



## **CONTRIBUTION TO THE ZERO DRAFT OF THE CFS POLICY CONVERGENCE PROCESS ON AGROECOLOGICAL AND OTHER INNOVATIVE APPROACHES**

**29 November 2019**

The International Panel of Experts on Sustainable Food Systems (IPES-Food) welcomes the publication of the High Level Panel of Experts on Food Security and Nutrition (HLPE) report on agroecology, and the beginning of a process towards policy convergence. IPES-Food hopes that this process will deliver action-oriented policy recommendations in support of agroecology, guided by international frameworks, while recognising the importance of tailoring policies to the national, regional, and subregional levels.

The HLPE report rightly acknowledges that profound transformation is needed to achieve sustainable food systems (SFS) that enhance food security and nutrition (FSN). However, IPES-Food wishes to express concern over a definition and application of agroecology that may be reduced or equated to stand-alone technologies. Although IPES-Food agrees that there is no *one-size-fits-all* solution, a growing body of evidence is demonstrating agroecology's capacity to address food system challenges in their entirety.<sup>1</sup>

IPES-Food underlines that agroecology represents a cohesive and systemic approach, founded on a set of guiding principles for redesigning food and farming systems. IPES-Food underlines the unique potential for diversified agroecological systems<sup>2</sup> to succeed where

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<sup>1</sup> IPES-Food (2016). From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems. 'Diversified agroecological systems' :

<sup>2</sup> Diversified agroecological systems (IPES-Food, 2016) refer to systems based on: Diversifying farms and farming landscapes; Replacing synthetic chemical inputs to preserve soils, water and air; Optimizing and conserving biodiversity and stimulating interactions between different species; Developing holistic strategies to build long-term soil fertility and improve water use efficiency; Rebuilding healthy and resilient agro-ecosystems that are net carbon sinks; Securing a decent and fair income for farmers; Producing sufficient, healthy, nutritious and diverse food for all.

current systems are failing, namely in reconciling concerns such as food security, ecosystems protection, climate change, nutritional adequacy, and social equity, thus successfully sparking food system transformation. Agroecology should not, therefore, be compared to stand-alone technologies, techniques, or innovations (e.g. crop breeding advances; specific forms of integrated pest management; input reduction techniques) which may help to reduce some of the environmental and social impacts of agroecosystems, but are generally applied as part of predominantly industrial systems, i.e. focused on monocultures and the production of uniform commodities for distant markets. In other words, specific technologies only partially mitigate, and do not reverse, the severe social and environmental impacts of the industrial agricultural systems which brought us to the crossroads we face today.

The added value of agroecology is to offer an alternative *paradigm* – one in which system redesign and diversification are prerequisites, and changes in knowledge transmission, participation, and power relations are as important as shifts in farming practices. Specific technologies and innovations (social and technological) must thus be considered as *part of* agroecological systems, not as alternatives to them.

### **1. Do you think that the recommendations in the HLPE report accurately reflect the findings of the report?**

- **Reassessing the relevance of agroecology.** The recommendations should more firmly underline and prioritise agroecology as a transformative paradigm for achieving SFS that ensure FNS for all, including its potential to mitigate and adapt to climate change, and not as an *innovation* amongst others. This comes out clearly from the analysis of the report, but it is not adequately reflected in the recommendations. IPES-Food therefore suggests that i) the recommendations consider specific innovative approaches, practices, and technologies for their potential *within* and compatibility with agroecological systems, in line with the 10 Elements of Agroecology identified by the Food and Agriculture Organization of the United Nations (FAO); ii) 'agroecological approaches' be used only to refer to systemic approaches (i.e. as a synonym for 'agroecology') and not referring to itemized practices; and that iii) innovations are prioritised according to their documented potential to achieve SFS that ensure FSN for all.
- **Shifting public support towards diversified agroecological production systems.** There needs to be a meaningful quantitative and qualitative shift towards agroecology in the public policies affecting agriculture, land and resource management. By definition, the 'transformation' referred to in the report requires a clear change in the direction of travel. Partial redistribution of public subsidies and support to agroecology will not be

commensurate to this goal. Current industrial production models do not only compete with agroecology, but also undermine it (by undercutting prices, capturing markets, and depleting the resources available for sustainable forms of production). Under these circumstances, agroecology cannot reach its full potential and its performance cannot be fully assessed and recognized. The logical conclusion of the HLPE report is that public support must be entirely redirected to agroecology in the medium term; at a minimum, agricultural subsidies should be shifted away from unconditional payments and reserved for practices that clearly provide public goods. This should be clearly stated (e.g. rephrasing and reinforcing recommendation 2.a.i), alongside guidance for sequencing the shift over time with clear targets for the short-, medium-, and long-term. facilitating access to land for young farmers who want to start farming in a sustainable way

- **Shifting agricultural research and development funds towards agroecology.** Public and private investment in agroecological research and development have been very limited. The report recommends (3.a) increasing investments in public and private research, and developing support programmes, for agroecological and other innovative approaches. IPES-Food suggests making this recommendation more precise by proposing a framework for ensuring that research and investment programmes are aligned with the FAO 10 Elements of Agroecology.
- **Strengthening agency, building new forms of stakeholder engagement and governance, and empowering marginalised groups.** The report rightly acknowledges that supporting inclusive and democratic decision-making processes is key to achieve food system transformation. Recommendation 4 must be strengthened by pointing to best practices in existing policies. Recommendations should also include: i) enhancing producer-consumer relationships by promoting short food supply chains (in various forms); ii) supporting farmer-to-farmer knowledge sharing networks; iii) providing opportunities for the co-creation of agroecological knowledge between scientists and farmers; and iv) building new community-led governance structures.
- **Using public procurement to support local agroecological producers.** The report rightly points to public procurement policies as a way to support transition towards SFS. Recommendations in this regard (2.b.iii) should be more detailed. Governments should support and promote short food supply chains in order to make them a viable, accessible, and affordable alternative to mass retail outlets, e.g. by repurposing urban infrastructure in favour of farmers' markets. More attention should also be paid to the role of informal markets. Meanwhile, public procurement should be used with increasing ambition in order to ensure sales outlets for diversified agroecological farms, while providing fresh, nutritious food and diversified diets for the users of public canteens, particularly school-children.

- **Developing new indicators for sustainable food systems.** The report rightly underlines the importance of developing new metrics to assess environmental, social, and economic impacts across the whole food systems. The benefits of diversified agroecological farming are still systematically undervalued by the criteria typically used to measure agricultural performance. It is therefore essential to adopt and systematically refer to a broader range of indicators, covering long-term ecosystem health; total resource flows; sustainable interactions between agriculture and the wider economy; the sustainability of outputs; food security, nutrition, and health outcomes; livelihood resilience; ecological footprint; and the economic viability of farms with respect to debt, climate shocks, *inter alia*.<sup>3</sup> The FAO should provide guidelines to governments to assess the sustainability of food systems using a holistic lens (expand the scope of recommendations 1.b and 5).
- **Putting trade in the service of SFS transition.** The issue of trade is only partially addressed in the recommendations, though trade policies play a key role in locking in current food systems. IPES-Food suggests expanding recommendation 4.b by specifying the following actions: i) removing trade-distorting agricultural incentives; ii) strengthening sustainability clauses in trade agreements and making food importers accountable for ensuring their supply chains are free of deforestation, land grabs, and rights violations ('due diligence'); iii) removing investor protections ('ISDS') in trade agreements and providing accessible complaints mechanisms for farmers and civil society.
- **Developing integrated food policies at multiple levels.** A transition towards SFS will not happen fast enough if policy processes are constrained by compartmentalized approaches and short-term thinking. It is therefore crucial to build on the promising examples of joined-up policy-making for food systems. Long-term, cross-party, inter-ministerial planning around food systems – reaching across political boundaries and transcending electoral cycles – should therefore be supported. Crucially, integrated food systems planning must be based on broad participation, bringing together the various constituencies and groups with a stake in food systems reform. At the global level, the Committee on World Food Security (CFS), as the foremost inclusive, intergovernmental policy space on food system issues, should advocate for coherent integrated food policies<sup>4</sup> and contribute to strengthening diversified agroecological food systems.

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<sup>3</sup> Ibid.

<sup>4</sup> An example of integrated food policy has been developed in: IPES-Food (2019). Towards a Common Food Policy for the European Union: The policy reform and realignment that is required to build sustainable food systems in Europe.

## 2. Do you think that major problems are missing from the HLPE recommendations?

- **Addressing concentration of power in the food chain.** The report rightly raises a number of serious concerns related to corporate concentration, intellectual property rights, digital agriculture, and Big Data. It recognizes increased corporate concentration in the input and retail sectors, and acknowledges that excessive industry influence acts as a barrier to food systems transformation. A report published by IPES-Food in 2017<sup>5</sup> also expressed concern over the negative impacts of corporate concentration on food systems, highlighting that. Big Data, and the rush to control multiple stages of the food value chain, is driving the latest round of corporate mergers. As a social movement, agroecology has voiced serious concerns on this issue with the aim to reduce corporate concentration. These concerns are not, however, taken up in the HLPE recommendations. While the HLPE report mentions a proposal to establish a global observatory on gene editing, it falls short of actually recommending this. IPES-Food recommends tackling corporate concentration in an integrated and robust fashion, by i) establishing new global governance structures to regulate concentration; ii) taking steps to reform the scope of antitrust rules and ensure their effective usage; iii) developing comprehensive metrics to assess concentration; iv) developing a new knowledge and innovation paradigm that recognizes the need for diversity, accessibility, and local-applicability of new technologies; and v) adopting a new economic paradigm to underpin sustainable supply chains and sustainable food systems. The first three recommendations are expanded on below:

- **Establishing new global governance structure.** IPES-Food recognises that Mergers and Acquisitions (M&As) are often pursued to ensure control of new technologies. A first step to address concentration at the global level could involve undertaking a collaborative assessment of its impacts on food systems. Various intergovernmental bodies should work together to monitor the impacts of increased concentration at various levels.<sup>6</sup> Meanwhile, national competition authorities should, when relevant, seek the advice and expertise of other government departments. This could include consulting relevant bodies to carefully scrutinize the justification

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<sup>5</sup> IPES-Food (2017). Too big to feed: Exploring the impacts of mega-mergers, consolidation and concentration of power in the agri-food sector.

<sup>6</sup> E.g. Committee on World Food Security (CFS) on rights, Food and Agriculture Organization of the United Nations (FAO) on food and agricultural policies, Convention on Biological Diversity (CBD) on biological diversity, United Nations Conference on Trade and Development (UNCTAD) and FAO on commodity trade, International Labour Organization (ILO) on labour and producer livelihoods, World Health Organization (WHO) and FAO on food quality and nutrition, UNCTAD's Science, Technology and Innovation for Development on technology.

used to approve M&As, e.g. the assertion that industrial food systems and a consolidated agri-food sector delivers 'cheap food'. Advocacy and civil society groups must also be encouraged to consider concentration in their local, regional, and global contexts. To support these processes, IPES-Food recommends the development of a United Nations (UN) Treaty on competition that directly addresses the differing needs and concerns of all member states. To this end, the recent work at the UN Conference on Trade and Development (UNCTAD) in presenting a Model Law on Competition Policy and the Set of Multilaterally Agreed Equitable Control of Restrictive Business Practices should be noted; although these are only templates for governments, they could provide a basis for developing a global treaty. In light of the apprehension of many governments in the global South for the World Trade Organization (WTO) to tackle international competition policy, any international treaty would have to ensure that all countries are given equal weight in the process.

- **Reforming anti-trust legislation.** Anti-trust legislation must be expanded to include consideration of M&As' impacts on production and processing, and not only on a limited understanding of consumer welfare. The possibility to regulate antitrust activities of a foreign company operating in another market should also be considered.
- **Developing comprehensive metrics to assess concentration.** The recommendation to develop metrics for SFS (see above) could include metrics on corporate concentration and control of data. Relevant indicators of concentration in various agri-food sectors need to be established, taking into account the risks of concentration of power and political influence. Widely accepted indices such as the Herfindahl-Hirschman index (HHI) or the 4-firm concentration ratio (CR4) may not be appropriate to capture risks in food systems, and are unable to measure the more complex facets of concentration (e.g. cross-licensing agreements, vertical integration). More sophisticated and cross-cutting indicators of concentration could pave the way for regulatory agencies to address the risks of specific forms of vertical integration.
- **Protecting genetic resources.** Recommendation 2.a.iii on genetic resources is an important and relevant recommendation. To further the applicability of this recommendation at the national level, a wide array of policies supporting farmers' rights to their own seed systems already exist, and should be used as a basis to develop even more precise recommendations. Of particular importance would be the urgent need to address the impacts of policies and laws on intellectual property that are incompatible with, or that undermine, farmers' rights as elaborated in the International Treaty on the Rights of Peasants and Other People Working in Rural Areas.

### 3. Can you give examples of policies related to agroecological systems and other innovation systems for sustainable food systems that ensure food security and nutrition? How were these policies formulated and what was their impact?

Spreading agroecology requires an appropriate policy environment that is able to break the lock-ins keeping industrial food systems in place.<sup>7</sup> This can be better achieved by developing policy frameworks that bring together the various sectoral policies that affect food production, processing, distribution, and consumption - refocusing all actions on the transition to sustainability.

IPES-Food recommends the adoption of policy reforms that are overarching and integrated as the best way to ensure a successful transition to agroecology.

Several **cross-cutting food policy frameworks** in various stages of development, adoption, and implementation have been developed in recent years. These frameworks provide positive examples of the types of policy environment needed for a successful agroecological transition, and thus the realisation of SFS that enhance FSN.

- Examples of **cross-cutting food policies** include:
  - IPES-Food's "Common Food Policy" blueprint for the EU<sup>8</sup> provides an example of an integrated food policy proposal that includes agroecology as a key pillar of SFS transition. In 2019, the European Commission has announced the launch of a "Farm to Fork Strategy", inspired in part by this approach.<sup>9</sup>
  - The French Bill on the Future of Agriculture, Food, and Forestry provides unprecedented support for agroecology as a pillar of French agricultural policy. The law covers many aspects of the legal framework needed to promote agroecology (e.g.

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<sup>7</sup> IPES-Food (2016). Op. cit.

<sup>8</sup> IPES-Food (2019). Towards a common food policy for the European Union: The policy reform and realignment that is required to build sustainable food systems in Europe.

<sup>9</sup> The Commission plans to set out a vision for sustainable food systems by 2030 that seeks to improve lives and well-being, ensures healthy and low-carbon ecosystems and enhance livelihoods and resilience, while fostering inclusive economic growth. The Commission announced that this acceleration of the transition cannot be done without adopting an integrated approach, addressing all aspects of sustainability. Greater policy coherence and addressing inconsistencies to achieve an "integrated food policy" are key, as sustainable food systems can only be achieved "through a collective approach involving authorities, industry, NGOs & citizens." AGRAFACTS No.90-19. AGRA-EUROPE Presse und Informations dienst 2019. Published by Agra-Europe (AgE), Bonn.

education and research, development of plant protection alternatives, restrictions on the use of antibiotics in livestock farming, environmental compensation, acknowledgment of the ecological role of forests, public procurement and territorial food system initiatives).

- Examples of **comprehensive organic action plans** include:
  - Denmark's Organic Action Plan identifies the role of the public sector as a key driver of transition. The Plan suggests converting publicly owned land from conventional to organic production; using public procurement as a leverage point to support the transition and improve FSN; facilitating public education campaigns to improve citizen awareness and choice for more sustainable diets; and ensuring research programmes support the transition towards sustainable practices. This multi-level approach has proven to be effective in guiding Denmark's transition towards SFS.
  - The Indian State of Sikkim is the first fully organic certified state. The state's comprehensive policy approach accounts for the socioeconomic aspects of transition (e.g. improving market access, ensuring safe, healthy, and diverse foods for consumers), as well as provisions for culture, health, education, rural development, and sustainable tourism. Most notably, the policy put in place a phase out of chemical fertilisers and pesticides as well as a state-wide ban on the sale and use of chemical pesticides.
- Examples of **agroecology-focused agri-development policies** include:
  - In Senegal, following a strategic dialogue between the Alliance for Agroecology in West Africa (3AO), local civil society organisations, and Senegalese authorities, the Prime Minister of Senegal put forward a recommendation to the Ministry of Agriculture to embrace agroecological transition and include agroecology in the PRACAS 2 during the inter-ministerial council of April 2019. A number of local actors, including Senegalese members of 3AO, will be collectively drafting a strategic document outlining how public policies framed by a national strategy could better support agroecology. This document will be submitted to President Sall in early January 2020 during the "Journées Nationales de l'Agroécologie".<sup>10</sup>

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<sup>10</sup> Additional examples can be found in the policy section of the "Agroecology Info Pool" initiated by Biovision. Available from : <https://www.agroecology-pool.org/showcases/>.



#### **4. Are there any other thoughts that you think should be taken into account by the CFS as part of this policy convergence process?**

- **Clarity on the articulation between FAO's 10 Elements of Agroecology and the HLPE set of 13 principles.** The HLPE report developed 13 principles of agroecology, building on the 10 Elements identified by FAO through regional dialogues and an extensive literature review. The 13 principles are categorized by their ability to improve resource efficiency, strengthen resilience, and secure social equity and responsibility. In some cases, the principles are a subdivision one of FAO's 10 Elements (e.g. "diversity" is subdivided into biodiversity and economic diversification). In others, the principles clarify or expand on one of the Elements (e.g. expanding "human and social values" to include fairness and participation). The 13 principles in the HLPE report are completely congruent with the 10 FAO Elements; a clearer link should therefore be made between the two to facilitate future assessments of food systems practices.
- **Compatibility between agroecology and digital innovation.** IPES-Food agrees on the need to focus on democratic governance, agency, and knowledge systems, and to scrutinize the use of digital technologies and whether these are compatible with the principles of agroecology and with the respect of human rights, including the right to food. The main barrier for considering the use of digital innovations in agroecology is related to their accessibility and the potential lack of farmer autonomy. Agroecology is based on inclusiveness; it emphasises the importance of dialogue between producers, researchers, and communities through participatory learning processes. Bottom-up approaches, experiential learning, and freedom of information are needed to support agroecological innovations. Involving users in the design of agro-equipment, creating financial incentives for innovative equipment purchase, sharing costs among cooperatives and farming communities, and training end-users on the high potential of these new technologies are pivotal aspects of adapting digital tools to agroecological innovation. However, these types of bottom-up approaches are currently insufficiently supported, and the risk of concentration of power is significant given the limited number of actors who currently own and control these technologies. These concerns need to be present in the recommendations. The need for just, democratic, and equitable governance of digital information (e.g. regulatory frameworks on the ownership of data) is crucial and should be included in the recommendations.

- **Concerns on Big Data and power balance.** The report remains descriptive in regards to Big Data, and does not raise any of its potential risks,<sup>11,12</sup> while being appropriately critical of digital agriculture and automation's potential impact on employment. The report rightly raises questions about governance of data and issues of data control and access. However, it equally states that digital technologies are being successfully adopted by small-scale and agroecological farmers. The report suggests that differences in uptake are not due to the technologies themselves but to issues of power, and calls for a reconfiguration of knowledge systems. IPES-Food agrees with this point, but power asymmetries cannot solely be addressed by reconfiguring knowledge systems. As recommended in Question 2, there is a need to reassess the regulation of new technologies, antitrust measures must be reformed, and new democratic governance structures must be put in place.
- **Intellectual property rights.** The report states that Intellectual Property Rights (IPR) and seed legislation can act as a barrier to food system diversification (e.g. contradiction between current IPR and the agroecological principle of farmer empowerment in regards to modern biotechnologies). It thus recommends that international agreements and national regulations on genetic resources and IP should better account for farmers' access to diverse, traditional, and locally adapted genetic resources, and better support farmer-to-farmer seed exchange. It also suggests fair treatment of IP (though not explicitly defined) as part of the transition towards SFS. However, these recommendations could be significantly strengthened. Many studies show a tangible link between current IPR and corporate concentration, with clear negative effects on livelihoods, equity, knowledge and culture.<sup>13,14</sup> Recommendations should therefore address the incompatibility of current IPR policies with farmers' rights, following on the International Treaty on Plant Genetic Resources for Food and Agriculture or the UN Declaration on the Rights of Peasants.
- **Ensure a rigorous, transparent, and inclusive assessment of modern biotechnology.** The overarching scientific justification for the use of genome-editing techniques, such as CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), is that these systems are controllable, precise, and free of unintended effects. However, genome-editing

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<sup>11</sup> IPES-Food (2017). Op. cit.

<sup>12</sup> ETC Group (2015). Breaking Bad: Big Ag Mega-Mergers in Play. ETC Group Communique 115.

<sup>13</sup> Glenna, L. L., & Cahoy, D. R. (2009). Agribusiness concentration, intellectual property, and the prospects for rural economic benefits from the emerging biofuel economy. *Southern rural sociology*, 24(2).

<sup>14</sup> Howard, P. H. (2016). *Concentration and power in the food system: Who controls what we eat?* (Vol. 3). Bloomsbury Publishing.

techniques can induce unintended on- *and* off-target effects,<sup>15,16,17,18,19,20</sup> making regulation of genome-edited organisms crucial. A general framework for biosafety oversight is critical for genome-edited crops, based on case-specific risk assessment.<sup>21</sup> Assessments should be conducted for classic genetic engineering tools, which still make up the majority of applications, as well as for the novel risks introduced by genome editing.

- **Genome-editing technologies are serving to further entrench food systems along current unsustainable trajectories set by GM and other quick-fix technologies** – presenting risks to farmers and the environment, while further concentrating corporate power. Results of genome editing are by and large protected by IPR, with implications for market power and purchasing power of seed and biotech companies on the one hand, and farmers on the other. The large agribusiness corporations controlling much of the seed market<sup>22</sup> have already positioned themselves to use IPR over these new techniques. For example, DowDuPont (now Corteva) has reportedly signed contracts with all the major patent-holders of CRISPR technology, giving it an unprecedented position in genome-

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<sup>15</sup> Agapito-Tenfen SZ, Okoli AS, Bernstein MJ, Wikmark OG and Myhr AI (2018). Revisiting Risk Governance of GM Plants: The Need to Consider New and Emerging Gene-Editing Techniques. *Front. Plant. Sci.* 9, 1874.

<sup>16</sup> Kosicki M, Tomberg K and Bradley A (2018). Repair of double-strand breaks induced by CRISPR-Cas9 leads to large deletions and complex rearrangements. *Nat. Biotechnol.* 36, 765-771.

<sup>17</sup> Bruner E, Yagi R, Debrunner M, Beck-Schneider D, Burger A, Escher E, Mosimann C, Hausmann G and Basler K (2019). CRISPR-induced double-strand breaks trigger recombination between homologous chromosome arms. *Life Sci. Alliance* 2(3), pii: e201800267.

<sup>18</sup> Ono R, Ishii M, Fujihara Y, Kitazawa M, Usami T, Kaneko-Ishino T, Kanno J, Ikawa M and Ishino F (2015). Double strand break repair by capture of retrotransposon sequences and reverse-transcribed spliced mRNA sequences in mouse zygotes. *Scientific Reports* 5, 12281.

<sup>19</sup> Ono R, Yashuhiko Y, Aisaki K, Kitajima S, Kanno J and Hirabayashi Y (2019). Exosome-mediated horizontal gene transfer occurs in double-strand break repair during genome editing. *Communications Biology* 2, 57.

<sup>20</sup> Tuladhar R, Yeu Y, Tyler Piazza J, Tan Z, Clemenceau JR, Wu X, Barrett Q, Herbert J, Mathews DH, Kim J, Hwang TH and Lum L (2019). CRISPR-Cas9-based mutagenesis frequently provokes on-target mRNA misregulation. *Nat. Commun.* 10, 4056, doi: 10.1038/s41467-019-12028-5

<sup>21</sup> Eckerstorfer MF, Heissenberger A, Reichenbecher W, Steinbrecher RA and Waßmann F (2019). An EU Perspective on Biosafety Considerations for Plants Developed by Genome Editing and other New Genetic Modification Techniques (nGMs). *Front. Bioeng. Biotechnol.*, 05 March 2019 | <https://doi.org/10.3389/fbioe.2019.00031>

<sup>22</sup> IPES-Food (2017). *Op. cit.*

editing plant breeding techniques<sup>23</sup>. The company has also filed around 60 international patent applications with the World Intellectual Property Organization (WIPO) for specific applications of genome editing in plant breeding. Bayer/Monsanto has filed around 30 applications; in 2017, Monsanto announced a global licensing agreement with the Broad Institute for agricultural applications of CRISPR genome-editing techniques.

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<sup>23</sup> Testbiotech (2019) Neue Gentechnikverfahren und Pflanzenzucht: Patente-Kartell für große Konzerne. Press release in English: <https://www.testbiotech.org/en/news/patent-cartel-large-companies>