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A quantitative model to assess Social Responsibility in Environmental Science and Technology

M. Valcárcel *, R. Lucena

Department of Analytical Chemistry, University of Córdoba, Marie Curie building, Annex, Campus de Rabanales, Córdoba 14071, Spain

HIGHLIGHTS

- A quantitative model to assess Social Responsibility in Environmental Centres is developed.
- The model is based on the combination of well established written standards.
- The model relies on the definition of a hierarchical panel of indicators.
- Tools to implement the model are fully developed.

GRAPHICAL ABSTRACT

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ABSTRACT

The awareness of the impact of human activities in society and environment is known as "Social Responsibility" (SR). It has been a topic of growing interest in many enterprises since the fifties of the past Century, and its implementation/assessment is nowadays supported by international standards. There is a tendency to amplify its scope of application to other areas of the human activities, such as Research, Development and Innovation (R + D + I). In this paper, a model of quantitative assessment of Social Responsibility in Environmental Science and Technology (SR EST) is described in detail. This model is based on well established written standards as the EFQM Excellence model and the ISO 26000:2010 Guidance on SR. The definition of five hierarchies of indicators, the transformation of qualitative information into quantitative data and the dual procedure of self-evaluation and external evaluation are the milestones of the proposed model, which can be applied to Environmental Research Centres and institutions. In addition, a simplified model that facilitates its implementation is presented in the article.

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Abbreviations: CSR, Corporate Social Responsibility; EST, Environmental Science and Technology; EFQM, European Foundation of Quality Management; ILO, International Labour Organization; ISO, International Standardization Organization; NGO, Non Governmental Organization; R + D + I, Research, Development and Innovation; SA, Social Accountability; SR, Social Responsibility; SR ST, Social Responsibility in Science and Technology; SR EST, Social Responsibility in Environmental Science and Technology; UN, United Nations.

* Corresponding author. Tel./fax: +34 957 218 616.
E-mail address: qa1vacam@uco.es (M. Valcárcel).

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1. Background

According to Korgsgaard-Larsen et al. (2011) and Valcárcel and Lucena (2012a) the concept of Social Responsibility (SR), a topic well established in the enterprise realm, should be urgently introduced in the field of Science and Technology (SR ST) in order to be coherent with the Great Humanity Challenges defined in the Lund Declaration (New Worlds New Solutions Conference, 2009). In order to contextualize the topic of this work it is necessary to tidily SR, SR ST and SR EST. Also, it is important to comment on the great value of a quantification model to assess the implementation of SR EST instead of using just qualitative reports based on international written standards, which is a general tendency in Corporate Social Responsibility (CSR).

1.1. Social Responsibility (SR) concept

SR arises from the reaction against the *negative consequences* of the spectacular human developments in the past decades, which have been accomplished thanks to scientific and technical advances, leading to changes in the societal and environmental balances.

SR can be defined by compiling the extensive definition contained in the Guidance ISO 26000:2010 (ISO, 2010) as follows:

> "The awareness of an organisation/area for the impacts of its decisions on society and environment through transparent and ethical behaviour that contributes to sustainable development; it takes into account the expectations of stakeholders; it is in compliance with international norms of behaviour, and integrated throughout the organisation".

The *seven principles that support SR* are: accountability, transparency, ethical behaviour, and respect for a variety of aspects such as stakeholder's interests, rule of law, international norms of behaviour and human rights (UN).

To complete the SR concept it is interesting to describe *an interrelated set of characteristics* that can be summarised as follows: it should always be a compromise of all the people involved and should lead to a detailed strategy that fully recognises the social and environmental concerns of the activities carried out by the Centre/Institution in which it is to be implemented. This implies deep changes in internal and external management (i.e. new stakeholders never considered before – i.e. NGOs – new codes of conduct, new indicators integrated in a common control panel, etc.). The implementation of the management of SR should never be a difficulty to achieve the basic mission and vision of the institution. All of these characteristics can be summarised in one main goal: to achieve a responsible and sustainable organization.

1.2. Social Responsibility in Science and Technology (SR ST)

The concept of SR and its management has been extended from the public and private corporate realm to other facets of collective and individual human activities. Such is the case of SR of Science and Technology (SR ST), in general (Korgsgaard-Larsen et al., 2011; Valcárcel and Lucena, 2012a), and SR of Nanotechnology (Kuzma and Kuzhabekova, 2011), Nuclear Energy (Mizuo, 2008), Biotechnology (Snell, 2009), Analytical Chemistry (Valcárcel and Lucena, 2012b) among others, in particular. It is a topic of growing interest, whose main "engine" is to establish consistency between the scientific/technical activities and their impact in society and environment.

SR ST has been defined as *the responsibility of scientists from all the sectors of science to position and define their research activities in a context where they are able to contribute to the betterment of society and to help to meet the "Grand Challenges" of our time* (Korgsgaard-Larsen et al., 2011). Besides, it can be complementarily described as "a *topic directly related to the honesty and ethic behaviour of technicians, researchers, and managers involved in the R + D + I sequence of activities, as well as the society that receives their results or products*".

It is interesting to point out that education and training in SR ST is fully recognised by experts on the topic as a key aspect, especially in the first steps of the education of undergraduates, graduates and students of masters and doctorates.

In addition, the synergic relationships between the Guidance ISO 26000:2010 with other written standards (Valcárcel and Lucena, 2013) such as occupational health and safety or environmental management guides could greatly contribute to its successful implementation.

1.3. Social Responsibility in Environmental Science and Technology (SR EST)

SR EST can be defined as the awareness of scientists and technical people below to environmental centres/institutions, to contribute to the sustainability of the environment, in particular, and, in general, to the betterment of the society to help to fulfil the Grand Challenges of our time (New Worlds New Solutions Conference, 2009).

Sustainability in this context has two complementary connotations as can be seen in Fig. 1. The internal approach of SR EST means that all operations of the environmental research centres/institutions should not contribute (i.e. waste) to spoil air/soils/waters. On the other hand, the external approach (the most relevant) is oriented to improving sustainability of human activities as target of the R + D + I activities of environmental centres/institutions.

1.4. Evolution of SR: From reporting to quantitative assessment

Since the middle of the 20th Century, SR has been named "Corporate Social Responsibility" in the enterprise realm (Carrol, 1999). Its management is nowadays supported by international standards such as the ISO 26000:2010 guidance (ISO, 2010), the EFQM framework for SR (European Foundation for Quality Management, 2014), the Global Reporting Initiative (2010), the Social Accountability SA 8000:2008 (Social Accountability International, 2008), among others. These standards are based on general documents such as the United Nations Global Compact (UN: United Nations, 2012), the approaches from OECD (2001) and ILO (2009). All of them can be useful tools and frameworks for implementing the SR approach to a variety of organizations/areas involving human activities. The majority of them are oriented to

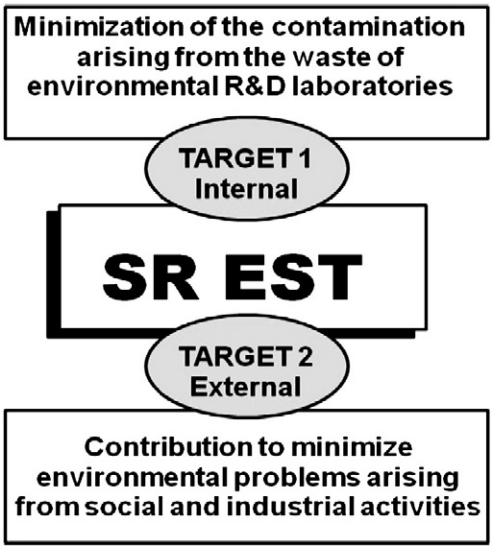

Fig. 1. The two basic connotations of Social Responsibility of Environmental Science and Technology.

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