

Fostering sediment issues into the policy agenda: who, how and when?

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The need to foster sediment issues into the policy agenda: Sustainable sediment management requires the integration of scientific knowledge in the understanding of sediment quantity, behavior, and quality at a wide range of spatial and temporal scales (e.g., [1 to 3]). However, scientific knowledge has not been widely used to develop science-based policies and management strategies. Ineffective scientific knowledge transfer arises as the major obstacle in knowledge integration into the policy and management frameworks. Several reasons for ineffectiveness of knowledge transfer have been suggested in the literature, most of which related with communication gaps among scientists and non-scientists (e.g., [4]).

The audience: To foster the integration of scientific knowledge into policy, scientists need to play an active role in the process of finding means to reach their audience. Two key actors arise as scientists' audience being *a*) policy-makers and managers and *b*) society (people and the way they are organized). Policy-makers and managers are responsible for establishing and implementing the policy framework for sediment management. Society is affected by the decisions taken by policy-makers and managers. Although often regarded as a passive intervenient, the role of the public in the decision-making process is increasing and, sometimes, decisive namely by means of lobbying.

How can scientists foster scientific knowledge transfer? To get their message across, scientists need to properly frame the message and foster engagement among key actors. Framing the message helps turning scientific data into meaningful information for the target audience. Engagement is grounded on empathy and goes beyond simple awareness of the problem. Scientists can adopt different mechanisms to foster knowledge transfer [5]: *outreach*, aiming at raising public awareness and understanding of science; *crowdsourcing*, which involves a high number of people in the generation of large sets of data; *management-oriented tools* designed to support the generation of specific information, directly useful to policy-makers and managers; and *co-production* a collaborative process among key actors bringing a plurality of knowledge types together to address a specific problem, aiming at building an integrated solution.

Each mechanism accounts for the audience specificities and conveys the message in a different way, leading to different types of feedback. Outreach is the most widely known and adopted mechanism to transfer scientific knowledge. However, the other mechanisms are also promising alternatives and should be considered as major opportunities to foster knowledge transfer.

“The last mile” challenge: To meet the challenge of sustainable sediment management, scientists must always commit with knowledge transfer outside the scientific community. This is not only desirable but also a social responsibility of scientists [6]. Engagement of key actors and message framing arise as conditions of vital importance to overcome gaps in knowledge transfer. The adoption of the proper mechanisms fosters knowledge integration in policy. These efforts are time-consuming and often challenge scientists to step outside their comfort zone. However, when scientists are able and willing to make these additional efforts, there is a positive feedback and science thrives. Furthermore, science is increasingly interdisciplinary and the ability to communicate more effectively across disciplines (e.g., natural and social sciences) fosters scientists and institutions' collaboration, leading towards more sustainable sediment policies and management practices.

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