

## **International Workshop on Geoethics — India**

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### **SLIDE (1)**

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My compliments to the organizers of this international workshop on geoethics, particularly as related to geohazards and mining disasters. The International Association for Promoting Geoethics exists to help people worldwide as we build a resilient and sustainable new world together. I invite you to think of this as the beginning of an ongoing partnership.

I have heard it said that ethics arises from a community sense of the “right” and “wrong” way to act. In promoting an awareness of ethical behavior, we are encouraging people to do what is right. Here, we are primarily concerned with the ethical practice of geoscience and related areas of civil engineering. **(SLIDE 2)**

My perspective is as someone who has worked on a variety of disasters and other issues as an engineering geologist. I have studied the evidence and issues related to climate change. And I have also contributed to development of geoethics since the 1980s **(SLIDE 3)**.

I am *not* here to tell you what to do, because *you* are the experts about the needs and challenges faced by the people of India with respect to geohazards and mining disasters **(SLIDE 4)**. I am here to offer perspectives and assistance to the extent that it proves useful to you. Indeed, the IAPG and its many different national sections will always be available to help Indian experts to develop their own measures to confront these challenges. **(SLIDE 5)**

We always work within constraints. Many of the fundamental problems that we face as geoscientists, engineers, and public planners are difficult problems whose possible solutions are constrained by time, energy, cost, and our evolving expertise. **(SLIDE 6)** The tendency is to make pragmatic decisions that gives primacy to our own self-interest, or that of our immediate family or group. Geoethics challenges us to think more broadly, and apply constraints to our planning and work that promote the general wellbeing of society. **(SLIDE 7)**

I have been fortunate to know exemplary geoscientists in universities and in professional practice who were guided by a strong ethical imperative — a commitment to integrity — that best serves the interest of all. And, unfortunately, I have known some geoscientists who seem prone to speak, write, or act in an unethical manner. And so, with your indulgence, I would like to say a few words about geoethics in the context of engineering geology. **(SLIDE 8)**

Why people act badly is an important (but frequently unanswerable) question. Sometimes the reason an engineering geologist falls short of our expectations relates to a focus on perceived self-interest — the acquisition of personal wealth and prestige — that takes precedence over what should be an absolute commitment to public safety and wellbeing, and to the truth.

Engineering geology **is not just another job**, chasing another paycheck. **(SLIDE 9)** It is a *profession*, which in many countries requires a license to practice because of its impact on public safety and wellbeing.

My experiences with the unethical behavior of some geoscientists have led me to spend part of my time since the mid 1980s working within the developing field of geoethics. We are all capable of good and bad behavior, of course. Establishing community standards and norms for ethical behavior, and the consistent reaffirmation of those ethical constraints at community gatherings like this, help us to keep our work consistent with the best practices of the geoscience community.

Science is the most efficient process humans have devised for discovering reliable information about our world. Because science is such a consequential endeavor, ethics is of central importance to science. And truth-telling is at the core of science ethics. **(SLIDE 10)** As physicist C.P. Snow observed, "The only ethical principle [that] has made science possible is that the truth shall be told all the time." Not a shading of truth to align with the limited interests of a client, but truth unvarnished, along with our honest assessment of uncertainty. **(SLIDE 11)**

There is an ethical dimension to work as an engineering geologist that is based on our responsibilities to **each other, society**, and the **interconnected global environment** upon which we all depend. We recognize this **geoethical responsibility** as an essential element of our work.

Engineering geology exists to serve society as it interacts with the geological environment. Engineering geologists provide essential expertise that helps society recognize natural **hazards** and assess the **risks** that they pose. **(SLIDE 12)** Engineering geologists **inform public policy** with respect to **land use, building codes**, and the **mitigation or avoidance of natural hazards**. And we form an important part of the **engineering and environmental-science teams involved in construction projects, (SLIDE 13)** helping to ensure that **human activities** do not combine with **natural conditions** to produce **disaster**.

Engineering geology *must* be practiced in accordance with **two broad imperatives. (SLIDE 14)** The **first imperative** is to **protect public safety**. Many natural hazards can result in **death, injury, significant loss of infrastructure, and damage to property**. Some natural disasters result in long-term problems of food insecurity, shortages of potable water, heightened risk of disease, interruption of energy, and **increased homelessness within human society**, as well as **dramatic changes to ecosystems** in the surrounding environment.

Because of this connection between

- the work of **engineering geologists**,
- **public wellbeing**, and
- **environmental health**, engineering geology is recognized as a **profession** that requires **licensure** or **certification** in most jurisdictions.

**(SLIDE 15)** We share the **second imperative** with all geoscientists -- to abide by the ethical norms, standards, and practices of science. Our only value to society arises from the quality of our work as scientists, working to generate and communicate reliable information about the Earth.

Most geoscience societies worldwide help to define and shape the character of their membership by requiring adherence to **ethical codes** and **standards of professional practice** based on the broader field of **science ethics**.

**(SLIDE 16)** I assert that **the ultimate client of any engineering geologist is society -- the community --** and that **engineering geologists share in an engineer's canonical responsibility to (SLIDE 17)** "hold paramount the safety, health, and welfare of the public and [to] strive to comply with the principles of sustainable development" (ASCE 2017; Cronin, 1991-1993).

Rather than being solely constrained by the limited interests of an individual client or a company, a professional engineering geologist must be an **advocate for the public interest. (SLIDE 18)** Equally important, a professional engineering geologist should **advocate for the interests, if you will, of the Earth and its non-human inhabitants.** We must be **informed stewards** of Earth's resources and ecosystem **who consider the broader impacts and long-term consequences** of any professional task or project.

We are well positioned to help society to become more **adaptive** and **resilient** in the face of **regional** and **global-scale environmental challenges** in the years to come. No other group in society has the training, perspective, and knowledge of Earth's history, processes, materials, and hazards to provide this essential service.

**(SLIDE 19)** The public needs accurate information about natural hazards and associated risks. It is our responsibility as geoscientists to provide information clearly, before **hazard** becomes **disaster**, before disaster is **compounded** and **amplified**, while the information is still **useful**. The information needs to be communicated using intelligible language appropriate to the audience. And it is essential that the information be communicated fully and truthfully to the persons and institutions with the **power** and **responsibility** to minimize the potential effects of the natural hazard.

**(SLIDE 20)** If we do not act as responsible scientists in the public interest, the contributions of engineering geologists "will not be **sought** or **valued** by society" (Slosson et al., 1991).