



Helicopter research in soil science: A discussion



In April 2018, an article was published in the prestigious journal *Cell* on the physiological and genetic adaptations of the Bajau people in Indonesia (Ilardo et al., 2018). These “sea nomads” evolved genetic traits allowing them to dive for prolonged periods of time. However, this study on a remarkable sub-chapter of human evolution also drew attention in another way. In an article in the journal “*Science*” the ethics of the study was called into question (Rochmyaningsih, 2018). In particular, the fact that only one Indonesian author was included in an author list otherwise consisting of Danish, US, UK and Dutch scientists received criticism. In addition, it was suggested that regulations were violated by shipping of human DNA outside Indonesia. The leading authors of Ilardo et al. (2018) denied anything unethical had taken place, and pointed to offers of collaboration with an Indonesian institute prior to the study that were turned down.

Regardless of the validity of the accusations against Ilardo et al., this example highlights the issue of “Helicopter research” or “Parachute research”, where scientists from elsewhere (typically a developed country or non-Indigenous group) conduct research in a developing country or on Indigenous land with the help of local infrastructure and local knowledge, and proceed to publish those results without strong involvement of the local scientists or knowledge owners and without structural improvement of local communities.

The question is to what extent “Helicopter research” occurs in soil science. A glance in a random issue of *Geoderma* shows that we certainly publish plenty of studies conducted in developing countries with many authors from developed countries. The same is true for other leading soil science journals. But are these generally examples of mutually beneficial collaboration or is there reason to look more critically? Budiman Minasny and Dian Fiantis wrote an online opinion piece in the online outlet “The Conversation” in which they argue that most international soil science research conducted in Indonesia can be labelled as Helicopter research. For example, on the issue of the large peat fires in Indonesia they conclude that “*It seems that years of [soil science] research produce little benefit to Indonesian scientists and communities who need practicable solutions to map their peatlands*” (<http://theconversation.com/helicopter-research-who-benefits-from-international-studies-in-indonesia-102165>).

As Editors of *Geoderma*, we recognize that this is an important topic, and that we need to ask ourselves to what extent helicopter research is still inherent in research conducted by (western) soil scientists in developing countries. For that reason, we invited professors Minasny and Fiantis to expand upon their opinion piece and submit a discussion paper to *Geoderma* on this topic (the author list now expanded with three more Indonesian scholars; Minasny et al., 2020a). We subsequently found three scientists with different relevant perspectives willing to formulate a response to this discussion paper. These responses are from one African scholar (Professor Mitiku Haile from

Mekelle University in Ethiopia; Haile (2020)) as well as from two scholars from leading western universities with a long history of research programs in Africa (Professor Ken Giller of Wageningen University in The Netherlands and Professor Tammo Steenhuis of Cornell University in the USA; Giller, 2020 and Steenhuis et al., 2020). Finally, we asked Minasny et al. for some final thoughts on the discussion (Minasny et al., 2020b). We would like to emphasize that, as this is a discussion, the various contributions represent the opinions of the authors. Therefore, apart from some minor language editing the manuscripts were not peer reviewed for scientific content.

From these discussion papers, it is clear that helicopter research is generally perceived to be an urgent topic in the soil sciences. The perception of the most important issues and considerations with respect to helicopter research in soil science differed considerably between contributors. While Minasny et al. (2020a) focuses on involvement of local scientists in published articles as authors, Haile (2020) and Giller (2020) also stress the need to involve local stakeholders in research. Giller argues that involving local experts is not just a matter of capacity building but can also increase the quality of the research. The contributions identify several aspects of more of more inclusive research:

- Addressing involvement of local experts early on, in the project initiation stage (mentioned by Giller, Haile, as well as Minasny et al.) Funding agencies have an important role here, by setting research priorities in accordance with local needs (Minasny et al., Giller), appreciating the exchanges built (Steenhuis et al.), and facilitating project startup workshops with local partners (Giller).
- Building an enabling environment for local research, through capacity building and involving students and young scientists (Minasny et al., Haile, Steenhuis et al.) and by supporting development of local laboratory facilities (Haile). Steenhuis et al. do warn here for the possible tension between this need for local capacity building and the need for scientists to publish in key journals.
- Creating good support networks to catalyse meaningful collaborations. This ranges from the willingness and commitment of the scientists involved and support from their loved ones while they spend time away from home, to full commitment and flexibility of senior university administrators (Steenhuis et al.).

Minasny et al. propose the formulation of standards in soil science to combat helicopter research and ensure that collaborative research benefits both local and international scientists. This is supported by Haile who proposes requiring ethical clearance for publications. While ethical training and approvals are standard practice in social and medical sciences, it is far from common in the soil sciences.

As editors of an international soil science journal, we need to (re) consider our role with respect to studies that may qualify as helicopter

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research. In line with the example mentioned by Minasny et al. (2020a) from the *Global Health Action* journal and in line with Díaz Ríos et al. (2020) we have extended our "Instructions for Authors" with the phrase "Articles reporting research involving primary data collection will normally include authors and institutions from the countries concerned, and should include in-country ethical approval when appropriate. The same applies to research done on Indigenous lands and/or with Indigenous communities". Whenever possible, we will invite at least one qualified reviewer from the country or Indigenous community concerned. Although it may seem tempting to implement more binding criteria, we decided against this because of potential undesired side-effects. Requiring that every article submitted to us should include a certain fixed number of authors from the country in which the primary data collection took place may lead to frivolous post-hoc adding of authors to fit our guidelines, rather than meaningful contributions from such scientists. This would be contrary to the COPE/ICMJE guidelines on authorship which we follow (<http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html>). Meaningful co-operation in soil research should start at the setup phase of research projects and thereby lead to joint publications; it cannot be created at the publication stage. As editors of a soil science journal, we think it is our task to raise this issue, and to facilitate discussion on this topic. In line with suggestions of the contributors, we think that there is a need for education in ethics for soil scientists to create awareness of these issues.

Finally, we recognize that this is still a limited set of opinions: they are all from established scientists, a clear gender perspective is still missing, and we would also welcome perspectives from other communities (for example Indigenous scientists). Nevertheless, we think this is a good first step and we welcome responses to this discussion. Responding to this discussion is possible through our Twitter account (@Geoderma_jrnl) where we will set up a thread related to these discussions. We may invite especially interesting contributions to submit a letter to the editor to be subsequently published in *Geoderma*.

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discussion. When we invited potential authors to submit contributions, it became clear to us that helicopter research is indeed something of an "elephant in the room" in soil science. Although almost everyone we approached thought it was an important issue in soil science, quite a number of potential authors (a more diverse group than the ones that finally agreed to contribute) in leading positions stated that it would be unwise for them to publish an opinion on such a sensitive topic. We are very grateful that we have found authors that were willing to express their opinion, and sincerely hope that this set of contributions will spark a broader discussion in the soil science community about this important topic. Finally, we would like to thank Kelsey Leonard and Jared Dahl Aldern, as well as our fellow *Geoderma* editors, for their constructive comments on this editorial.

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