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Ex-Post Evaluation Report for the Projects of Establishing ICT Training Center

KOICA

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한국국제협력단

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This evaluation study was entrusted to KTE Corporation by KOICA for the purpose of independent evaluation research. The views expressed in this report do not necessarily reflect KOICA's position.

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Acronyms

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Acronyms

| | |
|---------|--|
| A+ | CompTIA(Computing Technology Industry Association), testing environment setup of PC hardware and software (Operating Systems) and an ability to take an action against a failure |
| CAS | Country Assistance Strategy |
| CBT | Computer Based Test Development Aid Committee |
| DAC | Development Assistance Committee |
| DBC | CERTIFICACION BASICA DE REDES Y SUS SOLUCIONES (E-LEARNING) |
| DoIT | Department of Information and Communication, under the Ministry of Planning, Kurdistan Regional Government(KRG) |
| DT | DIRECCIÓN BÁSICA PARA PEQUEÑAS EMPRESAS (E-LEARNING) |
| EDCF | Economic Development Cooperation Fund, Foreign Economy Cooperation Fund |
| FGI | Focus Group Interview |
| ICDL | An IC Driving License, 7 Module Tests of information, process and communication field which ECDL (European Computer Driving License) Association supervises |
| INTECAP | Instituto Tecnico de Capacitacion Productivade, Institute of Technology and Training of Guatemala. |
| ITA | IT Academy, Local Name of ICT Training Center in Arbil of Iraq |
| KRG | Kurdish Regional Government, Local Government of Kurdistan |
| LMS | Learning Management System |
| MECE | Mutually Exclusive and Collectively Exhaustive |
| MoHAC | The Ministry of Humanitarian Aid and Cooperation |
| MoP | Ministry of Planning, KRG |
| MOS | Microsoft office specialist |
| NGO | non-government organization |
| OECD | Organization for Economic Co-operation and Development |
| PDM | Project Design Matrix |
| Telgua | Telecomunicaciones de Guatemala, National Telecommunication Corporation of Guatemala. |
| TICS | Tecnologias de Informacion y Comunicacion |
| USAID | United States Agency for International Development |



Evaluation Summary



I

Evaluation Summary



1. Background and Purpose of Evaluation

Background

- The aid scale has been gradually enlarged since Korea participated in OECD/DAC in 2009, and, concurrently, the demand for sharing information on aid effectiveness and the efficiency of aid delivery has also increased.
- There needs to be a Post-Evaluation for the project of establishing ICT Training Center out of Grant-Type Aids as more than 2 years are passed after the evaluation for completion.

Purpose

- We analyzed the project based on 5 main standards of DAC Evaluation such as Relevance, Effectiveness, Efficiency, Impact and Sustainability(added Gender Mainstreaming and consideration standards for environment), and would like to propose improvements to enhance the effectiveness of various projects which are already completed.
- We would like to enhance the effectiveness of similar Aid projects in the future by drawing the outcomes, learning and strategy from the project of establishing an ICT Training Center.
- We intend to improve the awareness of the people for KOICA projects which our Government develops as a member of OECD/DAC and secure the transparency by sharing the evaluation information through systematic and scientific evaluation.



2. Scope and Methodology of Evaluation

2.1 Scope

- Evaluation for the establishment and operation situation of ICT Training Center
 - Evaluation for developing methods & procedures, planning & details and follow-up services of ICT Training Center which were developed in Iraq and Guatemala
- Evaluation of a ripple effect which impacted directly and indirectly after establishing ICT Training Center
 - Evaluation of a ripple effect on Reconstruction Policy of KRG through improving administration ability of public officers for Iraq, and an economic development policy such as increasing employment through training ICT manpower for Guatemala

2.2 Methodology

- Evaluation Framework is used referring to the Guidelines of Development Cooperation Project Evaluation by Korea International Cooperative Agency (Nov. 2008, KOICA), and ex-post evaluation methodology of this project was constituted based on foregoing evaluation framework.

| Item | Phase | Description | Method | Components |
|--------------------|------------------------|--|----------|--|
| Survey Preparation | Securing a logic Model | Check relation between project's activity and purpose, evaluation index by each phase> Establishing questionnaires and survey method | Logframe | Length: Goal, Outcome, Outputs, Activities(Inputs, Premise) Width: Evaluation Index, Basis, Restriction |

| Item | Phase | Description | Method | Components |
|--------------------|--------------------------------------|--|---|--|
| Survey Preparation | Preliminary Survey | Local Survey: Literature Review, Interview >To establish sub-evaluation model and fix evaluation method | Questionnaire and Interview, preliminary survey on Site when necessary | Literature Survey: Important documents of the target to aid, other Aid-organ's documents Interview: Concerned persons of evaluation target, Concerned experts |
| Survey Preparation | Fixing Evaluation Model | A model which analyzed input, process, output, effect and impact based on evaluation standards | Logframe | Project Name, Beneficiary, Aid Receiving Organ/Region, Version, date, Length 4* Width 4 Matrix |
| Survey Preparation | Questionnaires Development | To develop sub-evaluation questionnaires matching with evaluation target and situation. | MECE Method (Hierarchical Questionnaire Model) | Basic Question>Target's Feature, Evaluation time, Consideration of major items to evaluate>To develop sub-questionnaires by each evaluation standard. |
| Survey Design | Adopting Evaluation Methodology | To collect information and select survey method through which answers for each question shall be understood most efficiently | Data Collection, Observation, Survey, Interview and Group Discussion | To design data collection strategy and its method, analysis framework and report system. To describe evaluation methods including Access/Sufficiency/ Relevance |
| Survey Design | Preparing Evaluation Matrix | To prepare a table by associating evaluation questionnaires and methods. | Deductive Method, Research of Post-Change without control group, Triangulation Method | To select major 3 evaluation items considering evaluation time/target/scope based on evaluation standards> To select methodology and conduct evaluation |
| Survey Design | Establishing Evaluation Plan in Site | To conduct an evaluation after reviewing frequency of survey 1 month before survey on site when survey is included. | Interview and Survey | To check person in charge of Aid-receiving organization, establish evaluation on site schedule, secure consent of Aid-receiving organization for evaluation method/means, check cooperative matter from Aid-receiving organization, check targets to interview/survey, Translator/Translation, Transportation, Experts, Safety and other trip procedure etc. |
| Conducting Survey | Conducting Evaluation in Site | To prepare meeting minutes for major checking points, report evaluation result in site | Interview and survey | To prepare and report meeting minutes, visit records (photographs etc.) and summary evaluation result report. |
| Result Analysis | Completing Evaluation | Evaluation Report | Evaluation Report | To prepare evaluation report(plan), Review evaluation report, fix and distribute evaluation report and Follow up |

- Evaluation of this project falls into a Post-Evaluation according to Evaluation Type in terms of time. The Post-Evaluation means an evaluation conducting after a certain period from completion of development activity, and is conducted in order to obtain proposals for similar projects by measuring sustainability, impact, effectiveness of the project or a strategic learning.
- The evaluation of this project includes a process evaluation and an performance evaluation according to evaluation type in terms of purpose.
- The target of this evaluation is the project to establish ICT training Center in Iraq and Guatemala, and the evaluation of this project is a project evaluation according to evaluation type in terms of target.
- The evaluation of this project is an external evaluation according to evaluation type in terms of subject.

2.1.1 Post-Evaluation Standards to apply for this Project.

- 7 items adopted in this post-evaluation such as relevance, effectiveness, efficiency, impact, sustainability, gender mainstreaming and environment are recommended by OECD/DAC and are evaluation standards of Aid-project adopted by KOICA.
 - At the time of conducting evaluation of this project, items such as gender mainstreaming and environment were not presented as evaluation standards of Aid-project. Thus, it was difficult to evaluate the achievement standard of goal index defined in advance for these two items.
 - In addition, the evaluation for gender mainstreaming and environment was carried within a level of checking the situation in operation environment.
- Evaluation standard of relevance is defined as follows.
 - Relevance has an important meaning in preliminary phase of the project. The project institution shall measure the relevance of the development

- activity at the phase of planning and preparation and establish a proper strategy accordingly. Afterwards, it shall analyze the effectiveness of strategy established at the planning phase when interim and post evaluation.
- As for questionnaires testing for the relevance of the project, they may ask question such as "Does this project match with the goal of national policy of the Aid-receiving organization in operation phase?" or "Does the goal of the project match with policy and priority of KOICA?" etc.
- Evaluation standard of effectiveness is defined as follows.
 - Effectiveness could be measured in two phases. When analyzing the outcome, they give importance on whether the evaluation target produced all targeted outcome while they give importance on analyzing the level of change which the production of the outcome has brought, namely the level of achieving target when analyze the result.
 - Output analysis is mainly conducted in end-of-project evaluation while outcome analysis is conducted in ex-post evaluation.
 - As for the questions for effectiveness, they may question such as "To what extent of change did the project bring about, apart from the external effect?" "why the intended achievement of target was succeeded or failed at the side of stakeholders such as government, ICT center, trainers, trainees respectively?" and "What shall be improved in order to enhance the operation outcome?" including the level of intended achievement of target and goal through the project.
 - Evaluation standards such as efficiency, impact, sustainability, gender mainstreaming and environment shall be selected for conducting evaluation according to type and scope of evaluation.
 - The basic logic model in evaluation methodologies are as follows:
 - The basic frame in development project evaluation is Logic Model(Logframe).
 - Logframe enables planning, monitoring, and evaluation while showing

logical relation between the cause and effect of development activity.

- Thus, first of all, Logframe for the evaluation target shall be secured in this evaluation and we shall establish evaluation questionnaires and survey method after checking project activity, relationship between purpose and evaluation indicators by each phase. Each evaluation indicator, evaluation measurement and sub-evaluation questionnaires shall connect logically to each other.
- A survey was carried out using a population survey, fixing sampling size standard, sampling and survey method etc.



■ 3. Major Findings

3.1 Relevance

- Short term evaluation results in view of establishing activity strategy are as follows.
 - ICT Training Center which is the result of the project has been utilized actively upon completion based on the political will of partner country.
 - Especially for Iraq, including the installation of IT dedicated department (DoIT, Department of IT, Information & Communication Department) under MOP, Ministry of Planning of KRG(Kurdish Regional Government) along with this project shall be considered as an exemplary case of ICT project in terms of producing sustainable outcome on developing an e-government in the future.

- It was planned to construct an IT Center so that public officers and residents of Arbil could be provided with computer, Information & Communication related education. Also, IT center was expected to be groundwork of an education institution where the best experts in IT fields not only for Arbil area but also for the northern area of Iraq and beyond were to be educated in the future.
- Since an IT dedicated department was planned to be installed systematically under the Prime Ministry Office of KRG as a result of teaching the importance of IT to Iraq during the process of excavating this project, it was expected to help Iraq significantly in developing the knowledge based economic system based on IT in future.

- Mid-term/Long-term evaluation results deriving from the strategy established at the planning phase are as follows.
 - ICT is a field which carries the role of Infrastructure in all public and industrial activities. The education and training of ICT were adopted and developed as a political means to enhance the administration efficiency for Iraq, and as a direct and indirect political means for economic development for Guatemala in national policy level.
 - As it was developed at a national policy level, the partner country could utilize it actively by producing trainees who completed the education and training upon constructing the Center and it still continues producing trainees.
 - For Iraq, it was included in the development strategy of e-government of KRG and "To reinforce ICT ability of public officers in order to improve the administration efficiency of the government" was carried as the most important task. DoIT, the subject of developing the e-government actively utilize ICT Center which is the first task of the e-government project.
 - For Guatemala, utilizing ICT was included in National Development Strategy as an important component and the Government actively invested in it. Operation and utilization of ICT Training Center is developed at the level of National Strategy contributing in enhancing the national prestige by cultivating it as a target of bench market of neighbor countries together with an employment effect through training IT industrial manpower.
 - It is recommended to develop the training by establishing Mid-term and

Long-term strategy for ICT Training Center itself in order to improve the operation outcome as ICT Training Center which complies with ICT policy of partner countries and continuously maintains the improved outcomes.

- When comparing 2011 to 2006, early time of this project based on PDM (Project Design Matrix, the tool to manage projects), it is evaluated that curriculum development and transferring the ICT technologies to operate ICT Training Center are properly formed and developed through supporting the latest equipments, dispatching experts and conducting invitational training of management staffs and teachers.
 - For Iraq, it was necessary to include plans for extension of centers to 3 states of KRG and progressive ICT ability enhancement of the whole public officers in Mid/Long term strategy of ICT Training Center after analyzing beneficiaries and detailed target level in advance in order to maximize the outcome of this ICT training Center. It is recommended to prepare PDM in the future because it provides opportunities to review these activities.
 - For Guatemala, target group, project purpose and output were modified in PDM 2.0 as a result of preliminary investigation. The e-Learning system which was added in PDM 2.0 target was evaluated that it needed a supplement considering Internet environment of Guatemala. Therefore, it is necessary to review preconditions and feasibility by examining indicators more in detail when the components are changed after preliminary investigation. It is recommended to present a proper preparation procedure, time and renew procedures of PDM in detail in KOICA project process and reinforce the education for drafters.

3.2 Effectiveness

- Effectiveness means the extent of output level which matches with the project target and was probed through literature study, interview and survey.
 - In order to measure quantitative outcome (Operation Outcome Index),

- number of students produced, size of operation manpower, number of curriculums and managerial components, etc, were collected.
- As for qualitative outcome, improvement of IT education Infrastructure, curriculum operation for IT expert, improvement of ability to carry IT based on practice and reducing information difference were surveyed.
 - Surveys and analyses contribution items for major evaluation targets of this project such as achievement level of project target, enterprise, students and teachers through above surveys.
- As a result of the evaluation for the achievement level of the project target, the measurement index of the project such as satisfaction of students, the satisfaction of enterprises and institutions where the students are registered, the employment rate or administration efficiency, the access rate to ICT Center, the number of students and teachers of ICT Training Center, the utilization rate of ICT Training Center, contents production rate for e-Learning were found to be very high in satisfaction from the data collected, interview and survey results.
- Through training ICT manpower, they contributed to job creation of the region to make a new social and economic energy by supplying IT manpower necessary in regional society and public fields (for Guatemala), and also contributed to enhancing administration ability by utilizing ICT in Government services (Iraq)
 - It is necessary to have tools like a Website to provide SNS service such as Facebook and Twitter to keep continuous information exchange between Student Management System, Administration Support System of operators, teachers and students in order to enhance the education effect for the students.
 - For Guatemala, when examining the details and contribution of the project activities to achieve the project target, achievement rate exceeded its target in most of measurement index though the training period was rather short.

- Short-term evaluation result shows as followings in terms of effectiveness.
 - For the ICT Training Center, it was evaluated to be outstanding in satisfaction and operation performance according to survey with teachers, students and graduates.
 - Advanced facilities, equipments and software were provided in order to enhance the effectiveness of ICT training Center and practical curriculums are given based on the ground.
- Mid/Long term evaluation results in terms of effectiveness are as follows. As a evaluation result for the graduates of the ICT Training Center, the mid-term outcome such as an increase of work efficiency and employment opportunity was identified.
 - However, there was a restriction for measuring the extent of target achievement because a detailed target was not set up through PDM in early time of the project.
 - An ability to plan mid/long-term vision, strategy and target of the Center by ICT Training Center itself annually and operate them strategically is still weak.
 - It is necessary to have a system to ensure the outcome in long-term base through continuous improvement by reflecting outcome results regularly.
 - It is recommended that the operation system shall be established such that the Center develops continuously by receiving the outcome results drawn from the target achievement index, fixed in the project PDM. The index is to be known to the Center side also.

3.3 Efficiency

- Efficiency means the level that an outcome which the project targeted is achieved with minimal resources. It has a purpose to evaluate whether the selection out of various alternatives including Output comparing to Input

was proper or not.

- Input plan was compared to output of this project through data collected, interviews and surveys; output section such as support of equipments and materials, invitational training, dispatch of experts and maintenance and input section such as project period and cost.
- In addition, feasibility of equipments on site, relevance of experts dispatched, relevance of manpower trained, usefulness of the project operation methods and the degree of execution of the project activity plan were probed.
- As a result of comparing input plan to its output of the project, distribution and execution of the budget by each project's activity were proved to be proper.
 - When adjustments between budget items like additional requests or balance occurrence according to bidding in the process of executing the budget are risen, the budget was adjusted and executed efficiently in order to enhance the completion of the project by, for example, upgrading equipments (CRT monitor was upgraded to LCD monitor for Iraq while PC memory components were upgraded for Guatemala) and dispatching construction experts by two times (Guatemala).
 - As a result of studying the feasibility of applying equipments and materials on site, it is outstanding to apply the latest specification for PC, network equipments and hardware, considering traffic in the future and processing capacity, etc.
 - For Guatemala, the software of e-Learning program (LMS) supported was not utilized on site due to language compatibility problem etc. It is recommended to consider using general LMS software allowing for the open platform in the future.
- When examining the relevance of the experts dispatched, we may evaluate that it is proper in terms that the experts dispatched provided sufficient education for installation of equipments and materials and overall operation in the field. However, it was difficult to expect the continuous effect of

the education under environment where most of trained people in partner countries have been changed after several years from the completion of the project.

- It is necessary to provide an apprenticeship education in parallel on the related documents and operation system such as an operation direction, manual, transferring procedure of operation manpower etc.
 - It is recommended to settle down the management system early including the utilization of the checklist for examining the operation situation regularly, create database with those information and train these systems in the apprenticeship education.
 - Not only securing competent manpower but also establishing a systematized management is significant in preparation to the expansion in the size and the role of the ICT training center from the national policy level.
- When evaluating the relevance of the trainees, it was evaluated to be proper in terms of utilization, for example, trainees expressed satisfaction for the result of invitational training.
- For Guatemala, as a result of interviewing 9 trainees, 3 were employed in ICT center while 6 moved to other occupations. In addition, trainees carried out key roles in management and operation of ICT training center; however, roles of the remained two people were changed from teaching to management.
 - It is recommended to reinforce the management of trainees by, for example, making work transfer, technology transfer or a certain period of work mandatory.
- When evaluating the usefulness of project carrying method, the project was efficiently carried out while project implementing agency carried an actual project through cooperation with the institution of partner countries and KOICA carried monitoring and management.
- project implementing agency needs to understand the consistency of the

national policy and the project from the viewpoint of the partner country and enhance the efficiency of the project by presenting the operation strategy more in detail in order to comply with the national policy.

- When evaluating the efficiency of management system of the project, it is necessary to operate an information center with which information exchange and sharing are available between concerned people by opening a Website in order to understand all progresses of the project at a glance as various communication means were used in monitoring and decision making system of the project.
- Short-term evaluation result in terms of the efficiency is as follows:
 - Since the project plan was carried out according to the procedures set and the Center was operated normally without a big change, it can be said as efficient in project operation aspect.
- Mid/Long-term evaluation result in terms of the efficiency is as follows:
 - ICT Training Center has a nature to adopt advanced facility and equipments. There were inevitable delays or budget changes due to change of high-tech technology environment in the project process, but they were properly adjusted in a way to enhance the degree of completion by upgrading equipments and materials and additional experts dispatched.

3.4 Impact

- Impact has a purpose to investigate whether the result of the project is reflected on national policy of the partner country or any possibility of systematic change, and shall be analyzed through literature reviews, interviews and surveys.
 - For Guatemala, as a direct ripple effect, it was examined that the cost for operation was to be secured systematically through education tax support. As for the indirect effect, a change of attitude from neighbor countries

- due to high quality ICT education, tendency of increase in remittance of people working in ICT sector abroad were observed.
- For Iraq, as an indirect ripple effect, the ICT center was included in the policy of e-government project of KRG
 - For Guatemala, a ripple effect of the project is seemed to be great considering the fact that a system to compensate the deficit in the operation with the tax exemption and education tax support to educational institutions.
 - ICT Training Center is becoming a standard model of producing industrial manpower by leading standards of ICT training center among the Caribbean countries because its excellence in adopting advanced equipments, materials and curriculums.
 - Short-term impact such as a direct change is as follows.
 - The project was evaluated to have an excellent ripple effect in regional society by obtaining a positive image such as producing excellent ICT experts
 - Mid/Long -term impact such as attitude, technology, knowledge and behavior change are as follows.
 - As a survey result of stakeholders, we could identify the recognition that the project shall have a great ripple effect in the whole industrial fields by the graduates from ICT Training center because the essential means for the development of an advanced society is the knowledge economy and the institution which produces ICT experts is the ICT Training Center.
 - For Iraq, ICT Training Center was designated as an unique institution to reinforce ICT ability in order to develop e-government in Blueprint Report of Electronic Government of KRG. Therefore it is expected to play a role as a representative model of KRG government for producing ICT manpower in the future.
 - ICT Training Center may include experts as targets to educate, who shall operate high-tech facilities which are weak fields in developing countries.
 - Since most of high-tech facilities include ICT technology, it is necessary to

form a cooperative system so that other projects such as building a hospital or a general education center project could utilize ICT Center as an education institution for necessary high-tech facilities.

- For this, it is necessary to include a wide demand analysis for regional society and a consideration of relation with other projects from the time of planning ICT Training Center.
- It is necessary to include the item like "Analysis of Regional Society's Demand" and "Understanding development situation other projects" in the phase of forming project framework.

3.5 Sustainability

- It has a purpose to evaluate maintenance and operation of ICT Training Center, and the evaluation result comes from the literature review, interviews and surveys observing the operation and maintenance system, technology, budget, etc.
- When evaluating operation and maintenance system, it can be said that the ICT center excellent management capability. With this, efficient operation and management status are maintained and recruiting teachers through a thorough selection process is systematically maintained as well.
 - It was presented that students' satisfaction to the teachers was excellent and a smooth communication between directors, managers and teachers was provided.
 - Operation and maintenance system of the Center is excellent by having a plan itself to extend the manpower for operation and maintenance and securing the budget accordingly.
- When evaluating operation and maintenance technology, the Center secures related technology by recruiting new technical manpower and educating existent operation manpower and adopting facilities and equipments for

which operation and maintenance are available and settles technical issues excellently through entering into agreements with related enterprises such as Microsoft in order to ensure continuous SW Update.

- When evaluating operation and maintenance budget, the operation independence of the Center is excellent by securing own budget of operation and maintenance of ICT Training Center and support from government level.



■ 4. Lessons and Proposals

4.1 Lessons

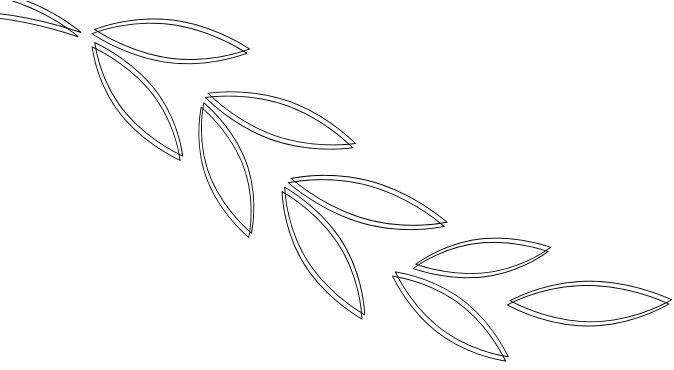
- Lessons shall be presented by each phase of policy, strategy, planning, execution and management based on the post-evaluation results of the project.
- Forming a department taking charge of ICT is the most important component for the project of building ICT Training Center. ICT dedicating department in the partner country became the factor to boost the achievement of outcome in all aspects such as policy consistency, effectiveness of target achievement, operation and manpower and sustainability through securing technology, etc.
- If PDM was developed with baseline data from the beginning; it would have been easier to measure the effectiveness using the measurement index.
- Education center management system (Education management, Administration management, Textbook management, Facility management, teacher management, student management, Graduates management and e-Learning center etc.) which may enhance the effectiveness of operation and maintenance of ICT Training Center needs to be established.
- Outcome of the project can be categorized into 3 levels: Micro Level, Meso Level and Macro level.

- Micro Level: It is desirable to maintain the latest software through cooperation with Microsoft and CISCO which are global enterprises, and to open classes for global certificate program which verifies ICT ability, such as classes for network expert qualification of CISCO, Microsoft ICT capability license, etc.
- Meso Level: It is recommended to establish a Mid/Long-term strategy of ICT Training Center itself in compliance with ICT utilization policy of the partner country in order to carry detailed vision, strategy, target and task, and implementing agency is also recommended to establish the Mid/Long-term strategy for ICT training center.
- Macro Level: It is necessary to materialize the long-term target such as improving administration ability of KRG, contributing to economic development and reducing digital divide, etc. It is reasonable to expect the improvement of administration ability and the knowledge-economy improvement in nation level according to construction of ICT Training center. It is necessary to present a long-term expectation so that the ICT Training Center could play a role as an excellent model and extend its positive effect to the private sector.

4.2 Proposals

- Opinions to be recommended for the project management system and its policy improvement are as follows.
 - It is recommended to adopt the project framework so that the project could consider the whole life cycle from the beginning.
 - The Project Framework, could itself be applied as a Ex-post-Evaluation Framework after modification.
 - It is recommended that they shall extend the scope of environment survey in a way to create physical and logical synergy effect between the said project and other projects such as supporting schools and hospitals
 - It is recommended to evaluate the efficiency exactly by comparing and

- selecting various alternatives including opinions for risk analysis.
- It is recommended to establish and present the Mid/Long-term Processing Strategy which complies with the goal of PDM from the beginning and establish a Mid/Long-term Development Strategy of ICT Training Center at the end of the project in order to combine it into the operation system.
 - It is recommended to adopt the education center management system from the phase of project planning in order to settle down early.



Outline and Background



II

Outline and Background



1. Purpose and Scope of Evaluation

1.1 Purpose of Evaluation

- The project was evaluated based on 5 major standards (added gender mainstreaming and environment impact level) of OECD/DAC such as relevance, effectiveness, efficiency, impact and sustainability and an improvement plan shall be presented in order to enhance the effectiveness of the project completed.
- The effectiveness of similar projects related to ICT education shall be enhanced referring to the outcome, lessons and strategy of this project evaluation.
- Awareness of nation toward KOICA projects which our Government develops as a member of OECD/DAC shall be increased through systematic and scientific evaluation and the transparency for projects shall be secured through sharing information of the evaluation.

1.2 Scope of Evaluation

- Evaluation for the establishment and operation situation of ICT training center
 - Evaluation for implementing methods and procedures such as project request, feasibility study, etc.
 - Examine and evaluate progress of the project and details step by step.

- Evaluate operation situation and follow-up system of the project.
- Evaluation of the ripple effect impacted directly or indirectly on the e-government policy of KRG in Iraq after building ICT Training Center in Arbil of Iraq.
 - Investigate the related organizations such as higher authority of ICT Training Center, NGOs and other donor countries.
 - Evaluate image of ICT Training Center in Arbil.
 - Evaluate ICT related policy of KRG in Iraq and roles of ICT Training Center.
- Evaluation of the ripple effect impacted directly or indirectly on national policy of Guatemala, Industrial environment and neighbor countries after the project of constructing ICT Training Center in Guatemala



■ 2. Limitations for evaluation planning

- The standard data to measure an effect of the project was not defined at the time of developing the project, and there was some limitation for measuring the impact, such as the ripple effect to the regional society because of safety problem etc.
- For Iraq, we focused on securing the outcome index and its evaluation process, and reliability and logicity of evaluation result through following activities in order to overcome such limits.
 - First, we obtained information prior to the field study through interviews with the representative of KOICA office in Arbil and other participants in the project and reflected it on developing questionnaires and interviews, and also referred them in measuring awareness and importance of the project.
 - Second, the quantitative data was analyzed by obtaining the latest information on the operation situation of ICT Training Center prior to the field study.

- Policy information such as e-government Development Strategy of DoIT and information for operation situation of ICT Training Center were additionally obtained at the time of survey on site.
- Third, when obtaining information of operation situation of ICT Training Center, aggregations and statistic data calculated mainly by Excel were collected. However, they were still insufficient for securing systematic and statistic analysis.
 - Thus, we obtained additional information which is more accurate and reliable through interviews with 5 FGI groups including policy making department, a director, managers, teachers and students of ICT Training Center and through survey questionnaires (total 74 persons answered) from managers(4), teachers(9), students(49) and graduates(12)
 - Fourth, for qualitative data, 5 FGI and questionnaires were analyzed.
 - We made a balance of the formation rate of participants with various types in the interview and survey. This is to have more reliable data and to draw the outcome of this project comprehending information above.
- For Guatemala, we focused on securing reliability and logicity of the outcome index and evaluation result through following activities for evaluation of ICT training Center project.
- First, we obtained information prior to the field study through discussion with the then representative of KOICA office in Guatemala, the then project manager, and the person in charge of the project in implementing agency and reflected it on developing questionnaires and interviews, and also referred them in measuring awareness and importance of the project.
 - Second, the quantitative data was analyzed by obtaining latest information for operation situation of INTECAP and ICT Training Center prior to the field study, and information for operation situation of INTECAP and ICT Training Center were additionally obtained at the time of the field study as of end of July 2011.
 - Third, when obtaining information of operation situation of ICT Training

Center, aggregations and statistic data calculated mainly by manual and Excel were used. However, they were still insufficient for securing systematic and statistic data analysis.

- Thus, we obtained additional information which is more accurate and reliable through interviews with 5 FGI groups including policy management(3), managers(6), teachers(12) and students(12), graduates & enterprises(9) of ICT Training Center and through questionnaire surveys(total 429 persons answered) from managers(17), teachers(20), students(171), graduates(190) and enterprises(30).

| Course | Target manpower of Survey | Sub Course Information |
|--|----------------------------------|--|
| ICT Business Technology | Office Courses: 20 | 1. Computer Repairer (long term course) |
| Data Base | Database Courses: 10 | 1. Admin of Data Bases (long term course) |
| S/W Development | Web Design Courses: 9 | 1. Junior Web Design (long term course) |
| Animation | 3D animation courses 12 | 1. 3D Animator (long term course) |
| Network Engineer | Networking courses: 20 | 1. Networks Administrator (long term course) |
| System Engineer | Application developer courses 16 | 1. JAVA Programmer(long term course) |
| System Engineer | Application developer courses 16 | 2. PHP Programmer(long term course) |
| System Engineer | Application developer courses 16 | 3. Visual Basic.net Programmer(long term course) |
| System Engineer | Application developer courses 16 | 4. Junior PHP Programmer(long term course) |
| KOICA Plan in 2008: 20 persons x 6 courses=120 persons x 4 times annual = Producing 480 Graduates a year | | |

- Fourth, for qualitative data, 5 FGI and questionnaires were analyzed.
- We made a balance of formation rate of participants by gender in the interview survey and the questionnaires so that more reliable data could be obtained.



3. Object of Evaluation

3.1 The project of establishing IT Training Center in Arbil of Iraq.

- Project Budget : 4.5 Million USD
- Project Period: 2 years (2006-2007) / Completion in 2009

3.2 The project of establishing ICT Training Center in Guatemala.

- Project Budget : 2.5 Million USD
- Project Period : 3 years (2006-2008) / Open in 2009



4. Evaluation Team

- Ex-post Evaluation Services
 - Ex-post Evaluation Service, PM(Project Manager) : Choi YoungHwan (Korea Information & Communication Technology)
 - Ex-post Evaluation Service, field study:
 - Iraq- Kim IlHwan, Director
 - Guatemala- Choi YoonGeun, director, Hwang WookTae, director (Korea Information & Communication Technology)
 - Ex-post Evaluation Service Support : Han EunWoo, Senior Engineer (Korea Information & Communication Technology), Kim CheolHo, Senior Engineer (Korea Information & Communication Technology)
 - Ex-post Evaluation Service, Quality Assurance: Ko JungHong, Director (Korea Information & Communication Technology))
- Ex-post Evaluation Service, Advisors
 - Kim HakMin, Professor (KyungHee University)
 - Park HeeJae, Professor (KyungHee University)



Methodology of Evaluation



Methodology of Evaluation



1. Evaluation Period

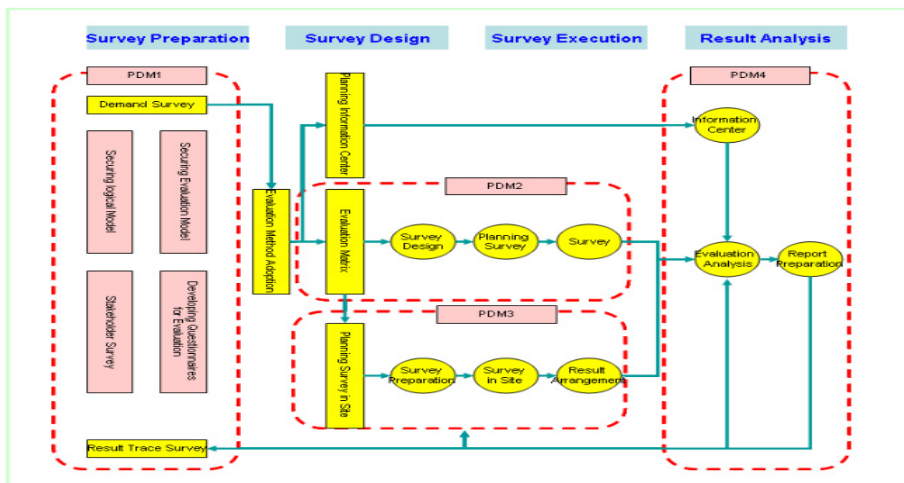
- Field study Period : June 2011. ~ Sept. 2011.
- Field study in Arbil of Iraq : July 2011. ~ July 2011.
- Field study in Guatemala : August 2011.~ August 2011.



2. Evaluation Method

2.1. Ex-post Evaluation Method

- The Ex-post Evaluation section of Development Cooperative Project Evaluation Guideline (KOICA, November 2011) was referred as methodologies.
 - Following "Ex-post Evaluation Framework" was induced as follows.



2.1.1 Major Activities of Ex-post Evaluation

| Phase | Description | Method | Components |
|--------------------------------------|--|---|--|
| Securing a logic Model | Check relation between project's activity and purpose, evaluation index by each phase> Establishing questionnaires and survey method | Logframe | Length: Goal, Outcome, Outputs, Activities(Inputs, Premise) Width: Evaluation Index, Basis, Restriction |
| Preliminary Survey | Local Survey: Literature Review, Interview >To establish sub-evaluation model and fix evaluation method | Questionnaire and Interview, preliminary survey on Site when necessary | Literature Survey: Important documents of the target to aid, other Aid-organ's documents Interview: Concerned persons of evaluation target, Concerned experts |
| Fixing Evaluation Model | A model which analyzed input, process, output, effect and impact based on evaluation standards | Logframe | Project Name, Beneficiary, Aid-receiving organization /Region, Version, date, Length 4* Width 4 Matrix |
| Questionnaires Development | To develop sub-evaluation questionnaires matching with evaluation target and situation. | MECE Method (Hierarchical Questionnaire Model) | Basic Question>Target's Feature, Evaluation time, Consideration of major items to evaluate>To develop sub-questionnaires by each evaluation standard. |
| Adopting Evaluation Methodology | To collect information and select survey method through which answers for each question shall be understood most efficiently | Data Collection, Observation, Survey, Interview and Group Discussion | To design data collection strategy and its method, analysis framework and report system. To describe evaluation methods including Access/Sufficiency/ Relevance |
| Preparing Evaluation Matrix | To prepare a table by associating evaluation questionnaires and methods. | Deductive Method, Research of Post-Change without control group, Triangulation Method | To select major 3 evaluation items considering evaluation time/target/ scope based on evaluation standards> To select methodology and conduct evaluation |
| Establishing Evaluation Plan in Site | To conduct an evaluation after reviewing frequency of survey 1 month before survey in site when survey is included. | Interview and Survey | To check person in charge of Aid-receiving organization, establish evaluation on site schedule, secure consent of Aid-receiving organization for evaluation method/means, check cooperative matter from Aid-receiving organization, check targets to interview/survey, Translator/Translation, Transportation, Experts, Safety and other trip procedure etc. |

| Phase | Description | Method | Components |
|-------------------------------|--|----------------------|--|
| Conducting Evaluation in Site | To prepare meeting minutes for major checking points, report evaluation result in site | Interview and survey | To prepare and report meeting minutes, visit records (photographs etc.) and summary evaluation result report. |
| Completing Evaluation | Evaluation Report | Evaluation Report | To prepare evaluation report(plan), Review evaluation report, fix and distribute evaluation report and Follow up |

2.1.2 Literature Review and Data Examination

- Following examination result was induced after reviewing major documents of the project.
 - Feasibility study result for the project, report of experts dispatched, end-of-project evaluation report, interview results were referred.
 - Ex-post evaluation report of other KOICA projects and of JICA were referred

| Survey Item | Major Documents of the project | Survey Result |
|---|----------------------------------|--|
| Who is IT policy maker of the completion evaluation report and why is invitational training necessary and what are details required for the training? | Internet | 08.3 Operators of ICT Training Center/Manager Training/Public officer Training |
| What are details of support for establishing e-government and developing IT industry in completion evaluation report? | Internet | 06~10.4 Input & Million USD for opening Eastern Emergency Hospital 09 Operation Consulting of Arbil Airport 09.11 Water Supply Extension Project of Arbil. |
| Were target of establishing ICT Center and operation plan developed according to a firm plan? | End-of-project Evaluation Report | The best regional ICT Training center Vision A Plan to adopt International Certified Curriculum. |

| Survey Item | Major Documents of the project | Survey Result |
|--|----------------------------------|--|
| Is the organization to operate ICT center and extension plan in future established? | End-of-project Evaluation Report | To establish Center Operation Strategy |
| Is a detailed target for the Mid/Long-term outcome established? | End-of-project Evaluation Report | Profit Creation Plan utilizing Center hall. To introduce to press as an exemplary IT Center |
| Is a plan for regular evaluation/ reflection for the Mid/Long-term outcome established? | End-of-project Evaluation Report | To open various courses suitable to education demand and present situation of producing graduates. |
| Are producing ICT manpower and reducing information difference in Iraq only for public officers? | End-of-project Evaluation Report | Target: Public officers/ University Teachers A Plan to extend to Residents |

- Line of sight techniques was introduced to supplement the index. Each index was finally determined passing through 5 Point Measurement Evaluation Process after inducing items of project purpose which may reach by short-term ,mid-term and long-term base.
- As a result of analyzing the similar project of JICA, characteristics such as standardization of framework in commencing phase of the project and considering software factors in developing phase of the project as important induced.
- As a result of obtained information from the interview with the related stakeholders, positive will of government, safety issue were obtained and reflected on the survey plan.
- Quality index, Utilization index and effect index were induced as follows by examining project purpose and its long-term ripple effect.

| Classification | | Investment Index(Input) | Quality Index (Output) | Utilization Index (Outcome) | Effect Index (Impact) |
|----------------|--------------|-------------------------|---|---|--|
| Duty Outcome | Duty | | | IT Utilization Duty/ Whole Duties Duty efficiency improvement contribution | Number of Graduates/Number of total public officers Lesson Deviation/By each public officer |
| Duty Outcome | Service | | Graduates Target/Result Lesson Satisfaction Target/Result Student Attracting Target/Result | | |
| Duty Outcome | Process | | Instructors Recruiting Plan/Result Process Development Plan /Result Process Demand Survey Plan/Result | | |
| IT Outcome | IT Manpower | IT Manpower Plan/Result | IT Manpower Education Plan/Result | | |
| IT Outcome | IT Infra | IT Infra Budget/Result | IT Infra Service Budget/Result IT Student Reception Scale/Result | | |
| IT Outcome | Other Assets | | | | |

2.2. Evaluation Matrix for the Iraq project

- Questionnaires for evaluation and survey method shall be established after identifying logic model, securing, priority between activity and purpose of the project and evaluation index.

2.2.1 Logical Framework (Plan)

| | | | |
|---|---|--|---|
| Project Name | Establishing IT Training Center in Arbil of Iraq | | |
| Beneficiary(Target Group) | Public Officers of KRG | | |
| Beneficial organ(Target Area) | IT Training Center in Arbil of Iraq | | |
| Version-Date | 001-20110614 | | |
| Target by Phase | Index | Basis | Restriction |
| Goal: Producing IT Manpower Reducing digital divide | Number of graduates of curriculum /Number of public officers | Process Operation Plan/Graduate situation Number of public officers in Arbil | Realization of Long-term production target Realization of Long-term Reduction target |
| Outcome: Securing IT ability Improving Administration ability | Rate of curriculum completion Rate of ICT utilizing Service | Process Completion Situation Survey result of ICT utilizing Service Rate | Quality of process completion condition Saving Service time/Enhancing Quality |
| Outputs: Improving ICT Training Infra. Operating curriculum of ICT Expert | Number of securing Infra Number of operating curriculum | Situation of Infra Establishment/ Operation Curriculum Situation of Early/Now | Infrastructure Operation Stability/Quality Process Demand Plan/Quality |
| Activities: 110 Kinds of HW, SW, A/V, Furniture etc. Invitational Training (29) Expert Dispatch (10) | 06~07, 2 years. Input 4.5 Million USD | End-of-project Evaluation et al. | Proposals: Capacity building/assessment Invitational Training of IT policy maker Establishment of e-Government Political Support for developing IT industry |

2.2.2 Fixing Evaluation Model

- Evaluation model was fixed by reflecting logical framework(Plan), short-term, mid-term and long-term index and result of the feasibility study, etc.

2.2.3 Fixing Evaluation Matrix

- Questionnaires were made considering viewpoints by each evaluation standard

associated with short-term, mid-term and long-term index induced from evaluation model, and sub-questionnaires were induced considering survey method by each questionnaire and field situation.

2.3 Evaluation Matrix for the Guatemala Project

- Logframe and evaluation matrix were prepared as follows.
 - The Logframe used different indices to reflect its characteristics by each project.
 - Evaluation indices in short-term, mid-term and long-term base were selected using Line of sight techniques. Questionnaires were made by 5 DAC standards and sub-questionnaires were made.



■ 3. Restrictions for Carrying out the Evaluation

- There was restrictions for examining the ripple effects toward the regional society because of safety problem.
- For Iraq, there were following situations and restrictions.
 - ICT Training center is located in Arbil of Iraq, and KRG government develops actively the e-government project through DoIT, an organization in charge of IT. DoIT considers improvement of IT administration ability of public officers as the most basic task in order to develop the e-government.
 - Thus, ICT education is targeting not only public officers of Arbil but also those of Dohuk and Sulaymania state, namely all public officers of KRG area.
 - KRG is comparatively a safe place out of Iraq area. There were some restrictions in meeting with the trainees in fields and surveying their ripple effect of the whole KRG area because of safety issues and limited survey period etc.

- For the quantitative data, the data concerning the situation were collected through visiting ICT Training Center and this was confirmed in the interviews with trainees.
 - There were some restrictions in securing various opinions through questionnaires or interview survey because the target of the survey has the same purpose (Improvement of IT administration) and business (Public officers).
 - ICT Training Center has an excellent management system through excellent administration manpower and teachers, but its management system is still insufficient that there was a restriction in securing the accumulated data through data warehouse etc.
 - Thus, outcome of the project was determined based on information, such as survey and interviews with teachers and trainees visiting ICT Training Center, data for developing e-government of KRG which was commissioned by PWC, a consulting organization of e-government in USA, and opinions from the consultant who knows well about the site, which seemed to be reliable.
- For Guatemala, there were following situations and restrictions.
- ICT Training Center is located in Zone 5 where the security is comparatively safe out of Guatemala City and INTECAP is located as well.
 - We made a balance of formation rate of participants by gender in the interview and the survey of teachers, students and graduates and outcome of the project was determined comprehending these various information.



General Situation of Iraq and Guatemala



IV

General Situation of Iraq and Guatemala



1. General Situation of Iraq

1.1 Outline of the target

- KRG was established in 2003 after Saddam power was collapsed and has focused on reconstruction after war and economic development. KRG is developing "Kurd Region Development Plan 2008-2011" connecting to National Development Plan of central Government of Iraq.
- Investment in IT field is planned in order to reinforce administration ability and prepare the basis of industrial development which are key development targets of "Kurd Region Development Plan"
- MoHAC, The Ministry of Human Aid and Cooperation of KRG requested KOICA to support for establishing ICT Training Center in order to reinforce the administration ability.
- According to following Evaluation Report of Reconstruction project of Iraq, Iraq is one of major cooperative country and is included in the 2nd support plan (2008-2010, 100 Million USD) as a part of Peace building support. In addition, the project of establishing ICT Training Center is included in the field of "Producing ICT Manpower" which is one of 3 major programs in Information & Communication field.

(Unit: 10,000USD)

| Year | Total | Education | Health | Administration | Rural Development | ICT | Industrial Energy | Environment and Others | Disaster Relief |
|------------|----------|-----------|---------|----------------|-------------------|---------|-------------------|------------------------|-----------------|
| '03 | 3,779.4 | 898.7 | 236.1 | 847.5 | - | 49.2 | 592.5 | 703.8 | 442.6 |
| '04 | 6,008.4 | 747.2 | 502.3 | 992.5 | 261.5 | 743.6 | 932.3 | 1,420.2 | 408.8 |
| '05 | 7,382.9 | 1,691.7 | 2,918.8 | 1,423.8 | 6.7 | 43.1 | 840.9 | 151.6 | 297.3 |
| '06 | 4,949.3 | 342.9 | 609.3 | 1,447.5 | 9.3 | 512.6 | 1,009.6 | 1,018.1 | - |
| '07 | 4,562.2 | 387.4 | 1,086 | 1,193.9 | 39.7 | 120.7 | 1,280.1 | 454.4 | - |
| Total | 26,673.2 | 4,067.9 | 5,352.5 | 5,914.2 | 317.2 | 1,469.2 | 4,655.4 | 2,748.1 | 1,148.7 |
| Occupation | 100% | 15.3% | 20.0% | 22.2% | 1.1% | 5.5% | 17.5% | 14.1% | 4.3% |

※ Source: "Evaluation Report of Reconstruction Project of Iraq", Result of the 1st phase and Direction of 2nd Reconstruction Project(KOICA, 2007.8, p16, p66)

- The project has a relation with developing a global partnership for development, the 8th target out of MDGs, and especially is associated with the sub-target No. 21 which is defined as "To enable the use of New Technology collaborated with private partner, especially the use of New technology in field of Communication".

1.2 Major Findings

1.2.1 Relevance

- It has a purpose to evaluate the technical relevance and policy consistency of the project. Policy consistency of KRG, compliance with necessity and priority of KRG, compliance with KOICA's Aid Policy were surveyed and analyzed on the basis of literature review, interview and survey.
- ICT education is mentioned as a task to improve administration ability for the e-government Plan established on 2010 out of Reconstruction Plan of KRG.
 - The roles of ICT Training Center is to reinforce ICT ability as a preferential

task to improve administration ability.

- After the interview with director of DoIT and check with the Website of www.krgit.org, the policy consistency was found to be excellence.
- KRG has set a target to reinforce the ICT ability of public officers and the target to set e-government matches with the master plan of ICT Training Center. ICT Training Center has a target to acquire ICT ability through qualification courses such as IT office ability and Network Management ability through entering into agreements with Microsoft and CISCO etc.
- ICT capacity is mentioned as the first initiative in the report of "IT Blueprint of KRG of Iraq" and the utilization of ICT Training Center is clearly specified in the first page.

1.2.2 Effectiveness

- Operation of Curriculum for ICT Experts
 - Opening the qualification Course to verify ICT ability: It was surveyed that IT Training Center was opening global qualification course which is operated by CISCO.
 - Satisfaction with various operation procedures: Operation procedures such as selecting students, recruiting teachers are said to be excellent in the interviews with teachers and students.
 - Those aforementioned operation procedures offers lessons when recruiting students: take for example, selecting procedures of students and recruiting procedures of excellent teachers include verifying the qualification of applicants.
- It is observed that the project improved ICT ability through education based on practice.
 - The curriculum is revised to teach the essential techniques which can

be applied right in the field and it is surveyed that the project pursues actual improvements of ICT ability reflecting the education outcome management on the curriculum and practice operation.

- It is surveyed that the satisfaction of student was excellent for opening courses that are very useful such as using OA, computers and printers.
- When evaluating the contribution to major targets of the project such as public sectors, trainees and trainers, it is examined that the contribution was excellent in that a chance to overcome the digital divide in Arbil was prepared by establishing ICT Training Center.
- It is necessary to have tools like a Website to provide SNS post service such as Facebook and Twitter to keep continuous information exchange between Student Management System, teachers and students which may provide a systematic service in terms of Pre-to-Post follow-ups for students.

1.2.3 Efficiency

- As a result of comparing the input plan to actual input, distribution and execution of the budget by each project activity was appeared to be proper as follows.
 - Number of air-conditioners was adjusted, after finding the difference between the budget and actual design drawing.
 - A new budget was assigned in order to enhance the outcome of the project for additional demand from KRG by replacing CRT monitors to LCD monitors,
 - It is judged that the project cost was efficiently executed in a way to enhance the degree of project completion by upgrading equipments and materials through adjusting the budget items under mutual discussion without changing the total contracted price.
- It is necessary to establish the master plan of ICT Training Center in detail

by understanding the compliance among master plan of reinforcing ICT ability, development of ICT Training Center and its operation strategy and KOICA's policy direction.

1.2.4 Impact

- It seems that the fact that 200 public officers trained a year has relatively low economic of scale when comparing to the input. Therefore, it is necessary to have a Education and Training Plan of public officers and regional society which should be connected to the e-government plan established already.
 - In addition, it is judged to have no adverse impact on regional society of KRG.
- From the interview and survey of trainers and trainees, it was identified that the ICT Training Center is well known to the regional society due to its high-tech facility.
 - In addition, ICT manpower is evaluated as excellent only with a work career in ICT Training Center.
- It was understood that there was an education improvement on the trainees due to the excellent educational environment, in the trainees' interview. In addition, as a result of curriculum analysis, it was seen that the global process was properly adopted in the curriculum.
 - It is expected to have a ripple effect which raises confidence for the education outcome and passion to be educated in ICT Training center between public officers of KRG.
 - Nevertheless the Center sets its education target as acquiring global qualification license and recruits trainees through pre-test, the number of applicants are on the increase. This indicates that there is a ripple effect according to excellent educational environment.

1.2.5 Sustainability

- Seen from the survey and interviews, directors and managers are well aware about the e-government plan of KRG and have a clear purpose for operating ICT Training Center.
 - It was surveyed that trainers and trainees have a sense of purpose and maintain the operation management system in good condition from planning, operation and evaluation of the courses.
- The center continuously secures applicable technology through producing manpower by additional recruits of technical manpower and education of operating manpower.
 - It was identified through survey and interviews that recruiting teachers and students are made systematically and efficiently.
- As a result of observation, the status of facility management was very good, and the maintenance status is also evaluated to be excellent. For example the air-conditioner in a conference room was added by securing the own budget in order for the large event.
- For management status of equipments, the Center keeps a good condition with nearly no break or damage though the equipment are installed more than 2 years ago.
- The center fully understands the problem of manpower and teachers change and considers to have an improvement action such as contract supplementation at the level of managers.

1.2.8 Other survey analyses

- From the interviews, managers had difference opinions for "Improvement of the part where an automation is needed such as monthly expense detail which describes a regular report in manual", "To respond such as

recruiting teachers and enlarging facility according to increase of students" while teachers and students had different opinions for "Improvement of curriculums".

- They are generally satisfied with facility and curriculums at the moment but students are expected be increased when recognizing the importance of the education in developing e-government of KRG.
- It is necessary to adopt an education management system which manages overall education in order to respond to expected increase of students systematically, and establishing Mid/Long-term strategy for the systematic improvement of curriculum and education schedule is needed.



■ 2. General Situation of Guatemala

2.1 Outline of Evaluation Target

- They felt a necessity of ICT Training Center to extend the professional education through regular Internet Forums between the countries of Central America, Panama and the Caribbean.
- They understand that establishing ICT Training center equipped with high-tech training facilities such as e-Learning brought a chance to lead the standards of not only Ministry of Technology but also ICT training centers of Central America and Caribbean countries; for example, Guatemala, Costa Rica (INA), El Salvador (UNSAFORP), Honduras(INATEC), Nicaragua(INFOP), Panama(INAFORP), Republic of Dominique(INFOTEP) and Haiti(INFP).
- Lots of enterprises and employees were expected to receive benefits through producing professional and competitive manpower who are in accordance with global standard.

- It is reality that universities and educational institutions of Guatemala don't satisfy the demand sufficiently while the demand for IT experts in educational and industrial fields was suddenly increased in recent years.
- Guatemala has developed the economic growth and reinforcement of National competitiveness through national infrastructure improvement by developing the system of "2005-2014 National System of Science, Technology and Innovation".
 - Especially, since "National Development Plan 2008-2011" stresses on professional education, improvement of National ICT Training Infrastructure and the effect of economic growth and reinforcement of National competitiveness are expected.
- Guatemala is one of focal cooperative countries of KOICA, and the project to evaluate belongs to IT and Education field out of 7 KOICA's major sectors.
 - Since the project complies with "Production of ICT Manpower" which is one of 3 major programs in Information & Communication field, it is judged to be in accordance with political priority of Aid-giving country.
- As Guatemala was one of focal cooperative countries; the scale of KOICA's cooperative project had been increased each year.
 - Aid volume during 1991-2010 is total of 24.694 Million USD (Average 1.23 Million USD yearly).
 - 16 projects were carried out; 6 professional training, 5 projects in IT, 2 health projects, 1 project of regional development and 2 projects in education.
- The Center was the first modern ICT Training Center in Guatemala City and has operated 6 major curriculums including Web-design by classifying short-term (20-60 hours) and long-term (480 hours) since opened in March 2009.
 - According to the feasibility study on the education demand by INTECAP, various curriculums including Web-design, Database and Application, Office automation, 3D animation, e-Learning, Network, Innovation management and English have been opened (788 lessons in 2009, 1,098 lessons in

- 2010, 568 lessons till July in 2011).
- Students are increasing continuously by more than 10,000 students yearly and number of graduates is still increasing gradually by educating government officers, citizens and students(9,943 graduates in 2008, 12,329 graduates in 2010 and 7,465 graduates till end of July in 2011).
 - Digital divide is being reduced by offering open-typed curriculums regardless of region, age, gender, religion and position combined with the distance learning in remote areas. (3,170 lessons in 2009, 1,798 lessons in 2010, and 1,662 lessons till end of July in 2011)
 - The center operates the administration management and related curriculum under the management of INTECAP of Guatemala. (10 managers including director and 54 teachers)

2.2 Major Findings

2.2.1 Relevance

- When investigating policy consistency of the recipient, Guatemala has established "Vamos Guatemala(Comprehensive Master Plan of National Development) in August 2004, which is a basic policy of national development strategy and focuses on the development of the "Stability of Economy and Society" while intending to achieve the Millennium Development Goals (MDG).
- For some equipments and materials (software for e-Learning), supply of software which meet the global trends to open between platforms was insufficient and this point shall be referred to similar projects in the future.
- The center agreed to establish a system which may produce the contents to teach e-Learning program complying with the purpose of ICT Training

Center except the video conference system because the "Video Conference System" which Guatemala Government requested didn't match with its purpose and target as a result of the feasibility study.

- It was surveyed that the open-typed e-Learning system should have been recommended from the beginning considering regional environment of information & communication.
- It was surveyed that they should have considered professional knowledge for external global e-Learning system, situation of Wire and Wireless Information & Communication infrastructure between local regions in Guatemala and open-typed equipments and materials comprehensively.

2.2.2 Efficiency

- When investigating the relevance of professional manpower dispatched to the site, this was proper in that they provided sufficient apprenticeship training for installation and overall operation management in the site.
 - It is difficult to expect the continuous effect of training because most of people in the recipient part who participated in the training changed their position after several years from completion of the project.
 - It is necessary to combine the alternative plan for transferring of trainees in written form of the operation guideline and manual etc.
- It is judged that there have been some difficulties in communication because of language problem of technical manpower when transferring the technology, through interviews with teachers. It is necessary to display and utilize the check list to check the operation situation regularly and adopt Training Management Information System including apprenticeship training so that the operation system could be settled in early time.
- Curriculums are continuously developed in order to match them with international standards.

- The center is focusing on enhancing the efficiency of general project management including self conformity against problems other than prescribed courses so that a long term service could be possible.
- However, it was surveyed that a better treatment for teachers and a regular information exchange with local regions should be provided in order to improve the quality of labor market.

2.2.3 Effectiveness

- As a result of evaluation for achievement level of project target (Purpose), the measurement index of the project such as satisfaction of students, satisfaction of enterprises and institutions where the students are belonged, employment rate or administration efficiency, access rate to ICT Center, scale of students and teachers of ICT Training Center, utilization rate of ICT Training Center, contents production rate for e-Learning were proved to be very high in satisfaction and index(2009~July 2011) through the data for 27 months, interview and surveys.
- When investigating the contents of the project input and activities, the achievement rate was proved to exceed the target in most of measurement indices.
- When evaluating the contribution to target groups of this project such as enterprises, students and teachers, strong positive answers were expressed in the interviews in that a chance to overcome the knowledge-economy deficit in the society of Guatemala by establishing ICT Training Center. Also the answer included the opinion that the center contributed a lot to creating new jobs in regional society by providing a new economic energy by supplying IT manpower which society in Guatemala needs a lot now.

- It is necessary to equip with tools like a Website to provide SNS service such as Facebook and Twitter in order to keep continuous information exchange between Student Management System, Administration Support System of operators, teachers and students in order to enhance the education effect for the students.
- The center is an education institution which is a perfect place for offering preparation course for obtaining international qualification and discovering capable persons. The center also has an advantage to complete the premium curriculum at low cost and is recognized as an open education institution where anybody may participate regardless of age, gender and physical impairment. It was evaluated that opening evening classes for applicants not able to take classes in the day time and holiday classes are effective in discovering more capable persons and satisfying diverse student's needs.

2.2.4 Impact

- Korea-Guatemala ICT Training Center is operated by the tax which is imposed on private enterprises in Guatemala and the tuition from students. A significant level of operation know-how of education center and systematic internal management system established are verified that the potential self-development of ICT Training Center is very high.
- The position was identified as an international institution to produce professional manpower and an institution which leads standards of ICT Training Center between Caribbean Sea countries of Central America.
 - Students applying the education are increasing because of the excellent facilities and courses while other states are requesting to establish similar centers.
 - They understand that establishing ICT Training center equipped with

high-tech training facilities such as e-Learning brought a chance to lead the standards of not only Ministry of Technology but also ICT training centers of Central America and Caribbean countries; for example, Guatemala, Costa Rica (INA), El Salvador (UNSAFORP), Honduras (INATEC), Nicaragua (INFOP), Panama(INAFORP), Republic of Dominique(INFOTEP) and Haiti(INFP).

- Neighbor countries acknowledge that lots of enterprises and employees shall have benefits from producing professional and competitive manpower who are in compliance with global standards through courses to obtain professional qualification from Microsoft and CISCO etc.
- Registration request from many groups or communities are increasing because improved service ability was recognized with its excellence of curriculums, and direct outcomes are obtained reflecting the education results on the employment. Take for example; teachers are actively introducing students to enterprises.
- In addition, in light that anybody may participate in e-Learning regardless of age, gender and physical impairment, it is expected to contribute to reducing the knowledge-economy deficit which is actually a long-term based target.
- Considering the directions of outcomes at the moment, it is judged that the impact of transferring technology to various classes shall be enhanced by providing more professional premium and various curriculums.

2.2.5 Sustainability

- When evaluating operation and maintenance system, the satisfaction of teachers is high due to a thorough selection process and systematic operation management. They also keep lesson atmospheres of smooth communication between managers, teachers and students. It is judged that operation and maintenance system are stable as well.

- When evaluating operation and maintenance technology, the Center secures related technology by recruiting new technical manpower and educating existent operation manpower and adopts facilities and equipments for which operation and maintenance are available on site. Also the center settles technical issues excellently through entering into agreements with related enterprises such as Microsoft in order to ensure continuous software Update.
- When evaluating operation and maintenance budget, the operation independence of the Center is excellent by securing own budget of operation and maintenance of ICT Training Center and support from government level together with regular expenditure of operation cost each month.
- When evaluating the situation of operation and maintenance, it is judged that facility and equipments management status are good. If some components of equipments and materials are smoothly procured, it would not be a big problem for maintenance of equipments and materials because the center has an excellent technology and maintenance ability for PC and networks etc.
- However, it is necessary for the center to have a management tool such as an education center management system to respond to job changes and operation service.
- The center is known for as the first institution when people are saying about employment and education. Also, the center operates popular lessons including computer repair courses and putting lots of effort to provide the skill after surveying the industrial demand. However, it requires a proper action for better treatment for teachers and maintenance for equipments in order to keep the education level continuously.



Evaluation Result



Evaluation Result



1. Evaluation of Relevance

- Short-term evaluation result including establishment of activity strategy are as follows.
 - It is evaluated that through the feasibility study the selection project activities were properly developed based on the political will of Arbil, even though the project request in 2005 for this project was made even before the establishment of the strategy of e-government of KRG (2010)
 - It is evaluated that through the feasibility study the selection project activities were properly developed based on the accumulated knowledge and experience of many projects with Guatemala since 1991 even though the project request was made before the establishment of CAS (Country Assistant Strategy) of Guatemala (2008).
- Mid/Long-term evaluation results are as follows including efficiency of strategy in planning phase.
 - When comparing the initial stage of the project in 2006 to now, it is evaluated that the direction of the strategy which pursued technology transfer including curriculum development and operation technology through support of latest equipments and material, dispatching experts by each field and invitation of managers, teachers and students are properly provided.
 - There were insufficient indices for ICT Training center to examine the achievement of the goal.
 - For Iraq, the political consistency for operating ICT Training Center to produce

IT manpower at the level of KRG Government was identified. However, it is not possible to judge the policy compliance because a detailed Mid/Long-term strategy of ICT Training Center which complies with government policy is not established.



■ 2. Evaluation of Effectiveness

- Short-term evaluation results including the achievement of output are as follows
 - As a result of survey for measurement indices including satisfaction of students and graduates, it is evaluated that the target is properly achieved.
 - It is evaluated that the target is achieved very effectively based on measurement indices including satisfaction of students, graduates and enterprises and utility rate of ICT Training Center.
 - For the measurement indices of similar projects in the future, it is necessary to develop the project by setting the baseline on the basis of PDM from the beginning.
- Mid/Long-term evaluation results including achievement of output are as follows.
 - When considers the scale of students and teachers of ICT Training Center, operation of global curriculums and enhancing IT ability according to the government's strategy etc, are evaluated that the long-term based target is achieved very effectively in terms of reducing the digital divide.
 - It is evaluated that major groups of this project such as government department, enterprises, students and teachers are very excellent in that they prepared a chance to overcome the digital divide by establishing ICT Training Center.

- Thus, the project is evaluated to have a high value to contribute to reinforce the national competitiveness by producing IT manpower necessary for establishing e-government and National Industrial Development.
- It is necessary to prepare a student management system which may provide a systematic service to students in terms of pre-to-post follow-up.
 - It is necessary to have tools like a Website to provide SNS service such as Facebook and Twitter to keep continuous information exchange between Students and teachers.
 - It is necessary to maintain continuously the effectiveness in long-term base by establishing an education management system.



■ 3. Evaluation of Efficiency

- Short-term evaluation results including output comparing to input are as follows. There were some modifications for delay of construction and interim budget allocation etc according to details of input and output.
 - Since the results were induced according to the plan as prescribed procedures and the results are operated normally without a big change, the project is evaluated to have achieved the target efficiently.
- Mid/Long-term evaluation result including maintenance output comparing to input and alternatives are as follows. Buildings, equipments and material, invitational training, dispatching experts and maintenance are evaluated to have been provided effectively.
 - Most of equipments and materials including PC and network equipments are evaluated to have been utilized efficiently according to reflection of the local situation and the local demand forecasted in the future.
 - Thus, it requires a selective alternative equipped with an openness and

extension at the time of project planning and design, and the risk control items are necessary when analyzing value realization of the project activity, namely analyzing the utility.

- For LMS, it requires a selective alternative equipped with an openness and extension.
- When considers the construction delay due to permits & approval problem since 2007 and serious shrinks of socio-economy of Guatemala including destruction of social infrastructure because of a global recess in 2009 and natural disaster in 2010, the risk control is necessary when analyzing value realization of the project activity, namely when analyzing the utility. It also needs to select an alternative to compare several alternatives by applying opinions such as risk analysis for similar projects in the future.
- For similar projects in the future, it shall need to select an alternative after comparing several alternatives including provision of management system by applying opinions of risk analysis based on PDM.



■ 4. Evaluation of Impact

- Short-term evaluation results including directing change are as follows.
 - As ICT Training Center was utilized as a venue of events of other donor agencies and NGO, the image of KOICA was enhanced.
 - An impact of the project is seemed to be great considering the fact that they induced a system to compensate the deficit in the operation through tax exemption and education tax support to educational institutions such as ICT Training Center for Guatemala.
 - An impact of the project is seemed to be great by securing a positive image, take for example, when thinking of a high technology, people firstly think of the ICT Training Center in regional society. Especially for

Guatemala, it is excellent in terms of absolute number of students under education.

- Mid/Long-term evaluation results such as attitude, technology and changes of behaviors are as follows.
 - For Iraq, it is evaluated that the role of ICT Training center is recognized as important at the level of government for development strategy of e-government of KRG.
 - For Iraq, ICT Training Center was designated as an unique institution to reinforce IT ability in order to develop e-government in the Blueprint Report of e-government of KRG. Therefore it is expected to play a role as a representative model of KRG government to produce IT manpower in the future.
 - Neighbor countries acknowledge that lots of enterprises and employees shall have benefits from ICT training center producing professional and competitive manpower who are in compliance with global standards.
- Because of frequent job changes of managers and teachers in 2009 and 2010, the career of teachers and managers who work in ICT Training Center is mostly 1~2 years.
 - However, this means that the career in the ICT Training Center is being acknowledged in the society.
 - Thus, we may see that the ICT Training Center plays a role of a school producing IT teachers, managers and experts in the society and is expected to bring a ripple effect of enhancing the IT level of the regional society in Mid/Long-term basis.



5. Evaluation of Sustainability

- Facility and equipment management and maintenance possibility in terms of Mid/Long-term base are evaluated.
 - The center carries operation and maintenance of equipments and materials through securing teachers and operators including managers.
 - We may see that components of equipments and consumables for education are smoothly procured through monthly regular expenditure list of operation cost. The center also keeps the latest versions for software through agreements with global enterprises like MS and CISCO etc. As a result of survey and interviews, it is judged that technology and maintenance ability of teachers for PC and network equipments are excellent.
- However, it is necessary for the ICT Training Center to increase stability through establishing Education Management System for systematic response for job changes and continuous operation service management in terms of Operation Service.



6. Evaluation of Gender Mainstreaming

- Evaluation results for Woman's participation are as follows.
 - For students of the ICT Training Center, curriculums are open to anybody regardless of religion, gender, race, social position and etc.
 - From the interviews, survey, data research, opinion of consultant on site, participation of woman is a natural social phenomenon in Arbil autonomous region of Iraq.
 - For students of the ICT Training Center, the impact and effectiveness are

evaluated to be very positive in that woman's entry into the society such as professional job or small business is gradually active each year. However, it is necessary to have a systematic improvement for woman's participation because there are little woman teachers.

- Mid/Long-term evaluation results including gender equality recognition are as follows.
 - It is evaluated that the impact and effectiveness for gender equality is being raised to positive direction in that more women have education which used to be given to men; number of graduates is getting bigger each year; number of women CEOs in Web design, 3D animation, office automation related professional jobs or own small business is continuously getting bigger.



■ 7. Environment Consideration

- Short-term evaluation results including green environment are as follows:
 - For Iraq, the environment of the ICT Training Center was not considered when the project was planned. As a result of observing operation and management status, the center always power off the air-conditioner when completing the use of the class room.
 - For Guatemala, the building of ICT Training Center was designed for environment friendly considering space utilization, energy efficiency and disabled persons. Especially, the fact that the building has awarded grand prix of good design of public architecture in 2011 shall be referred in other projects in the future.
- Mid/Long-term evaluation result considering environment are as follows.
 - For Iraq, ICT Training Center doesn't particularly consider environment.

Thus, it is recommended to hold or participate in seminars or forums for environment regularly each year. Then it is judged that students who shall lead public sectors in the future shall be able to take a leading role in supplying and expanding IT technology considering environment in Mid/long-term base.

- For Guatemala, concerned persons of INTECAP and ICT training Center hold or participate in DLINK, a green seminar and forums for researching the environment friendly technology and its distribution through low power, high efficiency technology and methods each year.



Conclusion and Proposals



VI

Conclusion and Proposals



- 1. Strengths and matters to be improved
 - Through training ICT manpower, they may bring a chance to overcome the digital divide of the society and also contribute to job creation of the region to make a new social and economic energy by supplying IT manpower necessary in regional society and public fields, and also contributes to enhancing administration ability by utilizing ICT Training Center.
 - One of major factors of successful ICT Training Center is the fact that it is a high-tech IT education institution necessary for reinforcing IT ability which developing countries need and may play a role of exemplary model for various fields including IT technology in terms of IT utilization.
 - The impact and effectiveness of ICT Training Center are very positive in that all curriculums of ICT center are open to everyone regardless of religion, gender, race and social position and are operated continuously each year and qualified people are produced through global qualification process, which becomes a motivation for all targets of education.

1.2 Strengths in terms of strategy in future.

- The project of ICT Training center may create a synergy effect combining facilities which contain components of IT technology in other projects of supporting schools and hospitals.

1.3 Improvements needed when planning in the future.

- It is necessary to improve manual by supplementing existing project management and evaluation procedures as follows.
 - It is ideal to establish a evaluation plan in the beginning and monitor by it.
 - At present, the evaluation office in KOICA is in the process of developing the result-based model and puts emphasis on project monitoring and evaluation.
- If a project execution framework is developed by setting baseline indices at the time of undertaking the project, it will be much easier to establish a detailed target and evaluate the project by utilizing the measurement indices such as satisfaction of graduates and public sectors where graduates are assigned, utility rate of ICT Training Center etc.
- Most of equipments including PC and network equipments could be utilized efficiently for several years if designed considering fixed traffic and reception capacity according to reflection of the local situation and the demand forecasted in the future.
- It is recommended for the project of ICT Training Center to be designed and constructed in an environment friendly way considering the space utilization, energy efficiency and disabled persons. Also, activity plans like education or seminars related to environment issue are a way of increasing awareness toward the environment issues.

1.4 Matters to be improved in future projects.

- It is necessary to have a risk control item when analyzing value realization, namely analyzing the usefulness. For similar projects in the future, it is possible to evaluate the effectiveness of each alternative exactly by comparing the chosen one to the another risk factors.
- Maintenance period shall be calculated considering the time required for order placement of latest equipments and materials, contract, transportation, delivery to warehouse, installation and commissioning and completion period of the building etc. The opportunity cost shall be occurred when delaying delivery, which also affects on maintenance period.
- It is desirable to select foreign products or global software and process which are excellent for openness and extension rather than opt for Korean products for more choices.
- It is necessary to utilize the management tool such as education center management system based on operation service in order to maintain ICT Training Center effectively and efficiently.
- It is necessary to have tools like a Website to provide SNS service such as Facebook and Twitter to keep continuous information exchange between Student Management System, Administration Support System of operators, teachers and students in order to enhance the education effect for the students.
- Outcome opinions sorted in 3 levels, Micro, Meso and Macro Level could be proposed as follows.
 - Evaluation by Micro Level: It is desirable to maintain the latest software through cooperation with Microsoft and CISCO which are global enterprises in information and communication field, and an operation of verified global qualification process such as the qualification process of ICT ability

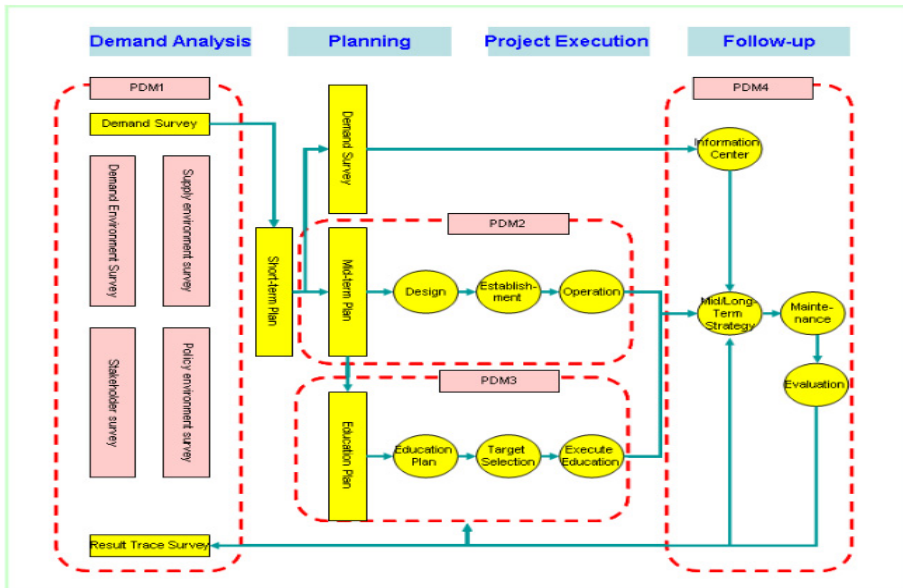
- qualification process of Microsoft and network expert qualification process of CISCO is recommended.
- Evaluation by Meso Level: It is necessary to refer the points that reinforcing IT ability and the important roles in the national strategy from the government level. It is necessary to have ICT Training center which complies with developing strategy of e-government.
 - Evaluation by Macro Level: It is necessary to refer the points that it intends to reduce the digital divide, expects national competitiveness through reinforcing IT ability, and expects to play an excellent roles as exemplary model.
- The following key points are based on the interview and surveys with concerned people of ICT Training center and are suggested reflecting the changes of external environment in order to use them as lessons for similar projects in the future.
- First, The ICT training center is a model of an excellent education institution for developing e-government of KRG and to make it as a model KRG has paid continuous attention in compliance with national policy to produce IT manpower.
 - Second, The Center has maintained excellent facilities and equipments to be recognized as high-tech even after 2-3 years from the installation.
 - Third, the Center could have presented roles and targets of ICT Training center more in detail if monitored continuously from the phase of beginning in line with PDM.



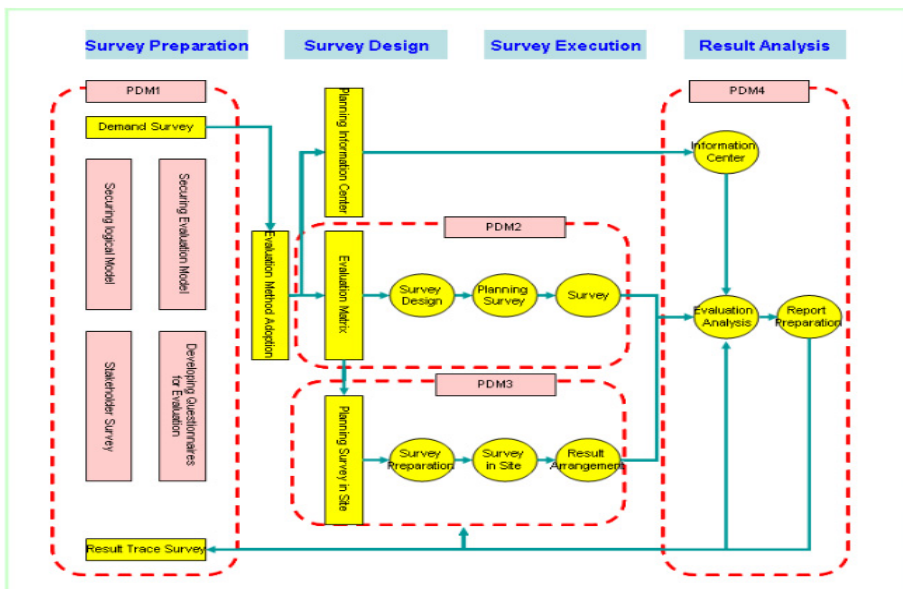
2. Policy Proposal

- The following are recommended for the improvement of the project design and implementation:
- It is recommended to adopt following project framework so that it could

be a project considering the whole life cycle from the beginning.



- Project framework could be modified and applied to Post-Evaluation (Survey preparation: Preliminary Analysis)



| Phase | Description | Method | Components |
|--|--|---|---|
| Securing a logic Model | Check relation between project's activity and purpose, evaluation index by each phase> Establishing questionnaires and survey method | Logframe (Logical Framework) | Length: Goal, Outcome, Outputs, Activities(Inputs, Premise) Width: Evaluation Index, Basis, Restriction |
| Preliminary Survey | Local Survey: Literature Review, Interview >To establish sub-evaluation model and fix evaluation method | Questionnaire and Interview, preliminary survey in Site when necessary | Literature Survey: Important documents on the target group, other policy documents Interview: Concerned persons of evaluation target, Concerned experts |
| Fixing Evaluation Model | A model which analyzed input, process, output, effect and impact based on evaluation standards | Logframe | Project Name, Beneficiary, Aid Receiving Organ/Region, Version, date, Length 4* Width 4 Matrix |
| Questionnaire Development | To develop sub-evaluation questionnaires matching with evaluation target and situation. | MECE Method (Hierarchical Questionnaire Model) | Basic Question>Target's Feature, Evaluation time, Consideration of major items to evaluate>To develop sub-questionnaires by each evaluation standard. |
| Adopting Evaluation Methodology | To collect information and select survey method through which answers for each question shall be understood most efficiently | Data Collection, Observation, Survey, Interview and Group Discussion | To design data collection strategy and the method, analysis framework and report system. To describe evaluation methods including Access/Sufficiency/Relevance |
| Preparing Evaluation Matrix | To prepare a table by associating evaluation questionnaires and methods. | Deductive Method, Research of Post-Change without control group, Triangulation Method | To select major 3 evaluation items of evaluation time/target/scope based on evaluation standards> To select methodology and conduct evaluation |
| Establishing Evaluation Plan for the field study | To conduct an evaluation after reviewing frequency of survey 1 month before the field study when survey is necessary. | Interview and Survey | To check person in charge of the recipient organization, establish evaluation schedule, secure consent from the recipient organization for evaluation method/means, check targets to interview/survey, Translator, Transportation, Experts, Safety and other procedure etc. |

| Phase | Description | Method | Components |
|-------------------------------|--|----------------------|---|
| Conducting Evaluation on site | To prepare meeting minutes for major checking points, report evaluation result in site | Interview and survey | To prepare and report meeting minutes, visit records (photographs etc.) and summary evaluation result report. |
| Completing Evaluation | Evaluation Report | Evaluation Report | To prepare evaluation report(plan), Review, fix and distribute evaluation report and Follow up |

- It is recommended to conduct extended supply environment survey in a way to create physical and logical synergy effect between the project under evaluation and other projects of supporting schools and hospitals.
- It is recommended to evaluate the efficiency exactly by comparing and selecting various alternatives including risk analysis such as the estimated risk index for similar projects in the future.
- It is recommended to establish and present the Mid/Long-term Processing Strategy which complies with the goal of PDM from the beginning and establish a Mid/Long-term Development Strategy of ICT Training Center itself in the operation system at the phase of completion of the project.
- It is recommended to adopt the education center management system(Education Management, Administration Management, Textbook Management, Facility Management, Teacher Management, Student management, Graduates Management, e-Learning center etc.) from the project planning for early settlement of ICT Training Center and prevention of follow-up degradation.

□ Essential points for the project are recommended as follows.

| Development Procedure | Essential Points | Points to be improved |
|--------------------------------------|---|--|
| Project Excavation (Need assessment) | Prevent from overlapping surveys Secure possibility to connect with following projects in advance. | informing to the recipient organization is necessary |
| Preliminary Feasibility Study | Transfer the result of feasibility study to contractor exactly | |

| Development Procedure | Essential Points | Points to be improved |
|--------------------------|--|--|
| Project Execution | Make a PDM mandatory activity when establishing the project execution Plan. | Needs to set a baseline of outcome index |
| Evaluation and Follow Up | Feedback Timely following the execution phase of Preliminary, Interim, completion and Post-Evaluation. | Evaluate by Outcome index (Preliminary, Interim, Completion and Post-Evaluation) |

- When having no choice but to measure project outcome and prepare PDM at the same time, it is necessary to make measurement indices by the process of developing measurement indices, designing the measurement method and finally taking the measurement.
 - For measurement methods, related data research, field survey, direct experience, experiment, survey, interview, bench marking and Delphi analysis shall be sorted and designated and the cycle of report collection, form of report and delivery system of report shall be specified in order to obtain the accuracy and reliability.
 - When measuring, the difference between the beginning stage of the project and the current situation must be calculated after understanding well of both situations. In addition, for the target group, the difference between users and non-users shall be well calculated.
- When developing the project to establish ICT Training Center in the future, the measurement index shall be considered from the stage of planning through PDM.
 - Measurement indices shall be sorted out according to the types such as a single casual relationship, Co-relationship, non-relationship, indirect relationship and complex relationship etc.
 - It is possible to define types of relationship in a way that indirect relationship for satisfaction between the project and students, complex relationship of satisfactions of enterprises where graduates are employed, complex relationship

of employment rate and access rate to ICT sectors, complex relationship between students and teachers of the ICT Training center, single casual relationship of utility rates of ICT Training Center, and single casual relationship of contents production rates for e-Learning etc.

- When setting the measurement index, the standards for setting the baseline, detail of collection method, size of the sample and its cycle should be prepared.
- When analyzing the value realization according to measurements, it is recommended to carry inducement of risk factors, forming a risk analysis team, analyzing the possibility of risk occurrence, its impact and analyzing the value realization yearly etc.
- For the project of establishing ICT Training center, natural disaster, increase of social instability according to political power change etc could be additionally considered as well as technology and quality, users, leadership and rigidity of organization as risk factors.

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