

Country Name	Food Crop Diversification Support Project for Enhancement of Food Security
Republic of Zambia	

I. Project Outline

Background	Food shortages in Zambia resulted from high dependency on rain-fed cultivation where drought usually entailed a food crisis. This was particularly serious among small scale farmers, where prevalence of the monoculture of maize production (at the expense of crops tolerant to drought) exacerbates the impact of damages caused by adverse weather, in particular drought, on food situation. Since maize is susceptible to drought, compared to other crops, agricultural production can be dramatically low in case of short-term adverse weather conditions as well as longer term climate changes. Under these circumstances, the Government of Zambia requested the Government of Japan for a technical cooperation project to enhance multiplication and extension of crops resistant to drought as well as to increase of production and consumption of such crops by small scale farmers.														
Objectives of the Project	1. Overall Goal: Food security and income at household level are improved in target areas. 2. Project Purpose: Food crop diversification is realized in selected communities.														
Activities of the project	<p>1. Project site:</p> <p>(1) Foundation seed production sites: Mutanda Research Station (North Western Province), Mansa Research Station (Luapula Province)</p> <p>(2) Primary multiplication sites: Mount Makulu Research Station (Lusaka Province), Msekera Research Station (Eastern Province), Nanga Research Station (Southern Province)</p> <p>(3) District and community level: 8 districts in 4 provinces - Western Province (Sesheke District), Southern Province (Sinazongwe District and Siavonga District), Lusaka Province (Chongwe District and Luangwa District) and Eastern Province (Nyimba District, Petauke District and Mambwe District) (Among 8 districts above, there are two categories of activities (i) Development of district level secondary multiplication field at Farmer Training Institute at Chongwe, Petauke and Mambwe District) (ii) Extension (seed distribution and training) to farmers in all 8 districts</p> <p>2. Main activities: (1) The project establishes foundation, primary and secondary sites for multiplication of cassava and sweet potato planting materials, and produces and distributes planting materials at different levels. (2) The project establishes seed multiplication fields for alternative crops and supports their production through provision of seeds and training to farmers. (3) The project conducts training for extension officers and farmers on target food crops. (4) The project disseminates technologies for processing, preservation and utilization of target food crops.</p> <p>3. Inputs (to carry out above activities)</p> <table border="0"> <tr> <td>Japanese Side</td> <td>Zambian Side</td> </tr> <tr> <td>1. Experts: 5 persons</td> <td>1. Staff allocated: 5 persons</td> </tr> <tr> <td>2. Training in Japan:</td> <td>2. Land and facility: Project office and land for demonstration farm,</td> </tr> <tr> <td>3. Equipment: Pickup trucks, tractors, PCs and others</td> <td>3. Local cost: equipment</td> </tr> <tr> <td>4. Facilities: Installation and rehabilitation works of irrigation facilities were carried out at 6 sites (Mansa, Nanga, Mt. Makulu, Msekera, Masumba, Chalimbana) and new nurseries were set-up at one site (Nyimba).</td> <td></td> </tr> </table>					Japanese Side	Zambian Side	1. Experts: 5 persons	1. Staff allocated: 5 persons	2. Training in Japan:	2. Land and facility: Project office and land for demonstration farm,	3. Equipment: Pickup trucks, tractors, PCs and others	3. Local cost: equipment	4. Facilities: Installation and rehabilitation works of irrigation facilities were carried out at 6 sites (Mansa, Nanga, Mt. Makulu, Msekera, Masumba, Chalimbana) and new nurseries were set-up at one site (Nyimba).	
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Ex-Ante Evaluation	2006	Project Period	October 2006 –February, 2012 (Follow-up period: October 30, 2011-29 February, 2012)	Project Cost	(ex-ante) 250 million yen (actual) 287 million yen										
Implementing Agency	Implementing agency: Zambia Agricultural Research Institution (ZARI), Department of Agriculture (DOA) of Ministry of Agriculture and Cooperatives (MACO) (Currently, Ministry of Agriculture) *Implementing structure: (1) ZARI is responsible for overall project management and multiplication at foundation and primary multiplication sites. (2) DOA carries out extension services (from secondary multiplication to farmers) (Actual extension activities are carried out by District offices)														
Cooperation Agency in Japan	The Ministry of Foreign Affairs, The Ministry of Agriculture, Forestry and Fisheries														

II. Result of the Evaluation

1 Relevance
<p><Consistency with the Development Policy of Zambia at the time of ex-ante evaluation and project completion></p> <p>The project was consistent with Zambia's development policy both at the time of ex-ante evaluation and project completion. At the time of ex-ante evaluation, under National Agriculture Policy 2004-2015 and the Fifth National Development Plan (under preparation), food security at national and household level was prioritized and diversification of crops was regarded as the strategy to achieve the food security. At the time of project completion, the 6th National Development Plan 2011-2015 promoted development of an efficient, competitive sustainable agricultural sector which assures food security and increased income. It implied that the diversification of agricultural production is one of the strategies for achieving the sector's vision.</p> <p><Consistency with the Development Needs of Zambia at the time of ex-ante evaluation and project completion ></p>

The project was consistent with the needs for food security in Zambia both at the time of ex-ante evaluation and project completion. At the time of ex-ante evaluation, Zambia was highly dependent on rain-fed cultivation which led to the food crisis during droughts. At the time of project completion, while experiencing good harvesting years, Zambian farmers, particularly small-scale farmers, were still facing a number of challenges such as growing crops without reliable irrigation, erratic and insufficient supply of farm inputs and underdeveloped rural infrastructure. As a result, the risk of food shortage still existed.

<Consistency with Japan's ODA Policy at the time of ex-ante evaluation>

The project was consistent with Japan's ODA policy as, according to the ODA Databook 2006, support for poverty reduction through primarily rural development was prioritized area of ODA to Zambia as of 2006.

<Evaluation Result>

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

2 Effectiveness/Impact

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

The project purpose was achieved by the time of project completion as the following indicators set to measure the project purpose were attained: Cultivation areas (ha) and production of target food crops are increased (indicator 1), Number of households planting target food crops is increased (indicator 2), Quantity of target food crops consumed by farmers and/or purchased by enterprises is increased (indicator 3) and Crop Diversification Index (CDI) value decreased (indicator 4).

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

Although district-wise data for most indicators were not obtained, according to the farmer interviews at four districts¹, project effects have continued after project completion to some extent. The observation by farmers was backed up by district officers. Generally, production of cassava, cowpeas and sweet potato have continued and increased, while production of beans and some sorghum variety did not increase. Beans were affected by droughts. As for sorghum, it was found that the red variety introduced by the project was not preferred and hence the production declined. Similar trends were observed among the number of households which grow the crops targeted under the project, and the consumption. However, situations differ by district for different crops. Production for cassava and sweet potato have increased in Chongwe, because the market is available; while some stagnation was found for these crops in Sesheke and Petauke largely due to limited market², as well as diseases and pests. Sesheke experienced some increase in white sorghum, sweet potatoes and cowpeas, for which demands were observed from Namibia. In the case of Sinazongwe, though there was some declining trend for beans due to droughts, there are some positive results as production and consumption of the crop continued albeit at low levels. However, cassava declined due to droughts and termite in the district. CDI suggests that the crops have been diversified; at the end-line survey the index was 0.65 in 2011, compared to 0.37 in 2009, suggesting improved diversification.

The foundation sites, whose activities were enhanced by the Project, have continued to produce cassava and sweet potato after the project completion. On the other hand, most secondary multiplication sites (district sites) were not functional due to limited funding. Training for the target crops have continued after the project ended, though at reduced rates due to limited funding.

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

The overall goal was partially achieved. The food security situation was reportedly having improved by 76 % of the farmers. They explained that the improvement was seen in the form of being able to eat three meals; improved diversity in the diet with protein rich foods like beans; better access to seed for food crop production and improved income through sales. The farmer survey shows that 78.9 % of the respondents reported that their income increased as the project linked farmer groups to buyers. Farmers and district officers observed that limited market access, poor rainfall patterns, disease and pests have, to some extent, affected the food security and income level in Sesheke and Sinazongwe.

The data on malnutrition was not readily available. However, in some place it was reported that nutrition for their children improved (e.g. access to proteins by consuming beans in Sinazongwe).

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

The Project did not have unforeseen adverse impacts. For example no land acquisition and resettlement occurred under this project, and no negative impacts on natural environment were observed.

<Evaluation Result>

In light of the above, the project purpose was achieved at the time of project completion as food crop was diversified and diversification has continued to some extent after project completion. Overall goal was partially achieved as food security and income have improved. Therefore, the effectiveness/impact of the project is fair.

Achievement of project purpose and overall goal

Aim	Indicators	Results				
(Project Purpose) Food crop diversification is realized in selected communities.	Indicator 1: Cultivation areas (ha) and production of target food crops are increased.	Status of the achievement: achieved (partially continued)				
		(Terminal evaluation)				
		Crops	2009 (n=318)		2011 (n=280)	
			% of Grower	Average area (ha)	% of Grower	Average area (ha)
		Cassava	2.5	0.01	46.4	0.22

¹ During the ex-post evaluation survey, site visits were carried out at community level multiplication sites in four districts (Petauke in Eastern Province, Chongwe in Lusaka Province, Sinazongwe in Southern Province and Sesheke in Western Province). Chipata (Msekera Research Station) and Mambwe (Technical Assessment Site) were also visited.

² Initially, the market was facilitated by the project in Petauke, however, the market growth has not been sustained.

Sweet potato	7.2	0.02	26.1	0.07
Sorghum	13.8	0.12	15.4	0.07
Rice	0.6	0.00	2.5	0.01
Beans	7.9	0.02	6.1	0.02

(Ex-post Evaluation)

Cassava

District	Average Areas and production	2013	2014	2015
Sesheke (n=11)	Area (ha)	0.18	0.07	0.02
	Production (50kg Bag)	2.6	1.1	0.6
Chongwe (n=7)	Area (ha)	0.27	0.19	0.34
	Production (50kg Bag)	11.0	10.7	13.1
Petauke (n=9)	Area (ha)	0.41	0.41	0.37
	Production (50kg Bag)	29.2	25.7	18.4

Note: During the project implementation, the number of beneficiaries who planted cassava was minimal in Sinazongwe.

Sweet Potato*

District	Average Areas and production	2013	2014	2015
Sesheke (n=11)	Area (ha)	0.3	0.2	0.2
	Production (50kg Bag)	5.5	3.7	4.9
Chongwe (n=7)	Area (ha)	0.1	0.3	0.4
	Production (50kg Bag)	11.1	20.0	15.1
Petauke (n=9)	Area (ha)	0.03	0.03	0.03
	Production (50kg Bag)	1.11	0.89	0.78

* The camp visited in Sinanzongwe was not the target for Sweet Potatoes vines. However, the assessment from the District Agriculture Coordinator (DACO) indicated that there was an increase of sweet potato production and consumption in the district.

Beans/cowpeas

District	Average Areas and production	2013	2014	2015
Sesheke (n=11)	Area (ha)	0.14	0.16	0.12
	Production (50kg Bag)	22.8	8.55	8.52
Sinazongwe (n=11)	Area (ha)	0.18	0.20	0.17
	Production (50kg Bag)	18.40	14.60	15.50

Sorghum

District	Average Areas and production	2013	2014	2015
Sesheke (n=11)	Area (ha)	0.01	0.01	0.03
	Production (50kg Bag)	0.0	0.0	0.14

Note: For other districts there were no data on sorghum in the selected camps.

The assessment by the District Agriculture Coordinator revealed that Sorghum production and consumption declined in Chongwe, Nyimba and Petauke despite seed having been distributed by the project. According to one of the implementing counterparts, sorghum was not culturally popular in the Eastern part of Zambia (Chongwe, Petauke, and Nyimba) and hence the declining trend. In Sesheke, the district assessment shows that the production of white sorghum increased whereas the red sorghum distributed to farmers declined due to limited market/demand. Our observation in the field also revealed a lot of white sorghum in Sesheke. In Sinazongwe, the camp visited received no sorghum; however, the district picture assessed by the DACO's projected an increase of sorghum.

Indicator 2: Number of households planting target food crops is increased.

Status of the achievement: achieved (partially continued)

(Project completion)

Beneficiary No. of households by Crop

(Unit: Household)

	Cassava (7 districts)	Sweet potato (8 districts)	Sorghum (7 districts)	Beans (5 districts)

No. of beneficiaries	2,417	1,660	3,200	681
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(Ex-post Evaluation)

Average number of growers in Sesheke, Chongwe and Petauke

(Unit: Household)

	2013	2014	2015
Cassava	2,454	4,031	2,617
Sweet Potato	253	415	333
Beans/Cowpeas	900	1,563	1,087
Sorghum	2,358	3,975	2,748
Rice	8	13	8

Note: the average was based on data provided by the District Agriculture Officers. The quantitative data was not provided by Sinazongwe.

Indicator 3: Quantity of target food crops consumed by farmers and/or purchased by enterprises is increased

Status of the achievement: achieved (Partially Continued, although declining for some crops such as sorghum in Eastern part and red sorghum in Sesheke)

(Terminal evaluation)

Statistics were not available; however, the following events show that quantity of target food crops consumed by farmers and/or purchased by enterprises is increased.

- According to interviews with farmers in the target areas, they are now consuming more of the target food crops, especially cassava and sweet potato.
- Local farming households and a NGO started to buy products from one of the beneficiary farmers in Sesheke; they bought 20 bundles of cassava.
- A beneficiary in Siavonga has established a link with a food company.
- A women association in Chongwe has started processing cassava at the plant and selling products to local traders

(Ex-post Evaluation)

Percentage of those that observed increase in consumption

(Unit:%)

District	Cassava	Sweet Potato	Beans/ Cowpea	Sorghum	Rice
Sesheke (n=11)	54.5	81.8	81.8	45.5	9.1
Chongwe (n=7)	100.0	85.7	28.6	0.0	0.0
Petauke (n=9)	33.3	0.0	0.0	0.0	0.0
Sinazongwe (n=11)	0.0	0.0	72.7	0.0	0.0
Overall (n=38)	42.1	39.5	50.0	13.2	2.6

Source: Farmer survey, 2016

The data on the assessment on consumption were also compiled from the DACOs.

Generally the data by the DACO and that from farmers tallied. In few cases of discrepancy, this could be explained by some micro-geographical variations of the selected camps, compared to the overall picture seen by the DACO. Camps could have micro and specific situations which do not represent the full picture.

Differences are evident in Sesheke with respect to sweet potatoes, where 81 % of the farmers observe an increase while the DACO noted a decline. Another situation is Sinazongwe where the DACO saw an increase, while farmers in Sinadabbwe camp saw no change (justifiably so) because they did not participate in this crop under the project.

Indicator 4: Crop Diversification Index value decreased.

Status of the achievement: achieved (partially continued)

(Terminal evaluation)

Data source	CDI (Beneficiary)	CDI (Non-beneficiary)	Deviation
2009 baseline	0.79	0.70	-0.09

		2011 end-line	0.65	0.69	+0.04
		Change	-0.14	-0.01	
		The reduction in CDI value suggests a progress in diversification; the lower the index, the higher the diversification *CDI was calculated based on the two year average area planted.			
		(Ex-post Evaluation)			
			2013	2014	2015
		CDI	0.38	0.34	0.37
		As the data source for the Ex-post evaluation is different from that for the terminal evaluation, it is difficult to make a simple comparison between them. However, we could say CDI has improved as the CDI at the ex-post evaluation alone shows the declining trend. (2013-2015).			
(Overall goal) Food security and income at household level are improved in target areas.	Indicator 1: Number of households in the target areas which are food insecure reduced.	(Ex-post Evaluation) partially achieved Number and percentage of those who report food security improved.			
		District	Number	Percentage (%)	
		Sesheke (n=11)	7	63.6	
		Chongwe (n=7)	7	100	
		Petauke (n=9)	9	100	
		Sinazongwe (n=11)	6	54.5	
		Total (n=38)	29	76.3	
	Indicator 2: Number of people classified as malnourished reduced.	(Ex-post Evaluation) partially achieved No data was available for the malnutrition. However, in some place (Sinazongwe), it was reported that nutrition for their children improved. In Petauke it was also reported that food availability improved, implying improved security.			
	Indicator 3: Household income level is improved in target areas.	(Ex-post Evaluation) partially achieved Number and percentage of those who report income improved.			
		District	Number	Percentage (%)	
		Sesheke (n=11)	6	54.5	
		Chongwe (n=7)	7	100	
		Petauke (n=9)	9	100	
		Sinazongwe (n=11)	8	72.7	
		Total (n=38)	30	78.9	

Source : JICA internal documents, questionnaires and interviews with counterparts, and farmer survey.

3 Efficiency

Both project period and project cost slightly exceeded the plan (ratio against the plan: 115% and 107% respectively). The follow up was implemented in order to provide the bridging backstopping activities towards the development for the successor project, Food Crop Diversification Project focusing on Rice Production (2012- 2015) .

Therefore, efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

There are established policies which secure the effects of the project to continue. The Revised Sixth Development Plan (2013-2016) prioritizes the diversification of crops.

<Institutional Aspect>

Roles and responsibilities for seed multiplication, distribution and extension are adequately assigned within ZARI and DOA respectively, and demarcation among these organizations is also clear. ZARI is basically responsible for multiplication and DOA is responsible for distribution and extension. At ZARI, Crop Improvement and Agronomy division is responsible for seed multiplication, while the Farming Systems Research and Social Sciences Division is responsible for trying out the technologies at the farm level. At DOA, Agriculture Extension provides advice to farmers on how to grow crops. They are spread in all districts with the Senior Agriculture Officer heading extension services at the district. The sub district level is broken down into blocks and then camps. The extension officers that provide advice to farmers in agricultural camps (the smallest unit for extension). The number of staff at ZARI is sufficient. According to ZARI, the number of research staff increased after the project completion; Diploma and Degree holders increased from 232 in 2013 to 255 in 2016.

The number of staff is insufficient as some camps were not filled up; according to discussions with a senior officer (at least Deputy Director) the Department requires approximately 1,700 staff but only 1,350 (or 79.4%) were in place. The situation was confirmed with the DOA district offices, among the five districts visited, three districts indicated the number is sufficient as they had staff in all camps, on the other hand, the other two districts did not have extension staff in all camps. On the positive side, the department indicated that the situation of staffing had improved compared to the time of the project completion because some staff had been employed. The complete filling of the gap was hampered by funding shortages.

<Technical Aspect>

Staff in DOA and ZARI are generally well trained and manuals developed by the project are well utilized and on demand. As to

extension officers, training in cultivation of specific aspects needs to be implemented, as some officers were not familiar with disease control for the target crops. Failure to identify and control diseases could jeopardize the continued growing of the crops. There is no regular training for extension staff due to the budget limitations. At the time of the Ex-post Evaluation it was found that the Department had requested Cabinet Office to employ a Principal Seed Officer to spearhead the seed distribution and extension activities, with a view to further enhance the technical capacity of the Department. The project produced manuals for rice, cassava, beans and sweet potato production which are still being utilized. The Ministry was in the process of updating some of the manuals in August 2016, with support from the Smallholder Productivity Promotion Project (S3P) under funding of International Fund for Agricultural Development (IFAD).

<Financial Aspect>

Financing for seed multiplication by the government is not only short but unpredictable. Only 20% of the approved budget was disbursed to ZARI in 2015 and budget released to DOA in each year is estimated to be 30-40% of the approved amount. However, the continued implementation has been complemented through the support from other the development partners such as International Institute of Tropical Agriculture (IITA), USAID and Food and Agriculture Organization (FAO).

<Evaluation Result>

In light of the above, slight problems have been observed in terms of the institutional, technical and financial aspects. Therefore, the sustainability of the effectiveness through the project is fair.

5 Summary of the Evaluation

The project purpose was achieved at the time of project completion as food crop was diversified and diversification have continued to some extent after project completion. Overall goal was partially achieved as food security and income have improved. As for sustainability, there are some challenges in the institutional, technical and financial aspects. For efficiency, both project period and project cost exceeded the plan. Considering all of the above points, this project is evaluated to be partially satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing agency:

1. The Ministry of Agriculture should continue to print manuals of the crops that were promoted (Cassava, Sweet potatoes, Sorghum, Beans/Cowpeas and Rice) to be distributed in camps where farmers are growing the crops.
2. The Ministry of Agriculture should address some aspects of sustainability such as budgeting or mobilizing financial resources to train farmers and ensuring that trained staff are available in all project camps.
3. The Ministry of Agriculture should have plans for replacing planting materials over time to address the possible declining potency of seed at farmer level from time to time say after 5 years; whereas the materials were available at farmer level, most secondary sites (district) were non-functional. This means that if materials diminished at farmer level due to disease, pests and loss of potency, the project effects could be jeopardized.

Lessons learned for JICA:

1. It is important to ensure access to sustainable market linkages for sustained growing of crops in the design as we promote diversification. The market has been important in sustaining growing of cowpeas and sorghum in Sesheke; and cassava and sweet potatoes in Chongwe.
2. It is important to first try out many crops/varieties and then identify those that are acceptable to the communities before promoting diversification. Although red sorghum was promoted under the project, it was abandoned as it was not as popular as the white sorghum.
3. When implementing similar projects at the multiplication of seed, there is need to build staff capacity for disease and pest identification for continuous inspection of seed for disease and pests to ensure that quality planting materials are distributed sustainably. There should be an in-service training programme for Camp Extension staff in identification of Pest and Diseases, as well as the control measures.
4. Capacity also needs to be built in disease and pest identification among farmers who receive materials. Given that beneficiary farmers were expected to share or pass-on materials to others in their areas, the training will mitigate the danger of the farmers disseminating materials that are contaminated with diseases and pests.



Mr. Chimbamulonga, farmer cassava seed (stem cutting) producer in Mambwe: Continued seed multiplication at farmer level.



Ms. Beatrice Mufwabi showing her newly planted cassava in Sesheke District. The seed is near the household to control animal destruction.