HOPE'87 RISK ASSESSMENT GUIDELINES[1]

1. INTRODUCTION

Risk assessment is the methodical collection and ranking of risks according to severity of consequences and probability of occurrence, and then the creation of a plan to mitigate identified risks. It is used with specific technical meanings in a number of contexts, from finance to implementation, but certain common elements can be identified across the board.

In all cases, risk can be defined as the potential for negative eventualities, including loss, injury, and damage. Assessing risk involves taking into account not only the severity of the negative eventuality but also its probability. There are mathematical formulas for assessing risk, but these can only be used if all of the data you are trying to analyze is quantitative, which is rarely the case outside of the world of finance.

In an NGO context, risk assessment is generally going to be based more on facts and opinions than on numbers.

Risk assessments provide a framework for prioritizing and mitigating risk.

These Guidelines provide an introduction to the processes involved in Project Risk Analysis and Management, offering a simple but robust and practical framework to help HOPE'87 staff get started. Project Risk Analysis and Management has to be used on all projects, whatever the sector or donor, and whatever the timescale or budget.

2. WHAT IS PROJECT RISK ANALYSIS AND MANAGEMENT?

Project Risk Analysis and Management is a process which enables the analysis and management of the risks associated with a project or an organisation. Properly undertaken it will increase the likelihood of successful completion of a project to cost, time and performance objectives.

Risks for which there is ample data can be assessed statistically. However, no two projects are the same. Often things go wrong for reasons unique to a particular project, industry or working environment. Dealing with risks in projects is therefore different from situations where there is sufficient data to adopt an actuarial approach. Because projects invariably involve a strong technical, engineering, innovative or strategic content a systematic process has proven preferable to an intuitive approach. Project Risk Analysis and Management has been developed to meet this requirement.

[1] (by courtesy of the THE ASSOCIATION FOR PROJECT MANAGEMENT (formerly The Association Of Project Managers)

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3. WHAT IS INVOLVED

The first step is to recognise that risk exists as a consequence of uncertainty. In any project there will be risks and uncertainties of various types as illustrated by the following examples:

- the management and financial authority structure are not yet established
- a technology is not yet proven
- authority relations problems seem likely
- resources may not be available at the required level.

All uncertainty produces an exposure to risk, which, in project management terms, may cause a failure to:

- keep within budget
- achieve the required completion date
- achieve the required performance objective.

Project Risk Analysis and Management is a process designed to remove or reduce the risks, which threaten the achievement of project objectives. The next section of these Guidelines describes the benefits that Project Risk Analysis and Management can bring to a project and also the wider benefits to the organisation and its beneficiaries and donors. It should be regarded as an integral part of project or business management and not just as a set of tools or techniques.

Experienced risk analysts and managers hold perceptions of this process that are subtle and diverse. In order to simplify the process these Guidelines divide the overall process into two constituents or stages:

a. Risk Analysis

This stage of the process is generally split into two 'sub-stages'; a qualitative analysis 'sub-stage' that focuses on identification and subjective assessment of risks and a quantitative analysis 'sub-stage' that focuses on an objective assessment of the risks.

i. Qualitative Analysis

A Qualitative Analysis allows the main risk sources or factors to be identified. This can be done, for example, with the aid of checklists, interviews or brainstorming sessions. This is usually associated with some form of assessment that could be the description of each risk and its impacts or a subjective labelling of each risk (e.g.

high/low) in terms of both its impact and its probability of occurrence.

A sound aim is to identify the key risks, perhaps between five and ten, for each project (or part-project on large projects) which are then analysed and managed in more detail.

ii. Quantitative Analysis

A Quantitative Analysis often involves more sophisticated techniques, usually requiring

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computer software. To some people this is the most formal aspect of the whole process requiring:

- measurement of uncertainty in cost and time estimates
- probabilistic combination of individual uncertainties.

Such techniques can be applied with varying levels of effort ranging from modest to extensively thorough. It is recommended that new staff members start slowly, perhaps even ignoring this 'sub-stage', until a climate of acceptability has been developed for Project Risk Analysis and Management in the organisation.

An initial qualitative analysis is essential. It brings considerable benefit in terms of understanding the project and its problems irrespective of whether or not a quantitative analysis is carried out. It may also serve to highlight possibilities for risk 'closure' i.e. the development of a specific plan to deal with a specific risk issue.

Experience has shown that qualitative analysis - Identifying and Assessing Risks - usually leads to an initial, if simple, level of quantitative analysis. If, for any reason - such as time or resource pressure or cost constraints - both a qualitative and quantitative analysis are impossible, it is the qualitative analysis that should remain.

It should be noted that procedures for decision making will need to be modified if risk analysis is adopted.

b. Risk Management

This stage of the process involves the formulation of management responses to the main risks. Risk Management may start during the qualitative analysis phase as the need to respond to risks may be urgent and the solution fairly obvious. Iteration between the Risk Analysis and Risk Management stages is likely.

Risk Management can involve:

- identifying preventive measures to avoid a risk or to reduce its effect
- establishing contingency plans to deal with risks if they should occur
- initiating further investigations to reduce uncertainty through better information
- considering risk transfer to insurers
- considering risk allocation in contracts
- setting contingencies in cost estimates, float in programmes and tolerances or 'space' in performance specifications.

4. WHY IS IT USED?

There are many reasons for using Project Risk Analysis and Management, but the main reason is that it can provide significant benefits far in excess of the cost of performing it.

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Benefits

The benefits gained from using Project Risk Analysis and Management techniques serve not only the project but also other parties such as the organisation and its beneficiaries and donors. Some examples of the main benefits are:

- An increased understanding of the project, which in turn leads to the formulation of more realistic plans, in terms of both cost estimates and timescales.
- An increased understanding of the risks in a project and their possible impact, which can lead to the minimisation of risks for a party and/or the allocation of risks to the party best able to handle them.
- An understanding of how risks in a project can lead to the use of a more suitable type of contract.
- An independent view of the project risks which can help to justify decisions and enable more efficient and effective management of the risks.
- A knowledge of the risks in a project which allows assessment of contingencies that actually reflect the risks and which also tends to discourage the acceptance of financially unsound projects.
- A contribution to the build-up of statistical information of historical risks that will assist in better modelling of future projects.
- Facilitation of greater, but more rational, risk taking, thus increasing the benefits that can be gained from risk taking.
- Assistance in the distinction between good luck and good management and bad luck and bad management.

Who benefits from its use?

- The organisation and its senior management for whom a knowledge of the risks attached to proposed projects is important when considering the sanction of capital expenditure and capital budgets.
- Beneficiaries and donors, as they are more likely to get what they want, when they want it and for a cost they can afford.
- Project managers and Country Representatives who want to improve the quality of their work i.e. they want to bring their projects in to cost, on time and to the required performance.

What are the costs of using it?

The costs of using Project Risk Analysis and Management techniques vary according to the scope of the work and the commitment to the process. Below are some example costs, time-scales and resource requirements for carrying out the process.

Cost

The cost of using the process can be as little as the cost of one or two days of a person's time up to a maximum of 5-10% of the management costs of the project, even this higher cost, as a percentage of the total project cost, is relatively small. It can be argued that the cost incurred is an investment if risks are identified during the process that may otherwise have remained unidentified until it was too late to react.

Time

The time taken to carry out a risk analysis is partially dependent upon the availability of information. A detailed cost and time risk analysis usually requires anywhere from one to three months depending upon the scale and complexity of the project and the extent of planning and cost preparation already carried out. However, as indicated above, a useful analysis can take as little as one or two days.

Resources

The minimum resource requirement is obviously just one person within a organisation with experience of using Project Risk Analysis and Management techniques. However, if expertise does not exist within the organisation it can be readily acquired from outside consultants. It is likely that once Project Risk Analysis and Management has been introduced to an organisation, in-house expertise will develop rapidly.

5. WHEN SHOULD IT BE USED AND WHO SHOULD DO IT?

Project Risk Analysis and Management is a continuous process that can be started at almost any stage in the life cycle of a project and can be continued until the costs of using it are greater than the potential benefits to be gained. As time progresses, the effectiveness of using Project Risk Analysis and Management tends to diminish, therefore it is most beneficial to use it in the earlier stages of project such as during design of the LF.

There are five points in a project where particular benefits can be achieved by using it.

- Feasibility Study - At this stage the project is most flexible enabling changes to be made which can reduce the risks at a relatively low cost. It can also help in deciding between various implementation options for the project.
- Appraisal - The donor can make use of it to view the risk exposure associated with the project and can check that all possible steps to reduce or manage the risks have been taken. If a quantitative analysis has been carried out then the client will be able to understand the 'chance' that he has of achieving the project objectives (cost, time and performance).
- Tendering - The Country Representative can make use of it to ensure that all risks have been identified and to help him set the risk contingency or check the risk exposure.
- Post Tender - The Country Representative can make use of it to ensure that all risks

having been identified by the contractor and to assess the likelihood of tendered programmes being achieved.

- At Intervals during Implementation - It can help to improve the likelihood of completing the project to cost and time- scale if all risks are identified and are correctly managed as they occur.

Which projects are suitable?

Many experienced users of Project Risk Analysis and Management would say 'any and all' in answer to this question, and experience does show that this is the case.

All projects contain risk and risk analysis and management is an integral part of project or business management.

Who should do it?

Many people advocate the use of an independent expert or external consultant to ensure that they receive an unbiased view, whereas others suggest that Project Risk Analysis and Management support should be an internal function. Opinions differ widely at this stage but essentially any staff member and Country Representative can do it provided consideration is given to the 'angle' from which they are viewing the project. In any event, the project management team should be closely involved in the analytical process to ensure validity of the analysis and also to allow them to believe in the results.

6. HOW TO DO IT - Techniques And Methods

Project Risk Analysis and Management can be split into its two constituents or stages:

a. Risk Analysis (Qualitative and Quantitative) and

b. Risk Management

There is no one technique or method for carrying out either stage of the

Project Risk Analysis & Management process. Some of the techniques and methods that can be employed are detailed below.

i. Qualitative Risk Analysis

The first phase of the qualitative analysis is **identification**. This is considered by some as the most important element of the process since once a risk has been identified it is possible to do something about it.

ii. Quantitative Risk Analysis

Once all risks have been identified, during the qualitative analysis, it may be appropriate to enter into a detailed quantitative analysis. This will enable the impacts of the risks to be quantified against the three basic project success criteria: cost, time and performance. Several techniques have been developed for analysing the effect of risks on the final cost and time-scale of projects. However, such techniques do not always readily apply themselves to the analysis of performance objectives.

The main techniques currently in use are:

- Sensitivity Analysis, often considered to be the simplest form of risk analysis. Essentially, it simply determines the effect on the whole project of changing one of its risk variables such as delays in design or the cost of materials. Its importance is that it often highlights how the effect of a single change in one risk variable can produce a marked difference in the project outcome.

In practice, a sensitivity analysis will be performed for more than one risk, perhaps all identified risks, in order to establish those which have a potentially high impact on the cost or time-scale of the project. The technique can also be used to address the impact of risk on the economic return of a project.

Once identified, the risks are then subjected to an initial assessment that categorises the risks into high/low probability of occurrence and major/ minor impact on the project should the risk materialise. It is often advisable to prepare initial responses to each identified risk, especially if risks are identified that require urgent attention. The analysis may be terminated during this phase if the assessment immediately suggests a way in which many identified risks can be mitigated.

It may be necessary to revisit the identification phase after the assessment phase to see if any consequential 'secondary' risks can be identified: a secondary risk may result from a less impact.

- Probabilistic Analysis specifies a probability distribution for each risk and then considers the effect of risks in combination. This is perhaps the most common method of performing a quantitative risk analysis and is the one most people consider, incorrectly, to be synonymous with the whole Project Risk Analysis and Management process.

The most common form of probabilistic analysis uses 'sampling techniques', usually referred to as 'Monte Carlo Simulation'. This method relies on the random calculation of values that fall within a specified probability distribution often described by using three estimates: minimum or optimistic, mean or most likely and maximum or pessimistic.

Another technique is the Controlled Interval and Memory Method for combining probability distributions which provides an alternative to the Monte Carlo Simulation. This technique can offer greater precision for much less computerised effort if either complex CPM networks or 'feedback loops' are not involved.

- Influence Diagrams are a relatively new technique for risk analysis. They provide a powerful means of constructing models of the issues in a project, which are subject to risk. As a result influence diagrams are now used as the user interface to a computer based risk modelling tool thus allowing the development of very complex risk models that can be used to analyse the cost, time and economic parameters of projects.
- Decision Trees are another graphical method of structuring models. They bring together the information needed to make project decisions and show the present possible courses of action and all future possible outcomes. Each outcome must be given a probability value indicating its likelihood of occurrence. This form of risk analysis is often used in the cost risk analysis of projects.

Risk management uses the information collected during the risk analysis phase to make

decisions on how to improve the probability of the project achieving its cost, time and performance objectives.

This is done by reducing the risk where advantageous to do so and monitoring and managing the risk which remains.

The project manager/Country Representative uses the information at his disposal to choose between the feasible responses to each risk identified during the qualitative phase. This may involve amending the project plans to reduce the risk e.g. moving high risk activities off the critical path, developing contingency plans to allow rapid response if certain risks occur or setting up monitoring procedures for critical areas in order to get early warning of risks occurring.

There are two types of response to a risk which can be defined as follows:

- *immediate response*: an alteration to the project plan such that the identified risk is mitigated or eliminated
- *contingency response*: a provision in the project plan for a course of action that will only be implemented should the adverse consequences of the identified risk materialise.

Responses to risks can do one or a combination of five things:

- *remove* - risks that can be eliminated from the project and therefore no longer propose a threat
- *reduce* - risks that can be decreased by taking certain actions immediately
- *avoid* - risks that can be mitigated by taking contingency actions should they occur
- *transfer* - risks can be passed on to other parties, unfortunately this does not normally eliminate the risk it just makes someone else worry about it
- *acceptance* - the benefits that can be gained from taking the risk should be balanced against the penalties.

The risk management phase begins immediately when the qualitative analysis is complete and is then a continuing process through the complete life cycle of the project. The information gained during the quantitative analysis allows the project manager/Country Representative to trade off taking actions now against the likelihood and impact of risk occurring. The project manager/Country Representative may choose to immediately amend his overall time and cost plan in order to increase the probability of achieving his time and cost objectives.

7. HOPE'87 RISK ASSESSMENT GRID

In order to keep the HOPE'87 Risk Assessment and Management for both, projects as well as the organisation itself, unbureaucratic, easy to manage as well as time and cost effective, the following "grid" is proposed by HQ. It may be amended by the CO according to the needs as well as in light of the above guidelines.

HOPE'87 RISK ASSESSMENT

Use the guidelines below to complete the risk assessment for each identified risk event. Each risk event can have multiple Mitigation Strategies and Contingency Plans. Probability of Occurrence and Estimated Project Impact can be used to "prioritize" risk events for continuous monitoring throughout the project.

Probability Guidelines		**Impact Guidelines for Scope, Cost, Schedule, or Quality**	**Mitigation Strategy**	
Very Likely	70-100%	**High** (Catastrophic)	**Deflection**	Transfer the risk to another party.
Probable	40-70%	**Medium** (Critical)	**Control**	Minimize the effect.
Unlikely	0-40%	**Low** (Marginal)	**Retention**	Accept the consequences.
			Avoidance	Reject the risk; do nothing.

Key risks for project (please, fill-in the name):
Country:
Area:
Donor:
Planned duration of project:
Officer-in-charge:
Additional documentation available for this risk assessment (please name: studies, field assessments, statements by international/UN Agencies/Government, etc.):

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Risk Event	Description/Issue	Probability of Occurrence	Estimated Project Impact	Mitigation Strategy	Contingency Plan
High-level description or risk event name (e.g. “Budget”)	Detailed description characterizing risk event	See guidelines above	See guidelines above	See guidelines above	Description of planned or possible actions to address the risk event.

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