

Human Rights in Natural Science and Technology Professions' Codes of Ethics?

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Abstract: No global professional codes for the natural science and technology professions exist. In light of how the application of new technology can affect individuals and communities, this discrepancy warrants greater scrutiny. This article analyzes the most relevant processes and seeks to explain why these processes have not resulted in global codes. Moreover, based on a human rights approach, the article gives recommendations on the future process and content of codes for science and technology professions. The relevance of human rights in the realm of individual conduct is based on the fact that while human rights treaties primarily outline State obligations, individuals have responsibility for human rights promotion. Human rights principles have only recently been subject to interests from policy makers and academics, and must be better clarified. Human rights principles are found to be relevant, but are effective only if they are applied in conjunction with substantive human rights.

Key Words: research ethics, science ethics, UNESCO, European Science Foundation, International Covenant on Economic, Social and Cultural Rights, World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), American Association for the Advancement of Science (AAAS)

Unlike the medical profession, natural science and technology professions do not have global codes of ethics. This article will also refer to the broad term 'scientific professions' (UNESCO and International Council for Science [ICSU] 1999, paragraph 41) and the more narrow term 'engineers' (Engineers Australia 2011; Engineers Ireland 2010; National Society for Professional Engineers 2007), acknowledging, however, that engineering is about developing and applying

technology, not necessarily engaging in science (Vincente 1993). Science is defined by the Oxford Reference Online as “the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment,” while technology is defined as “the application of scientific knowledge for practical purposes, especially in industry.” As we are talking about *several* natural science and technology professions, spanning from laboratory researchers to industrial engineers, the article will also refer to the ‘natural science and technology discipline.’ Those working in this discipline are able to exert considerable impacts on the lives of both individuals and communities by developing and applying new technology.

The article identifies the relevant processes that have been initiated, and seeks to explain why no international processes have resulted in the adoption of substantive global codes of ethics for those in the natural science and technology discipline. In this article ethics is operationalized as complying with minimum standards of conduct. Furthermore, the article will clarify how human rights could be relevant to such codes. Human rights represent a widely recognized ethical framework (Harris et al. 2008, 215–216; see also Hoole 2002), but human rights are not undisputed (Enderle 2011). The various challenges against human rights—which are emerging from distinct cultural or religious traditions and from the war on terror—will not be analyzed here. The article takes as a starting point that human rights are applicable also to non-state actors (UN Special Representative on Business and Human Rights 2011), and argues that human rights principles are particularly useful to guide any decision-making process involving the introduction and application of new technology. Therefore, human rights principles set out some of the crucial compliance standards that could be included in ethical codes, but not every issue relevant for natural science and technology professions can be captured by human rights principles, as will be shown below.

As stated by the American Association for the Advancement of Science (AAAS): “scientists generally share a strong sense of responsibility regarding the health and well-being of people and the planet” (AAAS 2011, 2). Moreover, the International Council for Science (ICSU) emphasizes the “scientific responsibility and accountability to society” (International Council for Science 2011). Wyndham (2012) provides five arguments for the mutual relationship between engineering and human rights, and these arguments apply equally to scientists: (i) Engineers have human rights; (ii) engineers can promote human rights; (iii) engineering provides products and processes for human rights; (iv) engineering has the potential

to violate human rights; and (v) everyone enjoys a human rights to benefit from scientific advancement, encompassing engineering efforts.

The applicability of a human rights based approach to natural science and technology's professional ethics is not unchallenged, however. Other approaches are more common, such as sustainability (National Society for Professional Engineers 2007, III.2.d), social justice (Conlon and Zandworth 2011), or approaches from specific STS (science, technology, and society) studies (ibid.).

After reviewing both human rights principles and environmental law principles, and analyzing the weaknesses and strengths of a human rights basis for professional ethics codes, the paper presents UNESCO's work on human rights and research ethics. Moreover, efforts by relevant international associations and national science ethics councils seeking to integrate human rights and professional ethics are analyzed.

Human Rights Principles

Human rights principles identify minimum standards of good conduct. In general, rights are more enforceable and with a clearer boundary, while principles are less applicable in any adjudication process, noting that principles are "always used in tandem with more precise rules" (de Sadeleer 2002, 274). Alexy explains the difference by saying that "[r]ules are norms that, given the satisfaction of specific conditions, definitively command, forbid, permit, or empower. Thus they can be characterized as 'definitive commands,'" while principles "are norms commanding that something must be realized to the highest degree that is actually and legally possible" (Alexy 1992, 145).

There is no universal agreement on what constitutes a human rights principle. The following seven human rights principles are applied in this article: dignity, non-discrimination, rule of law, accountability, transparency, participation, and empowerment (Food and Agricultural Organization 2007; for another list, see Food and Agricultural Organization 2012). These principles are relevant in all realms regulated by law: signing and enforcement of commercial contracts (commercial law), regulating and sanctioning individual behaviour (penal law), and regulating and distributing public goods (administrative law).

Before elaborating more on these principles in the context of this study, it will be argued that it is necessary to distinguish these *principles* from the *nature* of human rights.¹ Hence, the nature of human rights says something about how these rights are to be *understood*. The human rights principles says something on

the requirements on the relevant *processes* that must take place to ensure the best realization of human rights.

The first two principles must be said to be the basic foundation upon which human rights are built, namely that all human beings are entitled to human rights protection independent of the characteristics with which they are born or their own capacities. Non-discrimination is about treating like cases like and unlike cases differently. Different treatment is justified if this aims to enhance the possibilities for the less privileged to achieve substantive equality with the more privileged. This different treatment must end when the situation for those who used to be in a less favourable situation have had their situation improved up to a satisfactory level.

The next three principles highlight the role of the State apparatus. Rule of law includes access to courts, independence of the judiciary, and the availability of appropriate remedies to restore justice. Accountability is crucial in order to assess public conduct in accordance with internationally objective minimum standards. Transparency must be strived for within any public programme, legislation, or agreement, and is also about making budgets available, and having access to reliable statistics.

The two last principles emphasize the involvement of human beings in the realization of human rights. Participation is both a human rights principle and a substantive human right. Empowerment is a consequence of appropriate participation.²

There might be other principles which arguably could have been included in this listing, more specifically the principle of equality. This principle is, however, embraced by the principle of non-discrimination—as unequal treatment can be justified if this is done in order to ensure substantive equality. Moreover, the principle of good governance is covered by the totality of the seven human rights principles.

How are these principles applicable to the introduction of and application of new technologies? Dignity and non-discrimination will obviously be relevant in the context of introducing new medical technology and new technologies for food production.

The rule of law, accountability, and transparency are mutually reinforcing. Access to independent courts will be a manner by which possible abuses of technology can be addressed. As regards accountability, this principle will apply to any policies on the introduction of technology, and the manner in which the technology is introduced, saying that the State retains the overall accountability even if the responsibility for providing particular goods or services are left to private actors. Transparency will be particularly relevant in the context of the introduction of new

technology, where the private actors tend to only emphasize the positive aspects, and none of the potentially harmful aspects of the introduction of new technology.

Participation and empowerment is crucial for a successful introduction and absorption of technology. Learning how to apply—and maintain—new technology is absolutely necessary for the adequate social functioning of new technology. Excluding persons from this learning process will contribute to keep them in a marginalised situation.

Environmental Law Principles, Primarily the Precautionary Principle

While human rights principles address several concerns, they are formulated with relatively general terms. Hence, in the context of introducing and applying new technology, environmental principles are also relevant. Within the principles analyzed by Beder (2006), the emphasis will be on the precautionary principle. The UN first endorsed the precautionary principle in 1982, with the relevant provision reading “where potential adverse effects are not fully understood, the activities should not proceed” (United Nations 1982b, paragraph 11b). This expresses a strong version of the precautionary principle—even if the relatively soft term ‘should’ is applied, and not the term ‘shall.’ The weak version of the precautionary principle does not require a complete halt, but rather a modification, and is embedded in a cost-benefit approach, as will be explained below. While a dispute settlement panel of the World Trade Organization said that the legal status of the precautionary principle remains unsettled (World Trade Organization 2006, paragraph 289), it is nevertheless recognized in the EU Treaty of Lisbon (European Union 2007, paragraph 191(2)).

Moreover, while the precautionary principle places the responsibility on the regulatory authorities, there is also a responsibility on those who introduce a particular product, process or activity: “Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm” (Earth Charter 2000, paragraph 6b; see also Saunders undated; Saunders 2010). Finally, the term ‘precautionary approach’ is recognized as the seventh principle of the UN Global Compact.

Hence, there is agreement on neither the scope of nor the legal nature of the precautionary principle. One scholarly definition reads:

Where, following an assessment of available scientific information, there are reasonable grounds for concern for the possibility of adverse effects but scientific uncertainty persists, provisional risk management measures

based on a broad cost/benefit analysis whereby priority will be given to human health and the environment, necessary to ensure the chosen high level of protection in the Community and proportionate to this level of protection, may be adopted, pending further scientific information for a more comprehensive risk assessment, without having to wait until the reality and seriousness of those adverse effects become fully apparent. (von Schomberg 2006, 37)

By emphasizing that “provisional risk management measures . . . may be adopted,” the focus is clearly on the regulatory authorities. Moreover, the definition refers to both risk assessment and risk management, the latter involving a wider range of policy tools, including the possible application of human rights (Cottier 2008, 48–49). We also see that the definition emphasizes a cost/benefit analysis, in a similar fashion to the relevant provision of the United Nations Framework Convention on Climate Change.³

Another approach says that the actor placing new products on the market “has to demonstrate beyond reasonable doubt that it is safe” (Saunders undated, 2) where ‘safe’ must be understood to imply that the risks are small and are outweighed by the benefits. In a French case where the appeals court found that “because of the fragmentary state of knowledge, there is a need to pursue research on the possible harmfulness of an exposure,” it nevertheless ordered the company to pay compensation to the plaintiffs and to remove the mast within four months (Versailles Court of Appeal 2009).

A review of various standards concluded that the precautionary principle has four ‘versions’: scientific uncertainty should not automatically preclude regulation; regulatory controls should incorporate a margin of safety; activities that present an uncertain potential for significant harm should be subject to best technology available requirements; and activities that present an uncertain potential for significant harm should be prohibited (Stewart 2002, 76).

An analysis of the actual application of the precautionary principle finds that “the EU application of the precautionary approach in its territory and its application in the international arena are completely different” (Recuerda 2008, 39). In the latter realm EU is said to apply precautionary measures where “the cause for concern is based just on preliminary scientific findings” (ibid.).

Acknowledging the disputed nature and application of the precautionary principle, this should not imply less emphasis on its relevance in the context of natural science and technology. The applicability of the precautionary principle does not require absolute certainty, but a transparent assessment of both the benefits and

the risks resulting from the application of the relevant product or process. These concerns should also be present when natural scientists and engineers invent and develop products and processes. Hence, the precautionary principle is relevant when analyzing codes of ethics for the natural science and technology professions.

Moreover, the links between the precautionary principle and human rights is evident, as the purpose of human rights law is to protect the integrity and dignity of every human beings, and as a human rights approach requires that a particular attention is given to the most vulnerable persons and groups of persons, including women, children, persons with disabilities, minorities, and indigenous peoples.

Are Human Rights Applicable To Assess Individual Professional Conduct?

As we have found that human rights principles and the precautionary principle are relevant in the context of introducing and applying new science and technology, there will now be an assessment of the weaknesses and strengths of a human rights approach applying to natural scientists and others applying new technology.

The greatest weakness of human rights as applied to the conduct of individuals is obviously that human rights are written by States for States, not to specify individuals' conduct. On the other hand, while human rights primarily regulate a relationship between an individual and the State, human rights promotion will also depend on relationships between individuals, based on responsible individual conduct.⁴

Moreover, while human rights define States—and to a lesser extent the international community⁵—as their obligation holders, this does not relieve individuals from responsibility. This is most comprehensively expressed by the common sixth preambular paragraph to the International Covenant on Economic, Social and Cultural Rights (ICESCR) and the International Covenant on Civil and Political Rights (ICCPR), reading:

the individual, having duties to other individuals and to the community to which he belongs, is under a responsibility to strive for the promotion and observance of the rights recognized in the present Covenant.

Also the last preambular paragraph of the Universal Declaration of Human Rights specifies that “every individual and every organ of society . . . shall strive . . . to promote respect for these rights and freedoms and . . . to secure their universal and effective recognition and observance.” It is reasonable to state that those individuals who are in a position to impact on the health and well-being of fellow human

beings have particular responsibilities to strive for the respect, recognition, promotion, and observance of human rights.

Those belonging to the natural science and technology professions can influence the health and well-being of other human beings to a considerable extent, and they have an individual responsibility for their actions and decisions (Engineers Australia 2011; Engineers Ireland 2010; National Society for Professional Engineers 2007). Natural science research can, on the one hand, be driven by a motivation of relieving suffering and making better use of scarce resources. On the other hand, such research can be driven by a motivation to control and dominate others, its most extreme form being modern weapons of mass destruction.

While having a responsibility to society, as well as a responsibility to act for one's employer, scientists should not generally be directed in their research. Academic freedom applies to those working at academic institutions, while scientific freedom applies to all involved in scientific efforts, with different emphasis between states (Barendt 2011, 51–57). The corresponding obligations for the state apply most directly in relation to scientists working in public institutions. While the principle of institutional autonomy makes it more difficult for the state to interfere in order to ensure scientific freedom for scientists that work in private institutions, academic or not, these scientists cannot be restricted from enjoying academic or scientific freedom. Scientific freedom is recognized in Article 15.3 of the ICESCR, reading “The States Parties to the present Covenant undertake to respect the freedom indispensable for scientific research and creative activity,” in Article 14.3 of the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, and in Article 13 of the EU Charter on Fundamental Rights (CFR), reading “The arts and sciences research shall be free of constraint. Academic freedom shall be respected.”⁶

While these provisions can be understood to relate to a respect obligation for states, implying non-interference, the revised Guidelines on State Reporting on ICESCR Article 15.3 (United Nations 2009, paragraph 72) has changed the verb from ‘respect’ to ‘protect.’⁷ A protect obligation implies regulating others from interfering. This shift indicates an increased awareness of the many actors beyond the State that can interfere with scientific freedom.

Moreover, scientific freedom must be exercised responsibly, as noted by the ICSU:

As the right has been interpreted, scientific freedom is not absolute, it must be balanced with the canons of scientific responsibility and accountability

to society, including respect to research practices. (International Council for Science 2011; see also International Council for Science 2008, 17)

This emphasis on responsibility and accountability is reasonable. As with all other human rights, the right to scientific freedom must be interpreted and applied with a reference to all other human rights, requiring complex balancing.

Human rights is about establishing a minimum basis for good conduct through conscientious efforts by all relevant actors, which have also been termed 'obligation of conduct.' Said differently, "how research is conducted is as important as its results" (Parker 2010, 564). Awareness of and application of human rights principles, particularly non-discrimination, participation and transparency, will improve conduct.

It must be acknowledged that 'human rights' is a legal construct and that human rights litigation is crucial for human rights realization. An 'adversarial adjudication' approach as applied by courts is essentially about proving one side right and one side wrong. Human rights is, however, also a moral construct, and the most effective strategy for human rights realization is primarily done through broad-based awareness-raising and by applying institutions and other arrangements for better monitoring and accountability.

Human Rights in UNESCO's Work on Codes of Ethics

UNESCO has highlighted two approaches for analyzing the prospects for the interface between human rights and natural science and technology. One approach emphasizes the individual responsibility for scientists and engineers undertaking natural science and technology research, including the practical applications. Another approach emphasizes the whole context of science and technology, identifying the responsibilities of all involved actors in order to promote human and social development nationally and internationally by the means of science, while respecting both the environment and human dignity. UNESCO refers to the former as research ethics, and the latter as science ethics (World Commission on the Ethics of Scientific Knowledge and Technology [COMEST] 2009).⁸ The term professional ethics is understood as falling within the scope of research ethics.

It can be argued that UNESCO reveals an unclear distinction between *science* ethics and *research* ethics. As an example, the 2009 report to COMEST on science ethics, says, inter alia:

The ethical principles developed for States and other institutions in the existing normative framework should be extended in a coherent fashion to individual researchers and corporate scientists. (COMEST 2009b, 21)

In other words, the intention is that the ethical principles developed for States should be applicable to all natural scientists and researchers, irrespective of their employer. While the States' obligations is to regulate the activities of any private actors in accordance with the obligation to protect, it is not clear that the best manner to do this is to extend ethical principles adopted for States to natural science researchers—even if it is beyond doubt that everyone has a responsibility to strive for the promotion and observance of human rights. By giving too much weight to State policies, scientific freedom can be impeded.

We will now analyze whether other processes under the auspices of UNESCO have contributed to a clearer understanding of research ethics for the natural science and technology professions, and what role—if any—human rights can play in this research ethics.

At the first World Conference on Science in 1999, the Declaration said that “a code of ethics based on relevant norms enshrined in international human rights instruments should be established for scientific professions” (UNESCO and ICSU 1999, paragraph 41). While the term ‘scientific professions’ is applied, this term is less specific than the terms ‘teaching professions’ or ‘medical professions.’ From the context where it appears, there can be no doubt that it applies to all those undertaking research applying to natural science and technology, which is a highly diverse group, and no single profession. It can therefore be argued that the sentence could rather have ended with the wording “those working in the natural science and technology discipline.” No specification for this process was identified in this paragraph, but the previous paragraph addressed COMEST.

How did COMEST implement the 1999 recommendation? Twelve years after the World Conference on Science, COMEST decided to end its process, by noting that the document that had been developed through its process—and that was now in its sixth version—“did not produce specific enough conclusions” and “would not produce . . . added value” (COMEST 2011, 6).

The specific mandate for this process was given in 2004, when the UNESCO Executive Board commissioned the UNESCO Director-General and COMEST to write a study “on the advisability of elaborating an international declaration on science ethics to serve as a basis for an ethical code of conduct for scientists” (UNESCO 2004, paragraph 7). This study was then resubmitted in revised

versions, but subsequent decisions at COMEST tended to emphasize the 1974 Recommendation on the Status of Scientific Researchers (COMEST 2009, 2–3; COMEST 2011, 6). In 2009, while acknowledging the limitations of the Recommendation,⁹ COMEST decided to initiate a monitoring process to “ensure integration of science ethics and science policy issues” emphasizing “the practical steps that might be taken to supplement the 1974 Recommendation, inter alia through enhanced articulation with the 1999 Declaration on Science and the Use of Scientific Knowledge.”¹⁰

In 2012, UNESCO’s Executive Board mandated the UNESCO Director-General to establish an ad hoc expert group to prepare “a study of the technical and legal aspects relating to the desirability of revising the 1974 Recommendation on the Status of Scientific Researchers” (UNESCO 2012, 5, decision 6). Delegates presented several arguments in favor of a revision of the 1974 Recommendations, including increased emphasis on precautionary approaches, conditions of access to scientific information, growing commercial and security pressures on science, and the impact of new information technologies (*ibid.*, 3). A specific proposal was that social responsibility of scientists and research ethics should be better reflected in a possibly revised text, by adding “Social Responsibility” in the title of the Recommendation (*ibid.*).

Hence, notwithstanding the outcome of the possible revision of the 1974 Recommendation, the 1999 Declaration’s call for a code of ethics based on human rights has been replaced by general policy considerations. Are there any explanations for this shift from human-rights based research ethics to policy-focused science governance?

First, the uncertainties regarding whether UNESCO should ‘supplement’ the 1974 Recommendation (COMEST 2009a, 2) or if it should be subject to ‘updating’ (UNESCO 2006, paragraph 22) or ‘revising’ (UNESCO 2012, 5, decision 6) has not paved the way for an agreeable and easily comprehensive process. Second, the unclear division of responsibility between States and the scientific community, including the format of the “wide participatory process” (UNESCO 2006, paragraph 25.7) has led UNESCO to be sidelined by the efforts of international scientific associations, as will be seen below. Third, as a result of diverging interests and perceptions among States, there is a lack of a “strong and broad political commitment” (*ibid.*, paragraph 11) to allow UNESCO to fulfill its role. Fourth, the current emphasis in UNESCO is on implementation of the existing standards, not developing new ones (ten Have 2010). Moreover, the UNESCO 2008–2013 strategy applies the

phrase “refinement of existing normative instruments” (UNESCO 2008, paragraph 76), without clarifying the exact content of such refinement.

Other International Standards

When COMEST in 2011 decided not to proceed with the document on science ethics, it noted that “other institutional processes . . . had produced significant clarifications of general ethical principles to regulate science and the professional conduct of scientists” (COMEST 2011, 6). Five such clarifications are listed: *Best Practices for Ensuring Scientific Integrity and Preventing Misconduct* (OECD 2007), *Facilitating International Research Misconduct Investigations* (OECD 2009), *Freedom, Responsibility and Universality of Science* (International Council for Science 2008), *The Singapore Statement on Research Integrity*, adopted at the Second World Conference on Research Integrity (WCRI) (2010), and *Fostering Research Integrity in Europe*, containing a Code of Conduct (European Science Foundation [ESF] 2010); see also ESF and All European Academies (ALLEA) 2011). These standards on scientific misconduct, including plagiarism, apply to all kinds of research activities, not exclusively to natural science and technology. The development of the European Codes of Conduct is motivated by the fact that the ESF finds that national research integrity guidelines and institutions only exist in Australia, Canada, Denmark, Finland, Germany, Norway and the USA (ESF 2010, 11; see also ESF 2008).

As we see from the titles, four of the five are primarily related to research integrity and scientific misconduct. Also the ICSU report on balancing freedom (of movement, association, expression, as well as access to science and scientific information) with responsibilities does address research integrity. The Singapore Statement lists four principles and fourteen responsibilities, all being formulated on a general level. When inviting to the Singapore Conference it was stated that participants will “work together to develop guidelines and recommendations for promoting integrity in research” and this includes ‘Global codes of conduct.’ No such global codes were adopted (World Conference on Research Integrity 2010).

While scientific misconduct can impact on the realization of human rights of others (ESF 2010, 14), the norms basis for integrating human rights and research ethics should be broader than what is identified in documents outlining scientific misconduct. The potential impact on people and nature resulting from the conduct of scientists cannot adequately be encompassed by general rules on scientific misconduct. Several human rights are relevant to the conduct of science,

and in addition to the human rights acknowledged in the ICSU report referred to above, they include the right to freely chose one's work (ICESCR Article 6.1) and the right to the protection of the moral and material interests resulting from one's scientific production (ICESCR Article 15.1(c)).

Hence, both general and discipline-specific codes are more likely to be adopted by the professions' associations themselves than by intergovernmental organisations. This concurs with Weeramantry, finding that regulation "comes best from the scientists themselves" (Weeramantry 1998, 460). He also recognizes that a code developed by international scientific bodies can subsequently be approved by the UN General Assembly (*ibid.*, 465).¹¹

As seen above, UNESCO has failed to propose "a code of ethics based on relevant norms enshrined in international human rights instruments should be established for scientific professions" (UNESCO and ICSU 1999, paragraph 41), and the outcome—if any—of the revising of the 1974 Recommendation is not given (UNESCO 2012, 5, decision 6). Based on UNESCO's signals over the last decade on the frame and format of any code applying to natural science and technology professions, it should probably not be regretted that UNESCO has been unable to implement the 1999 decision. UNESCO's approach would be in danger of embedding codes or principles in political considerations, but some proposals are more promising (*ibid.*, 3).

If the specific codes do not build on human rights, those working in the realm of natural science and technology might have no specific human rights-based guidance. In order to assess whether association-specific codes can be appropriate, a review of some of the recently adopted national association-specific codes is therefore pertinent.

National Association-specific Ethical Codes— Do They Build on Human Rights?

There is an uncertain number of professional, discipline-specific or association-specific codes at national, regional, and international levels.¹² A review done by the Science and Human Rights Programme at the American Association for the Advancement of Science (AAAS) found that only twelve of these codes of ethics referred to the term human rights,¹³ while the UNESCO Director-General found that of the sixty-five codes surveyed, fourteen referred to human rights and twenty referred to human dignity (UNESCO 2006, 6). Neither of these reviews are exhaustive, as the former seems to cover primarily international codes and

standards developed by associations based in the USA, and have not reviewed the considerable number of codes of ethics developed by national associations in other States, and the latter sample of sixty-five codes is lower than the total number of codes globally.

Hence, while the number of codes of ethics that refer to human rights is certainly higher than those identified by these surveys, it is not that interesting to undertake a counting of those association-specific codes that *explicitly* apply the term human rights. A review will be undertaken to assess the extent to which these codes actually build on human rights, hence having an *implicit* human rights basis.¹⁴

One example of a code of conduct is Engineers Ireland, which requires members to be "familiar with the substance and intent of national, European Union and other legislation relevant to their field of engineering practice" (Engineers Ireland 2010, paragraph 3.5). The term 'other legislation' must be understood to refer to international treaties. This requirement is vague, however, as it does not specify any conduct, only that the members shall be 'familiar' with various kinds of legislation. The Code of Ethics starts, moreover, by setting out standards for relationships with other engineers and professional colleagues that are substantively different from their relationship to society in general, the latter requiring only to "behave with integrity and objectivity" (*ibid.*, paragraph 1.2), while the former requires the engineers to "do nothing directly or indirectly to injure maliciously their reputation, practice, employment or livelihood" (*ibid.*, paragraph 1.1). While subsequent paragraphs are more comprehensive regarding the social and environmental impact,¹⁵ there is a high threshold for their application, by the use of terms such as 'serious detriment'.

Another code on engineers' social responsibility has been adopted by Engineers Australia (2011). In addition to the Code of Ethics, certain 'tenets' of the Code have been identified, the first reading "Members shall place their responsibility for the welfare, health and safety of the community before their responsibility to sectional or private interests, or to other members" (Engineers Australia 2010, paragraph 1). This is a comprehensive requirement, which is not found in the Code of Ethics by Engineers Ireland, and requires a broad-based understanding of relevant conditions. The sixth paragraph of the tenets says:

Members shall, where relevant, take reasonable steps to inform themselves, their clients and employers, of the social, environmental, economic and other possible consequences which may arise from their actions.

While this does not say anything about the termination of a project, it is noteworthy that the members are required to take 'reasonable steps' to inform their clients about any consequences of certain actions.

If we turn to the Engineers Australia's Code of Ethics itself, we will now test its principles in relation to the seven human rights principles introduced above. While the term 'human rights' is not explicitly mentioned, the principles of the Code are embedded in human rights principles.¹⁶ Does this imply that the Engineers Australia's Code of Ethics implicitly builds on human rights? Not necessarily, but the effect of complying with the Code will result in more effective protection of human rights. It can be argued, however, that accountability is regulated more comprehensively in the Engineers Ireland Code of Ethics (Engineers Ireland 2010, Part 4).

Human rights are explicitly referred to in the Code of Ethics adopted by the Indian Institution of Engineers (Institution of Engineers [India] 2004, paragraph 1.1.2). While this Code of Ethics applies a non-problematizing wording which do fall within the human rights principles in a similar manner as the Engineers Australia, it provides the most explicit wording regarding the precautionary principle, as it requires that its Corporate members:

should keep his employer or client fully informed on all matters which are likely to lead to a conflict of interest or when, in his judgement, a project will not be viable on the basis of commercial, technical, environmental or any other risks. (*ibid.*, paragraph 4.1)

The phrase 'will not be viable' does not read 'cannot proceed.' On the other hand, when a member finds that the environmental risks are of such a nature that the project will not be viable, this implies that the project should either be substantively amended, scaled down—or discontinued.

While Engineers Australia code implicitly builds on human rights, there are many ways through which this and other codes can be improved. First, by referring more explicitly to substantive human rights and human rights principles. Second, by referring not only to 'legal and statutory requirements,' but also require understanding of the existence of—and compliance with—customary law in the region in which the project is carried out. Third, by specifying that members shall not exploit the existence of weak legislation or enforcement mechanisms in one State to involve in activities in this State that one would not undertake in another State. Fourth, by including a provision with similar or stronger wording than India's National Institution of Engineers' Codes of conduct on environmentally non-viable projects—or

by an explicit requirement that the affected communities must have given their free, prior and informed consent (FPIC).¹⁷ Fifth, by outlining in more detail the content of—and procedure involving the application of—the ‘disciplinary regulations.’

If human rights were specified to guide the conduct of engineers, the engineers would have to become more familiar with the content of human rights. It is difficult to assess the extent to which human rights are at all part of the curriculum of engineers, but sustainable development is applied when addressing issues which are relevant for human rights for communities (COMEST 2003, 20).

Hence, this review indicates that the codes of ethics in the realm of engineering—as one specific area of natural science—are not adequately comprehensive regarding human rights. The review also, however, shows that in order to assess how human rights are taken into account in these codes, it is not fully appropriate only to count those codes which explicitly refer to human rights.

National Ethical Research Guidelines—Do They Build on Human Rights?

As found above, only seven States are recognized to have established national research integrity procedures or guidelines and national offices to oversee their application (ESF 2010, 11). The same study finds that measures to promote responsibilities must encompass prevention, investigation and imposition of sanctions (ibid., 10), and specifies that the objective is to “ensure that global principles can be translated into national policy and practice” (ibid.). Hence, legislation is necessary in order to establish this structure as a part of national policy, implying that ‘national offices’ must be understood as public bodies established by the means of legislation and/or regulation.

A comparison will be made between the Nordic states Denmark (2009 and 2010), Finland (2002), and Norway (2006). The initial observation is that their relevant legislation on research ethics differ considerably.

First, the Danish system addresses only scientific misconduct, while the two others specify that the mandate includes ‘to inform the public about research ethics’ (Finland Section 2.5; Norwegian National Committee for Research Ethics in Science and Technology [NENT] 2007, Section III.3).

Second, concerning sanctions for scientific misconduct, these are outlined in detail in the Danish Act (Denmark 2010, Section 31(4)) and Executive Order (Denmark 2009, Section 15). The Executive Order also requires that any financial contributor is notified if scientific dishonesty is found. In Finland, it is the director or rector who is to decide on the action and sanctions warranted (Finnish National Advisory Board on Research Ethics [TENK] 2002, paragraph 9). To address appeals

on any decisions on scientific misconduct, this is in Denmark done by the same committee that considered the case in the first instance, but only when “new information is received which, if it had been available during the consideration of the case, might probably have led to a different outcome” (Denmark 2009, Section 14; see also Denmark 2010, Section 34). The Norwegian system provides for the establishment of a specially appointed commission possibility for appeal (Norway 2006, Section 5) while TENK is the appeals body in Finland, and “may propose that the rector or director undertake another investigation” (TENK 2002, paragraph 12). Hence, the Danish system is the most rigid, while the Finnish system is the most decentralized, and the handling allegations of scientific misconduct might leave too little room for independent investigations.

In neither of the legislation on research ethics in the three States is there any explicit reference to human rights. In the NENT Guidelines, however, there are two references; one saying that research cannot violate the five categories of human rights (civil, political, economic, social and cultural), and the other introducing human rights concerns in the context of the precautionary principle (NENT 2008a, 12 and 16n4). The preamble of the Guidelines explicitly states that they are supplementary to international research ethics guidelines—without giving a systematic listing of such guidelines. In the context of traditional knowledge (*ibid.*, 19n9), there is a reference to the 1999 Declaration (UNESCO and ICSU 1999, paragraph 26).

NENT’s mandate when considering specific cases is only to make recommendations. The recommendation could be that the research project is not undertaken, in accordance with the precautionary principle (NENT 2009).

There is no evidence that human rights concerns have been explicitly applied in the recommendations by NENT, but one particular request raised human rights concerns. This request was made by the Genographic Project, which seeks to collect human genes from all over the world.¹⁸ As the Project does not specifically address the health aspects of the gene collection, it was handled by NENT (2008b). It is relevant to note that the Norwegian legislation on biobanks only applies to the medical research (Norway 2003; Norway 2004; Norway 2008). There was an attempt to amend the previous Norwegian Act on biotechnology to extend its scope to apply to other research (Norwegian Ministry of Health and Care Services 1999, Section 1(3)), but this proposal was turned down by the Norwegian Parliament (2000, 3).

NENT emphasized two concerns when considering the request, acknowledging that other bodies had to approve the establishment of the biobank itself

(Norway 2008, Section 25, paragraph 1): First, the Project must be considered in light of indigenous peoples issues. Second, the Sami Parliament should be consulted before a decision is made. These recommendations must be considered to be in accordance with both the United Nations Declaration on the Rights of Indigenous Peoples on control of their human and genetic resources (United Nations 2007, Article 31; see also Articles 18 and 19), and the International Declaration on Human Genetic Data, requiring FPIC (UNESCO 2003, Article 8(a)). Hence, by recommending that the most representative indigenous peoples' body in Norway should be consulted, NENT sought to protect indigenous peoples' human rights. Little legal research, however, is done on genetic screening of indigenous peoples (Motoc 2009).

Conclusion

The article has shown why human rights can be seen as providing an overall framework for the good conduct for those working in the natural science and technology discipline—acknowledging that the major human rights treaties, the ICCPR and the ICESCR, explicitly recognize everyone's duties to other individuals and to the community. While there are already strict ethical requirements on research (Hansson 2011), there are many unmet expectations for a global code applying to natural science and technology.

Researchers operate in different macro-political or project-specific contexts which might affect their freedom to operate, and the overall priorities of the institutions, companies, or funders might affect the priorities of the researchers. Moreover, specific conditions that researchers have to sign up to, or general loyalty requirements can affect their specific public relationship. Any factors relating to the source of funds, conditions of employment and overall priorities of one's institution should of course never allow for any compromises regarding the overall research quality and the specific conduct of research. As we saw above, every individual has a responsibility to promote human rights.

As we have seen, human rights principles establish standards for minimum standards of conduct. Are there any arguments against emphasizing human rights principles in the standards set for conduct in the realm of natural science and technology, irrespective of whether a global code will be adopted or not, and can such arguments against the relevance of human rights be refuted?

First, human rights principles, to be effective and ensure accountability, must be applied in conjunction with substantive human rights. This requires adequate understanding of such human rights. While business corporations—in the context

of a human rights impact assessment—are expected to have a precise understanding of relevant human rights standards and local customary rights (UN Special Representative on Business and Human Rights 2007, paragraph 23), this cannot be required by the individuals working for this corporation. Therefore, an adequate application of human rights principle will require an understanding of legal norms that not every individual can be expected to possess. As a counter-argument, it is reasonable to state that it is not difficult to understand the essence of particularly social human rights.

Second, even if one were to have an adequate understanding of both the principles and the substantive human rights, their wording is too general and their enforcement mechanisms too weak to actually result in new forms of research conduct. This argument can be met by emphasizing that human rights also have a moral, and not only a legal basis. By observing these standards and principles more carefully, the conduct when developing, disseminating, and applying technology will be improved. In order to ensure accountability, however, a sanctions mechanism has to be in place.

Third, if human rights are at all referred to, there tends to be a mere listing of the categories of human rights (NENT 2008a, 12). This does not provide any assistance in order to understand exactly which human rights that are referred to, or the scope of these rights. This objection must be met by adequate training and information following the adoption of the codes or guidelines, as these documents in themselves cannot be expected to encompass a comprehensive clarification. Other resources are available. The International Standards Organization (ISO) has developed ISO 26000 on social responsibility, which is a guidance document, and not a basis for certification. Section 6.3 on human rights covers ten pages.

Fourth with the exception of the Convention on the Rights of Persons with Disabilities Article 3, human rights principles have not received formal endorsement in any legally binding instrument and their overall status in international law is therefore uncertain. It is, however, relevant to note that the human rights principles are increasingly acknowledged.¹⁹ Moreover, human rights are formulated in a way which allows them to be adaptable to different contexts.

Fifth, it is reported that “the superior method for teaching engineering ethics is through the use of case studies” (Abaté 2011, 589; see Harris et al. 2008, 234–285 for forty-five cases). Presenting cases in order to show problems and solutions can be combined with an approach that seeks to develop the principled thinking of those qualifying for or working in natural science and technology.

Hence, while all the five arguments are relevant, they can also be refuted by other arguments. These arguments apply irrespective of whether there will be a global code adopted by an intergovernmental body or codes adopted by the professions' associations themselves.

Acknowledgments

Thanks to Stefan Eriksson and Henk Ten Have for comments on an earlier version. The usual disclaimers apply.

Endnotes

1. United Nations Development Group 2003, 2, lists as human rights principles: universality and inalienability; indivisibility; interdependence and inter-relatedness; equality and non-discrimination; participation and inclusion; accountability and rule of law. The nature of human rights is outlined in the Vienna Declaration and Programme of Action by stating: 'All human rights are universal, indivisible and interdependent and interrelated,' see United Nations 1993, paragraph 5. For an argument why the FAO principles are preferred, see Haugen 2011a.

2. Empowerment is outlined most comprehensively in the International Covenant on Economic, Social and Cultural Rights (ICESCR) Article 13.1, outlining the objectives of education, namely '*the full development of the human personality and the sense of its dignity, and shall strengthen the respect for human rights and fundamental freedoms. They further agree that education shall enable all persons to participate effectively in a free society.*'

3. Article 3.3 of the UNFCCC reads (extract): "lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective." For a criticism on cost-benefit analysis, see Künzler 2011.

4. There has been one failed attempt of adopting a declaration on individual human rights responsibility, see United Nations 2003. The proposal met with harsh criticism, with States saying that the declaration "is contrary to the principles on which the international human rights system is built" (United Nations 2005a, paragraph 3) and "would undermine the fundamental role of the States in safeguarding and guaranteeing the rights of all individuals" (ibid., paragraph 11). In a 2005 decision in the Commission on Human Rights, a mandate was given—with 26 against 25 votes—to prepare "a new initial version of the pre-draft declaration on human social responsibilities"; see United Nations 2005b. This decision has not been implemented.

5. For specifications on the 'obligations of actors other than States parties,' see CESCR (Committee on Economic, Social and Cultural Rights) 2000, paragraphs

63–65; CESCR 2003, paragraph 60; CESCR 2006, paragraphs 55–57; CESCR 2009, paragraphs 73–76.

6. A Legal Explanation to this article reads: “The right is deduced primarily from the right to freedom of thought and expression. It is to be exercised having regard to Article 1 and may be subject to the limitations authorized by Article 10 of the ECHR.” (www.eucharter.org/home.php?page_id=20). It is problematic to link academic freedom too closely to freedom of thought and expression, as academic freedom is a profession-based freedom relating to the conduct of research and teaching for the purposes of revealing truths and promoting knowledge, and is not primarily about expressing public opinions; see Barendt 2011.

7. The whole paragraph reads: “Indicate the legal provisions in place to protect the freedom indispensable for scientific research and creative activity and any restrictions on the exercise of this freedom.” For an analysis of ICESCR Article 15.3, see Haugen 2011b, chapter 3.

8. This categorization appears at Unesco’s homepage ‘Ethics of Science and Technology Programme’; http://portal.unesco.org/shs/en/ev.php-URL_ID%3D10581&URL_DO%3DDO_TOPIC&URL_SECTION%3D201.html.

9. Note, however, that the 2006 report of the UNESCO Director-General (UNESCO 2006) states at paragraph 22 that the Recommendation ‘is a relevant and coherent text even nowadays.’

10. Also ICSU referred to COMEST’s work in the realm of science ethics by applying the phrase “up-dating a declaration on the status of scientific workers” (International Council for Science 2010, 10); the term ‘updating’ is also applied in UNESCO 2006, paragraph 22.

11. The UN General Assembly has adopted one resolution on professional ethics; see United Nations 1982a.

12. CODEX, at the Centre for Research Ethics and Bioethics at the University of Uppsala, provides a database on ‘Rules and guidelines for research.’ www.codex.uu.se/en/regler.shtml#B; UNESCO provides the ‘Global Ethics Observatory’ www.unesco.org/shs/ethics/geo/user/?action=select&lng=en&db=. Database 5 on ‘Codes of Conduct’ includes more than 150 codes, but does not include all codes.

13. The AAAS document ‘Include human rights in their code of ethics’ is available with the author.

14. There are 33 codes of conduct for engineering science professionals available under Database 5 of the Global Ethics Observatory (see note 13), some of which are company-specific and some of which are for biomedical laboratory scientists. It is relevant to note that a ‘Guide to Human Rights Impact Assessment and Management’ was adopted in 2010 by the International Finance Corporation et al.; see also UN Special Representative on Business and Human Rights 2007, paragraphs 12 through 16 and 23.

15. Paragraph 1.9 says: “A Member shall not engage in any activity which he/she knows or has reasonable grounds for believing is likely to result in a serious detriment to any person or persons.” Moreover, paragraph 2.1 says that “Members shall strive to eliminate risks to health and safety” and “undertake to minimise or eliminate any adverse impact on the natural environment.” Hence, the Code of conduct gives no basis for not proceeding with a project, as is emphasized in some versions of the precautionary principle.

16. Dignity (Guideline 1.3), non-discrimination (ibid., Guideline 1.3a and 1.3b), rule of law (ibid., Guideline 2.3a), transparency (ibid., Guideline 3.3a), accountability (ibid., Guideline 1.2c; see also introductory text on ‘disciplinary regulations’), participation (ibid., Guideline 4.1.c) and empowerment (ibid., Guideline 2.1 d).

17. Guidelines on FPIC have been developed by the UN-REDD (2013) (*Reduced Emissions for Deforestation and Forest Degradation*). Note that the FPIC has been included in recent multi-stakeholder standards on biofuels; see Roundtable on Sustainable Biofuels 2010, principle 12a; Roundtable on Sustainable Palm Oil 2007, criterion 2.3; Roundtable on Responsible Soy 2010, criterion 3.2.2; Bonsucro 2011, 22 (principle on ‘Fair Representation and Participation of Indigenous and tribal peoples’). On the other hand, the World Bank has not explicitly endorsed FPIC; see World Bank 2005, paragraph 20, unlike its lending facility for the private sector; see International Finance Corporation 2012, paragraphs 13–17.

18. David Comas, the Investigator for the Genographic Project in Western and Central Europe, informed the author (e-mail 26 January 2011) that they had asked for a “permission to collect Norwegian samples for a population genetics study. The committee informed us that the application will not be accepted in the Bioethics committee without a Norwegian partner. Unfortunately until now, we have tried unsuccessfully to contact local researchers in Norway but we have not received any answer.” This is confirmed by the (then) NENT Secretariat leader (Matthias Kaiser, e-mail 26 January 2011), saying that the requirement of a Norwegian partner and an assessment by a regional committee before NENT (and NESH) could consider the request, was communicated by telephone to Comas.

19. For recognition of human rights principles in a non-binding document adopted after an inter-governmental negotiation, see Food and Agricultural Organization 2012, Guideline 3B.

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