Final Evaluation Report on the "International Diagnostic Imaging Course for Radiologists and Radiology Technicians in Central America and the Caribbean"

February 2010

Japan International Cooperation Agency

Dominican Republic

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PREFACE

The Japan International Cooperation Agency realized the final evaluation study on "International Diagnostic Imaging Course for Radiologists and Radiology Technicians in Central America and the Caribbean" during the term between November and December in 2009.

I hope that the report will be helpful for the doctors and radiologists in Central America and the Caribbean, and the Project promotes to strengthen the good relation among the participated countries.

Finally, I would like to extend my gratitude to all the related persons who gave to us their collaboration and support for the counties concerned.

Santo Domingo, February 2010

Tadashi Ikeshiro
Director
Japan Internacional Cooperation Agency (JICA)
in Dominican Republic

SUMMARY (English)

1.GENERAL DESCRIPTION OF THE PROJECT		
Name of the Country: Dominican Republic		Title of Project: International Diagnostic Imaging *Course for Radiologists and Radiology Technicians in* Central America and the Caribbean
Sector : Health		Type of Cooperation: Technical Cooperation Project
Responsible Agency: JICA Dominican Republic Office		Amount of Cooperation (accumulated amount until the Project Final Evaluation): ¥ 142 million
Period of Coopera-tion	(By Record of Discussion) : 2005.9.8～2010.3.31	Local related agencies: Ministry of Public Health and Social Asistance of State (SESPAS) and Dominican Japanese friendship Center of Medical Education (CEMADOJA)
	(Extension):	Japanese collaborating agency: Oita University
	(Follow Up) :	Other cooperation scheme: None
	(Exchange of Notes) for Grant Aid	

1-1 Background and Profile of the Cooperation

Considering the lack of development in the field of medicine and public health induces various impediments for meeting the needs of the majority in the Dominican Republic, Dominican Ministry of Public Health officially requested to the government of Japan for constructing the new center for medical education by Grand Aid within the Luis Aybar General Hospital (currently called the Luis Aybar Health and Hygiene City). In addition, it was also mentioned that there was the needs of providing the training courses for the experts in Imaginology and Epidemiology.

Consequently, in 1999, Dominican Japanese friendship Center of Medical Education (CEMADOJA) was constructed and the medical education projects had started in same year for the period of 5 years. In the project, the emphasis was on the provision of equipment for completing its facility as well as the training courses for the local medical doctors and technologists for achieving the technology transfer. As the result, the center had become one of the highly evaluated medical educational institutions in the country.

In March 2004, the project was finished with the recognition of success by the final evaluation. In the response to its success, the Dominican government requested further technical cooperation in executing the training programs for medical experts within the country as well as for her neighboring countries.

After revising the proposals, evaluation of the capacity of CEMADOJA as a training institute was conducted by the local consultant as indicated by the previous evaluation. In addition, CEMAJOJA-JICA joint mission was dispatched to the five countries in the Central America (such as Honduras, Panama, El Salvador, Guatemala and Nicaragua) to investigate needs for trainings for such fields.

The result shows that the further technical cooperation was necessary. In these targeted countries, the knowledge and skills of Radiologists and Radiological technologists are backward and undeveloped;

therefore, there is the high demand of renewing and updating their knowledge and information. In addition, the CAMADOJA has certain capacity to provide the training courses to meet those needs with the collaboration of JICA in planning and execution of the training program.

Based on the result of the previous evaluation, the agreement on its program of the first training course was made between JICA and CEMADOJA. Finally, on September in 2005, the both signed the R/D, the Dominican Minister of Public Health and Director of JICA.

Radiologists and Radiological Technologists participate in the course from each country (two radiologists and two radiological technologists from the Dominican Republic), in total 14 participants. The Course is composed of the two parts: Program for radiologists and for radiological technologists. CEMADOJA's medical staff gave class of the radiological diagnosis (vascular system, brain, etc). The other part, technical staff gave class of radial protection, projection position, etc. Japanese experts collaborate to compose the program and gave class about the advanced diagnostic Imaging.

1-2 Contents of Cooperation

(1) Overall Goal

The medical service become efficient through the improvement of diagnostic imaging technique in the target country, to apply the result of diagnostic in the clinical place, and to enable to judge the condition, indication and effect of the treatment of patients.

(2) Project Purpose

The Radiologists and Radiological Technologist in Central America and Caribbean, who participated in the Course, progress the capacity to do Diagnostic Image.

(3) Outputs

1. The Radiologists and Radiological Technologist, who participated in the Course, diffuse their knowledge, technique, and progress in the capacity to diagnose by image to contribute the improvement of health service in their countries.
2. CEMADOJA progresses the capacity of management to realize international courses by efficient and effective means, and shall be the Regional Center of Central America and Caribbean on the area of Diagnostic Image.

(4) Inputs (at a evaluation moment)

Japanese side :

Long-term Experts 0 Amount of Equipment supplied 25,839 thousand yen
Short-time Experts 19 Local Operational Expenditure: 32,247 thousand yen
Acceptance of Trainees(Third country) 54 Acceptance of Trainees(Japan) 12

Dominican side:

Assignment of Counterparts 25 Local Operation Expenditure RD$ 6,468,415.58
Provision of land and facilities Others

2. Composition of Evaluation Mission

Members	(Responsible Area, Name, Position) Mitsuo Isono: Mission leader, Senior Advisor, Japan International Cooperation Agency Hiromu Mori: Diagnostic Imaging, Professor and Chairperson, Department of Radiology, Oita University Faculty of Medicine Doris Holguín: Evaluation, Dominican Republic Office, Japan International Cooperation Agency

	Toshiya Wakabayashi: Planning the Evaluation, Dominican Republic Office, Japan International Cooperation Agency Maritza Oliver: Evaluation and Analysis	
Period of Evaluation	November 25, 2009 ~ December 9, 2009	Type of Evaluation: Final

3. Summary of Evaluation Results

3-1 Verification of the Project's Achievement

(1) Overall Goal

In Guatemala, the resident program of the CEMADOJA was incorporated into the curriculum of the educational investigation in the national level by the participant of the course. In Nicaragua, the trainees developed the plan to invite the CEMADOJA's lecturers to improve the capacity of diagnostic imaging, thus it is judged that the trainees actively promote the results of the course to their colleagues. The trainees have recognized again the importance of diagnostic imaging by the course, the equipments of diagnostic imaging have introduced in some hospitals where the trainees work. The trainees keep motivation to improve the capacity of the diagnostic imaging and spread their knowledge and experience to their colleague. Thus, it is expected that the medical service improves efficiently in target countries.

(2) Project Purpose

More than 90% of the trainees were satisfied at the contents of the program and quality of the lecturers of the course, and the 60% of the trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues base on the results of the project. More than 80% of the trainees answer to increase the number of diagnostic imaging and improve the health service through the course. It can be said that the trainees apply the knowledge and technique learned by the course, thus, it is judged the project purpose has been achieved at certain degrees. However, it takes considerable time for the trainees to apply the knowledge and technique of diagnostic imaging, and it should be evaluated objectively the achievement of project purpose after following up the activities in certain period.

(3) Output1

The result of the post test was better than that of the pre test in the past session, and the 60% of trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues base on the results of the project. Therefore it is judged that there is certain achievement regarding putput1, but as same as the achievement of the project purpose, objective evaluation of the project on output 1 should be made after following up for certain duration.

(4) Output 2

Though CEMADOJA tended to rely on JICA and Japanese experts, it is judged that CEMADOJA has acquired the basic management capacity to execute the course through the past session. However, it is extremely fast progress in the knowledge and technique of the diagnostic imaging, CEMADOJA should prepare the implementation method for the course including the academic area to be leading training center on the diagnostic imaging in Central America and Caribbean.

3-2 Summary of Evaluation Results

(1) Relevance

The Project contributes to improve the life level of Dominican people through progressing the quality and efficiency of medical and health service, and benefits to the people in poor level. Thus, the project contributes to the poverty reduction, and coincides with the Dominican national policy and Japanese ODA policy. Diagnostic imaging is of fundamental technique in health and medical service, and the improvement of diagnostic imaging is the same issue in Central America and Caribbean,

therefore the project coincides with the target group needs. It is judged that the relevancy of the project is high.

(2) Effectiveness

The course offers to the trainees the practical knowledge and technique on the diagnostic imaging, and CEMADOJA has accumulated the experience of the implementation of the course, therefore it has been improved gradually the facility of implementation of the project. These results have contributed to the improvement of the diagnostic imaging and adaptation to the clinical place, as the project purpose. More than 80% of the trainees (Radiologists and Radiological Technologist) have applied the knowledge and technique acquired through the course to the clinical place, and improved the medical service. It is judged that the approach of the project is effective. Particularly, it is very effective to design the training contents based on the preliminary study of the countries. It is judged that the effectiveness of the project is medium.

(3) Efficiency

It is appropriate the timing and period on the dispatch of experts, and the equipments indispensable offered adequately, thus input of the project is judged efficient based on the results. However, it is extremely fast progress in the knowledge and technique of the diagnostic imaging, CEMADOJA has to endeavor for the capacity developments, and needs to establish the committee to execute the course, prepare the system to progress the quality of the course, knowledge and technique of diagnostic imaging in case of managing the course by CEMADOJA alone. It is judged that the effectiveness of the project is medium.

(4) Impact

The trainees actively promote the results of the course to their colleagues, thus it is expected that the medical service will be efficient in the target countries, and the achievement of overall goal. As the positive impact of project, in Guatemala, the resident program of the CEMADOJA was incorporated into the curriculum of the educational investigation in the national level by the participant of the course. In Nicaragua, the trainees developed the plan to invite the CEMADOJA's lecturers to improve the capacity of diagnostic imaging. Therefore, these findings indicate that the trainees keep motivation to improve the capacity of the diagnostic imaging and spread their knowledge and experience to their colleague. Particularly, it has not confirmed the negative impact.

(5) Sustainability

Although CEMADOJA have always enjoyed the full support of Japanese experts, CEMADOJA has fulfilled its commitment of organizing four sessions of the international imaging course adequately, accumulated the knowledge and experience to execute the international course. However, to cope with extremely fast progress in the knowledge and technique of the diagnostic imaging, it is necessary to establish the mechanism to keep up the quality of contents on the course as the teaching hospital. It includes to establishing the review and feedback mechanism to the course, spreading the knowledge and technique on the diagnostic imaging and reviewing periodically the contents of material on the course. On the financial aspect, it would be difficult for only CEMADOJA to execute the international course supported by SESPAS, but CEMADOJA can work as the national training center. It is judged the sustainability of the project is medium.

3-3 Factors promoting better sustainability and impact

(1) Factors concerning to Planning

The content of training course has been planed based on the situations analysis of the target countries to meet their demand. Also, the contents have been revised based on the evaluation of the trainee. As a result, the training course has contributed to the improvement of the quality and efficiency of the clinical service as described before.

(2) Factors concerning to the Implementation Process

In Guatemala and El Salvador, most of the trainees (doctors and technicians) were selected of a same hospital, which facilitated that they could apply to their knowledge and experiences in the clinical part. These promoted the effect of synergy to improve the quality and efficiency of the service.

CEMADOJA has obtained an equipment of computerized tomography with their own budget, and this will contribute with the trainees to acquire more recent knowledge and greater experience in the diagnosis by image in the course.

3-4 Factors inhibiting better sustainability and impact

(1) Factors concerning to Planning

The improvement of diagnostic imaging is necessary the personal capacity improvement and the maintenance and renewal of equipments, particularly it is high cost for the maintenance and renewal of equipments. The course contributes to the personal capacity improvement, thus, the course should have considered the institutional capacity for the maintenance or renewal of the diagnostic imaging equipments at the selection of trainees. However, an act worthy of special mention, the trainees in El Salvador and Nicaragua proposed to renew the equipments and obtained it.

(2) Factors concerning to the Implementation Process

It has been delay to pay the incentive to the CEMADOJA's lecturers by SESPAS and it demotivated the lecturers. On the preparation of the course, the lecturers have to send the lecture document in advance to the Japanese experts to check the contents. However the lecturers never have sent the documents until the deadline and, as a result, the Japanese experts have no choice but to modify the most of documents just before the course.

3-5 Conclusion

The trainees has improved the knowledge and technique on diagnostic imaging and applied it at the clinical place. Although CEMADOJA needs certain improvements in technical areas, developed its capacity as a teaching hospital through implementing the project. Based on the results achieved, the Project has been executed according to the plan and that it will achieve its purpose in the established timeframe. There are big impacts of project in target countries, for example, in Guatemala, the resident program of the CEMADOJA was incorporated into the curriculum of the educational investigation in the national level by the participant of the course. Thus, it is judged the high efficient project.

3-6 Recommendations

(1) Short-term

1) The CEMADOJA is required to develop a short term strategic planning to respond to the necessities of qualification of the participant countries efficiently.
   i. Preparation of teaching file
   ii. Re-activation of pathological clinical radiological conferences Students' presentation of cases from their daily practice and to perform exchange sessions between them and the teachers of CEMADOJA
   iii. Introduction to make action plan
   iv. Review of the contents on Pre and Post test
2) CEMADOJA must formally create a mechanism of reward and monitoring of knowledge and technique on diagnostic imaging for their teachers and staff to capacity development.
3) The "Network of the Ex- trainees of the Course" should be established to progress the effectiveness of project. Each participant country will have an ex trainee in charge, to give to preside over the group of ex- trainees in the Network.

(2) Mid-Term

1) The CEMADOJA must develop mid-term strategic plan, and form the working group to realize

and monitor the mid-term strategic plan, as a leading teaching hospital for domestic trainings.

2) The CEMADOJA must take the initiative of continuously to renew the training program according to international technological advances in the diagnosis by image for technicians and doctors radiologists.

3) SESPAS should be involved more as monitoring and evaluation entity against the teaching hospital as CEMADOJA.

4) A renovation and preventive maintenance plan for equipments must be elaborated and implemented, because these are of the main inputs of the imaging diagnoses and has a high vulnerability to the technological changes.

3-7 Lessons Learns

1) It is better, in certain situations, to set indicators for each target country to encourage dissemination of training effect.

2) It is important to establishing a follow-up mechanism, for example, monitoring system for the trainees, network for the trainees, and monitoring of action plan at the beginning of the project to measure and enhance results.

3) If the international training program realizes the first case in the country, implementation of the course might be a burden for single institute like CEMADOJA. Thus, the rector organization must have a greater participation from the stage of preparation of the course.

SUMMARY（Japanese）

評価調査結果要約表

<table>
<tr><td colspan="3">１．案件の概要</td></tr>
<tr><td colspan="2">国名：ドミニカ共和国</td><td>案件名：中米カリブ地域画像診断技術向上（第三国研修）プロジェクト</td></tr>
<tr><td colspan="2">分野：保健</td><td>援助形態：技術協力プロジェクト</td></tr>
<tr><td colspan="2">所轄部署：ドミニカ共和国事務所</td><td>協力金額（評価時点）：1.42億円</td></tr>
<tr><td rowspan="4">協力期間</td><td>（R/D）：2005.9.8～2010.3.31</td><td>先方関係機関：保健省、日本ドミニカ友好医学教育センター</td></tr>
<tr><td>（延長）：</td><td>日本側協力機関：大分大学医学部</td></tr>
<tr><td>（F/U）：</td><td>他の関連協力：なし</td></tr>
<tr><td>（E/N）（無償）</td><td></td></tr>
<tr><td colspan="3">１－１　協力の背景と概要
ドミニカ共和国の保健省は、医療分野の未発展が同国のニーズを充足する障害となっていることに鑑み、日本政府にルイスアイバール病院（現；ルイスアイバール保健衛生都市）内に医学教育センターの無償資金協力による建設、及び同センターにおける画像診断と疫学分野の専門家を養成するための技術協力を要請し、1999年日本ドミニカ友好医学教育センター（CEMADOJA）が建設され、同年10月8日から5年間、医学教育プロジェクトが実施された。同プロジェクトでは同センターが画像診断及び公衆衛生分野における医学教育を実施できるよう機材の整備、医師、技術者への技術移転及びセンターの運営指導を行い、同センターは上記分野における教育機関として高い評価を得るようになった。
2004年3月に実施された同プロジェクトの終了時評価でプロジェクトは目標を達成したと評価され、同時にドミニカ共和国側からプロジェクトの成果を活用した画像診断の研修プログラムを国内及び近隣諸国の医師及び技術者に対して実施したいとの意思が表明され、JICAの技術協力が要請された。
事前評価において、CEMADOJAの能力評価及びCEMADOJA-JICA合同調査団による中米五カ国（ホンジュラス、パナマ、エルサルバドル、グアテマラ、ニカラグア）の当該分野技術レベル及び研修ニーズの確認を実施した。この結果、対象地域において放射線科医及び放射線技師の技術が遅れており更新の必要性が高いこと、またCEMADOJAがこのニーズを満たす研修を実施可能であること、但し一部の技術及び研修計画･運営についてJICAの協力が必要であることが確認され、本件協力が妥当であることが判明した。事前調査の結果を受け、2005年9月8日に保健省大臣とJICAドミニカ共和国事務所長により討議議事録（Record of Discussions：R/D）が署名され、同日より5年間の予定でプロジェクトが開始された。
本プロジェクトは、ホンジュラス、パナマ、エルサルバドル、グアテマラ、ニカラグアの各国から医師、放射線技師1名ずつ（ド国は2名ずつ）が参加し、日本人専門家の協力を得て、CEMADOJAの講師がMRI、CT等の画像診断技術向上に関する第三国研修を実施している。
１－２協力内容
（1）上位目標
研修参加国における画像診断技術が向上し、その診断結果が臨床現場で活用されることにより、患者の病態の把握、病気の重症度の判定、治療の効果、予後の推測が可能となり、医療サービスが効率化する。</td></tr>
</table>

(2) プロジェクト目標

研修に参加する医師や技術者の画像診断技術が向上し、帰国後研修で得た技術を臨床現場で適用できるようになる。

(3) 成果

1. 研修に参加する医師や技術者がX線、CT及び超音波診断等の画像診断知識及び技術を習得する。
2. 日本ドミニカ友好医学教育センター（CEMADOJA）が効果的効率的な研修を実施する運営能力を獲得し、画像診断分野において中米カリブ地域の中核的研修センターとしての地位を確立する。

(4) 投入（評価時点）

日本側：

長期専門家派遣	0名	機材供与	25,839千円
短期専門家派遣	19名	ローカルコスト負担	32,247千円
研修員受入（第3国研修）		54名	本邦研修 12名

相手国側：

カウンターパート配置	16名	ローカルコスト負担	DOP 6,468,415.58
土地・施設提供			
その他			

2．評価調査団の概要

調査者	（担当分野：氏名　　職位）	
	総括：　磯野　光夫	独立行政法人国際協力機構　国際協力専門員
	画像診断：森　宣	大分大学医学部教授
	評価分析：Maritza Oliver	コンサルタント
	評価企画：Doris Holguin	独立行政法人国際協力機構ドミニカ共和国事務所
	若林　敏哉	独立行政法人国際協力機構ドミニカ共和国事務所
調査期間	2009年11月25日～2009年12月9日	評価種類：終了時評価

3．評価結果の概要

3－1　実績の確認

(1) 上位目標：研修参加国における画像診断技術が向上し、その診断結果が臨床現場で活用されることにより、患者の病態の把握、病気の重症度の判定、治療の効果、予後の推測が可能となり、医療サービスが効率化する。

グアテマラでは研修員により、CEMADOJAのレジデントプログラムが国内の教育･研究カリキュラムに取り入れられ、ニカラグアの研修員グループは画像診断能力の向上のために、CEMADOJAの教官の招聘を計画していること等から、研修員が帰国後、研修の成果普及を積極的に実施しているといえる。また、研修員が画像診断の重要性を再認識し、画像診断に必要な機材について新規購入もしくは更新を行なっており、将来的に対象国での医療サービスが効率化することが期待される。

(2) プロジェクト目標：研修に参加する医師や技術者の画像診断技術が向上し、帰国後研修で得た技術を臨床現場で適用できるようになる。

90%以上の研修員が研修の内容について満足しており、60%の研修員が本研修で得られた知識、技術を用いて何らかの教育的な活動を行なっている。また、80%以上の研修員が本研修を通じて、画像診断の数、サービスの向上がはかられたと回答していることから、研修で習得した技術を臨床現場で適用しているといえ、プロジェクト目標は達成見込みである。但し，習得技術の適用には研修終了後相応の時間が必要な事から，プロジェクト目標達成の客観的評価は，一定期間のモニタリングがなされる必要がある．

(3) 成果1：研修に参加する医師や技術者がX線、CT及び超音波診断等の画像診断知識及び技術を習得する。

過去4回の研修とも、研修実施後のテストの結果が、研修実施前のテストの結果を上回っており、60%の研修員が本研修で得られた知識、技術を用いて何らかの教育的な活動を行なっていることから、研修員が画像診断に関する知識、技術を習得したといえる。但し，プロジェクト目標と同様の理由から，客観的評価は一定期間のモニタリングがなされる必要がある．

(4) 成果2：日本ドミニカ友好医学教育センター（CEMADOJA）が効果的効率的な研修を実施する運営能力を獲得し、画像診断分野において中米カリブ地域の中核的研修センターとしての地位を確立する。

CEMADOJAは、JICA、日本人専門家に依存する傾向があったものの、現在まで4回の研修を実施しており、研修実施にかかる知識、経験が蓄積しているといえる。しかしながら、画像診断分野における進歩は非常に早いことから、CEMADOJAが中米カリブ地域及び国内の中核的研修センターとなるためには、学術面での自己研鑽も含め研修実施に関わる体制の整備が必要である。

3－2　評価結果の要約

(1) 妥当性

本プロジェクトは、医療･保健サービスの質と効率性の向上を通じて、国民の生活レベルの改善へ寄与することであり、貧困層に属する住民への裨益は大きいことから、貧困削減に寄与し、ド国の国家政策、我が国の援助政策に合致している。また、画像診断は保健医療サービスにとって基本的な技術であり、画像診断技術の向上は、中米カリブ地域の共通の課題であることから、対象グループのニーズに合致している。これらのことから、総じて妥当性は高いといえる。

(2) 有効性

本研修では、臨床現場に直接適用できる画像診断の知識、技術を習得できるように、日本人専門家、CEMADOJAの講師により、プログラムが形成されている。また、CEMADOJAが第三国研修の実施機関として、研修を実施する運営能力を高めつつあり、効果的効率的な研修の実施に寄与している。これらの成果は、プロジェクト目標である、医師や技術者の画像診断技術向上、臨床現場での適用に大きく貢献している。

80%以上の研修員（医師、放射線技師）が研修で習得した知識、技術を臨床現場で活用し、サービスの質が向上したとしていることから、本プロジェクトのアプローチは有効であったと判断される。特に，事前に参加国のニーズを調査した上で研修デザインを行ったことは効果的であった。総じて有効性は高いといえる。

(3) 効率性

達成された成果からみて、専門家の派遣時期、期間は適切であり、第三国研修を実施するために必要な機材が適切な時期に投入されており、総じて投入は効率的に行われたといえる。しかしながら、進歩の早い画像診断分野において、CEMADOJAが単独で研修を実施するためには、研修実施のための専門員会を設置した上で同分野における研修の質の向上，講師の恒常的な技術、知識の向上をはかるためのシステム整備が必要であり、更なる自己研鑽を要することから、効率性は中程度といえる。

(4) インパクト

研修員が帰国後、研修の成果普及を積極的に実施している国があることから、将来的に対象国での医療サービスが効率化することが期待され、上位目標の達成が期待される。

本プロジェクトにおける正のインパクトとして、グアテマラでは研修員により、CEMADOJAのレジデントプログラムが国内の教育･研究カリキュラムに取り入れられ、ニカラグアの研修員グループは画像診断能力の向上のために、CEMADOJAの教官の招聘を計画している。これらのことからも、それぞれの国の研修員が習得した知識、技術を臨床現場で普及していることが伺える。

負のインパクトは特に確認されなかった。

(5) 自立発展性

日本人専門家からの全面的な支援を受けながらであったが、CEMADOJAは本研修を4回実施しており、研修実施にかかる知識、経験が組織的に蓄積されている。しかしながら、画像診断分野は急速に進歩しているため、研修の質を維持するためには研修病院としての制度整備が必要である．これには，コースのレビュー・フィードバック行う制度の策定．教官達が画像診断分野に関する技術や知識を普及し、研修の教材を定期的に改定するためのメカニズム等が含まれる。保健省による支援によりCEMADOJAが単独で国際的な研修を実施することは資金面で困難であり、国内研修機関として機能することは可能と思われる。総じて自立発展性は中程度といえる。

3－3　効果発現に貢献した要因

(1) 計画内容に関すること

本研修は、画像診断技術に関する理論、実習から構成されており、研修員が帰国後すぐに研修の成果を適用できるように計画されている。研修員のアンケート結果では、画像診断数が増え、サービスが向上しているとしていることから、本研修は研修で得た技術を臨床現場で適用できるようになることに寄与しているといえる。

(2) 実施プロセスに関すること

グアテマラ、エルサルバドルでは、研修員（医師、放射線技師）が同一の病院から戦略的に選出されており、研修後の成果普及に大きく貢献している。また、CEMADOJAは自己資金によりCTを購入しており、研修員が最新の画像診断技術の知識、技術を習得することに寄与している。

3－4　問題点及び問題を惹起した要因

(1) 計画内容に関すること

画像診断技術向上には、人材育成と機器のメンテナンス・更新が必要であり、機器のメンテナンス・更新には高いコストがかかる。本研修では人材育成を行なっているものの、各国（病院）の状況を鑑み、機器のメンテナンス・更新ができる病院から候補者を選定することを考慮すべきであった。しかしながら、エルサルバドル、ニカラグアでは帰国研修員が中心となって画像診断機器の更新を実施した。

(2) 実施プロセスに関すること

本研修実施において、保健省からCEMADOJAの講師に払われるインセンティブの支払いが遅れており、講師のモチベーションの低下につながった。このため、講義で使用する教材の作成が大幅に遅れることがあったが、日本人専門家の指導により、予定通り研修を実施することができた。

3－5　結論

各国の研修員は、本研修により画像診断技術の向上がはかられており、臨床現場で適用されている。また、研修実施機関であるCEMADOJAは、学術的に更なる向上をはかる必要があるものの、研修実施にかかる知識、経験を蓄積している。

上述のとおり、プロジェクトが設定したプロジェクト目標ならびに成果も概ね達成されているとともに、CEMADOJAのレジデントプログラムが国内の教育･研究カリキュラムに取り入れられるなど、各国において本研修のインパクトが拡大しており、有効性の高いプロジェクトであったと評価できる。

３－６　提言（当該プロジェクトに関する具体的な措置、提案、助言）

（1）短期的な提言

1）CEMADOJAは参加国のニーズを満たした研修の質の向上に向けた短期的な戦略計画を策定する必要がある。

ｉ．ティーチングファイル作成

ii．放射線･病理･臨床科合同カンファレンスなどの活動を再活性化

iii．研修員が持参症例について教官とディスカッションをできる機会の導入

iv．アクションプラン作成の指導

ｖ．プレ・ポストテストの内容の検証

2）CEMOADOJAは教官、スタッフの能力開発･向上に向け，技術レベルの更新・モニタリング体制を整備する必要がある。

3）プロジェクトの有効性を高めるために，「帰国研修員ネットワーク」を構築し、参加国各国で研修に関するフォローアップやネットワークにおける国別のリーダーを１人ずつ選定することが望まれる。

（2）中期的な提言

1）質の高い教育機関となるためには，CEMADOJAは組織としての戦略計画を策定し、計画された活動を実施し、モニター出来るようなワーキンググループを編成する必要がある。

2）同様に，CEMADOJA は国際的な画像診断技術の進歩に応じて、放射線医師･技師対象の研修プログラムを積極的に更新する必要がある。

3）保健省は保健行政の監督官庁として、CEMADOJAの研修機関としての実施能力をモニターし、的確な指導をすることが望まれる。

4）画像診断に機材は不可欠であり、この分野での技術革新が特に進んでいるため、研修機関としてあるべき機材の予防メンテナンスや、更新計画を作成し、実現に向けた努力を行う必要がある。

３－７　教訓

（1）第三国研修の実施にあたり、研修の効果測定を行なうため、各国の状況に応じた指標を設定することが望ましい。

（2）効果的な研修実施のためには，プロジェクト（第三国研修）形成段階から、研修員のモニタリング・システムの構築、研修員のネットワーク形成、アクションプランの実施モニタリングを検討することが望ましい。

（3）第3国研修の実施が初の試みである場合には，実施機関のみではマネージメントが負担になることから，保健省などの監督官庁等も巻き込んだ研修実施体制作りが必要である。

ACRONYMS AND ABBREVIATIONS

ADS	Antidiuretic Substance
CEMADOJA	Centro de Educación Médica y Amistad Dominico-Japonesa Dominican Japanese friendship Center of Medical Education
C/P	Counterpart
CT	Computed Tomography
JCC	Joint Coordination Committees
JICA	Japan International Cooperation Agency
IVR	Interventional Radiology
MRI	Magnetic Resonance Imaging
SESPAS	Secretaría de Estado de Salud Pública y Asistencia Social Ministry of Public Health and Social Asistance of State
SEEPYD	Secretaría de Estado de Economía, Planificación y Desarrollo Ministry of State of Economy, Planning, and Development
RX	Convencional X-ray

CONTENTS

1. INTRODUCTION

1.1 Background of the Project

Considering the lack of development in the field of medicine and public health induces various impediments for meeting the needs of the majority in the Dominican Republic, Dominican Ministry of Public Health officially requested to the government of Japan for constructing the new center for medical education by Grand Aid within the Luis Aybar General Hospital (currently called the Luis Aybar Health and Hygiene City). In addition, it was also mentioned that there was the needs of providing the training courses for the experts in Imaginology and Epidemiology.

Consequently, in 1999, Dominican Japanese friendship Center of Medical Education (CEMADOJA) was constructed and the medical education projects had started in same year for the period of 5 years. In the project, the emphasis was on the provision of equipment for completing its facility as well as the training courses for the local medical doctors and technologists for achieving the technology transfer. As the result, the center had become one of the highly evaluated medical educational institutions in the country.

In March 2004, the project was finished with the recognition of success by the final evaluation. In the response to its success, the Dominican government requested further technical cooperation in executing the training programs for medical experts within the country as well as for her neighboring countries.

After revising the proposals, evaluation of the capacity of CEMADOJA as a training institute was conducted by the local consultant as indicated by the previous evaluation. In addition, CEMAJOJA-JICA joint mission was dispatched to the five countries in the Central America (such as Honduras, Panama, El Salvador, Guatemala and Nicaragua) to investigate needs for trainings for such fields.

The result shows that the further technical cooperation was necessary. In these targeted countries, the knowledge and skills of Radiologists and Radiological technologists are backward and undeveloped; therefore, there is the high demand of renewing and updating their knowledge and information. In addition, the CAMADOJA has certain capacity to provide the training courses to meet those needs with the collaboration of JICA in planning and execution of the training program.

Based on the result of the previous evaluation, the agreement on its program of the first training course was made between JICA and CEMADOJA. Finally, on September in 2005, the both signed the R/D, the Dominican Minister of Public Health and Director of JICA.

Radiologists and Radiological Technologists participate in the course from each country (two radiologists and two radiological technologists from the Dominican Republic), in total 14 participants. The Course is composed of the two parts: Program for radiologists and for radiological technologists. CEMADOJA's medical staff gives class of the radiological diagnosis (vascular system, brain, etc). The other part,

technical staff gives class of radial protection, projection position, etc. Japanese experts collaborate to compose the program and gives class about the advanced diagnostic Imaging.

1.2 Objectives of the Evaluation

The International Diagnostic Imaging Course for Radiologists and Radiology Technicians in Central America and the Caribbean (hereinafter referred to "The Course") will have been under way and completed in March of 2010.

JICA decided to conduct a Final Evaluation in order to evaluate the activities held to date, the initial results achieved and the difficulties encountered, as well as to identify suggestions and recommendations that will allow for improving execution during the rest of the Project's duration. For this purpose, the Mission was organized, which visited the Dominican Republic and some of the participating countries - El Salvador, Guatemala and Nicaragua - between 25th November and 9th December 2009

The activities were realized as follows:

(1) Describe, understand and verify the processes and achievements of the implementation of the International Diagnostic Imaging Course for Radiologists and Radiological Technologists in Central America and the Caribbean.

(2) Joint evaluation by Dominican and Japanese teams for five criteria.

(3) Discussion on the process and achievement of the Project, extract lessons learned and draw up a set of recommendations aimed at improving the course implementation.

1.3 Evaluation agenda

It shows in Annex 1-1.

1.4 Interviewee List

It shows in Annex 1-2.

2. METHODOLOGY OF FINAL EVALUATION

2-1. Evaluation Methodology

2-1-1. Evaluation Method

The evaluation was based on the "JICA Project Evaluation Guidelines" manual and was conducted on the basis of the following criteria that the Manual defines:

(1) Relevance

Relevance of the Project plan is reviewed by the validity of the Project Purpose and the Overall Goal in connection with the development policy of the Government of Dominican Republic and needs of the beneficiaries and also by logical consistency of the Project plan.

(2) Effectiveness

Effectiveness is assessed by evaluating to what extent the Project has achieved its purpose and clarifying the relationship between the purpose and outputs.

(3) Efficiency

Efficiency of the Project implementation is analyzed with the emphasis of the relationships between outputs.

(4) Impact

Impacts of the Project are assessed in both positive and negative influences caused by the Project.

(5) Sustainability

Sustainability of the Project is assessed in organizational, financial, and technical aspects by examining the extent to which the achievement of the Project will be sustained and expanded after the Project's completion.

2-1-2. Method of collection and analysis on the data

The following activities were carried out for the evaluation:

(1) Review of Documents

A set of basic documents about CEMADOJA and about the courses that were held were reviewed and analysed.

(2) Visits to CEMADOJA

Visits were made in order to get to know the structure and the conditions of the Centre and to meet with its staff.

(3) Visits to participants' Hospitals in El Salvador, Guatemala, Panama and Nicaragua

Visits were made to several of the participants' hospitals in order to get to know the conditions and the type of work that they do, to hear the opinions of their managers and co-workers, and to get to know the follow-up work they have done since they received the training.

(4) Interviews

Structured and open interviews were held with: CEMADOJA and JICA officials, Course teachers and beneficiaries. During the evaluation participants from El Salvador, Guatemala, Nicaragua, Panama and Dominican Republic were made.

(5) Use of questionnaires

Questionnaires were prepared, distributed, compiled, processed and analysed, targeted at: Japanese experts, teachers, and participating radiologists and radiological technologists. 60% of the participants responded to the questionnaire, 92% of the teachers and 53% of Japanese experts. Since the completed questionnaires comprise a significant quantity as a total but lacked sampling criteria, it can be said that they are relevant but not necessarily representative.

2-2. Joint Evaluation

The final evaluation was executed by the Joint Evaluation Committee composed by four Dominican and four Japanese evaluators. The members of the Joint Evaluation Committee as follows:

(1) Japanese part

- Mitsuo Isono: Mission leader, Senior Advisor, Japan International Cooperation Agency
- Hiromu Mori: Diagnostic Imaging, Professor and Chairperson, Department of Radiology, Oita University Faculty of Medicine
- Doris Holguín: Evaluation, Dominican Republic Office, Japan International Cooperation Agency
- Toshiya Wakabayashi: Planning the Evaluation, Dominican Republic Office, Japan International Cooperation Agency
- Maritza Oliver: Evaluation and Analysis

(2) Dominican part

- Julio Manuel Rodriguez Grullón: President of "la Ciudad Sanitaria, Dr. Luís E. Aybar" / Coordinator of Dominican part
- Federico E. Núñez: General Director, Cardio-Neuro Ophthalmologist y Trasplant Center
- Lucas Gómez: General Director of Hospital department, Secretariat of State of Public Health and Social Asistance(SESPAS)
- Pablo Herasme: Annalist of International Cooperation, Ministry of State of Economy, Planning and Development (SEEPYD)

2-3. Project Design

(1) Project Purpose

The Radiologists and Radiological Technologist in Central America and Caribbean, who participated in the Course, progress the capacity to do Diagnostic Image.

(2) Output

1) The Radiologists and Radiological Technologist, who participated in the Course, diffuse their knowledge, technique, and progress in the capacity to diagnose by image to contribute the improvement of health service in their countries.

2) CEMADOJA progresses the capacity of management to realize international courses by efficient and effective means, and shall be the Regional Center of Central America and Caribbean on the area of Diagnostic Image.

(3) Participants

The course is aimed at Radiologists and Radiological Technologist in Central America and the Caribbean. In the first four occasions, professionals from El Salvador, Guatemala, Honduras, Nicaragua, Panama and the Dominican Republic (as host country) took part. Each session was supposed to contain seven (7) radiologists and seven (7) radiological technologists. The participants must be university educated, have more than 2 years' professional experience, from the public sector, under the age of 45 and not providing any kind of military service.

(4) Project Beneficiaries

The project has direct and indirect beneficiaries.

1) Direct Beneficiaries:

- Participating Radiologists and Radiological Technologists

  These are the most direct targets and beneficiaries of the Course. They are the Radiologists and Radiological Technologists from the invited countries who have taken part in the course.

- Lecturers

  CEMADOJA's technical and medical staff members who have taught classes in the courses.

- CEMADOJA staff

  The Centre's management and administrative staff who have taken part in the organization and development of the courses.

2) Indirect Beneficiaries:

- Patients or users of services

  Service users in the hospitals or organizations where the course participants work, who have been able to receive benefit from the increase in practical and theoretical knowledge of participants in the Course.

- Radiologists and Radiological Technologists

Staff in the workplaces of the trained radiological technologists and radiologists who have opportunity to receive benefit from the trained professionals and through sessions where the acquired knowledge has been reproduced.

(5) Lecturers or Instructors

The teachers responsible for teaching the Course are radiologists and radiological technologists at CEMADOJA. Most of them were trained in Japan. For capacity development of the centre, there are also support by Japanese experts who provide technical and organizational advice.

(6) Course Methodology

The course combines theoretical knowledge with practical teachings derived from the services that CEMADOJA provides on a daily basis. It also includes visits to other imaging centres. During the course, participants are divided into two groups: one made up of radiologists and one made up of radiological technologists, which join together on several occasions. The idea is to generate a participative and interactive environment, through a horizontal atmosphere of professional colleagues.

(7) Sessions held

To date the Course has been held on four occasions:

1st Course	30th January and 3rd March 2006
2nd Course	29th January and 2nd March 2007
3rd Course	29th January to 28th February, 2008
4th Course	2nd February to 6th March, 2009

3. Project Achievements

3-1. Achievement of the Project Purpose

Four sessions of the International course on the diagnostic imaging have been conducted, and 54 trainees (Radiologist: 25, Radiological Technologist: 29) participated in the course.

The 60% of the trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues based on the results of the project. These activities, described in details as below, can help improving the capacity on diagnostic imaging in their own countries. Therefore, it might be judged that the project purpose will be accomplished. However, it is difficult to prove improvement of diagnostic capacity objectively at this moment due to lack of appropriate indicators. It is necessary to follow up the productivity of ex participants, to evaluate objectively the achievement of capacity development on diagnostic imaging.

In the Minutes of Meeting of this project, it is mentioned that the capacity of diagnostic imaging on radiologists and radiological technologists shall be improved. This evaluation found that by the planned implementation of formal training radiologists and radiological technologists acquired the academic requirements for high performance in their work. It is found that the implementation of the course led to the recognition of the training needs in hospitals in the target counties, to assure that the staff meets the condition demanded on their work.

Among the results of the project, there is certain achievement in the distribution of knowledge obtained by the course. From the fourth course, to design the action plan became to be mandate. This seems to encourage distribution of the knowledge and improvement of abilities for their colleagues in various hospitals.

Impact of the course in target countries:

Generally, more than 90% of the trainees has expressed that their motivation increased not only in the implementation of work, but also in the desire to continue to train and update their knowledge and skills after the course. This motivation of the trainees to learn continuously affect to their colleagues stimulating the academic interest.

Panama

As for the impact in Panama, some radiological technologists showed the positive effect. Communication with patients during treatment has been improved by which the direct treatment for the patients has been improved by keeping informing what they are doing.

The radiological technologists, who participated in the interview, told that they learned how the equipments work to produce the imaging and also they could deepen the knowledge about function of the equipments. Therefore they avoid excessive use.

Also, the ex participants expressed that they learned in the course how to identify needs of equipments to request.

Nicaragua

In the Lenin Fenseca Hospital, one of the most beneficiaries in the course, ex-participants told that their attendance of the course was very important. Because they could apply the knowledge in their diagnostic imaging center, which was built after six month of their return form the Dominican Republic. Therefore, the new structure was benefited easily by the course. The participation of the course motivated them for continuous learning and, for the reason, they requested to JICA the follow up cooperation to transfer the knowledge by the CEMADOJA to other colleagues. And, some ex participants utilize the teaching material of CEMADOJA in their area.

For the radiological technologist in this hospital, knowledge about the magnetic resonance was completely new, but helped them to use the new equipment.

Finally, ex participants in Nicaragua have confident that now they have obtained the capacity to respond the hospital needs including new equipments and human resource development.

Guatemala

It is most important impact in Guatemala that all of the protocols of imaging have been changed to adjust the protocols of CEMADOJA after participation in the course. The case presentation was very meaningful for them in the course and they have integrated the case presentation to the post graduate program for the first time. The lecturers, who are ex participants of the course, agreed that the teaching material in the course is very useful for the lecturers in the country.

Experiences in the course was applied to the Continuous Education Program and the topic of the course, for example breast cancer, was introduced as the one of theme.

El Salvador

In Rosales Hospital, the residents program of CEMADOJA was introduced by the ex participant. On the other hand, the most of ex trainees have participated as an exponent of the congress and coordinator of academic activities.

The committee to update the imaging diagnosis in Rosales Hospital was formed by ex trainees of the course. Also, the communication among and radiologist in Center America has improved after the course.

Dominican Republic

CEMADOJA's Lectures could update the knowledge as the lecturers thorough the participation of the training course in Japan, and it was their direct beneficial, by the assistance by Japanese experts, to make teaching material and to have opportunity of practical teaching with participants groups in organized activities.

The ex trainees of radiologists participated from 11 hospitals and 10 provinces, and it is expected that the results of the course will be spread widely in the country.

Thus, it is judged the project purpose has been achieved at certain degrees, although there is no objective indicator.

3-2. Achievement of Outputs of the Project

3-2-1 Output 1

On the acquirement of the knowledge and technique of the diagnostic imaging, the trainees examine pre – test and post test during the course, and the result of the post test was better than that of the pre test as the below table. In third and fourth training courses, there was only little improvement in scores for radiologists. In general, radiological technicians tended to gain better scored than radiologists. However, exact evaluation by pre- and post-tests are difficult, because of different settings and motivation of participants with different level of knowledge and technique.

Table: Result of Pre test and Post test

Radiologist

	1st course	2nd course	3rd course	4th course
Pre Test	39.3	40.4	36.0	40.1
Post Test	62.0	69.2	43.0	46.6

Radiological Technologist

	1st course	2nd course	3rd course	4th course
Pre Test	51.4	40.0	29.8	20.4
Post Test	79.7	80.6	78.4	69.5

The 60% of the trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues based on the results of the project as described in 3-1.

Thus, it is judged that there is certain achievement regarding output1, but as same as the achievement of the project purpose, objective evaluation of the project on output 1 should be made after following –up for certain duration.

3-2-2 Output 2

On the management capacity of the CEMADOJA to execute the course, it can be analyzed as follows:

- Planning of implementation of the course
- Review of the program
- Quality of the lecturers
- Equipment of the diagnostic imaging
- Administration of the course
- Evaluation and Feedback system on the course

More than 90% of the trainees were satisfied at the contents of the program and quality of the lecturers of the course. This result indicates the capacity of CEMADOJA to conduct international training courses. In addition, based on the following analysis, it is judged that CEMADOJA has acquired the basic management capacity to execute the course, although still there are certain points to be improved.

(1) Planning of implementation of the course

CEMADOJA has executed the four sessions of the course supported with JICA. A technical coordinator was assigned in the project and has accumulated the experience for the planning and implementation of the course through the four sessions. Only one coordinator has been engaged on the planning, so that it is necessary to share the experience in the institution to sustain capacity in this regards.

(2) Review of the program

Continuous review of the program to improve contents of trainings is crucial, but CEMADOJA has relied on the supports by Japanese experts in this regard. By utilizing accumulated experiences on the review of the program, active involvement of CEMADOJA into review of the program is expected. In this regards, coordinating committee should be developed to review, organize and implement training courses.

(3) Quality of the lecturers

As qualified teaching hospital, continuous improvement of knowledge about diagnostic imaging is crucial. CEMADOJA's lecturers have realized the significance of this issue and have just recently begun to have initiative of improvement of the knowledge about diagnostic imaging and contents of the lecture.

(4) Equipment of the diagnostic imaging

The renewal of equipment is crucial to keep up with international standards, but expensive cost might be obstacles. However, recently CEMADOJA could made efforts to obtain the Computerized Tomography by their own budget. Therefore it is expected that CEMADOJA can renew the equipment of diagnostic imaging periodically from now on.

(5) Logistic of the course

The coordinator of the project has accumulated experience on the logistic of the course, therefore there was no logistic problem such as transportation, accommodation, etc. This was proved by the interview and questionnaires of participants. However, it is necessary to form the coordination team, to maintain the implementation capacity of the course.

(6) Evaluation and Feedback system on the course

The evaluation meeting was held at the end of the each course by initiative of the CEMADOJA staff. They have discussed many points to improve the course in each evaluation meeting. It is necessary to strengthen the feedback system through the formation of the coordination committee to reflect the result of the meeting.

3-3. Input of the Project

(1) Personal Input

In the project, Japanese experts work in the area of formation of the program (Radiologist, Radiological Technologist), and Lecturers of the course (Radiologist, Radiological Technologist), in total it is sent 19 experts shown in Annex 1-3.

(2) Equipment Input

It is donated the equipment to complement the implementation of the project, such as sonography, workstation, computer, etc, shown in Annex 1-4.

(3) Trainees

54 trainees participated in the course shown in Annex 1-5.

(4) Training course in Japan

12 trainees of CEMADOJA participated in various training course in Japan shown in 1-6.

(5) Implementation cost of the course

The Implementation cost of the course shown in Annex 1-7.

4. EVALUACION RESULTS

4-1. Evaluation Results on five criteria

4-1-1. Relevance

Result: High

Diagnostic imaging is of fundamental and has growing importance in health interventions, in the midst of an epidemiological transition from preventable diseases to chronic degenerative diseases. The Central American and Caribbean countries are continuously acquiring radiological equipment, although the quantity and quality do not match their needed, in order to improve their diagnostic procedures. This increase in equipment requires technically trained staff for interpreting test results. But also, due to a lack of adequate radiological knowledge, some diseases are not detected in time and later turn out to be catastrophic. It is in this context that the International Diagnostic Imaging Course for Radiologists and Radiological Technologists in Central America and the Caribbean responds to these regional training demands in the area of diagnostic imaging.

The Course organization by CEMADOJA corresponds to the center's Vision, having emerged as the leader in the Dominican Republic when it comes to continuing education in imaging and serving other, technologically less advanced, countries. Likewise, it is in keeping with its Mission as a teaching, training, skill sharing and research and development centre for continuing medical education in advanced and high technology diagnostic imaging. Moreover, increasing the skills of national staff in the area of imaging supports the process of improving health services pursued by the Dominican Government through its Health Sector Reform and the implementation of the New Dominican Social Security System. In addition, the provision of an international course in diagnostic imaging by a public institution supports the Dominican Government's efforts to project the country as a regional technological centre.

As documented in "Tokyo declaration 2005 action plan", Dominican Republic would play a crucial part on the medical education in Central America and Caribbean countries. From this point of view, this project fully coincides with the international assistance plan of Japan.

The deliberation about Economic Cooperation Policies between Japan and the Dominican Republic was held in August of 2003, and it was defined that the assistant areas of Japanese part are as follow: 1) Agriculture, forestation and fishery, 2) Health, 3) Education, 4) Environment, 5) Promotion of Foreign Investment and Exportation, and 6) Tourism. The Project is the cooperation in Health area, therefore, coincides with the Japanese ODA policy.

JICA Dominican Republic concentrates on the three programs: 1) Poverty Reduction, 2) Competitiveness Improvement,3) Environmental Protection. The over goal of project is to improve the quality and efficiency of the clinical service, and it contributes to improve the life level of the population. Therefore, the project is contained in the Poverty Reduction Program, and coincides with the policy of JICA Dominican Republic.

4-1-2. Effectiveness

Result: High

(1) Achievement of the project purpose

As described in 3-1 and 3-2, certain achievement by the project has been confirmed.

(2) Contribution of the results to the achievement of the project purpose

It has been contributed the achievement of the project by the two results: 1) Acquirement of the knowledge and technique on the diagnostic imaging by trainees, 2) Improvement of the CEMADOJA's management capacity on the course.

The course offers to the trainees the practical knowledge and technique on the diagnostic imaging, therefore it is contributed for the trainees to apply effectively the experience of the course to the clinical place. For designing the course, situational analysis in the target countries was conducted to investigate the needs for trainings. This helped to develop the program to meet demands in target countries. In this evaluation, the 84% of the trainees of radiologists and radiological technicians expressed that the knowledge acquired by the course is quite beneficial for patients on the clinical service. For the organization of the course, for more 90% of trainees were satisfactory. These indicate means that the contents of the course were appropriate to meet the demand of the trainees and coincide to the needs.

CEMADOJA has accumulated the experience of the implementation of the course, therefore it has been improved gradually the facility of implementation of the project, and it contributes for the trainees to learn effectively the contents of the course.

4-1-3. Efficiency

Result: Medium

The evaluation found that there was some weakness in capacity for conducting training courses which affected the efficiency of the project. Therefore the efficiency is judged to be Medium.

(1) Japanese experts

In each course, the Japanese experts worked on the field as follow: 1) formation of the program (Radiologist, Radiological Technologist), 2) Lecturers of the course (Radiologist, Radiological Technologist). The Japanese experts were present at the expected dates and timescales. The evaluation found that the inputs of those experts were adequate and contributed to the achievement of the project activities significantly.

(2) Dominican Counterpart

CEMADOJA assigned radiologists and radiological technologists in charge of the technical areas and the coordinator in charge of logistic of the project. It is enough to execute the course on the quantity and quality. CEMADOJA does not have enough capacity to work as the educational institution to play the role of host on International training. For example, CEMADOJA does not have the system that secures the use of original radiologic Imaging of CEMADOJA and the provisioning system of teaching files (teaching

archives). This weakness depends on lack of coordination committee to plan, organize, implement and review training course.

(3) Training course in Japan

The most Dominican counterpart participated in the training course in Japan, it contributed to improve the knowledge and technique on the diagnostic imaging.

(4) Equipment

Donated equipments by the project such as the fluoroscopy, sonography, workstation and computers have complementally worked for the implementation of the course. The input of equipments is adequate in the point of quality, quantity, and timing.

(5) Cost

Some factors, that have contributed to reducing the direct costs of the Course, are: a) use of CEMADOJA's existing physical infrastructure (teaching classrooms, work spaces, etc.) and teaching equipment (PowerPoint, projectors, blackboards, desks, tables, PCs, etc.),which has allowed minimum provision of additional equipment; b) By holding the Course at the workplace, it was not necessary to pay transportation fee for the teaching and administrative staffs.; and c) Contributions from other public institutions which involved SESPAS, SEEPYD and the Ministry of Foreign Relations

4-1-4. Impact

Result:High

The evaluation found numerous efforts by the trainees to spread the results of the course in each country. For examples, in Guatemala, the resident program of the CEMADOJA was incorporated into the curriculum of the educational investigation in the national level by the participant of the course. In Nicaragua, the trainees developed the plan to invite the CEMADOJA's lecturers to improve the capacity of diagnostic imaging. Therefore, these findings indicate that the trainees keep motivation to improve the capacity of the diagnostic imaging and spread their knowledge and experience to their colleague. Thus, the high level capacity of the diagnostic imaging expected to be developed in target countries eventually.

Many trainees have begun to reconstruct their own department to improve the infrastructure of diagnostic imaging. It has also just begun to incorporate the teaching system of CEMADOJA including case conferences and some of postgraduate training curriculum. In some cases behavior or attitude toward patient by examiner was improved.

4-1-5. Sustainability

Result: Medium

(1) Management Sustainability

As mentioned above, CEMADOJA has acquired important experience through the organization and implementation of the International Course, although they have always enjoyed the full support of Japanese experts. CEMADOJA has fulfilled its commitment of organizing four sessions of the international imaging course adequately. However, in all four settings, the payment of incentives to lectures was delayed and this was a negative factor which has affected implementation of the training course.

(2) Technical Sustainability

The annual seminars has been held by CEMADOJA to exchange knowledge of Diagnostic imaging, and CEMADOJA Staff has been dispatched to others institutions to improve their capacities to acquire new knowledge and technique. However, to cope with extremely fast progress in the knowledge and technique of the diagnostic imaging, it is necessary to establish the mechanism for the lecturers to brush up the knowledge and technique and to review periodically the contents of material on the course. As the educational institution, CEMADOJA should develop its system, including provision of the transmission network system on diagnostic imaging which is already available in Nicaragua and Panama.

(3) Financial Sustainability

CEMADOJA has demonstrated self-management capacity by buying, with its own funds, a tomography and resonance scanner. Another favorable factor is that JICA has reduced its contributions to the courses and the Centre responded by supplying these resources. But the current modality for implementing the course still requires major economic contributions from SESPAS, CEMADOJA, and JICA. SESPAS has fulfilled its commitments, although with delays on some occasions. At the present moment, CEMADOJA generates income by selling services, but does not have a surplus, so it would be practically impossible for it to cover the entire cost of the courses. Thus, it is necessary to consider the modality of implementation of the course, for example the trainees foot the expense of the participation, based on the concrete financial plan.

CEMADOJA has not developed the capacity to obtain the financial support by the international agency, to market and offer the service. Thus, it is feasible that CEMADOJA works as the national training center, if CEMADOJA fulfills the conditions of educational system. For implementation of domestic training course, CEMADOJA needs the supports by SESPAS for organization and implementation, including financial support. Especially, authorization of the training course by requesting from SESPAS is crucial and also CEMADOJA needs coordination with different health institutions such as medical School, and universities to execute the academic programs according to the national needs.

4-1-6. Verification of inhibiting and promoting factors

(1) Factors that have contributed to promotion

1) Factors concerning to the planning

The content of training course has been planed based on the situations analysis of the target countries to meet their demand. Also, the contents have been revised based on the evaluation of the trainee. As a result, the training course has contributed to the improvement of the quality and efficiency of the clinical service as described before.

2) Factors concerning to the Implementation Process

In Guatemala and El Salvador, most of the trainees (doctors and technicians) were selected of a same hospital, which facilitated that they could apply to their knowledge and experiences in the clinical part. These promoted the effect of synergy to improve the quality and efficiency of the service.

CEMADOJA has obtained an equipment of computerized tomography with their own budget, and this will contribute with the trainees to acquire more recent knowledge and greater experience in the diagnosis by image in the course.

3) Advantage of the course for the technicians.

Some changes have been taken place to influence in the improvement of the course. These changes were:

a. Diminution of hours of theories
b. More time dedicated to the practical part in subjects indicated by the trainees like their areas of preference

These changes seemed to be positive for the participants of the fourth course.

(2) Factors that have inhibited the Project

1) Factors concerning to the planning

For the progress of efficient clinical service with high quality, maintenance and renewal of the diagnostic imaging equipments is crucial. Although, the trainees in El Salvador and Nicaragua proposed to renew the equipments and obtained it, it is usually very difficult to renew diagnostic equipments to utilize obtained knowledge in the course

Also, in targets countries, it was often found that the diagnostic imaging equipments are broken by over use due to lack of maintenance or renewal of these equipments for the shortage of budget. Thus, the course should have more focus on contents to improve the personal and institutional capacity for the maintenance or renewal of the diagnostic imaging equipments.

During the final evaluation, the limitations of the former participants to develop effective action plans were identified. Therefore, their action plans were not concrete and feasible. This is due to lack of appropriate

knowledge of participants how to develop action plans.

2) Factors concerning to the implementation process

It has been delay to pay the incentive to the CEMADOJA's lecturers by SESPAS and it demotivated the lecturers. On the preparation of the course, the lecturers have to send the lecture document in advance to the Japanese experts to check the contents. However the lecturers never have sent the documents until the deadline and, as a result, the Japanese experts have no choice but to modify the most of documents just before the course.

The progress of diagnostic Imaging is very fast and capacity of CEMADOJA as a teaching hospital has not yet reached to enough level. As described in the previous content, this was a weakness which hampered the efficiency of the project. Thus, CEMADOJA needs to improve its system in several aspects. CEMADOJA's lecturers have realized significance of the regular meeting to improve the knowledge and experience of the diagnostic imaging, however, still there are points to be improved such as the record of the meeting, development of teaching files. Also, the CEMADOJA's lecturers (doctors) should be more encouraged to take initiative to improve the academic part of the course.

4-2.Conclusion

1) Based on the results achieved, the evaluation team acknowledges that the Project has been executed according to the plan and that it will achieve its purpose in the established timeframe.
2) Several points should be improved for the quality of the training course and those should be considered for implementation the last training course.
3) Although CEMADOJA developed its capacity as a teaching hospital through implementing the project, it needs certain improvements in technical areas.
4) Since it is difficult to continue international training courses, considering current situation, CEMADOJA should focus on developing its capacity as a teaching hospital for domestic trainings. For this purpose, CEMADOJA should develop the strategic plan.

5. RECOMMENDATIONS AND LESSONS LEARNT

After to have made the final evaluation of the course on the basis of the five criteria of evaluation according to the methodology of JICA, the following recommendations for the short and medium term become.

5-1 Recommendations

5-1-1 Short-term

(1) CEMADOJA is required to develop a short term strategic planning to respond to the necessities of qualification of the participant countries efficiently. This includes developing the system for preparation of teaching files, system of registry of academic activities and pathological clinical radiological conferences, etc.

(2) Participants in the next international course must be instructed how to prepare action plans. Therefore, lecture should be included in the program to acquire knowledge about elaboration of such plans.

(3) It is recommended based on the evaluation of previous trainees that the next course includes students' presentation of cases from their daily practice and to perform exchange sessions between them and the teachers of CEMADOJA to improve their diagnostic capacity.

(4) It is pertinent that in the 5th course the pre and post tests should be revised for an objective evaluation base on review of previous experiences

(5) CEMADOJA must assume a greater level of commitment for the development of their human resources. It would have to start elaborating a system to monitoring their teachers in regards with updating and improving their competences to keep up with the technical advances.

(6) CEMADOJA must formally create a mechanism of reward and compensation to their teachers, according to the their efforts for improving quality of trainings (for example, preparation of teaching files, improvement of the support material and magisterial conferences, etc).

(7) To establish the "Network of the Ex- trainees of the Course" so that they can constantly exchange information and knowledge through the information technology. By this network, participants can utilize chances to make questions to previous lecturers or someone can easily distribute knowledge and information obtained specific opportunities such as international conferences.

CEMADOJA would be responsible to promote the Networks, to create the rules and to give support, to maintain a data base updated, and to announce their programs of qualification and other projects that

arise. Each participant country will have an ex trainee in charge, to give to preside over the group of ex- trainees in the Network.

5-1-2 Mid-Term

(1) CEMADOJA must develop mid-term strategic plan as a leading teaching hospital for domestic trainings.

(2) CEMADOJA must take the initiative of continuously to renew the training program according to international technological advances in the diagnosis by image for technicians and doctors radiologists.

(3) CEMADOJA must be reinforced and be reconstructed to assume its functions for developing and following-up action plans.

(4) As implementing organization of international training course, CEMADOJA needs more managerial support by SESPAS. Thus, it is recommended that SESPAS be involved more as monitoring and evaluation entity against CEMADOJA. This activity by SESPAS must include monitoring achievement indicators, problem solving and initiatives ensuring its permanent improvement. Also, for institutional development of CEMADOJA as a teaching hospital, SESPAS should support in certain aspects, including authorization of trainings based on needs assessment.

(5) For curriculum of radiological technicians, it is recommended to review the experiences in this course, considering significance of practical trainings, and develop appropriate program for future training courses.

(6) A renovation and preventive maintenance plan for equipments must be elaborated and implemented, because these are of the main inputs of the imaging diagnoses and has a high vulnerability to the technological changes. Therefore this it is a key aspect for the sustainability of the CEMADOJA as a leading teaching institution .

(7) The CEMADOJA is recommended to develop capacity as the regional hospital by utilizing current experiences and inputs by Japanese experts. Under transformation of health service system, it can influence on the establishment of policies, systems and norms in the matter.

(8) It is required for SESPAS and CEMADOJA to develop training plans based on needs assessment and the plan of human resource development for future domestic trainings

5-2. Lesson Learnt

The resulting information of the final evaluation of the Course by means of questionnaires and the interviews to ex- participants medical and technician radiologists serve to present important learned lessons in their positive aspect as negative. These are of internal utility so that CEMADOJA takes for reflections and actions and external for the subjects relative to the sustainability of the Project.

(1) Although it is not required to set definite indicators in case of the third country training programs, it is better, in certain situations, to set indicators for each target country to encourage disssemination of training effect. Also, for this kind of trainng courses which includes advanced technology, since instant effect shortly after tarinings is not feasible, it is recommended to develop system to follow-up effects of trainings for certain years.

(2) For evaluation of capacity improvement by training courses, pre-and post-tests are usually used. However, it is difficult to evaluate participants from different settings and motivation with different level of knowledge and technique by simple uniformed test. This might relates to other similar third country training programs and elaborated system for evaluation should be developed for this purpose.

(3) It is important to establishing a follow-up mechanism at the beginning of the project to measure and enhance results. This includes developing action plans by each participants how to utilize knowledge acquired in the course in his/her country and network of participants to exchange information and experiences after the course.

(4) Since this international training program was the first case in this country, implementation of the course might have been a burden for single institute like CEMADOJA. Also, this training program was the first case in this country. Thus, the SESPAS as rector organization must have a greater participation from the stage of preparation of the course.

ANNEX1-1 Agenda of Final Evaluation

			Activities
1	11/25	Wed	9:00 Meeting with former participants (Panama) 14:00 Visit to Santo Tomás Hospital
2	11/26	Thu	Panama→Nicaragua
3	11/27	Fri	9:00 Meeting with former participants (Nicaragua) (Antonio Lenin Fonseca Hospital) 10:00 CAT 15:00 Reporte to JICA office
4	11/28	Sat	Nicaragua→Guatemala
5	11/29	Sun	Internal Meeting
6	11/30	Mon	9:00 Visito to Roosevelt Hospital 14:00 Meeting with former participants (Guatemala)
7	12/1	Tue	Guatemala→El Salvador
8	12/2	Wed	8:00 Meeting with former participants (El Salvador) 13:00 Meeting with Director Hospital Rosales 14:30 Meeting at the Minister of Health 16:30 Reporte to JICA office
9	12/3	Thu	El Salvador→Dominican Republic
10	12/4	Fri	9:00 Internal Meeting 14:30 Interview with firmer participants and C/P
11	12/5	Sat	Internal Meeting
12	12/6	Sun	Internal Meeting
13	12/7	Mon	9:00 Joint Evaluation Committee
14	12/8	Tue	9:00 Joint Evaluation Commitee
15	12/9	Wed	8:30 Signing of MM 11:00 Reporte to JICA Dominican Republic 15:00 Reporte to EOJ

ANNEX 1-2 List of Interviewee

Counterpart

NAME	POST	INSTITUTION
Dr. Alejandro Montero	Director	CEMADOJA
Yuderkis Mejia	Direction Assistance	CEMADOJA
Laura Thoner	Coordinator of the International Course Project	CEMADOJA
Dra. Magdalena Ortiz	Chief of imaging department	CEMADOJA
Dr. Julio Manuel Rodríguez Grullón	Representive of Educación	CEMADOJA
Nurys Tamayo	Chief of Administrativa department	CEMADOJA

Ex Participants

NAME	POST	HOSPITAL	COUNTRY
Cesar Barrías del Cid	Radiological Technologist	Santo Tomas	Panama
Nuria Batista	Radiological Technologist	Hospital Oncológico	Panama
Marabellys Jurado	Radiological Technologist	Policlínica del Seguro	Panama
Maria Fonseca	Radiologist	Hospital Roosevelt	Guatemala
Sandra M. Caniz	Radiological Technologist	Escuela Nacional de Técnicos en Radiología Diagnóstica	Guatemala
Delia Maritza Rodríguez	Radiological Technologist	Hosp. Regional de Occidente	Guatemala
José Manuel Pineda Chacón	Radiologist	Hellen Lossi de Laugerud	Guatemala
Edwin Ottoniel Ixcot Hidalgo	Radiological Technologist	Hellen Lossi de Laugerud	Guatemala
Linda M. Barba Rodríguez	Radiologist	Hospital Escuela Lenin Fonseca	Nicaragua
Brenda Ant. Conrado Mendieta	Radiological Technologist	Hospital Escuela Lenin Fonseca	Nicaragua
Adela C. Castillo Miranda	Radiologist	Hospital Amistad Dominico-Japonesa	Nicaragua
Carla Antonia Largaespada	Radiological Technologist	Hospital Bertha Calderón	Nicaragua
Yadira de los Ángeles López Bravo	Radiological Technologist	Hospital Escuela Lenin Fonseca	Nicaragua
Manuel Ortiz Mercado	Radiologist	Hospital Nacional Rosales	El Salvador
Ana M. Ramírez Vásquez	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Héctor Ant. Guidos Rodríguez	Radiologist	Hospital Nacional Rosales	El Salvador
Julio César Rodríguez Muñoz	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Roxana Jacqueline Escobar	Radiologist	Hospital Nacional Rosales	El Salvador
Carlos Humberto Reyes	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Martha Navarro Batlle	Radiological Technologist	Hospital Nacional Rosales	El Salvador

ANNEX1-3 List of Japanese Experts

Name	Area	Period		MM
NORIO HONGO	Lecturer, Course for Radiologist	2006/1/15	2006/3/13	1.9
HIROMU MORI	Support for Course Preparation (Chief Advisor)	2005/11/6	2005/11/16	0.4
MASAKI WAKISAKA	Support for Course Preparation (Radiologist)	2005/10/24	2005/11/21	1.0
TOMOHIRO HAMADA	Lecturer, Course for Radiologcal Technician	2006/1/15.	2006/3/13	1.9
KOICHI NAKAYAMA	Support for Course Preparation (Radiological Technician)	2005/10/24	2005/11/21	1.0
MASAHISA TAKUMA	Support for Course Preparation (Radiologist)	2006/8/9	2006/9/10	1.1
YUKIO KOISHI	Support for Course Preparation (Radiological Technician)	2006/8/9	2006/9/10	1.1
MICHIAKI SAI	Lecturer, Course for Radiologist	2007/1/14	2007/3/12	1.9
TOMOAKI SHIROO	Lecturer, Course for Radiological Technician	2007/1/14	2007/3/12	1.9
TORU MAEDA	Actualization of Techniqeus on Radiology (Radiolodist)	2007/9/1	2007/10/1	1.0
YASUFUMI KONDOH	Actualization of Techniques on Radiology (Radiological Technologist)	2007/9/1	2007/10/1	1.0
SHUICHI TANOUE	Course Lecturer (Radiologist)	2008/1/23	2008/3/8	1.5
YUKITO YOSHIDA	Course Lecturer, Radiological Technologist	2008/1/23	2008/3/8	1.5
YUZO HORI	Support for Course Preparation (Radiologist)	2008/9/24	2008/10/15	0.7
TOMOAKI SHIROO	Support for Course Preparation (Radiological Technician)	2008/9/24	2008/10/15	0.7
JUNJI KASHIWAGI	Lecturer, Course for Radiologist	2009/1/25	2009/3/14	1.5
KIYOHARU OKUGAW	Lecturer, Course for Radiological Technician	2009/1/25	2009/3/14	1.5
SHUICHI TANOUE	Support for Course Preparation (Radiologist)	2000/9/23	2009/10/8	0.5
IKUYA TAKAGI	Support for Course Preparation (Radiological Technician)	2000/9/23	2009/10/8	0.5

ANNEX1-4 List of Machinary and Equipment

December, 2009

Date	Articulo	Specification	Place	State	State Control	Unit Price (Yenes)	Quantity	Price (Yenes)	Note
Jan - 2006	Laser Printer	Laser Jet 2600n	Dirección/cuarto técnicos	In use	*	68,680.00	1	68,680.00	
Jan - 2006	Color Printer	Deskjet 6540 HP	Ofic. Expertos japoneses	In use	*	34,769.25	1	34,769.25	
Jan - 2006	Color Printer	Deskjet 6540 HP	Ofic. Expertos japoneses	In use	*	34,769.25	1	34,769.25	
Jan - 2006	PC computer	Dimension 3000 Dell	Sala Lectura A	In use	*	115,622.78	1	115,622.78	
Jan - 2006	PC computer	Dimension 3000 Dell	Sala Lectura A	In use	*	115,622.78	1	115,622.78	
Jan - 2006	PC computer	Dimension 3000 Dell	Cuarto de los técnico radiologos	In use	*	115,622.78	1	115,622.78	1 USD = DOP 34.578
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Ofic. Expertos japoneses	In use	*	208,907.39	1	208,907.39	1 DOP = 3.434
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Ofic. Expertos japoneses	In use	*	208,907.39	1	208,907.39	
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Cuarto de los técnico radiologos	In use	*	208,907.39	1	208,907.39	
Jan - 2006	Proyector digital	Infocus X2/1600 Lumenes	Cuarto de los técnico radiologos	In use	*	213,423.10	1	213,423.10	
Jan - 2006	Scanner	Canon scan 3000x	Ofic. Expertos japoneses	In use	*	15,624.70	1	15,624.70	
Jan - 2006	Pantalla de tripode	DA-LITE 84 X 84	Sala Lectura A			45,328.80	1	45,328.80	
May-2007	Fluoroscope	Shimadzu Modelo RS-50A System	CEMADOJA	In use	good	17,824,118.53	1	17,824,118.53	1 USD = ¥117.38 1 DOP = ¥3.675
Apr-2008	Chalkboard .	Blanca mágica 24X36	CEMADOJA	In use	good	2,388.92	1	2,388.92	1 USD = ¥99.29 1 DOP = ¥2.967
May-2008	Laptop	Dell Inspiron 1420	CEMADOJA	In use	good	124,860.00	1	124,860.00	
May-2008	Laptop	Dell Inspiron 1420	CEMADOJA	In use	good	124,860.00	1	124,860.00	
May-2008	Server	Power Edge 29000 III	CEMADOJA	In use	good	623,779.75	1	623,779.75	
May-2008	Hard Disk	750 Seagate	CEMADOJA	In use	good	31,423.10	1	31,423.10	
May-2008	Hard Disk	750 Seagate	CEMADOJA	In use	good	31,423.10	1	31,423.10	
May-2008	Desktop	Dell Vostro 200S	CEMADOJA	In use	good	88,442.50	1	88,442.50	1 USD = ¥104.05 1 DOP = ¥3.092
May-2008	Desktop	Dell Vostro 200S	CEMADOJA	In use	good	88,442.50	1	88,442.50	
May-2008	Switch Linksys	24 ports/SR224	CEMADOJA	In use	good	14,046.75	4	56,187.00	
May-2008	Digital Camara	HP R827	CEMADOJA	In use	good	23,931.50	1	23,931.50	
May-2008	Handycam	DCR-DVD408 DVD	CEMADOJA	In use	good	78,037.50	1	78,037.50	
May-2008	Printer	Laserjet colo HP 2600 Networking	CEMADOJA	In use	good	41,620.00	1	41,620.00	
Jan-2009	Workstation	Visage WS Workstation	CEMADOJA	In use	good	1,927,832.40	1	1,927,832.40	1 USD = ¥90.44
Jan-2009	Photocopier	Canon Imagen Runner IR-2022	CEMADOJA	In use	good	315,614.00	1	315,614.00	1 DOP = ¥2.587
Mar-2009	Sonography	MINDRAY DC-3 CTLP	CEMADOJA	In use	good	3,069,461.48	1	3,069,461.48	1 USD = ¥97.55 1 DOP = ¥2.772
		Total						25,838,607.89	

ANNEX1-5 Participantes of the Course

Year		Name	Country	Ocupation
2005	1	Manuel Ortiz Mercado	El Salvador	Doctor (Radiology)
	2	Ana M. Ramírez Vásquez	El Salvador	Technician (Radiology)
	3	María Fonseca de Chacón	Guatemala	Doctor (Radiology)
	4	Sandra M. Caniz Milián	Guatemala	Technician (Radiology)
	5	Carlos Enrique Rivera Argeñal	Honduras	Doctor (Radiology)
	6	Wilmer Alexander Vásquez Méndez	Honduras	Technician (Radiology)
	7	Linda M. Barba Rodríguez	Nicaragua	Doctor (Radiology)
	8	Brenda Ant. Conrado Mendieta	Nicaragua	Technician (Radiology)
	9	Mario Lee Escala	Panama	Doctor (Radiology)
	10	Nuria Mireya Batista Oda	Panama	Technician (Radiology)
	11	Lissette Bermúdez	Dominican Republic	Doctor (Radiology)
	12	Nurys Altagracia de Jesús Martínez	Dominican Republic	Technician (Radiology)
	13	Freddy Lionel Ortiz Tavarez	Dominican Republic	Technician (Radiology)
2006	1	Héctor Ant. Guidos Rodríguez	El Salvador	Doctor (Radiology)
	2	Marta Navarro Batlle	El Salvador	Technician (Radiology)
	3	Douglas Rafael Henry Ruiz	Guatemala	Doctor (Radiology)
	4	Delia Maritza Rodríguez de León	Guatemala	Technician (Radiology)
	5	Iris Hortensia Durón Gradiz	Honduras	Doctor (Radiology)
	6	Francisco José Mairena Rodríguez	Honduras	Technician (Radiology)
	7	Adela C. Castillo Miranda	Nicaragua	Doctor (Radiology)
	8	Edgar José Pérez Bermúdez	Nicaragua	Technician (Radiology)
	9	Sergio Andrés Landires Rojas	Panama	Doctor (Radiology)
	10	César Ant. Barria del Cid	Panama	Technician (Radiology)
	11	Iván Amaury Piña Saldaña	Dominican Republic	Doctor (Radiology)
	12	Carmen Yanet Pradel	Dominican Republic	Doctor (Radiology)
	13	Isramil A. Galán de la Cruz	Dominican Republic	Technician (Radiology)
	14	Alnerys Guzmán Mejía	Dominican Republic	Technician (Radiology)
2007	1	Susi Grisel Portillo Aguilar	El Salvador	Doctor (Radiology)
	2	Julio César Rodríguez Muñoz	El Salvador	Technician (Radiology)
	3	José Manuel Pineda Chacón	Guatemala	Doctor (Radiology)
	4	Nery Ernesto Acicón Torres	Guatemala	Technician (Radiology)
	5	Diana Carolina Martínez Montoya	Honduras	Technician (Radiology)
	6	Luís Rolando Delgado Velásquez	Honduras	Technician (Radiology)
	7	Noel Cajina	Nicaragua	Doctor (Radiology)
	8	Carla Antonia Largaespada	Nicaragua	Technician (Radiology)
	9	Marabellys Jurado	Panama	Technician (Radiology)
	10	Luís Manuel Castillo Hernández	Dominican Republic	Doctor (Radiology)
	11	Eduardo Miguel Jacobo Cid	Dominican Republic	Doctor (Radiology)
	12	Cristian Bienvenido Ramírez de los Santos	Dominican Republic	Technician (Radiology)
	13	Luz María Aramboles Santos	Dominican Republic	Technician (Radiology)
2008	1	Roxana Jacqueline Escobar	El Salvador	Doctor (Radiology)
	2	Carlos Humberto Reyes	El Salvador	Technician (Radiology)
	3	Irma Johanna Mazariegos de León	Guatemala	Doctor (Radiology)
	4	Edwin Ottoniel Ixcot Hidalgo	Guatemala	Technician (Radiology)
	5	María Berenice Reyes Cardona	Honduras	Doctor (Radiology)
	6	Helena Ruth Canales Funez	Honduras	Technician (Radiology)
	7	Olinda Mariela Espinosa Urbina	Nicaragua	Doctor (Radiology)
	8	Yadira de los Angeles López Bravo	Nicaragua	Technician (Radiology)
	9	Abdiel Horacio Castillo Tristán	Panama	Doctor (Radiology)
	10	Walkiria Yasmín Bell Gómez	Panama	Technician (Radiology)
	11	Yuri Quispe	Dominican Republic	Doctor (Radiology)
	12	Betania Sánchez	Dominican Republic	Doctor (Radiology)
	13	Ruddy Cuevas Féliz	Dominican Republic	Technician (Radiology)
	14	Gabriela Almánzar	Dominican Republic	Technician (Radiology)

ANNEX 1-6 Counterpart Training in Japan

Course	Name	Period	
Medical Equipment Management	Rances Alberto RAMIREZ VERAZ	2005/9/21	2005/12/18
Hospital Management	CASTILLO ESPINAL Sergio Antonio	2006/11/13	2006/12/16
Hospital Management	TAMAYO FRANCISCO DE PENA Nur	2007/10/1	2007/11/3
Imagenology (Radiologist)	PEGUERO HOLGUIN Niraima Donaty	2007/10/3	2007/11/17
Imagenology (Technologist)	SURIEL ROSARIO Fausto Antonio	2007/10/3	2007/11/17
Imagenology (Radiologist)	PEREZ DE LA CRUZ Josue	2007/11/8	2007/12/13
Imagenology (Technologist)	LINARES Maura Brazoban	2007/11/8	2007/12/13
Medical Staff Training Course	ROSARIO CRUZ Crucita	2008/1/8	2008/3/22
Hospital Management	REINOSO GARCIA Santiago Rafael	2008/10/11	2008/11/22
Advanced Technique on Diagnostic Imaging	MONTERO VALDEZ Alejandro Vidal	2009/10/22	2009/11/4
Imagenology (Technologist)	BRITO BATISTA Nahum	2009/10/31	2009/12/3
Imagenology (Radiologist)	PRADEL DE ASMAR Carmen Yanet	2009/11/1	2009/12/3

ANNEX 1-7 Budget Expenditure of the Course

(In RD$)

	2005		2006		2007		2008	
Item	Budget	Expenses	Budget	Expenses	Budget	Expenses	Budget	Expenses
Accommodation			931,392.00	875,882.30	931,392.00	640,695.00	1,079,568.00	942,479.96
Medical Insurance			45,150.00	42,763.50	22,750.00	20,475.00	25,200.00	25,560.00
Per-diem			303,680.00	30,680.00	312,440.00	290,540.00	339,000.00	343,500.00
Transportation	20,000.00	20,000.00	23,100.00	23,100.00	33,000.00	33,000.00	36,000.00	36,000.00
Transportation(Airport)			5,600.00	5,600.00	6,000.00	6,000.00	3,000.00	3,000.00
Food	32,760.00	32,760.00	33,600.00	33,600.00	38,976.00	38,227.40	87,777.20	87,777.20
Textbook	19,842.00	16,692.01	13,103.33	18,251.26				
Material Procurement	66,000.00	66,000.00					17,589.08	17,589.08
Others	20,830.00	20,830.00		29,812.00			49,938.00	55,560.84
	159,432.00	156,282.01	1,355,625.33	1,059,689.06	1,344,558.00	1,028,937.40	1,638,072.28	1,511,467.08

Final Evaluation of the Project of International Course for Radiologists and Radiology Technicians in Central America and the Caribbean at the Dominican Republic

General Consideration by the Chief of the Japanese Evaluation Team

By: Mitsuo Isono, Consultant in Human Development Affairs, JICA.

This was the second time I participated as an evaluator for this project after the Mid-Term Review carried out last year. The technical recommendations made at that time were implemented in the 4th training course (incorporating action plans by the trainees, changes for practice hours, etc..), which shows a positive and prompt actions taken by the course organizers for the purpose of improving the training program quality. However, the recommendations on sustainability and self-management of this course by CEMADOJA, such as approaching to international donors and other entities, have been very difficult, despite of efforts by the CEMADOJA's authorities. For this reason, I consider the most feasible option for now is to develop the institution as a national training center.

Through the studies carried out for the final evaluation, especially at the participating countries, we could verify that the ex-trainees had taken various actions to diffuse knowledge and experience acquired during the training and had raised their capacity for diagnostic imaging, which is judged as considerable positive impact.

Moreover, as referred to in the Final Evaluation Report, there are several aspects in consideration to evaluate a level of achievement for the Objective and Expected Effects for this kind of projects with the participation of third countries. Practically, there are no objective standards to measure the achievement of "improved imaging capability", and it is necessary to consider the time to be taken until tangible effects of their participation start to emerge. (ie, we can't expect the effects to be produced immediately after their return to their countries of origin). Therefore, It would be necessary to monitor the effects or results of this project from a medium to long-term vision. Some kind of follow-up is suggested.

In this occasion, some important problems were noticed for the implementation of this training course, such as methods of assessing the effects of third-country training. In this case, however, a preliminary study was done at its planning stage to verify the situation of the participating countries. It was also attempted to design a training program adjusted to their needs. This point is considered effective, but if it had been contemplated from the beginning to establish some verification indicators or specific goals of training, which might be effective to analyze a real situation of the participating countries, they would have been very useful to make an objective assessment for the project evaluation.

To determine this kind of training effects, the most common method is pre-and post-test to compare the

scores. However, under a more complex situation, with participants coming from different environment and having different levels of knowledge and experience, as if a training course in third countries, it has been pointed out the necessity to analyze an effectiveness of pre-and post text. To measure the impact of training more precisely, it is necessary to develop tests, taking into account the participant's different professional backgrounds. This would be a lesson for other similar projects to be issued in the future.

Being a training project in a third country, the participation of Japanese experts has been reduced, and perhaps partly for that reason, in this final assessment, it was observed that counseling by Japanese experts aimed at developing the CEMADOJA's capacity as an education and training institution, has not been fully assimilated by its staff. Therefore, the result of sustainability assessment has been very critical for the institution. It is required to improve or overcome many technical tasks to carry out the final year (course).

A number of technical requirements have been identified for CEMADOJA to develop as a national training center, as mentioned above. On the other hand, the country is not yet prepared to develop this type of training course as a lucrative business. Meanwhile, the initiative of the SESPAS authorities will be required at both central and regional level in order to take advantage of CEMADOJA capacity within a official scheme of the National Human Resources Training Plan. That means CEMADOJA will provide education and training programs as official assigned task by SESPAS, which will provide the necessary resources.

On the other hand, it will be required to establish a monitoring system by the SESPAS regarding to a quality of education and training services of the CEMADOJA. Besides, it is very difficult for the CEMADOJA to manage training programs by their own resources, and economic support would be essential by the public sector. In other words, SESPAS must have initiative to create a training mechanism, in which the CEMADOJA should be positioned as one of the important resources, instead of leaving them to manage it on their own. First of all, it would be necessary to develop a training plan and training for human resources in the country, according to an accurate assessment of training demand to be taken before.

As I mentioned at mid-term evaluation, this project has become to fulfill a completion or consolidation stage of Japanese assistance in the field of medicine that has been maintained for over 20 years since the construction of the Center for Gastroenterology in 1989 (non-reimbursable financial cooperation) and the implementation of the Clinic and Research Project for Gastroenterological Disease. Regarding this point, the conducting of a training project with the participation of neighboring countries means that the Japanese cooperation has opened the door to the region. I hope that the participation and involvement in this type of project could serve as a starting stone toward further development of radiology in the participating countries. I will take this opportunity to express my highest votes to the staff of Oita University and all the people who in one way or another have been involved in the present project.

Considerations on Aspects of Diagnostic Imaging at the Time of the Final Evaluation

By: Dr. Hiromu Mori, Professor and Chief of the Department of Radiology and Imaging Sciences, Faculty of Medicine, University of Oita, Japan.
Adviser for Research Projects.

Just a month ago, in order to commemorate the 100th anniversary of its foundation, the British Science Museum interviewed 50,000 people to survey the most important discoveries and inventions in human history. According to the results announced on 4 November 2009, the X-ray occupied the first place, beating the discovery of the double helix structure of deoxyribonucleic acid (DNA) and penicillin, which took second and third place respectively. After Wilhelm Röntgen discovered X-rays, 110 years later, currently the dominant methods of diagnostic imaging are computed tomography (CT) and magnetic resonance imaging (MRI). In Japan, almost all users of general hospitals are benefitted from some modality of diagnostic imaging.

The International Course for Medical Diagnostic Imaging for Radiologists and Radiological Technicians from Central America and the Caribbean Region is considered as the phase that would highlight the Japanese assistance in medical education for 10 years or so, including the preliminary study phase in 1998 and the implementation of the Medical Education Project (2000 to 2004). Considering different levels of medical technology and the uniqueness of each country in the imaging field, the biggest challenge was to design a course to enable as more efficient technology transfer as possible in a short period. It was also based on the idea of achieving a settlement of a mechanism for academic updating of teaching staff and a financial management system that would enable the renewal of radiological equipment properly at CEMADOJA, which would serve as the international training scene with the purpose for disseminating those system or mechanism to the participating countries.

As mentioned in the Final Evaluation Report drafted in English and Spanish, it was observed that ex-trainees from Guatemala, El Salvador, Nicaragua and Panama, had succeeded in improving significantly the working environment for diagnostic imaging services at medical facilities to which they belong and maintain high level of motivation to raise their expertise. In addition to achieving infrastructure improvement such as an introduction of computerized tomography, also an improvement in the case studies system was verified (morning conference, for example). The ex-trainees and those involved in these participating countries showed great desire to continue this training course. Even better, some of them requested an implementation of technical cooperation project with direct participation of Japanese experts such as the Medical Education Project executed at Dominican Republic. This is an evidence of the high level of achievement of this training project with third countries. However, it is true that in a short time you cannot measure the degree of improvement in diagnostic capacities and should also be analyzed the level of sustainability of the project. We require deep analysis on the possibility of some kind of follow up, based on the results obtained and verified in the final evaluation.

On the other hand, it is really disappointing to say that it has been observed on this occasion, a low level of awareness of CEMADOJAs' teaching staff as a member of an educational institution. One of the reasons of such low motivation is the delay in payment of incentives from the Ministry of Health and Welfare (SESPAS). Therefore, it is considered essential to have greater economic contributions by the SESPAS to meet this commitment to teaching staff of CEMADOJA.

Furthermore, it is also found that the CEMADOJA still lacks one of the most fundamental systems that must have an educational institution, in other words, an effective system for updating expertise of teachers hasn't been established, although the task was initiated since the Project of Medical Education.

Speaking specifically, they haven't yet established an appropriate system to stock so-called teaching files, with educational utility which must be composed of the history of each patient, images and radiographic findings (blood flow), interpretation and diagnosis references (main and differential diagnosis) and bibliography. This lack causes the fact that still a big part of the images or cases used in classes of this course, are taken from books or internet. This implies a lack of monitoring effort to confirm the radiological diagnostic with clinical and pathological evidence, for example, cases of biopsy, conferences among three departments (radiology, clinical and pathology), which must be held regularly, and so on. Also it means a lack of a system of records which must be organized at the institutional level, all this information as a case study for feedback on educational activities.

As an educational institution in a field of diagnostic imaging that is now progressing very fast, it is extremely important to implement and maintain storage systems of case studies and updating of technical staff expertise. While not denying an importance of each particular technique, the main objective of the training course is to demonstrate and diffuse a system of academic development as an educational institution and innovative measures implemented in this sense. Considering the great diversity of needs and professional standards of the countries involved, without avoiding the very speedy advances in diagnostic imaging, although we could design a training program that covers 100% of all advanced technologies at one point, sooner or later, it will become obsolete as a result of steady progress of radiology. Indeed, in the medical field, there are not few technologies that become "fossil" after only 10 years in existence.

As mentioned above, there have been still several issues to be improved on CEMADOJA as training institution, however, it is considered that the Project has achieved significant results and improvements suggested in this occasion are achievable. CEMADOJA is required to endeavor to implement financial management systems and professional development at the institutional level, as well as to continue improving as an educational institution in the field of diagnostic imaging.

MINUTES OF MEETING BETWEEN
THE JAPANESE FINAL EVALUATION MISSION
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE DOMINICAN REPUBLIC
ON
JAPANESE TECHNICAL COOPERATION FOR
THE PROJECT OF THE INTERNATIONAL COURSE OF THE DIAGNOSIS BY IMAGES COURSE FOR
RADIOLOGISTS AND TECHNICIANS OF LATIN AMERICA AND THE CARIBBEAN

The Japanese Final Evaluation Mission (hereinafter referred to as "the Mission"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Mitsuo Isono visited the Dominican Republic and the countries concerned from November 25 to December 9, 2009, for the purpose of Final Evaluation of The Project of the International Course of the Diagnosis by Images for Radiologists and Technicians of Latin America and The Caribbean (hereinafter referred to as "the Project").

During its stay, the Mission had a series of discussions with the Dominican authorities concerned, jointly evaluated the achievements of the Project, and exchanged views for further improvement of the Project.

As a result of the discussions, both sides agreed upon the matters referred to in the document attached hereto.

This text is written in English and Spanish. Both of which are equally official. The English text shall prevail in case of any divergence of interpretation.

Santo Domingo, Decembert 9, 2009

Dr. Mitsuo Isono
Leader
Japanese Mid-term Evaluación Mission
Japanese International Cooperation Agency
Japón

Dr. Bautista Antonio Rojas Gómez
Secretary of State
Secretary of Public Health and Social Asistance of State
Dominican Republic

Dr. América Bastidas.
Subsecretary of International Cooperation
Secretary of Economic, Planning, and Development
of State
Dominican Republic

ATTACHED DOCUMENT

Summary

The Evaluation Mission and Evaluation Committee for the Project in the Secretary of Public Health and Social Assistance of State (hereinafter referred to as "the Evaluators") prepared the Final Evaluation Report and confirmed the following achievement of the Project. Besides, based on the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability), the Project is evaluated as successfully been implemented. However, more strengthening is needed for efficiency and there still remain points to be improved in the Project's sustainability.

Annex

- Final Evaluation Report

Final Evaluation Report on the "International Diagnostic Imaging Course for Radiologists and Radiology Technicians in Central America and the Caribbean"

Joint Evaluation Committee

Santo Domingo, Dominican Republic, December 9, 2009

Evaluation Committee Members:

Mitsuo Isono

Julio Manuel Rodríguez Grullón

Hiromu Mori

Federico E. Núñez

Doris Holguín

Lucas Gómez

Toshiya Wakabayashi

Pablo Herasme

Maritza Olivier

CONTENTS

ACRONYMS AND ABBREVIATIONS

ADS	Antidiuretic Substance
CEMADOJA	Centro de Educación Médica y Amistad Dominico-Japonesa Dominican Japanese friendship Center of Medical Education
C/P	Counterpart
CT	Computed Tomography
JCC	Joint Coordination Committees
JICA	Japan International Cooperation Agency
IVR	Interventional Radiology
MRI	Magnetic Resonance Imaging
SESPAS	Secretaría de Estado de Salud Pública y Asistencia Social Ministry of Public Health and Social Asistance of State
SEEPYD	Secretaría de Estado de Economía, Planificación y Desarrollo Ministry of State of Economy, Planning, and Development
RX	Convencional X-ray

1. INTRODUCTION

1.1 Background of the Project

Considering the lack of development in the field of medicine and public health induces various impediments for meeting the needs of the majority in the Dominican Republic, Dominican Ministry of Public Health officially requested to the government of Japan for constructing the new center for medical education by Grand Aid within the Luis Aybar General Hospital (currently called the Luis Aybar Health and Hygiene City). In addition, it was also mentioned that there was the needs of providing the training courses for the experts in Imaginology and Epidemiology.

Consequently, in 1999, Dominican Japanese friendship Center of Medical Education (CEMADOJA) was constructed and the medical education projects had started in same year for the period of 5 years. In the project, the emphasis was on the provision of equipment for completing its facility as well as the training courses for the local medical doctors and technologists for achieving the technology transfer. As the result, the center had become one of the highly evaluated medical educational institutions in the country.

In March 2004, the project was finished with the recognition of success by the final evaluation. In the response to its success, the Dominican government requested further technical cooperation in executing the training programs for medical experts within the country as well as for her neighboring countries.

After revising the proposals, evaluation of the capacity of CEMADOJA as a training institute was conducted by the local consultant as indicated by the previous evaluation. In addition, CEMAJOJA-JICA joint mission was dispatched to the five countries in the Central America (such as Honduras, Panama, El Salvador, Guatemala and Nicaragua) to investigate needs for trainings for such fields.

The result shows that the further technical cooperation was necessary. In these targeted countries, the knowledge and skills of Radiologists and Radiological technologists are backward and undeveloped; therefore, there is the high demand of renewing and updating their knowledge and information. In addition, the CAMADOJA has certain capacity to provide the training courses to meet those needs with the collaboration of JICA in planning and execution of the training program.

Based on the result of the previous evaluation, the agreement on its program of the first training course was made between JICA and CEMADOJA. Finally, on September in 2005, the both signed the R/D, the Dominican Minister of Public Health and Director of JICA.

Radiologists and Radiological Technologists participate in the course from each country (two radiologists and two radiological technologists from the Dominican Republic), in total 14 participants. The Course is composed of the two parts: Program for radiologists and for radiological technologists. CEMADOJA's medical staff gives class of the radiological diagnosis (vascular system, brain, etc). The other part,

technical staff gives class of radial protection, projection position, etc. Japanese experts collaborate to compose the program and gives class about the advanced diagnostic Imaging.

1.2 Objectives of the Evaluation

The International Diagnostic Imaging Course for Radiologists and Radiology Technicians in Central America and the Caribbean (hereinafter referred to "The Course") will have been under way and completed in March of 2010.

JICA decided to conduct a Final Evaluation in order to evaluate the activities held to date, the initial results achieved and the difficulties encountered, as well as to identify suggestions and recommendations that will allow for improving execution during the rest of the Project's duration. For this purpose, the Mission was organized, which visited the Dominican Republic and some of the participating countries - El Salvador, Guatemala and Nicaragua - between 25th November and 9th December 2009

The activities were realized as follows:

(1) Describe, understand and verify the processes and achievements of the implementation of the International Diagnostic Imaging Course for Radiologists and Radiological Technologists in Central America and the Caribbean.

(2) Joint evaluation by Dominican and Japanese teams for five criteria.

(3) Discussion on the process and achievement of the Project, extract lessons learned and draw up a set of recommendations aimed at improving the course implementation.

1.3 Evaluation agenda

It shows in Annex 1-1.

1.4 Interviewee List

It shows in Annex 1-2.

2. METHODOLOGY OF FINAL EVALUATION

2-1. Evaluation Methodology

2-1-1. Evaluation Method

The evaluation was based on the "JICA Project Evaluation Guidelines" manual and was conducted on the basis of the following criteria that the Manual defines:

(1) Relevance

Relevance of the Project plan is reviewed by the validity of the Project Purpose and the Overall Goal in connection with the development policy of the Government of Dominican Republic and needs of the beneficiaries and also by logical consistency of the Project plan.

(2) Effectiveness

Effectiveness is assessed by evaluating to what extent the Project has achieved its purpose and clarifying the relationship between the purpose and outputs.

(3) Efficiency

Efficiency of the Project implementation is analyzed with the emphasis of the relationships between outputs.

(4) Impact

Impacts of the Project are assessed in both positive and negative influences caused by the Project.

(5) Sustainability

Sustainability of the Project is assessed in organizational, financial, and technical aspects by examining the extent to which the achievement of the Project will be sustained and expanded after the Project's completion.

2-1-2. Method of collection and analysis on the data

The following activities were carried out for the evaluation:

(1) Review of Documents

A set of basic documents about CEMADOJA and about the courses that were held were reviewed and analysed.

(2) Visits to CEMADOJA

Visits were made in order to get to know the structure and the conditions of the Centre and to meet with its staff.

(3) Visits to participants' Hospitals in El Salvador, Guatemala, Panama and Nicaragua

Visits were made to several of the participants' hospitals in order to get to know the conditions and the type of work that they do, to hear the opinions of their managers and co-workers, and to get to know the follow-up work they have done since they received the training.

(4) Interviews

Structured and open interviews were held with: CEMADOJA and JICA officials, Course teachers and beneficiaries. During the evaluation participants from El Salvador, Guatemala, Nicaragua, Panama and Dominican Republic were made.

(5) Use of questionnaires

Questionnaires were prepared, distributed, compiled, processed and analysed, targeted at: Japanese experts, teachers, and participating radiologists and radiological technologists. 60% of the participants responded to the questionnaire, 92% of the teachers and 53% of Japanese experts. Since the completed questionnaires comprise a significant quantity as a total but lacked sampling criteria, it can be said that they are relevant but not necessarily representative.

2-2. Joint Evaluation

The final evaluation was executed by the Joint Evaluation Committee composed by four Dominican and four Japanese evaluators. The members of the Joint Evaluation Committee as follows:

(1) Japanese part

- Mitsuo Isono: Mission leader, Senior Advisor, Japan International Cooperation Agency
- Hiromu Mori: Diagnostic Imaging, Professor and Chairperson, Department of Radiology, Oita University Faculty of Medicine
- Doris Holguín: Evaluation, Dominican Republic Office, Japan International Cooperation Agency
- Toshiya Wakabayashi: Planning the Evaluation, Dominican Republic Office, Japan International Cooperation Agency
- Maritza Oliver: Evaluation and Analysis

(2) Dominican part

- Julio Manuel Rodriguez Grullón: President of "la Ciudad Sanitaria, Dr. Luís E. Aybar" / Coordinator of Dominican part
- Federico E. Núñez: General Director, Cardio-Neuro Ophthalmologist y Trasplant Center
- Lucas Gómez: General Director of Hospital department, Secretariat of State of Public Health and Social Asistance(SESPAS)
- Pablo Herasme: Annalist of International Cooperation, Ministry of State of Economy, Planning and Development (SEEPYD)

2-3. Project Design

(1) Project Purpose

The Radiologists and Radiological Technologist in Central America and Caribbean, who participated in the Course, progress the capacity to do Diagnostic Image.

(2) Output

1) The Radiologists and Radiological Technologist, who participated in the Course, diffuse their knowledge, technique, and progress in the capacity to diagnose by image to contribute the improvement of health service in their countries.

2) CEMADOJA progresses the capacity of management to realize international courses by efficient and effective means, and shall be the Regional Center of Central America and Caribbean on the area of Diagnostic Image.

(3) Participants

The course is aimed at Radiologists and Radiological Technologist in Central America and the Caribbean. In the first four occasions, professionals from El Salvador, Guatemala, Honduras, Nicaragua, Panama and the Dominican Republic (as host country) took part. Each session was supposed to contain seven (7) radiologists and seven (7) radiological technologists. The participants must be university educated, have more than 2 years' professional experience, from the public sector, under the age of 45 and not providing any kind of military service.

(4) Project Beneficiaries

The project has direct and indirect beneficiaries.

1) Direct Beneficiaries:

- Participating Radiologists and Radiological Technologists

  These are the most direct targets and beneficiaries of the Course. They are the Radiologists and Radiological Technologists from the invited countries who have taken part in the course.

- Lecturers

  CEMADOJA's technical and medical staff members who have taught classes in the courses.

- CEMADOJA staff

  The Centre's management and administrative staff who have taken part in the organization and development of the courses.

2) Indirect Beneficiaries:

- Patients or users of services

  Service users in the hospitals or organizations where the course participants work, who have been able to receive benefit from the increase in practical and theoretical knowledge of participants in the Course.

- Radiologists and Radiological Technologists

  Staff in the workplaces of the trained radiological technologists and radiologists who have

opportunity to receive benefit from the trained professionals and through sessions where the acquired knowledge has been reproduced.

(5) Lecturers or Instructors

The teachers responsible for teaching the Course are radiologists and radiological technologists at CEMADOJA. Most of them were trained in Japan. For capacity development of the centre, there are also support by Japanese experts who provide technical and organizational advice.

(6) Course Methodology

The course combines theoretical knowledge with practical teachings derived from the services that CEMADOJA provides on a daily basis. It also includes visits to other imaging centres. During the course, participants are divided into two groups: one made up of radiologists and one made up of radiological technologists, which join together on several occasions. The idea is to generate a participative and interactive environment, through a horizontal atmosphere of professional colleagues.

(7) Sessions held

To date the Course has been held on four occasions:

1st Course	30th January and 3rd March 2006
2nd Course	29th January and 2nd March 2007
3rd Course	29th January to 28th February, 2008
4th Course	2nd February to 6th March, 2009

3. Project Achievements

3-1. Achievement of the Project Purpose

Four sessions of the International course on the diagnostic imaging have been conducted, and 54 trainees (Radiologist: 25, Radiological Technologist: 29) participated in the course.

The 60% of the trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues based on the results of the project. These activities, described in details as below, can help improving the capacity on diagnostic imaging in their own countries. Therefore, it might be judged that the project purpose will be accomplished. However, it is difficult to prove improvement of diagnostic capacity objectively at this moment due to lack of appropriate indicators. It is necessary to follow up the productivity of ex participants, to evaluate objectively the achievement of capacity development on diagnostic imaging.

In the Minutes of Meeting of this project, it is mentioned that the capacity of diagnostic imaging on radiologists and radiological technologists shall be improved. This evaluation found that by the planned implementation of formal training radiologists and radiological technologists acquired the academic requirements for high performance in their work. It is found that the implementation of the course led to the recognition of the training needs in hospitals in the target counties, to assure that the staff meets the condition demanded on their work.

Among the results of the project, there is certain achievement in the distribution of knowledge obtained by the course. From the fourth course, to design the action plan became to be mandate. This seems to encourage distribution of the knowledge and improvement of abilities for their colleagues in various hospitals.

Impact of the course in target countries:

Generally, more than 90% of the trainees has expressed that their motivation increased not only in the implementation of work, but also in the desire to continue to train and update their knowledge and skills after the course. This motivation of the trainees to learn continuously affect to their colleagues stimulating the academic interest.

Panama

As for the impact in Panama, some radiological technologists showed the positive effect. Communication with patients during treatment has been improved by which the direct treatment for the patients has been improved by keeping informing what they are doing.

The radiological technologists, who participated in the interview, told that they learned how the equipments work to produce the imaging and also they could deepen the knowledge about function of the equipments. Therefore they avoid excessive use.

Also, the ex participants expressed that they learned in the course how to identify needs of equipments to request.

Nicaragua

In the Lenin Fenseca Hospital, one of the most beneficiaries in the course, ex-participants told that their attendance of the course was very important. Because they could apply the knowledge in their diagnostic imaging center, which was built after six month of their return form the Dominican Republic. Therefore, the new structure was benefited easily by the course. The participation of the course motivated them for continuous learning and, for the reason, they requested to JICA the follow up cooperation to transfer the knowledge by the CEMADOJA to other colleagues. And, some ex participants utilize the teaching material of CEMADOJA in their area.

For the radiological technologist in this hospital, knowledge about the magnetic resonance was completely new, but helped them to use the new equipment.

Finally, ex participants in Nicaragua have confident that now they have obtained the capacity to respond the hospital needs including new equipments and human resource development.

Guatemala

It is most important impact in Guatemala that all of the protocols of imaging have been changed to adjust the protocols of CEMADOJA after participation in the course. The case presentation was very meaningful for them in the course and they have integrated the case presentation to the post graduate program for the first time. The lecturers, who are ex participants of the course, agreed that the teaching material in the course is very useful for the lecturers in the country.
Experiences in the course was applied to the Continuous Education Program and the topic of the course, for example breast cancer, was introduced as the one of theme.

El Salvador

In Rosales Hospital, the residents program of CEMADOJA was introduced by the ex participant. On the other hand, the most of ex trainees have participated as an exponent of the congress and coordinator of academic activities.

The committee to update the imaging diagnosis in Rosales Hospital was formed by ex trainees of the course. Also, the communication among and radiologist in Center America has improved after the course.

Dominican Republic

CEMADOJA's Lectures could update the knowledge as the lecturers thorough the participation of the training course in Japan, and it was their direct beneficial, by the assistance by Japanese experts, to make teaching material and to have opportunity of practical teaching with participants groups in organized activities.

The ex trainees of radiologists participated from 11 hospitals and 10 provinces, and it is expected that the results of the course will be spread widely in the country.

Thus, it is judged the project purpose has been achieved at certain degrees, although there is no objective indicator.

3-2. Achievement of Outputs of the Project

3-2-1 Output 1

On the acquirement of the knowledge and technique of the diagnostic imaging, the trainees examine pre – test and post test during the course, and the result of the post test was better than that of the pre test as the below table. In third and fourth training courses, there was only little improvement in scores for radiologists. In general, radiological technicians tended to gain better scored than radiologists. However, exact evaluation by pre- and post-tests are difficult, because of different settings and motivation of participants with different level of knowledge and technique.

Table: Result of Pre test and Post test

Radiologist

	1st course	2nd course	3rd course	4th course
Pre Test	39.3	40.4	36.0	40.1
Post Test	62.0	69.2	43.0	46.6

Radiological Technologist

	1st course	2nd course	3rd course	4th course
Pre Test	51.4	40.0	29.8	20.4
Post Test	79.7	80.6	78.4	69.5

The 60% of the trainees has conducted or planned some educational activities to diffuse the knowledge and experience of the course to their colleagues based on the results of the project as described in 3-1.

Thus, it is judged that there is certain achievement regarding output1, but as same as the achievement of the project purpose, objective evaluation of the project on output 1 should be made after following –up for certain duration.

3-2-2 Output 2

On the management capacity of the CEMADOJA to execute the course, it can be analyzed as follows:

- Planning of implementation of the course
- Review of the program
- Quality of the lecturers
- Equipment of the diagnostic imaging
- Administration of the course
- Evaluation and Feedback system on the course

More than 90% of the trainees were satisfied at the contents of the program and quality of the lecturers of the course. This result indicates the capacity of CEMADOJA to conduct international training courses. In addition, based on the following analysis, it is judged that CEMADOJA has acquired the basic management capacity to execute the course, although still there are certain points to be improved.

(1) Planning of implementation of the course

CEMADOJA has executed the four sessions of the course supported with JICA. A technical coordinator was assigned in the project and has accumulated the experience for the planning and implementation of the course through the four sessions. Only one coordinator has been engaged on the planning, so that it is necessary to share the experience in the institution to sustain capacity in this regards.

(2) Review of the program

Continuous review of the program to improve contents of trainings is crucial, but CEMADOJA has relied on the supports by Japanese experts in this regard. By utilizing accumulated experiences on the review of the program, active involvement of CEMADOJA into review of the program is expected. In this regards, coordinating committee should be developed to review, organize and implement training courses.

(3) Quality of the lecturers

As qualified teaching hospital, continuous improvement of knowledge about diagnostic imaging is crucial. CEMADOJA's lecturers have realized the significance of this issue and have just recently begun to have initiative of improvement of the knowledge about diagnostic imaging and contents of the lecture.

(4) Equipment of the diagnostic imaging

The renewal of equipment is crucial to keep up with international standards, but expensive cost might be obstacles. However, recently CEMADOJA could made efforts to obtain the Computerized Tomography by their own budget. Therefore it is expected that CEMADOJA can renew the equipment of diagnostic imaging periodically from now on.

(5) Logistic of the course

The coordinator of the project has accumulated experience on the logistic of the course, therefore there was no logistic problem such as transportation, accommodation, etc. This was proved by the interview and questionnaires of participants. However, it is necessary to form the coordination team, to maintain the implementation capacity of the course.

(6) Evaluation and Feedback system on the course

The evaluation meeting was held at the end of the each course by initiative of the CEMADOJA staff. They have discussed many points to improve the course in each evaluation meeting. It is necessary to strengthen the feedback system through the formation of the coordination committee to reflect the result of the meeting.

3-3. Input of the Project

(1) Personal Input

In the project, Japanese experts work in the area of formation of the program (Radiologist, Radiological Technologist), and Lecturers of the course (Radiologist, Radiological Technologist), in total it is sent 19 experts shown in Annex 1-3.

(2) Equipment Input

It is donated the equipment to complement the implementation of the project, such as sonography, workstation, computer, etc, shown in Annex 1-4.

(3) Trainees

54 trainees participated in the course shown in Annex 1-5.

(4) Training course in Japan

12 trainees of CEMADOJA participated in various training course in Japan shown in 1-6.

(5) Implementation cost of the course

The Implementation cost of the course shown in Annex 1-7.

4. EVALUACION RESULTS

4-1. Evaluation Results on five criteria

4-1-1. Relevance

Result: High

Diagnostic imaging is of fundamental and has growing importance in health interventions, in the midst of an epidemiological transition from preventable diseases to chronic degenerative diseases. The Central American and Caribbean countries are continuously acquiring radiological equipment, although the quantity and quality do not match their needed, in order to improve their diagnostic procedures. This increase in equipment requires technically trained staff for interpreting test results. But also, due to a lack of adequate radiological knowledge, some diseases are not detected in time and later turn out to be catastrophic. It is in this context that the International Diagnostic Imaging Course for Radiologists and Radiological Technologists in Central America and the Caribbean responds to these regional training demands in the area of diagnostic imaging.

The Course organization by CEMADOJA corresponds to the center's Vision, having emerged as the leader in the Dominican Republic when it comes to continuing education in imaging and serving other, technologically less advanced, countries. Likewise, it is in keeping with its Mission as a teaching, training, skill sharing and research and development centre for continuing medical education in advanced and high technology diagnostic imaging. Moreover, increasing the skills of national staff in the area of imaging supports the process of improving health services pursued by the Dominican Government through its Health Sector Reform and the implementation of the New Dominican Social Security System. In addition, the provision of an international course in diagnostic imaging by a public institution supports the Dominican Government's efforts to project the country as a regional technological centre.

As documented in "Tokyo declaration 2005 action plan", Dominican Republic would play a crucial part on the medical education in Central America and Caribbean countries. From this point of view, this project fully coincides with the international assistance plan of Japan.

The deliberation about Economic Cooperation Policies between Japan and the Dominican Republic was held in August of 2003, and it was defined that the assistant areas of Japanese part are as follow: 1) Agriculture, forestation and fishery, 2) Health, 3) Education, 4) Environment, 5) Promotion of Foreign Investment and Exportation, and 6) Tourism. The Project is the cooperation in Health area, therefore, coincides with the Japanese ODA policy.

JICA Dominican Republic concentrates on the three programs: 1) Poverty Reduction, 2) Competitiveness Improvement,3) Environmental Protection. The over goal of project is to improve the quality and efficiency of the clinical service, and it contributes to improve the life level of the population. Therefore, the project is contained in the Poverty Reduction Program, and coincides with the policy of JICA Dominican Republic.

4-1-2. Effectiveness

Result: High

(1) Achievement of the project purpose

As described in 3-1 and 3-2, certain achievement by the project has been confirmed.

(2) Contribution of the results to the achievement of the project purpose

It has been contributed the achievement of the project by the two results: 1) Acquirement of the knowledge and technique on the diagnostic imaging by trainees, 2) Improvement of the CEMADOJA's management capacity on the course.

The course offers to the trainees the practical knowledge and technique on the diagnostic imaging, therefore it is contributed for the trainees to apply effectively the experience of the course to the clinical place. For designing the course, situational analysis in the target countries was conducted to investigate the needs for trainings. This helped to develop the program to meet demands in target countries. In this evaluation, the 84% of the trainees of radiologists and radiological technicians expressed that the knowledge acquired by the course is quite beneficial for patients on the clinical service. For the organization of the course, for more 90% of trainees were satisfactory. These indicate means that the contents of the course were appropriate to meet the demand of the trainees and coincide to the needs.

CEMADOJA has accumulated the experience of the implementation of the course, therefore it has been improved gradually the facility of implementation of the project, and it contributes for the trainees to learn effectively the contents of the course.

4-1-3. Efficiency

Result: Medium

The evaluation found that there was some weakness in capacity for conducting training courses which affected the efficiency of the project. Therefore the efficiency is judged to be Medium.

(1) Japanese experts

In each course, the Japanese experts worked on the field as follow: 1) formation of the program (Radiologist, Radiological Technologist), 2) Lecturers of the course (Radiologist, Radiological Technologist). The Japanese experts were present at the expected dates and timescales. The evaluation found that the inputs of those experts were adequate and contributed to the achievement of the project activities significantly.

(2) Dominican Counterpart

CEMADOJA assigned radiologists and radiological technologists in charge of the technical areas and the coordinator in charge of logistic of the project. It is enough to execute the course on the quantity and quality. CEMADOJA does not have enough capacity to work as the educational institution to play the role of host on International training. For example, CEMADOJA does not have the system that secures the use of original radiologic Imaging of CEMADOJA and the provisioning system of teaching files (teaching archives). This weakness depends on lack of coordination committee to plan, organize, implement and review training course.

(3) Training course in Japan

The most Dominican counterpart participated in the training course in Japan, it contributed to improve the knowledge and technique on the diagnostic imaging.

(4) Equipment

Donated equipments by the project such as the fluoroscopy, sonography, workstation and computers have complementally worked for the implementation of the course. The input of equipments is adequate in the point of quality, quantity, and timing.

(5) Cost

Some factors, that have contributed to reducing the direct costs of the Course, are: a) use of CEMADOJA's existing physical infrastructure (teaching classrooms, work spaces, etc.) and teaching equipment (PowerPoint, projectors, blackboards, desks, tables, PCs, etc.),which has allowed minimum provision of additional equipment; b) By holding the Course at the workplace, it was not necessary to pay transportation fee for the teaching and administrative staffs.; and c) Contributions from other public institutions which involved SESPAS, SEEPYD and the Ministry of Foreign Relations

4-1-4. Impact

Result:High

The evaluation found numerous efforts by the trainees to spread the results of the course in each country. For examples, in Guatemala, the resident program of the CEMADOJA was incorporated into the curriculum of the educational investigation in the national level by the participant of the course. In Nicaragua, the trainees developed the plan to invite the CEMADOJA's lecturers to improve the capacity of diagnostic imaging. Therefore, these findings indicate that the trainees keep motivation to improve the capacity of the diagnostic imaging and spread their knowledge and experience to their colleague. Thus, the high level capacity of the diagnostic imaging expected to be developed in target countries eventually.

Many trainees have begun to reconstruct their own department to improve the infrastructure of diagnostic imaging. It has also just begun to incorporate the teaching system of CEMADOJA including case conferences and some of postgraduate training curriculum. In some cases behavior or attitude toward patient by examiner was improved.

4-1-5. Sustainability

Result: Medium

(1) Management Sustainability

As mentioned above, CEMADOJA has acquired important experience through the organization and implementation of the International Course, although they have always enjoyed the full support of Japanese experts. CEMADOJA has fulfilled its commitment of organizing four sessions of the international imaging course adequately. However, in all four settings, the payment of incentives to lectures was delayed and this was a negative factor which has affected implementation of the training course.

(2) Technical Sustainability

The annual seminars has been held by CEMADOJA to exchange knowledge of Diagnostic imaging, and CEMADOJA Staff has been dispatched to others institutions to improve their capacities to acquire new knowledge and technique. However, to cope with extremely fast progress in the knowledge and technique of the diagnostic imaging, it is necessary to establish the mechanism for the lecturers to brush up the knowledge and technique and to review periodically the contents of material on the course. As the educational institution, CEMADOJA should develop its system, including provision of the transmission network system on diagnostic imaging which is already available in Nicaragua and Panama.

(3) Financial Sustainability

CEMADOJA has demonstrated self-management capacity by buying, with its own funds, a tomography and resonance scanner. Another favorable factor is that JICA has reduced its contributions to the courses and the Centre responded by supplying these resources. But the current modality for implementing the course still requires major economic contributions from SESPAS, CEMADOJA, and JICA. SESPAS has fulfilled its commitments, although with delays on some occasions. At the present moment, CEMADOJA generates income by selling services, but does not have a surplus, so it would be practically impossible for it to cover the entire cost of the courses. Thus, it is necessary to consider the modality of implementation of the course, for example the trainees foot the expense of the participation, based on the concrete financial plan.

CEMADOJA has not developed the capacity to obtain the financial support by the international agency, to market and offer the service. Thus, it is feasible that CEMADOJA works as the national training center, if CEMADOJA fulfills the conditions of educational system. For implementation of domestic training course, CEMADOJA needs the supports by SESPAS for organization and implementation, including financial support. Especially, authorization of the training course by requesting from SESPAS is crucial and also CEMADOJA needs coordination with different health institutions such as medical School, and universities to execute the academic programs according to the national needs.

4-1-6. Verification of inhibiting and promoting factors

(1) Factors that have contributed to promotion

1) Factors concerning to the planning

The content of training course has been planed based on the situations analysis of the target countries to meet their demand. Also, the contents have been revised based on the evaluation of the trainee. As a result, the training course has contributed to the improvement of the quality and efficiency of the clinical service as described before.

2) Factors concerning to the Implementation Process

In Guatemala and El Salvador, most of the trainees (doctors and technicians) were selected of a same hospital, which facilitated that they could apply to their knowledge and experiences in the clinical part. These promoted the effect of synergy to improve the quality and efficiency of the service.

CEMADOJA has obtained an equipment of computerized tomography with their own budget, and this will contribute with the trainees to acquire more recent knowledge and greater experience in the diagnosis by image in the course.

3) Advantage of the course for the technicians.

Some changes have been taken place to influence in the improvement of the course. These changes were:

a. Diminution of hours of theories
b. More time dedicated to the practical part in subjects indicated by the trainees like their areas of preference

These changes seemed to be positive for the participants of the fourth course.

(2) Factors that have inhibited the Project

1) Factors concerning to the planning

For the progress of efficient clinical service with high quality, maintenance and renewal of the diagnostic imaging equipments is crucial. Although, the trainees in El Salvador and Nicaragua proposed to renew the equipments and obtained it, it is usually very difficult to renew diagnostic equipments to utilize obtained knowledge in the course

Also, in targets countries, it was often found that the diagnostic imaging equipments are broken by over use due to lack of maintenance or renewal of these equipments for the shortage of budget. Thus, the course should have more focus on contents to improve the personal and institutional capacity for the maintenance or renewal of the diagnostic imaging equipments.

During the final evaluation, the limitations of the former participants to develop effective action plans were identified. Therefore, their action plans were not concrete and feasible. This is due to lack of appropriate knowledge of participants how to develop action plans.

2) Factors concerning to the implementation process

It has been delay to pay the incentive to the CEMADOJA's lecturers by SESPAS and it demotivated the lecturers. On the preparation of the course, the lecturers have to send the lecture document in advance to the Japanese experts to check the contents. However the lecturers never have sent the documents until the deadline and, as a result, the Japanese experts have no choice but to modify the most of documents just before the course.

The progress of diagnostic Imaging is very fast and capacity of CEMADOJA as a teaching hospital has not yet reached to enough level. As described in the previous content, this was a weakness which hampered the efficiency of the project. Thus, CEMADOJA needs to improve its system in several aspects. CEMADOJA's lecturers have realized significance of the regular meeting to improve the knowledge and experience of the diagnostic imaging, however, still there are points to be improved such as the record of the meeting, development of teaching files. Also, the CEMADOJA's lecturers (doctors) should be more encouraged to take initiative to improve the academic part of the course.

4-2.Conclusion

(1) Based on the results achieved, the evaluation team acknowledges that the Project has been executed according to the plan and that it will achieve its purpose in the established timeframe.

(2) Several points should be improved for the quality of the training course and those should be considered for implementation the last training course.

(3) Although CEMADOJA developed its capacity as a teaching hospital through implementing the project, it needs certain improvements in technical areas.

(4) Since it is difficult to continue international training courses, considering current situation, CEMADOJA should focus on developing its capacity as a teaching hospital for domestic trainings. For this purpose, CEMADOJA should develop the strategic plan.

5. RECOMMENDATIONS AND LESSONS LEARNT

After to have made the final evaluation of the course on the basis of the five criteria of evaluation according to the methodology of JICA, the following recommendations for the short and medium term become.

5-1 Recommendations

5-1-1 Short-term

(1) CEMADOJA is required to develop a short term strategic planning to respond to the necessities of qualification of the participant countries efficiently. This includes developing the system for preparation of teaching files, system of registry of academic activities and pathological clinical radiological conferences, etc.

(2) Participants in the next international course must be instructed how to prepare action plans. Therefore, lecture should be included in the program to acquire knowledge about elaboration of such plans.

(3) It is recommended based on the evaluation of previous trainees that the next course includes students' presentation of cases from their daily practice and to perform exchange sessions between them and the teachers of CEMADOJA to improve their diagnostic capacity.

(4) It is pertinent that in the 5th course the pre and post tests should be revised for an objective evaluation base on review of previous experiences

(5) CEMADOJA must assume a greater level of commitment for the development of their human resources. It would have to start elaborating a system to monitoring their teachers in regards with updating and improving their competences to keep up with the technical advances.

(6) CEMADOJA must formally create a mechanism of reward and compensation to their teachers, according to the their efforts for improving quality of trainings (for example, preparation of teaching files, improvement of the support material and magisterial conferences, etc).

(7) To establish the "Network of the Ex- trainees of the Course" so that they can constantly exchange information and knowledge through the information technology. By this network, participants can utilize chances to make questions to previous lecturers or someone can easily distribute knowledge and information obtained specific opportunities such as international conferences.

CEMADOJA would be responsible to promote the Networks, to create the rules and to give support, to maintain a data base updated, and to announce their programs of qualification and other projects that

arise. Each participant country will have an ex trainee in charge, to give to preside over the group of ex- trainees in the Network.

5-1-2 Mid-Term

(1) CEMADOJA must develop mid-term strategic plan as a leading teaching hospital for domestic trainings.

(2) CEMADOJA must take the initiative of continuously to renew the training program according to international technological advances in the diagnosis by image for technicians and doctors radiologists.

(3) CEMADOJA must be reinforced and be reconstructed to assume its functions for developing and following-up action plans.

(4) As implementing organization of international training course, CEMADOJA needs more managerial support by SESPAS. Thus, it is recommended that SESPAS be involved more as monitoring and evaluation entity against CEMADOJA. This activity by SESPAS must include monitoring achievement indicators, problem solving and initiatives ensuring its permanent improvement. Also, for institutional development of CEMADOJA as a teaching hospital, SESPAS should support in certain aspects, including authorization of trainings based on needs assessment.

(5) For curriculum of radiological technicians, it is recommended to review the experiences in this course, considering significance of practical trainings, and develop appropriate program for future training courses.

(6) A renovation and preventive maintenance plan for equipments must be elaborated and implemented, because these are of the main inputs of the imaging diagnoses and has a high vulnerability to the technological changes. Therefore this it is a key aspect for the sustainability of the CEMADOJA as a leading teaching institution .

(7) The CEMADOJA is recommended to develop capacity as the regional hospital by utilizing current experiences and inputs by Japanese experts. Under transformation of health service system, it can influence on the establishment of policies, systems and norms in the matter.

(8) It is required for SESPAS and CEMADOJA to develop training plans based on needs assessment and the plan of human resource development for future domestic trainings

5-2. Lesson Learnt

The resulting information of the final evaluation of the Course by means of questionnaires and the interviews to ex- participants medical and technician radiologists serve to present important learned lessons in their positive aspect as negative. These are of internal utility so that CEMADOJA takes for reflections and actions and external for the subjects relative to the sustainability of the Project.

(1) Although it is not required to set definite indicators in case of the third country training programs, it is better, in certain situations, to set indicators for each target country to encourage disssemination of training effect. Also, for this kind of trainng courses which includes advanced technology, since instant effect shortly after tarinings is not feasible, it is recommended to develop system to follow-up effects of trainings for certain years.

(2) For evaluation of capacity improvement by training courses, pre-and post-tests are usually used. However, it is difficult to evaluate participants from different settings and motivation with different level of knowledge and technique by simple uniformed test. This might relates to other similar third country training programs and elaborated system for evaluation should be developed for this purpose.

(3) It is important to establishing a follow-up mechanism at the beginning of the project to measure and enhance results. This includes developing action plans by each participants how to utilize knowledge acquired in the course in his/her country and network of participants to exchange information and experiences after the course.

(4) Since this international training program was the first case in this country, implementation of the course might have been a burden for single institute like CEMADOJA. Also, this training program was the first case in this country. Thus, the SESPAS as rector organization must have a greater participation from the stage of preparation of the course.

ANNEX1-1 Agenda of Final Evaluation

			Activities
1	11/25	Wed	9:00 Meeting with former participants (Panama) 14:00 Visit to Santo Tomás Hospital
2	11/26	Thu	Panama→Nicaragua
3	11/27	Fri	9:00 Meeting with former participants (Nicaragua) (Antonio Lenin Fonseca Hospital) 10:00 CAT 15:00 Reporte to JICA office
4	11/28	Sat	Nicaragua→Guatemala
5	11/29	Sun	Internal Meeting
6	11/30	Mon	9:00 Visito to Roosevelt Hospital 14:00 Meeting with former participants (Guatemala)
7	12/1	Tue	Guatemala→El Salvador
8	12/2	Wed	8:00 Meeting with former participants (El Salvador) 13:00 Meeting with Director Hospital Rosales 14:30 Meeting at the Minister of Health 16:30 Reporte to JICA office
9	12/3	Thu	El Salvador→Dominican Republic
10	12/4	Fri	9:00 Internal Meeting 14:30 Interview with firmer participants and C/P
11	12/5	Sat	Internal Meeting
12	12/6	Sun	Internal Meeting
13	12/7	Mon	9:00 Joint Evaluation Committee
14	12/8	Tue	9:00 Joint Evaluation Commitee
15	12/9	Wed	8:30 Signing of MM 11:00 Reporte to JICA Dominican Republic 15:00 Reporte to EOJ

ANNEX 1-2 List of Interviewee

Counterpart

NAME	POST	INSTITUTION
Dr. Alejandro Montero	Director	CEMADOJA
Yuderkis Mejia	Direction Assistance	CEMADOJA
Laura Thoner	Coordinator of the International Course Project	CEMADOJA
Dra. Magdalena Ortiz	Chief of imaging department	CEMADOJA
Dr. Julio Manuel Rodríguez Grullón	Representive of Educación	CEMADOJA
Nurys Tamayo	Chief of Administrativa department	CEMADOJA

Ex Participants

NAME	POST	HOSPITAL	COUNTRY
Cesar Barrías del Cid	Radiological Technologist	Santo Tomas	Panama
Nuria Batista	Radiological Technologist	Hospital Oncológico	Panama
Marabellys Jurado	Radiological Technologist	Policlínica del Seguro	Panama
Maria Fonseca	Radiologist	Hospital Roosevelt	Guatemala
Sandra M. Caniz	Radiological Technologist	Escuela Nacional de Técnicos en Radiología Diagnóstica	Guatemala
Delia Maritza Rodríguez	Radiological Technologist	Hosp. Regional de Occidente	Guatemala
José Manuel Pineda Chacón	Radiologist	Hellen Lossi de Laugerud	Guatemala
Edwin Ottoniel Ixcot Hidalgo	Radiological Technologist	Hellen Lossi de Laugerud	Guatemala
Linda M. Barba Rodríguez	Radiologist	Hospital Escuela Lenin Fonseca	Nicaragua
Brenda Ant. Conrado Mendieta	Radiological Technologist	Hospital Escuela Lenin Fonseca	Nicaragua
Adela C. Castillo Miranda	Radiologist	Hospital Amistad Dominico-Japonesa	Nicaragua
Carla Antonia Largaespada	Radiological Technologist	Hospital Bertha Calderón	Nicaragua
Yadira de los Ángeles López Bravo	Radiological Technologist	Hospital Escuela Lenin Fonseca	Nicaragua
Manuel Ortiz Mercado	Radiologist	Hospital Nacional Rosales	El Salvador
Ana M. Ramírez Vásquez	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Héctor Ant. Guidos Rodríguez	Radiologist	Hospital Nacional Rosales	El Salvador
Julio César Rodríguez Muñoz	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Roxana Jacqueline Escobar	Radiologist	Hospital Nacional Rosales	El Salvador
Carlos Humberto Reyes	Radiological Technologist	Hospital Nacional Rosales	El Salvador
Martha Navarro Batlle	Radiological Technologist	Hospital Nacional Rosales	El Salvador

ANNEX1-3 List of Japanese Experts

Name	Area	Period		MM
NORIO HONGO	Lecturer, Course for Radiologist	2006/1/15	2006/3/13	1.9
HIROMU MORI	Support for Course Preparation (Chief Advisor)	2005/11/6	2005/11/16	0.4
MASAKI WAKISAKA	Support for Course Preparation (Radiologist)	2005/10/24	2005/11/21	1.0
TOMOHIRO HAMADA	Lecturer, Course for Radiologcal Technician	2006/1/15.	2006/3/13	1.9
KOICHI NAKAYAMA	Support for Course Preparation (Radiological Technician)	2005/10/24	2005/11/21	1.0
MASAHISA TAKUMA	Support for Course Preparation (Radiologist)	2006/8/9	2006/9/10	1.1
YUKIO KOISHI	Support for Course Preparation (Radiological Technician)	2006/8/9	2006/9/10	1.1
MICHIAKI SAI	Lecturer, Course for Radiologist	2007/1/14	2007/3/12	1.9
TOMOAKI SHIROO	Lecturer, Course for Radiological Technician	2007/1/14	2007/3/12	1.9
TORU MAEDA	Actualization of Techniqeus on Radiology (Radiolodist)	2007/9/1	2007/10/1	1.0
YASUFUMI KONDOH	Actualization of Techniques on Radiology (Radiological Technologist)	2007/9/1	2007/10/1	1.0
SHUICHI TANOUE	Course Lecturer (Radiologist)	2008/1/23	2008/3/8	1.5
YUKITO YOSHIDA	Course Lecturer, Radiological Technologist	2008/1/23	2008/3/8	1.5
YUZO HORI	Support for Course Preparation (Radiologist)	2008/9/24	2008/10/15	0.7
TOMOAKI SHIROO	Support for Course Preparation (Radiological Technician)	2008/9/24	2008/10/15	0.7
JUNJI KASHIWAGI	Lecturer, Course for Radiologist	2009/1/25	2009/3/14	1.5
KIYOHARU OKUGAW	Lecturer, Course for Radiological Technician	2009/1/25	2009/3/14	1.5
SHUICHI TANOUE	Support for Course Preparation (Radiologist)	2000/9/23	2009/10/8	0.5
IKUYA TAKAGI	Support for Course Preparation (Radiological Technician)	2000/9/23	2009/10/8	0.5

ANNEX1-4 List of Machinary and Equipment

December, 2009

Date	Artículo	Specification	Place	State	State Control	Unit Price (Yenes)	Quantity	Price (Yenes)	Note
Jan - 2006	Laser Printer	Laser Jet 2600n	Dirección/cuarto técnicos	In use	*	68,680.00	1	68,680.00	
Jan - 2006	Color Printer	Deskjet 6540 HP	Ofic. Expertos japoneses	In use	*	34,769.25	1	34,769.25	
Jan - 2006	Color Printer	Deskjet 6540 HP	Ofic. Expertos japoneses	In use	*	34,769.25	1	34,769.25	
Jan - 2006	PC computer	Dimension 3000 Dell	Sala Lectura A	In use	*	115,622.78	1	115,622.78	
Jan - 2006	PC computer	Dimension 3000 Dell	Sala Lectura A	In use	*	115,622.78	1	115,622.78	
Jan - 2006	PC computer	Dimension 3000 Dell	Cuarto de los técnico radiologos	In use	*	115,622.78	1	115,622.78	1 USD = DOP 34.578
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Ofic. Expertos japoneses	In use	*	208,907.39	1	208,907.39	1 DOP = 3.434
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Ofic. Expertos japoneses	In use	*	208,907.39	1	208,907.39	
Jan - 2006	Laptop	Toshiba Tecra A3-SP611	Cuarto de los técnico radiologos	In use	*	208,907.39	1	208,907.39	
Jan - 2006	Proyector digital	Infocus X2/1600 Lumenes	Cuarto de los técnico radiologos	In use	*	213,423.10	1	213,423.10	
Jan - 2006	Scanner	Canon scan 3000x	Ofic. Expertos japoneses	In use	*	15,624.70	1	15,624.70	
Jan - 2006	Pantalla de tripode	DA-LITE 84 X 84	Sala Lectura A			45,328.80	1	45,328.80	
May-2007	Fluoroscope	Shimadzu Modelo RS-50A System	CEMADOJA	In use	good	17,824,118.53	1	17,824,118.53	1 USD = ¥117.38 1 DOP = ¥3.675
Apr-2008	Chalkboard	Blanca mágica 24X36	CEMADOJA	In use	good	2,388.92	1	2,388.92	1 USD = ¥99.29 1 DOP = ¥2.967
May-2008	Laptop	Dell Inspiron 1420	CEMADOJA	In use	good	124,860.00	1	124,860.00	
May-2008	Laptop	Dell Inspiron 1420	CEMADOJA	In use	good	124,860.00	1	124,860.00	
May-2008	Server	Power Edge 29000 III	CEMADOJA	In use	good	623,779.75	1	623,779.75	
May-2008	Hard Disk	750 Seagate	CEMADOJA	In use	good	31,423.10	1	31,423.10	
May-2008	Hard Disk	750 Seagate	CEMADOJA	In use	good	31,423.10	1	31,423.10	
May-2008	Desktop	Dell Vostro 200S	CEMADOJA	In use	good	88,442.50	1	88,442.50	1 USD = ¥104.05 1 DOP = ¥3.092
May-2008	Desktop	Dell Vostro 200S	CEMADOJA	In use	good	88,442.50	1	88,442.50	
May-2008	Switch Linksys	24 ports/SR224	CEMADOJA	In use	good	14,046.75	4	56,187.00	
May-2008	Digital Camara	HP R827	CEMADOJA	In use	good	23,931.50	1	23,931.50	
May-2008	Handycam	DCR-DVD408 DVD	CEMADOJA	In use	good	78,037.50	1	78,037.50	
May-2008	Printer	Laserjet colo HP 2600 Networking	CEMADOJA	In use	good	41,620.00	1	41,620.00	
Jan-2009	Workstation	Visage WS Workstation	CEMADOJA	In use	good	1,927,832.40	1	1,927,832.40	1 USD = ¥90.44
Jan-2009	Photocopier	Canon Imagen Runner IR-2022	CEMADOJA	In use	good	315,614.00	1	315,614.00	1 DOP = ¥2.587
Mar-2009	Sonography	MINDRAY DC-3 CTLP	CEMADOJA	In use	good	3,069,461.48	1	3,069,461.48	1 USD = ¥97.55 1 DOP = ¥2.772
		Total						25,838,607.89	

ANNEX1-5 Participantes of the Course

Year		Name	Country	Ocupation
2005	1	Manuel Ortiz Mercado	El Salvador	Doctor (Radiology)
	2	Ana M. Ramírez Vásquez	El Salvador	Technician (Radiology)
	3	María Fonseca de Chacón	Guatemala	Doctor (Radiology)
	4	Sandra M. Caniz Milián	Guatemala	Technician (Radiology)
	5	Carlos Enrique Rivera Argeñal	Honduras	Doctor (Radiology)
	6	Wilmer Alexander Vásquez Méndez	Honduras	Technician (Radiology)
	7	Linda M. Barba Rodríguez	Nicaragua	Doctor (Radiology)
	8	Brenda Ant. Conrado Mendieta	Nicaragua	Technician (Radiology)
	9	Mario Lee Escala	Panama	Doctor (Radiology)
	10	Nuria Mireya Batista Oda	Panama	Technician (Radiology)
	11	Lissette Bermúdez	Dominican Republic	Doctor (Radiology)
	12	Nurys Altagracia de Jesús Martínez	Dominican Republic	Technician (Radiology)
	13	Freddy Lionel Ortiz Tavarez	Dominican Republic	Technician (Radiology)
2006	1	Héctor Ant. Guidos Rodríguez	El Salvador	Doctor (Radiology)
	2	Marta Navarro Batlle	El Salvador	Technician (Radiology)
	3	Douglas Rafael Henry Ruiz	Guatemala	Doctor (Radiology)
	4	Delia Maritza Rodríguez de León	Guatemala	Technician (Radiology)
	5	Iris Hortensia Durón Gradiz	Honduras	Doctor (Radiology)
	6	Francisco José Mairena Rodríguez	Honduras	Technician (Radiology)
	7	Adela C. Castillo Miranda	Nicaragua	Doctor (Radiology)
	8	Edgar José Pérez Bermúdez	Nicaragua	Technician (Radiology)
	9	Sergio Andrés Landires Rojas	Panama	Doctor (Radiology)
	10	César Ant. Barria del Cid	Panama	Technician (Radiology)
	11	Iván Amaury Piña Saldaña	Dominican Republic	Doctor (Radiology)
	12	Carmen Yanet Pradel	Dominican Republic	Doctor (Radiology)
	13	Isramil A. Galán de la Cruz	Dominican Republic	Technician (Radiology)
	14	Alnerys Guzmán Mejía	Dominican Republic	Technician (Radiology)
2007	1	Susi Grisel Portillo Aguilar	El Salvador	Doctor (Radiology)
	2	Julio César Rodríguez Muñoz	El Salvador	Technician (Radiology)
	3	José Manuel Pineda Chacón	Guatemala	Doctor (Radiology)
	4	Nery Ernesto Acicón Torres	Guatemala	Technician (Radiology)
	5	Diana Carolina Martínez Montoya	Honduras	Technician (Radiology)
	6	Luís Rolando Delgado Velásquez	Honduras	Technician (Radiology)
	7	Noel Cajina	Nicaragua	Doctor (Radiology)
	8	Carla Antonia Largaespada	Nicaragua	Technician (Radiology)
	9	Marabellys Jurado	Panama	Technician (Radiology)
	10	Luís Manuel Castillo Hernández	Dominican Republic	Doctor (Radiology)
	11	Eduardo Miguel Jacobo Cid	Dominican Republic	Doctor (Radiology)
	12	Cristian Bienvenido Ramírez de los Santos	Dominican Republic	Technician (Radiology)
	13	Luz María Aramboles Santos	Dominican Republic	Technician (Radiology)
2008	1	Roxana Jacqueline Escobar	El Salvador	Doctor (Radiology)
	2	Carlos Humberto Reyes	El Salvador	Technician (Radiology)
	3	Irma Johanna Mazariegos de León	Guatemala	Doctor (Radiology)
	4	Edwin Ottoniel Ixcot Hidalgo	Guatemala	Technician (Radiology)
	5	María Berenice Reyes Cardona	Honduras	Doctor (Radiology)
	6	Helena Ruth Canales Funez	Honduras	Technician (Radiology)
	7	Olinda Mariela Espinosa Urbina	Nicaragua	Doctor (Radiology)
	8	Yadira de los Angeles López Bravo	Nicaragua	Technician (Radiology)
	9	Abdiel Horacio Castillo Tristán	Panama	Doctor (Radiology)
	10	Walkiria Yasmín Bell Gómez	Panama	Technician (Radiology)
	11	Yuri Quispe	Dominican Republic	Doctor (Radiology)
	12	Betania Sánchez	Dominican Republic	Doctor (Radiology)
	13	Ruddy Cuevas Féliz	Dominican Republic	Technician (Radiology)
	14	Gabriela Almánzar	Dominican Republic	Technician (Radiology)

ANNEX 1-6 Counterpart Training in Japan

Course	Name	Period	
Medical Equipment Management	Rances Alberto RAMIREZ VERAZ	2005/9/21	2005/12/18
Hospital Management	CASTILLO ESPINAL Sergio Antonio	2006/11/13	2006/12/16
Hospital Management	TAMAYO FRANCISCO DE PENA Nu	2007/10/1	2007/11/3
Imagenology (Radiologist)	PEGUERO HOLGUIN Niraima Donaty	2007/10/3	2007/11/17
Imagenology (Technologist)	SURIEL ROSARIO Fausto Antonio	2007/10/3	2007/11/17
Imagenology (Radiologist)	PEREZ DE LA CRUZ Josue	2007/11/8	2007/12/13
Imagenology (Technologist)	LINARES Maura Brazoban	2007/11/8	2007/12/13
Medical Staff Training Course	ROSARIO CRUZ Crucita	2008/1/8	2008/3/22
Hospital Management	REINOSO GARCIA Santiago Rafael	2008/10/11	2008/11/22
Advanced Technique on Diagnostic Imaging	MONTERO VALDEZ Alejandro Vidal	2009/10/22	2009/11/4
Imagenology (Technologist)	BRITO BATISTA Nahum	2009/10/31	2009/12/3
Imagenology (Radiologist)	PRADEL DE ASMAR Carmen Yanet	2009/11/1	2009/12/3

ANNEX 1-7 Budget Expenditure of the Course

(In RD$)

	2005		2006		2007		2008	
Item	Budget	Expenses	Budget	Expenses	Budget	Expenses	Budget	Expenses
Accommodation			931,392.00	875,882.30	931,392.00	640,695.00	1,079,568.00	942,479.96
Medical Insurance			45,150.00	42,763.50	22,750.00	20,475.00	25,200.00	25,560.00
Per-diem			303,680.00	30,680.00	312,440.00	290,540.00	339,000.00	343,500.00
Transportation	20,000.00	20,000.00	23,100.00	23,100.00	33,000.00	33,000.00	36,000.00	36,000.00
Transportation(Airport)			5,600.00	5,600.00	6,000.00	6,000.00	3,000.00	3,000.00
Food	32,760.00	32,760.00	33,600.00	33,600.00	38,976.00	38,227.40	87,777.20	87,777.20
Textbook	19,842.00	16,692.01	13,103.33	18,251.26				
Material Procurement	66,000.00	66,000.00					17,589.08	17,589.08
Others	20,830.00	20,830.00		29,812.00			49,938.00	55,560.84
	159,432.00	156,282.01	1,355,625.33	1,059,689.06	1,344,558.00	1,028,937.40	1,638,072.28	1,511,467.08