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INTEGRATED EVALUATION FRAMEWORK

Based on the Logical Framework Approach for Project Cycle Management

EVALUATION SECTION
DEPARTMENT OF TECHNICAL CO-OPERATION

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FOREWORD

This *Integrated Evaluation Framework* (IEF) was developed by TC Evaluation with the aim of presenting in a comprehensive manner the logic of thinking used when evaluating projects and programmes. Thus, in the first place, the intended audience for this report are evaluation officers, so that when applying the evaluation procedures and check lists, data can be organized following a systematic and logical scheme and conclusions can be derived "objectively". The value of such a framework for reporting on performance and in providing a quality reference for disbursements represents one of its major advantages.

However, when developing and applying the IEF, it was realized that a *Logical Framework Approach* (LFA), like the one upon which the IEF is based, needs to be followed throughout the project life cycle, from the Country Programme Framework planning stage, through project design and implementation. Then, the helpful consequences flow into project design quality and smooth implementation. It is only in such an environment that meaningful and consistent evaluation can take place.

Therefore the main audience for this report are Agency staff involved in planning, designing and implementing TC projects as well as their counterparts in Member States. In this understanding, the IEF was subjected to review by a consultants meeting, which included both external consultants and Agency staff. This Consultants Review Meeting encouraged the Secretariat to further adopt the LFA into the TC management process.

1. INTRODUCTION

1.1. BACKGROUND

In 1995, as a result of the acknowledgment of the key role that the Model Projects concept has in the Agency's Technical Co-operation Programme and the importance of being able to demonstrate achievements, performance indicators were agreed for each model project. For most of the projects the performance indicators identified met the requirements for evaluation, that is, they quantified the anticipated results and compared the project outputs with the project objectives.

The setting of project indicators for the model projects in 1995 was seen as a vital but, nevertheless, only a first step in improving the quality of project management. Following recommendations made at the 1995 TACC meeting, the December 1995 Board meeting encouraged TC Evaluation Section to introduce an "Integrated Evaluation Framework" for assessing project performance.

Thus during the Spring of 1996 a study was made of the approach taken by a number of UN and national aid agencies. It was concluded that integrated evaluation approaches are already well established as part of "Project Cycle Management" in most aid agencies, in particular by UNDP, AUSAID, USAID, CIDA and the ODA. An adaptation of the technique is also used by the German GTZ for project planning, this being called the ZOPP technique. In all cases, the evaluation approaches adopted are based on a "Logical Framework Approach" (LFA) for project design, which provides a "tool" for "measuring" project quality and performance on a systematic basis.

As a quite separate initiative, the Technical Co-operation Policy Review Seminar, in September 1994, had discussed how best to ensure that the Agency's technical co-operation activities were in line with Member States' national development goals and priorities. As a consequence, in the Spring of 1995, TC introduced "Country Programme Frameworks" (CPFs), these being the initial step of the programming cycle, having the objective of focusing the Agency's Programme with a Member State on the areas of highest need and of identifying one or two project opportunities with model-like characteristics. In December 1995 the TC Evaluation Section was requested by management to evaluate the approach taken and the progress achieved with compiling CPFs. The Consultants Meeting held in March 1996 concluded that a holistic system approach to the TC programming cycle, in which the entire process (from CPF, through project formulation and management) should be the focus of the TC improvement effort.

A logical framework for evaluation is most successful when fully integrated into the project cycle. If applied at the project design stage, immediately following on from project opportunity identification at the Country Programme Framework (CPF) planning stage, then the helpful consequences flow into the project quality assessment, project implementation/monitoring and project evaluation stages. This is because the methodology guides the project design staff to logically:

- Gather and analyse background data;
- Assess project proposals, unemotionally;
- Quantify, where possible, overall goals, project purpose and project outputs;
- Establish the likely impact, relevance and sustainability of the project; and

- Set performance indicators/success criteria for the detailed project inputs and activities.

Furthermore, the methodology ensures that subsequent independent reviews of progress and evaluation of performance focus on the main aims of project evaluation, namely:

- to improve the management of on-going projects;
- to ensure accountability; and
- to learn from past experience.

1.2. TESTING OF THE INTEGRATED EVALUATION FRAMEWORK

Having surveyed the approaches being taken by others, TC Evaluation Section adopted a system that is in general use, particularly by agencies concentrating on technical assistance[1]. This methodology had, however, to be tailored to meet the Agency's needs. Chapter 2 outlines the broad principles of the methodology and, in particular, defines and explains the terms used.

Next, four model projects were chosen for evaluation using the methodology. These were:

CPR/5/009 - Industrial Scale Irradiation of Rice and Other Foodstuffs, in China.
MLI/5/014 - Field Performance of Selected Mutants of Sorghum and Rice, in Mali.
PER/7/003 - Nuclear Techniques to Improve Child Nutrition, in Peru.
SLR/9/005 - Strengthening of the Nuclear Safety Regulatory Body, in Slovakia.

To test the methodology when applied to a multiplicity of projects, an evaluation of the "The Agency's Activities in Some Sectors of Agriculture in Sub-Saharan Africa" and "The TC Programme in the Islamic Republic of Iran During the Past Decade" were also evaluated in this logical framework.

It was considered that, choosing these six diverse projects/programmes for evaluation using the methodology, would demonstrate the flexibility and practicality, or otherwise, of its application and would identify any limitations in its capabilities.

1.3. CONSULTANTS REVIEW MEETING

The draft report on the Integrated Evaluation Framework and its case-study applications have been reviewed by a Consultants Meeting, experienced in evaluation and in technical co-operation.

The external members of the review team were:

Mr. Didier Picard, Scientific Director, CIRAD (Centre de coopération internationale en recherche agronomique pour le développement), France.
Mr. John Mayne, Principal, Office of Auditor General of Canada
Mr. M. K. Rassouli, Director, Esfahan Nuclear Technology Centre (ENTC), Iran

[1] Adapted from "Evaluation, Based on the Project Cycle Management Method", March 1994, by K. Samset, Scanteam International, Oslo, Norway. Developed for Foundation for Advanced Studies on International Development, Japan.

Mr. Robert Springer, Argonne National Laboratory, USA. Member of SAGTAC, and
Mr. Alexandre de Faria, Chief Quality Assurance, UNIDO, Vienna.

Also invited to the review team were the following in-house staff members:

Mr. Royal Kastens, Head, Programme Co-ordination Section, TC Department, and
Mr. Frederick Williams, PPAS Co-ordinator, Internal Audit and Evaluation
Mr. Trevor Edwards, TC Evaluation Section, acted as scientific secretary.

2. THE BASIS OF THE APPROACH

2.1. THE LOGICAL FRAMEWORK APPROACH

Figure 1 represents the Logical Framework Approach for project evaluation. It is based on the subdivision, in a logical step-by-step approach, of project design into its main elements: overall goal, project objective, outputs, activities, inputs and assumptions.

The cross-cutting issues, to be considered at the outset and at different stages of project life, are also represented. In the context of the IAEA such cross-cutting issues are likely to be the appropriateness of nuclear techniques vis-à-vis alternative technologies, the economic/social aspects, donor and Member State commitment, IAEA policies and mandates and institutional and management aspects. Such issues correspondingly become of concern during evaluation, as they become important factors influencing efficiency, effectiveness, impact, relevance or sustainability, as shown in Figure 1.

The relationships between the project design elements and the major evaluation concerns, namely, efficiency, effectiveness, impact, relevance and sustainability are shown in Figure 1.

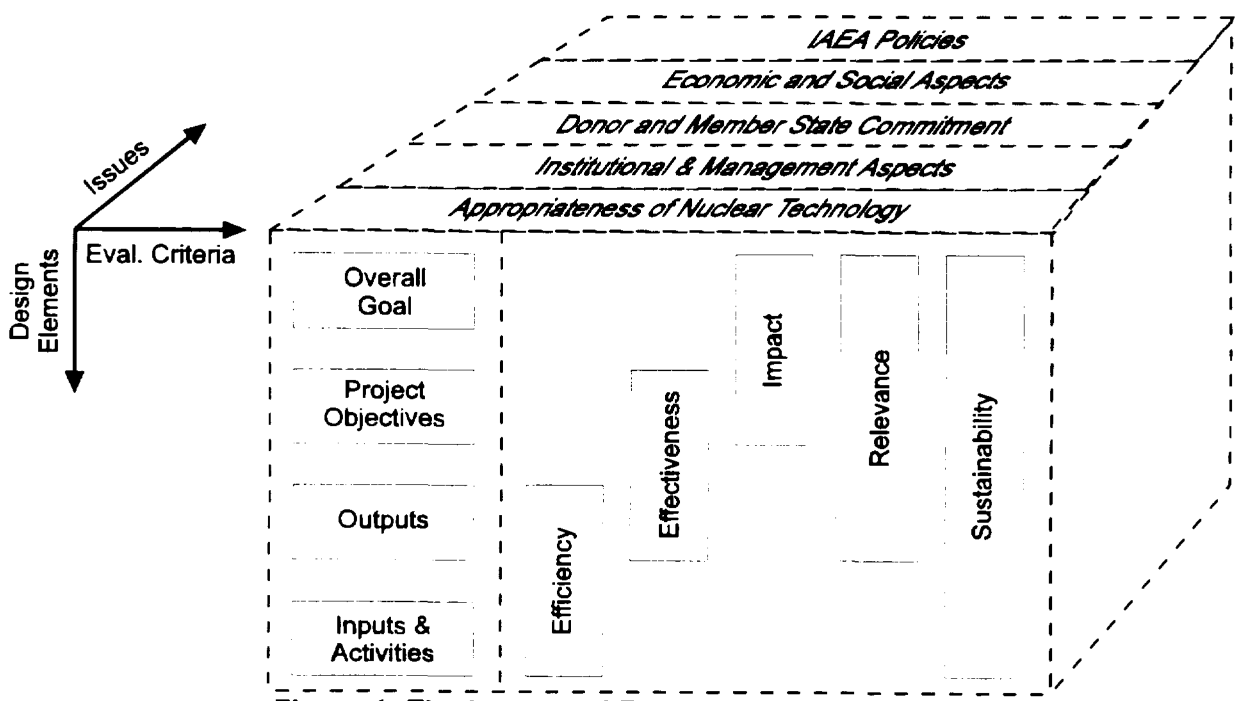


Figure 1: The Integrated Evaluation Framework

2.2. THE ELEMENTS OF PROJECT DESIGN

Before proceeding further, it is important that the design elements are defined and interpreted in a consistent manner.

Overall Goal

The overall goal is the ultimate and long term objective. It is the development impact that is expected to be achieved after the project objectives have been achieved. Any particular project needs to be understood as one of a number of contributing projects to the overall goal.

Project Objectives

The effect which a project is expected to achieve if completed successfully and on time. They are the immediate purpose of the project.

Outputs

Two types of outputs may be defined:

- In some projects *operational outputs* are identifiable, which are those needed to achieve the project outputs. Operational outputs are defined when a "complex" input is delivered to a project, e.g. a laboratory facility, requiring a number of inputs from different sources to ensure operation, such as the equipment, construction works and expertise.

- The *project outputs* are the results that can be guaranteed as a consequence of the activities carried out, e.g. the screening of neonatals country-wide by using the laboratory and trained staff.

Inputs/Activities

The inputs are the funds, personnel, materials etc. that are necessary to produce the outputs. The project activities are the actions taken or the work performed to transform the inputs into outputs.

Performance Indicators

Achievement of project progress is measured by managers through the establishment of project milestones for the progress of project activities, and quantities and qualities for inputs and outputs.

Producing the outputs is under the control of project management. This, however, does not necessarily guarantee that the project objectives or goal will be achieved, as there may be external factors beyond management control. Thus, "signals" allowing the measurement of achievement of objectives or goal are needed. Such signals are introduced by means of indicators of success or "performance indicators", providing quantifiable and verifiable evidence of the progress made towards the objectives. Performance indicators should specify the results obtained through the use of the outputs by the direct recipients.

Logical and real links between the various elements of project design should be ensured at the formulation stage, highlighting the assumptions made, so as to enable monitoring and evaluation.

Indicators of the achievement of objectives and goals should be set up at the project design stage and be used as standards against which achievements are to be compared.

2.3. AREAS OF ASSESSMENT AND EVALUATION CONCERNS

The definitions of the evaluation concerns and the relationships to project design are outlined in Figure 2.

Project Design Elements	Evaluation Concerns				
	Efficiency	**Effectiveness**	**Impact**	**Relevance**	**Sustaina-bility**
Overall Goal			The positive and negative changes produced, directly or indirectly, as the	The degree to which the objectives of a project are, or	The extent to
Project Objective		A measure of the extent to which a project or programme is	result of the project or programme	remain, pertinent, significant and worthwhile, in relation to the	which partner country institutions will continue to
Outputs	A measure of "productivity" of the project process – how	successful in achieving its purpose		identified priority or needs and concerns	pursue the objectives and goals after external
Activities + Inputs	economically inputs are converted into outputs				assistance is terminated

Figure 2 - Definitions of Evaluation Concerns

Efficiency

Efficiency is a measure of the "productivity" of the implementation process - how economically inputs are converted into outputs. It measures the production of outputs of the project, both qualitative and quantitative, in relation to the total resource inputs.

Effectiveness

Effectiveness is a measure of the extent to which a project is successful in meeting or is likely to meet its objectives. It is thus a question of the degree to which the outputs contribute towards achieving the intended project objectives.

Impact

The assessment of impact goes beyond the "management-by-objectives" perspective. Consideration needs to be taken of the fact that the project may be only one of several actions contributing to the goal and even to the purpose. The assessment of impact aims at identifying not only the project specific contribution to the objective and goal but also takes into account both positive and negative consequences of the project.

Relevance

Relevance relates to the direction and usefulness of the project strategy seen in a wider policy context and from the point of view of the users.

At the highest level it concerns the relationship between the project and the development policy of the recipient country, as well as whether the project corresponds to the priorities of the Agency.

At the lowest level there is the question of the structure of the project itself, the relationships between the project elements, taking into account a realistic boundary of external factors and assumptions.

Sustainability

It is concerned with what will happen after project completion. Among the key factors affecting sustainability are the availability of funds for maintenance of equipment, spares and re-training of staff, the regulatory framework, the radiation protection infrastructure, as well as the appropriateness of technology, institutional and management capabilities.

3. THE BASIS OF ASSESSMENT

3.1. ASSESSMENT OF EFFICIENCY

Efficiency is determined by the following factors: (a) *project design quality*, measured by the appropriateness and linkage of inputs and the activities that transform them into outputs; (b) *project implementation*, measured by adherence to schedule; timeliness and fitness-for-purpose of inputs, and budget utilization; and (c) *management performance*, measured by the ability to guide the project, monitor progress and take corrective actions. Cost-effectiveness, as a result of combining the issues mentioned above, is assessed by the utilization of outputs and when meaningful, by comparing the approach adopted with other options.

Key aspects of efficiency are identified in the following paragraphs. Professional judgement enables the assessment of such key aspects versus accepted levels of good design practice in an unambiguous manner.

3.1.1. Assessment of Project Design Quality

Good project design is characterized by the inclusion of the following features at the outset of the project:

(a) Key aspects needing support were identified. Baseline data substantiating the problem or need that the project addresses was available.
(b) Such key aspects were supported adequately by the Agency, the counterpart or a third party.
(c) The level of linkage between Agency and other parties' inputs, project activities and outputs was thorough.
(d) Operational outputs were justified in terms of their need to achieve the project outputs, e.g. cost-effectiveness.
(e) The users of the outputs were involved in the project and links with beneficiaries were established.
(f) Appropriate design features were incorporated to address project constraints.
(g) An adequate level of project design documentation was available.

3.1.2. Assessment of Project Management

An adequate project management structure is characterized by the following attributes:

(a) The project counterparts have the managerial and technical skills as well as previous experience that substantiate their capability to lead the project to its objectives.
(b) The links and lines of authority between various participating partners and with parties with an interest in the project were clearly defined.
(c) A well dimensioned and competent project team was deployed.
(d) Agreements between the project partners were formalized.
(e) Cost-effective provisions to follow up, monitor and report on progress and results were included and corrective actions were taken as necessary.

3.1.3. Assessment of Project Implementation

Adequate project implementation is characterized by the following attributes:

(a) A realistic time schedule was in place to achieve project outputs.
(b) A realistic budget to implement the project was made available. The sources of funding to the project were reliable and their magnitude was adequate.
(c) The inputs, both Agency's and counterpart's, were fit-for-purpose and delivered timely, i.e. expert job description specified the outputs intended, such as design documents or calculations; the duration of expert services was adequate to achieve its objectives.
(d) The project progress corresponds to the established time schedule and budget.

3.2. EFFECTIVENESS

3.2.1. Standards for Assessment - Performance Indicators

In order to assess effectiveness the project objectives should be unambiguously and operationally defined so as to make verification possible. When objectives are stated in too general a manner, for example, "improving counterpart's capabilities", then performance indicators are needed to operationalize such terms as well as target dates for achieving the objectives. If the project under evaluation is ongoing and performance indicators had not been adequately defined at the design stage, then such indicators need to be discussed with project management, and precise, verifiable and realistic indicators introduced during the evaluation.

3.2.2. Agency's Contribution

An assessment of the *Agency's contribution* to achieving the project objectives is to be made, to ensure that each evaluation addresses the question as to whether the Agency's contribution has made a difference.

3.2.3. Learning from Evaluation

Although performance indicators enable measurement of achievements, the major aim of an evaluation is to understand the factors contributing to the degree of success and the role of Agency assistance. It is often the case that the causes of effectiveness (or lack of such) relate to project design and management. Through such an insight lessons are learnt about the aspects which have a greater weighting on results, and thus on which the focus of improvement should be placed.

Equally important is to make a thorough assessment of the external factors - the assumptions - that also influence the project's chance of success. Ultimately, identifying such external factors is an important part in project appraisal, as well as providing the means in the project design to diminish the consequential risks.

3.3. IMPACT

The project objectives and/or the performance indicators specify the intended use of outputs and thus the positive effects which derive. Impact is broader, as it looks at the unforeseen effects as well. However, for a number of Agency projects it is impractical to place significant evaluation efforts into assessing such unforeseen effects and in such cases it is practical to combine effectiveness and impact concerns into one criteria relating to meeting objectives or achieving success.

For example, some Agency projects aim at screening neonatals for various diseases. Effectiveness then relates to the process of reaching all neonatals whereas impact, i.e. improving health conditions, would be achieved if the neonatals affected by the disease are treated. Practically, impact assessment in such cases is based upon the feedback regarding the treatment that was given and not, for instance, upon the lifetime consequences or the reduction in subnormality rates.

3.4. RISKS AND OPPORTUNITIES ON IMPACT, RELEVANCE AND SUSTAINABILITY

When evaluating ongoing projects it is useful to assess the presence or absence of factors that may contribute to or hamper the achievement of the intended impact or their relevance or sustainability. Figure 3 presents an example of such an analysis.

	Opportunities	Risks
Impact	• Important role of project counterpart institutions in the country's agronomic research; • Involvement and participation of Extension Services and farmers - users of project's agronomic outputs;	• If target extension goals are not achieved within the project time span, the lack of other sources of project funding poses a risk to sustainable extension of African rice after termination of Agency funding;
Relevance	• The likelihood of sustainable utilization of isotope laboratory facilities and tissue culture laboratory would increase if the Agency advises the counterpart institutions on their economic and relevant utilization on other national/donor funded projects;	• P-32 technology poses a concern with regard to its adequacy vis-à-vis the lack of radiation protection regulations and infrastructure;
Sustainability	• Agronomic research programmes on sorghum and rice are on-going within IER and IPR, involving essentially the project team; • ICRISAT involvement is an asset for the sustainability of the sorghum breeding programme and extension of results;	• Since resources for consumables, maintenance, spares, retraining and upgrading come mostly from project-specific funding, sustainable utilization of laboratory facilities is at risk; • The sustainability of the tissue culture laboratory is at risk if cost-effective utilization on relevant and feasible programmes is not further substantiated.

Figure 3 - Example of Analysis of Risks and Opportunities (Project on Agriculture)

4. APPLICATION OF THE INTEGRATED EVALUATION FRAMEWORK

When performing an evaluation it is necessary to take a number of logical steps to guide evaluators to their conclusions. In order, the steps consist of:

- Reviewing the project document or preparing a project summary if available information is not comprehensive;
- Identification of the main evaluation questions;
- Establishing the evaluation plan and assessing the adequacy of the evaluation instruments;
- Analysis and rating; and
- Presentation of results.

4.1. PROJECT SUMMARY

The project summary is a document that is prepared when the project documentation available is not comprehensive. The project summary outlines the elements of project design and presents the status of progress towards the objectives at the time of evaluation, as indicated below:

- Project objectives and performance indicators;
- Quantities and qualities of inputs and outputs and their logical relationships;
- The external factors and assumptions;
- The status of project outputs and the progress towards the objectives;
- The management scheme and institutional arrangements; and
- The project time schedule and budget.

It is thus the starting point for the evaluator. A project summary is attached in Annex A1 as an example.

4.1.1. The Project Logic Chart

It is useful to construct a "project logic chart" which shows the linkage between the Agency and counterpart inputs and the operational outputs with the project activities and project outputs. Two charts are shown as examples in figures 4a and 4b.

The attached examples allow the prompt visualization of some key counterpart activities that were not supported by the project, in Figure 4a. Figure 4b shows that some inputs were not strictly required to achieve the immediate project objectives. Such inputs contribute to diverting the attention from the main objectives and in such cases undue consideration might have been given to cost-effectiveness or sustainability.

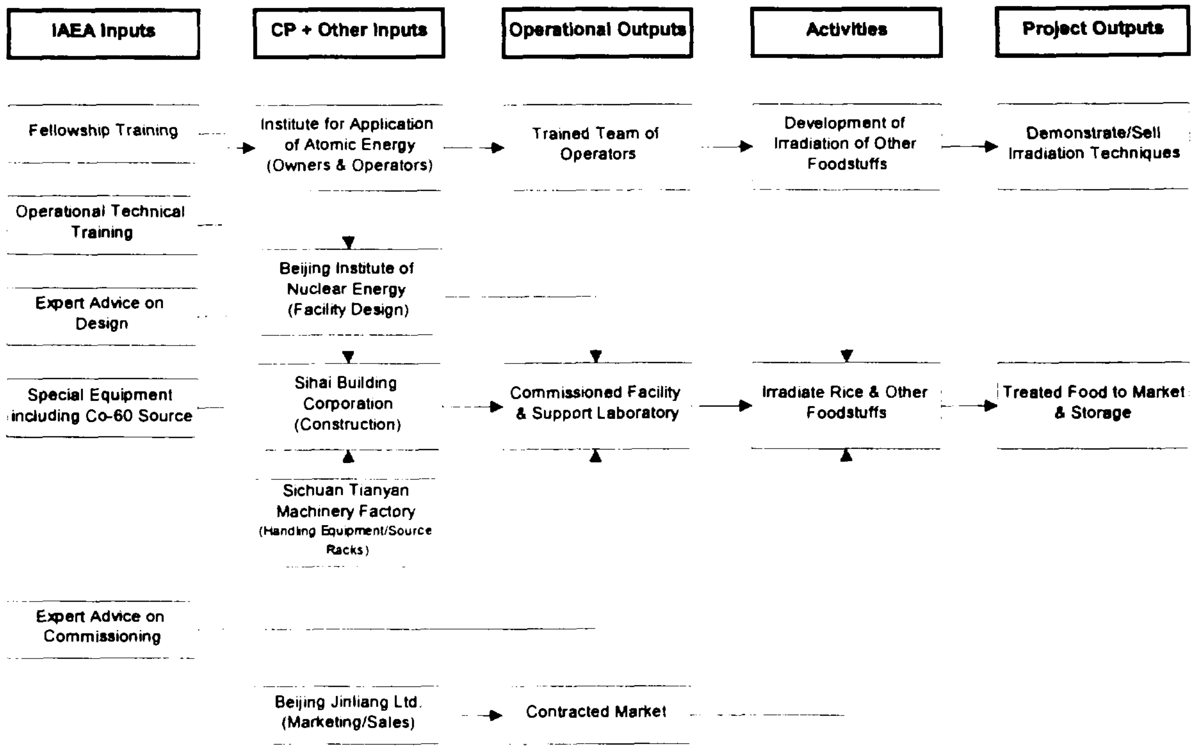


Figure 4a: Project Summary Chart (Food Irradiation)

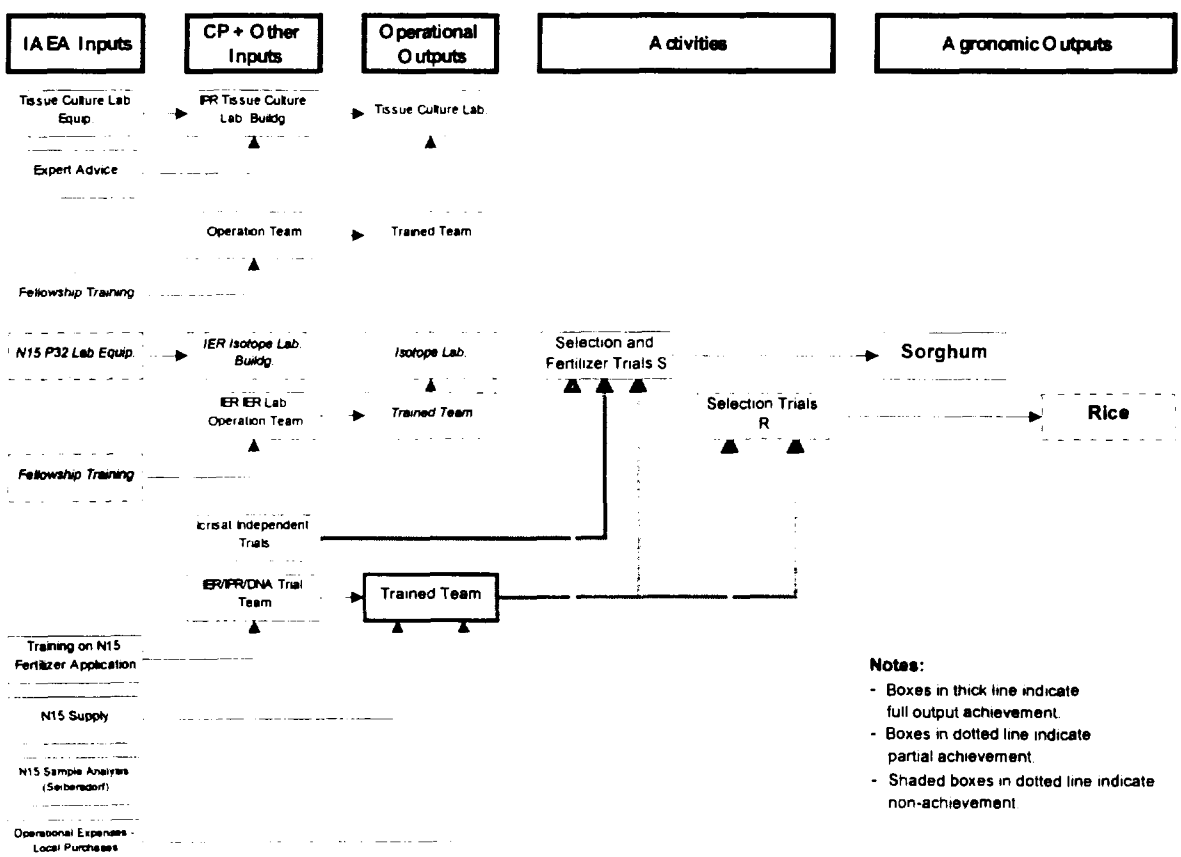


Figure 4b: Project Summary Chart (Agriculture)

4.1.2. The Performance Indicators Matrix

It is also expedient to include in the project summary the verifiable indicators, the means of verification and the main assumptions that may influence the course of the project. This is best presented in the form of an Evaluation Performance Indicator Matrix. Again, two examples are shown in Figures 5a and 5b.

Project Design	Verifiable Indicators	Means of Verification	Assumptions
Overall Goal:	• Quality rice and other foodstuffs available to market outlets, with reduced losses (10% reduced to 5%).	• Results of quality control programme.	Irradiation results in acceptable shelf life of 2 years.
Project Objective:	• 5,000-9,000 tonnes of rice and other foodstuffs treated per annum from 1995.	• Project progress reports.	Rice and other foodstuffs delivered to irradiator - marketing plan adopted.
Outputs:	• Trained staff. • Facility operating to full capacity and with adequate availability factor.	• Project progress reports.	Construction proceeds according to schedule.
Inputs/Activities:	• Milestones in work plan. (time, quality, quantity).	• Project progress reports.	Design already completed in 1993 is acceptable.

Figure 5a - Performance Indicators Matrix (Food Irradiation)

Project Design	Verifiable Indicators	Means of Verification	Important Assumptions
Development goal: • To contribute to the development of sustainable sorghum and rice	Indicators of goal achievement: • Land coverage with improved varieties by 2000, as anticipated.	Project progress reports - trial and extension records	Acceptance by farmers and extension services.
Project purpose: • Better awareness of best species by extension services and end-users	Indicators of achievement of purpose: • Seed extension (targets: 20 kits in 1995, 40 in 1996, 2000 in 1997).	Project progress reports - trial and extension records	Acceptance by farmers and extension services.
Outputs: • Direct results of project activities: • **Agronomic: best performing sorghum and rice varieties + soil management information** • **N-15 and P-32 lab.** • **Tissue culture lab.** • **Trained staff**	Measures verifying achievement of major outputs: • Yield results of selection/agronomic trials (target 10-15% increase). • Qualitative characteristics, drought resistance, nutritional value, etc.	Project progress reports - trial and laboratory records.	Performance of agronomic outputs as anticipated.
Activities: • Rice & sorghum selection and agronomic trials • Seed distribution ***IAEA + CP Inputs:*** • Experts • Equipment + buildings • Training	Milestones and targets (type, time, quantity, quality)	Project progress reports - trial and laboratory records	Inputs delivered as anticipated. Outputs produced as anticipated. Activities performed as anticipated. Radiation protection regulations enacted.

Figure 5b - Performance Indicators Matrix (Agriculture)

4.2. THE EVALUATION PLAN

4.2.1. The Evaluation Questions

Having established the project summary the outstanding questions will surface which will focus the assessment on project-specific concerns and guide the evaluation plan. They need to be not only succinct but penetrating.

The evaluation questions relate to the evaluation concerns in the same way as performance indicators relate to project design. Thus, very often, the performance indicators guide the selection of evaluation questions. Typically, an evaluation needs to ensure that answers are obtained to the questions as outlined in the example in Figure 6. Further examples of typical evaluation questions are given in the TCSEV "Procedures Manual for Evaluating IAEA Technical Co-operation Projects". In addition to these general queries, project specific technical questions need to be addressed, so as to really establish the project's efficiency, effectiveness, impact, relevance and sustainability.

When choosing the evaluation method it is advised that a table be constructed. Figure 6 shows an example of how the general questions have been addressed. The questions also show how the evaluator is guided to the conclusion as to which evaluation instrument will most likely produce the best results.

AREA OF ASSESSMENT	EVALUATION QUESTIONS	METHODS	RELIABILITY
***Efficiency*:**			
• Project design • Project implementation and management • Counterpart inputs	• Were the aspects requiring assistance adequately identified and supported. • Were Agency inputs fully connected to the project outputs and objectives. • Was the project completed within the budget and was the budget utilized efficiently. • Was 'fit-for-purpose' equipment ordered to time and within cost. • Were the IAEA inputs of expert advice, specialized equipment and training delivered to the necessary standard and in a timely manner. • Were the design of the facility, the construction, equipment fabrication and installation adequately conducted. • Were project milestones met in accordance with the project time schedule.	-Desk Review/ -Interview with Agency staff and experts/ -Questionnaire	Medium Medium and high Medium
***Effectiveness*:**			
	• Are there sufficient trained staff to manage and operate the facility. • Has the treatment of other foodstuffs been demonstrated. • Is the facility operating at the planned utilization rate (hrs/day) and throughput (tonnes/day).	-Interview with Agency staff and experts/ -Questionnaire	Medium
***Impact*:**			
	• Does an operational plan for the next 2-3 years exist which ensures cost-effective utilization of the facility. What foodstuffs, other than rice, are to be treated by the facility.	-Interview with Agency staff and experts/ -Questionnaire	Medium
Relevance:			
	• Has the shelf-life and reduced loss been demonstrated. • Are irradiated foodstuffs accepted by the public. • Are there plans to phase out the use of chemical treatment.	Questionnaire	Medium
Sustainability:			
	• Are plans in hand to train replacement personnel and to expand the technology. • Is a marketing plan available	Questionnaire	Medium

Figure 6: Evaluation Questions and Methods for the Project on Food Irradiation

In the example it would appear that the combination of methods should yield answers of medium reliability, which are deemed sufficient for the stage of development of the project. The additional advantage of a field visit and direct interview of counterparts would not be justified in terms of cost in this case.

4.2.2. Gathering Data

When compiling the questions, consideration needs to be given as to what methods or instruments are to be used to derive the answers and how reliable the instrument is likely to be. The evaluator has to ensure that:

- The adopted evaluation instrument is a valid means of measuring what is intended;
- Repeated use of the evaluation instrument will produce the same result; and that
- The information is accessible and can be supplied in the intended time scale.

There are a number of methods of gathering the answers to evaluation questions. These methods can be used individually or in combination. In practice they vary considerably in their level of reliability; but often precision has to be tempered with cost, time and resource availability. The main avenues available are:

- Desk review of project information contained in Agency files;
- Internal interview of Agency project and technical staff;
- Interview of experts that serviced the project;
- Questionnaires completed by the counterpart;
- Questionnaires completed by a random sample of beneficiaries;
- Interview of the counterpart and a selected number of the beneficiaries; and/or
- Direct observation by inspection and field visits.

The appropriateness of the main methods of gathering data and the advantages and disadvantages of each method are as listed in Figure 7.

Data Gathering Method	Appropriateness	Advantage	Disadvantage
Desk Review	♦ Establishes basic data on the project and gives an overall picture of the project ♦ Aids identification of data that needs to be gathered by other means	♦ Quick, relatively inexpensive	♦ Limited availability of impact-related data ♦ Accuracy of data difficult to determine ♦ May not reflect counterpart's views
Interviews with project staff and experts	♦ Yields insight into motives of different in-house parties ♦ Aids development of questions for later testing and elaborating	♦ Inexpensive and quick to implement	♦ Risk of one-sided view, i.e. Agency's
Questionnaire to Counterpart	♦ When it is not possible to visit or hold face-to-face interview with the Counterpart ♦ When there is a need to obtain back-up information of a general nature to substantiate impact and sustainability	♦ Provides precise, quantitative information ♦ High degree of reliability	♦ Risk of one-sided view, i.e. Counterpart's ♦ Time delay in obtaining response
Questionnaire to Random Sample of Beneficiaries	♦ When a range of opinions (counterpart, direct beneficiary, end-users, others) is required ♦ When statistical socio-economic information is required to substantiate relevance	♦ Produces general information which can be analysed statistically	♦ Data collection is resource demanding and time consuming
Interview of Counterpart	♦ For eliciting direct reaction of counterpart(s) ♦ For yielding insight into motives and attitudes ♦ When interpreting quantitative data	♦ Direct contact with recipients ♦ Easy to implement	♦ Risk of one-sided view, i.e. Counterpart's
Direct Observation	♦ For obtaining deeper insight into impact and socio-cultural conditions ♦ Peer review required	♦ Can yield comprehensive, highly relevant information	♦ Can be expensive and time consuming

Figure 7: Main Methods of Gathering Data

4.2.3. Methods of Assessment

A brief description of some of the assessment methods most frequently used is given in Figure 8, as well as the type of project or programme to which they are best applied. A combination of such methods is needed in most cases.

Assessment Method	Best Application	Strengths and Weaknesses	Relative Cost
Peer & Modified Peer Review	When focusing on efficiency and effectiveness	**Strengths** -Relatively easy to organize -Probably the most appropriate for technical assessments **Weaknesses** -When used in isolation, limited value for impact assessment	Medium
User Surveys	When focusing on impact and for projects with many beneficiaries	**Strengths** -Provides statistical data and facilitates statistical analysis **Weakness** -Limited in depth of insight -Time consuming	Low
Cost-Benefit Method	For large investments and focusing on social benefits	**Strengths** -Justification of large investments and /or of long term policies **Weaknesses** -Lends itself to be speculative -Time consuming	High
Case Studies	On sectoral basis evaluations, focusing on impact of representative sample cases	**Strengths** -To make decisions regarding repetitive projects -Very powerful for impact assessment **Weaknesses** -Difficulties for extrapolating results on impact	Medium

Figure 8 - Assessment Methods

When quantitative information has been gathered, for example, from samples of end users, statistical analysis can be applied to analyse data. There is a need to search for trends, unexpected variations and irregularities. Statistical analysis is best used:

- To describe phenomena in a concise way, making use of tables, percentages and averages;
- To test relationships between variables; and
- To generalize findings from an overall population.

An example of where statistical analyses can be applied in TCSEV is when assessing the feedback from a large number of students that attended training courses. The majority of TC projects do not lend themselves to statistical analysis of this nature.

4.3. RATING ISSUES

Having carried out the analysis of the information it is not unusual, indeed often desirable, to rate the evidence obtained. This can be done by rating each finding in a qualitative manner (High satisfaction, Acceptable satisfaction, Low satisfaction, or Not achieved) or in a quantitative manner (95% efficient use of budget, objectives achieved to 65% of target values).

The procedure is to reach a rating assessment for each evaluation concern, as well as the basis for the rating, i.e. the level of compliance or deviation with respect to the applicable qualitative or quantitative standards. The background detail analysis that is carried out in order to reach the ratings is shown in Figure 9.

	Efficiency	Assessment	Basis
Outputs: • Trained staff capable of operating the facility safely • An operating facility capable of irradiating 5,000-9,000 tonnes of rice or other food stuffs per annum	**PROJECT DESIGN:** -Selection of areas of assistance -Linkage Agency Inputs/ Outputs -Basic Design	**ACCEPTABLE** -Low -Low -Acceptable	-Support in project and business management not requested nor provided -Extent of expert support needed underestimated
	PROJECT MANAGEMENT • Work plan • Utilization of budget • Co-ordination of contractors	**ACCEPTABLE** -Acceptable -Acceptable -Low	-Commissioning delayed, -WP updated as needed, -Budget mainly spent as intended
	PROJECT IMPLEMENTATION:	**LOW**	
	CP input • Detail Design "right first time" • Fit-for-purpose equipment	**LOW** -Low -Low	-Substantial as-built design modifications still on going -Local equipment had to be re-made
Inputs/Activities: Counterparts • Design • Construction/Equipment • Manpower IAEA • Experts • Special Equipment Training/Fellowships	**Agency's input** • Expert mission timeliness • "Fit-for-purpose" equipment supplied to time • Quality of expert services • Adequacy of training	**ACCEPTABLE** -Low -Low -High -High	-Inadequate timing of the only mission held to date -IAEA initially supplied inadequate sealer and microscope -Training by expert was of right quality and flexible. Fellows very competent

Figure 9 : Assessment of Efficiency (Food Irradiation)

This particular example illustrates the assessment of efficiency and is based in assessing the process of converting inputs into outputs. Individual ratings have been combined to derive an overall rating for each of the major contributors to efficiency.

However it is often the case that judgement has to be made as to the relative importance or weight of the individual ratings on the effects that any particular aspect has in overall terms. In this specific example, a high weighting factor might be given to the "Low" rating assigned to the timeliness of Agency expert input into the project and the extent to which it was needed. In this specific case, such an issue was taken into account when rating project design, as it was judged to be more a project design fault than an implementation problem.

The same thinking can be applied to obtain an overall rating for the other evaluation concerns. The exercise of identifying weighting factors is of great assistance in the lesson learning process, as it is often the case that the factors affecting low efficiency also result in low effectiveness, thus hampering the chances of reaching the project objectives.

4.4. PRESENTING RESULTS

The analysed data is gathered together in an overall project performance assessment matrix. An overall project performance matrix is shown as an example in Figure 10. The judgements and conclusions presented in Figure 10 various analyses need be included in the evaluation report:

(a) Analysis of those major factors affecting efficiency, i.e. inputs having low linkage with project outputs, or operational outputs for which cost-effectiveness was not sufficiently justified.

(b) Analysis of progress towards or achievement of project objectives. This analysis provides a quality reference of financial data, i.e. disbursements made versus objectives achieved.

(c) Analysis of the major factors affecting effectiveness, as a source for learning lessons, and proposals for management actions.

PROJECT DESIGN ELEMENTS	EFFICIENCY	EFFECTIVENESS	IMPACT	RELEVANCE	SUSTAINABILITY
OVERALL GOAL			**Sorghum** seed extension targets (20 kits in 1995): **High Satisfaction.** 1995 **Rice** seed extension targets: **Not achieved**	Role of counterparts in agronomic research: **High Satisfaction.**	**Risks on agronomic outputs**: If the targeted level of extension is not achieved within the project time span,
PROJECT OBJECTIVE		1995 **sorghum** results do not yet demonstrate the target performance of the mutants, however, progress towards the objective was of **High Satisfaction**. In 1995, **for rice, No progress** towards achieving the objective was made.	Overall probability of achieving the anticipated impact: **Acceptable Satisfaction.**	Relevance of sorghum and African rice mutants: **High Satisfaction.**	**Low** probability of sustainable extension of sorghum and African rice after termination of Agency funding, due to: **Authority line acceptance problems** among counterparts **and No other sources of funding** for this project.
OUTPUTS	**PROJECT DESIGN - High Satisfaction:** -Adequate concept for sorghum and rice breeding programmes. **COST-EFFECTIVENESS - Low Satisfaction:** -Reasonable cost-effectiveness of equipment input not yet ensured by a programme of utilization.			**Adequacy to local conditions** of isotopic analysis **technique:** N-15: **Acceptable Satisfaction.** P-32: **Low Satisfaction.**	
ACTIVITIES + INPUTS	**PROJECT IMPLEMENTATION: Agency Inputs - Acceptable Satisfaction-** However, -Shortage of staff to create critical in-vitro culture team at IPR. -Non-documented expert advice led to misunderstandings in building layout and delayed construction. **Counterpart inputs: Acceptable Satisfaction** -Sorghum trials implemented as anticipated -Implementation of rice trials not as planned nor managed correctly -IER Isotope Lab was not built				**Risks for sustainable utilization of laboratories**: limited local resources for consumables, maintenance, spares, retraining and upgrading

Figure 10 - Overall Project Performance Assessment (Agriculture)

5. APPLICATION OF THE IEF TO MULTIPLE PROJECTS/PROGRAMMES

The Integrated Evaluation Framework is also a means of drawing global conclusions with regard to the overall performance of a multiplicity of projects under a thematic programme area, by adding up ratings on corresponding issues.

Performance Rating

An example of added ratings is given in Figure 11a. It represents the ratings assigned to a number of projects under various thematic programme areas implemented in one Member State over a ten-year period, covering: Nuclear Power, Human Health, Health Physics, Industrial Applications, Mineral Resources, Isotope Hydrology, Research Reactors, Analytical Techniques, Agriculture and General Atomic Energy Development. The assessment and rating of the evaluation concerns was based on the IEF.

Assessment Areas / Ratings	Relevance	Efficiency	Effectiveness	Impact
High	NPP Human Health Health Phys. Indust. Applic. Res. Reactors Anal. Tech. Agriculture Gen. A. E. Dev.	NPP (b) Human Health Health Phys. Indust. Applic. Mineral Resources Anal. Tech. Agriculture	NPP(b) Human Health Health Phys. Indust. Applic. Anal. Tech. Agriculture Gen. A. E. Dev.	NPP(b) Human Health Health Phys. Indust. Applic. Res. Reactors Anal. Tech. Agriculture(d) Gen. A. E. Dev.
Acceptable	Mineral Resources Isotope Hydrol. (a)	NPP Isotope Hydrol. Res. Reactors Gen. A. E. Dev. (c)	NPP Mineral Resources Res. Reactors	NPP Mineral Resources Agriculture
Low			Isotope Hydrol.	Isotope Hydrol.

(a) Medium institutional linkage.
(b) Training component
(c) Medium linkage to TC project objectives.
(d) Animal health component.

Figure 11a - Programme ratings

Performance Ranking

From the ratings presented in Figure 11a, the number of times that the various ratings (High, Acceptable or Low) were assigned to the thematic programme areas (frequency of rating) was obtained and is shown in Figure 11b. This type of analysis allows comparison of relative performance of the different projects or thematic areas and subsequent ranking.

Frequency / Ratings	4	3	2	1
High	NPP (b) Human Health Health Phys. Indust. Applic. Anal. Tech. Agriculture (d)	Agriculture Gen. A. E. Dev.	Res. Reactors	NPP Mineral Resources
Acceptable		NPP Mineral Resources	Isotope Hydrol. Res. Reactors	Agriculture Gen. A. E. Dev.
Low			Isotope Hydrol.	

Figure 11b - Frequency of ratings

Budget Performance

From Figure 11a the disbursements utilized with High, Medium and Low performance can be derived by adding the disbursements on the projects or thematic programme areas having obtained the same ratings under each of the evaluation concerns. Then the utilization of disbursements can also be represented as per Figure 12.

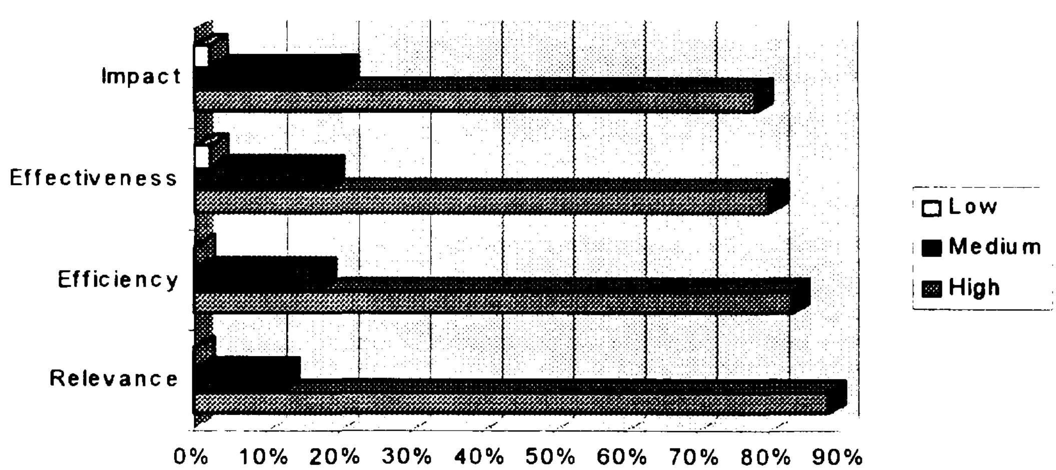


Figure 12 - Budget Performance vs. Assessment Areas

ANNEX A1

AN EXAMPLE OF A PROJECT SUMMARY

A1.1. PROJECT DATA

PROJECT NUMBER: CPR/5/009.

PROJECT TITLE: Industrial Scale Irradiation of Rice and other Foodstuffs.

SECTORS: 5H, Food preservation

PROJECT TIME-SPAN: 1994-1995

The project counterpart was Professor Shi Peixin of the Chinese Academy of Agricultural Sciences.

The approved budget for Agency support was $248,850. Two subsequent programme changes have resulted in a current budget of $323,870, distributed as shown in Table A1.1. Also shown in this figure are the disbursements up to June 1996.

Table A1.1 - Current Budget and Disbursements ($)

Year	Experts	Equipment	Fellowships	Total
Current Budget				
1994	**10,800**	**200,000**	**22,050**	**232,850**
1995	**20,520**	**54,000**	**16,500**	**91,020**
Total	**31,320**	**254,000**	**38,550**	**323,870**
Disbursements				
1994	**1,697**	**23,694**	**-**	**25,392**
1995	**21,706**	**191,494**	**26,487**	**239,688**
1996	**-**	**29,635**	**-**	**29,635**
Total	**23,403**	**244,825**	**26,487**	**294,716**

The total cost of the project was estimated at $1,331,300. The Chinese Government, through an annual loan, has supplied the remaining funds.

A1.2. PROJECT OBJECTIVES

The immediate objective of the project was to support the construction of an industria- scale food irradiation facility by the Academy of Agricultural Sciences, capable of processing 5000-9000 tonnes annually of rice and other agricultural products, to meet the market demand in the Beijing area.

Once the safe operation of the facility was successfully demonstrated, the intention was to spread the technology and experience in the treatment of rice and other foodstuffs as part of the national programme on the commercialization of food irradiation.

The IAEA contribution included the supply of expert advice on nuclear techniques and good practice, the delivery of defined specialist equipment (including a 100 kCi cobalt source), and training of scientists and technicians. This was to ensure that there was a trained team capable of operating the facility in a safe and efficient manner.

A1.3. PROJECT ACTIVITIES AND WORK PLAN

In 1993. China put forward a request for Agency support, and this was approved as a model project for funding in 1994-1995. The national decision to proceed with the project had already been taken before Agency approval was received. Thus, by 1994 the design of the facility was nearing completion and a contract for construction was about to be placed. The design was being undertaken by the Beijing Institute for Nuclear Engineering. In addition it was understood that the project was being carried out in co-operation with the Beijing Jinliang Limited Company, a company already engaged in the production and marketing of rice and other cereals.

At the outset, a work plan was agreed which outlined key dates as follows:

Civil engineering construction .... complete 31 Oct. 1994
Training of operating personnel .... complete 31 Dec. 1994
Cobalt source and assoc. equipment .... delivered 1 Feb. 1995
Installation of equipment .... start 1 Feb. 1995
.... completed 15 March 1995
Commissioning and test run .... start 15 Feb. 1995
.... completed 30 April 1995
Normal operation .... start April 1995

Due to delays, first with national funding caused by an unexpectedly high inflation rate of more than 10%, followed by equipment manufacture difficulties, this work plan was amended on a number of occasions, resulting in an overall slippage of commencement of operation to January 1996, that is an overall delay of some 9 months. The original work plan and the eventual outcome is as shown in Table A1.2.

A schematic of the inputs, activities and outputs for the project is given in Figure A1.1. This figure outlines the relationship between the IAEA and the other organizations involved in the project, as well as their interdependence.

A1.4. IAEA INPUTS

A1.4.1. Experts

Two expert missions were planned, the first to advise on disinfestation and packaging and the second to provide advice on process control, dosimetry and source loading.

The first expert mission has been postponed three times and has recently been scheduled for October 1996. The delays occurred due to unexpected delays in loading the Co-60 source into the facility, following the need to replace or modify some of the locally made equipment. The planned duties for this two week mission are:

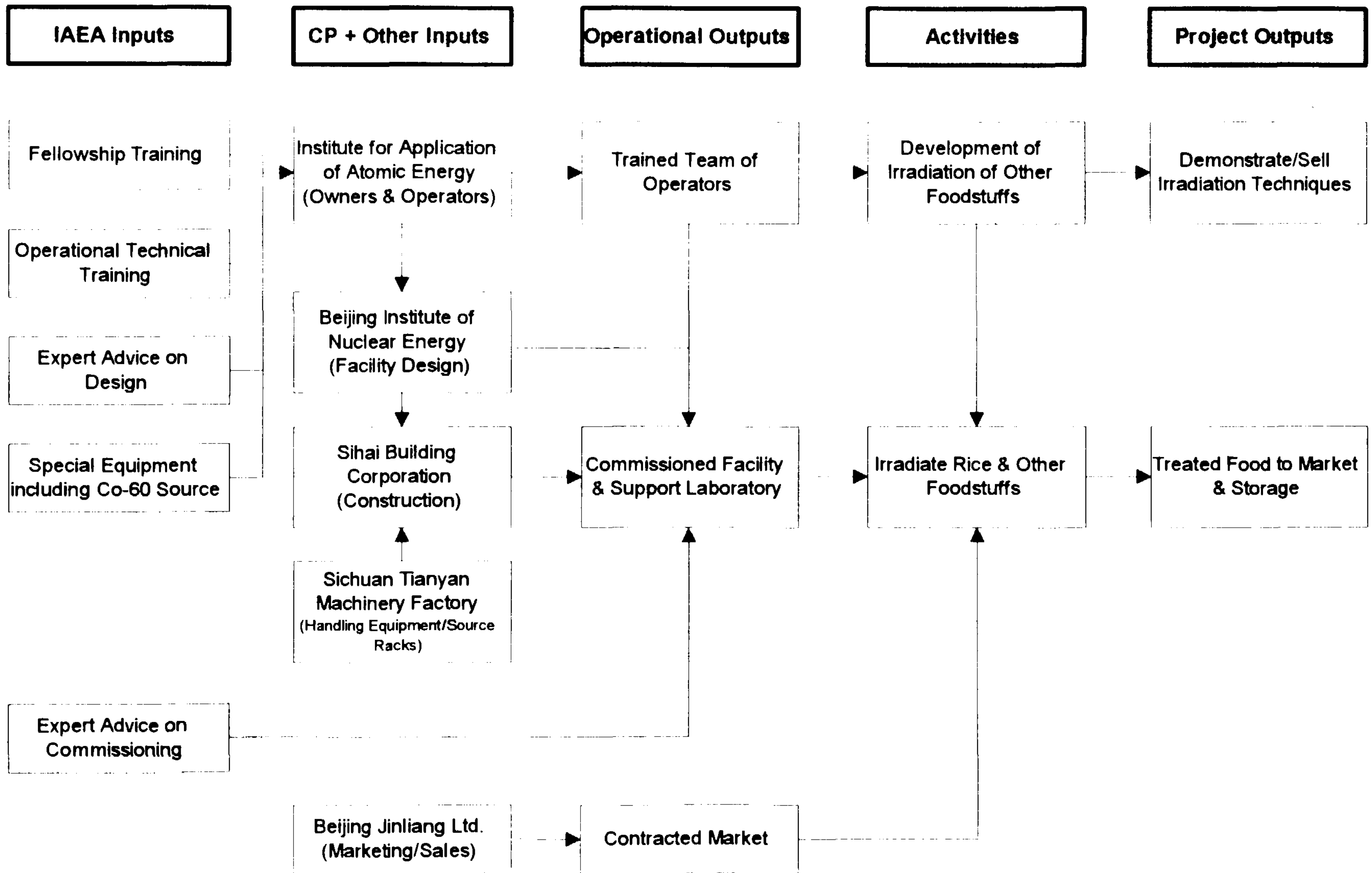
(a) The establishment and application of the National Codex Standard for food irradiation during processing, storage and fresh-keeping.

TABLE A1.2 - ORIGINAL WORK PLAN AND OUTCOME

INDUSTRIAL-SCALE IRRADIATION OF RICE AND OTHER FOODSTUFFS (CPR/5/009)													
		1994				1995				1996			
	ACTIVITIES	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
1	Project Approval	x■[1]											
2	Design Phase	xxxxxx■•											
3	Civil Engineering Construction	xxxxxxxx	xxxxxxxx	xxxxxxxx	xx■-----•								
4	Fellowship CPR/94005		xxx	xxxxxxxx	xxxxx■--	------- -	-------------	•					
5	Equipt. manuf. (i.e. Source/Product Handling. Control panel etc.)		xxxxxxx■x	xxxxxxxx■	------------- -	•							
6	Training Oper. staff		xxx	xxxxxxxx	xxxxxx•								
7	Equipment (Item 2-5 RFP-1)				xxxxxxx■	------------	•						
8	Expert (-01) Irradiation/ disinfestation (1 month)				xxxxxxx■						xxxxxxxxx		
9	Equipment Co-60 source (RFP 1, Item #1)					xxx■•							
10	Start Installation of Facilities				+	xxx■•							
11	Fellowship CPR/96028						xxxxxxxxx	xxxxxxxx■			xxxxxxxxx		
12	Installation Completion					xxxx■	------------- -	------------- -	--------•				
13	Expert (-02) Process Control						xxxxxx■•						
14	S.V.'s (Two #)						xxxxxxxx	xxxxxxx•					
15	Commissioning and Test Run					xxxxxxxx	xxxx■-----	------------- -	------------- -	------------- -			
16	Start Operation						xxxxx■----				xxxxxxxxx		

[1] ■ Planned Completion Date
• Actual Completion Date

Figure A1.1 - Schematic of Inputs, Activities and Outputs



(b) The microbial analysis and the change of the food in colour, smell, and taste after irradiation processing.
(c) The commercialization and consumer acceptance of irradiation disinfestation, including market survey and economic benefits.

The second expert mission took place during May-June 1995. The planned duties for this 30-day mission were to:

(a) Provide training on food irradiation process control and dosimetry.
(b) Provide assistance during source loading and commissioning of the facility.

The expert helped to install the facility's process control programme, inspected the equipment rooms and the irradiation facility, measured the Institute's dosimeters and compared them with his own dosimeter. The instructive recommendations and proposals he put forward for the irradiation facility were accepted and provided for improvements to the facility. However, the major intent of this expert mission was to provide assistance during source loading and commissioning, including dose rate mapping and dosimetry evaluation during source loading. Since the source could not be loaded before his departure, the effectiveness of the mission was reduced. Before leaving, however, the expert achieved the following:

- Transferred the expertise to the counterpart staff on the steps to be taken during commissioning and on the dosimetry requirements.
- Provided training on dosimeters and calibration methods.
- Carried out rate and dose measurements and mapping using chemical dosimeters, physical rate meters, and computer modelling.
- Gave a lecture and consultations on gamma irradiation of food.
- Provided relevant literature on gamma irradiator and dose rate mapping computer programmes.

The expert concluded that the estimated plant capacity for rice is between two and three tonnes per hour when using the 100 kCi cobalt source. The annual throughput is thus a minimum of 9000 tonnes with one shift of eight hours per day over 300 days per year. The annual rice irradiation is planned to be 8000 tonnes and during the rest of the time other agricultural products can be irradiated. Advice on the preparation of various goods to be irradiated was also provided to the staff.

He further concluded that the irradiation unit, before commissioning, was in a safe condition and that completion of the dose rate distribution of the irradiation room, labyrinths, outside shielding walls could be finished by the operating staff.

His recommendations to the counterpart institution were that they should:

(a) Install a calibrated ECB chemical dosimeter system.

(b) Find a locally available semiconductor detector unit for regular dose rate control of the radiation technological process, and for the regular control of the exposure of materials to be irradiated.

(c) Introduce dose indicators for the materials to be irradiated.

(d) Provide a portable dose rate monitor for the operating staff to control the safe daily operation of the facility.

(e) Ensure a separate and well equipped chemical dosimetry laboratory.

(f) Since the operated irradiation units cannot provide high dose rate, the national secondary standardization institute, and the IDAS control should be called in.

(g) Ensure a fellowship of 3-4 months duration for one radiation chemist, or for one nuclear engineer.

(h) Participate in the IAEA regular operated IADS programme.

(i) Provide TLD dosimeters for low and medium dose ranges from 1 krad to 500 krad.

(j) Keep the pilot irradiator for sample irradiation, because a gamma cell type irradiation unit is missing.

(k) For the future, increase the source activity and geometry for high dose, fast sample irradiation.

(l) The new food demonstration facility needs increased activity in scientific and experimental capacity of irradiation.

His recommendations to the Agency were that it should:

(a) Support the Institute to purchase the ECB dosimeter system, including the computer controlled interface and 1000 pieces of ECB dosimeters for immediate use (approximately $3000).

(b) Support, in 1995-1996, scientific visits, fellowships, and training abroad in the field of high dose dosimetry.

(c) Support the Institute with one set of Alanine dosimeters, to be used to calibrate the field of the pilot irradiator by the IDAS (approximately $100).

(d) Consider to have the expert return to support source loading and dosimetry utilization.

In addition to the expert mission to China, the project funded visits by Chinese staff members of the Academy of Agricultural Sciences to the IAEA (L. Wang) and to a National Workshop in Sri Lanka (P. Shi). At both venues they imparted their views and experiences on irradiation of foodstuffs and the progress with this project, as well as other matters.

A1.4.2. Equipment

The initial request to the Agency was for a 100 kCi Co-60 source, chromatography system, gas chromatograph, and UV/VIS spectrophotometer. However, no technical specifications were given for this equipment and only the manufacturer and model number were provided. Upon Agency approval of the project the Technical Officer determined that the chromatography system and the gas chromatograph were for research purposes and did not meet the criteria of this model project, which was to establish a commercial-scale irradiation facility for high quality rice and other grains, for which food irradiation methodology has been well established. Once the initial requisitions were approved the counterpart continued to request additional equipment, including an additional 50 kCi Co-60 source, incubator, stereo microscope, bag sealer, forklift trucks, a colour projection training and education system, belt freezer, data management system, and room air-conditioning. Each request was considered on its merit. The list of equipment actually supplied is as shown in Table A1.3.

A1.4.3. Fellowships and Scientific Visits

Four project-funded fellowships and scientific visits were awarded to the local staff for a total of 13.5 months of training abroad, as shown in Table A1.4.

Table A1.4 - Fellowships and Scientific Visits

Name	Host Institute	Dates	Training Subject	Result
CPR/94005 - M. Gao	US Dept. of Agriculture Food Safety Laboratory, Philadelphia	March to Sept. 1995 (6 months)	Microbiological examination of irradiated foods	Completed successfully
CPR/96028 - J. Zhang	Iowa State University	Starting in Q2 1996 for 6 months	Packaging materials Eval. of effects of radiation on materials, compatibility of materials with food during irradiation	Course underway
CPR/94073 - P. Shi (Scientific visit)	Canadian Irradiation Centre	July 1995 (21 days)	Operation of irradiation facility and process control	
CPR/94074 - Y. Lin (Scientific visit)	Canadian Irradiation Centre	July 1995 (21 days)	Operation of irradiation facility and process control	

A1.5. IMPLEMENTATION

As mentioned in Section A1.3, faults in the design and manufacture of equipment delayed the completion of the facility. There was lack of co-ordination between the designers and manufacturers. In particular, the design and manufacture of the source rack and automated conveyor system was found to be flawed. The source rack could not meet the international regulations outlined in IAEA Safety Series No. 107 for an irradiation facility. Therefore the source rack and all the source modules had to be re-manufactured.

The loading and unloading system also had to be modified owing to deficiencies in the system design. This work was not completed until late 1995. Further, the food transportation system would not operate as required and had to be modified.

The loading of the cobalt-60 source took place in October 1995, but commissioning was still being hampered because the re-manufactured food transportation system was still not running smoothly as of late 1995

In the autumn of 1995 the Chinese regulatory authorities formally informed the counterpart that the commissioning test period must last at least six months before the Chinese Government would issue an operating license (this has now been granted). This has further delayed the commencement of normal operations. It is this delay that has resulted in the postponement of the expert mission on disinfestation and deterioration of irradiated food.

TABLE A1.3 - EQUIPMENT SUPPLIED BY THE AGENCY

EQUIPMENT ID	REQUEST RECEIVED	DESCRIPTION	ORDER DATE	RECEIPT DATE	TOTAL COST	VENDOR'S NAME
1A	94-01-27	Irradiator Gamma, Source (100 kCi Co-60 Source)	94-07-21	95-03-30	138,400	Reviss Services Limited, UK
1B	94-01-27	Incubator	94-07-08	94-10-17	4,309	Fischer Scientific Co., USA
1C	94-01-27	Microscope, Optical Research (Stereo Microscope)	94-07-08	94-10-17	See 1	Fischer Scientific Co., USA
1D	94-01-27	Spectrophotometer, UV-VIS	94-06-17	95-01-11	20,443	Biolab. G.m.b.H., AUSTRIA
1E	94-01-27	Sealer, Heat	94-07-08	94-10-17	See 1	Fischer Scientific Co., USA
2A	94-12-19	Spares (Spare Lamps for UV-VIS)	95-02-24	95-04-07	804	Biolab. G.m.b.H., AUSTRIA
2B	94-12-19	Sealer, Heat	95-03-28	95-08-31	40,727	Nissei Trading Co. Ltd., JPN
2C	94-12-19	Climatic chamber, Walk-In Cooling Chamber	95-03-28	95-12-30	29,570	Lab-Line Instruments Inc., USA
3A	94-12-21	Microscope,Optical Technical (Stereo Microscope)	95-03-28	95-08-31	10,504	Carl Zeiss Jena G.m.b.H - (Formerly Jenoptik Jena GMBH), GER

Some problems with the supply of certain items of equipment by the Agency have also been identified. Due to a misunderstanding by the Agency concerning the utilization of this equipment at the Institute and the absence of technical specifications by the Institute, the microscope and heat sealer initially purchased by the Agency did not meet the needs of the project and had to be replaced.

The microscope that was purchased was a student microscope and was not adequate for the technical requirements. The bag sealer was designed for sealing laboratory samples and was not designed for commercial use. It would appear that this situation arose because the counterpart requested specific equipment by named manufacturers and did not supply a technical specification of their use.

As required, the Agency requested bids for all the equipment and selected the lowest priced equipment considered as equivalent to that requested by the counterpart. Apart from the two items mentioned above, the counterpart notified the Agency that the spectrophotometer selected did not meet their needs. They also noted that the Agency did not consider the availability of servicing in the Beijing Area for the equipment supplied and that additional shipping expenses were incurred when the UV/VIS spectrophotometer, produced in Japan, was shipped to Vienna and then to China. Similarly, the stereo microscope was produced in China, shipped to the USA and then back again to China.