

Independent Evaluation Report

IRAQ

Pilot Project for the Rehabilitation of the Dairy
Sector in Iraq

UNIDO project number FB/IRQ/04/003



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO EVALUATION GROUP

Independent Evaluation

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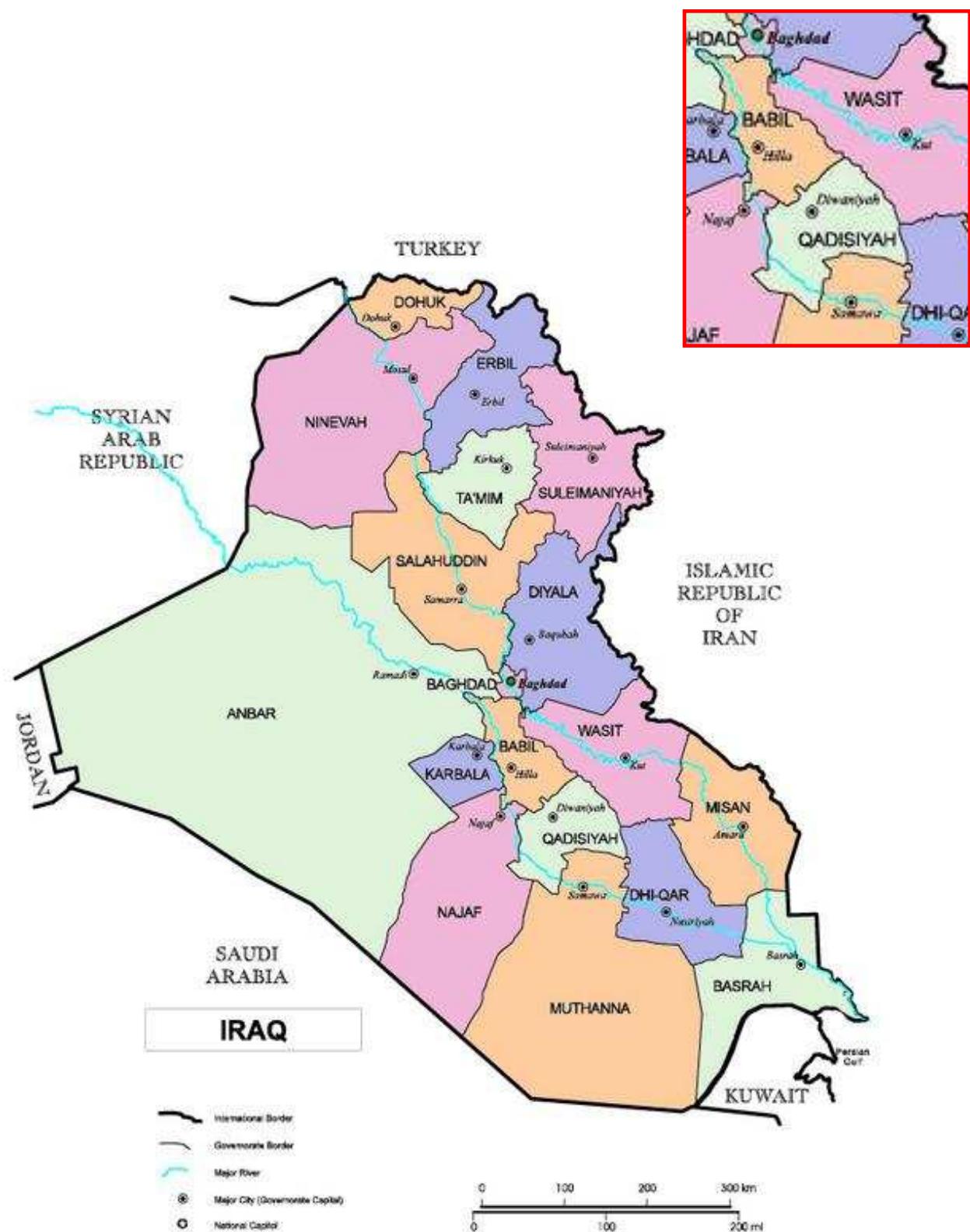
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This document has not been formally edited.

Contents

	<i>Page</i>
Executive Summary	7
I. Introduction	13
II. Country Context.....	16
III. Project Planning and Design.....	19
3.1 Project identification	19
3.2 Initial project design.....	19
3.3 The inception workshop	23
3.4 The needs assessment study.....	23
3.5 The selection workshop	29
3.6 Conclusions on the project planning and design process	31
3.7 Revisited and condensed logframe.....	32
IV. Project implementation	34
4.1 Adverse boundary conditions of the project.....	34
4.2 Project management	34
4.3 Status of implementation	36
VI. Evaluation of project performance	41
5.1 Relevance	41
5.2 Efficiency.....	42
5.4 Impact	48
5.5 Ownership and sustainability	49
VI. Recommendations.....	51
ANNEX 1:.....	54
ANNEX 2:.....	62

Map of project area



Abbreviations and acronyms

CTA	Chief Technical Advisor
EDIP	Enterprise Development and Investment Promotion Project (UNIDO)
FAO	Food and Agriculture Organization of the United Nations
ID	Iraqi Dinar
IDP	Internally Displaced Person
GHP	Good Hygiene Practices
GLP	Good Laboratory Practices
GMP	Good Management Practices
GOI	Government of Iraq
HACCP	Hazard Analysis Critical Control Points
KRG	Kurdistan Regional Government
MDG	Millennium Development Goals
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOI	Ministry of Industry
MSSE	Micro- and Small-Scale Enterprise
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOC	Ministry of Culture
MOLSA	Ministry of Labour and Social Affairs
NDS	National Development Strategy
NPC	National Project Coordinator
PG	Production Group
PMU	Project Management Unit
PSC	Project Steering Committee
TOB	Training of Beneficiaries, but also in the project, and therefore in this report, used as abbreviation for “Trained Beneficiaries”
TOR	Terms of Reference
TOT	Training of Trainers, but also in the project, and therefore in this report, used as abbreviation for “Trained Trainers”
UNAMI	United Nations Assistance Mission for Iraq
TWG	Technical Working Group
UNEP	United Nation Environment Programme
UNDG	United Nations Development Group
UNDG-ITF	United Nations Development Group – Iraq Trust Fund
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
VTC	Vocational Training Centre

Glossary of evaluation related terms

Term	Definition
Conclusions	Conclusions point out the factors of success and failure of the evaluated intervention, with special attention paid to the intended and unintended results and impacts, and more generally to any other strength or weakness. A conclusion draws on data collection and analyses undertaken, through a transparent chain of arguments.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.
Institutional development impact	The extent to which an intervention improves or weakens the ability of a country or region to make more efficient, equitable, and sustainable use of its human, financial, and natural resources, for example through: (a) better definition, stability, transparency, enforceability and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Such impacts can include intended and unintended effects of an action.
Lessons learned	Generalizations based on evaluation experiences with projects, programs, or policies that abstract from the specific circumstances to broader situations. Frequently, lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.

Logframe	Management tool used to improve the design of interventions, most often at the project level. It involves identifying strategic elements (inputs, outputs, outcomes, impact) and their causal relationships, indicators, and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution and evaluation of a development intervention. Related term: results based management.
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs. Related terms: result, outputs, impacts, effect.
Outputs	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Recommendations	Proposals aimed at enhancing the effectiveness, quality, or efficiency of a development intervention; at redesigning the objectives; and/or at the reallocation of resources. Recommendations should be linked to conclusions.
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies. Note: Retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.
Results	The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention. Related terms: outcome, effect, impacts.
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long-term benefits. The resilience to risk of the net benefit flows over time.

Executive Summary

This evaluation was conducted by Mr. Freddie Andersen, International evaluation expert and Managing Director of HAP Consultants and Mr. Peter Loewe, Senior Evaluation Officer of the UNIDO Evaluation Group. Mr Andersen carried out desk and field research in April 2010 and submitted a first draft report in June 2010. Subsequently, the report went through several rounds of consultations. The evaluators are grateful for intensive discussions with the backstopping officer and project staff. The evaluators and the project manager have differing views on certain points, which are mentioned in the text (chapter 3.5), in line with the UNIDO Evaluation Policy.

Project aims and status

The project under evaluation aimed to improve living conditions in Iraq through increased and improved production of milk. The main project activities concerned the rehabilitation of a state owned dairy plant; training of dairy farmers; improvements of the local milk collection system and training of trainers and staff from dairies throughout Iraq.

The initially planned duration of 16 months was agreed in response to donor requirements but turned out to be unrealistic and was therefore extended several times. At the time of the evaluation, more than five years after the start of the project, the dairy plant was still not functioning, due to technical problems. However, UNIDO remains committed to a successful completion of the project and activities were underway during the evaluation in order to solve the technical problems.

Project planning and inception phase

The intervention theory and the logframe in the project document were rather vague but the inception phase of the project was well managed and made up for some of the shortcomings of the initial planning. At the inception workshop it was decided that not only state owned but also private dairies would be eligible for rehabilitation and that the technology should be “affordable and not necessarily state-of-the-art”. For packaging, “the cheapest version fulfilling market requirements should be chosen. For a well founded selection of candidates, a needs assessment study based on thorough selection criteria was conducted.

The study identified 14 private and three state owned dairies and found that the private dairies performed far better than the state owned ones. Furthermore, the study found that 40% of the local milk production was processed by industrial dairies and another 40% by artisanal “cottage” dairies. However, the needs assessment report did not shed light on the economics of dairy production in Iraq, the cost structure of imported vs. locally produced milk and poor consumers’ access to milk products.

At a subsequent workshop the state owned dairy plant in Diwaniyah was selected. Although this plant had come out from the needs assessment as one of the weakest candidates, it was decided to develop it into a “model factory” by installing sophisticated equipment (UHT plus TetraPak)¹. This technology choice was motivated by the objective to provide milk for a school milk program and the selection of a state owned dairy instead of a private one by the objective not to distort the market. Less sophisticated technologies such as “traditional” dairy equipment with pasteurisation, bottling and autoclaving and alternative approaches such as spreading the support among several privately owned dairy plants or supporting the smaller “cottage” dairies, which are presumably closest to poor consumers, were not analyzed in any depth. The evaluators and the project manager have differing views whether these alternatives would have been viable solutions under the given circumstances.

Relevance

The development objectives of the project were wide ranging including post-war recovery of agriculture and agro-industry; safer food production; better access of poor consumers to milk; poverty alleviation of farmers and job creation in the dairy sector. Each of these development objectives is relevant to national and UN programme frameworks as well as to the UNIDO mandate in industrial development and post-crisis assistance. At face value, the project is therefore highly relevant.

However, as it is usual for projects with similarly wide ranging ambitions, the relevance of the project remains to some extent theoretical. Local industrial production of UHT milk does not enable in itself school milk programmes or better access to milk for poor consumers. There could be other potentially more relevant options but these were not explored. The lesson here is that vague and “multi-purpose” intervention theories with wide ranging relevance claims tend to be blurred and not very helpful when it comes to practical decision making about strategic options.

Effectiveness

At the time of the evaluation, the UHT and TetraPak lines at the state dairy were not yet functioning and the production and storage halls for UHT milk were still far from being HACCP compliant. Thus, the project had not achieved its main expected outcome of local milk production but there is a still chance that the production and filling lines delivered by the project will eventually become operational.

The project was more successful in implementing improved manufacturing and hygiene practices for the existing production lines of the dairy, which resulted in a better quality and improved customer acceptance of cooked cheese and yoghurt. Sales have gone up by about 10% and customer complaints have decreased from 5 to 2 per month on the average.

¹ More than ten years ago, the dairy had used similar processing equipment but these lines are no more functioning since long and considered obsolete and impossible to rehabilitate.

The project was also successful in upgrading the local milk supply chain of the dairy. A total of 225 dairy farmers were trained, of which 20 deliver milk to the dairy. Before the training, the dairy used only powder milk for its production. After the training and the improvement of the quality of the raw milk, the factory started to buy from the farmers. At the time of the evaluation the daily need of up to 7,000 litres of raw milk was covered from local sources.

Another expected outcome was improved food safety and food quality in other dairies throughout Iraq. To this end, the project trained a pool of trainers (TOT) who then trained 764 staff members from dairies and other milk production units. This TOT pool is still operational and trainings are ongoing under the auspices of the counterpart. Unfortunately, the project did not monitor this outcome, which is why it is not possible to assess whether and to what extent this training has actually led to improved food safety and food quality in the dairy sector of Iraq beyond the pilot dairy in Diwaniyah.

Efficiency

The efficiency of the project must be seen in the light of the exceptionally difficult security conditions on the ground, in particular during the first years of implementation. The “remote implementation” model has been definitely a major limiting factor not only for this but also for other similar projects. The shift in Government procurement policies during the project has been another major cause of delays. The initial planning of the packaging line was built on a supplier loan model, which is a standard arrangement world wide. This option was initially accepted by the Government but then rejected, leading to additional financial requirements, delays and eventually to coordination problems between different suppliers.

Another major cause of delays was the decision of the UHT supplier not to send his technical staff to the site using the argument of security problems. Although understandable, this decision was not in line with the contractual arrangements with UNIDO. As a result of the delays and of currency losses (budget in USD but procurement in euro) the project budget came under stress, leaving less room for project financing of unforeseen equipment, parts and activities, which instead had to be procured and undertaken by the counterpart under Government procedures. The allocation and use of Government funds for procurement and rehabilitation of necessary equipment was very time consuming.

Efficiency has probably also suffered from the administrative and management weaknesses on the side of the counterpart. The decision power for project implementation was at the level of the State Company in Baghdad and the general manager of the Diwaniyah dairy had very little influence, causing lack of commitment and frequent coordination problems on the ground.

Last but not least, efficiency was negatively affected by the decision of FAO to withdraw from the project during the final approval process. UNIDO managed to cushion the negative consequences of this decision by taking on the training of farmers, which under normal circumstances would fall outside the UNIDO mandate. The UNIDO project manager was also committed to further improve efficiency by creating synergies with

another project, under which the rehabilitation of a milk collection centre and the provision of a refrigerated milk bowser for delivering milk to the Diwaniyah Dairy Factory were financed.

Impact

The prospects for impact depend of course on the achievement of outcomes.

Because the expected outcome of local UHT milk production has not yet been achieved there is no impact with regard to better access to milk by poor consumers or school children. In case the local production of UHT milk will eventually take off, it remains to be seen whether this will only lead to substitution of imports or produce a wider impact on better access to milk for poor consumers. There is no evidence that the latter will occur because the project did not analyze the structures of the local milk and dairy markets nor did it examine the factors prohibiting access to milk by the various segments of poor consumers.

However, even if no poverty impact would be encountered, the expected impact on the recovery of agro-industry may materialize under the condition that the local UHT milk production at the rehabilitated dairy will prove to be economically viable and sustainable. It is unlikely that this will occur unless the dairy will be privatized (see below under ownership and sustainability).

Despite these question marks, positive impact has already been encountered at the supply side of the value chain and there are clear signs that the project has contributed to the recovery of agriculture. The trained farmers have improved the quality of their milk production, resulting in reduced rejection rates and a very substantial increase in selling price per litre of raw milk of 30 to 40%. Furthermore, the improved agricultural practices seem to be spreading beyond the immediate participants of the training.

Ownership and Sustainability

In principle, the ownership at the central level (Ministry of Industry and State Company for Dairy Products) seems to be solid. The newly introduced import duty for dairy products to protect local production is a sign that the development constraints of the sector are politically understood although such levies may be a double-edged sword with a view to improving the access of poorer consumers to milk products.

At the moment of the evaluation, there was no evidence that the MOI was committed to providing the necessary finance and manpower to sustainably complete the Diwaniyah project as intended, including efficient maintenance and supply of spare parts and assuring the necessary hygienic conditions in the production and storage halls to meet GMP, GHP and eventually HACCP standards.

At the level of the dairy management the decision power and project ownership seems to be rather limited and there was no evidence that the plant managers are committed to the project objective of developing the dairy into a “model factory” for UHT milk. By contrast, the factory management demonstrates good ownership of the project

objective to replace milk powder with local raw milk for the production of the traditional cheese and yoghurt products.

Of course, the project ownership of all parties and the prospects for sustainability depend crucially on a possible privatization of the dairy, which seems to be under discussion since quite some time. At the selection workshop, improving the chances for successful privatization were used as a selection argument but no concrete plans have been communicated.

Recommendations

- (1) It is recommended to the Ministry of Industry (MOI) to
 - Develop a solid and viable business and investment plan for the Diwaniyah dairy;
 - Invest in improved hygienic conditions at the UHT, Tetra Pak and other production and storage halls;
 - Invest in additional filling and packaging equipment for UHT milk (matching the capacity of the new UHT line) and also in other sections of the dairy, such as yoghurt and cheese;
 - The management of the Diwaniyah dairy should become organisationally, technically and financially autonomous and get a fully fledge import licence that would allow free access to importation of spare parts;
- (2) In the medium term, MOI should consider entering into a management contract with a dairy company from one of the neighbouring countries or privatising the dairy

It is recommended to the management of the Diwaniyah diary:

- (3) To establish an extension service to the existing and potential milk suppliers that would further improve the local supply chain and comprise: upgrading the collection system for raw milk, delivering extension services and supply of needed inputs for the milking cows.

The following recommendations are addressed to UNIDO for execution under its ongoing follow-up project:

- (4) Seek close cooperation with FAO and the GOI for the development of a national development plan for the dairy sector. This plan should not only cover industrial dairies but also “cottage” and artisanal dairies and give serious consideration to the objective of improved access by poor consumers to safe milk and other dairy products.
- (5) Seek close cooperation with FAO and the GOI to make best use of the pool of dairy trainers (TOT). Enable experience exchange among TOTs through annual meetings and request quarterly monitoring reports from them on progress in

GMP, GHP and GLP within their respective plants. Distribute the interactive TOB training programme (on CD) to all TOTs and other relevant project parties.

The following more general lessons learned and recommendations are submitted to UNIDO for consideration under future projects and programmes:

- (6) UNIDO management should provide clear policy guidance under which conditions technical assistance and “upgrading” activities at company level are allowable and justified. In order to avoid unfair competition between public and private companies, such assistance should not be restricted to Government owned companies.
- (7) Complex industrial investment projects, in particular those in post-crisis environments, should normally be implemented as turn-key projects. It is questionable whether UNIDO rules and procedures for purchasing and financial management and the HQ based implementation mode are adapted to implementing such projects. UNIDO management should provide clear guidance under which conditions and by which means UNIDO should become involved in complex industrial investment projects.
- (8) Project documents should be built on thorough intervention theories and include state-of-the-art logframes. Vaguely formulated “multi-purpose” development objectives open the door to inadequate operational decision making on the strategic orientation of the project during the inception phase. For projects with an expected impact on poverty alleviation, the causal chain and the key assumptions for such impact need to be clearly spelt out and demonstrated.
- (9) Post-crisis projects are expected to produce immediate benefits for vulnerable target groups. Longer term capacity building and economic development should also be aimed at but not at the cost of reducing the benefits for vulnerable target groups. The choice of appropriate technologies is particularly critical in post-crisis environments. There is an increased risk of failure when applying sophisticated technologies in such environments.
- (10) Key decisions and agreements with the counterpart should not be made orally but in a written form. This relates in particular to critical co-funding arrangements (cash and kind) and investment decisions related to the type of equipment (e.g. second hand) and the form of purchasing (e.g. leasing; supplier loans; etc). The project document and all subsequent agreements should be signed and formally endorsed not only by the direct counterpart ministry but also by all other involved line ministries.
- (11) Envisaged cooperation with other UN agencies and projects should be formally agreed at higher management level. If such binding arrangements cannot be reached, projects should not be planned as joint projects but as stand-alone operations.
- (12) For technical assistance projects in Arab speaking countries UNIDO should consider the translation into Arabic of project documents, agreements, reports and other major supporting documents.

Introduction

The project under evaluation aimed to improve living conditions in Iraq through increased and improved production of milk. The main project activities concerned the rehabilitation of a state owned dairy plant in Diwaniyah, the capital of the Al-Qadessiyah Governorate in the South of Iraq; training of technical staff and managers of this plant; training of dairy farmers and dairy extension workers and improvements of the milk collection system in the geographical area around the plant and training of trainers and staff of dairy related organizations from throughout Iraq.

The initial planning envisaged a direct complementarity of the project with the FAO animal husbandry programme in Iraq. The project document mentions both UNIDO and FAO as participating UN Organizations and the Ministry of Industry (MOI) and the Ministry of Agriculture (MOA) as counterparts. However, because FAO decided to withdraw after project approval and MOA gradually pulled out from it, the project became de facto a UNIDO/MOI operation.

The project was funded by the Iraq Trust Fund of the UN through a financial contribution from Italy. In 2007 the donor increased the initial project budget of USD 2,937,550 by USD 1,481,964 to an overall amount of USD 4,419,514.

The Project Document was signed on 1st September 2004. The project started on 1st January 2005 for a planned duration of 16 months (completion 30 April 2006). It was extended several times until June 2009 for a total duration of 54 months. At the time of evaluation, more than five years after the project start, the Diwaniyah dairy plant was still not functioning, due to technical problems. However, UNIDO is still committed to a successful completion of the project and activities were going on during the evaluation in order to solve the technical problems. Another dairy rehabilitation project in Northern Iraq was launched in 2010 with a different approach.

Initially, the present evaluation should have been conducted in 2009. This would have enabled taking into account recommendations and lessons learnt for the design of the follow-up project in Northern Iraq. Unfortunately, this evaluation planning did not materialize because no evaluation funds were included in the budget of the Diwaniyah project.

The evaluation

This independent end-of-project evaluation was conducted on the basis of the Terms of Reference (TOR) in Annex 1 by Freddie Andersen, International evaluation expert and Managing Director of HAP Consultants and Peter Loewe, Senior Evaluation Officer of the UNIDO Evaluation Group.

In March 2010 an initial briefing was held at UNIDO HQ in Vienna, where the evaluators met with the UNIDO HQ Project Backstopping Officer, the General Manager of the Iraqi State Company for Dairy Products under the Ministry of Industry and Minerals (MOI), the Manager of the MOI Market Study Department, the UNIDO Chief Technical Adviser² (CTA), and the National Project Coordinator (NPC). On this occasion, the evaluation work plan and methodology were discussed and agreed upon.

Following the initial briefing at UNIDO HQ the international evaluation expert conducted a desk study of relevant documentation and drafted an inception Report laying out the evaluation plan and questions for project managers, beneficiaries and stakeholders.

On 7 and 8 April 2010 the International evaluation expert met with the CTA in Amman to discuss the evaluation programme, the planned survey of the 18 project trained trainers (TOTs) and the evaluation questions.

Between 9 and 23 April 2010 the international evaluation expert conducted a field mission to Diwaniyah. For the on-site visits, surveys and interviews of trained trainers (TOT) he was assisted by Mr. Ali Fikiki (economist), and Ms. Wurood Ahmed (numerator). Mr. Safwat Jamil Al-Windawi (dairy factory expert) assisted with the technical evaluation of the Diwaniyah Dairy Factory. The National Project Coordinator (NPC) joined the evaluation team throughout the evaluation mission.

During the field visit the international evaluation expert met with:

- The management of the Diwaniyah Dairy Factory

² Who was on board from 2007 onwards but not during the planning phase of the project.

- 6 of the 18 project trained trainers (TOTs) in Hazard Analysis Critical Control Points (HACCP), Good Hygiene Practice (GHP) and Good Management Practise (GMP)
- 5 of the 24 people trained (TOBs) in hygiene and good management by TOTs in Diwaniyah Dairy Factory
- 5 of the 6 people trained in UHT in Denmark
- 2 of the 6 people trained in COMFAR in Amman
- 3 of the 17 dairy farmers trained in dairy cow management and hygiene in milk handling and storage
- 8 of the 13 extension service staffs (4 from Department of Agriculture (DOA) and 4 from the Diwaniyah Dairy Factory) trained in dairy cow management and hygiene in milk handling and storage

Visits were made to:

- Diwaniyah dairy factory
- Farmers in the districts of Shamia, Effec, Shanafia and Shafieah in Al Qadessiyah

The TOTs survey covered seventeen out of eighteen TOTs. Personal interviews were conducted with six of them and the remaining eleven were interviewed by telephone based on the questionnaire sent to them by e-mail. Information from TOTs , TOBs and other project stakeholders was carefully triangulated with physical evidence on the ground and control questions. The questionnaire used for the interview is attached in Annex 2.

On the basis of the desk research, the survey and the field visits, the International evaluator prepared a preliminary draft report for discussion at the project steering committee meeting on 15 June 2010. On this occasion, the UNIDO Senior Evaluation Officer presented the preliminary draft results and collected feed back. Unfortunately, the International evaluation expert could not attend this meeting because of an accident.

Subsequently, the evaluators produced a revised report that underwent several rounds of discussion and feed back. The evaluators and the project manager maintain differing views on the technology choice made by the project. In line with the UNIDO Evaluation Policy, these differing views are mentioned in the text (chapter 3.5).



Country Context

This project has been funded under the United Nations Development Group Iraq Trust Fund (UNDG ITF) that was established in 2004 to ensure coordinated, flexible and swift financing for reconstruction activities, sector wide programmes, investment projects and technical assistance. As of December 2007, 25 donors had deposited USD 1.3 billion to support 141 UNDG ITF projects. The closure of the ITF is envisaged for the end of 2010.

To put into perspective the conditions under which this project has been implemented it is useful to remind here the key findings of a stocktaking review of the UNDG ITF conducted in 2008:³

- The ITF was set up based on a set of assumptions about the conditions needed for successful implementation, including improved security conditions, political stability and the ability to place personnel in the field. None of these assumptions materialised. There was a serious escalation in violence and instability within its first year of operations, peaking in 2006 and only showed signs of improvement in later 2007.
- The ITF has been implemented in the midst of a high intensity conflict. No other MDTF and few, if any, recovery assistance programmes have been implemented under such extreme conditions. All aspects of programming were affected; from the ability to plan, communicate, move inside the country and implement projects to maintain a management and oversight capacity.
- Threats to personal security were real and omnipresent. Iraqi nationals working with the UN as employees or contractors were vulnerable to targeted reprisals. UN staff was not allowed to enter Iraq and UN Agencies introduced “remote management” structures from Amman.
- Projects reviewed under the stocktaking were delayed by an average of 130 percent over the approved duration. All projects experienced some combination

³ Stocktaking Review of the International Reconstruction Fund Facility for Iraq; Scanteam, 2009

of a change to their objectives and/or a change or reduction in the scope of outputs.

- Synergies between projects of different UN Agencies were sought but coordination proved problematic. Responsibility moved wholly to individual agencies after project approval. There was no central point in the UNDG ITF system with authority for oversight and quality control.
- Reporting from UN projects has been narrative and focused on the technical dimension of activities and outputs. There appeared to be a reluctance to deliver “bad news” to donors, which undermined the credibility of reporting. As a result, information on results is generally quite scarce.
- Difficulties in finding the right balance between medium to longer term capacity development projects and quick impact or short term service delivery activities is typical for most recovery assistance programmes. In the case of the ITF there was no clear guidance how to seek for trade-offs between these two dimensions.
- The tension between medium term capacity development and quick impact projects has also been present in UNIDO’s portfolio of ITF funded projects. A series of “cottage industry” projects have a prominent position in this portfolio. These projects were quite successful in striking a balance between institutional strengthening of Vocational Training Centres and other training providers and delivering direct ad-hoc income creation support to vulnerable groups.

Industrial development activities in Iraq are facing an industrial fabric that is heavily deteriorated, if not to a large extent destroyed. This situation is a consequence of the economic sanctions on Iraq and the wars, which strangled the productive sectors of the country. At the same time, it should not be forgotten that Iraq is also a country in economic transition with significant parts of the industry being still Government owned. Of course, under the conditions of totally broken down political and government structures, the situation of these Government owned industries has been desperate.

The food sector was heavily affected by the fact that the Oil for Food programme did not permit procurement of food from domestic production with the result that imported food became common in the food basket and food processing factories suffered from under utilisation and lack of spare parts. After the war, the open door policy with no customs duty on imports further undermined the economic viability of domestic agriculture and agro-industries.

In the animal husbandry sector the animal population declined steeply during the embargo years due to severe shortage of feed and vaccines, and it has not recovered during the years after the war. It is estimated that the total number of cows in Iraq is about 1.5 million heads of which around 1 million heads are located in Baghdad Governorate and its peripheries. The remaining 0.5 million cows are scattered in the southern Governorates, Al-Qadessiyah, Basra, Missan and Thi-Qar. As a result, the local production of milk has seriously declined.

The needs assessment study prepared by the project in 2005 showed that the dairy sector in Iraq is in a very poor shape. Most dairy plants are situated in and around Baghdad Governorate. In the South only two dairy plants of medium to large scale are still operating, the state owned dairy factory in Diwaniyah that was supported under this project and a privately owned plant in Missan.

Quality of milk delivered to the factories is poor in the absence of cooling and hygienic handling facilities for milk. Most of the dairies depend on milk collectors collecting milk from the smallholder dairy farmers using non-refrigerated vehicles and means. The factories are producing very small quantities compared with their rated capacities, particularly the two biggest ones, Abu-Graib and Diwaniyah, which are both State owned. Their equipment is very old and has not been renewed since 1990. Most are out of order or is in severe need of maintenance. Power supply is unstable and insufficient for refrigeration.

Al-Qadessiyah, where the project has been implemented, is the poorest Governorate in Iraq and Al Hamsa District close to Diwaniyah is the poorest district in the country. All social indicators are low and the Governorate has no oil or other assets that could generate some support from the Government.

The main economic activity in Al-Qadessiyah is agriculture, which is the economic basis for more than 60% of the population. However, agriculture is generally in bad condition due to lack of support, unaffordable input prices, competition from import and low earnings because of low quality and quantity of products.



Project Planning and Design

3.1 Project identification

The project proposal was based on a project brief entitled “Pilot Project for the Rehabilitation of the Dairy Sector in Iraq”, which was prepared by UNIDO following the Government’s policy decision to support the revitalisation of the country’s dairy sector and its wish to be supported in this endeavour by UN and the international donor community.

3.2 Initial project design

The Project Document was prepared by UNIDO in cooperation with the Iraqi Ministry of Industry and Mineral (MOI) and approved by the UNDG-ITF 22 August 2004.

The Project Document defines the Development Goal, Key Immediate Objectives, Outputs and Key Activities of the project. However, most descriptions are vague and the intervention logic is not in line with logframe terminology and partly flawed. For example, one activity reads:

“in close coordination with FAO’s animal husbandry programme, improving the supply chain for raw milk, the milk collection system, and generating increased rural incomes as a result.”

Some of the “key activities” in the logframe are different from the ones in the activity plan. The latter includes an activity to *“establish an extension service for dairy farmers”*, which is not mentioned in the logframe, probably because, initially, this was planned to be conducted by FAO.

Important concepts are not explained, such as *“rehabilitation in the broader sense of making (milk processing units) again a viable part of the food supply chain”* and setting up a *“community based supply chain for milk”*. The type and number of dairies to be rehabilitated is not specified.

It is difficult to reconstruct the underlying problem analysis and intervention theory from the project document. Some aspects of such a theory transpire from the following explanation on page 8 of the project document:

"The high quality of food needed to supplement the essential food basket, including those necessary to provide the needed bio-available micronutrients, are animal based foods – meat, fish, eggs and dairy products – and fruits and vegetables. Most of these are imported at present. Only a few of them are locally produced. Some of these food items are categorised as expensive and are beyond the purchasing power of most Iraqis. ... The project aims on reviving viable basic milk processing and packaging units based on realistic economic development strategies. The management will be enabled to develop the enterprise by product diversification and using soft loans as the next source for rehabilitation support."

Another explanation on page 10 points seems to develop the idea of a multi-purpose pilot operation:

"The project outputs and activities will rehabilitate the selected dairy and create a pilot model for further rehabilitation activities in the country's food sector. On being equipped with modern technology, the dairy will, in the first phase, act as a main source for liquid milk based on milk powder supplied through food aid projects, thus insuring wholesome and safe milk for the consumers replacing milk recombined with unsafe water and consumed without previous heat treatment. ... On having a well running dairy in the country, the farmers will be encouraged to increase milk production and step by step to replace the imported powder. This is the way to create jobs and income in agriculture and industry and contribute to food security as well as to support vulnerable groups in the rural and urban areas."

Page 9 of the Project Document mentions several figures. The rehabilitated dairy factory is expected to allow additional production of milk and milk products equivalent to 50,000 litres of milk per day. 400 jobs will be created at the selected dairy plant by "upgrading the strategic (?) production lines" in the first stage of the project. Subsequently, up to 100,000 children will benefit from a regular school milk programme and more than 100,000 citizens "will have the possibility to have a daily milk supply".

The link with agriculture and FAO activities and the need to make viable again the local supply chains for milk are deemed important and stressed in different parts of the document, for example, on page 9:

"In the later stages of the project and especially in combination with FAO's C5-010 Restoration of Animal Production Services the dairy rehabilitated through the project will be partner for several thousand farmers on purchasing their milk, bearing in mind that it is estimated by FAO that 40% of the project will be spent in the lower South of Iraq, the target area of this project."

Despite the inconsistencies and shortcomings of the logframe, it seems to be clear that job creation, income generation and food safety were set as the overall objectives of the project and that the main project beneficiaries should be vulnerable groups such as school children, poor citizens without access to milk and dairy farmers.

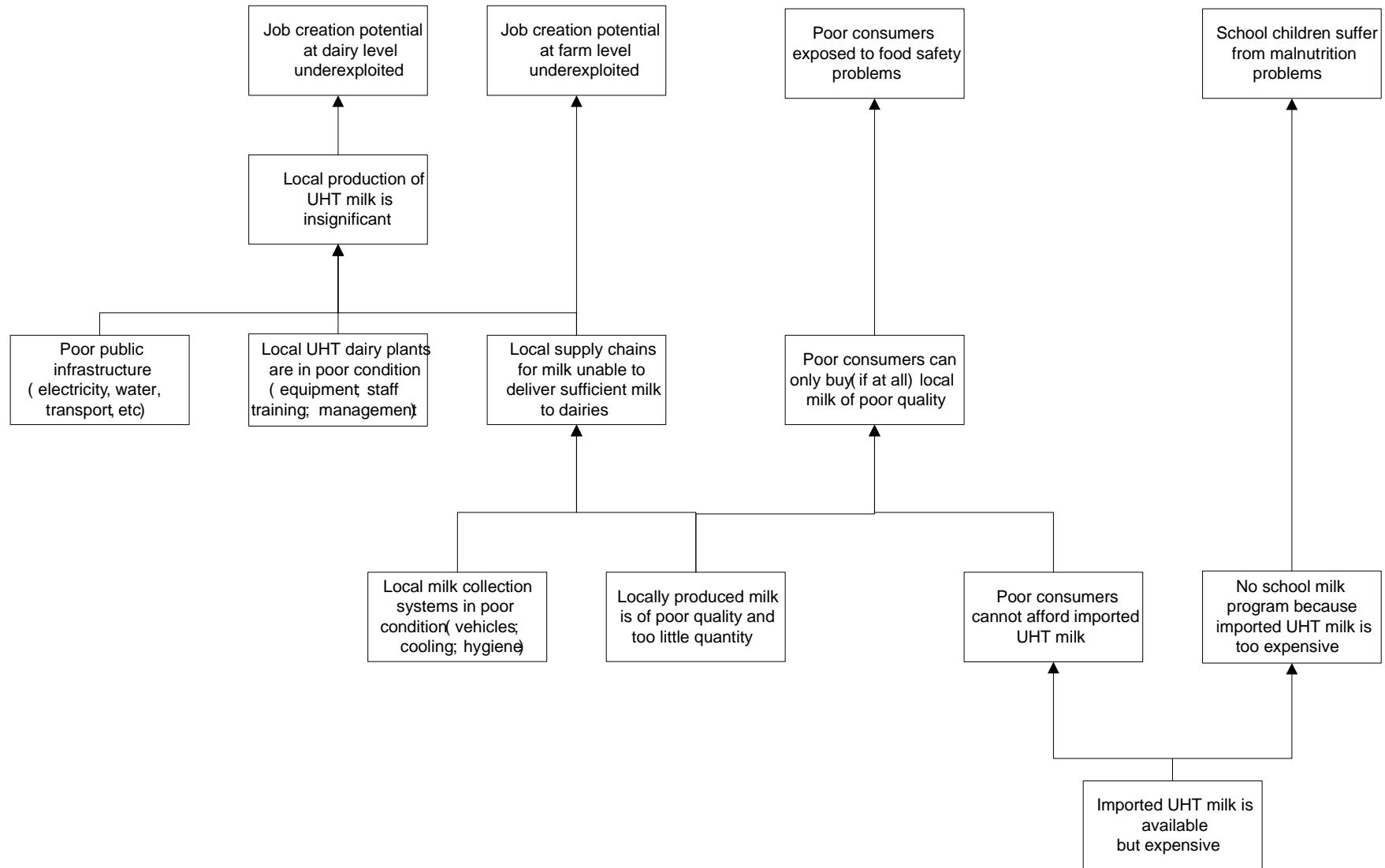
The vagueness of the project document reflects the limited state of knowledge during project formulation, although this vagueness is in stark contrast with the detailed yet unrealistic activity scheduling, which assumed that it would be possible to “*repair and equip the facilities*” in 6 months and to conduct “*procurement and installation of processing line equipment*” in 7 months. The unrealistic schedule was a result of accepting the time constraints coming with UNAMI funding. Fortunately, these constraints were subsequently softened by a series of project extensions.

Figure 1 shows the attempt of the evaluators to make the underlying problem analysis explicit and to depict it in a problem tree. It becomes clear that translating this problem analysis into a viable intervention theory would imply a number of key assumptions:

- Problems of the public infrastructure (electricity, water, transport) can be overcome;
- The counterpart would be able to overcome the typical structural, administrative and managerial problems of an inefficient state company;
- The locally produced milk will be less expensive than the imported milk so as to make it affordable for those consumers that cannot afford imported milk;
- The centralized food basket system will be able to reach poor consumers despite the post-conflict environment;
- Part of the production would be distributed to children through a Government financed for a school milk programme;
- The FAO project will contribute to put farmers in a position to deliver milk in sufficient quantity and quality and upgrade the milk collection system.

None of these assumptions are made explicit in the project document but it was of course clear to all participating parties that the planning basis in this document required additional clarification. Additional data gathering and analysis would be required to make the necessary decisions before the project could enter into its operational phase.

Figure 1: Assumed underlying problem analysis



3.3 The inception workshop

An Inception Report was foreseen in the project document but not prepared. Instead, an Inception Workshop was organized in Amman on 18-19 January 2005 with representatives from the State Company for Dairy Products under MOI; the MOA; the Italian Ministry of Foreign Affairs; the Italian Embassy in Amman; ICU-Rome and UNIDO HQ.

The workshop confirmed that the project aims to provide safe food for vulnerable groups like children and elderly people and to replace imported milk powder by locally produced raw milk. According to the minutes "*the representative of the donor as well as UNIDO's Backstopping Officer made it clear that the project will provide technical assistance, technology transfer, create a pool of experts, and have several training components.*" With regard to the way forward, the inception workshop decided that a "needs assessment study" should be conducted to identify the most appropriate candidate(s) for the dairy rehabilitation. The workshop established also the following four key points:

1. The needs assessment study should concentrate on Baghdad and the southern regions of Iraq.
2. The enterprise could be private or state owned, but should necessarily meet the requirements of sustainable development and replacing imported milk powder by local raw materials.
3. The selection of the enterprise to be upgraded should be based on sustainable development possibilities derived from a business plan.
4. As project funds are limited, the company should purchase at least part of the equipment by using soft loan possibilities offered by the Government of Italy.

With regard to the technology choice, the guidance from the inception workshop was very vague: "*the equipment to be provided has to meet affordable requirements and not necessarily state-of-the-art, especially in case of packaging, the cheapest version fulfilling modern market requirements should be chosen.*"

3.4 The needs assessment study

The TORs of the Needs Assessment Study defined a catalogue of 24 parameters combining technical, economical, managerial, logistical and social criteria that should be investigated for each of the dairies:

Technical conditions of dairies

1. The condition of the facilities and its equipment especially supply and Processing related equipment
2. The supply of the facilities with energy and water
3. The infrastructure of the dairy,
4. The installed and the working capacity of the equipment
5. Prevailing processing technology
6. Prevailing hygienic situation

Supply chain parameters

7. Existing transport means and their description (collection and delivery)
8. The infrastructure in the area the dairy is collecting and delivering milk and products
9. The distance of the dairy to milk production areas.
10. The prevailing milk supply
11. Price for raw milk and its seasonality
12. Possibilities to link the dairy to dairy farmers in order to replace powdered milk by locally produced milk

Agriculture and livestock parameters

13. Number dairy farmers and cows in the area the dairy is acting
14. Ongoing livestock programmes in the area
15. Possibility to establish milk collection centers in villages
16. The number and skills of the employed staff grouped in processing, administration, marketing and maintenance

Socio-economic parameters

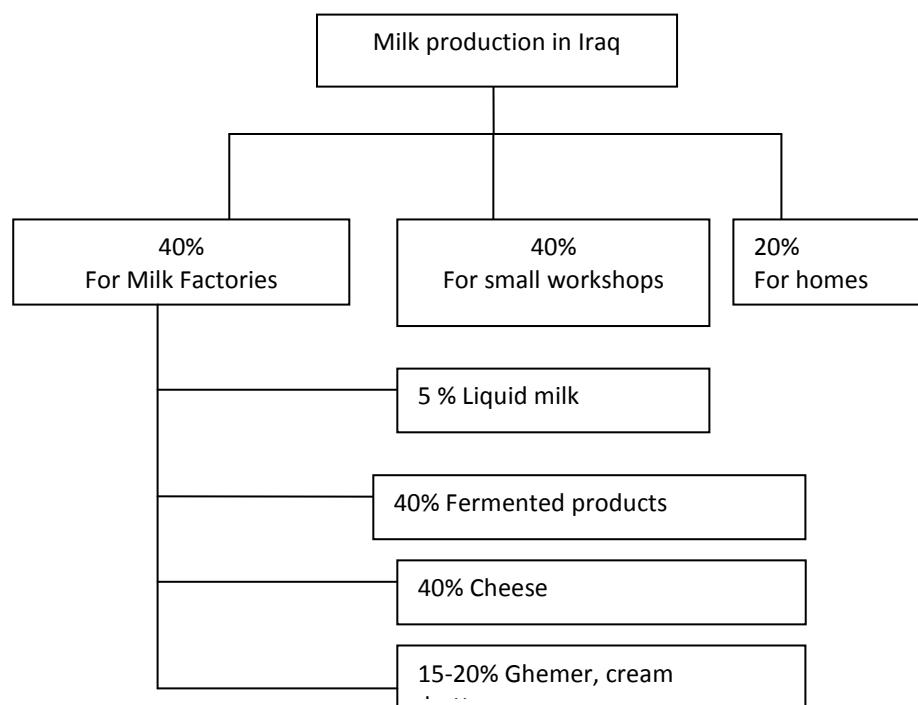
17. The management structure and skills
18. Costs of labour
19. Social activities provided by the dairy
20. Possible markets for dairy products
21. Market prices of the milk and milk products and their seasonality
22. Existing inclusion of schools in the school feeding program of the government
23. Number of children in the area
24. Existence of centers for vulnerable people like hospitals etc. in the dairy area

The needs assessment study was undertaken after competitive bidding by the consulting company Razconsult who submitted its report in June 2005.

The consultant estimated the total number of cows at around 1.5 million, of which around one million is located in Baghdad and its peripheries, while the other half million is scattered in southern governorates. After the 2003 war, most dairy farms were looted and only three big private farms remained out of 16 private and public dairy farms before the war. As a result, milk production in Iraq declined sharply and is estimated at 250 thousand tons per year.

Figure 2 from the report shows that 40% of the total milk production is processed by dairy factories while another 40% is processed by “cottage industry” workshops and 20% consumed at homes.

Figure 2: Current use of milk production in Iraq



It was reported that, for all factories except one, sufficient milk is produced at a distance of 5 to 50 km. However, the report emphasizes the poor conditions of the supply chains. Most dairies rely on milk collectors using non-refrigerated vehicles and tools in extremely unhygienic circumstances. Because of lack of awareness, the collectors cause

severe quality problems, such as addition of ice to the milk to decrease acidity and handling of milk in non-refrigerated means for more than six hours.

Table 1 extracted from the report summarizes the information on the 17 dairy plants that were identified in the defined area. 13 of them were located in Baghdad and four in Southern Iraq. The rated capacities vary between 5 and 500 tons/day. Only one dairy produced pasteurized milk. All others produce cooked cheese, yoghurt and ghemer. Only three dairies (Diwaniyah and two private ones) used imported milk powder as raw material; all other used fresh milk collected from local supply chains, sometimes from as far away as 200km.

14 dairies were private and three Government owned. The latter are not only among the biggest ones (Abu-Graib with 500 tons/day and Diwaniyah with 80 tons/day) but they are also the ones with the lowest capacity utilization. The capacity utilization in Abu-Graib is 2%, the one for Diwaniyah is 1%. By contrast, most of the private companies come out much better. Two of them produce at 100% capacity and most of them between 30% and 60%. The average capacity utilization of all 17 plants is 20%.

All dairies are connected to the national electricity grid but all have to rely on stand by generators because electricity from the grid is not available for long hours. All dairy factories have access to the national water supply but Diwaniyah and a few others depend on surface water from water cleaning stations.

For each company the report describes the technical, logistical and managerial situation and the specific reasons why most of them produce below their rated capacity. The report does not provide systematic information on the socio-economic parameters (17 to 24 of the above list). In particular, information on prices and production costs of the different products is insufficient to assess competitiveness.

The findings of the needs assessment study on the Diwaniyah plant are summarised as follows:

- Diwaniyah is among the few dairies on the list that have to rely on water cleaning stations utilizing water from rivers because water supply from the national network is insufficient;
- It has experience with UHT milk production but is “one of the worst in Iraq” and the only dairy on the list whose status is characterized as “operating but very poor”;

- It has a nominal capacity of 80,000 litres of milk per day, but the actual production is only one ton of powder milk per day for producing yoghurt, cooked cheese, and ghemer;
- The two UHT lines of the factory are defunct and too old to be rehabilitated;
- The yoghurt line is a manual production line and the equipment is very old and needs maintenance;
- The cooked cheese line is very old and need maintenance and rehabilitation and a packaging machine;
- The ghemer production line needs maintenance and a packaging machine;
- The pasteurizer, homogeniser, cream separator, various filling machines, water chilling unit and laboratory are not functioning;
- Total staff of the factory is 223 of which 62 in production. Most of the staff is de facto unemployed.

Table 1: Dairies analyzed under the needs assessment

ID	Factory	Ownership	Status	Location	Capacity (tons)/day (shift)			Milk type	Dairy products	Milk collection centers
					planned	actual	%			
1.	Abo-ghreib	Gov	Operating	Baghdad	500	10	2%	cow	Yoghurt, cheese , butter and ghemer	15 not working
2.	University of Baghdad	Gov	Operating	Baghdad	5	3	60%	cow	Yoghurt, cheese, butter ghemer	----
3	Adewanieyah	Gov	Operating but very poor	Diwaniyah	80	1	1%	powder	Yoghurt Ghemer	3 not working
4	Albarary	private	operating	Baghdad	25	13	52%	cow	Yoghurt, cheese, ghemer	----
5	Adhwaa Baghdad	private	operating	Baghdad	25	25	100%	cow	Cheese, ghemer	----
7	Al-Ikhtiar	Private	operating	Baghdad	10	1.5	15%	cow	Ghemer, Yoghurt and soft cheese	----
6	Baghdad	private	operating	Baghdad	70	30	43%	cow	Cheese, yoghurt, ghemer	----
8	Al-Sadeq	private	operating	Baghdad	100	30	30%	cow	Cheese, ghemer , cream	2 working
9	Al-Iraqiah dairy factory	private	operating	Baghdad	40	40	100%	cow	Yoghurt, cheese, ghemer and pasteurized milk	----
10	Al-Basra dairy factory	private	operating	Basra	40	12	30%	Buffalo Powder	Yoghurt, cheese, cream	1 not working
11	Amara dairy factory	private	operating	Amarah	20	12	60%	Cow	Yoghurt, ghemer, cheese	----
12	Al-Shahlaa dairy factory	private	operating	Baghdad	50	12	24%	cow	Yoghurt, cheese, butter, ghemer	----
13	Al-ASharqiah	private	operating	Baghdad	100	50	50%	cow	Yoghurt, Labaneh, cheese, cream Plus other food chains	---
14	Al-Namir factory	private	operating	Baghdad	10	3	30%	powder	Yoghurt, cheese and ghemer	---
15	Al-Samaawy dairy factory	private	Not operating	Baghdad	50	0	-	----	-----	-----
16.	Nasiriyah dairy factory	Private	Not operating	Baghdad	20	0	-	-----	-----	-----
17.	Al-Janoub dairy factory	private	Not operating	Nasiriyah	50	0	-	-----	-----	1 not operated
					1195	242	20%			

3.5 The selection workshop

On 26 and 27 June 2005 UNIDO organized a two days workshop in Amman followed by a meeting of the PSC to select the pilot dairy plant for project support. Participants included public sector representatives from MOI, MOA and state dairy companies, as well as dairy owners from the private sector, dairy farmers and dairy experts.

According to the minutes of the workshop⁴ the selection criteria were:

- Ownership
- Site
- Status
- Type of products
- Infrastructure

Quoting from the minutes, the Diwaniyah Dairy Factory was selected on the following grounds:

"Ownership: State owned dairy factories had the priority for UNIDO intervention. Furthermore, the earning from expected subsequent privatisation of public dairy factories, which is more realistic after rehabilitation, will be used in supporting the dairy sector in Iraq.

Site: The most interested areas in Iraq by Italian were the southern Governorates of Iraq, where Italian forces were located.

Status: Although the Diwaniyah factory was working at very low capacity, even on powder milk, still the system is there, staff is going to the factory and some sort of activities as well as production are going on.

Type of products: The project is intended to substitute gradually imported UHT milk. Preliminary studies showed that the cost of producing UHT milk in Iraq is far below that of similar imported products. Diwaniyah factory had earlier two UHT milk lines. Despite that they were not functioning and out of order an UHT milk line in Diwaniyah could be easily acquired by the staff, which had already relevant experience."

Infrastructure: (Minutes shortened by the evaluators) All needed premises were available at the Diwaniyah plant; it had a high capacity stand-by diesel generator and a water treatment and cleaning system using water from a nearby river canal.

⁴ Page 14 of the Final Project Report of 31 March 2009 prepared by the project CTA.

Given the findings of the needs assessment that Diwaniyah was “one of the worst” in the country (see above) it was clear that it would be extremely challenging to rehabilitate this plant within the given timeframe and financial limits. Nevertheless, Diwaniyah was unanimously selected at the Inception Workshop and endorsed at the subsequent PSC meeting. The case for selecting this state owned dairy was made on the following grounds:

“(Supporting only) one dairy in a governorate with several enterprises would disturb the situation in a manner that only the supported one would have a chance to survive but there is still the need of having a model plant or at least a model department in an existing dairy to establish trust between farmers and dairy, to establish a model how the milk price could be raised to an attractive level ad to provide a secure outlet for raw milk from cow stations as well small farmers.”

To counterbalance this decision, it was agreed that the private sector dairies should benefit from the project by offering quality related training to them. A possible alternative approach by which not only one but several of the identified private plants would have been supported with variable and needs specific inputs instead of focusing on only one “model factory” was not considered an option.⁵ The additional argument used at the workshop, that rehabilitating a state owned dairy would facilitate its subsequent privatization and increase Government income from such privatization is not mentioned in the project document.

The statement in the minutes that *“preliminary studies showed that the cost of producing UHT milk in Iraq is far below that of similar imported products”* is of course essential because it would support the condition of the inception workshop that *“the selection of the enterprise to be upgraded should be based on sustainable development possibilities derived from a business plan”*. Unfortunately, there is no needs assessment or feasibility study supporting this statement and no detailed analysis of technology options, optimum capacities and investment and operation costs has been made.

Whether the technology choice for UHT treatment plus TetraPak filling lines is in line with the vague guidance from the inception workshop (see above) is difficult to decide. Allegedly, the counterpart representatives insisted that they would not accept any intermediate technology and there is no evidence that UNIDO argued against this preference. Undoubtedly, the technology choice had profound consequences for the course of the project.

⁵ In other post-conflict environments UNIDO has provided such widespread rehabilitation support to private companies but no clear management guidance exists under which conditions UNIDO projects can adopt this approach of supporting private companies directly.

The evaluators and the project manager have differing views whether less sophisticated technologies would have been an option. The selected technology is state-of-the-art but relatively sophisticated. It depends on zero-delay uninterrupted power supply, a highly hygienic environment, immediate availability of spare parts for preventive maintenance and repairs and on highly skilled and dedicated staff for operation and maintenance. Information gathered among local dairy experts suggests that only one dairy in Iraq applies UHT milk processing technology successfully. At all other places where this technology is applied, severe problems arise in running the equipment to any efficiency.

A cheaper, more robust and above all more replicable technical solution would have been a "traditional" dairy equipment with pasteurisation, bottling and autoclaving. The bottles could be glass or plastic with autoclaving after bottling. The evaluators maintain that this type of technology choice would have matched the intention in the project document of "reviving viable basic milk processing and packaging units" and the guidance from the Inception Workshop. They maintain that this solution would probably have allowed the production of milk from local raw milk already in 2006/07. The project manager does not agree with this view.

3.6 Conclusions on the project planning and design process

The project document aimed at improved milk supply for vulnerable target groups and envisaged close cooperation with FAO to achieve revitalization of local milk supply chains and poverty alleviation of farmers. However, the intervention theory in the project document on how to achieve these objectives was not clearly described, the logframe was rather poor and key assumptions were not spelled out. In particular, the cost structure of imported vs. locally produced milk and its affordability for poor consumers was not considered. On the other hand, the project document includes an exact but unrealistic timing for the purchasing, installation and commercial running-in of the equipment, which was subsequently rectified.

The subsequent decision making process made up for some of the shortcomings of the project document. The inception workshop confirmed the orientation of the project document that private and publicly owned dairies from Baghdad and South Iraq would be eligible and that the technology choice should be based on economic viability and "affordability" of the technology. To enable rational decision making, a list of 24 selection criteria was endorsed at the inception workshop and a needs assessment study commissioned.

This needs assessment study produced very valuable results. It identified 14 private and three Government owned dairies in Baghdad and South Iraq and found that the private dairies performed far better than the publicly owned ones. Furthermore, it demonstrated that 40% of the local milk production was used by private dairies and another 40% was processed in artisanal “cottage” dairies. However, the needs assessment report did not shed sufficient light on the economics of dairy production in Iraq, the cost structure of imported vs. locally produced milk and its affordability for poor consumers.

At the selection workshop it was decided to go for a “model factory” approach and to install a relatively sophisticated type of equipment (UHT plus TetraPak) at the state owned dairy plant in Diwaniyah, although this plant had come out from the needs assessment as one of the weakest candidates. Possible alternative approaches such as spreading the support among privately owned industrial dairy plants or supporting the “cottage” dairies, which are presumably closest to poor consumers, were not considered.

3.7 Revisited and condensed logframe

To rationalize the evaluation of the project implementation, the evaluators prepared a simplified version of the log frame using standard log frame phrasing and a correct intervention logic, but without changing the meaning of the planning. This logframe is presented below:

Table 2: Condensed logframe

<i>Development Objectives</i>	<i>Indicators</i>
A. Poor consumers have better access to milk B. More jobs at dairy level C. Increased incomes at farm level	100.000 poor consumers; 100.000 school children 400 dairy jobs "Thousands of farmers"
<i>Outcomes</i>	
1. The pilot dairy is rehabilitated in conformity with relevant food safety and quality standards and ready for production	HACCP conformity 50 tons of milk per day
2. Food safety and food quality in dairies throughout Iraq are improved	
3. The local milk supply chain of the pilot dairy is upgraded	
<i>Outputs</i>	
1.1 The pilot dairy is equipped with appropriate new production and packaging lines	Pilot plant technically operational and commissioned
1.2 Managers of the pilot plant and other dairies are better qualified	
2.1 A pool of well trained national dairy experts (TOTs) is available	
2.2 Staff members from dairy factories throughout Iraq are better qualified	
3.1 Dairy extension workers and farmers are better qualified	
3.2 Milk collection system improved	

IV

Project implementation

4.1 Adverse boundary conditions of the project

A number of initially assumed boundary conditions of the project did not materialize as planned:

- Water treatment problems had to be solved.
- FAO withdrew from the joint project and was active in the Wasit and Salahuddin governorates but not in Al-Qadissiyah, where the UNIDO project was active. Salahuddin out of the predefined area. Wasit is in the neighbourhood of Diwaniyah and the project supplied a special milk collection and transport tank.
- The MOI did not accept using a refurbished second hand TetraPak filling line on the basis of a supplier loan agreement, as initially agreed.
- Using security reasons as an argument, the Danish contractor did not accept sending its staff to the project area.

Besides the unrealistic timeframe in the project document, the failure of important boundary conditions of the project is in the background of the repeated extensions of the project duration, the necessary extension of the budget by USD 1,481,964 to USD 4,419,514 and also the fact that, more than 60 months after project start, the pilot dairy is still not operational.

4.2 Project management

The Project was managed by the Backstopping Officer at HQ, a CTA based in Amman and a National Project Coordinator (NPC) based in Baghdad. The Project Steering Committee (PSC) was composed of the following members:

- (1) Representative of MOI
- (2) Representative of MOA (from April 2005 to end 2006)
- (3) Representative of the donor (Italy)
- (4) Representative of UNIDO (Project Backstopping Officer)
- (5) Chief Technical Adviser (CTA)
- (6) National Project Coordinator (NPC)

Only a few official PSC meetings were held but additional informal meetings took place. Communication between UNIDO and MOI was mostly oral and there are no formal agreements on sharing responsibilities and cost. At the operational level, the NPC submitted weekly reports to the CTA and the CTA prepared monthly reports to UNIDO HQ. There is no evidence from these reports that the NPC and the CTA were proactive in initiating follow-up and adjustments.

Project progress monitoring is documented in seven half yearly Project Progress Reports (the last one covering the period 1 January – 30 June 2008), in two PSC meeting minutes, and seven Back-to-Office Mission Reports. The progress reports include numerous repetitions from the Project Document, but give a fairly good overview of major project output achievements and project delays. In March 2009, the CTA produced a relatively detailed final report.

The monitoring of activities and output was detailed and frequent but the monitoring of outcomes was rather weak, if at all undertaken. The project expenditures up to the time of evaluation are presented in table 3.

Table 3 Project Expenditures

Category	Expenditures USD
<i>11-99 - Project Personnel</i>	<i>169,747</i>
<i>13-99 - Admin. Support Pers.</i>	<i>8,614</i>
<i>15-99 - Project Travel</i>	<i>20,423</i>
<i>16-99 - Other Pers. Costs</i>	<i>23,403</i>
<i>17-99 - Short-Term Nat.Consult.</i>	<i>89,458</i>
19-99 - Sub. total personnel costs	311,645
29-99 - Subcontracts	426,761
39-99 - Training & study tours	277,757
<i>45-01 - Purchase of Equipment - 2005</i>	<i>1,441,944</i>
<i>45-01 - Purchase of Equipment - 2006</i>	<i>290,599</i>
<i>45-01 - Purchase of Equipment - 2007</i>	<i>1,275,496</i>
<i>45-01 - Purchase of Equipment - 2008</i>	<i>21,977</i>
49-99 - Equipment/local procurement	3,030,001
<i>51-99 - Sundries</i>	<i>22,996</i>
<i>55-99 - Non-UNDP Hosp.</i>	<i>370</i>
<i>56-99 - Security Services</i>	<i>58,376</i>
59-99 - Sub.total miscellaneous costs	81,742
Total USD	4,127,906

Source: UNIDO Infobase, September 2010

4.3 Status of implementation

This chapter presents the status of implementation by outputs. Whether and to what extent each of these outputs has led to the related outcome will be assessed under chapter 6.3 dealing with project effectiveness.

Output 1.1: The pilot dairy is equipped with appropriate new production and packaging lines

This output has been the most demanding of the entire project, both in terms of financial resources and manpower. The following equipment was supplied to the Diwaniyah dairy:

- Milk reception
- Milk recombination unit
- Milk pasteurisation and homogenisation units
- Buffer tanks
- CIP unit
- Power generator
- Water treatment unit,
- Laboratory equipment
- UHT milk processing line
- Tetra Pak filling and packaging line

There were two major shifts in Government policies on the type of equipment to be purchased. While the MOI had initially accepted purchasing a refurbished filling line, this decision was revoked at a later stage claiming that a high-level policy orientation would not allow such a solution. The financing of the Tetra Pak packaging line through a supplier's loan was also not accepted, although this model is widespread in the dairy sector. These shifts had major consequences for the project and are among the main causes for the delays and problems encountered.

As a consequence of the Government policy shift, the necessary funding increased considerably. Fortunately, the Italian Government accepted to increase the project budget by USD 1,481,964 to USD 4,419,514. This amount mainly covered the additional financial needs for procurement and installation of a new Tetra Pak aseptic filling line with straw applicator, card board packer, tray shrink wrapper, and conveyors. However, because of the decision that the filling line had to be new major coordination problems and delays occurred. There is no evidence that UNIDO management made a stand on this key controversial point or insisted that the initially agreed purchasing policy be maintained.

At the time of evaluation the status for the equipment was as follows:

- Milk reception and recombination units, buffer tanks, CIP unit, power generator and water treatment unit installed and ready for operation;
- Laboratory equipment is installed, in use and suitable for the factory;
- Pasteurisation and homogenisation units were installed;

- The UHT line is reportedly ready for operation, but only two short trial/running-in attempts have taken place successfully. A host of technical problems arose related to soft ware, leaks, sensors, valves, damaged O-rings, etc. Proper running-in and commissioning has never taken place with the supplier (Scanpro/APV), due to delays on the client side and security problems used by the supplier as an argument not to send technical staff to the site. Although the UHT line is still not operational, the supplier considers his responsibility fulfilled.
- The TetraPak unit was installed but not yet tested because of the problems with the UHT line.

The power supply from the grid in Diwaniyah is very unstable with several power cuts a day. Technically, this problem can be considered to be solved because a zero delay generator was purchased under the project but cost-wise this solution will reduce the competitiveness of UHT milk production vis-à-vis imports because the cost of self-generated electricity is of course higher than the cost of grid electricity.

Furthermore, the International evaluation expert found that the present conditions in the UHT and Tetra Pak filling line halls do not meet at all HACCP requirements and questions whether the level of skill and commitment of the operation and maintenance staff will be sufficient to run the equipment.

There is a relatively big difference between the capacity of the plant (6 tons per hour) and the Tetra Pak unit (1.5 tons per hour). This limits the capacity to about 9,000 litres in one shift. Reportedly, the State Company for Dairy Products plans to invest in additional filling and packing capacity comprising a one litre and a 500 ml unit with capacities of per hour up to 4500 litres and 6,000 litres, respectively, but at the time of the evaluation no firm commitment was made yet.

Output 1.2 Managers of the pilot plant and other dairies are better qualified

From the beginning, improved management capacity was recognized as critical. The project organized two courses for dairy managers.

The first one was a *COMFAR III* training for six managers from the state owned dairies in Abu-Graib, Diwaniyah and Mosul. The course took place in Amman during two weeks in July 2006 and dealt with the preparation of feasibility studies (market analysis, technical analysis and financial and economic analyses).

The second course was on *business development* including business strategy formulation, business planning, access to soft loans, and implementation planning. It took place during 4 days in Amman in November 2007. Eight managers attended, two from the State Company for Dairy Products, one from MOI, three from private dairy factories, one from the College of Agriculture, and the project NPC.

Both courses were well structured and intensive with state-of-the-art teaching and course contents, although none of them was specialized on the dairy sector. At the end of each course the participants expressed great satisfaction with the subjects taught, the didactic techniques and the training materials.

The general manager and the processing manager of the Diwaniyah factory were also trained as TOTs. Subsequently, they conducted two courses for their staff in HACCP principles, GMP and GHP for 24 middle managers and equipment operators, 12 in each course during one week 4 hours per day. A curriculum was prepared for the courses on hygienic standards for premises and machinery, hygienic operation procedures and hygienic auditing.

Output 2.1 A pool of well trained national dairy experts (TOTs) is available

The training of trainers (TOT) was much more intensive than the management courses and comprised a series of intensive courses on HACCP, GHP, GLP, and GMP in dairies. The training took place in Amman and consisted of 5 modules of two weeks each. Between the teaching modules the TOTs were practising their new knowledge on-the-job.

Eighteen national dairy experts attended this TOT course. Thirteen came from dairy plants throughout Iraq, two from Diwaniyah, four from the dairy farming extension service of MOA, six from private companies and one from the University.

The International evaluation expert conducted a survey among the participants and interviewed them either face-to-face or by telephone. All except two had previous experience as trainers. All found the courses in Amman satisfactory and appropriate for their subsequent TOB training. The TOTs used the data sheets and hard copies from the TOT training (available in English and Arabic) in their TOB courses. Interactive CD ROMs with updated content in English and Arabic are reportedly being developed by UNIDO and should be distributed to the TOTs in the 3rd quarter of 2010.

As a result, this output comprises a pool of 18 national dairy experts to support the upgrading of the pilot dairy and other dairies throughout Iraq. All trainers come from the dairy industry and related agencies and are easily accessible and freely available for TOB training also outside their own working place. The TOTs are not formally organised as a group, but MOI keeps them in a roster and draws on their expertise when needed. All of them conducted TOB courses after the TOT training, mostly within their own dairy plants (see output 2.2).

As a side effect of this training, a participant from the University suggested to improve the quality of the teaching at the Faculty of Agriculture of the Baghdad and Sulaymaniyah Universities by including the TOT subjects, HACCP, GMP, GHP, and GLP into the curricula. At the moment of the evaluation, the NPC was taking action to implement this additional

output through providing literature for the teachers and if possible arrange a study tour for the same to a dairy factory meeting the TOT subject requirements.

Output 2.2 Staff members from dairy factories throughout Iraq are better qualified

The TOB courses covered mainly the overall principles of HACCP and in greater detail GHP. The duration of the courses is generally one week with four hours a day for 10-15 TOBs. Training in GMP and GLP has taken place on individual basis.

The TOT pool conducted 69 courses and trained 764 dairy plant and dairy related staff. Through these courses, HACCP, GHP, GMP and GLP knowledge has been broadly disseminated in the dairy sector of Iraq and the number of persons trained exceeds considerably the targeted figure of 200.

Output 3.1 Dairy extension workers and farmers are better qualified

Because the envisaged synergy with the FAO livestock project did not materialize, the UNIDO project had to venture into agriculture activities in order to tackle the expected outcome of upgrading the milk supply chain.

Twelve dairy extension workers and seventeen dairy farmers in the Diwaniyah region were trained in dairy cow management with the aim to increase milk quality and quantity. The duration of the training course was two weeks including study tours to the Diwaniyah dairy and to Najaf, where developed dairy farming practices can be found.

The results of this training are very encouraging. Within their limitations, farmers have applied their new knowledge. Farmers visited by the International evaluation expert gave the following examples:

- Before they tied the cows in the pens. Now they can move around in free penning within the stable/closure
- Before they took the cows to the river for drinking from time to time during the day. Now they use tap water in steel drum basins and the cows have free access and can drink as much as they want
- Before they supplied roughage to the cows from time to time in the pens during the day. Now the cows can eat freely when they want from a pile of roughage in the stable/closure.
- Before they cleaned around the cows in the pens about once a month. Now they do it daily
- Before they fed all the cows with the same amount of fodder. Now they give more to the milking cows and less to those not in milk
- Before they did not clean the utter before milking. Now they wash the utter before in semi warm water

- Before they did not give much attention to the condition of the utter. Now they look for scratches, mastitis, and other things, which have impact on the milk quality
- Before they cleaned the milk buckets and containers superficially. Now they clean more intensively and using a brush
- Before they did not treat the milk after milking. Now they cool the milk and sieve it for straw and other pollutants

Output 3.2 Milk collection system improved

For the improvement of the milk collection system the project initially relied to a large extent on the FAO programme. When this complementarity did not materialize, the Backstopping Officer at UNIDO who is also responsible for a joint WHO/UNIDO/FAO project in Iraq, managed to create some important synergy effects by orientating funds from the other project towards the rehabilitation of a milk collection centre in the Babil Governorate and the purchasing of a refrigerated milk bowser for this centre. Because Babil is within reach of the Diwaniyah dairy, this move contributed significantly to improving the supply chain and milk collection system for the pilot plant.

V

Evaluation of project performance

5.1 Relevance

The development objectives of this project are wide-ranging: post-war recovery of agriculture and agro-industry; safer food production; better access of poor consumers to milk; poverty alleviation of farmers and job creation in the dairy sector.

Each of these development objectives is relevant to national and UN programme frameworks as well as to the UNIDO mandate in industrial development and post-crisis assistance.

The project objectives address the Government of Iraq's (GOI) National Development Strategy (NDS) and the UN assistance strategy for Iraq with respect to employment creation, sustainable food production, and income improvement of vulnerable groups in rural and urban areas. They also address the Government priority on the recovery of the agricultural sector, which is considered critical for economic revival of the country. The national development strategy supported by the UN puts also emphasis on sustainable local food production and job creation in agriculture and agro-industries.

Potentially, the project is also relevant to the achievement of Goal 1 of the Millennium Development Goals (MDG): "Eradication of extreme poverty and hunger". The selection of Al Qadissiyah, which is the poorest Governorate of Iraq, indicates the priority of the project on poverty alleviation.

At face value, the project is therefore highly relevant. However, as for other projects with similarly wide ranging relevance claims, the relevance of the project remains to a large extent theoretical. Intervention theories with "multi-purpose" development objectives might satisfy donor expectations but tend to be blurred and not very helpful when it comes to providing practical orientation for decision making and project implementation.

This dilemma has been clearly visible in the present case. As described in chapter 4.2, the intervention theory it is difficult to reconstruct. The mentioning in the project document that the project should feed into school milk programmes motivated the decision for UHT milk plus TetraPak, which is incompatible, at least partly, with other claims such as setting up "*community based supply chains for milk*" and "*reviving viable basic milk processing and packaging units*".

In order to operationalize the vague ideas in the project document, key decisions had to be made during the inception phase that were not only of an operational nature but represented a choice between different strategic options. Each of these options would have had different implications on the priorities given to the various development objectives. .

The project management could have probed the "school milk" objective. Because school milk programmes with imported milk are underway, the socio-economic or post-crisis benefit of producing UHT milk for school milk programmes locally is not obvious. However, it is this interpretation of the intervention theory that seems to have informed the strategic choices of the project.

Other strategic decisions and scenarios would have been possible. Setting up "*community based supply chains for milk*" and "*reviving viable basic milk processing and packaging units*" as mentioned in the project document could have led to a focus on "cottage" dairies that - according to the needs assessment – process 40% of the national milk production, are near to poor consumers and rely on local supply chains.

Instead of the capital intensive and technologically advanced solution of UHT plus TetraPack packaging, less sophisticated "traditional" batch technology using bottles and autoclaving after bottling could have been another option that was not considered.⁶ Instead of focusing the support on a state owned dairy, one could have selected more promising privately owned dairies for a "lighter" technical assistance.

There is a lack of clarity in UNIDO under which conditions providing direct support to private companies is acceptable. The argument that UNIDO assistance to companies must be restricted to state owned companies is sometimes used but not valid. There are many examples of direct UNIDO support to private companies, in particular in post-crisis environments such as the LAISER project in Lebanon.

5.2 Efficiency

The management and implementation efficiency of the project must be seen in the light of the exceptionally difficult implementation conditions described in chapter 3. The "remote implementation" model has been definitely a major limiting factor not only for this but also for other similar projects. However, even taking into account these conditions and

⁶ The project manager does not share this point of view, see chapter 3.5.

experience from other projects, it should be stated that the de-facto extension of the duration of the project by 275 percent from 16 to 60 months is the double of the average delay of 130 percent. Looking into factors that might have limited implementation efficiency, several aspects should be mentioned.

First of all, the excessive time overrun is due to the fact that the ITF accepted such a complex industrial rehabilitation project under the constraints of a short duration of 16 months, a decision that was tacitly corrected by the subsequent extensions. When the project started, it was clear to all parties that the 16 months duration was far from realistic.

The shift in Government procurement policies has been the second major cause of delays. After using time to pursue supplier loan financing of the packaging line, this option was finally not accepted leading to cooperation and coordination problems in installing the UHT line and the Tetra Pak filling lines under two separate contracts with two different suppliers. Another major cause of delays was the decision of the supplier not to send his installation supervisory staff to the site using the argument of security problems. Although understandable, this decision was not in line with the contractual arrangements with UNIDO.

As a result of the substantive delays and also of currency losses (budget in USD but procurement in euro) the project budget came under stress, leaving less room for project financing of unforeseen equipment, parts and activities, which instead had to be procured and undertaken by the counterpart under Government procedures. The allocation and use of these Government funds for procurement and rehabilitation of necessary equipment was very time consuming.

Another source of delays relates to the fact that planning techniques were relatively basic and not up-to-standard with the management of complex technological investment projects. No GANNT chart or critical path modelling was used for overall management.

The selection of the NPC was hindered by the fact that qualified candidates were interested in posts in newly privatised dairy factories rather than by the comparably poorer conditions and salary offered by the project. It did probably also not help with implementation efficiency that the NPC had no assisting staff and was located in Baghdad more than 200 km from the project site. The decision for this location gave better access to the State Company for Dairy Products and the MOI but made day-to-day interventions at the project site in Diwaniyah challenging.

Efficiency has probably suffered from the administrative and management weaknesses on the side of the counterpart. Because the decision power for project implementation rested at the level of the State Company in Baghdad, the general manager of the Diwaniyah dairy had very little influence. Interviews with technical staff of the UNIDO subcontractors suggest that the insufficiency of day to day project management and the absence of clear leadership were the main reasons for the frequent coordination and cooperation problems and delays.

The decision makers of the project were the two MOI representatives, the UNIDO Backstopping Officer and the CTA. They were in close contact throughout the project and tried to facilitate project progress. However, they were more successful for the training activities than for the rehabilitation component. Interfaces between the MOI, the State Company and the Diwaniyah Dairy Factory caused delays.

Although not explicitly documented the UNIDO project manager increased efficiency by ensuring synergy with the project “Re-establishing the Food Safety and Food Processing Industry Capacity in Iraq”, which is jointly implemented by UNIDO, FAO and WHO. The rehabilitation of the Babil milk collection centre, the provision of a refrigerated milk bowser for delivering milk to the Diwaniyah Dairy Factory as well as other equipment for improving the food safety of the factory were financed under this project .

Project progress is documented in seven progress reports, two PSC meeting minutes , seven Back-To-Office Mission Reports and a final report. Project monitoring has only taken place at output level and no self evaluation of project management has been undertaken.

The evaluation found that the language barrier resulted in project delays and insufficient understanding of project concepts, strategies and decisions described in project documents. None of the project staff met and interviewed during the field visit, including the NPC, were in adequate command of English. This shortcoming is confirmed in the seventh progress report covering the period 1 January – 30 June 2008 that mentions as a lesson learnt for delays in programme/project implementation that *“Arabic speaking experts are necessary to improve communication between representatives of the stakeholder organisations and in order to ensure the success of the training courses.”*

5.3 Effectiveness

The effectiveness of the project is evaluated against its prospects to achieve the expected outcomes.

Outcome 1: The pilot dairy is ready for production and rehabilitated in conformity with relevant food safety and quality standards

This outcome is to be achieved by the combined outputs relating to equipment, management training and staff training at the pilot plant. Of course, reaching this outcome would suppose that, in addition the UNIDO outputs, a number of key assumptions are met on the side of the counterpart, such as HACCP compliant premises, availability investment funds, efficient management structures and availability of a viable business plan.

Effectiveness of management training

To assess the effectiveness of the management training, the International evaluation expert conducted interviews with a number of participants. From these interviews no significant

outcome from the management training could be traced. During the four years since the COMFAR III training and the two and a half years since the business development training nothing has really happened related to the trained subjects. There is evidence that COMFAR III was too sophisticated for those trained. Furthermore, the figures and necessary information is scattered around different entities of the Government and the direct transfer of data from the existing accounting system into COMFAR is not possible. As a result it is not realistic to expect any practical outcome from the COMFAR training.

According to the General Manager of the Diwaniyah dairy, business plans are prepared at HQ level and not under his responsibility. He has not received a business plan for the dairy and does not know whether such a plan exists. The current CTA and NPC were also not aware of any comprehensive business plan for the Diwaniyah Dairy Factory.

Effectiveness of staff training

The TOB training in the Diwaniyah Dairy Factory took place in 2006, meaning that the management had about four years to implement the principles of good practices in the factory. The full implementation of HACCP principles, GMP and GHP takes time and requires continuous attention and follow-up by the management and a change of mindset amongst the employees.

The acquired knowledge of the TOTs and TOBs resulted in a long list of improvements:

- Filtration of the milk before processing
- Control of right and constant temperature during pasteurisation
- More intensive cleaning of equipment
- More intensive floor cleaning
- Use of detergents for cleaning
- No trash containers in production halls
- Use of insecticides and pesticides against insects
- Internal transportation only with specific carts
- All storage on shelves and no space between walls and shelves
- Working coats and head cover for all employees in processing.
- Clean cloths
- Forbidding necklaces and bracelets
- Forbidding smoking
- Forbidding nail painting
- Forbidding necklaces and bracelets
- Hand washing and use of gloves
- Use of colours on steam and milk pipes and covering steam pipes with insulation
- Trucks and lorries cleaned and inspected before loading
- Expiring dates on all products

These improvements resulted in a better quality and improved customer acceptance of cooked cheese and yoghurt, the traditional products of the Diwaniyah dairy. Sales have gone up by about 10% and customer complaints have decreased from 5 to 2 per month on the average.

HACCP compliance of production premises

In contrast to the improved situation of the traditional production lines, the conditions in the UHT processing hall, the Tetra Pak filling hall, and the package and store room for the finished product are still far from being compliant with HACCP norms:

- No sluice with dip before entering the processing room.
- Almost all windows and doors very dirty, without fly mesh, and with big openings between frames and walls allowing dust, birds and rodents to enter.
- Too many doors.
- All drains uncovered allowing access for rodents.
- Most ventilators not working properly and with big openings between frames and walls allowing for dust, birds and rodents.
- Condition of floors, walls and ceilings far from GHP standard.
- No aircondition
- Insufficient lighting
- Tetra Pak plastic folio shrinking machine cabinet rusty
- Cigarette stubs many places on the floor

Improving this situation would have required moderate investment costs only. The International evaluation expert was informed that about two years ago an engineer from the State Company for Dairy Products in Baghdad visited the factory to identify the investments needed to meet acceptable hygienic and sanitation standards. At the moment of the evaluation, the factory management was not aware of any follow up of this visit. Reportedly, the State Company seems to be in the process of allocating USD 200.000 to address the hygienic and sanitation situation in the plant.

The evaluators conclude that the factory management is without sufficient management power and financial means to initiate even small improvements. At the time of evaluation the status of the plant was still far from its intended role as a pilot plant.

Outcome 2: Food safety and food quality in dairies throughout Iraq are improved

This outcome was intended to be achieved through the training of national dairy experts (TOT) and subsequent training of dairy staff (TOB).

As explained under chapter 5 above, the related outputs 2.1 and 2.2 were quite successful. However, because the project did not conduct an outcome monitoring at the level of the dairies that had delegated the 764 trained beneficiaries, it is not possible to assess whether and to what extent this training has actually led to improved food safety and food quality in the dairy sector of Iraq beyond the pilot dairy in Diwaniyah.

Outcome 3: The local milk supply chain of the pilot dairy is upgraded

In the original project planning this outcome was very much dependent on the synergy with the FAO livestock project. With the decision of the UNIDO project to select Diwaniyah as pilot plant and the decision of the FAO project to focus on the Salahuddin and Wasit governorates, this synergy became significantly reduced.

However, the management of the UNIDO project tried to safeguard parts of this outcome by including training activities for farmers in the Diwaniyah region into the project under evaluation and to create linkages with another project in the Babil Governorate.

The results of the dairy farmer training are impressive. A total of 225 dairy farmers have been trained, of which 20 deliver milk to the Diwaniyah dairy. Altogether 60 farmers daily deliver milk to the factory.

Through application of the new knowledge farmers delivering milk to Diwaniyah improved the quality of their milk production significantly, resulting in 30-40% increase in selling price per litre of raw milk. The dairy factory's milk payment schedule gives premium for fat, solids not fat, and low bacteria count. There are five grades:

- Grade 1: 500 dinars/litre
- Grade 2: 350 dinars/litre
- Grade 3: 250 dinars/litre
- Grade 4: 200 dinars/litre
- Grade 5: Rejection

At the time of evaluation 75% of the milk was paid as grade 2 and 25% as grade 3 and 4. There was no grade 1 and almost no rejections. In case the raw milk is of low or rejected quality, the farmers receive feed back and advice from the factory.

The training in good dairy cow management and hygienic precautions in milk production, storage and transportation has been very successful. Changed practices have been adopted by an estimated number of 1,000 dairy farmers, resulting in improved quality of milk and increased quantities as well as increased income for the farmers. Before the training the Diwaniyah dairy used only powder milk for its production. After the training and the improvement of the raw milk quality, the factory started to buy from the farmers and at the

time of evaluation the daily need of 5-7,000 litres of raw milk was covered from local sources.

The rehabilitation of the Babil milk collection centre and the provision of a refrigerated milk bowser under the joint WHO/UNIDO/FAO project contributed to this success. Quite clearly, the local supply chain for the Diwaniyah Dairy Factory has considerably improved. At the time of evaluation, the milk from Babil constituted about 25% of the 5,000 – 7,000 litres of raw milk supplied to the factory per day.

5.4 Impact

The project document envisaged impact at three levels:

- A. The pilot plant will produce 50 tons of safe milk per day for 100,000 poor consumers and 100,000 school children
- B. 400 new jobs will be created at the pilot dairy
- C. Thousands of farmers will increase their income

Furthermore, a replication mechanism was envisaged, by which the selected rehabilitated dairy factory would provide a model for further rehabilitation initiatives not only in the dairy industry but in Iraq's food sector at large.

Impact A) and Impact B) are fully dependent on outcome 1 "*The pilot dairy is rehabilitated in conformity with relevant food safety and quality standards and ready for production*". Because this outcome has not yet materialized, there is no production and hence no benefits for poor consumers, no benefits for school children and no job creation at dairy level.

The question whether future impact will occur once the key outcome will be reached is hypothetical. However, a number of critical factors should be reminded here.

- The needs assessment study showed that the state owned dairies in Iraq are physically, technically and management wise in relatively poor conditions as compared to the private dairies.
- The project did not conduct market studies nor did it produce a business plan that demonstrates the economic viability of UHT milk production under the current conditions in Iraq.
- Under the assumption that the production of UHT milk will be financially viable, it remains to be demonstrated whether this production will be affordable for poor consumers.
- The school milk programme is being discussed since several years but did not yet materialize; there is no reason to believe that this programme is not launched because of non-availability of milk from local production because, if all other conditions were in place, such a programme could be started with imported milk.

Different scenarios for future impact can be envisaged.

Under the assumption that the Diwaniyah dairy remains Government owned, the bureaucratic burden on investment decisions, provision of spare parts and other necessary inputs is likely to continue and the present weak factory management is likely to be maintained. Under this assumption, the most optimistic scenario would be that the commercial production of UHT milk will start in 2011 but stop-and-go utilisation of the UHT and Tetra Pak lines due to technical problems and limited market demand because of competition from imports will reduce the capacity utilisation of the plant to about 5-10,000 litres of liquid milk per day. This would be sufficient for 40,000 consumers and create employment for about 50 additional staff in the factory.

Under the assumption that the factory is privatized⁷, the prospects are most likely different, although a full production of 50 tons per day is not very likely either under this scenario. Moreover, the question remains open whether this scenario would lead to poor consumers gaining access to safe UHT milk.

Impact C) seems to be the most likely to occur. Chances are good that the local supply chains for milk will develop. Knowledge transfer among farmers beyond the formal training sessions continues to occur. It is estimated that about 1,000 dairy farmers have improved the quality of their milk production due better dairy cow management, which apart from giving a better price for the milk will have positive health impact at the village level, where most of the milk is sold either as fresh milk or as farm processed products.

Already at this stage, the income of a significant number of farmers has increased. It is quite realistic that the local raw milk production will further increase with the demand of the dairy factory, that the quality of the milk will be satisfactory and that, consequently, farmer income will increase. With continuous support to farmers by the dairy, milk powder could soon be replaced by locally produced raw milk.

5.5 Ownership and sustainability

Sustainability of project achievements requires that:

- Project ownership is anchored amongst local project stakeholders and
- Plans and budgets are prepared by local project stakeholders for continuation and replication of project activities

The International evaluation expert did not have the possibility to visit the MOI and the State Company for Dairy Products but, according to the CTA, both parties demonstrate strong project ownership. This is confirmed by the fact that the idea of establishing a pool of

⁷ Reportedly, a call for offers has already been placed.

trainers and providing training to dairy staff throughout Iraq in HACCP, GMP, GHP, and GLP seems to be well anchored at MOI.

However, the visit of the International evaluation expert of the Diwaniyah Dairy Factory did not produce evidence that the high level ownership had trickled down to the factory level. The communication, cooperation and interaction between the State Company and the dairy factory related to project issues and approaches appears to be very weak. At the factory management level the International evaluation expert did not trace any ownership of the project idea that the factory should become a pilot plant and model how to rehabilitate a run down dairy plant and establish something close to HACCP conditions in the production halls.

The COMFAR III knowledge is rather sophisticated and only few elements, in a simple form, may be applied. The dairy business strategic management knowledge is more appropriate in the Iraqi context and is more likely to be continuously used by the trainees.

At the moment of the evaluation there was no evidence that the MOI was committed to providing the necessary finance and manpower to sustainably complete the Diwaniyah project as intended, including efficient maintenance and supply of spare parts and assuring the necessary hygienic conditions in the production and storage halls to meet GMP and GHP and striving for reaching HACCP standards.

By contrast, the factory management demonstrates good ownership of the project objective to replace milk powder with locally produced raw milk. The cooperation with dairy farmers for increasing the quantity and quality of raw milk is well established and support needed at the farm level to increase quality and quantity of raw milk is provided. The better performance of the dairy farmers is likely to be sustainable and to spread as long as producing better quality pays off. This requires that the present payment schedule for milk delivered to the dairy factory (giving premium for quality) is maintained and that customers at village level buying milk products directly from the dairy farmers are also willing to pay for better quality. The newly introduced protection duty for local milk product, is also a sign that the Government has understood the development constraints of the sector.

VI

Recommendations

Since the project has come to an end more than a year ago, the following recommendations concerning the continued rehabilitation of the Diwaniyah dairy are addressed to the Ministry of Industry (MOI) and the State Company:

- (1) It is recommended to the Ministry of Industry (MOI) to
 - Develop a solid and viable business and investment plan for the Diwaniyah dairy;
 - Invest in improved hygienic conditions at the UHT, Tetra Pak and other production and storage halls;
 - Invest in additional filling and packaging equipment for UHT milk (matching the capacity of the new UHT line) and also in other sections of the dairy, such as yoghurt and cheese;
 - The management of the Diwaniyah dairy should become organisationally, technically and financially autonomous and get a fully fledged import licence that would allow free access to importation of spare parts;
- (2) In the medium term, MOI should consider entering into a management contract with a dairy company from one of the neighbouring countries or privatising the dairy

It is recommended to the management of the Diwaniyah diary:

- (3) To establish an extension service to the existing and potential milk suppliers that would further improve the local supply chain and comprise: upgrading the collection system for raw milk, delivering extension services and supply of needed inputs for the milking cows.

The following recommendations are addressed to UNIDO for execution under its ongoing follow-up project:

- (4) Seek close cooperation with FAO and the GOI for the development of a national development plan for the dairy sector. This plan should not only cover industrial

dairies but also “cottage” and artisanal dairies and give serious consideration to the objective of improved access by poor consumers to safe milk and other dairy products.

- (5) Seek close cooperation with FAO and the GOI to make best use of the pool of dairy trainers (TOT). Enable experience exchange among TOTs through annual meetings and request quarterly monitoring reports from them on progress in GMP, GHP and GLP within their respective plants. Distribute the interactive TOB training programme (on CD) to all TOTs and other relevant project parties.

The following more general lessons learned and recommendations are submitted to UNIDO for consideration under future projects and programmes:

- (6) UNIDO management should provide clear policy guidance under which conditions technical assistance and “upgrading” activities at company level are allowable and justified. In order to avoid unfair competition between public and private companies, such assistance should not be restricted to Government owned companies.
- (7) Complex industrial investment projects, in particular those in post-crisis environments, should normally be implemented as turn-key projects. It is questionable whether UNIDO rules and procedures for purchasing and financial management and the HQ based implementation mode are adapted to implementing such projects. UNIDO management should provide clear guidance under which conditions and by which means UNIDO should become involved in complex industrial investment projects.
- (8) Project documents should be built on thorough intervention theories and include state-of-the-art logframes. Vaguely formulated “multi-purpose” development objectives open the door to inadequate operational decision making on the strategic orientation of the project during the inception phase. For projects with an expected impact on poverty alleviation, the causal chain and the key assumptions for such impact need to be clearly spelt out and demonstrated.
- (9) Post-crisis projects are expected to produce immediate benefits for vulnerable target groups. Longer term capacity building and economic development should also be aimed at but not at the cost of reducing the benefits for vulnerable target groups. The choice of appropriate technologies is particularly critical in post-crisis environments. There is an increased risk of failure when applying sophisticated technologies in such environments.
- (10) Key decisions and agreements with the counterpart should not be made orally but in a written form. This relates in particular to critical co-funding arrangements (cash and kind) and investment decisions related to the type of equipment (e.g. second hand) and the form of purchasing (e.g. leasing; supplier loans; etc). The project document

and all subsequent agreements should be signed and formally endorsed not only by the direct counterpart ministry but also by all other involved line ministries.

- (11) Envisaged cooperation with other UN agencies and projects should be formally agreed at higher management level. If such binding arrangements cannot be reached, projects should not be planned as joint projects but as stand-alone operations.
- (12) For technical assistance projects in Arab speaking countries UNIDO should consider the translation into Arabic of project documents, agreements, reports and other major supporting documents.

ANNEX 1:

TERMS OF REFERENCE OF THE INDEPENDENT EVALUATION

I. BACKGROUND

This project concerns the rehabilitation of a dairy plant in Ad-Diwanyah, the capital of the Al-Qadisiyah province of Iraq. The project document defined the objectives and outcomes of the project as follows:

*Rehabilitation of a dairy plant with a production capacity of 25.000 ltrs/day;
Daily milk supply to up to 100.000 school children in cooperation with WFP;
400 jobs created at the dairy plant.*

During the first phase of the project the milk production would be based on milk powder supplied through food aid projects, thus ensuring wholesome and safe milk for the consumers replacing milk recombined with unsafe water and consumed without previous heat treatment. This would lead to considerable and verifiable public health benefits for vulnerable groups such as children and the elderly.

The project is expected to produce considerable side effects:

- Provide a model for the rehabilitation of food industries;
- Create a pool of experts and trainers, capable to disseminate the knowledge and experience gained throughout the country;
- Assistance to community based development;
- Capacity building at community level through the development of cottage activity associations and cottage industry facility centres.

Environmental benefits are expected to arise from the project because the clean production technologies will minimise discharge of waste and effluents.

At a later stage the dairy is expected to become a partner for thousands of farmers who would deliver fresh milk to the plant. The project should thus contribute to making viable again the local supply and value chain for milk. This medium-term objective would be achieved in cooperation with the FAO Program for the Restoration of Animal Production Services.

The project is in line with the national development strategy and the UN assistance strategy as it is expected to contribute to sustainable food production and job creation. It received funding from the Italian contribution to the UN Trust Fund for Iraq (UNDG ITF).

The project has been implemented through a project office in Amman, headed by a Chief Technical Adviser (CTA) and a National Project Coordinator (NPC) in the target region. The project manager is located at UNIDO headquarters in Vienna. Short term international and national consultants are recruited for specific activities.

Initially the project has been programmed for a period of 16 months (original completion date 30 April 2006). The project has been extended several times until June 2009.

II. PROJECT BUDGET

The initial budget of US\$ 2,695,000 has been expanded once to an overall amount of US\$ 4,130,387 (excluding support costs).

III. EVALUATION PURPOSE

The purpose of the evaluation is to assess the:

1. Project relevance with regard to the priorities and policies of the Government of Iraq, the authorities of the regions involved and UNIDO;
2. Project effectiveness in terms of the outputs produced and outcomes achieved as compared to those planned;
3. Efficiency of implementation: quantity, quality, cost and timeliness of UNIDO and counterpart inputs and activities;
4. Prospects for development impact;
5. Long-term sustainability of the results and benefits;

The evaluation should provide the necessary analytical basis and make recommendations to the Government, the donor, and UNIDO for ensuring the sustainability of the project's impact. The evaluation should also draw lessons of wider applicability and feed into a thematic evaluation of UNIDO "Post-crisis Rehabilitation" projects.

IV. METHODOLOGY AND SCOPE OF THE EVALUATION

The evaluation will be carried out in keeping with agreed evaluation standards and requirements. More specifically it will fully respect the principles laid down in the "UN Norms and Standards for Evaluation" and the Evaluation Policy of UNIDO.⁸ The evaluation

⁸ All documents available from the websites of the UN Evaluation Group:
<http://www.uneval.org/> and of UNIDO

shall determine as systematically and objectively as possible the relevance, efficiency, achievements (outputs, prospects for achieving expected outcomes and impact) and sustainability of the project. To this end, the evaluation will assess the achievements of the project against its key objectives, as set out in the project document and the inception report, including a review of the relevance of the objectives and of the design. It will also identify factors that have facilitated or impeded the achievement of the objectives.

While maintaining independence, the evaluation will be carried out based on a participatory approach, which seeks the views and assessments of all parties. It will address the following issues:

Project identification and formulation:

- The extent to which a participatory project identification process was applied in selecting problem areas and counterparts requiring technical cooperation support;
- Relevance of the project to development priorities and needs;
- Clarity and realism of the project's development and immediate objectives, including specification of targets and identification of beneficiaries and prospects for sustainability.
- Clarity and logical consistency between, inputs, activities, outputs and progress towards achievement of objectives (quality, quantity and time-frame);
- Realism and clarity in the specification of prior obligations and prerequisites (assumptions and risks);
- Realism and clarity of external institutional relationships, and in the managerial and institutional framework for implementation and the work plan;
- Likely cost-effectiveness of the project design.

Project ownership:

- The extent to which the project was formulated with the participation of the national counterpart and/or target beneficiaries;
- The extent to which counterparts have been appropriately involved and have been participating in the identification of their critical problem areas, in the development of technical cooperation strategies and in the implementation of the project approach
- The extent to which counterpart contributions and other inputs have been received from the Government (including Governorates) as compared to the project document work plan, and the extent to which the project's follow-up is integrated into Government budgets and workplans.

Project coordination and management:

- The extent to which the national management and overall field coordination mechanisms of the project have been efficient and effective;

- The extent to which the management, coordination, quality control and input delivery mechanisms have been efficient and effective;
- The extent to which monitoring and self-evaluation have been carried out effectively, based on indicators for outputs, outcomes and objectives and using that information for project steering and adaptive management;
- The extent to which changes in planning documents during implementation have been approved and documented;
- The extent to which coordination envisaged with any other development cooperation programmes in the country has been realized and benefits achieved.
- The extent to which synergy benefits can be found in relation to other UNIDO and UN activities in the country.

Efficiency of Implementation:

Efficiency and adequacy of project implementation including: availability of funds as compared with the provisional budget (donor and national contribution); the quality and timeliness of inputs delivered by UNIDO (expertise, training, equipment, methodologies, etc.) and the Government as compared to the work plan(s); managerial and work efficiency; implementation difficulties; adequacy of monitoring and reporting; the extent of national support and commitment and the quality and quantity of administrative and technical support by UNIDO HQ.

Effectiveness and Project Results:

Full and systematic assessment of outputs produced to date (quantity and quality as compared with work plan and progress towards achieving the immediate objectives); The quality of the outputs produced and how the target beneficiaries use these outputs, with particular attention to gender aspects; the outcomes, which have occurred or which are likely to happen through utilization of outputs. In particular, this includes an analysis of the likely effects of micro-enterprise industry activities as a means of creating employment and raising household incomes.

Prospects to achieve expected outcomes, impact and sustainability:

Prospects to achieve the expected outcomes and impact and prospects for sustaining the project's results by the beneficiaries and the host institutions after the termination of the project, and identification of developmental changes (economic, environmental, social) that are likely to occur as a result of the intervention, and how far they are sustainable.

Cost-effectiveness of the Project

Assessment of whether the project approach represented the best use of given resources for achieving the planned objectives.

Recommendations for a possible next project phase, or replication elsewhere

Based on the above analysis the evaluators will draw specific conclusions and make proposals for any necessary further action by Government, UNIDO and/or the UN or other donors to ensure sustainable development, including any need for additional assistance and activities of the project prior to its completion. The mission will draw attention to any lessons of general interest. Any proposal for further assistance should include precise specification of objectives and the major suggested outputs and inputs.

V. EVALUATION TIMING AND MAIN TASKS

The evaluation is scheduled to take place between September 2009 and March 2010.

The evaluation will be carried out through analyses of various sources of information, including desk analysis, field visits, survey data, and interviews with counterparts, beneficiaries, partner agencies, donor representatives, programme managers and through the cross-validation of data. In view of the particular aspects of this evaluation, particular attention will be given to the elaboration of a strategy for field surveys, the elaboration and test of questionnaires and the implementation of the surveys in line with agreed professional and impartiality standards.

The evaluation will encompass the following main tasks:

1. Desk study of available documents and definition of the evaluation methodology with a catalogue of project specific evaluation questions, to which the evaluation should provide answers; this methodology will have to be discussed and agreed with the UNIDO Evaluation Group;
2. Interviews with the UNIDO project manager in Vienna and the CTA;
3. Organization of a kick-off meeting in Amman involving national and international project staff, counterpart representatives and the entire evaluation team;
4. On-site visit of the dairy plant; interviews with counterparts and project staff; verification of the quality of the civil works, of the lay-out, quality and appropriateness of the production and packaging equipment and the quality of its installation, of the waste water treatment equipment and of the laboratory;
5. Execution of a market study and verification of the viability and sustainability of the business model for the dairy plant; verification of the availability and sustainability of production inputs; verification of the viability of the envisaged distribution channels and distribution model; assessment of the likelihood that the expected benefits and side-benefits will be achieved;

6. Organization of meeting in Amman or, as appropriate, in Iraq where the evaluation team will present its raw results and preliminary findings to project staff and counterparts and collect their feed-back;
7. Production of a first draft evaluation report and submission of this report to the UNIDO Evaluation Group and the UNIDO project manager for feed-back;
8. Incorporation of comments into a second draft and submission of this draft to the government, project participants and stakeholders for comments;
9. Incorporation of comments into final draft.

VI. EVALUATION REQUIREMENTS

The evaluation will require the following functions, competencies and skills:

1. Evaluation team leader with documented experience in:
 - a. Designing and managing complex evaluations;
 - b. Leading multi-disciplinary and multi-cultural teams of evaluators;
 - c. Development projects in Arab speaking countries;
 - d. Development projects in food industry;
 - e. Designing and supervising qualitative and quantitative field surveys;
 - f. Executing quality control of evaluation reports in line with agreed UN and DAC standards;
 - g. Drafting reports in English (excellent drafting skills to be demonstrated).
2. Evaluator(s) with documented experience in executing:
 - a. Industrial development projects;
 - b. Evaluations in Arab speaking countries;
 - c. Interviews in Arab language with managers and high-level officials.

The evaluation team must have the necessary technical competence and experience to assess the quality of the technical assistance provided under this project in the area of dairy rehabilitation and management and marketing of milk and milk products.

The evaluation team must have the necessary technical competence and experience to assess the quality of the technical assistance provided under this project in the area of rehabilitation of food industries; upgrading and equipment of food laboratories and training of food industry and administration staff in HACCP.

The execution of the evaluation will require full command and control of the specific situation in Iraq and full respect of the UN security rules for Iraq. The ability to carry out field operations in Iraq is a key requirement and must be demonstrated.

The evaluation team leader will be responsible for elaboration of an evaluation strategy, including the design of field surveys and elaboration of questionnaires; guiding the national evaluators for their field work in Iraq; analysis of survey results; gathering of complementary information from project staff, collaborators and stakeholders through telephone interviews and other means; and preparing a presentation of conclusions and recommendations as well as a final evaluation report.

The evaluator(s) will be responsible for carrying out the field surveys (under the guidance of the team leader). The field surveys will provide the foundation for the evaluation and must therefore be executed in line with the highest standards of professionalism and impartiality.

The UNIDO Evaluation Group will be responsible for the quality control of the evaluation process and report. It will provide inputs regarding findings, lessons learned and recommendations from other evaluations, ensuring that the evaluation report is in compliance with established evaluation norms and standards and useful for organizational learning of all parties.

The project office in Amman will logically and administratively support the evaluation team to the extent possible. However, it should be understood that the evaluation team is responsible for its own arrangements for transport, lodging, security, etc.

VII. CONSULTATIONS AND LIAISON

Liaison of the evaluation team with the Iraqi authorities will be provided by an official nominated by the Government of Iraq.

The evaluation team will maintain close liaison with the UNIDO representatives and the concerned national agencies, with the representatives of UNDP and other UN agencies, as well as with national and international project staff. The evaluation team is free to discuss with the authorities concerned anything relevant to its assignment. However, it is not authorized to make any commitments on behalf of the Government, the donor or UNIDO.

VIII. REPORTING

The evaluation report shall follow the structure given in Annex 1. Reporting language will be English. The executive summary, recommendations and lessons learned shall be an important part of the presentations to be prepared for debriefing sessions in Amman, Rome and/or Vienna.

Draft reports submitted to the UNIDO Evaluation Group are shared with the corresponding Programme or Project Officer for initial review and consultation. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. The

evaluators will take the comments into consideration in preparing the final version of the report.

The evaluation will be subject to quality assessments by UNIDO Evaluation Group that will apply evaluation quality assessment criteria and provide structured feedback. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality.

ANNEX 2:

EVALUATION QUESTIONNAIRE FOR TRAINER SURVEY

Profile of the Trainer

- (1) Name of respondent:
- (2) Address: Governorate, District, (Sub-district), Village, contact telephone and fax numbers, and e-mail:
- (3) Gender:
- (4) Professional education:
- (5) Professional experience:
- (6) How many years experience as a trainer (if any)?
- (7) What are the main subject matter expertises?
- (8) Employment (employer's name and address) and position before project training:
- (9) Present employment and position:

Appropriateness of Professional Qualifications and Experiences for Engaging into Training of Dairy Plant Managers and Technicians

- (10) Prior qualifications and experiences in dairy sector development:
- (11) Prior qualifications and experiences in dairy plant management and operation:
- (12) Prior qualifications and experiences in working with change management and training

Adequacy of Received Project Training

- (13) Training received under the project. List main subjects:
- (14) Name and address of training institution attended:
- (15) Calendar period of training/duration:
- (16) Number and names of other course participants supported under the project:

- (17) Main training subjects: Technical, business planning, investment feasibility study, marketing, financing:
- (18) Perceived quality of the training: Satisfactory, less satisfactory, poor:
- (19) Was the training evaluated by participants at completion? Result?
- (20) Which part of the training (if any) was insufficient or less comprehensive than expected?
- (21) What suggestions do you have to improve the training programme?
- (22) Was the training sufficiently comprehensive and adequate to form the basis to train project beneficiaries in engaging efficiently in dairy facility rehabilitation as well as milk process and product quality improvements?
- (23) If not, which subjects were missing?
- (24) Acknowledgement of training effort: Diploma, acknowledgement letter, test score, other (which?):
- (25) Do you agree with the course acknowledgement you received?

Trainings Conducted as a Trainer

- (26) Have you conducted training of project beneficiaries after your training?
- (27) How many courses have you conducted and how many beneficiaries have in total attended?
- (28) What have been the main subjects of your training courses: Technical, business planning, investment feasibility study, marketing, financing?
- (29) How useful was the training you have received for the training you conducted: Very useful, useful, less useful?
- (30) How do you judge the training material and equipment made available for your courses: Satisfactory, less satisfactory, poor?
- (31) What were the main deficiencies (if any)?
- (32) Were the training courses evaluated by participants or others at completion?
- (33) Which parts of the training (if any) were insufficient or less comprehensive than expected by the participants?
- (34) What suggestions do you have to improve your training courses?
- (35) Have you received further training under the project after the initial training?
- (36) If not, do you need further training? If yes, in which subjects?
- (37) Are you in (systematic) contact with your earlier trainees?

- (38) Are your trainees given the opportunity to contact you for needed advice?
- (39) Have you given post course mentoring support to your trainees?
- (40) If yes, what have been the subjects for mentoring: Technical, business planning, investment feasibility study, marketing, financing?
- (41) How do you assess the success of your training courses?
- (42) How do you assess the trainability of the participants in your courses considering that they upon the course should be able to efficiently lead/support dairy facility rehabilitation as well as milk process and product quality improvements?

Sustainability of the project trainer group

- (43) Have the trainers been organised as a core group for experience exchange and further education, mentoring of existing beneficiaries, and continued training of other beneficiaries and additional trainers?
- (44) If yes, where have the core group been organisationally anchored to ensure sustainability?
- (45) If no, are you a member of any formal or informal networks established amongst the project trainers?
- (46) Have you undertaken training for participants outside the project?
- (47) If yes, how many courses and how many participants in total?
- (48) Can you freely release yourself from other duties to undertake beneficiary training?
- (49) Are you satisfied with the contracts and remuneration you receive for your training courses under the project?
- (50) If no, which improvements will you propose?

