

TOWARDS SUSTAINABLE DEVELOPMENT: PROMOTING ENVIRONMENTAL AWARENESS AND TRAINING IN THE MINING SECTOR

Environmental awareness training mining sector

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Abstract

Business is increasingly challenged to support sustainable business development and prove that they are providing a net benefit to sustainable development. Promoting education, public awareness and training is seen as indispensable for achieving sustainable development. Chapter 36 of Agenda 21 recognises the critical importance of improving the capacity of people to address environment and development issues. The importance of promoting training and environmental awareness is also echoed by the ISO 14001:1996 international standard for Environmental Management Systems (EMS). The Centre for Environmental Management (CEM) addresses the important issue of promoting training and environmental awareness through the development of customised environmental awareness training kits and training of corporate trainers. This paper focuses on the training needs assessment conducted, the development and customisation of the training material, as well as the training and competency declaration of the trainers as recently applied at the Jwaneng Diamond Mine in Botswana. It also stresses the importance of providing similar training to the local community.

Keywords: environmental awareness training, ISO 14001, mining sector, sustainable development

Introduction

The challenge to business to pro-actively support sustainable business development is increasing globally as the evolving sustainable development agenda is characterised by challenges that require the attention of both the state and the private sector. In response to the growing global problems of poverty and environmental degradation, companies are increasingly asked to prove that they are providing a net benefit to sustainable development by maximising the positive and minimising the negative social and environmental impacts of their activities, while maintaining profits.

Capacitating people for sustainable development

Agenda 21

One of the major issues raised in the sustainable development debate deals with promoting education, public awareness and training. This issue, which is seen as indispensable for achieving sustainable development, is addressed in Agenda 21, a comprehensive plan of action to be taken locally, nationally and globally by organisations in every area in which humans impact on the environment. It was adopted at the UN Conference on the Environment and Development (UNCED) in Rio in 1992. The Agenda 21 document contains some forty separate sections of concerns, outlining a total of more than two and a half thousand recommendations [UNESCO (1997:2)].

Chapter 36 of Agenda 21 defines education as a process by which human beings and societies can reach their fullest potential. It is critical for promoting sustainable development and improving the capacity of people to address environment and development issues. It sees education as embracing all the ways in which people learn about the world around them, develop values and lifestyles that reflect an understanding of global realities and assume their responsibilities as global citizens to prepare for the future. Therefore, it recognises education in all its forms, including formal education, raising public awareness and training. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development. To be effective, environmental education should be integrated in

all disciplines, employ formal and non-formal methods and effective means of communication [Pollard (1993:1-2), UNESCO (1997), UNESCO (2001:2,5)].

Both formal and non-formal education are seen as indispensable in Agenda 21, Chapter 36, to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns. Due to the fact that formal education systems are notoriously slow to change, non-formal education (including public awareness) is presented as a key instrument. Non-formal channels are capable of delivering new information and taping new approaches and methods for teaching and learning more easily. The promise of the non-formal sector is increasingly seen as a complement to formal education [UNESCO (2001:7)].

According to Agenda 21, Chapter 36 there is still a considerable lack of awareness of the interrelated nature of all human activities and the environment, primarily due to inaccurate or insufficient information. Therefore, there is a need to increase public sensitivity to environment and development problems and involvement in their solution and to foster a sense of personal environmental responsibility and greater motivation and commitment towards sustainable development [Pollard (1993:6)].

Agenda 21, Chapter 36 recognises training as one of the most important tools to develop human resources and facilitate the transition to a more sustainable world. Training programmes should promote a greater awareness of environment and development issues as a two-way learning process. It should have a job-specific focus and be aimed at filling gaps in knowledge and skill that would help individuals find employment and be involved in environmental and development work [Pollard (1993:8)].

Agenda 21, Chapter 36 promotes the encouragement of all sectors of society, such as industry, universities, governments, as well as non-governmental and community organisations to include an environmental management component in all relevant training activities. The emphasis in these activities should be on meeting immediate skill requirements through short term formal and in-plant vocational and management training. It also calls for the strengthening of environmental management training capacities and the establishment of specialised "training of trainers" programmes to support training at the national and enterprise levels [Pollard (1993:9)].

The vision of education inscribed in Agenda 21, Chapter 36 has been reaffirmed, broadened and deepened since UNCED. Explicit recommendations concerning education, public awareness and training appear in each of the action plans of the major United Nations conferences held after UNCED, as well as in the three global conventions adopted after UNCED. Practical experience since Rio has also reinforced the conviction that sustainable development can not be achieved without public understanding, support and action. For this reason, education can be seen as a cornerstone of sustainable development in all its dimensions [UNESCO (1997:2, 3)].

As a result of the wisdom gained post 1992, education is no longer seen as an end in itself, but as a means to [UNESCO (1997:5), UNESCO (2001:7)]:

- effect the changes in values, behaviour and lifestyles that are needed to achieve sustainable development;
- disseminate the knowledge, know-how and skills that are needed to bring about sustainable production and consumption patterns and to improve the management of natural resources, agriculture, energy and industrial production; and
- ensure an informed public that is prepared to support changes towards sustainability emerging from different sectors.

ISO 14001

The importance of promoting training and awareness is also echoed by the ISO 14001:1996 international standard for Environmental Management Systems (EMS), where an element 4.4.2 is dedicated to training, awareness and competence. The principle underlying implementation in the basic ISO 14001 EMS model (Figure 1) is that an organisation should develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives and targets [International Organization for Standardization (1996b: 3)].

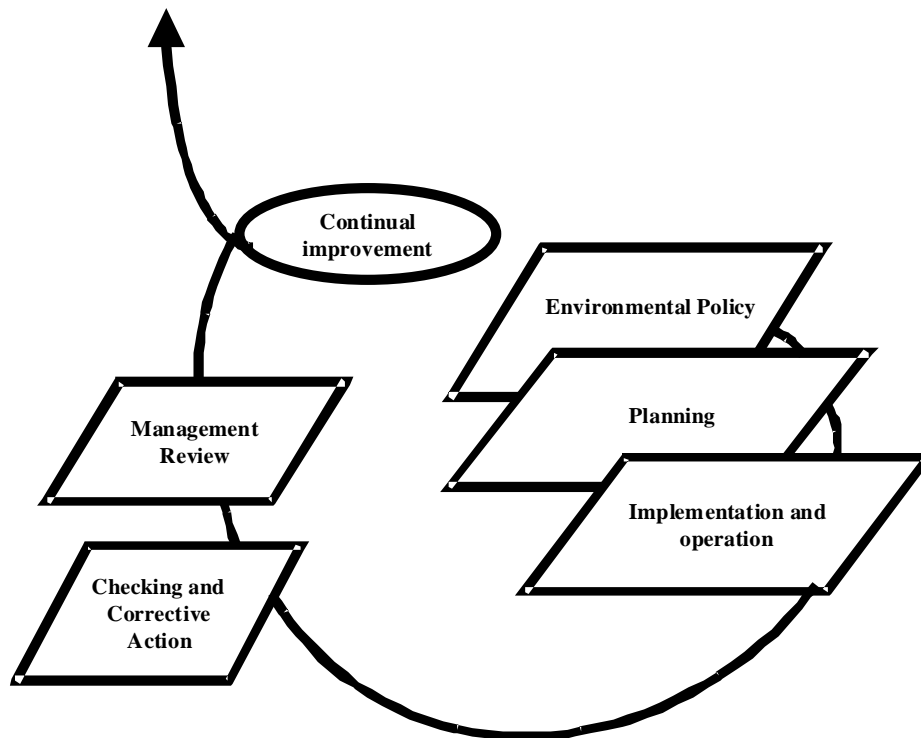


Figure 1: Environmental management system model for the International ISO14001 Standard

ISO 14004:1996 acknowledges the fact that it is the commitment of individual people, in the context of shared environmental values, that transforms an environmental management system from paperwork into an effective process. Therefore, an EMS can only be successfully implemented if the people involved in the system have been trained properly. All personnel of the organisation should understand and be encouraged to accept the importance of achieving the environmental objectives and targets for which they are responsible and / or accountable. To facilitate this, education and training is needed to ensure that employees have appropriate and current knowledge of regulatory requirements, internal standards and the organisation's policies and objectives. The level and detail of training may vary according to the task. Contractors working for the organisation on site should also be required to demonstrate that they have the required knowledge and skills to perform the work in an "environmentally responsible manner" [International Organization for Standardization (1996b: 16,17)].

ISO 14001:1996 requires that appropriate training, relevant to the achievement of environmental policies, objectives and targets, should be provided to all personnel within an organisation. Employees should have an appropriate knowledge base, which includes training in the methods and skills required to perform their tasks in an efficient and competent fashion and knowledge of the impact their activities can have on the environment if performed incorrectly [International Organization for Standardization (1996b: 17)].

ISO 14001:1996 stipulates that all personnel must receive basic environmental awareness training to make them aware of [International Organization for Standardization (1996a: 3)]:

- ✓ the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- ✓ the significant environmental impacts of their work activities and the environmental benefits of improved personal performance;
- ✓ their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- ✓ the potential consequences of departure from specified operating procedures.

ISO 14001:1996 further stipulates that personnel performing tasks which can cause significant environmental impacts must be declared competent on the basis of appropriate education, training and/or experience [International Organization for Standardization (1996a: 3)].

The ISO 14004:1996 guidelines for training are summarised in Table 1 [International Organization for Standardization (1996b: 17)].

Table 1: ISO 14004:1996 guidelines with regard to training and awareness.

Types of training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organisation's environmental policy
Raising general environmental awareness	All employees	To gain commitment to the environmental policy, objectives and targets of the organisation; and instil a sense of individual responsibility
Skills enhancement	Employees with environmental responsibilities	To improve performance in specific
Compliance	Employees whose actions can affect compliance	To ensure regulatory and internal requirements for training are met

ISO 14001:1996 recognises the key role of top management in building awareness and motivating employees and requires their involvement in explaining the organisation's environmental values and communicating its commitment to the environmental policy. It also recognises the key role of management in training, requiring management to determine the level of experience, competence and training necessary to ensure the capability of personnel. Top management should also ensure that appropriate resources are provided to ensure that the environmental management system is implemented and maintained. The appropriate human, physical (e.g. facilities, equipment), and financial resources should be defined and made available. All of these also relate to training and awareness [International Organization for Standardization (1996a: 8), International Organization for Standardization (1996b: 14,16)].

According to ISO 14004:1996, training programmes typically have the following elements [International Organization for Standardization (1996b: 17)]:

- Identification of employee training needs;
- Development of a training plan to address defined needs;
- Verification of conformance of training programme to regulatory or organisational requirements;
- Training of target employee groups;
- Documentation of training received;
- Evaluation of training received.

Capacitating people: Jwaneng case study

The Centre for Environmental Management (CEM) of the Potchefstroom University aspires to be respected locally as well internationally as a Centre of excellence which that aims to fulfil an innovative and leadership role in applied research and analysis, training and advisory services in environmental management and related fields that are directed towards the promotion of environmental sustainability. The Centre is involved in addressing the important issue of promoting training and awareness. This is done in line with the ISO 14001:1996 requirements through the development of customised environmental awareness training kits, as well as training of corporate trainers, in order to declare them competent to provide environmental awareness training. The entire initiative forms part of the implementation process of the ISO 14001:1996 certified Environmental Management System.

Jwaneng Diamond Mine became the first organisation in Botswana to become ISO14001 certified in 2000. In order to satisfy the ISO14001: 1996 requirements of awareness training, the Centre for Environmental Management was approached to assist the mine in this regard. The assistance included doing a training needs assessment for this project, developing a customised environmental awareness training kit, as well as training, assessment and competency declaration of trainers. The remainder of this paper will focus on these aspects as reflected in the Jwaneng case study.

The intervention at Jwaneng was initiated with a clear expression by the mine that they required training material that would satisfy the ISO 14001:1996 requirements for environmental awareness training. Jwaneng mine also required training for their trainers in order for them to be declared competent on the basis of appropriate education, training and/or experience in line with the ISO 14001:1996 requirement.

Training needs assessment

The training, awareness and competence element of ISO 14001:1996 requires that training needs must be analysed to ensure that all personnel whose work may create a significant impact upon the environment receive appropriate training. This is also in line with one of the principles of the Centre's training philosophy to develop course contents in conjunction with the client to ensure that deliverables are on specification and to the satisfaction of the client.

The training needs for the environmental awareness training was established during a facilitated workshop at Jwaneng mine during July 2001. The workshop was attended by the person responsible for co-ordinating the implementation of ISO14001 at Jwaneng, the trainers responsible for environmental awareness training and environmental specialists from the Centre. During this workshop, the local training needs were determined, focussing on what should be included and establishing at what level the training would be provided. The process was informed by the local situation at the mine, as well as the specialists' knowledge of and experience with ISO14001: 1996. It was decided to develop only one training kit for the whole mine, despite the fact that training was required at a range of personnel levels, from unskilled labourers to highly skilled managers.

Development of customised training material

The results from the training needs assessment were used to develop a basic environmental awareness training kit for Jwaneng. Jwaneng mine provided the bulk of the information on which the contents of the kit are based.

The kit focuses on familiarising people with the concept of the environment and why it is necessary to care for the environment. It contains basic information on the activities and services at Jwaneng mine, the major impacts of these, as well as efforts to manage the significant environmental aspects through the ISO14001 Environmental Management System. To satisfy all the ISO 14001:1996 requirements, the kit also contained information on

- ✓ the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- ✓ the roles and responsibilities of all personnel in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- ✓ the environmental benefits of improved personal performance; and
- ✓ the potential consequences of departure from specified operating procedures.

An important aspect of the kit is that it does not only focus on being environmentally conscious at work, but stresses the need to extend the environmental responsibility to the every day life at home.

Due to the decision to develop one training kit only, the importance of using locally known examples and incorporating as much visual material as possible was identified as critical success factors in the development of the training kit. This provided a special challenge to develop an understanding of the local operational and socio-economic situations and obtain sufficient visual material of the local conditions.

The basic training kit was evaluated during a workshop held at the mine, attended by the person responsible for co-ordinating the implementation of ISO14001 at Jwaneng, the trainers responsible for environmental awareness training and an environmental specialist from the Centre. This workshop focussed on sanitising the basic training kit, correcting inaccuracies and eliminating unnecessary detail. The training kit was also customised further by improving the use of local examples, as well as visual material of local conditions. The customised training kit, containing fairly detailed information, was provided to all the trainers as reference material.

Verification of training material

The final environmental awareness training kit was verified against ISO 14001:1996 and company requirements. It was found to satisfy all the company and ISO 14001:1996 requirements, except the requirement that employees must have appropriate and current knowledge of regulatory requirements. This deficiency was identified from the start as the one area where the Centre lacked expertise. It was flagged to Jwaneng mine and the required local expertise was sourced during a visit to Botswana. The details regarding the identified resource person were provided to the mine.

Training and competency declaration of trainers

Agenda 21 recognises the importance of properly trained trainers to support training at the enterprise level. This aspect is also part of the Centre's philosophy of providing sustainable solutions through building capacity in organisations, especially of trainers. It is believed that local trainers are not only conversant with the local operational conditions, but also with local customs. Being part of the organisation and involved with the daily operations, they are also aware of the possible obstacles to efficient training and the windows of opportunity to ensure efficient training.

The teaching strategy followed by the CEM is to expose trainees to a solid theoretical foundation, which is supported by appropriate practical assignments. Introductory sessions on environmental issues at the global, regional and local levels, environmental management, principles of environmental management, as well as a business perspective on environmental management and an overview of ISO 14001:1996 requirements provided a solid theoretical foundation to the trainers at Jwaneng. Experience at the Centre has shown that practical exposure to problem situations is essential to reinforce the learning outcome. In support of the principles of integration and outcomes-based education, practical assignments were conducted in dedicated small groups, with report back sessions.

The theoretical training was followed by training in the use of the standard training kit. It did not only focussed on capacitating the trainers to use the training material provided, but also to identify the specific requirements of their unique situations and further customise the kit to meet those requirements. Each trainer was asked to identify their specific target audience, as well as the time available for training sessions and develop a training kit by selecting appropriate slides from the standard training kit.

The training material primarily consisted of electronic presentations, supported by hard copies of the presentations. This allowed for the integration of visual material into the training material. It also fitted in well with the mine's training philosophy.

The trainers were given sufficient time after completion of the training to familiarise themselves with the training material, customise the standard kit to meet their specific training requirements and prepare themselves for evaluation. The evaluation was conducted at the mine to determine the competence of the trainers to present environmental awareness training to the identified audience within the available time, using the standard training kit, but also dealing with questions related to the contents of the training kit. All trainers that successfully met the above criteria, were declared competent and received certificates to support this.

Document training received

In line with ISO 14001:1996 requirements, records were kept of attendance at the training sessions, as well as the training material used.

Conclusion

Education, in all its forms, is valued as a means to effect the changes in values, behaviour and lifestyles that are needed to achieve sustainable development through disseminating the knowledge, know-how and skills that are needed to bring about sustainable production and consumption patterns and improve the management of natural resources, agriculture, energy and industrial production; and ensuring an informed public that is prepared to support changes towards sustainability. Therefore, promoting education, public awareness and training is seen as indispensable for achieving sustainable development and improving the

capacity of people to address environment and development issues. These issues are addressed in Agenda 21 and the international ISO14001 specification for Environmental Management Systems.

The experience of the Centre for Environmental Management during the involvement with Jwaneng Mine, highlighted the importance of the following aspects to ensure effective environmental awareness training:

- training needs should be analysed to ensure that appropriate training is provided;
- good co-operation between local trainers and environmental specialists is essential for the development of appropriate training material;
- customised training material should use locally known examples and incorporate as much visual material as possible;
- local operational conditions should be linked to global environmental problems;
- global environmental issues should be addressed at a local level;
- training by competent local trainers that are conversant with the local operational conditions, local customs and aware of the possible obstacles to and windows of opportunity.

Although the training material developed for Jwaneng mine focussed on training and awareness creation at the enterprise level, it also focussed on what can be done at home, thereby extending the environmental responsibility to every day life. It is, however, essential to facilitate sustainable development in the community at large, by also extending environmental awareness training programmes to other members of the local community, especially children. Where customised training kits have been developed, enterprises such as Jwaneng Mine could use such material effectively as tools for educating the broader community, thereby addressing its social and environmental responsibilities.

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