

Current scientific understanding and prevailing public opinion

Scientific research aims to generate new scientific knowledge that improves the accuracy of human understanding of the physical, biological and social world. Accomplishing this task is becoming increasingly challenging in keeping with the rapid growth of available information. The present generation of scientists and researchers are hard-pressed to formulate more detailed and comprehensive descriptions of natural phenomena that for experimental verification will also require the development of novel measurement techniques of greater precision, higher detection limit and resolving power as well as wider dynamic range.

Being able to understand more accurately how Nature works is already sufficient reward at least for those directly involved in the painstaking inquiry as well as for most members of the scientific community. Of greater practical significance is the fact that new scientific knowledge brings tangible benefits to society at large – its successful application boosts labor productivity, creates wealth and improves the quality of life. But for the general public to possibly enjoy the fruits of research and development an enabling social environment is needed where there is broad critical support for the scientific enterprise system especially among non-scientists including politicians, legislators, policy-makers, regulators and adjudicators who play a vital role in ensuring fair access and safe utilization of available scientific resources in the country.

In 2014 the Pew Research Center (PRC) in collaboration with the American Association for the Advancement of Science (AAAS) surveyed the views of people in the United States on a range of science, engineering and technology issues [1]. The survey sampled 2,002 adults representing the general public across the US and 3,748 US-based members (scientists) of the AAAS. The results were first released in January 2014 and they reveal opinion differences between the public and the scientists on twenty-two specific issues in climate change and energy, government funding, evolution, biomedical sciences, food safety, animal research, and space science. The survey reveals a wide 51-point gap between the scientists' opinion (88% with favorable view) and that of adults (37%) regarding the safety of genetically modified (GM) foods for human consumption. Moreover, 50% of adults were found to concur that climate change is mostly due to human activity as compared to 87% of their AAAS counterparts.

The PRC study has also observed that 79% of adult respondents thought that science has made life easier for most people and a majority had a favorable view on the impact of science on quality of health care, food and the environment. It was later disclosed that education or science knowledge is the strongest factor influencing the adults' opinions on GM foods [2-3] - the more education people have, the more likely they are to consider GM foods as generally safe to eat. On the other hand, ideology and age had the strongest influence on the matter of climate change.

A survey similar to that of the PRC, has not been conducted in the Philippines so there is no reliable information available to us about the views of Filipinos on the safety of GM foods and childhood vaccines, cause of global warming, importance of government funding for basic science and engineering, etc. Such a study will reveal possible differences in the views of Filipinos on vital issues in science and technology that are invaluable in the crafting of pertinent Philippine laws and regulations that are consistently enforceable and widely effective.

Recently, the Supreme Court of the Philippines (SC) decided to permanently enjoin the conduct of field testing for *Bt talong* (eggplant), to declare null and void Department of Agriculture Administrative Order No. 08, series of 2002, and to temporarily enjoin any application for contained use, field testing, propagation and commercialization, and importation of GM organisms until the promulgation in accordance with law of a new administrative order [4-5].

The SC decision was in response to a set of petitions that sought the reversal of a previous ruling by the Court of Appeals (CA) in 2013 which permanently stopped the conduct of field trials for genetically modified eggplant. The CA based its decision on submitted documentary evidence and testimonies of experts presented by the petitioners and respondents on the benefits and risks of GM plants. Philippine academician Emil Javier wrote a series of illuminating articles discussing the possible impact of the recent Supreme Court decision to our domestic science community and national economy [6].

The PRC survey and the SC decision highlight the utmost importance of achieving within the Philippine population a strong trust in the scientific enterprise system and a robust understanding of the scientific method. Our relatively fledgling science community constitutes a miniscule fraction of the entire population of more than 102 million Filipinos.

Its ability to earn the public trust is rendered more difficult by rising income inequality that keeps many from obtaining a high quality education, and prevents the emergence of an inclusive society of stakeholders who can work together towards the attainment of shared national goals.

A phenomenon is considered natural if it is measurable and a set of measurements always contain a certain degree of uncertainty due to the finite sampling bandwidth of real-world instrumentation and to the presence of noise. All of us particularly those in government service must be cognizant of this inherent limitation of scientific measurements in the discharge of our duties and responsibilities. Continued investments in research and development serve to reduce the amount of uncertainty and error and to extend measurement accuracy closer to the fundamental limit set by the laws of quantum mechanics. Competing factors other than current scientific understanding tend to dominate in shaping public opinion about a natural phenomenon in instances when the measurement uncertainty is high.

To avoid costly ambiguity with regards to their interpretation, laws and regulations dealing with the testing and use of GM products as well as with the implementation of measures designed to mitigate the dire impact of climate change, should include measurement standards of reference that are both attainable and enforceable. These quantitative standards of quality must be promulgated based on the latest experimental results published in leading peer-reviewed scientific journals.

Best wishes for 2016!

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Editor-In-Chief

References and Notes

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