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Environmental Review of United Nations Peacekeeping Operations for Sustainability, Kivu, DR Congo

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Abstract

The environmental aspects of United Nations (UN) peacekeeping is not as popularly known to the general public as its socio-economic issues. This thesis work looks at UN peacekeeping from the environmental perspective by carrying out an environmental review of peacekeeping in the North Kivu province of the Democratic Republic of the Congo using ISO 14001 as model.

Chapter one describes sustainable development as a shared responsibility and the need to ensure balance in the social, economic and environmental issues in the pursuit of peace in host nations during peacekeeping.
Chapter two summarizes the key issues in ISO 14001 and the requirements for conducting an environmental review. In chapter three, the research methodology is highlighted and chapter four gives an overview of UN peace and security actions and the interaction among other peace instruments and peacekeeping. That chapter also highlights peacekeeping in Africa and in the DRC with emphasis on the North Kivu province.

The results obtained from the environmental review are presented in chapter five and the analysis of the result based on the 'three party model tool for ethical risk analysis' presented in chapter six.
The research findings revealed that, the United Nations peacekeeping operations have environmental aspects which the author identified to include emissions to air, waste, energy consumption, chemicals usage, discharge to water, training, water consumption, exploration of resources, location/land use and fire and other uncontrolled activities. The environmental impacts and ethical risk analysis of the identified aspects were also assessed.

Conclusions and recommendations are given in Chapter seven which include the need for the United Nations to implement an effective environmental management system to handle its significant environmental aspects.

Keywords: Environmental Management System, Environmental Review, UN Peacekeeping, North Kivu, DR Congo, ISO 14001, Sustainable Development

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List of Abbreviations

CFR	Council on Foreign Relations
DFS	Department of Field Support
DPKO	Department of Peacekeeping Operations
DRC	Democratic Republic of the Congo
E/A	Environmental Assessment
E/R	Environmental Review
EMAS	Eco-Management and Audit Scheme
EMS	Environmental Management system
FARDC	Armed Forces of the Democratic Republic of the Congo
HCFCs	Hydrochlorofluorocarbons
ISO	International Standardization Organization
JPT	Joint Protection Team
MOBs	Mobile Operating Bases
MONUC	United Nations Organization Mission in the Democratic Republic of the Congo
MONUSCO	United Nations Organization Stabilization Mission in the Democratic Republic of the Congo
n.d.	no date
PCSI	Peripheral chemosensory Irritants
RCAs	Riot Control Agents
SD	Sustainable Development
TOBs	Temporary Operating Bases
UN	United Nations
WWF	World Wildlife Fund

CHAPTER ONE

INTRODUCTION

1.1 Sustainability, a shared responsibility

Sustainable development (SD) has become a global vocabulary used on daily basis by individuals, governments and organizations. In as much as it means different things to different categories of people, the common grounds is that the concept of SD is a global cry for a change which has emanated from some hidden fear of the future due to activities of the current generation. SD is not a new idea. Many cultures over the course of human history had realized the importance to maintain a balance between the environment, society and economy. What are new are the articulation and integration of these ideas in the context of global industrial and information society (SD Gateway, n.d).

There are over a hundred definitions of SD but the most popular is the definition according to the Brundtland (Our Common future) report. In the 1980's, increasing concern about the effects of economic development on health, natural resource and the environment led the United Nations to release the Brundtland Report which defines sustainable development as 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'

The objective of sustainable development is to enhance the quality of life for all the inhabitants of the planet without accelerating the use of natural resource beyond the environment's capacity to replenish them indefinitely. SD seeks to respect the limited capacity of an ecosystem which constitutes the life-support-system to absorb the impact of human economic activities. This requires maintaining a vital balance in the society, the economy and the environment without any major 'trade-offs' for both the present and future generation (Sustainable Environment, n.d.).

The figure below (Fig.1.1) shows sustainable development as the core of the balance between society, the economy and the environment.

Fig.1.1 Sustainable development; ensuring the balance

In the pursuit of a sustainable world, the guiding rules can be derived from the words of the West Australian Premier, Dr Geoff Gallop when he summed up the situation as: 'For many years we pursued economic, environmental and societal goals in isolation from each other. We have come to recognize that our long-term well-being depends as much on the promotion of a strong, vibrant society and the ongoing repair of our environment as it does on the pursuit of economic development. Indeed, it is becoming obvious that these issues cannot be separated. The challenge is to find new approaches to development that contribute to our environment and society now without degrading them over the longer term'. (Dr. Geoff Gallop, 2003 in The Natural Edge Project)
The innovation and adaptation to new approaches to development that contribute to our environment is a shared responsibility which requires a massive public education effort where by individuals, corporations and consumers alike, schools, governments and civil society organizations recognize that their choices and in-actions no matter how minute can have significant consequences.

In this regard, in the pursuit of lasting peace in conflict afflicted countries, the UN peacekeeping mission which has become one of the most vital and biggest activity especially on the African continent must therefore be conducted in the most sustainable way so as not to worsen the state of the natural environment which as a result of the conflict is already deteriorating in such countries.

This requires taking actions, changing policies and practice at all levels from the peacekeeper as an individual to the tactical and strategic levels.

1.2 Research Question & Background

The primary research question is does UN peacekeeping missions have environmental interactions?
Based on the primary question, the secondary question below was developed:
What are the environmental aspects and impacts of UN peacekeeping activities?

Research Background

The ecological impacts of peacekeeping operations are not as popularly known to the general public as compared to its social and economic aspects.
The purpose of this thesis work is therefore to find answers to the above stated questions using environmental review as a tool based on the ISO 14001:2004 model.

Defined scope of work

1. To identify some major activities involved in UN peacekeeping field operations and their respective significant environmental aspects and their associated impact on the natural environment with the focus on the north of the Kivu province in DR Congo.
2. To qualitatively assess the identified environmental impacts.
3. The environmental review only focuses on site-based activities in the operations.

CHAPTER TWO

THEORITICAL FRAMEWORK

2.1 The natural environment as a resource bank

The environment is anything that surrounds us and can be defined as 'surroundings in which an organization operates, including air, water, land, natural resources flora, fauna, humans and their interactions' (ISO14001:2004).

Its physical, biological and chemical elements are critical factors to life on the planet. The environment can be grouped into three main components-water, land and air. These components provide the needed requirements for the development and growth of communities of organisms (plants and animals) humans inclusive.

The natural environment is the ultimate resource for human activities and well-being as well as serve as a 'sink' for the unwanted by-products and wastes from society.

As an intricate part of modern society, businesses and other organizations utilize the earth's resources to produce a wide range of goods and services for their customers and in the process release enormous amount of waste into the environment. This use of the environment causes elements of the society to interact with the environment (referred to as environmental aspects) which directly or indirectly leads to changes in the natural environment – known as 'environmental impacts.' Environmental impacts may differ both in severity and in the type of impact. They can be gradual and from multiple sources or immediate, from a single activity. These impacts can also be positive or adverse in perspective.

The focus of environmental management practices is therefore to ensure reduced wastage of renewable and non- renewable resources, opt for renewable alternatives to non-renewable energy and materials and to also foster replacement of renewable resources (Hyde and Reeve, 2004, p.11-13).

2.2 Environmental management systems

Environmental management is a systematic process by which an organization identifies its vital environmental interactions and implements measures to minimize the associated negative impacts. This identification, assessment and management of such environmental interactions (aspects) have an overall aim of improving the environmental performance of the organization.

An EMS can be implemented in many diverse ways depending on the industry sector or activity and the needs perceived by the top management. However, there are some common core elements such as environmental policy, organizational structure, documentation of system to ensure collection, analysis, monitoring and information retrieval, corrective and preventive action, EMS audits, management review, training and external communications (EMAS, 2010b).

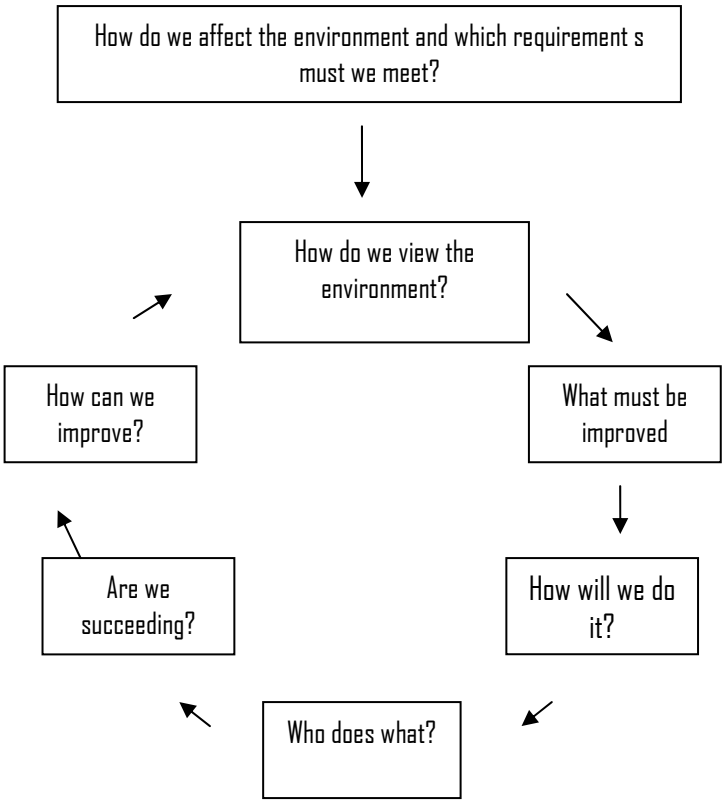


Fig 2.1: Basic principle of an EMS (Brorson and Larsson, 2006, p. 15)

An EMS includes activities such as:

- an introductory and initial systematic assessment of all of the organization's operations and activities which affect the environment to identify environmental aspects.
- the development of a set of system components for managing and controlling significant environmental aspects such as training, environmental objectives, measurements and audits.
- connectivity among the elements of the EMS and a correcting mechanism to assist the organization to make changes when it deviates from its set goals and procedures. (Brorson and Larsson, 2006, p.16)

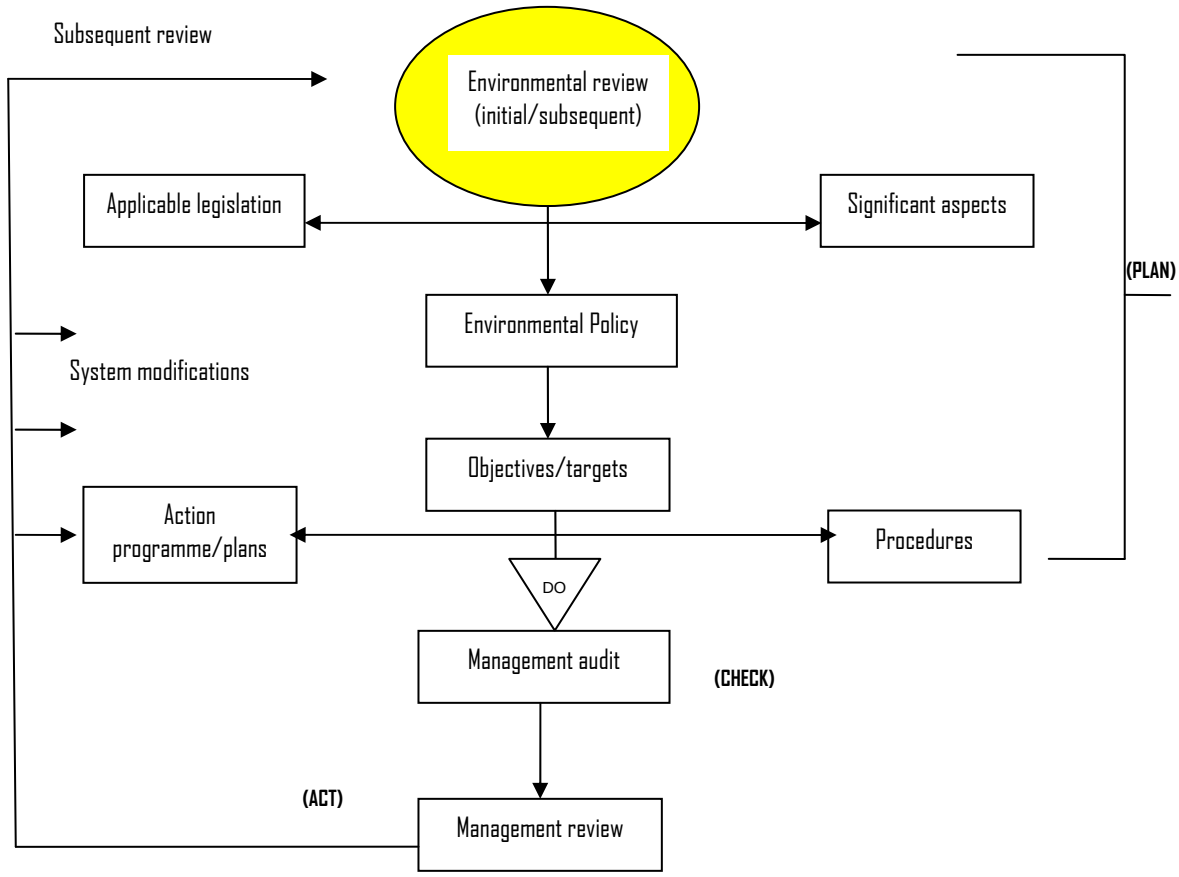


Fig.2.2: Key elements of an EMS (Hyde and Reeve, 2004, p.89)

It is possible to operate an EMS without certification to a standard such as ISO 14001 and reap most of the benefits there of. One of the main drivers that propel organizations to develop and implement an EMS is to reduce the organization's business risks associated with environmental issues through a step by step logical management of its significant environmental aspects.

There are many national and international EMS models; however the most predominant and widely accepted models include the ISO 14000, the international environmental management system standard and the European Union Eco-Management and Audit scheme (EMAS).

2.3 The European Union Eco-Management and Audit Scheme (EMAS)

The European Union Eco-Management and Audit Scheme (EMAS) regulation is a voluntary management tool for companies and other organizations to assess, report and improve their environmental performance. The scheme which was formerly restricted to companies since 1995 is now opened for the participation of all economic sectors with public and private services inclusive. The core elements of EMAS are environmental performance, credibility and transparency. The scheme requires the conduct of annual updates of environmental policy, targets and actions to implement and evaluate them to ensure that registered organizations continually improve their environmental performance and provide evidence of compliance with all environmental legislation applicable to them.

Verification by third-party independent auditors gives credibility to registered organizations by guaranteeing the value of the actions taken and the disclosed environmental information. As part of the EMAS registration, organizations are required to publicize their environmental statement. This serves as a communication tool for the organization to relay information of its environmental impact and performance to stakeholders and the general public. (EMAS, 2010a)

The overall aim of EMAS is to give companies which have integrated active environmental considerations into their processes a means of recognition which is common to all Europe. EMAS sets out requirements for a complete environmental management system and it begins with the requirement of environmental legislation and demands continuous improvements in environmental performance. There are some similarities between EMAS and ISO 14001 but EMAS, in some areas, sets out stricter requirements than ISO 14001, an example is the publicized environmental statement associated with EMAS. (Brorson and Larsson, 2006, p.17-20)

2.4 ISO 14000 Series

ISO 14000 is a collection of standards that present a uniform model for an effective EMS. This family of standards addresses environmental related issues in a proactive approach. The two central standards in this family are the ISO 14001 and ISO 14004. ISO 14004:2004 gives guidelines on the elements of an EMS and its implementation and discusses key issues involved. It is recommended to be read before implementing ISO 14001; ISO 14001:2004 gives the requirements for an EMS. In this section, emphasis will be laid on ISO 14001:2004 which constitute the model upon which this research work is based.

The other standards and guidelines in the ISO 14000 family address specific environmental aspects including: life cycle analysis (LCA), labeling, performance evaluation, auditing and communication. (Cascio, Woodside and Mitchell, 1996, p. 3-4; Brorson and Larsson, 2006, p.16)

2.4.1 ISO 14001

The ISO 14001 standard was first issued in 1996 and a revised version was published in 2004. It specifies all the actual requirements for the development and implementation of an EMS. This standard contains various elements which interact to help in the handling of an organization's environmental work in an efficient manner. It applies to environmental aspects which an organization can exert some level of control and over which it can be expected to influence. ISO 14001 is currently the only standard among the ISO 14000 series which is possible to be certified against by an external certification authority. However, organizations that design their EMS in conformance to the standard are not obliged to obtain certification.

The ISO 14000 standard is applicable to any organization type which wishes to:

- implement, maintain and improve an EMS.
- assure itself of its conformance with its own environmental policy.
- demonstrate conformance.
- make a self-determination of environmental conformance
- seek certification of its environmental management system by an external third party authority.

Benefits of ISO 14001:2004-based EMS

An EMS which systematically follows and implements the requirements of the ISO 14000:2004 is a management tool which enables an organization to identify and control the environmental impacts of its products, services and activities and to implement a sequential approach to setting environmental objectives and targets which contribute to a continually improved environmental performance with numerous benefits such as:

- savings in consumption of energy and materials.
- lower distribution costs.
- reduced cost of waste management.
- improved corporate image among stakeholders such as customers, regulators and the public.
- provides a framework of continual improvement of environmental performance.
- provides management with the assurance that it is in control of the organization's activities and processes which have environmental impacts.
- assure employees that they work an organization that cares for the environment.
- support claims and communications about the environmental policies, plans and actions of an organization. (ISO, 2009; Cascio, Woodside and Mitchell, 1996, p. 65-74)

Structure of ISO 14001 model

The ISO 14001:2004 provides a comprehensive framework for a holistic, strategic approach to the environmental policy, plans and actions of the organization.

The structure of the standard is based on five main components listed below:

1. Environmental policy
2. Planning
3. Implementation and operation
4. Checking
5. Management review.

Under each of the five components, there are series of system elements and provisions which must be met in order to comply with the standard. Notably, ISO 14001 does not spell out specific requirements for environmental performance. The underlying philosophy is that, the requirements of an effective EMS are the same irrespective of an organization's activity. Instead, it requires the

organization to make commitments in the policy statement to comply with applicable legislation, continual improvement and pollution prevention. (SIS, 2004, p. 5)

The standard is based on the Plan-Do-Check-Act (PDCA) methodology which will be elaborated upon in the next section.

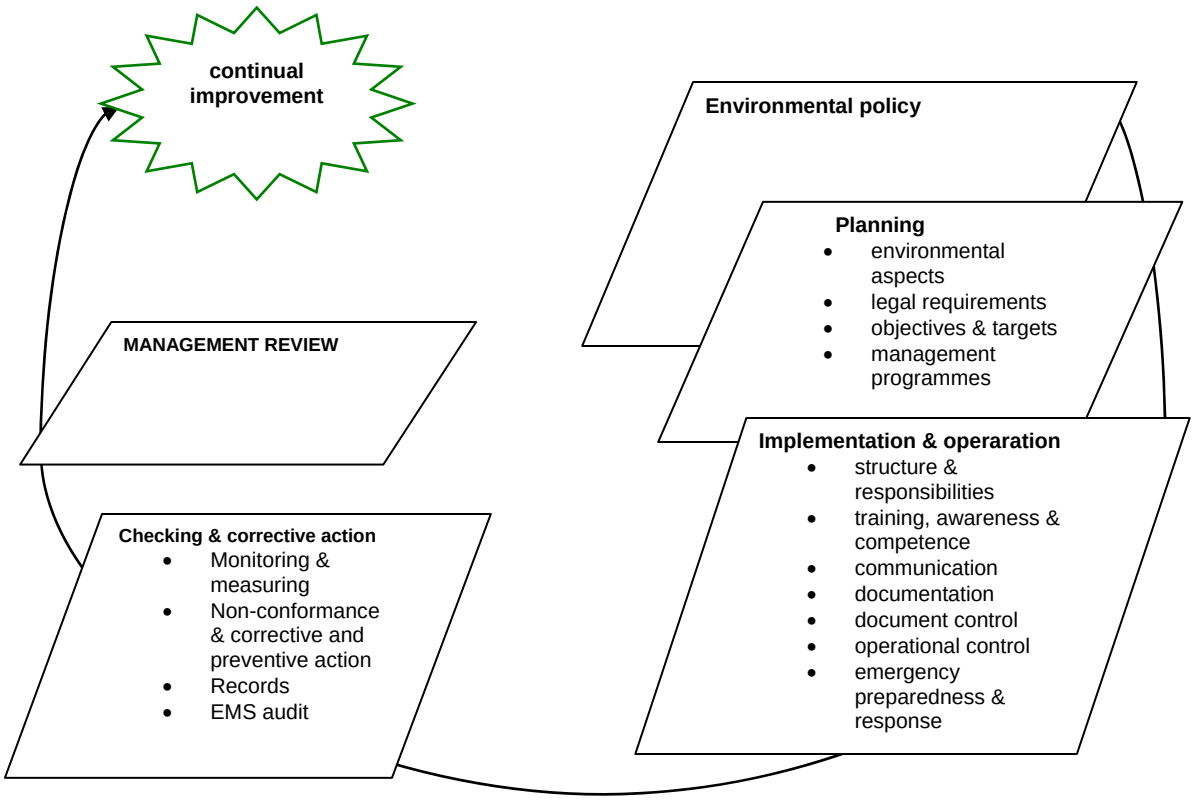


Fig.2.3 Overall structure of ISO 14001 Model

The Plan-Do-Check-Act Cycle (PDCA Cycle)

The 'PDCA cycle' as mentioned earlier is the operating principle of the ISO 14001 standard. The cycle offers a systematic approach in working with ISO 14001 EMS right from the development through to the implementation stage.

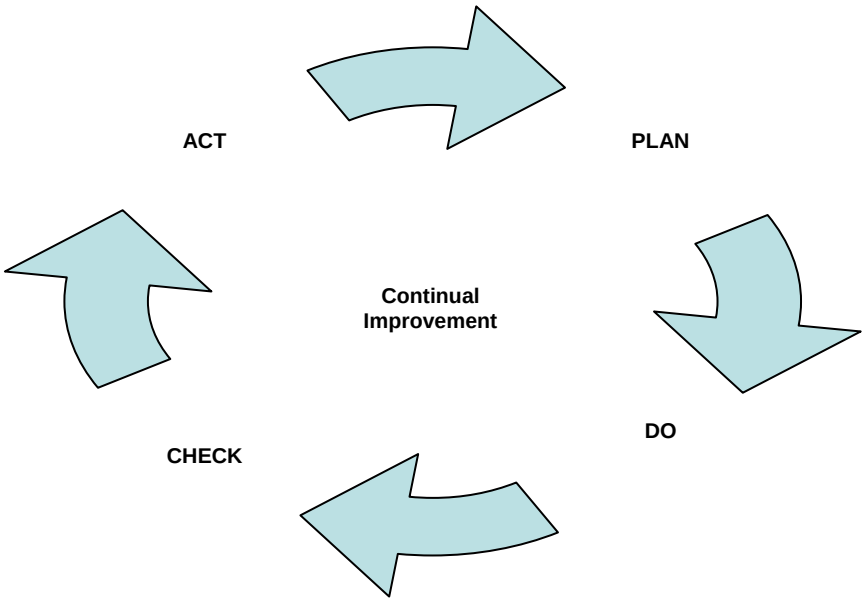


Fig. 2.4: PDCA cycle, the basis of ISO 14001:2004 model

Table 2.1: The four stages of the of the PDCA methodology

Cycle stage	Activities/steps	Useful environmental management tool
PLAN	• identify priority issues (significant aspects) • establish policy to address issues • identify performance standards • set objectives and targets • prepare action plans and procedures	environmental review (initial/subsequent)
DO	• implement action	Implement the plan and measure its performance
CHECK	• measure & monitor results • assess performance against objectives • determine non-conformance	environmental management audit
ACT	• take corrective action for non-conformance • identify changing situations • modify system elements if necessary	management review

2.5 Overview of Environmental Review

In the planning stage of the ISO 14001 standard, it is required to identify the significant aspects of an organization's activities and to access the associated environmental impact and effect. This is done by employing environmental review as a tool. An environmental review is conducted for any of the following reasons:

- the first time an organization start to implement ISO 14001.
- environmental aspects which were previously not considered are brought to book.
- the manager responsible for environmental issues gains better understanding of the structure of the EMS.
- weaknesses are encountered and identified.
- that the review gives good information for assessing the major environmental aspects
- potential savings are identified.

What an environmental review should cover

According to the ISO 14001:2004 model, environmental review of aspects by an organization must cover and assess the following:

- Site location of operations
- Soil and ground water pollution
- Consumption of water, energy, raw materials, fuel and other natural resources
- Dust, smell, noise, vibrations and visual problems
- emissions to air and discharges to water
- use of chemical substances
- Waste
- Fire, spillage and other uncontrolled situations
- Packaging
- products
- Transport

Steps in conducting environmental review

Environmental review should be carried out by a person or people who are familiar with the organization's activities, have the necessary competence and knowledge to assess the environmental impacts against the relevant EMS. Internal staff or external specialists can be made to conduct the review.

The three main activities involved in performing an environmental review are:

1. Preparations for the review
2. conducting the review
3. reporting of observations made

Preparations for the environmental review

The initial preparations require the spread of information to all the relevant people who will be affected by the environmental review and the support of top management must be sought and maintained throughout the project. It is also important to address the main problems first and to clearly outline the limits and scope of the review. This includes defining the geographical limits, operations which will be affected or excluded in the review, etc. In addition, the starting date and the expected duration of the review, document types to be reviewed, which people to be interviewed, when parts of the sites will be visited, and allocation of responsibilities must all be taken into account.

Performing/ conducting the review

Conducting the review involves review of documents which provides insight into the organization's activities and how it handles environmental issues. These documents include annual reports, environmental reports, the organization's presentations (processes and activities), environmental programme, monitoring procedures and programmes, etc. External sources such as authorities, suppliers, major customers can be contacted for more information.

Site inspection is a vital part of performing the review. Production facilities, chemicals and fuel storage house, waste-handling areas, outdoor areas, warehouses and other relevant places must be inspected.

Interviewing is a useful tool in this stage. It is crucial to ask the relevant questions which will help in getting the needed information.

Lastly, but not the least, establishing the flow of materials and energy and identifying core activities and situations and their associated environmental aspects and impacts forms a bigger part in this stage.

Reporting the observations

The report should document both the strong and weak sides of the organization's current environmental situation. It is essential that all misunderstanding concerning the report is settled before it is used for further work so as to ensure that errors are minimized. The report should be viewed as a constructive and positive part of the environmental work and not the contrary. (Brorson and Larsson, 2006, p. 30-33)

2.6 Environmental aspects and impacts

It is required that the identification of environmental aspects and their impacts as well as the assessment of significance should be reviewed at least once a year.

The ISO 14001 spells out the requirements with regards to the environmental aspects of an organization.

The organization shall establish, implement and maintain a procedure (s)

a. to identify the environmental aspects of its activities, products and services within the defined scope of the environmental management system that it can control and those that it can influence taking into account planned or new developments, or new or modified activities, products and services, and
b. to determine those aspects that have or can have significant impact(s) on the environment.

   The organization shall ensure that the significant environmental aspects are taken into account in establishing, implementing and maintaining its environmental management system.

According to ISO 14001:2004, environmental aspects are elements of an organization's activities or products or services that can interact with the environment and an environmental impact is defined as any change to the environment, whether beneficial or adverse, wholly or partially resulting from the environmental aspects of an organization. Environmental aspect and impact are linked in a cause-effect relationship. Environmental aspects can be grouped into direct and indirect aspects. It is worth noting that an environmental aspect can also be positive for the environment.

Direct environmental aspects

An environmental aspect is said to be direct if it's directly related to the organization's activities. These normally comprise of the inputs and outputs of the activities for which the organization is responsible for and over which it has direct control and influence. A large number of direct aspects are mostly identified through a systematic examination and assessment of site-based activities and operations.

Indirect environmental aspects

These are aspects which result from the activities of others which the organization has a business relationship with. The organization has some level of influence on its indirect aspects through the choice of suppliers and contractors, employees commuting choice, product design and distribution options. Unlike direct aspects, the identification of indirect aspects necessitates a broader perspective of activities, products, processes and services beyond the site-based focus.

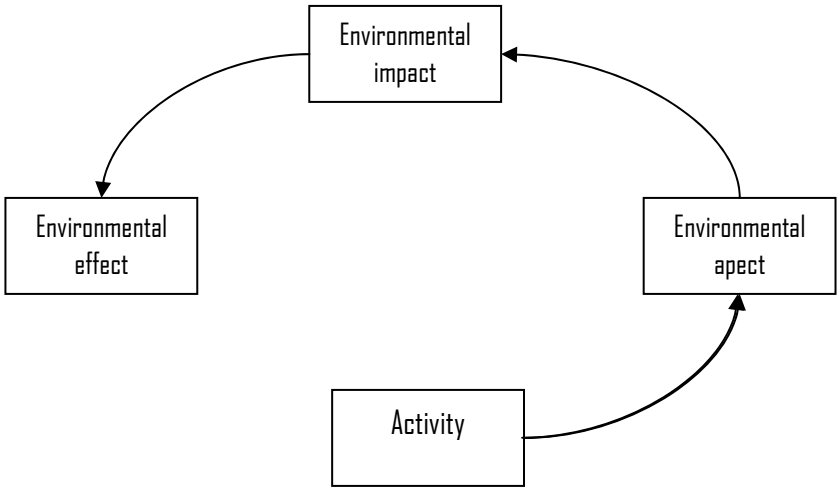


Fig.2.5: Relationship between activity, environmental aspect, impact and effect

2.7 Prioritization of environmental aspects

When environmental aspects (direct or indirect) have been identified, it is useful to assess their significance so as to help to determine which issues are most important to manage and there by procedures can be formulated to address them. The prioritization also helps the organization to effectively manage resources and efforts by concentrating on handling only important aspects.

A significant environmental aspect is therefore defined as an environmental aspect which has or can cause a significant environmental impact.

There is no standard criterion in determining the significance of an environmental aspect and an organization may set its own criteria. However, generally an aspect is deemed significant if it:

- is capable to cause a demonstrable impact on the environment.
- is controlled by regulatory legislation.
- is of importance to stakeholders.
- has a major financial implication in terms of cost or savings.

Tools for assessing significance

There are also no standard methods for assessing the significance of environmental aspects and ISO 14001 provides no guidance in this regard. This offers flexibility to organizations in the choice of the mode of conduct and the style of presentation of the assessment. Notwithstanding, it is imperative that the process is recorded and the rationale for the decisions reached must be clearly defined, unambiguous, consistent and recorded. This will help others in the organization to appreciate why an aspect is weighed significant and also make it possible for the process to be reviewed to ensure its effectiveness and sustainability in performance.

Some tools which are frequently employed by experts in the prioritization process include the scoring systems, decision diagrams and risk assessment. These methods can be utilized in isolation or in a combination where applicable and the choice of technique may depend on the objective of the evaluation - operational or strategic.

Decision diagram (Simple 'pass/fail' filter) method

This technique is one of the simplest and yet very effective. A set of relevant questions are applied to each aspect and if an answer is 'yes' to any of the questions then the aspect is treated significant. Thus, only one 'yes' response is sufficient and acts as the significance threshold. The method is shown Figure 2.6. More question boxes can be added when necessary and the method can also be presented in tabular form.

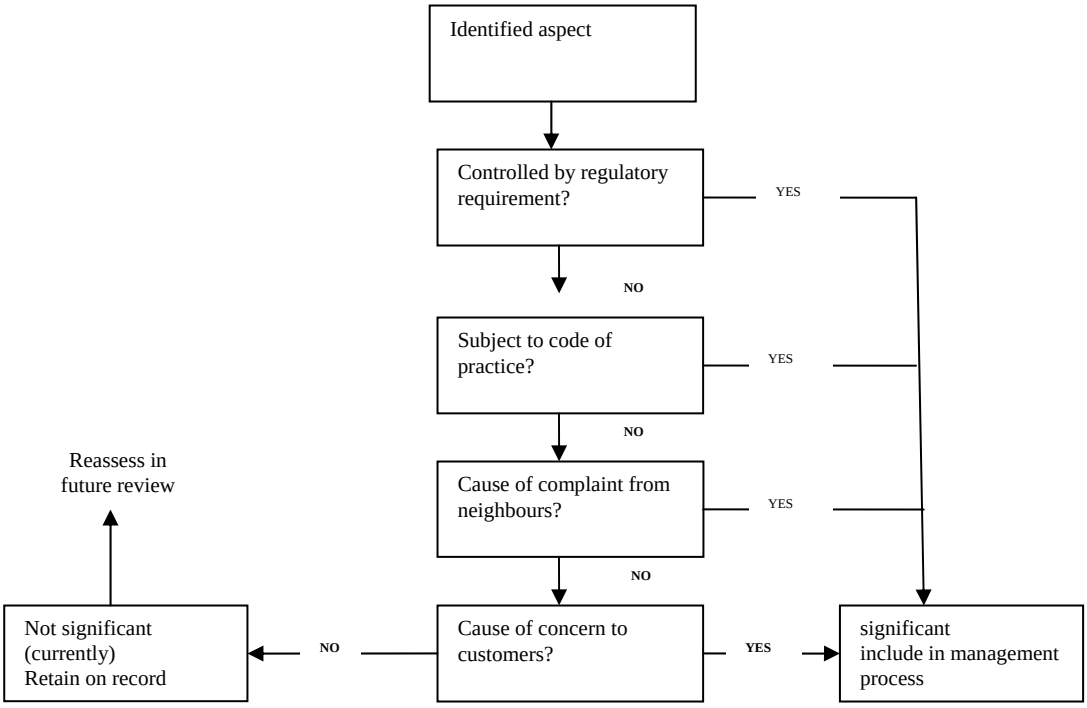


Fig 2.6: Simple 'pass/fail' decision flow chart

Scoring matrix method

This method involves comparing each aspect against various criteria with numeric scores assigned to the aspect depending on the best suitable description (eg low, medium, high) and if the total score exceeds a certain set limit, then the aspect is treated significant otherwise it's insignificant. Weighing factors are applied to ascertain that crucial criteria get higher scores. This is a more subjective approach and the scores are only indicative. The organization decides on the threshold limit and the weighting factor. A brief account of how a score was achieved must be recorded.

Table 2.2: Example of scoring matrix

Criteria	score				Weighting factor
	0	1	2	3	
Regulatory control	none	possible	impending	existing	3
Magnitude of aspect	negligible	low	medium	high	2
Stakeholder concern	negligible	some	moderate	major	2
Impact	none	unlikely	possible	known	3
					Total score: 8

Risk assessment method

The risk assessment approach is based on evaluating the probability of occurrence of an environmental aspect against its consequences. Aspects in the high and moderate risk regions are considered significant. The probability and consequence can be quantitatively evaluated by other statistical techniques or the scoring matrix method. The assessment can include the presence (or absence) of appropriate controls. One pitfall in this method is that, it does not make it clear if an aspect is regulated by legislation and thus should be significant. However, the technique is particularly helpful in evaluating if the risk of an incident is significant or not.

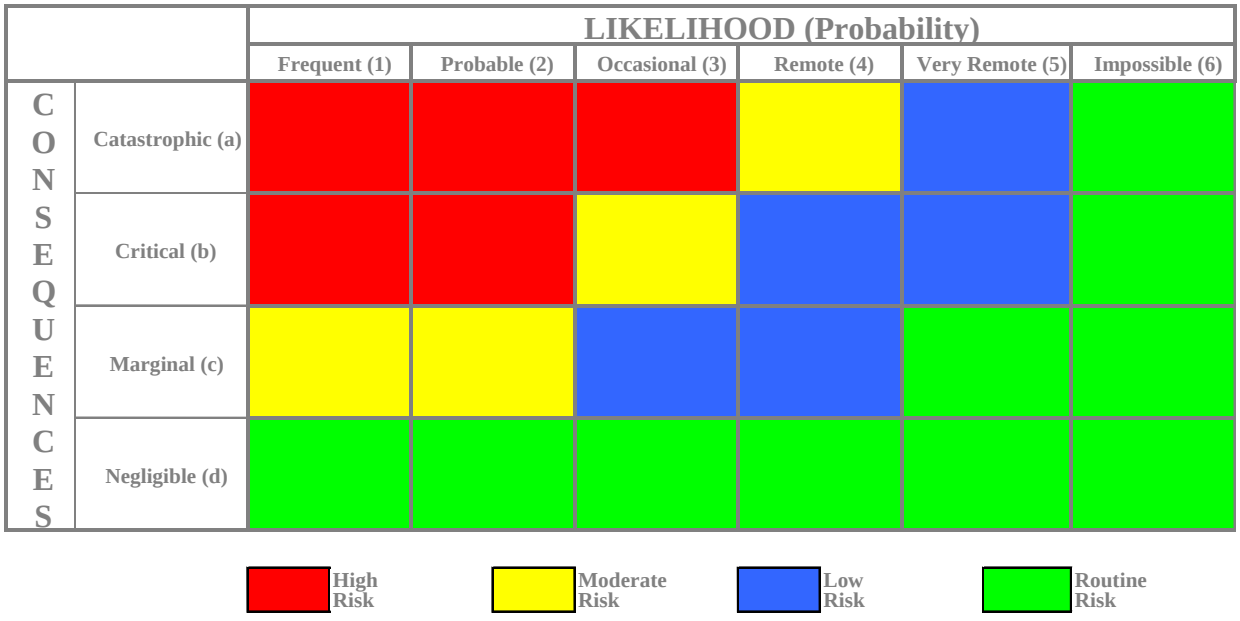


Fig. 2.7: Risk assessment matrix

2.8 A Three Party Model for Ethical Risk Analysis

The basis of modern risk analysis is a quantitative methodology from a decision-theoretical view point of assessing risk largely on risk-benefit analysis or as probability-weighted severity of the referred risks. Despite the usefulness of these methods, neither the probabilistic risk analysis (PRA) nor the risk-benefit analysis provides decision-makers with all the needed information to make risk management decisions as vital ethical concerns are not catered for in these forms of risk analysis. Thus in order to assess ethical issues in risk analysis, the 'three party model for ethical risk analysis' can be employed as an effective tool.

Benefits of the 'three party model for ethical risk analysis'

- It provides information to help appraise an action of risk-taking or risk imposition from a moral point of view which otherwise cannot be retrieved from quantitative risk analysis methods.
- It helps to identify the performers of an action and the intentions behind the action being taken.
- It serves as supplement to traditional quantitative analysis of risk by providing a systematic characterization of ethical aspects of the risks.

The model framework

In every risk management problem there exist people who are actually or potentially exposed to a risk, those who make decisions that influence the risk and a group of people who gain from the risk being taken. These three roles/parties, namely the risk-exposed, the decision-maker and the beneficiary respectively constitute the framework for the 'three-party model' of ethical risk analysis. In ethical risk analysis, it is crucial to note if more than one of these roles/parties are filled by the same persons and also if there exist some level of dependency among the parties. For instance, the risk –exposed are economically dependent on the decision maker. In respect to the above concerns, the list of questions (though inexhaustible) below can be useful.

- To what extent do the risk-exposed benefit from the risk exposure?
- Is the distribution of risks and benefits fair?
- Can the distribution of risks and benefits be made less unfair by redistribution or by compensation?
- To what extent is the risk exposure decided by those who run at the risk?

- Do the risk-exposed have access to all relevant information about the risk?
- Are there risk-exposed persons who cannot be informed or included in the decision process?
- Does the decision-maker benefit from other people's risk exposure? (Hermansson and Hansson, 2007, p.1-5)

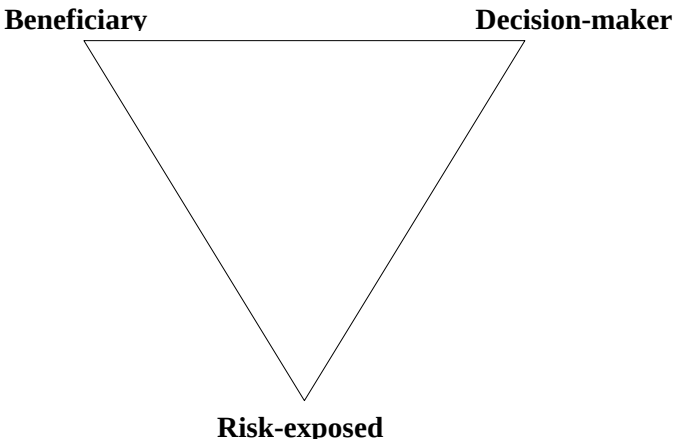


Fig. 2.8: Diagrammatic representation of the three-party model.

CHAPTER THREE

METHODOLOGY

3.1 Overview of approach/Procedure used to conduct the research

A systematic approach was followed to identify the environmental aspects and impacts as it provided a firm basis for an effective assessment and evaluation. The principal stages in the methodology used in this work are demonstrated in figure 3.1.

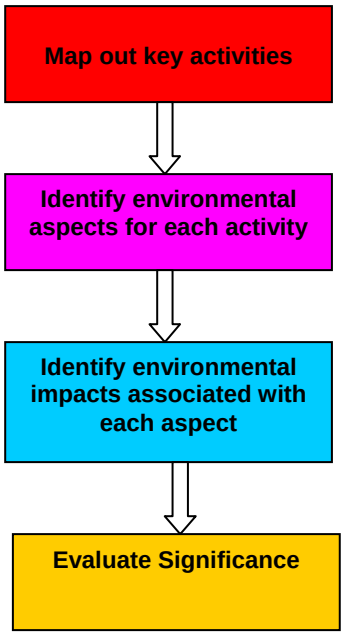


Fig. 3.1 main steps involved in the research approach

Map out key activities

A thorough review of the site-based activities of the UN peacekeeping operations in the North Kivu province (DR Congo) was conducted and the most frequent activities were selected for this study. The inputs and outputs of the selected activities were established to determine the material and energy flow of each activity.

Identify environmental aspects

Elements of an activity which can interact with the environment are known as environmental aspects. Based on the inputs and output of each activity, possible environmental aspects were noted. This approach was adopted because it is simple yet very efficient as it allows the use of land, water, energy and other resources to be captured in the aspects – and not only releases. The environmental aspects were identified in correspondence with the ISO 14001 requirements such as contamination of soil, emissions to the air, location, use of water, fuel, soil, energy and other natural resources, discharge to water, etc.

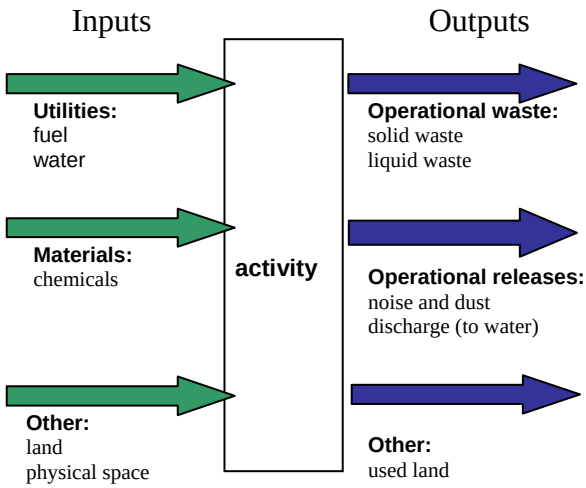


Fig 3.2 Identifying aspects from an activity

Identify Environmental impacts

Both beneficial and adverse environmental impacts associated with the aspects were identified. The impacts were identified based on the understanding of the overall environmental issues and concerns associated with the aspects.

Evaluate Significance

The decision diagram (Simple 'pass/fail' filter, refer to section 2.7.1) method was used to evaluate whether an identified environmental aspects is significant or not. Afterwards, the level of importance that must be dedicated in managing the significant aspects was assessed and prioritized as such using the prioritization matrix as a tool.

3.2 Data/ Information Sources and their reliability

The constraints in time and finances, coupled with the current security and safety situation in the Kivu province did not make an on-site inspection possible. However, much of the needed information was out-sourced from official UN documents, case studies, reports and other materials from BBC, CNN and other credible sources. Information which was unavailable at these sources was retrieved through questionnaires and interviews.

The personalities interviewed included three peacekeepers, two of which had been in DR Congo for the MONUC Mission, (MONUC), and the other went for the UN Mission La Cote D'voire (UNOCI). A DR Congolese lawyer from the Kivu province and two Swede researchers who had visited DR Congo in the last three months were was also interviewed. Interviews were conducted on the phone and in-person with a mixture of both open-ended and closed-ended questions. The questions were modified as deemed appropriate for each interviewee. Five questionnaires were sent out and all were received back fully answered. (See appendix for sample of questionnaires & interviews)

3.3 Verification and validation of results

Answers received from the questionnaires and interviews were compared and complied with an official MONUSCO document used as yardstick such that in instances where answers contradicted, the MONUSCO report was used to decide. The ISO 14001:2004 and ISO 14004:2004 were then used as guidelines in identifying the environmental aspects from the information gathered from the questionnaires and interviews. The prioritization matrix was also used to assess and evaluate the weight of the significant environmental aspects.

3.4 Analytical procedure to draw conclusions

The results of the research were then presented in a tabular form of activities and their respective environmental aspects and impacts. The results were analyzed and the environmental impacts were categorized into beneficial and adverse respectively based on whether the environmental change caused is positive or negative.

Based on the approximate length of time required to reverse the adverse environmental changes, the negative impacts were grouped into:

- instantaneous recovery (1-2yrs)
- long term recovery (5-10 yrs)
- permanent damage (10yrs –infinity)

The three-party model for ethical risk analysis was also used to assess the environmental risks.

3.5 Limits of application of result

The framework for the environmental review and the style of presentation of the results can generally be used in practice to conduct an environmental review for any type of organization. The attained results can be used for academic purposes. However, it is important to have a more detailed review of the results if decision-makers wish to implement measures to manage the aspects identified. This is because site inspection was not conducted and all the information used was from third-party sources. Within the above limitations the results can be said to be valid.

3.6 Challenges encountered in this work

The major challenge encountered in the research was access to information. All the needed information could not be retrieved from the publicly available official reports of the United Nations. Also there was difficulty in getting peacekeepers to talk about their activities on the field.

CHAPTER FOUR

UN PEACEKEEPING OPERATIONS

4.0 Background

Peacekeeping constitute one of the range of activities undertaken by the UN and other international actors to ensure international peace and security around the globe. UN peacekeeping missions are deployed on the mandate from the UN Security Council.

The UN peacekeeping operation was first established in 1948 when military observers were deployed and sent to monitor the Armistice Agreement between Israel and its Arab neighbours. From then, there have been about 63 peacekeeping operations by the organization around the globe.

The establishment of peacekeeping mission is to serve as a tool to assist countries emerging from conflict create the needed conditions for sustainable peace. (UN Peacekeeping, 2010)

4.1 UN Peace and Security Actions

Even though peacekeeping is the focus of this thesis work, it is vital to understand its relation and difference from peacemaking, conflict prevention, peace building and peace enforcement.

Conflict prevention

This relies on structural or diplomatic measures to keep inter-state and intra-state disputes and tensions from breaking into violent and catastrophic conflicts. It is built on early warning signals, information gathering and intelligent analysis of factors driving the conflicts. Activities in conflict prevention include preventive deployment and confidence building measures.

Peace enforcement

It comprises the application of coercive measures which include the use of military force as authorized by the UN Security Council. These actions are meant to restore international peace and security in instances where by the Security Council has established the existence of a threat to the peace or act of aggression. Peace enforcement may also involve the usage of force but only at the strategic or international level.

Peacemaking

Generally, peacemaking comprises of measures aimed to address conflicts already in progress by using diplomatic actions to bring hostile parties to a negotiated agreement. The UN Secretary-General may use his 'good offices' to facilitate conflict resolution activities upon the request of the security council or based on his own initiative. Other peacemakers may also include governments, groups of states, regional organizations or the United Nations.

Peacekeeping

It is a technique designed to preserve the peace where fighting has been halted and to assist to implement agreements already achieved by the peacemakers.

UN peacekeeping has adapted to meet the demands of various conflicts with the diversity in the nature of conflicts compelling it to expand its field operations from 'traditional' missions involving strict military task to complex 'multidimensional' ones such as human rights monitoring, disarmament, security sector reform, demobilization, etc.

Even though the military is the backbone of most of peacekeeping operations, administrators and economists, de-miners and electoral observers, human rights monitors and specialists in civil affairs, humanitarian workers, police officers and legal experts, and experts in public information and communication all plays important roles in peacekeeping operations.

Each peacekeeping operation has specific objectives but all share common aims to reduce human suffering and abuse and create the environment and build institutions for lasting peace. Depending on the mission's purpose, peacekeeping operations may be aimed to:

- stabilize conflict situations after a cease fire to create a conducive environment for peace agreements
- assist in implementing peace agreements
- prevent the outbreak of conflicts or the spill-over of cross border conflicts
- assist states through a transition to stable governments based on good governance, economic development and democratic principles. (UN Peacekeeping, 2008; UN Peacekeeping, 2010)

Robust peacekeeping involves the usage of force at the tactical level with the permission of the main parties to the conflict and the host authorities to defend the peacekeepers and their mandate,

especially in situations where the State is incapable to provide security and public order. (UN Peacekeeping, 2008)

Peace building

It involves the implementation of measures targeted to decrease the risk of lapsing or relapsing into conflict by strengthening the national capacities at all levels for conflict management and to set the foundation for sustainable development and peace. Peace building works by addressing the core issues and structural causes of violent conflict in a comprehensive manner, and then seeks to enhance the capacity of the State to legitimately and effectively carry out its functions.

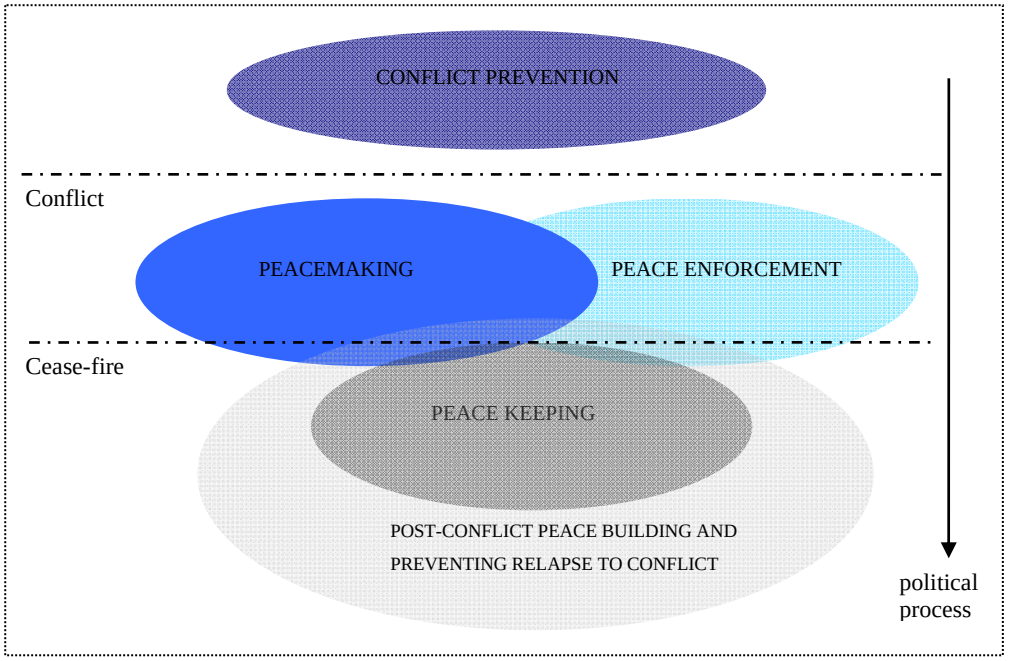


Fig. 4.1 Linkage of UN peace and security activities

The boundaries between the above five security activities increasingly gets blur. Although in principle UN peacekeeping missions are deployed to support the implementation of a cease-fire or peace agreement, they are usually required to play active roles in peacemaking efforts and early peace building activities. Conflict prevention, peacemaking, peacekeeping and peace enforcement seldom occur in a sequential path. Usually, they are seen as being mutually reinforcing to prevent recurring of conflicts. (UN Peacekeeping, 2008)

4.2 Overview of Peacekeeping Operations in Africa

Currently, Africa remains the centerpiece of UN peacekeeping with eight out of the seventeen UN peacekeeping missions. Nine of the continent's countries are listed among the top 20 troop contributing countries. (MONUSCO, 2009b)

As at 2005, peacekeepers in Africa constituted nearly 50,000 out of the 65,000 UN peacekeepers worldwide. A lot of factors have contributed to the need for peacekeeping operations in Africa, a key factor being the continent's history of colonialism and conflicts. The end of the Cold War which coincided with the breakdown of state institutions in countries such as Somalia, Liberia, DR Congo and Sierra Leone coupled with disputes over natural resources; diamonds in Sierra Leone, cobalt and gold in the DRC resulted in armed conflicts that grew into disastrous warfare involving warlords, mercenaries, child soldiers and militias. A massive supply of weapons and small arms from Eastern Europe in the 1990s escalated the conflicts. Also the unrest and armed violence in most African countries without central government led to instability which usually spilled over national borders. In response, the international community mostly through the United Nations deploys peacekeeping troops to these areas of conflict. (CFR, 2005)

4.3 The natural wealth of the DRC

The DRC is extremely wealthy and extremely big country with its size comparatively similar to Western Europe. The country is of strategic importance because it's at the core of the equatorial region of Sub-Saharan Africa and it covers about 2.5 million sq km of Africa. It also has about 50% of the continent's forest and is home to one of the world's mightiest river systems, the Congo River. The country has about 80 million hectares of land suitable for agricultural purposes. The forest and five national parks are listed by UNESCO as world heritage which is home for many rare wildlife including mountain gorillas, white rhino and savannah giraffe. It is said that the DRC's rivers could generate sufficient hydroelectric power for the entire Africa continent.

The largest part of the country has enormous deposits of diamonds, copper, gold, cobalt and coltan. DRC is said to possess about 80% of world reserves of coltan which is used in mobile phones and electrical gadgets. The diamond industry is estimated to be about $870m. The DRC ranks among the largest producers of industrial diamonds in the world. The Central African copper belt which runs

through the DRC contains one tenth and one third of the world's copper and cobalt reserves respectively. (MONUSCO, 2009b; CNN, 2010; CFR, 2005)

4.4 The DRC War

The DRC's population is estimated to be about 56 million and it is at least divided into 210 languages but with mainly French, Kiswahili, Kikongo, Tshiluba and Lingala. (CFR, 2005)
More than five million people have died since the turmoil in 1998 and the conflict is considered as the deadliest conflict since World War II and has been referred to as Africa's 'First World War' due to its catastrophic nature and the involvement of six other African countries. The rich natural resources of the country attracted vicious warlords, corrupt government and contemptuous corporations and adventurers and split the population on ethnic basis.

After gaining independence from the Belgians in the 1960s, the country was disintegrated and regions fought one another for control over resources. During the post-independence unrest, Colonel Joseph Mobutu seized power in 1965 and set out in unifying the nation. Mobutu was soon enticed by wealth and once he gained some level of prosperity and stability, ensured he remained ruling and clung to power for 32 years. However, as his rule went on, the country gradually slipped out of his control and the 1994 genocide in neighbouring Rwanda facilitated his downfall and plunged DRC into the deadliest war in the African history. Mobutu was then overthrown in 1997 with the aid of the Rwanda's Tutsi government and Laurent Kabila was installed as president of DRC.

During this period, more than two million Hutus after Rwandan's genocidal Hutu regime was overthrown had flown to DRC for refuge. Among them were many of the militia men responsible for the genocide as they were afraid of the counter attack against them by the new Tutsi government. Kabila failed to expel these Hutu militias from Rwanda. They then quickly joined forces with Mobutu's government and began to attack DRC's population of Tutsis who had lived in the country for decades. Kabila sought recourse from Angola, Zimbabwe and Namibia against rebels backed by Uganda and Rwanda and for about five years all six nations fought a proxy war in the DRC.

The UN blamed all sides of prolonging the conflict and using the cover of the war to loot the country's natural resources. Though the war as formally declared over in 2003, the eastern part of the country remains unstable. (BBC, 2009)

4.5 UN Peacekeeping missions in DRC (MONUC)

MONUC was established on 30th November, 1999. At a point in time, the UN peacekeeping operation in DRC was the biggest in the world with more than 20,000 personnel on the ground. The United Nations Organization Mission in the Democratic Republic of the Congo (MONUC) has been existence since 1999. The purpose of the mission was to protect civilians and also aid in the reconstruction of the country.

Some basic facts about the peacekeeping operation in DRC as of 30 April, 2010:

Total of 20,817 uniformed personnel

Fatalities: 157

Approved budget: $ 1,350.00 million

712 military observers, 18,884 troops, 1223 police, 991 international civilian (MONUC, 2010).

The North Kivu province MONUC statistics

The North Kivu province has a population of about 4.5 million people with the capital called Goma. The surface area of the province is about 59,483 km^2 and its hilly and forested with little or no roads and infrastructure. There are about 6,785 MONUC Blue Helmets with 36 MOBs of which ten are TOBs deployed in the province. MOBs are MONUC military deployed in the field, consisting of up to 160 military personnel with the ability to move as circumstances demands. TOBs are MOBs composed of up to 40 military personnel, deployed for a short time in an area for a maximum of two to three weeks. (MONUSCO, 2009c)

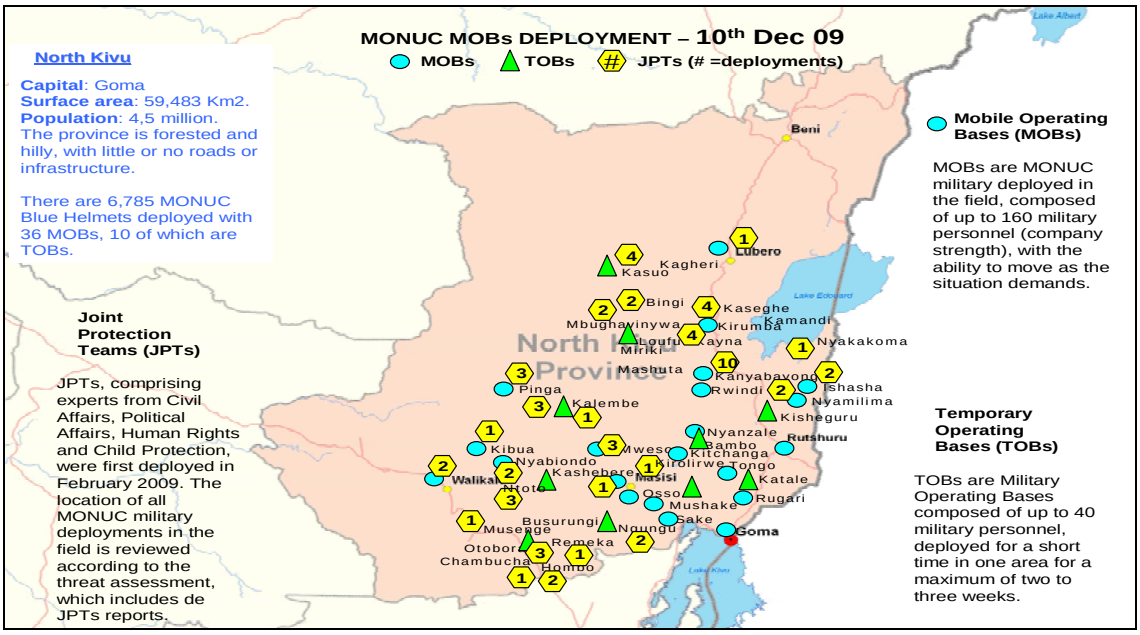


Fig. 4.2 North Kivu province MONUC deployment (MONUSCO, 2009c)

Fig. 4.3 Military UN peacekeepers at work in North Kivu:A military UN peacekeeper and the Joint Protection Team leader walk with local children during a daily foot patrol in a village in North Kivu province (credit: Refugees International,2010)

CHAPTER FIVE

THE ENVIRONMENTAL REVIEW RESULTS

This chapter deals with a summary of some major field activities identified in peacekeeping operations in the North Kivu province and the results obtained from the environmental review.

5. 1 Results

5.1.1 Some activities of UN peacekeeping in the North Kivu Province

In this section some major activities of UN peacekeeping operations which have environmental significance and the associated environmental aspects are presented.

- Protecting civilians: Peacekeepers provide armed escorts for civilians on market days and the North Kivu Brigade conducts about fifty market patrols and a hundred and twenty escorts per month for humanitarian operations.
- Disarming of armed groups, demobilizing and reintegration of former combatants.
- Training newly integrated brigades of the Congolese army.
- Promoting national reconciliation and election and building democratic institutions.
- Inspection of cargos at ports, airfields and border crossings:
- Humanitarian assistance/ assisting humanitarian work: patrol of key roads to facilitate safe delivery of help.
- Patrol: The North Kivu Brigade conducts about 1800 day and night patrols, on foot or in vehicles every month.
- Administrative work which include logistics management, deployment analysis, etc.
- Transportation of goods, equipments, ammunitions, commuting of peacekeepers to and from site, etc.
- Building camps and housing facilities (MONUSCO, 2009b; interviews & questionnaires).

5.1.2 Identification of environmental aspects

The direct environmental aspects which the author has identified from the UN peacekeeping activities in the North Kivu province include:

1. Waste and waste handling
2. Chemical usage
3. emissions to air
4. Blocking illicit natural resources exploitation
5. Facilities and plans for institutional building
6. Contingency and emergency plans
7. Land use and location
8. usage of electricity
9. Old computers and electrical equipment and gadgets.
10. Usage of water
11. Discharge to water
12. Fire and other uncontrolled activities
13. Exploration of natural resources (e.g. minerals and timber)

The indirect aspects identified are:

- Education and training of peacekeepers.
- Cooperation with local society.

In table 5.1, the results obtained from the environmental review conducted on the United Nations peacekeeping activities in North Kivu are presented. Details about the environmental review and the elements in the table are also given in section 5.1.3.

Table 5.1 Summary of Results from Environmental Review of UN peacekeeping activities, North Kivu, DR Congo

Broad Environmental Aspects	Activity (which is source of E/A)	Specific Environmental Aspects	Environmental Impacts	Driving Forces	Evaluation (1-3)
Emissions to air	**Transportation** • Patrolling of site/community • commuting of peacekeepers to and from site • transport of ammunitions, goods and equipments	**Emission of:** • carbon dioxide, perfluorocarbons, SF_6, methane, nitrous oxide, hydrofluorocarbons, sulphur oxides	• Contribution to global ozone depletion and climate change • Acid deposition (acid rain, acid snow, acid fog) • poor general air quality	• Existence of strict regulatory laws on permissible limits. • influence from mass media.	**3**
Waste	• Administrative/office works • Camping/ housing personnel • Rendering humanitarian support • disarming, demobilization (military task)	**Waste generation/treatment** • solid/liquid waste generation • hazardous waste • old computers, old light bulbs and other electrical waste. • Organic waste. • Old guns and ammunitions • Metals from prefab houses	• contamination of land and soil from effects of toxic and hazardous waste substances. • over consumption and wastage of materials. • pollution of water bodies.	• To foster economical and optimized use of resources • complaints from the mass media • Legal actions	**3**
Exploration of minerals and forest reserves.	• inspection of cargos at ports, airfields and border crossings	• Blocking illicit natural resources exploitation	• conservation of minerals (such as e.g. diamond, gold, coltan, etc.) and other natural resources e.g. timber, wildlife.	• Sustainable development • Renewable resources can be over-exploited.	**2**
Energy Consumption	• Administrative/office works • Camping/ housing personnel • Humanitarian support • Transportation	• Usage of electricity in lighting , heating, etc. • use of diesel (derived from fossil fuel) in vehicles, aircrafts, etc.	• Contribution to global climate change. • depletion of fossil fuels	• global concern on climate change and its effects.	**2**
Training	**Education/Training** • training military and police security forces of the Congolese army (FARDC). • Training peacekeepers.	• Integrating environmental concerns/issues into the training programs for peacekeepers • a community of practice on environme management has been set up	• Sustainable development • peacekeepers perform their roles in the most environmental friendly way • protection of the natural environment.	• The increasing importance of SD	**1**

Table 5.1 Summary of Results from Environmental Review of UN peacekeepingactivities, North Kivu, DR Congo (continued)

Broad Environmental Aspects	Activity(which is source of E/A)	Specific Environmental Aspect	Environmental Impacts	Driving Forces	Evaluation (1-3)
Chemicals usage	**Military tasks** • The use of RCAs such as PCSI chemicals, malodorants, obscuring smokes (e.g. cinnamic acids, Solvent Green 3, Solvent Yellow 33), visible and occult markers, dyes, etc to discourage participation in riots. • Use of different kinds of bullets • water treatment plants	• smoke and fumes, particulates, odour, • chlorine, zinc chloride, acids titanium tetrachloride • volatile organics • heavy metals	• nuisance • poor general air quality • spreading of chlorinated organic substances with effect on atmospheric ozone layer, • Acidification	• existence of strict legal requirements on the of chemicals. • Complaints from the mass media, NGO's and the local people.	3
Water Consumption	• Administrative/office works • Camping/ housing personnel • Humanitarian support • military task	• large volumes of water used for housekeeping purposes. • Use of tap water in mixing chemical solvents for military task.	• water resource depletion from inefficient usage of water supply and over consumption.	• To foster optimized and economical use of resources • The cost of water treatment.	1
Location/Land use	• Camping/ housing peacekeepers • Building camps for operations.	• land clearing for building prefabs (special houses). • location of camps based on security and nearness to locals	• deforestation • threat to wildlife	Pressure from conservation groups such as WWF.	2
Fire, and other major uncontrolled activities	• Storage of chemicals and flammable materials.	• chemical spills • gas explosions • fires	• death of fauna and flora • loss of human life • long term land, air and water pollution	• Complaints from the mass media, NGO's and the local people.	3
Discharge to water	• Handling of chemicals • disposal of liquid waste	• suspended solids • dyes and solvents • hazardous substances	• eutrophication, • Low oxygen levels in water bodies. • loss of fishes • general reduction in biodiversity, etc • Loss of drinking water.	• existence of strict legal requirements.	1

5.1.3 Environmental review of UN peacekeeping activities

The result of the review is an investigation of the various identified activities which have significant impact on the environment. It consist of six main parts; a broad perspective of the environmental aspect based on the ISO 14001 model, then specific aspects associated with a particular activity and the environmental impact there of, the significant aspects are evaluated based on the driving forces and their impacts on the environment on a scale of 1 to 3.

The activity column of the table of results is limited to the UN peacekeeping activities which have been identified and listed in section 5.1.1. However, the lists of activities identified are inexhaustible. First, each activity was reviewed to identify all associated specific environmental aspects. After which the specific aspects were grouped together based on the various categories of the broad environmental aspects and then the activities were linked to them respectively as shown in table 5.1 above.

The Environmental Aspects

The details of the broad environmental aspects and what each comprises and covers in the context of this work are summarized below. The specific environmental aspects as listed in section 5.2.2 are outcomes of the response gained from the sub statements and questions under each broad environmental aspect in table 5.1.

1. Emissions to air

- Emission of odourous substances.
- Emission of dust.
- Emission of HCFCs and other ozone depleting substances.
- Emission of solvents.
- Emission from energy usage.

2. Waste

- Where and how is waste generated?
- What are the characteristics and quantities of the waste?
- How is the waste handled or treated?

3. Exploration of minerals and forest reserves

- Mineral exploration like gold, diamond, copper, coltan, cobalt, etc.
- Forest reserves and logging of timber.
- What does the organization do to influence exploration of such resources?

4. Energy consumption

- Energy consumption for transport.
- Energy consumption for lightning.
- Energy consumption for administrative and camping purposes.

5. Training

- The content of environmental training and awareness programmes for peacekeepers and other MONUC personnel.
- The existence of measures to monitor environmental awareness programmes.

6. Chemicals usage

- Chemical compounds and mixtures which are stored and handled on site.
- Existence of a well documented priority list of hazardous substances.
- The existence of a list of the quantity and location of the chemicals.
- Existence of procedures used for chemical management.

7. Water consumption

- Inventory on supply and use of surface water, ground water and tap water.
- The total water consumption (small, significant or large volumes).
- Measures to ensure efficient consumption of water supply.

8. Location and land use

- The impact of MONUC on the surrounding areas.
- The state of the site in terms of agriculture, security, building and planning considerations.
- Consideration of the limits on the use of land because of previous environmental impact.

- The attitude of neighbours towards the organization.

9. Fire and other major uncontrolled activities

- The quantity and type of flammable substances that are handled and stored on site.
- The transport, loading and unloading of chemicals and flammable substances.
- Reactive, toxic and environmentally dangerous substances that are handled on site.

10. Discharge to water

- Map of wastewater systems (sanitary wastewater, chemical wastewater, etc)
- Classification and quantity of waste water.
- Discharge points and recipients for the waste water from the sites.

The Environmental Impacts

From the results of the environmental review in table 5.1, some environmental impacts found to be associated with the identified environmental aspects of the UN peacekeeping activities in North Kivu are listed below and grouped into four major environmental concerns:

1. Water related contamination

- Death of fauna and flora.
- Loss of fishes.
- Eutrophication: supply of excess nutrients in water bodies.
- Low oxygen levels for aquatic organisms as a result of the presence of excess organic matter.
- Acid deposition: This occurs when gases react in the atmosphere to become acids, the acidified moisture returns to the earth's surface as acid rain, acid snow or acid fog known as acid deposition.

2. Air related pollution

- Poor general air quality: the deterioration in local air quality through the accumulation of a range of pollutants in the air.
- Contribution to atmospheric ozone layer depletion.
- Nuisance (discomfort in breathing, impaired visibility due to fog of smoke or dust, odours.)

3. Land related pollution

- Land and soil contamination.
- Acid deposition

4. Sustainability: This includes impacts on environmental, social and economic resources.

- Protection of the ecological environment.
- Conservation of wildlife, forest, parks and minerals (gold, cobalt, diamond, copper, coltan, etc).
- Depletion of non- renewable resources such as fossil fuels and minerals.
- Threat to wildlife.
- General reduction in biodiversity in the area.
- Depletion of renewable resources.
- Deforestation.
- Water resource depletion due to inefficient and over consumption of water supply.
- Loss of human life.
- Contribution to climate change.

Evaluation/prioritization of significant aspects

The driving forces ranges from the existence of legal actions, stakeholders and the general public concerns, the concept of SD, economical considerations and other relevant issues associated with a particular environmental aspect.

The evaluation done with a prioritization matrix and it is based on the environmental impacts and the driving forces listed in table 5.1. The strictness or the measure of intensity of the driving forces and environmental impacts for a particular environmental aspect determines the level of seriousness or priority that must be devoted to handling it (i.e. the environmental aspect in question). The prioritization matrix is used to assess the weight of each environmental aspect and based on the percentage score, 1, 2 or 3 is assigned accordingly.

3- High priority: for aspects with a prioritization score of 10% and above

2- Medium high priority: for aspects with a prioritization score of 5- 10%

1- Low priority: for aspects with a prioritization score of 1-5%.

0- No priority, is not part of this evaluation because all the aspects have been screened already (using the Simple pass/ fail filter, section 2.7.1) and the ones presented in table 5.1 are considered to be the significant ones and so require some level of attention to deal with them.

Table 5.2: Prioritization of the significant environmental aspects, UN peacekeeping activities in North Kivu, DRC

Environmental Aspects	Emissions to air	Waste	Exploration of resources	Energy consumption	Training	Chemicals usage	Water consumption	Location/ Land use	Fire & other uncontrolled activities	Discharge to water	Row totals	Row totals (% of grand total)
Emissions to air		1	5	1	10	1	10	5	1	5	39	**17.87**
Waste	1		1	5	5	1	10	5	1	1	30	**13.74**
Exploration of resources	1/5	1		1	5	1/5	5	5	1/5	1/5	17.6	**8.06**
Energy consumption	1	1/5	1		5	1/5	5	5	1/10	1	18.5	**8.47**
Training	1/10	1/5	1	1/5		1/5	1	1/5	1/5	1/5	3.3	**1.51**
Chemicals usage	1	1	5	5	5		10	5	1	5	38	**17.41**
Water consumption	1/10	1/10	1/5	1/5	1	1/10		1/5	1/10	1/5	2.2	**1.01**
Location/ Land use	1/5	1/5	1/5	1/5	5	1/5	5		1/10	1	12.1	**5.54**
Fire & other uncontrolled activities	1	1	5	10	5	1	10	10		5	48	**21.99**
Discharge to water	1/5	1	5	1	1	1/5	1	1/5			9.6	**4.40**

1 Equally Important
5 Significantly More Important
10 Exceedingly More Important
1/5 Significantly Less Important
1/10 Exceedingly Less Important

CHAPTER SIX

ANALYSIS AND DISCUSSION

In this chapter the result of the environmental review is discussed and analyzed. The environmental impacts are grouped into beneficial and adverse impacts and the latter qualitatively assessed based on the approximate time duration to reverse the effects of the environmental impacts. The three-party model for ethical risk analysis is also employed in the analysis.

6.1 Analysis of results

It has been observed from the environmental review that an activity can have more than one environmental aspect. The aspects were identified by establishing the inputs and outputs of the different activities. Some of identified impacts associated with the significant environmental aspects are beneficial and others adverse.

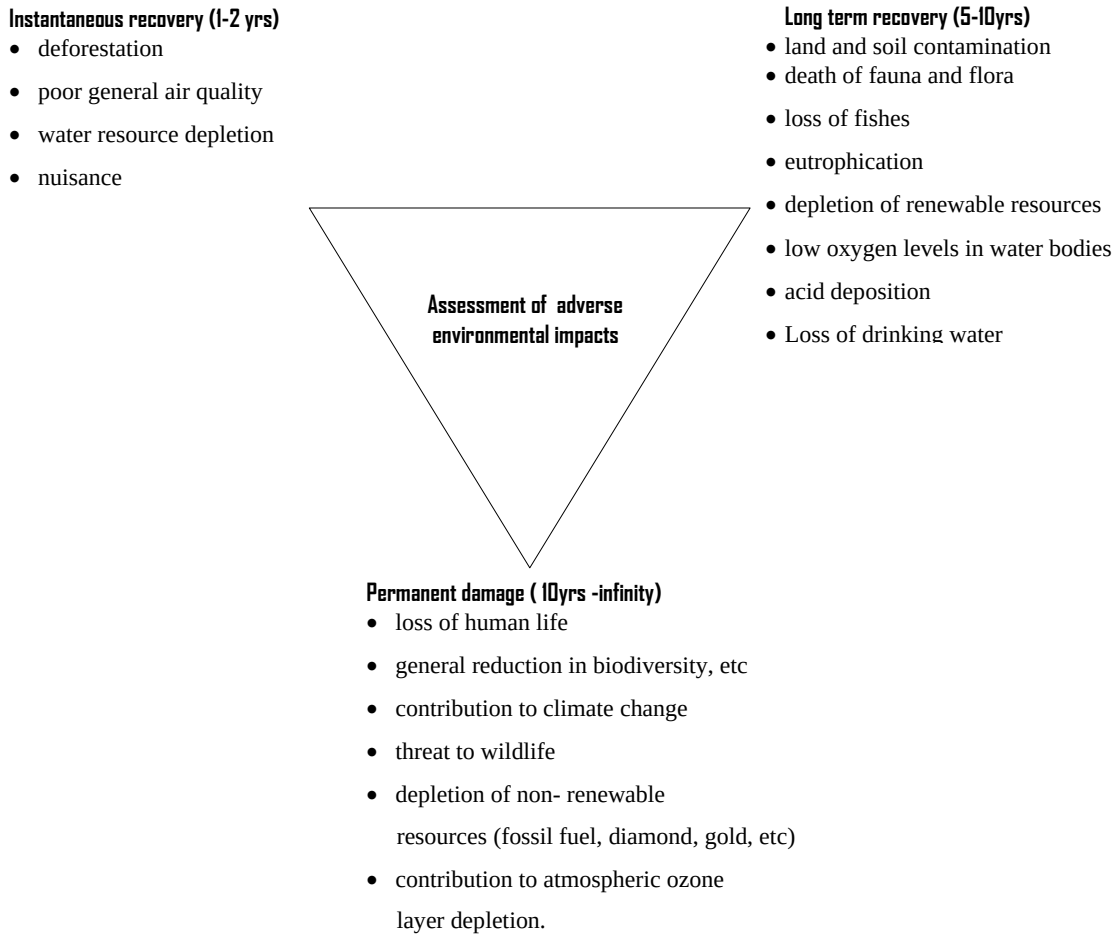
6.1.1 Beneficial environmental Impacts

The beneficial environmental impacts which the author identified to be associated with activities of the UN peacekeeping included:

- Natural resources conservation (e.g. wildlife, forest, parks and minerals).
- Sustainable development.
- Protection of the ecological environment.

6.1.2 Assessment of the adverse environmental impacts

The adverse environmental impacts (environmental risks) identified from the environmental review is qualitatively assessed and presented below.



6.1.3 Ethical Risk analysis of environmental aspects

In this section, using a three-party model as a tool, the ethical risk of each of the significant environmental aspects is analyzed. The beneficiary, the risk-exposed and the decision maker for the respective environmental aspects are identified. Attention is paid to the relationship that exists among the parties and how the nature of the relationships can influence the handling or management of the aspects. In the context of this analysis (UN peacekeeping activities, North Kivu), the beneficiary refers to the person who benefits or gains from the activities that serve as sources for the risks of the environmental aspects. The decision-maker is the person who influences decisions on

these activities and the risk-exposed are the ones who are at risk from the environmental aspects. All parties are limited to immediate stakeholders in the region with the environment inclusive.

Table 6.1: Identifying the three parties for the environmental aspects

Environmental Aspect	Decision-maker	Risk-exposed	Beneficiary
Emissions to air	MONUC (now MONUSCO) authority DRC government	Peacekeepers local populates (North Kivu) The local natural environment unborn persons (future generation)	Local populates
Waste	MONUC DRC government	Local populates The environment peacekeepers	local populates to some extent benefit from some of the activities that generate the waste.
Exploration of minerals and forest reserves	DRC government MONUC authority Foreign buyers Local rebel groups	Local populates DRC government The environment unborn persons (future generation)	Local rebel groups Foreign buyers of minerals Individual peacekeepers
Energy Consumption	MONUC authority	The environment	peacekeepers Local populates
Training	MONUC, authority	None	Peacekeepers local populates The environment (indirectly benefits)
Chemicals usage	MONUC, authority DRC government	Peacekeepers local populates The environment Rebel groups	MONUC, personnel benefit from chemicals for treating usable water in the camps. Local populates get security
Water Consumption	MONUC, authority	The environment The local populates	Peacekeepers local populates
Location/Land use	MONUC, authority Local civil chiefs DRC government	local populates The environment MONUC, peacekeepers	Local populates MONUC, peacekeepers
Fire, and other major uncontrolled activities	MONUC, authority	Peacekeepers local populates The environment	None
Discharge to water	MONUC, authority Local civil chiefs DRC government	local populates The environment unborn persons (future generation)	None

Table 6.2: Examining relationships among the three parties in the ethical risk analysis

	Emissions to air	Waste	Exploration of minerals and forest reserves	Energy Consumption	Training
I) To what extent do the risk-exposed benefit from the risk-exposure?	Local populates and the gain protection from patrols and basic needs from the transport of humanitarian goods and services. No benefit for peacekeepers. No benefit for the for the environment.	Local populates gain food and other basic needs through the humanitarian activity.	The risk falls on local populates in these area especially minors. There are no real benefits for the risk-exposed.	Local populates gain from the use of energy to provide escorts and humanitarian services. Peacekeepers utilize energy for their personal housekeeping.	No risk-exposure
2) Is the distribution of risk and benefits fair?	No, the benefits are largely for only the local populates and indirectly for the DRC government.	No, with respect to the environment. Yes to an extent, with respect to the local populates and peacekeepers considering the activities that create the waste	No, its mostly the rebel groups and their allies which benefit from such deals whiles exposing the general populates to high risks.	No, the risk falls on the environment.	Not applicable
3) Can the distribution of risk and benefit be made less unfair by redistribution or compensation?	Yes to some extent through eco- transport systems to reduce the level of emissions released and tree planting to help counteract the impacts of the emissions to air on the environment.	Yes through choice of waste handling systems.	No	Yes, through resorting to better alternatives for energy supply and effective consumption mechanisms.	Not applicable
4) To what extent is the risk exposure decided by those who run the risk?	To some extent, the DRC government and local civil chiefs are included in deciding the number patrols needed for a community in the region.	To a high extent, MONUC determines how waste generated directly from its activities is disposed.	The DRC government and some local authorities are included in formulating strategies to combat illegal exploration by rebel groups.	The amount of energy and the choice of energy source is determined by MONUC.	Not applicable

Table 6.2: Examining relationships among the three parties in the ethical risk analysis (continued)

	Emissions to air	Waste	Exploration of minerals and forest reserves	Energy Consumption	Training
5) Do the risk-exposed have access to all relevant information about the risk?	Not all as some are children and uneducated not to be assumed to understand the risks involved.	The local populates and MONUC, peacekeepers can be assumed to be reasonably aware of improper waste disposal on the community.	Yes, to some extent.	Not practicable as it's the natural environment which suffer the risk.	Not applicable
6) Are there risk-exposed persons who cannot be informed or included in the decision process?	Yes, children and minors, unborn persons	Yes, children and minors, unborn persons.	Yes, children and minors, unborn persons.	Yes, children and minors, unborn persons.	Not applicable
7) Does the decision-maker benefit from other people's risk exposure?	No	Yes to some extent as the choice of material types used for peacekeeping activities and waste disposal method is a direct financial cost to MONUC.	Yes to some extent, some of the foreign buyers have some level of influence on MONUC decisions. some individual peacekeepers may also benefit by compromising.	Yes, the choices taken affect the environment.	Not applicable

Table 6.2: Examining relationships among the three parties in the ethical risk analysis (continued)

	Chemicals usage	Water Consumption	Location/Land use	Fire, and other major uncontrolled activities	Discharge to water
I) To what extent do the risk-exposed benefit from the risk-exposure?	MONUC, personnel benefit from chemicals for treating usable water in the camps. Local populates get protected through the use of RCAs to drive away rebels.	Local populates have nothing to gain from peacekeepers using large volumes of water for their housekeeping activities except when used to dispense humanitarian support.	The location of military and humanitarian camps provide security for both peacekeepers and the local populates. The environment gains nothing.	There are no benefits associated with such accidents.	There are no benefits for the risk-exposed
2) Is the distribution of risk and benefits fair?	Yes to some extent, the the parties share the risks of the activities that benefit them. There are no real benefits to the environment.	No, local populates run the risk of facing shortage of water but MONUC personnel are prioritized in water supply to facilitate their activities.	Yes with regards to peacekeepers and the local populates but not for the environment.	No, since there are no benefits.	No
3) Can the distribution of risk and benefit be made less unfair by redistribution or compensation?	Yes, compensation to the environment in the choosing of less hazardous chemical substances.	Yes, the environment can be compensated by judicial use of water.	Yes, by considering environmental factors into the choosing of camping sites.	This varies depending on the nature of the accidents.	it is not practicable to give full compensation but alternate sources of Water supply can be provided.
4) To what extent is the risk exposure decided by those who run the risk?	The chemicals used are basically decided by MONUC and not local populates.	The local populate and the environment have no influence on MONUC's consumption of water.	To a large extent, the the risk exposure is decided by the risk-exposed.	MONUC decides the level of acceptability of risks associated with storage of flammable substances on site.	The local populates and the environment do not decide to concede to this action.
5) Do the risk-exposed have access to all relevant information about the risk?	yes to an extent, rebel groups are aware of the danger of exposure to RCAs.	Probably majority of them are not aware that over consumption can result in water shortage because of the perception that there is more than enough supply.	Yes, the local populates are aware of the implications of the nearness or otherwise of the location of the mission camps.	MONUC, authority and MONUC, peacekeepers may be aware but the same cannot be said for all the members of the local populates.	Probably yes but some of the local populates underestimate the level of the risk and still fish or swim in such polluted water bodies.

Table 6.2: Examining relationships among the three parties in the ethical risk analysis (continued)

	Chemicals usage	Water Consumption	Location/Land use	Fire, and other major uncontrolled activities	Discharge to water
6) Are there risk-exposed persons who cannot be informed or included in the decision process?	Yes, children and minors, unborn persons	Yes, children and minors, unborn persons	Yes, children and minors, unborn persons	Yes, children and minors, unborn persons	Yes, children and minors, unborn persons
7) Does the decision-maker benefit from other people's risk exposure?	No	No, MONUC has nothing to gain from its personnel not economizing the usage of water and the possibility of local populates to experience water shortage.	No	No	MONUC has nothing to gain directly from such accidents. However it benefits from not having to undertake costly measures prevent it.

One of the major merits of the three-party model is its effectiveness in bringing to focus some important conflict of interest that may exist in a perceived risk. In this case other stakeholders other than the environment have been taken into account and therefore help to establish the basis to handle the aspects in a way facilitate sustainable development.

A diagrammatic representation of the three-party model illustrating how the seven questions used in table 6.2 refers to the pairwise relationship between the parties is given in fig. 6.1.

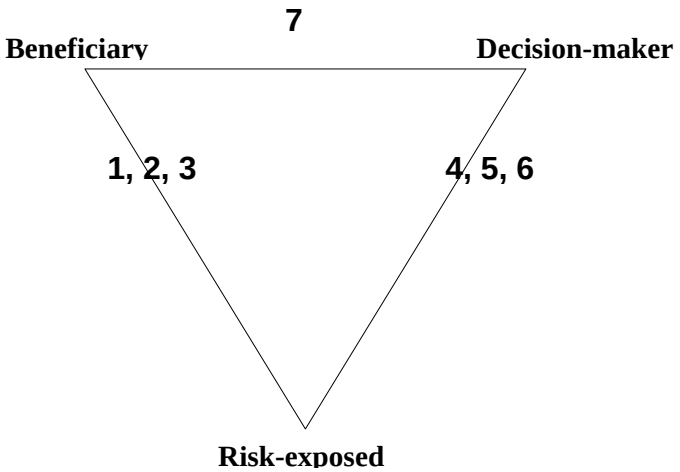


Fig 6.1: The position of ethical risk analysis questions in relation to the three parties (Hermansson and Hansson, 2007, p. 21)

Questions 1-3 are about the relationship between the beneficiary and the risk-exposed. The ethical concern in this relationship is to establish the distribution of the risks and benefits.

Questions 4-6 focuses on the relationship between the risk-exposed and the decision-maker with the concern to evaluate the influence that the risk-exposed exerts over the decision-making process.

Finally, the relationship between the beneficiaries and the decision-maker is assessed in question 7. This is to establish the legitimacy or credibility of the decision-maker.

The details for each of the seven questions used in the analysis have been given below.

1) To what extent do the risk-exposed benefit from the risk-exposure?

The purpose is an identity issue about the distribution of the risks and benefits. That is, to find out whether the risk-exposed and the beneficiary are different persons or coincides fully or partially.

2) Is the distribution of risk and benefits fair?

This assesses the differences in how the risks and benefits are spread. Large differences may not necessarily imply that the overall distribution of the risks is unfair and the judgment may be subjective.

3) Can the distribution of risk and benefit be made less unfair by redistribution or compensation?

This entails assessing the risks and benefits in the bid to abate the unfairness that may exist in the distribution of risks and benefits among interested parties. In this analysis the form of compensation encompasses possible compensations for the risk imposition itself and the actual harm that could result when the risk occurs.

4) To what extent is the risk exposure decided by those who run the risk?

This is an identity question with the objective to assess the extent to which the risk-exposed themselves decides about the risks. This covers voluntaries and imposition.

5) Do the risk-exposed have access to all relevant information about the risk?

This question concerns the availability of relevant information to the risk-exposed and his ability to fully comprehend and assimilate the information provided to him and make well informed choices.

6) Are there risk-exposed persons who cannot be informed or included in the decision process?

The objective of the question is to find out if there are a category of people who are exposed to the risk but its impossible for decision-makers to inform them or integrate them into the decision making process. This category includes children, future generations (unborn persons), people with mental handicaps, etc.

7) Does the decision-maker benefit from other people's risk exposure?

The aim of the question is to verify if the decision-maker himself stands to benefit from someone else being exposed to the risk. This is to ensure that the credibility of the decision-maker is not compromised or undermined. (Hermansson and Hansson, 2007, p. 3-16).

6.2 Discussion

This section is in two parts; the first part discusses the results obtained from the environmental review in chapter five and the second part highlights some important insights drawn from the ethical analysis of the environmental aspects in section 6.1.3.

High priority significant environmental aspects

Emissions to air, Waste, chemicals usage and fire and other uncontrolled activities were rated as high priority (3) significant environmental aspects with a prioritization score above 10%. It therefore implies that the highest level of consideration should be given to these when managing the environmental aspects. This is because these aspects have more severe negative impacts and there are stringent legal regulations for them in addition to other persuasive driving forces. Also these aspects if not handled properly could lead to other environmental aspects; for example, uncontrolled activities such accidental spillage of chemicals could lead to discharge of these chemicals into water bodies.

Medium high priority significant environmental aspects

Exploration of minerals and forest reserves, energy consumption and land use/location had a prioritization score between 5-10% and were rated medium high (2) significant environmental aspects. From the environmental review, the environmental aspect ‘exploration of minerals and forest reserves’ (specifically, the blocking of illicit natural resources exploitation) has a positive environmental impact.

Low priority significant environmental aspects

Training, discharge to water and water consumption scored between 1-5% on the prioritization matrix and they were subsequently rated as low priority (1) significant environmental aspects.

These significant aspects are considered to require low priority relative to the others because they could be indirectly taken care of in the attempt to handle the high and medium high priority aspects. For example, the proper storage and usage of chemicals or proper waste disposal may indirectly reduce or prevent discharge to water. Training could be embedded in the action plan to educate MONUC personnel on energy and water saving measures in their camps and during operations.

Insights from ethical risk analysis of aspects

The three-party ethical risk analysis of the environmental aspects reveals the major decision-maker as MONUC and to some extent the DRC government and some civil chiefs or authorities in the North Kivu province.

The decision–makers do not directly benefit from these risks, however there may be some benefits for not having to undertake costly measures to prevent or reduce the risks associated with the environmental aspects.

The major risk-exposed stakeholders identified are the Kivu local people (with children and mentally handicapped at a higher risk), the environment, unborn persons and peacekeepers with the main beneficiary being the local populates.

The risk-exposed in the case of the local populates and peacekeepers have some level of influence on the decision-making through their local or government representatives

In most of the risk associated with the environmental aspects, the risk-exposed and beneficiaries are the same persons except for the environment and unborn persons. This is because peacekeeping operations are meant to serve the local populates affected by the conflict in the region and it therefore leads to some major trade-offs at the expense of the environment and future generations considering the strong conflict of interests that are involved.

The author is not arguing for environmental protection to be put ahead of local populates safety and security but is of the view that check and balances can be implemented to reduce trade-offs on the natural environment and thereby aid to attain sustainability in peacekeeping operations.

CHAPTER SEVEN

CONCLUSION

7.1 Conclusions from Research

The United Nations Department of Peacekeeping Operations (DPKO) and the Department of Field support (DFS) realize the influence of its activities on the environment and as a result an environmental policy for UN Field Missions has been issued since 1 June, 2009. The policy states that the mission will take necessary measures to ensure that the usage of energy is optimized with the objective to minimize the mission's greenhouse-gas emissions as well as ensuring enough power for proper functioning. (Greening the Blue, n.d.)

Even though the DPKO/DFS is making these efforts to address its environmental interactions, from the environmental review energy usage and greenhouse-gas emissions are not the only environmental aspects associated with peacekeeping operations and therefore much more efforts are required.
It is important to incorporate the other significant aspects (waste, exploration of resources, training, chemicals usage, water consumption, location, discharge to water and fire & other uncontrolled activities) into the environmental policy and objectives and targets must be set in managing these environmental interactions.

In conclusion, the answer to the primary research question is; yes, UN peacekeeping missions have environmental interactions and it is vital that to achieve sustainable development in war torn countries, activities which are aimed to resolve the conflicts and restore lasting peace are carefully scrutinized and assessed so that there is a balance between the socio economic aspects and the natural environment of the host nations.

There is no doubt that peacekeeping is already taking a significant percentage of the United Nations budget and it may even be more costly to suddenly switch to more environmental friendly technologies, action plans and procedures in the discharge of mission's mandates. However the short term economical or financial cost of making changes in the operations is incomparable to the long term loss we stand to suffer as our world falls apart.

And with increasing concern on environmental damage and climate problems, its important that United Nations peacekeeping addresses its environmental aspects with negative impacts otherwise the organization may stand a risk of being perceived as “a necessary evil” by the public and could suffer an environmental stigmatization in the near future.

7.2 Recommendations

Achieving sustainability in peacekeeping is a very challenging task due to the sensitivity and dynamics of the operations and the stakeholders involved, nevertheless gradual continuous improvement can make a difference.

To improve the ecological foot print of UN peacekeeping operations, the author recommends that the ISO 14001 model will be used to implement an effective EMS to manage the identified environmental aspects to ensure the prevention or reduction of the associated negative environmental impacts and enhance the beneficial ones.

7.3 Further Work

- To conduct an environmental impact assessment of the identified aspects.
- To investigate into the natural environment condition of the host country before, during and after peacekeeping missions taking into account the time effects of the operations.

APPENDIX

Environmental Review of UN Peacekeeping Operations

Questionnaire

Background information

The author is writing her masters thesis work on the topic *'Environmental Review of UN peacekeeping missions towards sustainability, Kivu, DR Congo'***.** The case study is the Kivu province of DR Congo. The purpose of the research is to identify environmental interactions associated with peacekeeping operations based on the ISO14001:2004 model. The scope is limited to only field (on-site) activities of the operations.

Conducting the environmental review requires site inspection; unfortunately I did not have the opportunity to visit DR Congo. However, answers to the questions below will go a long way to give a better insight into peacekeeping operations which will help to make better environmental assessment of the main activities involved in peacekeeping operations.

'Activities' as used in the questions refer to military activities, humanitarian activities and other general activities that take place during peacekeeping operations.

Guideline: please write your answers in the spaces provided under every question, then save the document and mail back to the author.

Your familiarity with peacekeeping operations (high, medium, low):

Profile:

1. What are some of the principal activities on site (with respect to the Kivu province) and what is involved in these activities?

2. How are peacekeepers sheltered? Are new buildings put up to house personnel and equipments?

3. WASTE GENERATION/ TREATMENT

<table>
<tr><td colspan="2">SOLID WASTE</td></tr>
<tr><td>Are there activities that generate solid waste?
Yes/No
comment:</td><td rowspan="2">How are organic waste handled or disposed off? (For example: landfills, incineration, recycling, etc.)

comment:</td></tr>
<tr><td>What peacekeeping activities generate solid waste?</td></tr>
<tr><td>Are the following types of waste generated? (paper, plastic, wood, metals, household waste, etc)
Yes/No
comment:</td><td>How are electrical waste handled or disposed off?</td></tr>
</table>

SOLID WASTE	
Are electrical waste (examples: old computers, old light bulbs, old electrical gadgets) produced? Yes/No comment:	How are old ammunitions disposed off? comments:
Is solid waste generated sorted at source? Yes/No comment:	Is solid waste stored properly before handled? Yes/No comment:

LIQUID WASTE	
Are there activities that generate liquid waste? Yes/No comment:	Is the waste stored properly before handling? Yes/No
What types of liquid waste are generated? (chemical waste, used solvents, waste water, waste oil) comment:	What peacekeeping activities produce liquid waste?
How are liquid waste handled or disposed off? (discharge into water bodies, recycling, others) comment:	Is liquid waste treated before discharge into water bodies? Yes/No Comments:

4. WATER CONSUMPTION

Is large amount of water used in peacekeeping activities on site? Yes/No comment	What are the sources of water supply? tap water, ground water surface water comments
What activities consume large volumes of water?	Are there systems/measures in place to reduce water consumption and wastage? Yes/No comments:

5. ENERGY CONSUMPTION

What types of energy source (fuel) is used in mission vehicles for transportation?	What activities consume significant amounts of electricity?
Are fuels with low sulphur content used? Yes/No comments:	Is there training and awareness on energy use for peacekeepers and other personnel? Yes/No Comments:
Are efforts made to reduce the use of fossil fuels and use other alternative (renewable fuel) sources such as bio diesel? Yes/No comments:	

6. USE OF CHEMICAL SUBSTANCES

Which activities require the use of chemicals on field operations?	What are some the characteristics of these chemicals used? For example are they explosive, flammable, corrosive, etc.
What types of chemicals are used?	How are the chemicals handled?

7. LOCATION

Are there activities that require special places/locations to be carried out? Yes/No comments:	What is the nature of these locations needed? (Example closeness to the forest, mine, wildlife, far away from the public, use of land).
If yes, list some of such activities.	Which activities and for what purpose is land used?

8. SOIL AND GROUND WATER POLLUTION

Are there activities that can directly or indirectly cause soil and ground water pollution? Yes/No comments:	If yes, what activities and what is involved?

9. FIRE AND OTHER CONTROLLED ACTIVITIES

Which activities use substances that can cause fire, explosions or other environmental accidents?	How and where are explosives stored?
How and where are flammable substances stored?	

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