WSC Academic Day 2016
Standardization for sustainability: the role of education

On the evaluation and the communication of data and decisions about sustainability

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Sustainability is a complex subject, imposing trade-offs and socially controversial decisions, based on concepts such as ‘parts per million’, ‘reliability of data’, ‘statistical extrapolation’, ‘sensitivity of a model’, ...
Our students are growing in a society where “all is relative” is common saying, backed up by philosophical positions such as “pure data is not available”, “the given acknowledged as taken”, “anything holds”, …

Their implicit assumption is that outside the lab data and opinion are not really distinct
We have a problem of educating to scientific literacy

The critical issue in this context is:
how can sustainability be presented in rational terms?

Standardization can have a strategic role on this matter:
even if complete objectivity is not possible,
intersubjectivity is a reachable target,
as we know in terms of consensus
Consensus on scientific and technical topics should be based on data (as distinguished from opinions).

And if “pure” data is not available then there should be possible to reach agreements on the quality of “impure” data:

in order to properly deal with sustainability challenges our society requires public understanding and trust on data.
An example:

Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties

“These notes define a common approach and calibrated language that can be used broadly for developing expert judgments and for evaluating and communicating the degree of certainty in findings of the assessment process.”

Scientific literacy requires indeed
(i) a “calibrated language” and
(ii) a “common approach”
for evaluating and communicating
the quality of data and decisions

This is a basic task of metrology,
“the science of measurement and its application”
Standardization is actively involved in this endeavor, in the Joint Committee for Guides in Metrology (JCGM):

http://www.bipm.org/en/commissions/jc/jcgm

an organization of “broadly-based international organizations working in the field of metrology”, including ISO and IEC, aimed at the development of two documents addressing the general metrological needs of science and technology,

– the International Vocabulary of Metrology
  (the VIM: a “calibrated language”)

– the Guide to the Expression of Uncertainty in Measurement
  (the GUM: a “common approach” for evaluating and communicating the quality of data and decisions)
The VIM and the GUM are good resources in higher education

In our role of teachers we are called to make science and technology closer to our society, by teaching that a standard language and standard procedures to evaluate and communicate the reliability of our data, models, and decisions are possible

This is the fundamental purpose of the VIM and the GUM