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Authors

Opgenoorth, Lars
Hotes, Stefan

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IPBES is in the books: Pollination and scenario assessments are the first two steps to guiding policy makers in the global biodiversity crisis

During their 4th plenary session in Kuala Lumpur, the 124 member states of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) adopted their first assessment on the global state of pollination, pollinators and food production (IPBES 2016a) and a second one on scenarios and models (IPBES 2016b). With these first assessments, meant to provide an 'early win' for the work program 2014–2018 (Oggenorth and Faith 2013), IPBES establishes itself as a vital source of information for policy makers to counter the global biodiversity crisis just like IPCC has done regarding global climate change. Bob Watson, the new IPBES chair and former chair of the IPCC, stated (somewhat tongue-in-cheek) that the pollination assessment is "clearly better than anything the IPCC has ever produced." Enthusiasm is more than justified regarding the impressive amount of work the two teams of experts have put into the assessments over the last two years. It is now timely to have a closer look at what they set out to do and how it was carried out as well as to check how the 124 governments have dealt with the summaries for policy makers that were discussed in plenary.

The pollination and food production assessment

The pollination assessment—as will be the rule for IPBES assessments in general—is made up of a technical report and the summary for policy makers (SPM). As IPBES is a science-policy interface controlled by member states, the SPM is a document that needs to be adopted line by line by government representatives. This requires consensus and government delegations can hold up the process indefinitely if they don't agree with any aspect of the text. Requests for changes to the text could well be politically motivated; however, the co-chairs of the report as well as the coordinating lead authors of the respective chapters are present during this procedure to make sure that the

content of the technical report is not distorted in the SPM. The technical report on the other hand stands as presented to the governments by the experts. Here, only the executive summaries of each chapter get approved individually by governments' representatives.

The technical report

The technical report in its draft version includes some 830 pages of text divided into 6 chapters covering (i) background, (ii) drivers of change, (iii) status and trends, (iv) economic valuation, (v) bi-cultural diversity and socio-cultural values, and (vi) response to risks and opportunities associated [sic], all in relation to pollinators and pollination. The aim of the assessment, as originally set out in the scoping document, was to "assess animal pollination as a regulating ecosystem service underpinning food production in the context of its contribution to nature's gift to people and supporting a good quality of life". Its scope is global with the exception of Antarctica where no pollinators are known. As in all IPBES products, it is informed by natural, social and economic sciences as well as "knowledge of indigenous and local community stakeholders and practitioners". Especially this latter aspect is considered to be one of the central innovations of the IPBES process. This first report clearly documents that IPBES takes this innovative challenge serious. Numerous examples from indigenous and local knowledge (ILK) holders are presented in the assessment. At the same time it also documents that there is still some distance to cover until ILK will leave example boxes and become a more equal part of the assessment. Nevertheless, in Kuala Lumpur it was evident, that all bodies of IPBES will work hard to develop this integration further.

A second overarching perspective of IPBES is that this body and its assessments intend to be policy relevant but not policy prescriptive. To that end, each chapter presents factual statements

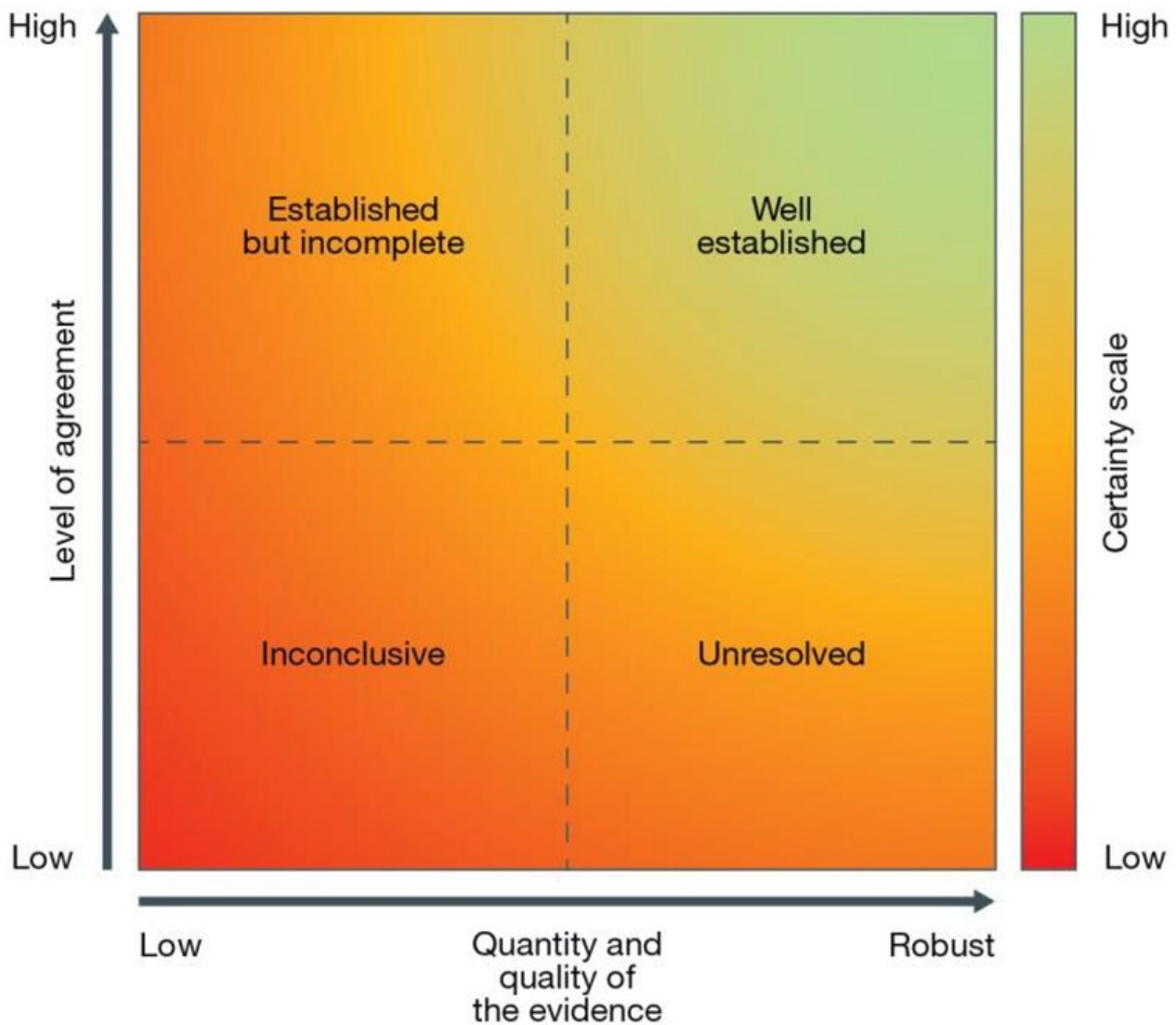


Figure 1. The technical report as well as the summary for policy makers of the IPBES assessment on pollination and pollinators use this four-box model for the qualitative classification of confidence of their statements. The scheme is based on Moss and Schneider (2000). Source: Appendix 2 of the Summary for policymakers of the thematic assessment on pollinators, pollination and food production.

that are categorized according to a four-stage scheme expressing the confidence placed in each of them including (i) well established, (ii) established but incomplete, (iii) unresolved, and (iv) inconclusive (Figure 1). In total, there are 222 such statements in the report with the four categories represented 98, 87, 23, and 14 times, respectively. As a result this technical report can be taken as a state-of-the-art summary of what is currently known and not known on the topic. It is based on a search and selection protocol of the literature as well as on expert opinion. One aspect of the search and selection protocol as the initial filter is

to give more weight to meta-analyses and reviews than individual studies to ensure a balanced approach. Both perspectives—the knowns and unknowns in the four-stage categorization—will have great value in flagging policy options as well as knowledge gaps to inform future research agendas and allocation of research funding. While the main focus lies with the policy relevance, one can certainly expect that such flagged research gaps will be used as arguments in research proposals in the future given recent initiatives like Future Earth.

It is to be expected that some topics with

Box 1 Two examples relating to Genetically Modified Organisms (GMOs) and pesticide usage, from the 22 key statements from the Summary for policy makers of the IPBES assessment on pollinators, pollination and food production.

19. Exposure of pollinators to pesticides can be decreased by reducing the use of pesticides, seeking alternative forms of pest control, and adopting a range of specific application practices, including technologies to reduce pesticide drift. Actions to reduce pesticide use include promoting Integrated Pest Management supported by educating farmers, organic farming and policies to reduce overall use. Risk assessment can be an effective tool to define pollinator-safe uses of pesticides, which should consider different levels of risk among wild and managed pollinator species according to their biology. Subsequent use regulations (including labelling) are important steps towards avoiding the misuse of specific pesticides. The International Code of Conduct on the Distribution and Use of Pesticides of the Food and Agriculture Organization of the United Nations (FAO) provides a set of voluntary actions for Government and industry to reduce risks for human health and environment, although only 15 per cent of countries are using this.

20. Most agricultural genetically modified organisms (GMOs) carry traits for herbicide tolerance (HT) or insect resistance (IR). Reduced weed populations are likely to accompany most HT crops, diminishing food resources for pollinators. The actual consequences for the abundance and diversity of pollinators foraging in HT-crop fields is unknown. IR crops can result in the reduction of insecticide use which varies regionally according to the prevalence of pests, the emergence of secondary outbreaks of non-target pests or primary pest resistance. If sustained, this reduction in insecticide use could reduce this pressure on non-target insects. How IR-crop use and reduced pesticide use affect pollinator abundance and diversity is unknown. Risk assessment required for the approval of GMO crops in most countries does not adequately address the direct sublethal effects of IR crops or the indirect effects of HT and IR crops, partly because of the lack of data.

far-reaching socio-economic implications and large potential for societal conflict—such as the chapters on pesticides and on GMOs (see Box 1)—will be scrutinized more extensively than others after the full technical report is released publicly in the coming months. However, given the fact that the review process already has been extensive with a total of ~10,300 comments (responses to which will be published on the IPBES website) from 280 reviewers representing governments and individual experts from over 50 countries, it seems likely that the report will withstand further scrutiny. The assessment contains hotly debated topics in the context of agriculture and forestry, demonstrating that it is not agenda driven – but that it carefully weighs the available facts and rather points out knowledge gaps than jumping to conclusions. In this context it must be mentioned that the assessment represents a snapshot of currently available evidence and is not a living document that can be updated as new insights are gained.

Summary for policy makers

The SPM contains 22 key statements for policy makers. These are backed up by 2 more pages of supporting statements which, as the 222 statements in the technical report, are classified according to Figure 1. One of the key changes introduced during the discussion in the plenary compared to the original version was to reduce the number of statements in the category ‘inconclusive’ included in the SPM. They were not assigned to a different category but rather were excluded from the SPM. Again, as some of the potentially most critical statements in relation to ongoing controversies, namely related to the impact of pesticides and genetically modified organisms (GMOs) on pollination and pollinators were from that category, this decision may be criticized by some as weakening the overall message. Nevertheless, in the opinion of many experts, and country delegations, IPBES can best serve its purpose and maintain its credibility if key statements are based on ‘well-established’ findings; elements that are so far inconclusive are then highlighted as significant research gaps.

Despite initial differences and two days of intense discussion in the contact group, the whole consensus process of concluding this first IPBES summary for policy makers was extremely constructive and carried by a spirit of mutual striving to finalize an assessment that will inform the global community to the best of current knowledge. In times of so much irrational unrest in the world this has really been a process that can restore some faith in the human capacity of knowledge-driven problem solving, which is in itself reason enough to get involved.

Scenarios and Models assessment

The second assessment that was presented to the delegates at the fourth plenary meeting of IPBES dealt with two methodological issues that are crucial for the work of the Platform: scenarios and models. Because of its focus on methodology rather than ecological, social or economic content it was generally expected to hold less potential for disagreement and opposing political views. However, the choice of methods does influence what results can be produced in a scientific study, and therefore this issue is relevant also for possible conclusions that might be drawn from it. Even though the task for IPBES is to provide the best available knowledge without being policy-prescriptive (see above), decisions on which scenarios to develop and what type of model to use in their analysis will inevitably have an effect on subsequent political debates. The discussion of the summary for policy-makers of the 'methodological assessment of scenarios and models of biodiversity and ecosystem services' and of the accompanying technical report was therefore far from being a mere academic exercise.

Although less voluminous than the report on pollinators and pollination, the technical report of the scenarios and modelling assessment is extensive with eight chapters covering 281 pages. After an introductory overview of the topics of scenarios and models and a vision for the role of these tools in the IPBES process, the subsequent chapters cover the use of scenarios and models to inform decision-makers, methods for building sce-

narios and models of drivers of change, modelling impacts of drivers on biodiversity and ecosystems, modelling consequences of change in biodiversity for ecosystem services (termed 'nature's benefits to people' here), linking and harmonizing scenarios and models across scales and domains, capacity-building for developing, interpreting and using scenarios and models, and finally options for improving the rigor and usefulness of scenarios and models through ongoing evaluation and refinement.

In the SPM of the methodological assessment of scenarios and models of biodiversity and ecosystem services, the contents of the technical report have been condensed into three so-called 'high-level messages', each subdivided into four to six 'key findings' illustrated by figures and tables. They are followed by 'guidance points' for science and policy in general and more specifically for task forces and expert groups in IPBES.

During the IPBES Plenary in Kuala Lumpur, issues raised by delegations in relation to the assessment on scenarios and models included requests to separate more clearly the guidance for scientists and guidance for policy-makers. Furthermore, some delegates felt that the language of the SPM was in general too technical for policy-makers, and that it was in effect policy-prescriptive. Amendments to the SPM included moving text with definitions of scenarios and models towards the beginning and including an outline of how indigenous and local knowledge can be represented in scenarios and models. With the changes incorporated, the SPM was finally approved, and the individual chapters of the assessment with their executive summaries were accepted. The Multidisciplinary Expert Panel of IPBES was requested to oversee further work on scenarios and models according to the terms of reference included in the annex.

Scenarios and models are key tools for the work of IPBES, but the Platform itself has no funding to support their further development. Clearly, this can be seen as a frontier in biogeography, and might encourage readers of this journal in their future work.

Ways to get involved – Global Assessment, Scoping processes and review activities

Starting this summer, IPBES will conduct its first Global Assessment on Biodiversity and Ecosystem Services and is seeking experts from "one or more disciplines within natural science, social science or humanities, [who] represent or have expertise in indigenous and local knowledge systems, or [are] policy experts and practitioners". Experts need to be nominated before the 5th of May through their national focal point or through a stakeholder organisation – which can range from a learned society like the International Biogeography Society (IBS) to a university or research institution. As IPBES' rules and procedures foresee a minimum portion of government nominated experts of 80%, chances are higher to be chosen when nominated through a government, e.g. an IPBES focal point. Furthermore, there is a specific IPBES Fellowship Pilot Programme¹ which targets early career experts who wish to gain experience by participating in the work of IPBES. Other tasks ahead for which experts are sought are the scoping for the thematic assessment of Sustainable Use of Biodiversity for which expertise in integrative approaches to human-nature relations, in ethics, trade, as well as in the relevant institutions and governance are needed.

Lars Opgenoorth

Faculty of Biology, Department of Ecology, University of Marburg, Germany
Chair, International Biogeography Society Special Committee on IPBES
Lars.Opgenoorth@uni-marburg.de

Stefan Hotes

Faculty of Biology, Department of Ecology, University of Marburg, Germany
Chair, IPBES committee of the Ecological Society of Germany, Austria and Switzerland
Stefan.Hotes@uni-marburg.de

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¹ https://gallery.mailchimp.com/5da0fed71c7e4399fb28ab549/files/Additional_guidance_fellowship_programme.pdf