strategy. The structures and technologies to maintain the effectiveness of this project in the medium term are largely secured. On the other hand, the sustainability of this project is fair, due to the factors such as the lack of financial resources to conduct trainings to maintain it in the future.

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

1. Project Description



Project Location(s)

Example of improvement of agricultural extension services (Checklist of reports submitted by extension officers)

1.1 Background

In Zambia, agricultural development was indispensable for poverty reduction as 60.5% of the population lived below the poverty line and 77.9% resided in rural areas. However, since the resultant weakening of the agricultural support structures of the government due to a sharp decline in the budget for extension services in the early 2000s caused by the structural adjustment, it became difficult to promote agriculture development targeting small-scale farmers in the remote areas.

In order to improve this situation, the Government of Zambia requested Japan to undertake a technical cooperation to mitigate poverty in the rural areas through implementation of a technical cooperation project, “Participatory Approach to Sustainable Village Development (hereinafter referred to as “PASViD”)”, which was mainly focused on conducting development projects investing small funds in farmers (hereinafter referred to as “micro project”), and the technical cooperation was implemented from 2000 to 2001. Based on the positive results of PASViD, a successor project was requested by the Ministry of Agriculture and Cooperative (hereinafter referred to as “MACO”) (at the time[1]) for the purpose of disseminating the approach nationwide, and a technical cooperation project “Participatory Village Development in Isolated Areas (hereinafter referred to as “PaViDIA”)” was implemented from 2002 to 2009. Through implementation of PaViDIA, even though a participatory practical model for isolated area’s communities was established, it was revealed that the institutional weakness of the

[1] The Ministry of Agriculture and Cooperatives, which was the implementing agency at the beginning of this project, was divided into the Ministry of Agriculture and Livestock and Ministry of Cooperatives in 2012, and the implementing agency of the project was the Ministry of Agriculture and Livestock. In 2016, the Ministry of Agriculture and Livestock was further divided into the Ministry of Agriculture and Ministry of Livestock and Fisheries, and the Ministry of Agriculture is the main body of substantive activities. Therefore, when the name of the Ministry before the Ministry of Agriculture appears in the main text, it is written with the words '(at the time)'.

agricultural extension structures that the communication and command system between each staff member in the framework among the Department of Agriculture, the provincial/district agricultural office and extension officers was not functioning at all was an obstacle to disseminating and expanding the PaViDIA approach nationwide. To solve this problem, a new technical cooperation for strengthening the agricultural extension structures was requested from the Ministry of Agriculture and Livestock (hereinafter referred to as "MAL") (at the time). Based on this, this project was implemented.

1.2 Project Outline

Overall Goal		Farmers' quality of life is improved in the target areas.
Project Purpose[2]		Rural extension services provided by MAL (at the time) are improved with the improved service delivery system, and skills and knowledge of extension officers including use of PEA-PaViDIA Approach (as an entry point) in the target areas.
Output(s)	Output 1	Appropriate technologies for farmers are identified in the target Districts of Northern/Muchinga Provinces.
	Output 2	In-Service Training System for Extension Officers is institutionalized within MAL (at the time).
	Output 3	Practical abilities of Extension officers are improved in the target Provinces/Districts.
	Output 4	Monitoring and backstopping capacity of Camp/Block[3], District and provincial level is strengthened.
	Output 5	Management capacity of MAL's extension service is improved.
Total cost (Japanese Side)		708 million yen
Period of Cooperation		December 2009 – December 2014
Implementing Agency		Department of Agriculture, Ministry of Agriculture and Cooperatives (Ministry of Agriculture at the time of ex-post evaluation)
Related Projects		【Technical Cooperation】 - Participatory Village Development in Isolated Areas Phase I (2002-2007) and Phase II (2007-2009)

[2] These contents are the one in the PDM at the time of ex-ante evaluation. Since the PDM was prepared up to version seven, this ex-post evaluation was evaluated according to the final version (revised in January 2013). For the comparison between the PDM at the ex-ante evaluation and the final one, see the section on effectiveness and impact.

[3] Camp is the smallest administrative unit consisting of several villages in Zambia. Blocks are the administrative unit in which three to four camps are gathered.

	- Rice Dissemination Project (2015-2018 (Plan)) 【Grant Aid】 Contribution of funds through counterpart funds from support for poor farmers (2KR) 【Other international organization, aid organization】 Contribution of funds through World Food Programme (WFP)[4]

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Terminal Evaluation

In this project, in addition to the fact that the indicators of the project purpose had been virtually achieved, efforts had been made to deepen the contents of the activities. As a result, activities related to the training and monitoring system were conducted while being expanded to whole provinces of Zambia and other departments in the Ministry of Agriculture and Livestock (at the time).

1.3.2 Achievement Status of Overall Goal at the Terminal Evaluation (including other impacts.)

At the time of the terminal evaluation, there was no information that could confirm the improvement of the socioeconomic situation of farmers in the target areas and improvement of the quality of life. However, as improvement of extension services had been confirmed, and the structure of the Department of Agriculture had been strengthened by this project and the necessary improvement of awareness of stakeholders had been observed, it was evaluated that it was possible to achieve the overall goal.

1.3.3 Recommendations from the Terminal Evaluation

- Drafted National Agricultural Extension and Advisory Services Strategy should be finalized as soon as possible and obtain approval from related organizations.
- At the central level, at least the Department of Agriculture should respond independently and not rely on Japanese experts to mobilize people and goods to secure funds as before.
- It should work closely with relevant departments at the Ministry, provincial and district level, aiming to establish an implementation structures for comprehensive extension structures.

[4] It was expected to be used for this project mainly by acquiring the counterpart fund of 2KR and part of WFP special funds funded by the Japanese government as a source of funds for implementing micro projects.

- Since the Agricultural Diary for Extension Officers (hereinafter referred to as "ADEOs"[5]) was an important tool for extension officers, it should be surely printed and distributed even after the 2015 version.

2. Outline of the Evaluation Study

2.1 External Evaluator

Satoshi Nagashima, INTEM Consulting Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: October, 2017 –December, 2018

Duration of the Field Study: January 7th, 2018 – February 8th, 2018,
April 15th, 2018 – April 28th, 2018

3. Results of the Evaluation (Overall Rating: B[6])

3.1 Relevance (Rating: ③[7])

3.1.1 Consistency with the Development Plan of Zambia

Agriculture is regarded as one of the priority areas in the *Fifth National Development Plan* (2006-2010) which was the policy at the time of the ex-ante evaluation, and improvement of extension services was positioned as one of the important programs of agriculture sector.

In the *Revised Sixth National Development Plan* (2013-2016) which was a policy at the time of project completion, "sustainable and effective production of diversified crops, improvement of productivity and value addition" was mentioned as one of the targets of agriculture, livestock and fisheries sector, and as a strategy for achieving it, employment of extension officers, promotion of participation of the private sector in the extension services and introduction of IT into extension services were mentioned.

As mentioned above, this project has been consistent in that the extension service is important for development of the agricultural sector in the policies at the planning stage and at the completion stage of the project, and the relevance on the consistency between this project and the development policy was high.

[5] It is a diary distributed to camp/block extension officers, consisting of calendar, format of report, agricultural technology information and so on. Though it is currently renamed as Agriculture Planning and Resource Guide for Extension Officers (ARGEOs), this report uses ADEOs.

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

[7] ③: High, ②: Fair, ①: Low

3.1.2 Consistency with the Development Needs of Zambia

3.1.2.1 Development Needs regarding Improvement of Agricultural Extension Services

Agriculture in Zambia consisted of dual structures such as large and medium scale farmers who were capital intensive agricultural management and produced for export, and small-scale farmers who run self-sufficient agriculture (Occupying 90% of the number of farmers). In order to reduce poverty, which was a priority policy of the government, rural development targeting the small-scale farmers was regarded as an important issue.

According to an interview survey at the Department of Agriculture, the GDP of the agriculture and livestock sector growth was observed to have become an average of 13% from 2010 to 2012 at the period of completion of this project, but small-scale farmers had low productivity and they could not gain adequate and sustainable income from crop income, and the poverty rate in rural areas remained high at 78%. Therefore, the development needs to support small-scale farmers were high even at the time of completion of the project.

Under the circumstances where the rural development for small-scale farmers was regarded as an important mean for poverty reduction, the Japan International Cooperation Agency (JICA) had implemented PaViDIA for seven years from 2002 and established an approach. However, prior to implementation of the project, information sharing at each level such as the Department of Agriculture, provincial/district agricultural offices and camp/block was not sufficient. Since the Department of Agriculture could not sufficiently grasp problems which farmers had faced, and they could not provide sufficient support to farmers, the structure for conducting a rural development in accordance with a flow of essential extension structures was very weak.

According to an interview survey conducted concerning district senior agricultural officers and camp/block extension officers at the time of the ex-post evaluation, information sharing at each level among the Department of Agriculture, provinces/districts, the camp/block extension officers was improved due to implementation of this project in the pilot areas of the project at the time of completion of the project. In addition, since some activities were conducted across the country, improvements in planning and monitoring were observed all over the country. However, there were large differences between the project target areas and areas outside the target areas in the frequency of trainings and participation opportunities, and much room for improvement of extension structures remained outside the target provinces even at the time of completion of the project.

As mentioned above, the agricultural sector was growing both before and after the

implementation of the project, but it did not contribute enough to reduce the poverty of small-scale farmers. Regarding extension services, although major improvements were observed in the target areas, the situation remained vulnerable outside the target areas of the project. Therefore, development needs remained high even at the time of completion of the project, and the relevance of development needs was high.

3.1.2.2 Development Needs in the Target Areas

Regarding the selection of the target areas, according to the detailed plan formulation survey report of this project, the target areas in this project were Northern and Western Provinces and it was agreed to position Northern Province as the most important area for the reasons that terminal evaluation reports for both a technical cooperation project "Project for Development through Empowerment of Rural Communities in Zambia Initiative Areas" implemented in Western Region by JICA, and PaViDIA implemented in Northern Province and Lusaka Province recommended the necessity of the follow-up. According to statistics on the percentage of urban population prepared by the Central Statistical Office of Zambia[8], the descending order of the urban population was Eastern Province (12.2%), Western Province (12.5%) and Northern Province (19.0%) in 2015, and it was reasonable that these provinces were selected as target areas. On the other hand, Lusaka Province, selected as another target area, was an overwhelmingly urban population as 85.7%, and according to statistics, about 76% of the population of Lusaka Province was concentrated in Lusaka City. Therefore, a question remains why Lusaka Province was selected as a target area.

According to interviews with experts who carried out this project, there were explanations that (1) PaViDIA as the former project and PASViD as the previous former project selected Lusaka as one of the target areas, and (2) when assigning a monitoring expert at the Ministry level to disseminate the activities of the project nationwide was examined, there was a request from the director of the Department of Agriculture at the time that the expert continue activities in Lusaka Province near the headquarter while monitoring the activities nationwide. Therefore, Lusaka Province was continuously selected.

Since there was the fact that the target area was selected for other reasons than development demand, there were some problems in the selection of the target area as the situation of improvement in the socio-economic aspects due to the results of this project in Lusaka Province was not as good as other provinces in Lusaka Province according to the result of the qualitative and quantitative survey conducted in this ex-post evaluation. However, there was no severe negative effect to lower the evaluation of the relevance.

[8] Zambia Population and Demographic Projections, 2011-2035

3.1.3 Consistency with Japan's ODA Policy

One of the priority areas is "support for poverty reduction centered on rural development" in *Country Assistance Program for Zambia* (2002), which was a policy of Japan at the time of ex-ante evaluation. It was consistent with this project and its relevance was high.

3.1.4 Appropriateness of the Project Plan and Approach

In this project, the project purpose was changed from "Rural extension services provided by MACO (at the time) are improved by using the PaViDIA Approach (as an entry point) in target areas" to "Rural extension services provided by MAL (at the time) are improved with the improved service delivery system and knowledge of extension officers including use of the Participatory Extension Approach (hereinafter referred to as "PEA")-PaViDIA Approach (as an entry point) in the target areas".

According to interviews with the Department of Agriculture and with experts who implemented this project, PEA in agricultural extension services was adopted by the Government of Zambia in 2000, but it was not fully recognized by extension officers. Meanwhile, on the Zambian side, the PaViDIA approach, which was targeted to be disseminated by this project, was not recognized as a part of PEA, and it was positioned as a participatory development in a village unit. However, since it was undesirable that similar approaches proceeded in parallel and it was judged that the ownership of the Department of Agriculture to PaViDIA would increase, PaViDIA was positioned as PEA's affiliate and became the PEA-PaViDIA approach which included the framework/approach of the participatory extension method called PEA in more detail and more concretely and also included the implementation and monitoring of PaViDIA's micro projects, and a part of the project purpose was modified. As a result of this modification, ownership for this project increased at the Department of Agriculture. In addition, according to an interview survey of camp/block extension officers in the target areas, it was possible to strengthen extension service capabilities such as participatory development led by farmers that can be practiced in the process of micro projects better than before implementation of the project, and the situation has been continued even now.

Furthermore, although the name PEA-PaViDIA approach is not used, PEA revised by incorporating the results of this project has been continuously used by other donors (for the details, see 3.2.2.2 Other impacts).

Importance of frequent information sharing with an implementing agency

According to the experts who implemented this project, the Director of the Department of Agriculture at the time (retired in November 2013) regarded that this project was just a continuation of the previous project, and it was interested in only expanding and extending the PaViDIA approach as "a donor project" and did not support overall important tasks of the Department of Agriculture, and he deeply criticized the project and passively responded from the beginning of this project. Under these circumstances, experts in this project tried to communicate and share information with the Director as frequently as possible, and made efforts to have discussions including irregular informal discussions with the director and provide information on project activities and receive comments and feedbacks through a Deputy Director. In particular, the experts tried to grasp and understand important issues and major activities within the Department of Agriculture. Among them, it was revealed that there was a similar approach called PEA in the Department of Agriculture in parallel with the PaViDIA approach, and the Department of Agriculture aimed to disseminate it to all extension officers as a formal participatory extension approach of the Department of Agriculture.

For this reason, experts in this project regarded that PaViDIA refined the framework/approach of the participatory extension method (PEA) further and also included concrete implementation and monitoring methods of micro projects, and it was decided to define clearly it in the MAL (at the time) again as PEA-PaViDIA under the umbrella of PEA. In addition, the PEA-PaViDIA approach adopted by this project was recognized as one of popularization methods that can be utilized as a concrete tool in extension activities by extension officers to deal with issues of various extension services, and it was widely used even in activities not related to PEA-PaViDIA activities. As a result, this project gained understanding and support from the Director of the Department of Agriculture (at the time) as the project to strengthen the structure of the Department of Agriculture's extension service as a whole.

In this way, though the project purpose was changed during the project implementation from the direction of improving extension services through PaViDIA to the direction of improving extension services through promotion of the PEA-PaViDIA approach which was positioned as PaViDIA under the umbrella of PEA, and there was no significant difference in the aims of the direction. Due to changes in the project purpose, positive effects were observed such as raising the implementing agency's ownership and contributing to strengthening the extension capacities of extension officers, and impacts were observed such as other donors continuing the same approach, and it was reasonable to change the project purpose.

From the above, this project was highly relevant to the country's development plan and development needs, as well as Japan's ODA policy, and the project plan and approach were appropriate. Therefore, its relevance is high.

3.2 Effectiveness and Impact[9] (Rating: ③)

3.2.1 Effectiveness

3.2.1.1 Achievement of Project Purpose

At the time of planning, this project was aimed at strengthening the capacities of agricultural extension services as extension officers frequently visited their camps through implementation of PaViDIA. However, the operations of camp/block extension officers were diverse, and it was obvious that implementation of PaViDIA alone could not adequately improve essential agricultural extension services such as guidance on appropriate agricultural techniques and proper reporting to the prefectures and districts on the real situation in rural areas. For this reason, this project was transformed into a project which aimed at improving general agricultural extension services such as the planning capacities of camp/block extension officers and provincial and district agricultural officers in the Department of Agriculture, practical implementation of extension services through demonstration in the farms, monitoring capacities through establishment of reporting format in an appropriate form and so on, while making PEA-PaVIDIA an opportunity to improve agricultural extension services.

With the revision of the contents of this project, the PDM was created up to version seven, and the project purpose and outputs were revised. Table 1 below shows a comparison between the PDM at the time of ex-ante evaluation and the PDM of the final version. Output 2 was divided into Output 2 and Output 3 in the middle of the project. These changes are justified as they are accompanied by the change of the contents of the project.

[9] Sub-rating for Effectiveness is to be put with consideration of Impact.

Table 1 Comparison between PDM at ex-ante evaluation and PDM at final version

	PDM at ex-ante evaluation	PDM at final version (Version 7)
Project Purpose	Rural extension services provided by MACO (Those days) are improved by using PaViDIA Approach (as an entry point) in the target areas.	Rural extension services provided by MAL (Those days) are improved with the improved service delivery system, and skills and knowledge of extension officers including use of PEA-PaViDIA Approach (as an entry point) in the target area.
Output 1	Appropriate techniques for farmers are identified.	Appropriate technologies for farmer are identified in the target Districts of Northern/Muchinga Provinces[10].
Output 2	Practical abilities for agricultural extension of Extension officers are improved.	In-Service Training System for Extension Officers is institutionalized within MAL.
Output 3	Monitoring and backstopping capacity of Camp/Block, District and Provincial level is strengthened.	Practical abilities of Extension officers are improved in the target Provinces/Districts
Output 4	Management capacity of MACO's extension service is improved.	Monitoring and backstopping capacity of Camp/Block District and Provincial level is strengthened.
Output 5		Management capacity of MAL's extension service is improved.

From the time of completion of this project to the time of the ex-post evaluation, a part of the appropriate technologies identified in Output 1 has been used by farmers in the targeted provinces. In addition, according to interviews with the Department of Agriculture, regarding identification of new technologies to be disseminated, this is done by utilizing the Linkage Model[11] for agricultural extension among agricultural research institutes, provincial/district agricultural offices and camp/block extension officers established during the project.

With regard to extension officer's trainings for Output 2, master trainers trained during the project implementation period whose tasks were training of trainers to conduct trainings in each province/district have remained in each Province, and there is a structure to conduct trainings. However, due to the severe financial situation, extension officer's trainings by the funds of the Department of Agriculture have not been implemented after completion of the project.

Extension services utilizing demonstration farms by extension officers in the target

[10] Activities concerning this output were originally planned to be carried out only in the Northern Province and were not noted in the output. However, due to the division of the Northern Province and the Muchinga Province in 2012, Chinsali District in the Northern Province would be included in Muchinga Province. As these activities continued in a part of Muchinga Province and it was included in the content of this output, the names of the provinces were also added on the PDM.

[11] It is a model in which new technologies developed at the Agricultural Research Institute are tested at the provincial/district level, and extension officers conduct dissemination activities through demonstration farms.

areas promoted in Output 3 have been maintained thereafter.

Efforts have been continued to maintain technical ability on the monitoring capabilities and supporting capacities on Output 4 at the camps/block extension officer's level, provincial/district level in the target provinces where these officers were trained during the project implementation period and Department of Agriculture level. However, as agricultural extension related budget is not allocated sufficiently, a decrease in the submission rate of reports is observed concerning camp extension officers who are located at a distance and cannot bear the transportation fee or concerning camp extension officers who cannot purchase stationery. On the other hand, due to the facts that extension officer's trainings and district senior agricultural officer's[12] trainings were targeted and conducted for the all provinces, and ADEOs were distributed to camp/block extension officers nationwide, it was confirmed that a part of the outputs were disseminated to all provinces. For this reason, although the submission rate of reports has decreased somewhat in target provinces (according to interviews conducted in several provinces and districts, those locations that had reached 90% during the project are down to approximately 60% to 70%), and this project also contributes to improving the quality of reports other than the target provinces.

In order to strengthen the dissemination service management ability of the Department of Agriculture on Output 5, the National Extension and Advisory Services Strategy aiming for approval during the implementation period of this project was approved in 2017 and is the basic policy of the extension services of the Department of Agriculture in Zambia at the time of the ex-post evaluation.

As the continuation results of the above Output 1 to 5 show, there are problems such as: 1) new trainings for extension officers and district senior agricultural officers have not been carried out, 2) the report submission rate of camp/block extension officers has been declining, and 3) new micro projects have not been implemented by the budget of the Department of Agriculture, as the budget situation of the Department of Agriculture is tight. On the other hand, even at the time of the ex-post evaluation, dissemination of new technologies through the demonstration farm and guidance of agricultural technology making use of ADEOs, monitoring of activities in rural areas etc. have been continued, and this project greatly contributed to improving the essential extension services that conduct rural development according to the flow of the essential extension structure such as the Department of Agriculture, provinces/ districts and camp/block.

[12] A chief executive of the Department of Agriculture's operations at the district agricultural coordination office, and his/her main task is to supervise the camp/block extension officers.

The level of achievement of the set indicators of the project purpose is as shown in Table 2 below.

Table 2 Achievement of Project Purpose

Project Purpose	Indicator	Actual
Rural extension services provided by MAL are improved with the improved service delivery system, and skills and knowledge of extension officers including use of PEA-PaViDIA Approach (as an entry point) in the target area.	1) Over 350 villages are implementing micro projects with PEA-PaViDIA Approach. (Achieved)[13]	Through confirmation of actual results by related materials and interviews by the evaluator to the Department of Agriculture, regarding the target of 350 villages, it was confirmed that micro projects using the PEA-PaViDIA approach were implemented at 354 villages in 14 districts of five provinces including four target provinces.
	2) More than 80% of Farmers in the target areas acknowledge the improvement of extension service. (Almost achieved)	Through confirmation of actual results by related materials and interview by the evaluator with the Department of Agriculture, 79.5% of the targeted 1,000 farmers in four provinces recognized that extension services were improved according to the results of the impact survey conducted during the project period (version 3.1).
	3) (Additional indicator) Staff members of the target areas (provinces/districts) and the Ministry of Agriculture's Headquarters (Department of Agriculture) recognize the improvement of the agricultural extension services at the time of completion of the project. (Achieved)	Since confirmation was not made as to whether the staff of the target areas (provinces/districts) and the Department of Agriculture recognized improvement of agricultural extension services at the time of project completion, it was confirmed by questionnaire survey at the time of this ex-post evaluation. Through the questionnaire survey of the Department of Agriculture and the provinces, it was confirmed that 100% of the respondents felt that the agricultural extension services had been dramatically or somewhat improved. Many of the provinces which answered that it was dramatically improved are the target provinces of this project, and Northwestern Province where micro projects were implemented. On the other hand, although Western Province was a target province, the improvement in the agricultural extension services had only been to some extent. According to the interview survey in the Western province, it was pointed out that a report submission rate had not been improved as there was no transportation method in the remote areas and the road construction was delayed.

[13] Concerning the indicator, with PDM revision, there were changes in the indicator value such as the target number going up to 500 and then decreasing to 350. According to the interview survey results from the experts who implemented this project, it was confirmed that the target of 500 villages included the 171 villages adopted during the implementation period of the previous project, PaViDIA. Therefore, the project decided to change the target value to the number of villages which was adopted to implement micro projects during the project implementation period.

Photo: Micro project on pig rearing

Photo: One of the appropriate technologies Dissemination of NERICA rice

Through confirmation of existing materials and interview by the evaluator with the Department of Agriculture, the set indicators 1), 2) and 3) were largely achieved. From above, the project largely achieved its purpose.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

The achievement of the project purpose has been maintained and improvement of the agricultural extension services has been sustained, and improvement of socioeconomic conditions in a certain number of farmers in the target provinces which was the overall goal was confirmed by qualitative and quantitative survey results especially through implementation of micro projects and dissemination of appropriate technologies, and dissemination of new technologies through demonstration farms etc.

Regarding the “application of PEA of which the PaViDIA method is a part as a trigger for promotion” in the project purpose, as described later in “3.2.2.2 Other Impacts”, although it is not an original form such as PEA-PaViDIA, it has been applied even at the ex-post evaluation period. In the first place, the objective of this project was to strengthen the capacities to provide extension services by extension officers triggered by PEA-PaViDIA, and PEA-PaViDIA was only a way to improve extension services and its expansion was not the objective. Therefore, the fact that activities are not continued in an original form does not exert a major negative impact on the continuation of the effects of this project.

Table 3 below shows the level of achievement of the indicators of the overall goal.

Table 3 Achievement of Overall Goal

Overall Goal	Indicator	Actual
Farmers' quality of life is improved in the target areas.	At least 70% of 1,000 farmers interviewed through Household Characteristics and Agricultural Practice Survey in the target areas/provinces improve their social and economic condition. (Achieved)	(1) Implementation status of micro projects According to the results of the qualitative survey[14] with farmers in the villages surveyed in Northern Province, Muchinga Province, Northwestern Province and Western Province, as shown in Table 1 of appendix 1, 62% of micro projects out of 53 micro projects in 23 villages visited are continued by a group or individual (including those transformed into other activities), and it has led to socio-economic improvements. Specifically, the following points were cited as positive socio-economic impacts by implementation of this micro projects. 1) It became possible to bear the cost of children's school fee and educational materials. 2) Quality of life was improved, by means such as purchase of electrical appliances and purchase of roofing materials. 3) It led to improvement of nutrition through consuming cultivated crops or breeding livestock or purchasing other foods by money from selling them. 4) Reduction of work load of farmers and their families was realized, since it became possible to cultivate wider cultivated land through hiring laborers by agricultural products and livestock products instead of wages, or they did not have to do charcoaling which was done to obtain cash income. 5) It became possible to pay the contribution for applying for the subsidy system of fertilizer which the country had offered. In addition, fertilizer has made it possible to increase the yield of crops. 6) Beneficiaries expanded by distributing the increased livestock to the villagers who were not initially included in the group and other villagers. 7) It has become possible to conduct activities by groups that could not be done by individuals such as construction of livestock pens. 8) Elderly persons, handicapped persons etc., which experienced difficulty in conducting cultivation by themselves became able to conduct cultivation by the micro-project of plow cultivation through the utilization of cattle, and their income increased. In addition, as a result of the quantitative survey[15] (Table 2 in Appendix 1), the percentage of households who answered that households had at least one positive socioeconomic impact as described above by implementing the micro project was 88.7%. (2) Dissemination of 14 appropriate technologies in Northern Province and Muchinga Province In the target counties of Northern Province, Muchinga Province, and Lusaka Province, a part of 14 appropriate technologies of Output 1 have

[14] Among the rural areas that carried out micro projects in this project, the evaluator visited randomly selected 23 villages at in Northern Province (Kasama District, Luwingu District and Mporokoso District), in Muchinga Province (Chinsali District), in North Western Province (Solwezi District), in Western Province (Senanga District, Kaoma District) and in Lusaka Province (Kafue District), and conducted semi-structured interviews with the resident group (three to 15 people).

[15] Of the target districts (one district of Lusaka Province, three districts of Western Province and five districts of Northern Province) in which the micro projects were implemented within the target provinces of this project, 10 camps in each province (10 camps/district in Lusaka province, five camps/district in Western and Northern Province) were randomly selected among the selected districts. Moreover, one village was also selected from selected 10 camps and a questionnaire survey was conducted to see whether improvement of the socio-economic situation was observed by implementing this project. The survey was conducted from February to April 2018. In this project, all the households were originally beneficiaries in each village. However, there were also some households that have left the group of micro projects due to the success or failure of subsequent activities. Therefore, 10 households in each village were selected according to the ratio of group members and non-group members of micro projects at the time the ex-post evaluation and the survey was conducted. The ratio of sex of selected target respondents are 163 males and 137 females. Distribution of age was 1 person in 10's, 18 persons in 20's, 72 persons in 30's, 72 persons in 40's, 70 persons in 50's and 67 persons in 60's or more. Survey results were compiled with spreadsheet software and statistical analysis was carried out if necessary.

		been established and contributed for improvement of livelihoods. According to the results of the qualitative survey in the 11 villages of Northern Province and Muchinga Province (Appendix 1 Table 3), among the 14 of appropriate technologies trialed for dissemination, it was confirmed that 27 % of them were established in the whole village or a part of the village at the time of ex-post evaluation. As an example, in a part of farmers in Northern Province, introduction of upland rice (NERICA rice) contributed to improve income 1.5 times than before. In addition, according to the quantitative survey (Table 2 in Appendix 1), The percentage of households who answered that the households had at least one positive socioeconomic impact as described above by practicing the appropriate technologies was 89.3% in the total of the three provinces. (3) Improvement of farmers' income As a result of the quantitative survey, a distribution of the income for 2010 and 2017 is as shown in Figure 1 of Appendix 1. In addition, the percentage of respondents who answered that the income in 2017 improved as compared to the income in 2010 was 53% as in Figure 2 of Appendix 1. For the income from 2010 and 2017, when comparing by the t-test, there was a significant difference[16] in the result shown in Table 4. Further, according to Table 5 of Appendix 1, the reasons that 53% of respondents answered that income has been increased included implementation of micro projects, dissemination of appropriate technologies, improvement of activities of extension officers etc., the percentage of the respondents that view the above as the effect of this project such was 154 persons (96.9%), out of 159 persons who answered that income has been increased. However, since there are 63 persons (41.0%) out of 154 persons who responded that they were also supported by other donors, it can be said that this improvement in income was the combined effects of support by this project and support by other donors.

From above, the project has been achieved the overall goal.

3.2.2.2 Other Positive and Negative Impacts

(1) Impact on natural environment and resettlement of residents/land acquisition

According to an interview with the Department of Agriculture, this project has not adversely affected the natural environment, and resettlement of residents and land acquisition have not been conducted.

(2) Support for similar projects by other donors

After implementation of this project, projects supported by other donors have been implemented with reference to this project. In the "Smallholder Productivity Promotion Programme[17]" under the support of the International Fund for Agricultural Development (IFAD), it has been implemented as a participatory rural development

[16] The results of this survey do not consider the inflation rate of Zambia. However, since the information to be the baseline of income for 2010 was not taken during the project implementation period, and farmers did not accurately record their income. They were asked to infer their income in 2010 based on the income at the time of the ex-post evaluation survey. Therefore, it is considered that it was answered in terms of current value.

[17] S3P: It is a project undertaken by the Department of Agriculture, Ministry of Agriculture, funded by IFAD, which started in 2015 and is scheduled to be completed in 2018, but is expected to be extended. The target areas are Northern Province, Muchinga Province and Luapula Province.

through farmer's field schools that is a method of PEA and extension officers have practiced in this project, and trainings for camp/bock extension officers. In addition, in the "Agricultural Productivity and Market Enhancement Project[18]" under the support of African Development Bank (AfDB), it has aimed to reduce poverty through implementation of sub-projects through funding to farmers' groups as a part of their activities.

These activities are not called PEA-PaViDIA and are recognized as PEA in the provincial and district agricultural offices. However, it was confirmed in the interview with the Department of Agriculture that through implementation of the project, PEA: which had been known in name only, was revitalized and had been revised by adopting the results of this project during this project in the flow of harmonization of extension services which was promoted in Output 5 of this project and it led to the formation and implementation of these projects and the adoption of PEA in the Department of Agriculture. Therefore, this can be regarded as the result of this project.

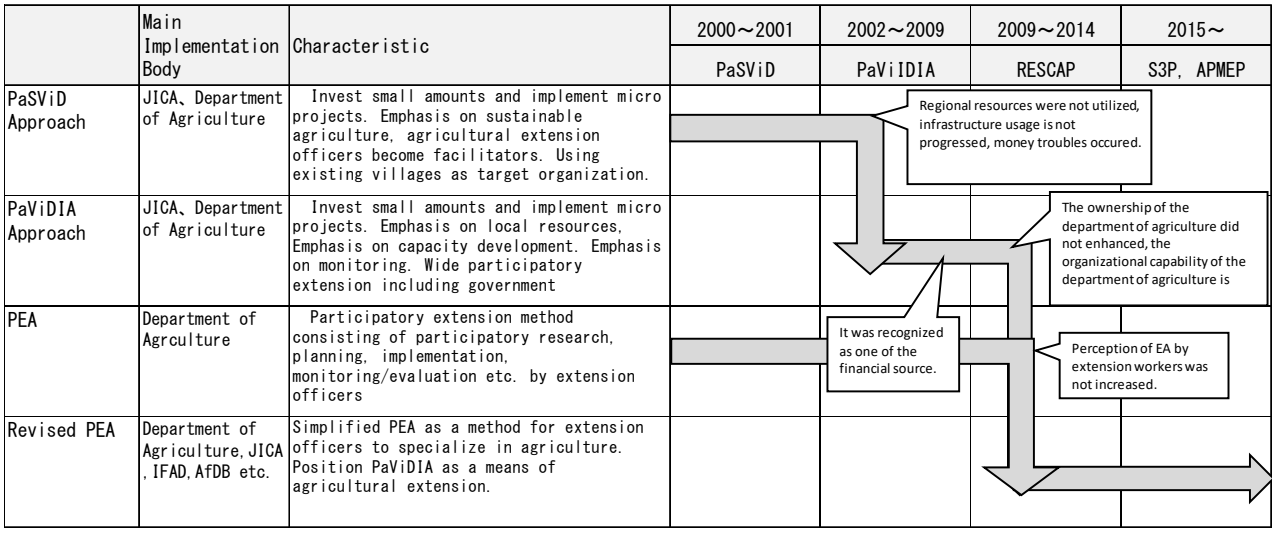


Figure 1 History of PEA revision

As described above, this project has largely achieved the project purpose concerning improvement of extension services provided by the Ministry of Agriculture and Livestock (at the time) through improvement of extension implementation structures in the target

[18] APMEP: It is a project for which the Department of Policy and Planning, Ministry of Agriculture has received funds from AfDB from 2015 to 2019 aiming at reducing poverty through agriculture. The budget for the project is US $ 31.1 million and is implemented in two districts each in Lusaka Province, Central Province and Southern Province. The main components are (1) improvement of agricultural production and productivity, (2) linkage between the value chain and the market, and (3) strengthening of the organization, and there are irrigation, provision of equipment for aquaculture, supply of livestock, provision of milling machine for added value, etc. to the farmer organization (mainly cooperative group) in a part of the activities of (1) and (2), and it is similar to the activities of micro projects of this project. According to an interview with the Director of the Department of Agriculture, information was gained that the activities of this project were partially referenced when APMEP was formulated.

areas and improvement of extension officers' technical abilities and knowledge and the overall goal in terms of confirmation of improvement of the socioeconomic condition of the farmers and planned effects. Therefore, effectiveness and impact of the project are high.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

The input of the project is as shown in Table 4 below.

Table 4 Inputs of the project

Inputs	Plan	Actual
(1) Experts	Long-Term: six persons Short-Term: two persons	Long-Term: six persons Short-Term: three persons
(2) Trainees received	two persons/year	29 persons in total
(3) Equipment	Vehicles, motorbikes	Vehicles, photocopy machines, scanners, PC
(4) Overseas project enhancing expense	Expense for implementation of trainings/seminars/workshops, employment of local consultants, developing manuals/guidelines	Approximately 160 million yen
Japanese Side Total Project Cost	701 million yen in total	708 million yen in total
Zambian Side Total Project Cost	Allocation of counterparts Providing land and facilities and project offices, electricity and water fee, wage of counterparts	Allocation of 73 counterparts in total, four experts' office spaces, wage of counterparts

* MM stands for man month.

3.3.1.1 Elements of Inputs

At the time of ex-ante evaluation, dispatch of six long-term experts and two short-term experts were planned, but six long-term experts and three short-term experts were actually dispatched. Prior to the project, it was difficult to judge the necessity of short-term experts specializing in technical fields and agricultural extension training, so one person was increased. For the acceptance of trainees, it was

supposed to be two people per year (about 10 people in five years), but it was actually 29 persons. In order to improve the extension services aiming for this project, not only extension officers but also senior agricultural officers who were their superiors, etc., were subject to training. The provision of equipment, overseas activities cost, and the project cost of implementing country were almost as planned. The project cost on the Japanese side will be analyzed in the next section.

3.3.1.2 Project Cost

Regarding the project cost, it was estimated as 701 million yen in the plan, but the actual result was 708 million yen (101% of the plan), and it was higher than planned. As mentioned above, the reason why the project cost increased by seven million yen was due to dispatching three short-term experts who were originally supposed to be about two persons.

3.3.1.3 Project Period

Regarding the project period, it was expected to be five years in the plan, while it was actually completed in five years (100% of the plan), and it was as planned.

From above, although the project period was within the plan, the project cost exceeded the plan. Therefore, efficiency of the project is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Policy and Political Commitment for the Sustainability of Project Effects

In order to sustain improved agricultural extension services provided by the Department of Agriculture through improvement of extension implementation structures and improvement of technical abilities; and knowledge of extension officers supported by this project, it is important that agricultural extension services become important for agricultural development in the future and the improved agricultural extension services approach becomes the basic policy of the Department of Agriculture.

Even in the *Seventh National Development Plan* (2017-2021) which is the successor policy of the *Revised Sixth National Development Plan* (2013-2016), it is pointed out that 1) increase in farmers' incomes will directly meet rural demand such as development of new activities, diversification of local economy and change of rural structure, 2) output by agriculture is an important source of employment and it leads development of upstream and downstream industries of agriculture which creates opportunities for economic diversification, integration of the value chain, and expansion of the agricultural industry, and that agriculture has been recognized as an important

industry. As one of its development strategies, promotion of small scale agriculture is mentioned, and it is regarded as a mean of increasing employment opportunities and improving livelihoods in rural areas.

The *National Extension and Advisory Services Strategy* having been targeted for approval during the implementation period of this project was approved in 2017 and became the basic policy of the Department of Agriculture's extension services even at the time of ex-post evaluation[19].

Furthermore, according to interviews with the Department of Agriculture, even at the time of ex-post evaluation, PEA is the basis for participatory approach in extension services in Zambia.

From the above, on the policy and institutional aspect, the policy sustainability for sustaining the effect of this project as confirmed in the effectiveness/impact part is high.

3.4.2 Institutional / Organizational Aspect for the Sustainability of Project Effects

In order to sustain improved agricultural extension services provided by the Department of Agriculture through improvement of extension implementation structure and improvement of extension officer's technical ability and knowledge supported by this project, it is important to maintain the structure of the agricultural extension services in the future.

The implementation structure for providing the agricultural extension services of the Department of Agriculture is shown in Figure 2 below.

[19] Among the 16 objectives, strengthening capacities in understanding of PEA, robust extension planning, monitoring, reporting and feedback, implementation of refresher trainings for extension officers, focus on farmer group activities, coordination and harmonization of extension, strengthening farmers-research and extension linkages etc. are listed as related items of this project.

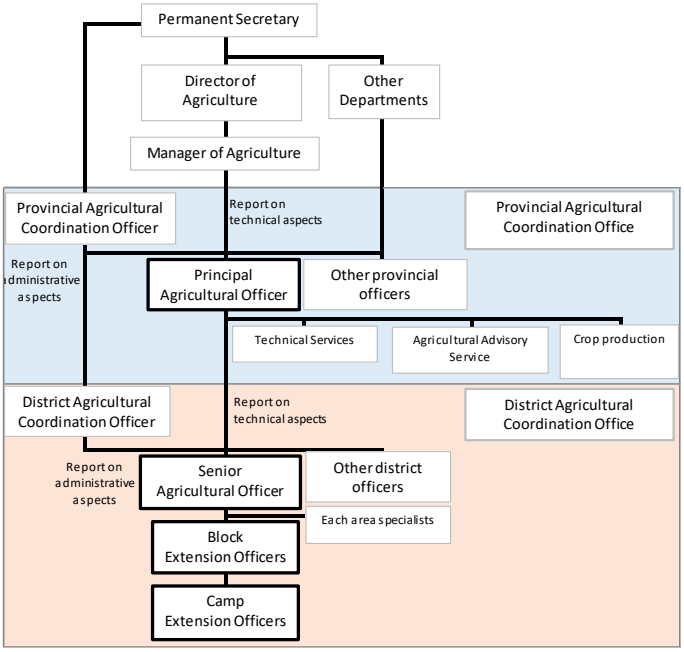


Figure 2 Implementation structure of agricultural extension services in the Ministry of Agriculture in Zambia

Source: Prepared by the evaluator based on the interview survey

Table 5 below shows the role of the implementing agency related to agricultural extension services and the main tasks.

Table 5 Role and main tasks on implementation of agricultural extension services by implementing agencies

Implementation body	Main tasks
Ministry (Department of Agriculture)	Development of strategy, raising strategy-based funding and promotion of the activities, follow-up on problems which are unable to be handled by provinces and districts
Province (Principal agricultural officer)	Coordination of advisory and technical services at the provincial level, planning and implementation of training on extension, coordination on human resources, finance and administration in the province, supervision of technical services and extension activities in districts, compilation of report submitted by senior agricultural officers and providing the feedback
District (Senior agricultural officer)	Coordination of advisory and technical services and extension at the district level, implementation of training, coordination on human resources, finance and administration in the district, supervision of technical services and extension activities by camp/block extension officers, compilation of report submitted by block extension officers and providing the feedback
Block extension officers	Supervision of extension activities by camp extension officers, compilation and providing the feedback of activity reports submitted by camp extension officers
Camp extension officers	Offering extension services in rural areas, submission of activity report

Regarding the number of staff at the Ministry, province and district level, the number

of persons who conduct a certain level of work is allocated. In addition, camp/block extension officers who are responsible for implementing extension services are mostly located in all camps/blocks. However, many block extension officers are not dedicated to the block extension officers' work, and one of the camp extension officers in a block serves as a block extension officer concurrently.

As mentioned above, although the implementation structures for provision of the extension services in Zambia have already been established, if the number of staff who attended the trainings would decrease by future personnel change or retirement, there is a possibility that the structure cannot be maintained, and there are some difficulties in maintaining the future structure. Therefore, sustainability of the structure aspect is relatively high.

3.4.3 Technical Aspect for the Sustainability of Project Effects

In order to maintain the improved agricultural extension services provided by the Department of Agriculture through improvement of extension implementation structures supported by this project and improvement of extension officers' technical abilities and knowledge, it is important that techniques for improving agricultural extension implementation structures of the Department of Agriculture, provincial and district agricultural office and camp/block extension officers have been maintained.

(1) Level of the Department of Agriculture

Among the staff who had worked for the Department of Agriculture, staff who have rich experience on the PEA-PaViDIA related activities such as trainees who took training in Japan, staff who were trained as trainers in this project and staff who was strengthened in capacity as a master trainer during the subsequent project period etc., have been assigned. In addition, the linkage model for extension among agricultural research institutes, provincial/district agricultural offices and camp/block extension officers established during the project is still one of the extension strategies of the Department of Agriculture in Zambia. Some manuals etc. created in this project are shared. Technical transfer from experienced staff to new staff is done individually and there is no opportunity for systematic technical transfer.

(2) Provincial/District Level

According to an interview survey at the provincial/district agricultural offices and others, there are still one to three persons working continuously in each province as master trainers trained during the project implementation, and even after completion of

the project, they have played an important role in the implementation of the trainings in other areas and other projects. In addition, in the technical cooperation project “Rice Dissemination Project” (2015-2018 (planned)) implemented by JICA from 2015, master trainers have been newly trained in Northern Province, Luapula Province and Muchinga Province etc., and training system established in this project (such as training of master trainers at the provincial level, master trainers train trainers in the districts and the trainers transfer technical skills through trainings to camp/block extension officers, etc., the so-called cascade type training system) is still being utilized.

Many provincial principal agricultural officers and district senior agricultural officers who received management trainings during the project period were assigned at the time of ex-post evaluation, and many of them have continued promoted activities by the project such as checklists for submission of reports and filing of documents by camps. In addition, when new camp extension officers have been assigned, the orientation for works is done using the teaching materials etc. developed in this project even at the time of ex-post evaluation when the budget of the Department of Agriculture is limited and trainings for new recruited staff cannot be conducted. This greatly improved the situation before the project, which new recruited staff was assigned without knowing what camp extension officers should do in rural areas and what to write in the report. However, as manuals etc. distributed at the time of trainings have not been handed over since then, there is no opportunity to receive such an opportunity for newly appointed provincial agricultural officers and district agricultural officers.

(3) Camp/block extension officer level

According to an interview survey of camp/block extension officers, in the project target areas where many extension officers who had taken the training of extension officers in the past and had experienced micro projects, the capacities of works which camp extension officers essentially should do was improved in areas such as plannability to disseminate new extension technologies through time management by ADEOs and demonstration farm, technical capacities on participatory extension approach obtained through implementation of micro projects and monitoring capacities to conduct regular reports with high quality using format, and these activities have been continued even at the time of the ex-post evaluation. However, the submission rate of the report tends to decline somewhat except for Northern Province. According to the results of the qualitative survey, there were reasons such as 1) due to lack of budget, transport means are limited as many extension officers are not given motorcycles and fuel costs are not paid, 2) due to the lack of stationery, it is not possible to submit the report on a regular basis, 3) occupied by other works such as Farmers Input Support

Program (FISP)[20] and there is no time for preparation of the report.

In addition, among the eleven camp extension officers[21] who were interviewed in the provinces on operation of the demonstration farm by extension officers in the target provinces, all are conducting extension activities through demonstration farms, and a total of 112 demonstration farms in total (average 10 demonstration farms per person) are managed. Therefore, it was confirmed that the dissemination of technologies through demonstration farms by camp extension officers was established in the target provinces. For some demonstration farms, the seed company has been asked to examine the growth situation of different species of maize, and it is managed with the support of private funds.

There are extension officers outside the target area of this project who had not implemented micro projects and who were unable to receive training opportunities, extension officers who were unable to receive the benefit of this project due to being newly employed after the project completion. However, though not to the same degree as the project target areas, improvement is observed in the works on management on demonstration farm and monitoring capacity to conduct periodical reporting due to 1) orientation given by district senior agricultural officers who received management trainings by the project, and 2) publishing of the submission date and the report form on ADEOs which has been continuously issued even at the time of the ex-post evaluation. Furthermore, the basic technical capabilities related to the participatory extension approach can be practiced in case the farmer's field school is conducted in other donor's projects (S3P) etc. Since issue of ADEOs are by sponsored funds such as agricultural machinery and seed companies, there is a high possibility that it can be continued in the future, and monitoring techniques for extension officers outside the target provinces will also be maintained to some extent in the future.

As mentioned above, the technical level of the Department of Agriculture level, province/district level and many of camp/block extension officer level in the target provinces are maintained at the time of ex-post evaluation. However, if trainings are not continued in the future, there is a possibility that it will be impossible to maintain the techniques in the future due to promotion, change, and retirement etc. of officers. Therefore, considered comprehensively, the technical sustainability has some difficulties.

[20] FISP is one of the subsidy schemes introduced since 2002 and will provide agricultural materials (seeds and fertilizer). (Source: Ex-post Evaluation Report on Participatory Village Development in Isolated Areas)

[21] It targeted camp extension officers selected in randomly selected target districts in consultation with district senior agricultural officers.

3.4.4 Financial Aspect for the Sustainability of Project Effects

In order to maintain improved agricultural extension services provided by the Department of Agriculture through improvement of extension implementation structures supported by this project and improvement of extension officers' technical abilities and knowledge, it is important whether the training system constructed through the implementation of this project is continued and whether it is possible to allocate the activity expense for camp/block extension officers to conduct activities. However, the result was that the financial sustainability on extension services at the Ministry level and province/district level was low.

(1) Financial situation of Ministry Level

Looking at the budget situation of the Ministry of Agriculture (it was the Ministry of Agriculture and Livestock until 2015) from 2011 to 2017, the total budget decreased to 0.2% of the previous year in 2014, but this was due to the devaluation of the currency by the Government of Zambia (Although there are differences by years due to the influence of copper's international price etc, more budget has been allocated to the whole Ministry of Agriculture than the year when this project was implemented.)

Approximately 60% to 90% of the budget distributed to the Ministry of Agriculture have been allocated to the Department of Policy and Planning and the Department of the Agribusiness and Marketing and has been used for implementation of the government's two major policy programmes (FISP and grain purchase by the Food Reserve Agency[22]). In the budget of the Department of Agriculture, which is the implementing agency of this project, the project budget is only 0.6%-2.1% of the budget of the Ministry of Agriculture, and the amount which it is allocated for training, monitoring and evaluation, purchase of motorcycles, etc. for improving extension service is small (about 8% in 2017). In addition, according to an interview with the Department of Agriculture, most of the budget is not executed by the Ministry of Finance, and the actual amount of execution is extremely limited about 3% to 30%.

(2) Financial situation of Provinces and Districts

According to information on the budget and execution amount in the past six years (2012 to 2017) at seven provincial agricultural offices in seven provinces surveyed, the actual amount of execution in the provinces tends to decrease in recent years, and there are also years in which the actual execution amount was around 1% against the budget, and there is no room to spend budget to continue the extension services, and it is a

[22] Food Reserve Agency (FRA) founded in 1996 has been purchasing maize as a leading player in the maize market since 2005 on the basis of the government's request. (Source: Ex-post Evaluation Report on Participatory Village Development in Isolated Areas)

situation in which it is difficult to conduct the activities of the entire Ministry of Agriculture in the provinces/districts.

In order to carry out activities of camp/block extension officers, it is necessary to visit the village in the camp, but there is little payment for motorcycles, fuel costs, motorcycle spare parts etc. from the district agricultural offices. When they do not have their own motorcycles, transportation expenses etc. related to visiting villages are also covered by their own expenses.

However, as stated in the structure and technical part, even though the budget situation is severe, the implementation structure of the agricultural extension services and the transferred technologies are still largely maintained and all extension officers do not stop their works. Though almost no extension expenses are paid to the extension officers for the work, it is continued by extension officers' self-help efforts due to high sense of responsibility. Therefore, financial problems are severe but it is not in a critical situation such as agricultural extension services stop completely.

From above, some minor problems have been observed in terms of the technical/financial aspects. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aims to improve the agricultural extension services provided by the Department of Agriculture through improving the extension implementation structures and improving the technologies and knowledge of the extension officers in the target areas, thereby improving the quality of farmers' lives in target areas.

This project was consistent with the development policy of the agricultural sector, the development needs of the agricultural sector before implementation and after completion of the project, and the development policy of Japan before implementation of the project. In addition, although the project purpose had been changed during the implementation period, there is no difference in the direction of aims, and the project plan and approach, etc. were appropriate. Therefore, the relevance is high.

Through implementation of the project, the agricultural extension services have largely improved through improvements in the extension implementation structures and improvement of extension officers' technical abilities and knowledge in the target areas. In addition, the overall goal has been mostly achieved as improvement is observed in socioeconomic conditions of farmers due to the above effects, and the effectiveness and impact are high.

In this project, the project period was as planned but the project cost exceeded the plan, and the efficiency is fair.

Policy and institutional sustainability of this project is secured by National Development Plan and National Agricultural Extension and Advisory Services Strategy. The structures and technologies to maintain the effectiveness of this project in the medium term are largely secured. On the other hand, the sustainability of this project is fair, due to the factors such as the lack of financial resources to conduct trainings to maintain it in the future.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

Continuation of management trainings to maintain the quality of extension officers

The district senior agricultural officers who attended the management trainings of the extension services in this project have been still assigned often at the time of ex-post evaluation. Since they have been conducting orientation for new camp extension officers and supervising existing camp extension officers, the quality of extension services has been maintained to some extent even without trainings for extension officers. However, if the number of staff who attended the trainings decreases due to personnel change or retirement, there is a possibility that these technologies will not be maintainable in the future. Therefore, it is desirable that the Department of Agriculture at least regularly organizes management trainings for district senior agricultural officers.

Bearing expenses for implementing the operations of camp/block extension officers

According to interviews with camp/block extension officers, most of camp/block extension officers have not been lent motorcycles, and even if they are lent, fuel and spare parts fees are not paid. However, since there are works to do, they are forced to walk to their own camps or hire vehicles by their own expense and visit camps in charge, and the motivation for improving extension services is decreasing. In order to improve the services of extension officers, the Department of Agriculture should allocate as much budget as possible to the camp/block extension officers for implementation of their works in each year.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Distribution of ADEOs

A noteworthy achievement of this project is the development and distribution of ADEOs. This project aimed to improve the capacity of camp/block extension officers in the target provinces through trainings, but as another activity, the development and distribution of ADEOs for nationwide extension officers were supported. This ADEOs consists of a calendar that can write monthly plans/achievements, a report form, technical information on agriculture and livestock, etc. Since this diary was distributed to camp/block extension officers nationwide, it contributed to improving the planning, implementation and monitoring capacities of camp/block extension officers outside the target provinces who did not attend extension worker trainings to some extent.

In addition, as a factor that ADEOs has been issued even though the issue is delayed every year, it can be pointed out that it is issued without using the agricultural budget but rather by placing advertisements of agricultural machinery and seed manufacturers.

In projects aiming to establish and diffuse rural development models, when spreading the effects of projects outside the target area during or after project completion, it is a good example of an extension method to make the activities sustainable without using large inputs but by instead utilizing private funds effectively by means such as placing advertisement, even in countries like Zambia where government budgets are limited.

Appendix 1: Result of qualitative and quantitative survey

Table 1 Implementing situation of micro projects in the target provinces based on the qualitative survey.

Provinces/Districts	Activities which are continued by groups even now and improvement of socio-economic condition is observed	Activities which are continued by some individuals and improvement of socio-economic condition is observed	Activities which was converted to other activities and improvement of socio-economic condition is observed[23]	Activities which were suspended and no improvement of socio-economic condition is observed
Kasama District, Northern Province	1	1		5
Luwingu District, Northern Province		4		1
Mporokoso District, Northern Province	5	2		
Chinsali District, Muchinga Province	3			4
Solwezi District, North Western Province			4	
Senanga District, Western Province	2	3		
Kaoma District, Western Province	2	1		3
Kafue District, Lusaka Province	1	4		7
Total	14	15	4	20
Activities which have contributed to improve livelihood	33			-
Percentage of activities which have contributed to improve socio-economic condition within the micro projects implemented.	62%			

[23] Although these activities are not activities carried out in this project, it was counted as the result of this project in the sense that it reused the funds invested in this project and got results.

Table 2 Positive impacts to the households which were gained through implementation of micro projects or learning of appropriate technologies based on the results of quantitative survey[24]

	Lusaka Province	Western Province	Northern Province	Whole	Lusaka Province	Western Province	Northern Province	Whole
	Implementation of micro projects				Learning of appropriate technologies			
Fertilizer was purchased, and yield was increased.	66	70	78	214	57	64	88	209
It was possible to purchase agricultural materials other that fertilizer	45	67	32	144	37	65	38	140
It was possible to pay school fees for children	74	70	66	210	64	72	80	216
It was possible to reduce workload of women and children	48	64	12	124	41	65	18	124
It was possible to start new business such as commerce	54	49	30	133	49	48	34	131
It was possible to invest in a new micro project	44	51	24	119	39	51	18	108
Group was able to have more budget/income for new investment	39	47	8	94	36	53	10	99
Employment opportunities for women and youth were increases	41	52	32	125	36	54	42	132
Common cultivated land was increased.	48	63	64	175	41	59	64	164
It was possible to purchase electric appliance, galvanized iron sheet etc.	60	48	30	138	51	44	42	137
Nutrition level of family was improved.	59	76	66	201	47	79	80	206
It was possible to pay medical expense.	61	61	24	146	54	58	22	134
It was possible to connect electricity.	34	30	12	76	32	29	8	69

[24] The error of the quantitative survey is ± 10% in each province and ± 5% in total, and the statistical reliability is 80% in each province and 90% in total.

No answer (No impact)	16/100	8/100	10/100	34/300	22/100	10/100	0/100	32/300
At least more than one positive impact was gained through micro projects or introduction of appropriate technologies.	84/100	92/100	90/100	266/300	78/100	90/100	100/100	268/300
	84%	92%	90%	**88.7%**	78%	90%	100%	**89.3%**

Table 3 14 appropriate technologies which have been continued at the time of ex-post evaluation in Northern Province and Muchinga Province based on the result of qualitative survey

		Utilized by many farmers even now	Utilized by a part of farmers
1	NERICA 4 under drilling method using line marker in dambo	5	-
2	Lowland rice using improved implements (weeder)	1	-
3	Sesame production and processing	1	-
4	New beans varieties	4	-
5	Use of sun-hemp green manure for Maize and NERICA	2	3
6	Improved finger millet under drilling method	5	1
7	Rainfed protected Tomato	1	1
8	Mushroom culture	1	1
9	Bee keeping using low cost implements	2	1
10	Hydro power mill gattari	1	-
11	Pest control using botanical pesticide and acaricide	2	3
12	Irrigated Irish potato	2	1
13	Improved Leaf Mustard variety		1
14	Tithonia as green manure for vegetable production	2	-
Number of technologies which are utilized by most or a part of farmers		41 technologies	
Dissemination rate		**27%** (41 technologies ÷ (11 villages×14 technologies) ×100)	

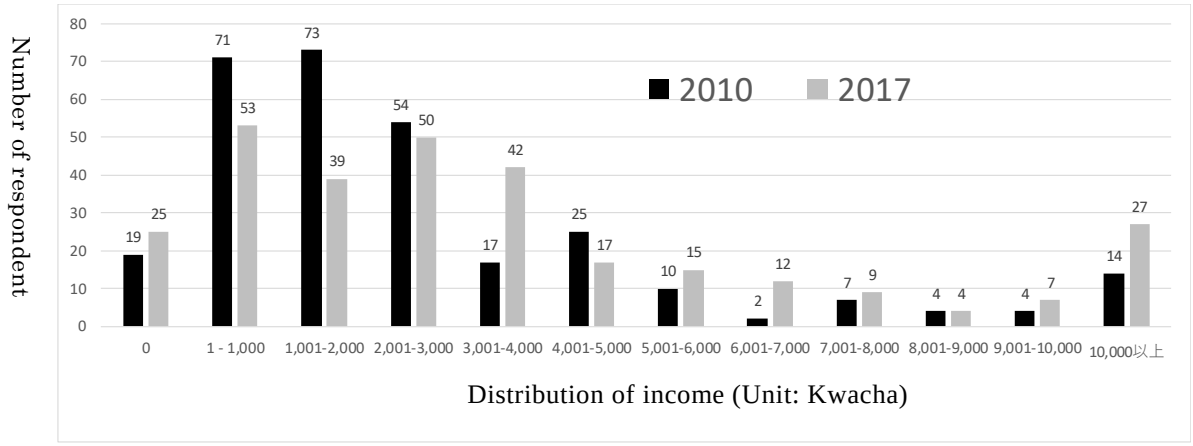


Figure 1 Distribution of income from agriculture, livestock and aquaculture in 2010 and 2017 based on the surveyed household of quantitative survey[25]

Table 4 Result of t-test on the difference of income from agriculture, livestock and aquaculture in 2010 and in 2017 based on the quantitative survey conducted in Lusaka Province, Western Province and Northern Province

	Number of respondent	Average income in 2010 (Kwacha)	Average income in 2017 (Kwacha)	Result of t-test	Result
Lusaka Province	100	3,590	3,080	P value 0.18>0.05	No significant difference
Western Province	100	2,670	5,090	P value 0.00<0.05	Significant difference
Northern Province	100	3,520	4,520	P value 0.00<0.05	Significant difference
Whole	300	3,260	4,230	P value 0.00<0.05	Significant difference

[25] 1 Kwacha = about 10.3 yen. Since January 1, 2013, currency has been devalued and 1,000 kwacha (ZMK) is 1 kwacha (ZMW). However, the income in 2010 before currency devaluation is also indicated by the currency value (ZMW) after currency devaluation.

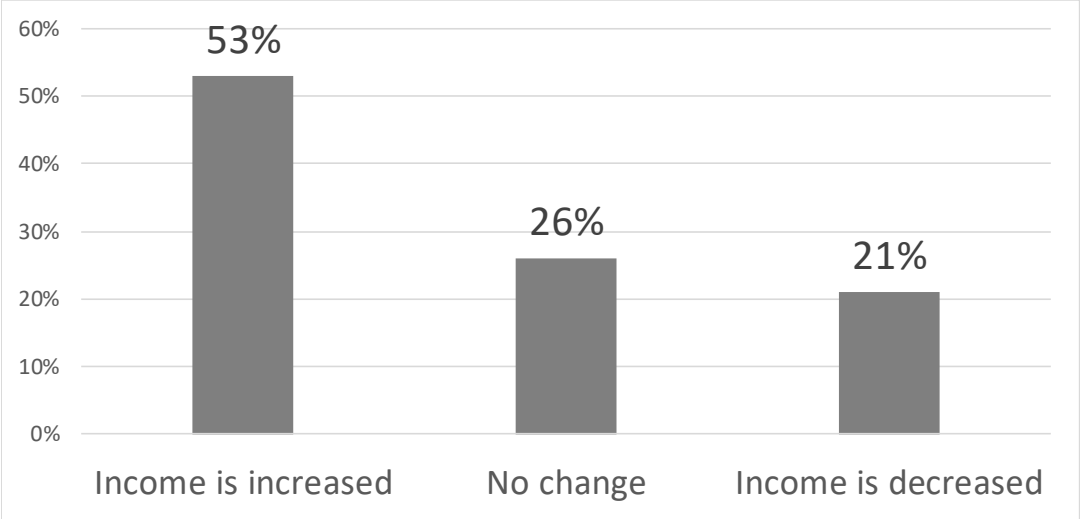


Figure 2 Percentage of increasing income from agriculture, livestock and aquaculture in 2017 compared with 2010 based on quantitative survey

Table 5 In the case the income from agriculture, livestock and aquaculture is increased, whether the support from this project is the cause of the effect. (Multiple answer)

	Lusaka Province	Western Province	Northern Province	Total
It is because of implementation of micro projects.	23	50	65	138
It is because of learning of appropriate technologies through extension officers.	24	51	61	136
Since extension officers regularly visit.	24	41	56	121
Since extension officers provide good advice	23	43	54	120
Number of respondents who answer one or more of the above options (the number of people who can be presumed to have benefited from this project)	33/33 (100%)	55/60 (91.7)	66/66 (100%)	154/159 (96.9%)
No answer to this question	0	5	0	5
Through implementation of other donor projects	12	15	36	63
Self-help effort	0	13	12	25
Others	0	8	1	9