

ERASMUS UNIVERSITEIT ROTTERDAM

ORET Evaluation 2007-2012 – Case Study of the ORET
Transaction TZ000030

Making Things Better: Rehabilitating Diagnostic Services in Tanzania



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List of Abbreviations

AMO	Assistant medical officer
BDH	Bagamoyo District Hospital
CCBRT	Comprehensive Community Based Rehabilitation in Tanzania
ICB	International competitive bidding
MoFA-NL	Ministry of Foreign Affairs of the Netherlands
MoHSW	Ministry of Health and Social Welfare of Tanzania
MoF	Ministry of Finance of Tanzania
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and Applied Sciences
PMS	Philips Medical Systems
PM&R	Preventive maintenance and repair
ORCI	Ocean Road Cancer Institute
ToR	Terms of Reference
TSRH	Tumbi Special Referral Hospital

Executive Summary

Transaction

1. The transaction "Rehabilitating Diagnostic Services in Tanzania" (TZ00030) involved supplying diagnostic equipment to 98 regional and district hospitals in Tanzania and providing training on its use and maintenance. The transaction amount was € 26,774,848 and the definitive ORET grant was determined at € 16,694,909 (60% of the total transaction costs). The project started in 1998 and was based on a comprehensive approach and the long-term cooperation between the Dutch company Philips Medical Systems BV (PMS) and the Tanzanian Ministry of Health and Social Welfare (MoHSW). The project aimed at improving the quality of health care services by halting the deterioration of diagnostic services in the country. This was achieved by extending the coverage of the services by replacing old outdated equipment, introducing new equipment, and improving the quality and quantity of the necessary medical and non-medical staff through training and education on the use of the equipment.
2. The evaluation of this transaction is based on the following sources of information:
 - Relevant documents in the ORET archives administered by ORET.nl, such as the grant agreement, feasibility studies and appraisal documents, progress reports, technical reports and monitoring and final reports.
 - Relevant documents in the archives of the Ministry of Foreign Affairs, including the Dutch Embassy in Dar es Salaam.
 - Documents and data provided by the Tanzanian authorities and other stakeholders in the country.
 - Various publications on the situation of the health sector in Tanzania.
 - Interviews with stakeholders in the Netherlands and Tanzania during the period August 2014 - March 2015.
 - Visit to four hospitals during a preparatory mission to Tanzania in August 2014.
 - A face-to-face survey in 20 of the beneficiary hospitals in September and October 2014.

Efficiency

Application

3. The first application for ORET support was submitted in the mid-1990s. It was rejected because the proposed equipment was considered too advanced for the recipient hospitals and the proposed project did not include the necessary training or the preparation of the locations. The embassy was anxious to avoid a repeat of the situation that had occurred in a similar project in Kenya, where Philips delivered equipment five years previously, where no money had been reserved for maintenance and pressure was put on the Dutch government to supply funds to prevent loss of the invested capital. This warning proved to have predictive value.
4. The second application did have a wider scope: it included basic equipment, the rehabilitation of the water and electricity supply, upgrading of the locations in which the equipment would be located and training of the hospital staff. The approval process took about 20 months between submission and signing the grant agreement, which is a usual period for ORET applications.
5. PMS was contracted directly because an ICB procedure was not required by ORET at the time of the procurement. The prices of the various components of the transaction were checked by an independent price consultant who concluded that they were market-compatible. The contract offered a comprehensive package, including a maintenance structure, delivery of spare parts, and training of local professionals. The non-grant part of the transaction was funded from the budget of the Tanzanian Government and paid in instalments after delivery of each batch of the transaction.

Implementation

6. The delivery of equipment was spread over several years to prevent the future situation in which replacements would be needed simultaneously. Parallel to installing the equipment, training of professionals – mainly radiographers and technicians (the latter in four zonal workshops) – took place. By 2006 all project obligations were fulfilled and 98 hospitals had been supplied with X-ray and ultrasound equipment and with equipment that was more basic, less expensive, and delivered only to selected hospitals. The health authorities indicated that collaboration with the Dutch embassy and PMS went smoothly (“friends in improving health care”). Shared responsibility was mentioned as a prerequisite for a successful project. All interviewees indicated that this ORET project was very successfully implemented. All the equipment was delivered and installed, most of them on time.

7. Halfway through 2000 the Tanzanian government faced difficulties into meeting its financial obligations. The government was too late with transferring the 2nd and 3rd tranche to the NIO Bank. In reaction the supplier stopped shipment of the supplies. It took some time before these problems were resolved, as a result of which the project was delayed by at least one year.

8. In the 20 hospitals surveyed 36 radiographers had been trained for using and maintaining the ORET diagnostic equipment. According to the archives, in total 434 staff members of the 98 recipient hospitals were trained, but this figure cannot be confirmed by the survey. The short training (two weeks) is, by most interviewees, considered too short. Eight technicians were successfully trained and employed by MoHSW to work in the four zonal maintenance centres. However, these workshops have since closed down. The School for Radiography revived their curriculum and collaborated with Fontys University of Applied Sciences.

Effectiveness

9. It is virtually impossible to determine the attribution and contribution of this transaction to health performance in the various regions, especially because the transaction took place such a long time ago. This was confirmed by some of the stakeholders, who stated that the substantial improvements in health care services in Tanzania over the last decade were largely a consequence of improved infrastructure, transport, and communication. As an illustration, the Tanzania Service Provision Assessment Survey 2006 showed that the situation at that point in time was far from optimal: “less than half of the facilities providing antenatal care have the basic recommended equipment and supplies”. Furthermore it noted that in only 7% of the antenatal care visits all relevant questions are asked and examinations (including ultrasound) were performed.

10. The ORET contribution can however be established at the level of the hospital services. The X-ray and ultrasound equipment were working well and being used for patient care. The X-ray and ultrasound equipment worked as expected and the survey revealed that on average, per hospital 40 X-ray images were produced on each workday. Before this ORET transaction most hospitals did not have working X-ray and ultrasound facilities. Thus as a result of the transaction, maternal care and TB care have improved, although it seems impossible to substantiate this view of the hospital staff by exact figures.

11. The project improved the diagnostic services at district, regional and tertiary (referral and specialised) hospitals through provision of medical equipment and infrastructure, preventive and corrective maintenance, training and technical assistance.

12. After the project a public procurement procedure was started for continuing maintenance of the equipment. This subsequent contract was awarded to PMS and covered the period 2006–2011. Partly because of the successful implementation of this project PMS was awarded another contract by the Government of Tanzania for a project co-financed by the successor to ORET: ORIO. This project aims to reduce mother and child morbidity and mortality rates, as well as general morbidity and mortality rates in Tanzania. To achieve this, the project takes an integrated approach in investing in infrastructural works, medical equipment and capacity building in 37 selected public hospitals at different levels.

Financial

13. The financial sustainability of the diagnostic services in governmental hospitals is not guaranteed. Consumables were provided by MoHSW or bought locally from the hospital budget, but this arrangement is still not sustainable due to irregularities in the supply system and in the flow of funds from government. The payment by patients is pooled with other resources to support the whole hospital activities.

Technical

14. Based on the four ORET hospitals visited and the survey of the 20 hospitals, the current picture is as follows. With a few exceptions, 14 years after the project ended the ultrasound equipment is no longer functioning. Most ultrasound devices worked for seven to eight years. The survey confirmed this initial assessment. It indicates that of the X-ray machines (excluding the dental X-rays) that were delivered 60% are still functional, and 40% are partly functional. Some indicated that the machines were used too intensively and broke down for that reason. The darkroom equipment delivered is either manual or automatic. Most manual darkroom equipment is still functional (16 out of 19) but is considered to be outdated and/or of poor quality. Half of the automatic darkroom equipment is no longer working. Furthermore, the results of the survey show that of the ultrasound equipment only two of the 15 devices are still in use. However, these devices are considered to be of poor quality and outdated.

15. The maintenance included in the transaction made it possible for the hospitals to keep the machines going and to sustain their diagnostic services. The contract between the Government of Tanzania and PMS for maintenance did not guarantee regular maintenance, since MoHSW did not pay for the services provided. Hence, PMS and its local representative (Mokasi) have now stopped services and this has led to recent technical problems at several locations.

Staffing

16. In the surveyed hospitals 28 of the 38 trained workers were still working at the hospital (average 1.4 per hospital). None of the eight technicians trained to be employed in the four zonal workshops is currently working for MoHSW. They have retired or changed jobs. The workshops are no longer operational, making MoHSW fully dependent on commercial suppliers such as Mokasi. In the long run the Tanzanian authorities expect an increase in the number of biomedical engineers because of the plans for a biomedical engineering degree course. The authorities foresee that the resulting graduates would be able to do preventive maintenance and would only have to call on the assistance of commercial suppliers in the case of breakdowns or when spare parts are needed.

Institutional

17. If adequately maintained, the X-ray machines may be expected to work for approximately another five years. However, there are no financial arrangements or proposed projects and therefore the continuation of diagnostic services in Tanzania is uncertain.

Environment

18. The radiation issue related to the X-ray equipment in the ORET-hospitals in Tanzania was dealt with by refurbishing the X-ray facilities. The main environmental issue seems to be the disposal of the chemicals for developing exposed X-ray film. It was not possible for the evaluation team to assess the environmental impact of the current situation and the treatment of chemical waste. All hospitals surveyed indicated that digital X-ray is the only way forward to improve this situation.

19. The delivery of ORET equipment has been relevant from the perspective of the overall health system and end users in Tanzania. At policy level, the ORET project was in line with the

goals of the health sector reform programme of work 1998/99 – 2000/2001 and with the health policy. One of the goals was to ensure that health services were available and accessible to all in urban and rural areas. The ORET project increased access to diagnostic service to the majority of people who had to travel long distances to access diagnostic services such as X-rays.

20. To PMS, the ORET project turned out to be the poster child for a successful project. It is still used within the company as a teaching example. The project was a learning experience for PMS in the sense that the equipment was not simply delivered but that training of staff and maintenance programmes were part and parcel of the implementation of the transaction.

Additionality

21. The ORET-financed rehabilitation of diagnostic services was unique for Tanzania and essential for upgrading the diagnostic capacity. Other donor countries did not provide support for such large scale projects in health care, and mainly focused on smaller medical equipment, drugs and consumables. We found other models of equipment with similar functions to the ORET equipment that other donors had supplied to Tanzanian hospitals. Basically the ORET project did not distort the domestic market or displace the efforts of local entrepreneurs; instead it was seen as complimenting other efforts.

Coherence

22. The transaction fitted well within the Dutch bilateral aid programme in Tanzania. This is illustrated by the fact that staff of the Netherlands' Embassy participated in the Steering Committee of this project. Sector-wise it was less coherent with export promotion policies, although it is worth noting that PMS is very successful in East African countries and this might also have positive consequences for other exports of medical equipment from the Netherlands.

1. Introduction

This document presents the results of the evaluation of an ORET-supported transaction to Tanzania. The transaction (TZ00030) involved the supply of diagnostic equipment to 98 regional and (at that moment all) district hospitals in the country and the provision of training in the use and maintenance of this equipment. The transaction amount was € 26,774,848 and the definitive ORET grant was determined at € 16,694,909 (60% of the total transaction costs). The project aimed at contributing to the improvement of the quality of health care services by halting the deterioration of diagnostic services in Tanzania. This was realised by rehabilitation and replacement of existing, often hazardous, equipment, an extension of the coverage of the services through the introduction of new equipment, and an improvement in the quality and quantity of the necessary medical and non-medical staff through training and education on the use of the equipment. The Dutch company was Philips Medical System BV.

This case study is part of the evaluation of the ORET programme covering the period 2007–2012. The evaluation of this transaction is based on the following sources of information:

- Relevant documents in the ORET archives administered by ORET.nl, such as the grant agreement, feasibility studies and appraisal documents, progress reports, technical reports and monitoring and final reports.
- Relevant documents in the archives of the Ministry of Foreign Affairs, including the Dutch Embassy in Dar es Salaam.
- Documents and data provided by the Tanzanian authorities and other stakeholders in the country.
- Various publications on the situation of the health sector in Tanzania.
- Interviews with stakeholders in the Netherlands and Tanzania during the period August 2014 – March 2015.
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The structure of this report is as follows. After this introduction the second chapter describes the transaction and the main stakeholders. The third chapter provides the results chain and the methods applied in the evaluation. The subsequent chapter assesses the transaction according to the evaluation criteria efficiency, effectiveness, sustainability, relevance, additionality and policy coherence.

2. Project Description

2.1 Project Context

Since the early 1990s the health status of the population of Tanzania improved considerably. Life expectancy at birth improved and child mortality declined to such an extent that, on the basis of information from the Demographic and Health Survey, it can be expected that the MDG target of 54 per 1000 life birth can be achieved. Other indicators also show positive developments although for some of them at a rather slow pace, such as for neonatal mortality or maternal mortality. At the start of 1990s the health situation in the country was different. At that time the country's health sector faced serious problems. There were not only shortages of essential drugs but also of equipment and supplies and the sector was confronted with poor and deteriorating infrastructure, which also had a detrimental effect on hospital care. Main reasons were a lack of funds, lack of qualified health workers and little coordination between public and private sector health service providers. In reaction the Government of Tanzania took the initiative together with the bilateral and multilateral donor community to develop a health sector strategic plan aimed at addressing the sector's deficiencies. This also included a plan to improve the diagnostic capabilities in hospitals. Against this background Philips Medical Systems initiated together with the Tanzanian authorities the formulation of a project to support the improvement of the diagnostic capabilities of public sector hospitals. A project which could qualify for support from the Dutch ORET programme.

The Development-Related Export Transactions programme (ORET, the Dutch acronym of Ontwikkelingsrelevante Export Transacties) was a facility funded by the Netherlands Ministry of Foreign Affairs that has existed in various configurations since 1983. According to the 2006 ORET Regulation its objectives were "to promote sustainable economic development and to improve the business climate in developing countries by facilitating investments in their economic and social infrastructure". ORET supported investments in public infrastructure in developing countries, by co-financing 35 to 50% of the eligible investment costs. ORET co-financed commercially non-viable transactions up to a ceiling of €45 million of eligible costs. In practice, commercially non-viable meant that eligible transactions and investments should have a payback period of longer than ten years and cannot be financed on commercial terms. A typical ORET-transaction involved the delivery of capital goods, services or construction works or a combination thereof. Also the transactions included technical assistance, the supply of spare parts or ongoing training once the transaction was up and running. This additional element was introduced to enhance sustainability and impact of ORET transactions. The transaction amount is the price of the transaction agreed in the contract between the supplier and the end user. This amount excluded preparatory costs (feasibility studies) and acquisition costs incurred to secure the contract. Co-financing of the transaction by the Netherlands government took place in the form of a grant to the national authorities of a developing country for purchasing the awarded capital goods, services or works. The supplier was, however, treated as applicant of the grant under the Dutch General Administrative Law Act.

This report focusses on one specific ORET-project: "Rehabilitation of Diagnostic Services in Tanzania" a transaction executed by Philips Medical Systems (TZ00030). For this project the following applies:

- Grantee: Ministry of Health and Social Welfare of Tanzania
- Supplier / Applicant: the Dutch company Philips Medical Systems BV
- Beneficiaries: 98 hospitals in Tanzania
- Time frame of the application: 12 February 1997 and project finalization 2007

2.2 Project History

The "Rehabilitation of Diagnostic Services in Tanzania" is a relatively old transaction, almost finalised before ORET.nl (PWC/Ecorys) took over from FMO as the executing agency of the ORET programme. The initiative for this project started in the early 1990s. The transaction was originally based on reports from 1991 and 1994 which identified a need for radiology equipment in Tanzanian hospitals. The first version of the project application was rejected because providing diagnostic systems (X-Ray machines) to Tanzania was considered too

advanced for the country's hospitals, and a focus on radiology equipment would be less effective than a broader scope of improving diagnostics services in general. The 1996 study, financed from PESP funds (Programme for Economic Cooperation in Projects¹) served as the feasibility study of the revised transaction. In 1998, the amended project proposal was accepted for ORET support, among others based on the assessment of the project by the Netherlands Economic Institute in August 1997, under the following conditions:

- The establishment of a supervisory committee to monitor project and project management. Composition; MoH, MoF, PMS, EKN Dar;
- Hiring of an independent consultant for monitoring the progress of the project during the first four years of the project;
- Philips Medical Systems is responsible for the maintenance of the equipment for the first seven years;
- Philips Medical Systems is responsible for the rehabilitation of all site rooms;
- Possibility to keep trained personnel for a certain period under contract of the Ministry of Health and Social Welfare will be investigated.

2.3 Project's Objectives

The project's aim was to rehabilitate the diagnostic services in 98 hospitals throughout Tanzania with a view to improve the performance of the health sector in the country. More specific the transaction included the rehabilitation, replacement and maintenance of medical diagnostic equipment in 98 regional and district hospitals of the Tanzanian Ministry of Health and Social Welfare, as well as the rehabilitation of the infrastructure for the provision of water and electricity in some of these hospitals. The project included also the training of the technicians responsible for the maintenance of the equipment and of the medical staff who will use the equipment.

2.4 Project Finance

The total transaction value amounted almost to €27 million of which 60% was financed from the ORET grant. The remaining financing came from the budget of the Government of Tanzania through regular instalments in line with the progress of the transaction. Halfway the project the non-grant instalments were delayed as a result of which the supplies were temporarily stopped, leading to a delay in the implementation of the transaction.

Table 1: Financing of the Transaction (in Euros)

Transaction amount	ORET grant	% Transaction amount	Non-ORET grant
€ 26,774,848	€ 16,694,909	60%	€ 10,709,939

2.5 Project Supplies

The transaction involved a wide range of medical equipment, among it X-Rays machines, but also diagnostic kits with ultrasound machines, blood pressure meters, weighing scales (e.g. to weigh new-borns) etc. Moreover, hospitals that lacked adequate water and electricity supply were provided with the necessary infrastructure to address this problem in order to guarantee that the equipment could actually be used effectively. Training and technical assistance was offered for the correct use and maintenance of the equipment. The table below gives an overview of the equipment supplied.

The equipment can be used for diagnosing in general, among them tuberculosis and examining pregnant women for delivery complications (which should lead to a decrease of infant- and maternal mortality, and a decrease in birth defects). In the long run this should result in a healthier population in the area the hospitals serve and as such contribute to a positive socio-economic impact by preventing death or disability of productive adults and birth of children with birth defects unable to provide for their own livelihood. The wide scope of the project

¹ In Dutch: Programma Economische Samenwerking Projecten

(including small hospitals in peripheral regions) was intended to reach not just the main urban centres of Tanzania, but also smaller and less well-served regions, among them some with the poorest inhabitants of the country.

Table 2: ORET Equipment Supplied

Equipment	Number
MRS Multi Radiology X-Ray System	83
Radiographic System Manual Darkroom	94
Radiographic System Automatic Darkroom	23
Oralix 65 Dental X-Ray System	8
BV25-gold C-Arm Surgical System	3
General Purpose X-Ray System	1
Ultra sound 100	72
Ultra sound 240	20
Dental chair & Drill Unit	9
Operating light	38
Operating table	43
Oxygen Concentrators	50
Sterilization Autoclave	59
Laboratory Photometer	25
Water purification equipment	21
Water softener	4
Refrigeration	25
Generator and Power protections	31

2.6 Beneficiary Hospitals

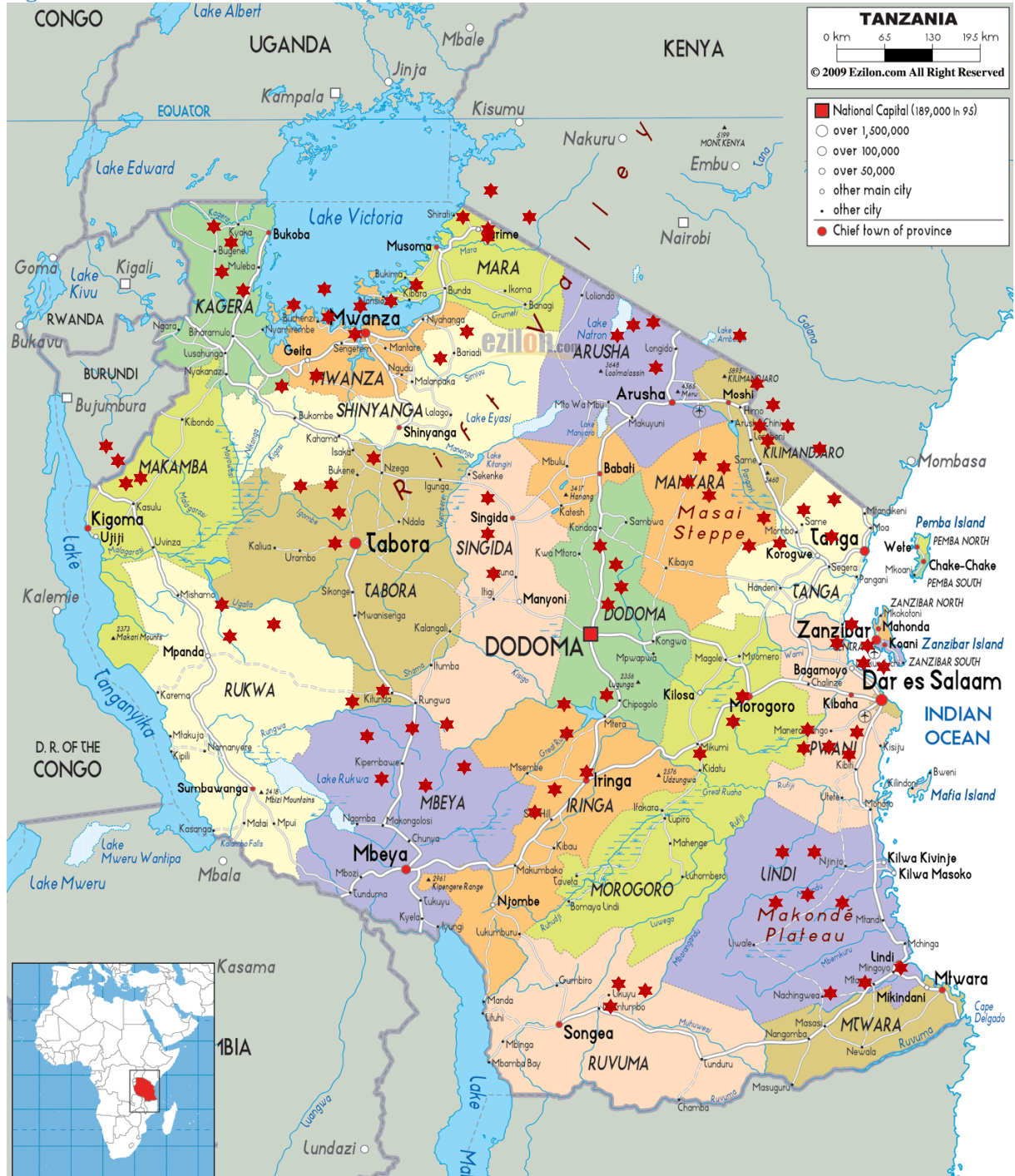
As mentioned, the transaction served all 98 governmental (regional and district) hospitals. Considering the type of equipment and the expertise needed to use and interpret diagnostic findings, more basic health care facilities like health centres were not considered. The beneficiary hospitals were, at that time, all regional, district or referral hospitals in Tanzania that were the responsibility of the Tanzanian government (in fact falling under the responsibility of the Ministry of Health and Social Welfare). As such, they are spread all over Tanzania. Table 3 and Figure 1 below show the regions where the hospitals are located. It clearly illustrates the wide regional diversity of the transaction.

Table 3: Number of hospitals by administrative region

Region	Number of Hospitals
Arusha	4
Dar es Salaam	5
Dodoma	4
Iringa	6
Kagera	4
Kigoma	4
Kilimanjaro	6
Lindi	5
Manyara	4
Mara	5
Mbeya	8
Morogoro	3
Mtwara	3
Mwanza	7
Pwani	5
Rukwa	3
Ruvuma	3

Shinyanga	4
Singida	3
Tabora	5
Tanga	7
Total	98

Figure 1: Location of Beneficial Hospitals



2.7 Stakeholders

Ministry of Health and Social Welfare is responsible for the recipient hospitals and was as such the main client of this transaction. According to its mission statement the Ministry is committed to facilitate the provision of basic health services of good quality, equitable, accessible, affordable, sustainable and gender sensitive. It aims in the long run at a healthy society with improved social well-being that will contribute effectively to individual and national development.

The 98 **recipient hospitals** are spread all over the country (see Figure 1). The project encompassed the rehabilitation, replacement, extension and maintenance of medical diagnostic equipment in 72 district hospitals, 19 referral hospitals four consultant hospitals and three specialised hospitals.

Philips Medical Systems Nederland BV (nowadays Philips Health Care) is one of the largest divisions of Philips multinational company. It is world market leader in the field of medical equipment and tries to look for new approaches to the benefit of patients in consultation with health sector authorities. The company supports research in the field of new medical technologies. For this transaction the company worked together with its local representative: Mokasi Medical Systems and Electronics Services Ltd.

AMPC International Health Consultants is a Dutch consultancy firm offering a wide range of services in the healthcare sector worldwide. With funding from Philips Medical Systems and a grant from the PESP programme, AMPC did a fact-finding mission to Tanzania visiting 20 hospitals, medical centres and discussing the scope of the project with several authorities in Tanzania in 1996. The results of this fact-finding mission and related studies are presented in the report 'Rehabilitation of Diagnostic Services in the United Republic of Tanzania', which formed the basis for the grant application for ORET support in 1997. After the ORET grant was awarded, AMPC consultancy teams visited all 98 incorporated facilities throughout the country for the definition of the final project specifications. The teams also included representative of the Ministry of Health and Social Welfare. The information collected during this visit was used to ensure that each facility received the correct medical equipment, the required generators and water treatment units, as well as infrastructural and construction adjustments.

The Steering Committee composed of representatives from the Tanzanian Ministry of Health and Social Welfare, the Tanzanian Ministry of Finance, and the Royal Netherlands Embassy supervised the execution of the transaction. It was supported by an independent external consultant, who was appointed in line with the requirements mentioned in the grant agreement at a late stage in the project.

Fontys University of Professional Education, College of Health Sciences, was involved in the development of the curriculum and the provision of the training to the technical and the medical staff of the recipient hospitals. For this component of the project it collaborated with the Muhimbili Medical Centre of the University of Dar es Salaam.

3. Methods of Evaluation

3.1 Theory of Change

Starting point for the evaluation framework is the (re)construction of a result chain to structure the ORET co-financed activities and their achieved results in a logical framework. This includes the elaboration of the theory of change that connects the various components of the result chain, including the underlying key assumptions and contextual factors. Figure 2 below presents the relation of the inputs to outcomes and the final impact. The figure shows the different components and potential results of the project. Along this chain the institutions, their activities, the output and outcomes have been evaluated.

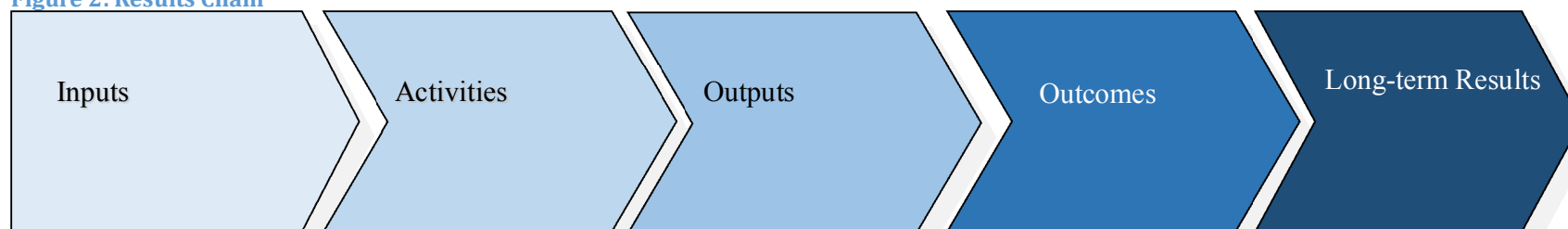
A standard result chain for ORET transactions identifies the specific relations between its components: inputs, activities, outputs, outcomes and impact.

- The inputs of ORET are the financial, material and human resources employed to produce the intended outputs;
- The outputs are the deliverables of the undertaken activities and the direct results of the completed ORET-transaction or the larger project if the transaction formed a part of that, which were under the direct control of the implementing agencies and the supplier;
- The outcomes of the transactions are the short-term and intermediate effects that the outputs have had on the intended end-users and beneficiaries, e.g. in terms of increased use of the realized public infrastructure and services or changes in their behaviour;
- The impact refers to the longer-term effects as a result of the changes in behaviour due to the intervention such as increases in employment, economic growth, enhanced health and less poverty in recipient regions.

Although improved diagnostics are expected to contribute positively to the long-term results for a number of reasons it is virtually impossible to link changes in the health situation of the population in the regions where the hospitals are located to the equipment supplied under the transaction. First, the equipment is in particular focused on diagnostics, whereas other factors are equally essential in hospital performance. Secondly, a great number of other developments, not related to hospital services, play an at least equally important role in determining health of the population. Lastly, the evaluation was complicated because it concerns a relatively old transaction. Therefore most of the staff involved in the transaction was no longer available for interviews.

Given the difficulties to establish the relationship between population health and diagnostic equipment the analysis has mainly been focused on institutional and organisational aspects of the recipient hospitals. It was therefore mainly based on a stakeholder analysis and on a beneficiary (hospital) analysis. For the institutional analysis the following sustainability criteria are chosen: financial, institutional, technical and social. The purpose was to elaborate whether the institution(s) has (have) the resources and deliberative capabilities to continue functioning financially, institutionally and technically while meeting the national standards after the equipment has turned over to the recipient hospitals.

Figure 2: Results Chain



Inputs	Activities	Outputs	Outcomes	Long-term Results
<ul style="list-style-type: none"> • ORET grant • Financial support by Government of Tanzania • Technical staff (training and transfer of knowledge) • Management time/staff (training and transfer of knowledge) 	<ul style="list-style-type: none"> • Delivery and installation of diagnostic equipment (see table above) • Technical assistance and training in maintenance and use of diagnostic equipment • Rehabilitation / installation of minimum water and electricity supply where needed (sufficient electricity to recharge batteries and operate light and equipment during operating hours) 	<ul style="list-style-type: none"> • 98 hospitals throughout Tanzania have improved diagnostics equipment and systems • Personnel in these hospitals are adequately trained to operate and maintain the equipment • Improved and constant provision of electricity and clean water 	<ul style="list-style-type: none"> • Better diagnosis of variety of diseases, among them contagious diseases such as TB, which can be diagnosed using X-Ray machines • Better diagnosis of variety of diseases through more effective use of the equipment • More effective maintenance of hospital equipment • More effective use of diagnostic equipment • Improved hygienic conditions 	<ul style="list-style-type: none"> • Better health population among others through less spread of TB and other contagious diseases that can be diagnosed using the equipment supplied • Reduced morbidity due to improved diagnosis • Less child mortality in delivery • Reduced morbidity as a result of better hygienic conditions leading to less loss of productive adults, and less motherless households • Healthier population, in as far as the diagnostic equipment can play a role in addressing health issues

3.2 Evaluation Criteria

The evaluation of the transaction was conducted according to the following criteria: Efficiency, Effectiveness, Sustainability, Relevance, Additionality and Coherence. These criteria were defined and determined as follows:

3.2.1 Efficiency

Efficiency concerns the outputs of the transaction, i.e. the supply of diagnostic equipment and the related training and management support, and determines the extent to which these outputs have been realized by the inputs as agreed and at the lowest possible cost.

For this evaluation the efficiency of the transaction was determined on the basis of a survey among 20 Hospitals, existing documents of the implementing agencies (e.g. dossiers ORET.nl, official documents of the Tanzanian authorities, etc.) and information on realised outputs (supply of the equipment, management support, training and capacity building), budget, delays and their causes. In addition interviews with the main stakeholders were held in the period August 2014 – March 2015.

For evaluating the technical aspects under the efficiency criterion the following indicators are used concerning the functioning of the equipment supplied. These indicators are also important to analyse the technical sustainability of the project.

- Availability of the equipment delivered;
- Present quality and status of the equipment delivered;
- Number of staff trained; and
- Status of the recipient hospitals.

The institutional analysis was based upon information from the relevant authorities, such as the Ministry of Health and the management of selected hospitals

3.2.2 Effectiveness

Effectiveness is the extent to which the transaction has contributed to the achievement of the project's expected results or objectives. Here a distinction is made between direct effects and intermediate/long-term effects on the recipient country's social and economic development and the Dutch company.

Effectiveness was determined on the basis of in-depths interviews with stakeholders and relevant documentation. The responsibility for the use of the equipment is with the management of the recipient hospitals whereas the responsibility of the health sector in general is with the Ministry of Health and Social Welfare of Tanzania and the regional / district authorities. These interviews also covered such issues as technical, financial and administrative aspects of the equipment and whether the equipment is working properly.

The effectiveness of this transaction also refers to the effects on the local health situation in the regions where the hospitals provide their services. These issues were discussed with representatives of the sector and with the hospitals visited.

3.2.3 Sustainability

Sustainability is defined as to what extent the transaction activities can be continued independently after completion of the contract between the supplier and the client. This concerns the following three aspects: technical, financial and institutional.

The information collected during the visits to the hospitals supported the analysis of these aspects. Financial sustainability is analysed on the basis of the financial position of the hospitals and on the

budgetary allocations made by the Government and the Ministry of Health and Social Welfare of Tanzania. Institutional sustainability is explored by disentangling the operational process of the services provided.

3.2.4 Relevance

The evaluation has assessed relevance by determining whether the objective of the intervention was consistent with the beneficiaries' requirements, the country needs, and the partners' policies. Relevance further demonstrates whether the transaction made a sustainable contribution in achieving the ultimate objective (the impact). This point has been evaluated throughout the study by assessing whether the transaction has contributed to improving the overall health situation in the service areas of the hospitals.

3.2.5 Additionality

The evaluation has assessed whether the transaction would have been implemented without ORET support and whether this support to the transaction has fulfilled a catalytic role in mobilising additional finance in Tanzania that would otherwise not have taken place and whether ORET triggered other funding sources.

3.2.6 Coherence

Under coherence the evaluation has analysed to what extent the ORET programme and transactions have complemented or contradicted other instruments of Dutch development cooperation and foreign (economic) policy.

3.3 Information Collected

3.3.1 Project Visit

In August 2014 a project visit to Dar-Es-Salam was undertaken. The aim of the project visit was to interview people who had been involved during the execution of the project and/or do potentially know about the ORET-project. For this reason it seemed relevant to interview national health authorities and staff at the hospitals sites, the medical director or head of clinicians and people from the imaging department (radiologist or radiographer). Besides, it deemed essential to visit the imaging department to see the apparatus and its' current status. The second aim of this visit was to preliminary assess the impact of the ORET project at several sites on the basis of which a survey would be developed to visit a sample of ORET hospitals would be visited throughout Tanzania. The methods and results of the visit are described in the report Mission Report Project Visit, August 9th – 14th 2014 as written by J. Severens. During this visit four ORET hospitals were visited (besides one non-ORET hospital; not reported): Bagamoyo District Hospital, Bagamoyo; Muhimbili National Hospital, Dar es Salaam; Ocean Road Cancer Institute, Dar es Salaam; and Tumbi Special Referral Hospital, Kibaha.

3.3.2 Survey

The outcomes of the transaction have been assessed on the basis of information provided by the recipient hospitals. For his purpose a survey has been carried out in September and October 2014. While the transaction potentially benefits the population in the regions in which the hospitals are located, the survey targeted the recipient hospitals, since it is for substantive and practical reasons not feasible to survey the target population that might have benefited in terms of improved health and to find a control group with similar characteristics which did not benefit from the improved health services offered through the transaction. The aim of the survey was to find out if the health services by the recipient hospitals have indeed improved over the last ten years (2004-2014) and what has been the role of the improved diagnostic services in that respect. Since at that time, all regional, district or referral hospitals in Tanzania that were the responsibility of the Tanzanian government (in

fact falling under the responsibility of the MoHSW) were taking part in the ORET-project it is not possible to define comparable hospitals that did not benefit from the deliveries of diagnostic equipment and training of staff.

The questionnaire has been developed in September 2014, in close cooperation with a local consultant who was responsible for executing the survey. During the project visit in August 2014, as mentioned above, four recipient hospitals were visited and the survey was executed in an additional 20 hospitals (see also Annex 2, which gives an overview of the research questions for the field visits).

The survey results are based upon the 20 facilities visited (see attached list). They were selected based on the following procedure:

- Five zones were selected from the eight zones defined by MOHSW.
- Within each zone one region was selected. If no facility received the ORET support in the selected region, then the region is replaced with another region which benefited from the funding.
- Within each region three districts were selected. If no facility received the ORET support in the selected district then the district is replaced with another district which benefited from the funding.
- We visited one regional hospital for each selected region and three district hospitals in a region; purposely select facilities which receive water, electricity support.

3.3.3 Performance Assessment of Selected Hospitals

There is an abundant quantity of information available on the health developments in Tanzania from secondary sources. Over a relatively long period the results of DHS at the national but also at the level of a number of regions can be accessed on line². The evaluation has analysed this present and historical data. Information on number of patients treated, use of diagnostic equipment, human resources available, availability of supplies, but also on financial flows and organisational structure has been made available by the surveyed recipient hospitals. On the basis of this information the present performance of these hospitals in terms of service delivery, both for provider and patients has been compared with it prior to the delivery of the diagnostic equipment. In spite of these activities and the activities mentioned below it should be recognised that there are serious difficulties related to the identification of the contribution of the ORET co-funded transactions to the performances of the hospitals, also because the transaction took place such a long time ago.

3.3.4 In-depth Interviews

The aim of the in-depth interviews was to explore the financial, institutional, technical and social sustainability of the outcomes and their impact on long-term results. For this project it is particularly important to address the complex interdependences between diagnostic equipment and its use, the quality of the services delivered and its impact on the health condition of the population. This implies that apart from the stakeholders directly involved in the project, other important stakeholders in the health sector have been interviewed as well. In this way we do not only evaluate the ability of the beneficiary hospitals and supporting institutions (e.g. the government) to provide health services, but also the socio-economic and institutional context in which this has to be done.

3.3.5 Documents Studied

As preparation for the project visits and the meetings organised, a review of relevant documents was performed. These documents were made available by IOB and ORET.nl. The desk review focussed on transaction documents and other relevant materials including a content analysis of ORET monitoring and evaluation documents. Purpose of the desk review was to assess relevant materials in order to:

- a) have in depth knowledge about the project to be able to discuss regarding inputs, activities, outputs, outcomes and impact of the project with local authorities;

² See for example DHS for a number of years, including the years that the equipment was delivered, but also the Kagera Health and Development surveys, waves 1 to 6 that cover the 1991-2010 period.

- b) be able to conduct site visits to obtain relevant information regarding the inputs, activities, outputs, outcomes and impact of the project by means of interviews and local observations;
- c) to be able to give inputs to the design of the survey / structured interviews that have been held during site visits after the project visit.

The documents that were studied are:

- Eindexamen vastgestelde ORET projecten 2007-2008: J Ament. November 2007.
- Health sector reform programme of work 1998/99 – 2000/2001. Ministry of Health, the United Republic of Tanzania, November 1997, Dar Es Salaam, Tanzania.
- PESP study 96.206 for the project Rehabilitation of diagnostic services in the United Republic of Tanzania: LM Damen, JWM Lathouwers, and S Terpstra. October 1996, Ministry of Economics, The Hague, The Netherlands
- Rehabilitation of diagnostic services Tanzania. Agreement between the Ministry of Health of the United Republic of Tanzania and Philips Medical Systems Nederland B.V. May 15th 1997.
- Rehabilitation of Diagnostic Services, Tanzania ORET 97/10. August 1997, Directorate-General for International Co-operation (DGIS), Ministry of Foreign Affairs, The Hague, The Netherlands (also known as the NEI-report)
- Report on the Tanzanian Public Health Expenditure in the Health Sector. The World Bank PER Team: Veronica Walford, DFID Consultant and Fabrice Sergent, DANIDA Consultant (draft version 1997).
- Tanzania Demographic and Health Survey 2010. National Bureau of Statistics, Dar es Salaam, Tanzania and ICF Macro Calverton, Maryland, USA.
- The health care sector reform action plan July 1998 - June 1999. Ministry of Health, the United Republic of Tanzania, November 1997, Dar Es Salaam, Tanzania.

3.3.6 Visits to the Hospitals

The main equipment delivered (in numbers and in investment) and that may be expected to be still in place after more than ten years are 1) the X-ray apparatus (including X-ray machine, power-supply and darkroom equipment) and 2) ultrasound equipment, even though the latter is expected to be operational for 5 to 8 years only. Smaller materials and equipment delivered can be considered to have passed their economic and technical life span, replaced, or being out of order. Regarding investment in human capital for each site, additional training for radiographers to be able to use X-ray and ultrasound was foreseen. It seemed relevant to see whether the people trained during the ORET project are still taking care of the diagnostic facilities at the different sites or whether successors have taken over their duties.

The aim of the project visits was to meet and interview people who have been involved during the execution of the project and/or do potentially know about the ORET-project. For this reason it was relevant to interview national health authorities and at the hospitals sites, the medical director or head of clinicians AND people from the imaging department (radiologist or radiographer). Besides, it was essential to visit the imaging department to see the apparatus and its' current status. For additional information, pictures have been made for additional information.

4. Results

4.1 Efficiency

4.1.1 The Application Process

Philips is active in Tanzania for decades, first together with Siemens who were mainly active in Northern Tanzania and at the coast. Philips was active in the rest of the country [interview MoHSW]. Siemens pulled its agent back long ago, whereas Philips always remained active in the country. In 1975 imaging techniques were donated by the Dutch. In 1982 a proposal was rejected [interview Mokasi]. In 1990 there were only ten radiologists in Tanzania. During a meeting of the Tanzanian Association of Radiologists the situation of the diagnostic services in the country was discussed. PMS had a 60-70% market share before onset of the ORET-project. In the 1990's Philips identified Africa as a potential market for diagnostic equipment, due to the absence of diagnostic machines and potential competitors and the presence of masses of potential patients (Müller-Rockstroh, 2007). The company started with a series of successive transfer projects of diagnostic imaging technology in Africa: Kenya (1988), Zimbabwe (1993), Ghana (1996), Tanzania (1998), Zambia (2002), Morocco (2003) and Uganda (2004). All projects in this list were ORET-funded projects, except the Kenya project. New applications for Tanzania and Ghana, for follow-up projects, were rejected in 2007 due to the budget ceiling of ORET. The Tanzania project, including investments in infrastructural works, medical equipment and capacity building in 37 selected public hospitals at different levels are made is now being implemented by Philips under ORIO (ORIO09/TZ/05).

The first application for ORET support in the Tanzania project was submitted in 1994. This application was rejected because radiology was not a priority of the Tanzanian government according to the Dutch embassy. The letter from the Tanzanian government stated that diagnosis of common diseases needs X-ray. The embassy disagreed and stated that the basic level of health care facilities was too poor for the diagnostic equipment to be effective. Basic amenities like running water and electricity were often problematic or absent in facilities. Questions were raised about the reason why X-ray systems that were in use were not functioning and no explanation was offered why it should work with this project. The embassy's advice further stated that a functioning referral system was assumed to be in place which was not the case. The social sector review supported by the World Bank concluded that 60% of Tanzanian government spending from own budget went to four referral hospitals, supplying a very small proportion of the population. Spending on curative care was far higher than principles of primary health care allowed, which aim for prevention and the rural population, and therefore the proposal conflicted with the Alma Ata Declaration according to the embassy's advice. Sustainability was not clear from the proposal. Possible negative effects on the health care sector in Tanzania were expected. The embassy had the impression that priorities from the Tanzanian government were influenced by marketing of Philips. The example of the Kenya project was mentioned (delivery of Philips equipment five years prior), where money for maintenance was not available and pressure was put on the Dutch government to supply funds to prevent loss of capital. Given the problems facing the health sector in Tanzania at that time the required funds for the transaction could, according to the appraisal, be utilised more effectively for addressing other problems in the sector. In addition the transaction was focused too much on the supply of X-Ray machines only and did not include the training needed to handle the equipment, neither improvement of the sites for the equipment.

In August 1996 a feasibility study was conducted by AMPC with support from PESP and in September 1996 the Tanzanian Minister of Health visited the Netherlands. The Tanzanians also approached the UK and Germany, but these countries were not willing to make such a large investment. At the time of procurement, other suppliers of diagnostic equipment were not able to compete with the PMS offer. In February 1997 a revised application was received and the NEI was asked to perform an assessment of the application. The second application did have a much wider scope, also including more basic diagnostic equipment, and paying more attention to the upgrading of the locations in which the equipment would be located as well as to training of the staff who were expected to operate it. The new proposal showed a broader orientation, and scored positive on poverty, women, environment, and sustainability. Moreover the Tanzanian Ministry of Health was in the process of decentralizing at

that time (installation of district health boards). The NEI came with their assessment in September 1997 and concluded that institutional sustainability was insufficient, and the project could probably be economically sustainable according to the NEI. If the proposal would be accepted, the NEI advised to;

- Cut up the delivery and installation in phases;
- Install a monitoring committee;
- Ensure the financial contribution from the Tanzanian government;
- Reformulate the training component;
- Provide more information on maintenance;
- Ensuring electrical supply;
- Include training on environmental aspects and supplies for hospitals;
- Verify risk on exposure to mercury.

A price consultant was also asked to assess the price of the transaction. The proposal was compared with prices in the UK. The total price in the proposal was regarded \$3m higher and there was no quantity discount. Commission/agent costs were regarded as high (9.1% where the norm is 5%). Profit of 7.2% was considered as reasonable, but also 5% contingencies, adding up to 12.2%, where a total of 10% for both is reasonable. The price consultant advised a minimal drop of 15% in the price as being reasonable.

In October 1997 the Dutch Embassy gave a positive advice for this project. The project was regarded economic feasible (looking at DALY's). Institutional sustainability was judged positive due to policy changes (district health boards). Mokasi, a company established in 1992, and founded by three people with a lot of experience with Philips would act as the local distributor for Philips. The company name stands for Mohammed, Kasim and Simon. Involvement in this project of one of the three founders of the company was refused by MoHSW, and therefore this person asked for compensation. The price of the transaction had to be adjusted because this compensation for Mokasi of NLG1.200.000 was not accepted by the Dutch Government.

The proposal was finally accepted, but special conditions were agreed upon in the grant agreement;

- A supervisory committee was installed to monitor the project and project management.
Composition: Ministry of Health, Ministry of Finance, PMS, and the Dutch Embassy in Dar es Salaam;
- An independent consultant would be appointed by PMS and approved by the Dutch Embassy in order to advise the committee. This consultant should report to the committee four times a year;
- PMS would be responsible for maintenance the first seven years;
- PMS would be responsible for the rehabilitation of the site rooms;
- The possibility to keep trained personnel for a certain period under contract would be investigated;
- Special attention would be paid to the treatment of (chemical) waste.

The approval process of the second application took about 20 months between submission (20 February 1997) and signing the grant agreement (26 October 1998), which was comparable with the usual period for ORET applications. In spite of the rather long lead period the parties involved appreciated the flexibility of the ORET programme allowing them to prepare the project and to cope with the issues that came up during the formulation of the applications. PMS was contracted directly because an ICB-procedure was not required by ORET or by Tanzanian law at the time of the procurement.

4.1.2 The Implementation

After several years of negotiation and preparation, the ORET Rehabilitation of diagnostic services set off in 1998 by delivering the first equipment to Tanzania. The delivery of equipment was spread over several years to prevent the future situation that simultaneous replacement was needed. Delivery of the equipment was done in six batches. Parallel to installing equipment, training of professionals (mainly radiographers and technicians, the latter situated in four zonal workshops) took place.

After a reasonably successful start of the project, there was a significant delay in 2000. The government of Tanzania was too late with the transfer of the second and third instalments that needed to be paid to NIO in December 1999 and December 2000. In January 2001, PMS temporarily

halted the delivery of the third batch in response, (29 hospitals were handed over at that time) and some site-surveys were postponed, until the situation was resolved. In April 2001 it was reported to the steering committee that there was a backlog in maintenance in many hospitals. Part of the ORET budget was reserved for technical work, but it required more funds. It was decided to use budget from the SWAp basket for the technical work as well. At this time 36 sites were handed over. In September 2001 NIO demanded payment of the own contribution by October 26, threatening to cancel the third batch. 52 hospitals were handed over at that time and at seven sites installations were ongoing. Payment was done and the third batch could be shipped with a year delay. In December 2001, 58 hospitals were already handed over. The remaining batches were delivered without further delays. According to some respondents the payment problems of the Tanzanian government could have been related to the burial of the father of the nation Nyerere in October 1999.

One of the arguments used to reject the first proposal was that basic amenities like running water and electricity were often problematic or absent in facilities where high tech machines would be placed. Rehabilitation of water and electricity supply was therefore an important element to be included. In the grant agreement a number of 50 facilities is mentioned which would be eligible for rehabilitation of these basic amenities. During implementation however some scope adjustments have been made due to lack of budget. X-ray rooms were extra budgeted at the expense of water and electricity works. Only 25 facilities received water and electricity works in the end. The project however only catered for some water filtrations and water softeners, while the primary problem lay in the shortage of water as reported to the steering committee in December 2004.

Photo 1: Water Softeners at Manyoni District Hospital, 2014



Another condition from the grant agreement was the appointment of an independent consultant by PMS and approved by the Dutch Embassy in order to advise the committee. This consultant was expected to report to the committee four times a year. In November 1997 it was decided that the consultant would have a 25% job. The name of a Dutch doctor was mentioned as a possible candidate. The appointment of this consultant proved to be difficult. In January 2001 four candidates were proposed by the Ministry of Health. All disqualified. The Dutch Embassy requested PMS in February 2001 to look for a more appropriate consultant. Finally another Dutch doctor was appointed as consultant. In December 2003 however, the steering committee requested to replace the independent consultant due to dysfunction of the consultant. In September 2004 during the 16th steering committee a new consultant was appointed. We read from the steering committee notes: "[...] was found to be the right candidate as ex PMS, he would work really independently without influencing PMS [...]." The Dutch Embassy was not present during this meeting. The consultant worked as employee of Philips since 1971 and employee of PMS since 1977 and stopped working for PMS in September 2014 and started working under AMPC as a consultant to the project.

The implementation was monitored by the steering-committee which was installed as agreed in the grant agreement. MoHSW indicated that collaboration with the Dutch embassy and PMS went smoothly, or as they indicated: "friends in improving health care". Shared responsibility was mentioned as a prerequisite for a successful project. Also PMS and Mokasi are positive about the functioning of the steering-committee. The steering-committee ceased to exist when the project ended.

By 2006 all project obligations were fulfilled and 98 hospitals were facilitated with X-ray and ultrasound equipment besides equipment that was more basic, less expensive, and delivered only to selected hospitals (for a full overview see Annex 1). Regarding the efficiency of the project implementation all interviewees indicated that this ORET-project was very successful and an example to other projects. Thanks to the ORET contribution, diagnostic services by government hospitals were revived substantially. Before, patients were confronted with outdated and even dangerous equipment, simply not diagnosed properly and sent home, or referred to hospitals at great distance which in many occasion is burdensome or even impossible to patients.

Photo 2: X-ray and Automatic Processor at Singida Regional Referral Hospital, 2014



Except from one water softener, all the equipment was delivered, of which most was delivered on time. All recipient hospitals indicated that the equipment was successfully installed by PMS and functional after installation (with the exception of one occasion where the water supply equipment for a dental care facility did not work properly).

4.2 Effectiveness

It was virtually impossible to determine the attribution and contribution of this transaction to health performance in the various regions, because the transaction took place such a long time ago and data was unavailable or not suitable for the purpose of this research. This was confirmed by some of the stakeholders who stated that the substantial improvements of health care services in Tanzania over the last decade were largely a consequence of improved infrastructure, transport, and communication. As an illustration, the Tanzania Service Provision Assessment Survey 2006 (TSPA) showed that the situation at that point in time was far from optimal: "less than half of the facilities providing antenatal care have the basic recommended equipment and supplies" (National Bureau of Statistics (NBS) [Tanzania] and Macro International Inc., 2007). Furthermore it is stated that in only 7% of the care for pregnant women all relevant questions are asked and examinations (including ultrasound) are performed. According to the TSPA the use of X-ray in diagnosing TB was only 4% and the use in care and support services for HIV/AIDS only 5%.

The contribution can however be established at the level of the hospital services. The X-ray and ultrasound equipment were working well and used for patient care. The X-ray and ultrasound equipment worked as expected and the survey shows that on average per hospital 30 images per working day are produced for both types of devices. Before this ORET transaction most hospitals did not have a working X-ray or ultrasound facility. As a result maternal care and TB care have improved considerably, although it seems impossible to substantiate this view of the hospital staff by exact figures.

Table 4: Number of Patients per Day in 20 Surveyed Hospitals

	X-Ray	Ultrasound
Total	520	248
Average	29	31
Minimum	8	13
Maximum	80	50

Although it seems impossible to assess the effectiveness of the ORET rehabilitation of diagnostic services retrospectively in every detail, two things are obvious. First, the X-ray and ultrasound equipment was working and used for patient care throughout the entire duration of the project; and secondly, preventive maintenance and necessary repairs were taken care of due to the fact that maintenance and spare part supply were part of the project agreement and thus funded. Maintenance and training were part of the six batches, so the moment the equipment of the first batch was delivered, the maintenance contract for this 1st batch started and trainings for the staff involved took place and did not have to wait for the other batches to take place. According to the hospital representatives the X-ray and ultrasound equipment reached the patients indicated. Before this ORET transaction most hospitals did not have working X-ray and ultrasound facilities. Maternal care and TB care was positively improved, although it seems impossible to substantiate this impression by exact figures at this late stage of evaluating the project. Most of the hospital revenue has increased through the cost sharing scheme. Facilities earn on average TZS 18,000-30,000/= per day since the installation of these equipment.

Regarding trade relations and new orders from Dutch exporters, after the project a public procurement procedure was started for continuing maintenance of the equipment. This subsequent contract was awarded to PMS and covered the years from 2006 until 2011 (initially 2010, but this contract was extended by one year).

Partly because of the successful implementation of this project Philips Medical Systems was awarded another contract with the Government of Tanzania for a project co-financed by the successor of ORET: ORIO. This project aims to reduce mother and child morbidity and mortality rates as well as general morbidity and mortality rates in Tanzania. Similar to the ORET transaction this project also takes an integrated approach in investing in infrastructural works, medical equipment and capacity building in 37 selected public hospitals at different levels. The project is defined as the improvement of diagnostic and surgical services at municipal, regional hospitals and tertiary (referral and specialized) hospitals through provision of medical equipment and infrastructure, preventive and corrective maintenance, training and technical assistance. The project focuses specifically on mother and neonatal care, improvement of emergency services, operating theatres, intensive care units, high dependence wards, patient monitoring and rehabilitation services.

4.3 Sustainability

4.3.1 Financial

Self-sustainability was the main focus in this project, according to a progress report from June 2002 to the steering committee. The progress report further stated that the equipment supplied by the project was generating income for the hospitals. Therefore, it was expected to be possible to establish a system where income from the equipment was able to (partly) finance the maintenance and other

costs for them. The key point, both for the maximum usage and sustainability of the systems would be a proper strategy and plan. The independent consultant would need to play an important role (Letter from NIO to the Dutch Embassy in Dar es Salaam).

In a progress report from December 2004 it is reported that it is not possible for each and every district hospital to pay for the maintenance expenses and consumables. MoHSW should therefore subsidise those ones. The new contract for a further five-year maintenance period is being finalised by PMS to be submitted to MoHSW by January 2005”.

In June 2005 the consultant mentions in a debriefing that 11 hospitals were visited, and ten hospitals reported a severe shortage of consumables (especially X-ray film) for several months (no stock at MSD and no allocations from RMO offices). To keep the services going the hospitals buy from commercial sources. Indications that equipment usage has gone down by 20% already, especially district hospitals.

Financial and economic sustainability of the diagnostic services in governmental hospitals was not guaranteed. In most hospitals, the ORET ultrasound equipment was replaced by other equipment provided by other donors or hospitals own sources. Consumables like X-ray films and chemicals were provided by MoHSW through the Central Medical Stores and in case supplies were insufficient, consumables were bought locally using the hospital budget. However, this arrangement is not sustainable due to irregularities in the supply system and flow of funds from government to the facilities. Payment by patients for each diagnostic procedure (varying between 1,000 and 5,000 Tanzanian shilling) were inputs to this budget as well. However, the collected funds are pooled with other resources to support the whole of hospital activities which may not necessarily guarantee allocation to X-ray consumables and supplies.

The maintenance included in the ORET contract made it possible for the hospitals to keep the machines going and to sustain their diagnostic services. Since 2012 there is a new contract between PMS and MoHSW for maintenance and repair, however, there is a lag in payment by MoHSW not having paid since 2012 (a debt over 6 million USD). Hence, PMS and Mokasi have stopped services since mid-2014 which is reflected in recent technical problems at several sites. Hospitals cannot handle the regular services of the equipment due to poor financial status hence some equipment have started to breakdown due to lack of maintenance. Mokasi estimated in august 2014 that approximately 15% of the X-ray equipment was out of order.

4.3.2 Technical

Part of the project was the establishment of four zonal workshops for maintenance on the equipment. Eight technicians were successfully trained and employed by MoHSW to populate these four zonal maintenance centres. The scale of the project standardized X-ray equipment and ultrasound throughout Tanzania, making preventive maintenance and repairs easier. In May 2002 the independent consultant advised to keep a logbook for the ORET-equipment. No such logbook could be found during the visits to the facilities or at MoHSW. In June 2005 it was reported to the steering committee that the maintenance by the local engineers was not functioning. Only in Bugando Hospital the engineer was doing the job, while other engineers were busy with other assignments. At present, the zonal maintenance centres are not functional anymore and MoHSW is fully dependant on external parties for maintenance.

During the short mission in August 2014 to the four ORET hospitals we observed that most of the ultrasound equipment is not functioning anymore, although there was an exception for one of the more advanced devices (SD240) that was still operational at Tumbi Special Referral Hospital. Most ultrasound devices worked for 7–8 years according to the hospital staff. The X-ray equipment in most hospitals has worked until recently according to hospital staff. An exception is the Duo Diagnost Fluoroscopy System at Muhimbili National Hospital, which was not used for about two years because of refurbishment of the theatre above on the 1st floor. During that time the machine was not used and not keeping the air-conditioning working destroyed the equipment due to corrosion. Also other large equipment broke down, like the BV25-gold C-Arm Surgical System in KCMC hospital, or the Duo

Diagnost Fluoroscopy System at Tumbi Special Referral Hospital which stopped working four months ago. The latter two machines are currently waiting for spare parts. The employees at the radiological department of Tumbi Hospital are working with a new X-ray now, which was donated from Korea. If the Philips machine would be repaired, they would prefer the Philips machine due to its options and robustness. Only one machine (at Ocean Road Cancer Institute) was fully operational. Some automatic developers in the hospitals are still working and some are replaced by new ones from hospitals own budget. The manual developers area all in place and seem to be operational. The survey confirmed this initial assessment. Regarding the current performance of the radiographic equipment the survey indicated the following: Of the 20 sites visited 13 sites showed to have their X-ray fully operational and eight were operational but with limited service due to technical issues such as problems with the break, rotation, battery, inability to use high KV and producing errors during process.

All Multi Radiology X-ray Systems and Duo Diagnost Fluoroscopy Systems were working except one hospital were the Duo Diagnost Fluoroscopy System was out of order. The C-Arm Surgical System at KCMC is out of order, and at Bugando we found a CT-scan which was part of the ORET project according to the hospital staff. The CT-scan was out of order since 2010. The Oralix equipment was found in four hospitals of which three were found to be operational and one partly operational. Of the sites where the X-ray equipment was in need of repair, non-availability of spare parts was causing the inability to solve the problem. A number of respondents indicated that the machines were simply used too intensively and broke down for that reason.

The dark room equipment delivered is either manual or automatic devices (some of the hospitals received both types of equipment). The manual darkroom equipment was still in use by 18 hospitals of which one had leakage problems and at two hospitals the system was not in use at the moment due to a shortage of chemicals. The manual devices are considered to be outdated and/or of poor quality by many hospital staff. The automatic darkroom equipment was still in use in four hospitals and broken at four hospitals. In hospitals were the ORET-darkroom equipment was not working, new equipment was in use, mainly funded by other donors and sometimes from the hospital's own budget. Ultrasound equipment was delivered to 17 of the 20 hospitals surveyed, of which two were operational at the moment of the survey, two were stolen and 13 were broken. The devices were considered to be of poor quality and outdated by hospital staff. The ultrasounds were operational during a range of three to ten years after delivery.

Data sources that were adressed, revealed an inventory of X-ray equipment (data provided by MoHSW). In 2008, 50 (17%) out of 295 X-ray facilities throughout Tanzania were not working. ORET-machines were not specified. The exact reason of dysfunction was not stated. In this year in total 515,445 images of the chest/spine/skull were produced and 642,632 images of pelvic/GUI/dental/others. It is not known how many of these images were produced on ORET-machines. In 2013 the total number of X-ray machines in Tanzania increased to 363 of which 82 (23%) were not functioning. Out of a total of darkroom facilities, film processors, and dryers 5% was out of order. It is unclear how this percentage is related to the percentage of non-functioning X-ray machines. In this year, the inventory of ultrasound devices showed the prevalence of 337 machines of which 32 were not functioning. Again, for all figures mentioned, ORET-specific numbers cannot be distinguished from the grand totals.

Regarding a longer timeframe, in the situation of adequate maintenance and repair, the X-ray machines may expect to be working for approximately another five years. Arrangements, either financially or by means of a project proposal are currently non-existent, severely threatening the continuation of the diagnostic services by government hospitals in Tanzania. Private diagnostic facilities are available but these are concentrated in the eastern regions of Tanzania and in larger cities and require out of pocket payments by patients (varying from 25,000 to 100,000 Tanzanian shilling).

4.3.3 Training

It is well known that shortage of human resources for health care delivery is a major challenge in Tanzania (Manzi, et al., 2012). Regarding diagnostics, the ideal minimum staffing for a district hospital is one Assistant Medical Officer (AMO), one radiographer and backup, two qualified ultra sound workers under supervision of an AMO. For a regional hospital minimal staffing is one radiologist, two radiographers, two ultra sound workers. A rating system (0-10 points) was adopted to measure the actual human resource situation against the ideal. The average rating of 11 district hospitals was 5.5, of five regional hospitals it was seven. The most striking gaps in district hospitals were sufficiently qualified persons for ultra sound (0%), and the presence of a sufficiently qualified AMO (20%). For regional hospitals major gaps were sufficiently qualified persons for ultrasound (20%), and only one out of five referral hospitals had a fully qualified radiologist, where four referral hospitals relied on an AMO. Training of radiologists, radiographers and technicians was another aspect of the sustainability of the ORET-project.

Photo 3: Unused Laboratory Photometer



Technicians

Of the eight technicians trained to be employed at the four zonal workshops (located in Mtwara, Arusha, Mwanza and Mbeya), none is currently working for MoHSW. All of them retired or changed jobs. It was not possible for the evaluation team to find out when they left. The workshops are not operational and maintenance and repair is fully dependent on commercial suppliers such as Mokasi, Philips and others. On the longer run the Tanzanian authorities expect an increase of the number of biomedical engineers due to the fact that an educational program has been enlarged recently. The authorities foresee that such personnel could take care of preventive maintenance and will only have to call for help from commercial suppliers in case of breakdown or when spare parts are needed. However, suppliers of medical equipment do not allow technicians from outside their own companies to take care of major maintenance for their apparatus.

School of Radiography

Part of the project was to set up an education programme for radiographers at the Muhimbili University in Dar es Salaam. In August 1999, two teachers from Muhimbili University – School of Radiography (SoR) visited Fontys in the Netherlands to get trained in computer skills, curriculum development and make a plan for curriculum revitalisation. The new curriculum started in September 2001 (one year delay). An e-learning space had also been established at Muhimbili, which enabled radiographers, radiologists and students to exchange information with colleagues in the Netherlands that, according to an evaluation by Fontys was widely and enthusiastically used (Müller-Rockstroh, 2007).

Radiographers

Radiographers are being educated for three years to learn their job independent from specific devices. Of the 20 hospitals surveyed, hospital staff reported that two radiologists and 36 radiographers in total were trained for using the ORET diagnostic equipment. This results in an average of 1.9 healthcare workers per hospital. During the hospital visits it was reported that 28 of the 38 trained workers were still working at the hospital (average 1.4 per hospital). In cases where the ORET-trained radiographers left, others took over (sometimes even trained for the Philips equipment) by their predecessor. According to the data from the ORET-archives, in total 434 staff of the recipient hospitals were trained. If we extrapolate the numbers from the survey (38 workers trained for 20 hospitals) we

arrive at 186 health care workers trained in total. Respondents who attended the trainings considered the training of two weeks too short.

Attendance to user trainings proved to be problematic, especially for X-ray. In January 2001 it was reported to the steering committee that training activities had to be rescheduled for that reason. PMS requested for a master list of the people to be trained (requested in earlier meetings of the steering committee but did not receive anything). The major obstacle proved to be the allowance costs for trainings, which had to be borne from MoHSW budget. In the same steering committee it was reported that a high proportion of installed equipment could not be used, due to a lack of staff. In April 2001 MoHSW still had difficulties in providing allowances to people who attended trainings. Instructions were given to solve this issue within MoHSW. More than two years later in October 2003 it is reported to the steering committee that the main problem in about a quarter of all ORET facilities is the shortage of staff. Of the 98 facilities, 21 seem to lack a radiographer assistant, five facilities have not sent anyone for training in ultrasound and another 19 sent only one, while training for two per facility was offered. The independent consultant recommended training an average of three times the foreseen need of staff because many disappear. The staffing remained problematic during the whole project. In July 2005 in a debriefing by the consultant it is reported that when the consumables issue is resolved (60% is delivered, 40% is still at customs), the lack of staff with sufficient education and experiences becomes the limiting factor in providing services. During the survey of the hospitals in 2014 we found an unused photometer at one of the hospitals. Stored in a box and never used because there was nobody to operate it.

4.3.4 Environment

The issue of radiation as a consequence of delivering X-ray equipment in the ORET-hospitals in Tanzania was dealt with by refurbishing the X-ray facilities. Chemicals for developing exposed X-ray films seem to be the main environmental issue. All hospitals indicate that digital X-ray is the only way forward to improve this situation. During the field mission we found one hospital where a digital processor was used together with the ORET-machine. This processor was provided to the hospital by the Ifakara Health Institute in 2006/2007 because of a research project on vaccination for Malaria for children <5. It was not possible for the evaluation team to assess the environmental impact of the current situation and the treatment of chemical waste. Malfunctioning ultrasound machines are still situated at the hospital stores or radiographer rooms since these are considered property of the hospital. No plans exist how to deal with these redundant devices. At one of the hospitals a very old X-ray machine was found standing outside at the hospitals premises, completely corroded.

Photo 4: Idle Manual Processor at Mawenzi Regional Hospital and Idle Ultrasound at Kilema Hospital



4.4 Relevance

It is no doubt that the delivery of the ORET equipment had both health system and end user relevance. At policy level, the ORET project was in line with the goals of the health sector reform programme of work 1998/99 - 2000/2001 and the health policy. One of the goals was to ensure that health services would be available and accessible to all in urban and rural areas. The Government of Tanzania alone was not able to facilitate the achievement of this goal. The ORET project contributed to the increase of access to diagnostic service by the majority of people who did not have access at all, or had to travel long distances to access, for example, X-ray services.

To PMS, the ORET project turned out to be illustrative for a successful project and is still used as an example within the company. The project was new to PMS regarding the fact that equipment was not simply delivered but that training of staff and maintenance programmes were part of implementation. This combination warranted sustainability of a longer time frame.

4.5 Additionality

The ORET rehabilitation of diagnostic services was unique and essential for its purpose. Other donating countries did not provide support for such large scale projects in health care, mainly focusing on smaller medical equipment, drugs and, consumables. We also found other models of equipment in some hospitals with similar functions as the ORET supplied equipment, brought by other donors. Basically the ORET project did not distort nor displace effort of the domestic market entrepreneurs but rather is seen as complimenting the other efforts.

4.6 Coherence

The transaction fitted extremely well within the Dutch bilateral aid programme in Tanzania, which is illustrated by the involvement of the Embassy of the Netherlands and the participation of the Embassy in the Steering Committee of this project. Qua sector it was less coherent with export promotion policies, although it should be mentioned that PMS is very successful in Eastern African countries, which also might have positive consequences for other exports from the Netherlands.

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Annex 1: Details Supplies per Hospitals

Table A 1: Supplies of the Transaction

Abbreviation	#	Equipment
MRS	83	MRS Multi Radiology X-ray System
D/R –m	94	Radiographic System Manual Darkroom
D/R – a	23	Radiographic System Automatic Darkroom
DD	23	Duo Diagnost Fluoroscopy System
Oralix	8	Oralix 65 Dental X-Ray System
BV25	3	BV25-gold C-Arm Surgical System
Bucky-TS	1	General Purpose X-Ray System
SD100	72	Ultra sound
SD240	20	Ultra sound
Dental	9	Dental chair & Drill Unit
OL	38	Operating light
OT	43	Operating table
OX	50	Oxygen Concentrators
ST	59	Sterilization Autoclave
PH	25	Laboratory Photometer
WT	21	Water purification
WS	4	Water softener
Refr.	25	Refrigeration
Gen	31	Generator and Power protections

Table A 2: Recipient Hospitals

	Hospital name	MRS	D/R – m	D/R – a	DD	Oralix	BV25	Bucky-TS	SD100	SD240	Dental	OL	OT	OX	ST	PH	WT	Gen	WS	Refrig.
1	Bagamoyo	1	1						1						1			1		
2	Kisarawe *	1	1						1			1	1		1					
3	Mafia	1	1						1						1					
4	Utete/ Rufiji	1	1						1								1	1		
5	Ludewa	1	1						1									1		
6	Makete	1	1						1					1	1					
7	Njombe	1	1						1			1		1	1	1		1		1
8	Tosamaganga	1	1						1				1	1						
9	Mafinga/ Mufindi	1	1						1					1	1			1		
10	Kilwa	1	1						1					1						
11	Liwale	1	1						1											
12	Nachingwea	1	1						1					1						
13	Ifakara/Kilombero	1	1						1					2	1	1				1
14	Kilosa	1	1						1				1		1					
15	Mahenge/ Ulanga	1	1						1			1		1						
16	Masasi *	1	1						1											
17	Newala *	1	1						1										1	
18	Mbinga	1	1						1			1			1					
19	Tunduru	1	1						1			1	1	1	1				1	
20	Handeni	1	1						1				1	1			1	1		
21	Korogwe	1	1						1			1			1				1	
22	Lushoto	1	1						1											
23	Muheza	1	1						1					1		1				1
24	Pangani	1	1						1				1	1			1	1		
25	Muhimbili			1	1	1					1									
26	KCMC *			1	1	1	1													

	Hospital name	MRS	D/R –m	D/R – a	DD	Oralix	BV25	Bucky-TS	SD100	SD240	Dental	OL	OT	OX	ST	PH	WT	Gen	WS	Refrig.	
27	Kibaha		1	1	1					1			1	1	1						
28	Iringa	1	1	1	1					1			1			1					1
29	Lindi (Sokoine) *		1	1	1					1				1		1					1
30	Morogoro	1	1	1	1					1	1	1	1		1						
31	Mtwara *	1	1	1	1					1	1					1					1
32	Songea (Ruvuma)		1	1	1					1	1	1		1							
33	Tanga/Bombo	1	1	1	1					1						1					1
34	Mpanda DH	1	1						1			1	1	1			1				
35	Kyela DH	1	1						1					1	1		1				
36	Mbozi (Vwawa) DH	1	1						1								1				
37	Tukuyu (Rungwe) DH	1	1						1			1	1	1	1			1			
38	Ilje/Isoko DH	1	1						1			1	1	1	1		1	1			
39	Chunya	1	1						1			1	1		1						
40	Nkasi/ Namanyere DH	1	1						1			1	1	1							
41	Same	1	1						1				1		1		1	1			
42	Ocean Road	1	1						1												
43	Huruma (Rombo)	1	1						1					1		1					1
44	KIDH (old Hai) *	1	1						1								1	1			
45	Kilema *	1	1						1									1			
46	Usangi	1	1						1				1	1	1			1			
47	Kibosho	1	1						1						1						
48	Arumeru	1	1						1			1	1	1	1			1			
49	Babati	1	1						1				1	1	1		1	1			
50	Katesh (Hanang)	1	1						1						1		1	1			
51	Kibaya/ Kiteto	1	1						1						1		1				
52	Mbulu	1	1						1						1		1				
53	Mondull	1	1						1					1	1		1				

	Hospital name	MRS	D/R – m	D/R – a	DD	Oralix	BV25	Bucky-TS	SD100	SD240	Dental	OL	OT	OX	ST	PH	WT	Gen	WS	Refrig.
54	Ngorongoro/ Wasso	1	1						1				1							
55	Kondoa *	1	1						1				1	1			1			
56	Mpwapwa *	1	1						1			1	1	1	1			1	1	
57	Iramba (Kiomboi) *	1	1						1			1		1	1		1	1		
58	Manyoni *	1	1						1			1		1	1			1	1	
59	Mbaya RH	1	1	1	1					1										
60	Sumbawanga (Rukwa)		1	1	1					1		1	1	1	1	1				1
61	Mawenzi RH *	1	1	1	1	1				1	1					1				1
62	Dodoma *		1	1	1	1				1	1					1			1	1
63	Arusha	1	1	1	1	1				1	1	1	1	1	1					
64	Singida *		1	1	1					1			1	1	1	1				1
65	Mbaya RH			1	1		1	1							1					
66	Mbaya maternal		1							1										
67	Mremba NR		1																	
68	Kibongoto RH		1																	
69	Geita	1	1					1			1	1	1	1						
70	Kongwa DH	1	1					1												
71	Sengerema	1	1					1			1	1	1	2						
72	Nansio (Ukerewe) DH *	1	1					1			1	1	1	1		1				
73	Ngudu/ Kwimba DH *	1	1					1			1	1	1	1			1			
74	Somanda/ Bariadi	1	1					1			1	1		1		1				
75	Kahama	1	1					1			1	1	1	1	1	1				
76	Maswa	1	1					1			1	1	1	1			1		1	
77	Meatu	1	1					1									1			
78	Urambo	1	1					1				1	1	1	1			1		
79	Biharamulo	1	1					1					1	1			1		1	
80	Karagwe/ Nyakanga	1	1					1			1	1					1			

	Hospital name	MRS	D/R – m	D/R – a	DD	Oralix	BV25	Bucky-TS	SD100	SD240	Dental	OL	OT	OX	ST	PH	WT	Gen	WS	Refrig.
81	Rubya (Muleba)	1	1					1			1	1		1	1					
82	Sikonge	1	1					1						1					1	
83	Ngara/ Murugwanza		1			1		1					1	1	1		1			
84	Kibondo	1	1					1			1	1	1	1	1		1			1
85	Kasulu	1	1					1			1		1	1	1					1
86	Bunda (Kibara)	1	1					1						1						1
87	Mugumu/ Serengeti	1	1					1			1	1	1	1						
88	Tarime	1	1					1						1		1	1			
89	Magu	1	1					1			1	1		1		1	1			
90	Igunga *	1	1					1					1	1	1					1
91	Nzega	1	1					1			1	1	1	1						
92	Seketoure RH Mwanza *	1	1	1	1				1		1	1			1					1
93	Bukoba (Kagera)	1	1	1	1				1						1					1
94	Musoma (Mara)	1	1	1	1	1			1	1	1	1	1	1	1					1
95	Shinyanga	1	1	1	1				1		1	1	1		1					1
96	Tabora (Kitte)	1	1	1	1				1		1	1		1	1					1
97	Kigoma RH (Maweni)		1	1	1				1		1	1	1	1	1					1
98	Bugando *			1	1	1	1			1				2						

*** Hospitals included in the survey**

Annex 2: Research Questions for the Field Visits

The field visits will assess the performance of the transaction / project on the basis of the evaluation criteria listed in the main text:

Efficiency (output)

- When did the transaction/ project start (formal/ actual) and when was it completed?
- What is the opinion of the recipient organization about the ORET-programme procedures and requirements? Are they consistent with the local requirements regarding for example procurement and funding? Was an ICB procedure followed?
- Have the transactions achieved the outputs in accordance to the time schedules and budgets as envisaged at appraisal stage?
- In the case of delays: what have been the main reasons for delays?
- In opinion of the client: were the goods / supplies / services co-financed from ORET funds competitive, both regarding price and quality? Were the maintenance costs, such as costs for spare parts, competitive, both regarding price and quality, in comparison with goods / supplies / services with a different origin?
- Did the transaction include advisory/training services and maintenance services, and if yes did this contribute to more efficient use of the supplied goods and the sustainability of the project?

Effectiveness (Outcome)

- What were the expected ultimate outcomes of the transaction/project? Were these realized and if not why not? Were there any external factors that hindered achieving the ultimate results and outcomes?
- In case of public utilities: how many consumers are being served. Did this number increase after the transaction?
- Have jobs been created as a result of the transaction/project (skilled/unskilled, direct/indirect, men/women)?
- Did the transaction contribute to higher production of the recipient organization?
- Did the transaction/project meet the needs of the beneficiaries or users?
- What was the economical spin off of this project for the region?
- Did this transaction contribute to sustainable trade relations and/or created new orders for the Dutch exporters?

Sustainability

Financial and economic sustainability

- What is the present financial position of the recipient organization?
- Are the revenues of the recipient organization influenced by government policies (e.g., tariffs and user fees)? What is the current policy of the government regarding these issues.
- To which extent does the client carry out monitoring and evaluation over its own performance? What can be observed about this performance, for example based on Annual Reports, evaluations, etc.?
- Has there been any update of the business plan for the project / organisation?
- What are the present cash flow forecasts?
- Are annual reports from completion to date available?

- Could you give us an overview of the national and regional development of the sector?

Technical sustainability

- Is the equipment / works still operational and maintained after the transaction / project was completed? How are the maintenance activities planned and organised? Is there a budget available for maintenance? Is there a maintenance contract with the Dutch supplier? Was local staff trained to operate and maintain the plant?
- What kind of services and after-sales provisions (including spare parts) are still delivered by the supplier?

Environmental sustainability

- Overview of the location of the different installations that are significant from the point of view of environmental protection (e.g. stockpile areas, waste product disposal, treatment areas, water storage areas, storage areas including fuel storage, hazardous products). Does the recipient organization have an environmental plan?
- Description of the project (including inputs, outputs and waste streams);
- Description of the characteristics of the receiving environment (including a map of the main environmental constraints and surrounding land uses).
- Relevant legislation (national, regional, local).
- Was an Environmental Impact Assessment made?

Relevance and policy coherence

- Policy relevance: Have the transactions been listed as priorities in the (local) development plan? Is the transaction in line with sector development strategies?
- What was the role of the Netherlands' embassy?
- What was the role of other Dutch export promotion instruments, such as the coverage of export credit insurance of the commercial non-grants loans by Atradius and the subsidy facilities of the Ministry of Economic Affairs to co-finance preparatory costs of the transaction?
- What criteria in the project/transaction selection process have been implied at the client's side to maximize the probability that the project/transaction effectively contribute to (either) poverty reduction, gender equality or the environment?
- Over the last 12 months, have case studies / monitoring reports / evaluations on the project been produced by the client / public entity?
- Was the project/transaction selected by the (local) government?
- How is the project imbedded in the national policy?
- Is the project aligned with national or sector development strategies?

Additionality

- Would the ORET-transaction have taken place without ORET-grants?
- Did the ORET-transaction displace other competitors or distort local competition?
- Did the ORET-grant enable other investments and/or stimulated investments in other sectors?