

Country Name		Health Capital Investment Support Project	
Republic of Zambia			
I. Project Outline			
Background	The Government of Zambia had engaged the health reform in an effort of reconstruction of the health sector since 1991. Nevertheless, due to the inappropriate maintenance of healthcare facilities and medical equipment, it was impossible to fully attain the objectives. Furthermore, as the National Health Development Plan emphasized the essential role of the health institutions in rural areas as health service providers in order to strengthen health services, it was indispensable to obtain information/data regarding the details of each capacity for health service provision, the situation of facility maintenance, arrangement of medical equipment and assignment of available health human resource, health status of residents in the community as well as their access to health facilities. Therefore, capacity development based on an objective rationale for the allocation of funds for maintenance and repair of medical equipment was deemed to be fundamentally important to expedite implementation of the Health Capital Investment Plan.		
Objectives of the Project	<p>Through the establishment of a health capital investment system, the project aimed at improving management capacity for medical equipment and facilities from primary to tertiary level health/medical institutions in Lusaka, Eastern Province, and Western Province, and thereby contributing to the improvement of conditions of health physical assets in the health system in Zambia.</p> <ol style="list-style-type: none"> Overall Goal: Conditions of the health physical assets (i.e. medical equipment, infrastructure, and utilities) in the health system in Zambia are improved to support the delivery of quality health services at all levels within the framework of the National Health Strategic Plan capital. Project Purpose: The capacity of public physical health asset management is improved in the pilot areas to plan and cost-effectively manage investment to facilitate the delivery of quality health services at all levels of service delivery. 		
Activities of the Project	<ol style="list-style-type: none"> Project Site: Lusaka, Western Province, Eastern Province Main Activities: Inputs (to carry out above activities) <ol style="list-style-type: none"> Development of management mechanism for medical equipment, infrastructure, and utilities, Development of standards of health infrastructure for the second and the third level hospitals, Operationalization of the health physical asset management mechanism with the emphasis of planned preventive maintenance. 		
	Japanese Side	Zambian Side	
	<ol style="list-style-type: none"> Experts: 15 persons Trainees received in Japan: 5 persons Third Country Training: 4 persons (in Tanzania) Equipment: vehicles, PC, laser printers, photocopier, projector, etc. 	<ol style="list-style-type: none"> Staff allocated: 121 persons Facilities: Office for the experts in MOH Local cost: Administrative and operational expenses for Zambian Side 	
Project Period	January 2010 - March 2016 (Extension period: March 2015 - March, 2016)	Project Cost	(ex-ante) 320 million yen, (actual) 436 million yen
Implementing Agency	Ministry of Health (MOH)		
Cooperation Agency in Japan	-		
II. Result of the Evaluation			
1 Relevance			
<Consistency with the Development Policy of Zambia at the Time of Ex-Ante Evaluation and Project Completion>			
<p>The project was consistent with the development policies of Zambia as the improvement of healthcare infrastructure by investing medical equipment, and strengthening the health data information system implemented addressed by the Health Chapter Priority Programs in the “5th National Development Plan”(2006-2010). In order to attain these objectives, the MOH implemented an analysis of the inventory of medical equipment and infrastructure to draft the management policy in 2006. Furthermore, the Government of Zambia had addressed the priority of medical equipment management in the “National Health Strategic Plan (NHSP) ” (2011-2015).</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 development needs of Zambia. Hospitals and health centers, especially in rural areas, could not fully function without proper preventive maintenance and rehabilitation of the facilities and equipment. It was also necessary to set up a database system to accurately indicate the current situation of medical facilities in rural areas. There was no change in the need for improving the medical equipment management to ensure the operation of health facilities by the time of project completion.</p>			
<Consistency with Japan’s ODA Policy at the Time of Ex-Ante Evaluation>			
<p>The project was consistent with the Country Assistance Program to Zambia in 2002 as it prioritized to assist its promotion of cost-effective healthcare services.</p>			
<Appropriateness of Project Design/Approach>			
<p>From perspectives of both effectiveness and sustainability of the project effects, the project was not appropriately designed as it had bypassed underlying issues how best to escalate the commitment of staff such as personnel evaluation for cost-saving in the management</p>			

of medical institutions in rural areas in Zambia. The project was implemented without much involvement of parties concerned in the leadership position who was in charge of improving the quality of medical services on the whole. Thus, after the project completion, there was no substantial basis for the project effect to be self-sustaining nor succeeded to further improve it.

<Evaluation Result>

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

2 Effectiveness/Impact

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

The Project Purpose was partially achieved by the project completion. According to the terminal evaluation report, only 13.3% of the medical equipment management committees (MEMC) established by the project for planning and budgeting maintenance of medical equipment in the target provinces scored at least 35 points in the medical equipment committee monitoring sheet to check the maintenance activities by the medical equipment committees (Indicator 1). 53.3% of medical equipment technicians in the target provinces scored at least 35 points in the technical monitoring sheet (Indicator 2). 5S activities for health facility management were introduced in the eight pilot facilities in the three target provinces (Indicator 3). The average technical score of 12 health institutions increased from 16.3 points to 24.33 points in 2015 (Indicator for the extension period).

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

The project effects have not been continued after the project completion. According to the survey results of the ex-post evaluation, the management capacities enhanced by the project have not been substantially retained, as confirmed that the activities or training program were not continued after the project completion. The medical equipment management committees were formed but they have not been fully functioning and the 5S activities and the technical evaluations for equipment management were discontinued after the project completion. On the contrary, the national focus has been more on the renewal of medical equipment and facilities that lowers the priority of the maintenance in health care institutions.

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

The Overall Goal has not been achieved at the time of ex-post evaluation. The proportion of non-functioning medical equipment reduced in all the provinces (Indicator 1). However, it was not by the improvement of the medical equipment management at the health institutions, namely the contribution of the project but by the construction of new health facilities and procurement of new medical equipment. According to the survey results for the ex-post evaluation, comparable data of predetermined indicators were not available for Indicator 2. Moreover, due to the provision of new medical equipment and facilities, a comparison of time-series data made virtually impossible and inadequate.

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

No negative impact was confirmed.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is low.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results
(Project Purpose) The capacity of public physical health asset management is improved in the pilot areas to plan and cost-effectively manage capital investment to facilitate the delivery of quality health services at all levels of service delivery.	Indicator 1 50% of medical equipment committees at the provincial and district levels in the project sites score at least 35 out of 50 points in medical equipment committee monitoring sheet	Status of the Achievement: not achieved (partially achieved) (Project Completion) 13.3% of medical equipment management committees in the target provinces scored at least 35 points. (Ex-post Evaluation) Although the medical equipment management committee was formed in each of the 9 target hospitals in the project sites, they have not fully functioned yet. The average score of all hospitals was 29 (max. 50) according to the surveyed evaluation sheet of medical equipment management activities. About 28% of the hospitals scored above 35.
	Indicator 2 50% of medical equipment technicians at the provincial and district levels in the project sites score at least 35 out of 50 points in technical monitoring sheet	Status of the Achievement: achieved (partially continued) (Project Completion) 53.3% of medical equipment technicians in the target provinces scored at least 35 points. (Ex-post Evaluation) According to the evaluation of preventive maintenance of medical equipment, the average score of all 9 hospitals was 21 (max. 50). It was confirmed that some activities had been implemented but they were not fully documented in the technical monitoring sheet.
	Indicator 3 Health facility management using the 5S approach is introduced to the 3 project provinces.	Status of the Achievement: achieved (not continued) (Project Completion) 5S pilot activities were in progress in Lusaka Province. Staff in Eastern and Western Provinces were trained to understand the essence of 5S and of 5S activities introduced in eight pilot facilities. (Ex-post Evaluation) The 5S activities were not continued after project completion. For health facility management, this was in fact attributed to lack of commitment and leadership by the medical equipment staff as well as the various medical staff in charge of key departments in the health facilities. There had not been any training and orientation of 5S principles to new staff.
	Indicator (Extension)	Status of the Achievement: achieved (not continued)

	A technical score of Medical Equipment Management Committee and Healthcare Facility Committee is increased	(Project Completion) According to the average score of pilot hospitals, the technical score increased as; 16.30 (2012), 20.58 (2015 1 st), 24.33 (2015 2 nd), 31.87 (2016). (Ex-post Evaluation) The committees were formed during project implementation, however, they had not continued the technical evaluation after project completion due to lack of leadership and commitment of medical equipment management staff in pilot hospitals and PHO/DHO.																																																																								
(Overall Goal) Conditions of the health physical asset (i.e. medical equipment, infrastructure, and utilities) in the health system in Zambia are improved to support the delivery of quality health services at all levels within the framework of the National Health Strategic Plan.	Indicator 1 The proportion of Non-functioning medical equipment is reduced by 20%	(Ex-post Evaluation) Not achieved. Although the proportion of non-functioning medical equipment was reduced by 20% at the time of the ex-post evaluation, this was mainly because MOH provided new medical equipment to most of the target hospitals with the financial support of donors, not by the improvement of the medical equipment maintenance system that the project intended to aim at. Table 1: The proportion of non-functioning medical equipment (%) <table border="1"> <thead> <tr> <th></th> <th>2010 baseline</th> <th>2012 Terminal evaluation</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Lusaka</td> <td></td> <td>39</td> <td>25</td> <td>18</td> <td>21</td> </tr> <tr> <td>Eastern</td> <td></td> <td>15</td> <td>25</td> <td>20</td> <td>12</td> </tr> <tr> <td>Western</td> <td></td> <td>55</td> <td>35</td> <td>30</td> <td>30</td> </tr> <tr> <td>Northern</td> <td></td> <td>n/a</td> <td>n/a</td> <td>28</td> <td>21</td> </tr> <tr> <td>Luapula</td> <td></td> <td>n/a</td> <td>n/a</td> <td>24</td> <td>19</td> </tr> <tr> <td>Muchinga</td> <td></td> <td>n/a</td> <td>n/a</td> <td>28</td> <td>25</td> </tr> <tr> <td>Copperbelt</td> <td></td> <td>n/a</td> <td>n/a</td> <td>28</td> <td>24</td> </tr> <tr> <td>Northwestern</td> <td></td> <td>n/a</td> <td>n/a</td> <td>30</td> <td>28</td> </tr> <tr> <td>Central</td> <td></td> <td>n/a</td> <td>n/a</td> <td>22</td> <td>20</td> </tr> <tr> <td>Southern</td> <td></td> <td>n/a</td> <td>n/a</td> <td>24</td> <td>21</td> </tr> <tr> <td>Average</td> <td>50</td> <td>33.3</td> <td>n/a</td> <td>25</td> <td>22</td> </tr> </tbody> </table>		2010 baseline	2012 Terminal evaluation	2016	2017	2018	Lusaka		39	25	18	21	Eastern		15	25	20	12	Western		55	35	30	30	Northern		n/a	n/a	28	21	Luapula		n/a	n/a	24	19	Muchinga		n/a	n/a	28	25	Copperbelt		n/a	n/a	28	24	Northwestern		n/a	n/a	30	28	Central		n/a	n/a	22	20	Southern		n/a	n/a	24	21	Average	50	33.3	n/a	25	22
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	Indicator 2 The proportion of health facilities needed for major repair is reduced by 20%	(Ex-post Evaluation) Not verified. As stated above, it is impossible to accurately confirm the proportion of facilities needing repair by data. Also, the detailed records are unavailable or not properly aggregated in the MOH. Evidently, its focus and priority have been mainly on the construction of new health facilities and the procurement of new medical equipment. Table 2: The proportion of health facilities need for major repair (%) <table border="1"> <thead> <tr> <th></th> <th>2010 baseline</th> <th>2012 Terminal evaluation</th> <th>2016</th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Lusaka</td> <td></td> <td>70</td> <td>40</td> <td>30</td> <td>30</td> </tr> <tr> <td>Eastern</td> <td></td> <td>22</td> <td>25</td> <td>28</td> <td>28</td> </tr> <tr> <td>Average</td> <td>24.1</td> <td>21.7</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> </tr> </tbody> </table>		2010 baseline	2012 Terminal evaluation	2016	2017	2018	Lusaka		70	40	30	30	Eastern		22	25	28	28	Average	24.1	21.7	n/a	n/a	n/a																																																
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Source : Questionnaire responses and field survey interviews, “Health Infrastructure Operations Plans” (2016-2018), “NHSP” (2017-2021) p.113, <https://www.moh.gov.zm/docs/ZambiaNHSP>

3 Efficiency

Although the outputs were produced as planned, both the project cost and project period exceeded the plan (ratio against the plan: 133% and 136%, respectively). Thus, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

Promotion of management capacity of medical equipment and facilities has retained its importance in the national policy of the Government of Zambia, namely the “National Health Strategic Plan” (2017-2021), as to manage and implement the acquisition, usage, maintenance, and management of medical health care technology in health institutions on a nationwide basis. In fact, with a structured system of how the medical equipment to be maintained and managed, several bilateral and multilateral donors also have been coming on board with their programs¹ to align with the policy and supplement the government efforts on maintenance of medical equipment and facilities. However, those policies have not necessarily backed up the medical equipment management at the health facilities by the medical equipment management committees introduced by the project.

<Institutional Aspect>

The roles and responsibilities of MOH have not been changed. MOH has been responsible for the formulation of its policy and advisory

¹¹ The Department for International Development, the Government of the United Kingdom (DFID) supported to provide training of biomedical equipment technologists (BMET) at NORTEC in Ndola City in 2013 for three years and a continued Medical Equipment Uptime Pilot Project in 2017/18. As a result, 8 trained BMETs were placed in 8 District Hospitals. United Nations Population Fund (UNFPA) conducted a Medical Equipment Uptime Pilot Project in 2017/18, 16 BMETs employed during 22 months in 16 hospitals, 8 hospitals in Western and Central provinces. The Swedish International Development Cooperation Agency (SIDA) funded 16 BMETs to be employed during 10 months in a total of 16 hospitals, 4 hospitals in each province (Luapula, Muchinga, Southern, Eastern) in 2018 for the three-year period.

function for policymakers. Survey results show that institutionally, a nationwide system for operation and management exists, however, not efficiently operationalized due to limited management ability and resource unavailability. In Provincial and District levels in all target provinces, only a few focal persons have been assigned to this specialized field. Thus, it was deemed that it remained insufficient in terms of manpower. This is attributed to the lack of adequate skilled staff. The establishments at the hospitals have not been revised to include employment of qualified medical equipment technologist. Therefore, such staff cannot be deployed to the hospitals because there are no vacancies. The staff who are working to maintain equipment are mostly electricians or environment health officers, with a few exceptional facilities that have qualified medical equipment staff and who are still on the payroll as “electricians”. This has also contributed to the inadequate numbers of medical equipment personnel in the hospitals. As mentioned above, the medical equipment management committees established in the pilot provinces by the project, have not been fully functioning for the medical equipment management.

<Technical Aspect>

According to the survey results, they perceived that all the required skills at each level were considered insufficient and seriously understaffed, although various training and technical assistance have been provided by bilateral and multilateral donors. Currently, there are only 91 biomedical technicians against 2,482 facilities in countrywide. Biomedical technicians working in the hospitals work on the position of electricians because that is the only position available on the hospital establishment. Technical Instruction is available from MOH Headquarters that provided policy guidelines but without accompanying resources. There is no plan for training staff to improve and retain capacity. Although manuals developed during the project are available in some facilities, implementation of the activities has not been systematically programmed on a regular basis.

<Financial Aspect>

As Zambia has depended on the export of copper, it has been vulnerable in terms of the government funding mechanism for the last three years. MOH has not guaranteed to disburse the amount of budget as anticipated the lesser amount of revenue for the next fiscal year. The annual budget has been allocated but reduced for medical equipment and healthcare facility maintenance management as 57 million Kwacha (2017), 51 million Kwacha (2018), and 36 million Kwacha (2019). Despite the national policy, under the current public finance, funding for the department of medical equipment has not been disbursed. This has, in effect, failed to implement any of the planned programs proposed by the project.

<Evaluation Result>

In the light above, there have been some problems with the implementing agency from the policy, institutional, technical and financial aspects. Therefore, the sustainability of the effects through the project is low.

5 Summary of the Evaluation

The project has not achieved the Project Purpose and the Overall Goal. As for sustainability, institutionally understaffed to perform each duty and technically challenging to retain the skillset. Also, the necessary budget has not been disbursed to conduct any training and activities for proper medical equipment management. As for efficiency, the project cost and period exceeded the plan.

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

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

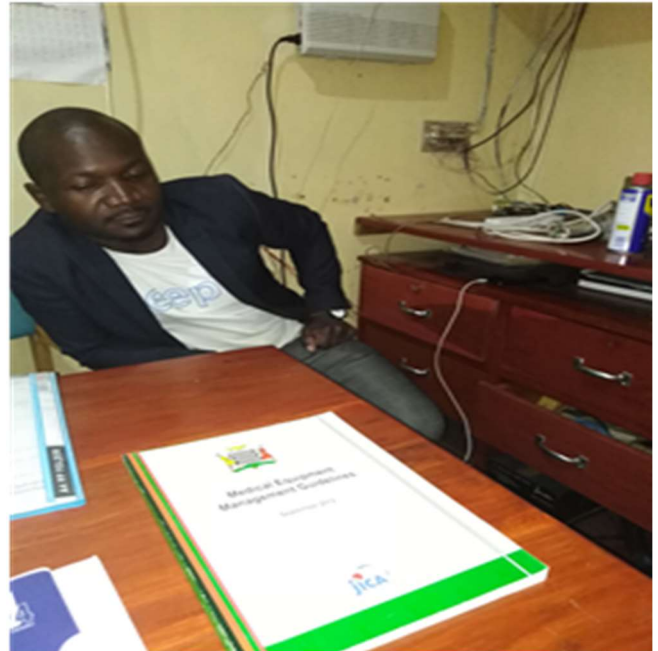
To maintain the project effect to improve maintenance capacity of medical equipment and facilities, MOH Permanent Secretary Administration, Director Planning and Policy, and Director Physical Planning and Medical Technologies are required to make a concerted effort to ensure all hospital establishments across the country include a position of “Medical Equipment Technician.” This should be done by facilitating for authority for all the hospitals to employ qualified personnel as necessary or to deploy staff from the central level. Furthermore, the MOH should improve on the disbursements of budgets for medical equipment management to ensure continued maintenance activities which are to eventually serve cost-saving locally and nationally. It is highly desirable if revised establishments for hospitals to be disseminated to all Provinces with authority for them to fill the positions of medical equipment technicians by the year 2020 during the annual planning cycle.

Lessons Learned for JICA:

Although capacity development was much needed and pertinent, the project design and approach were not appropriate particularly on the expected outcome of the project. JICA experts should have engaged the Human Resources (HR) department if needed to include the development of unconventional capacity and skills to ensure a common understanding of establishments and level of staff and required skillsets according to HR standards of the MOH. The project implemented capacity development activities targeted at expected medical equipment technicians when in fact some of the staff trained had not been qualified medical equipment technicians. The MOH did not have adequate qualified medical equipment technicians across the country in the first place and therefore, a position for medical equipment had not been available in most hospitals. The maintenance of equipment had been left to electricians and service contractors dispatched from suppliers. When the project was implemented, the intention was to enhance skills in equipment management within the existing organizational framework. The goal had not been fully met because of the gap in expected levels of implementation in the electrician and maintenance teams that received training. HR Department at the MOH should have been involved in the implementation to fully understand the gap and then initiate to review its policy in terms of establishment of medical equipment staff at the hospital level. Therefore, it is highly desirable that if the project covers some forms of training for counterpart staff, JICA project formulation team should ensure to the involvement of all necessary departments in the implementing agency, especially HR, in order for counterpart themselves to comprehend required skill sets prior to actual implementation of technology transfer activities. This may well gain a necessary understanding of the targeted positions and their roles and responsibilities, and feedback to get autonomously motivated by how newly acquired skills introduced by the project will be utilized to enhance their own benefit based on their official mandates and job description.



Medical Equipment repair workshop in Chadiza hospital, showing very unorganized tools and equipment



Petauke Hospital Medical Equipment Technician with the medical equipment manual in his office formulated during the project