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The Governance of Agrobiodiversity

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Abstract

Agrobiodiversity relates to humans and their environments. It is the result of interactions between humans and nature, and thus is simultaneously social and biological by nature. Without humans, agrobiodiversity would not exist. Seeds, as carriers of major agrobiodiversity components, are not mere material objects that exist outside of social relations: they are also sociobiological artifacts embedded in these relations. The multifaceted, highly dynamic realities of agrobiodiversity mean that those interested in questions of governance need to understand the limitations and political implications of the complementary and sometimes contradictory instrumental and relational perspectives on seeds; that is, the understanding of seeds as a production input or as the subject of a social network, in which agrobiodiversity brings together production and social linkages. International instruments aim to provide a legal basis for mediating competing interests and methodologies. In addressing governance, the global framing of these instruments reflects the dynamics of agrobiodiversity in global socioeconomic and environmental changes. From the earliest recognition of the potential value of crop diversity, crop genetic resources were treated as public goods in the public domain. Breeding companies have opposed this treatment. Breeders sought exclusivity and reward for their creative activities in using genetic resources to create novel varieties. Governance of agrobiodiversity—defined by a set of relationships that influences the access to and conservation, exchange, and commercialization of agrobiodiversity—reflects underlying value systems. Conflicting approaches (e.g., "stewardship" vs. "ownership" approaches) toward governance based on divergent value systems and rationales can be

Group photos (top left to bottom right) Bert Visser, Stephen Brush, Guntra Aistara, Regine Andersen, Gabriel Nemogá, Matthias Jäger, Stephen Sherwood, Martina Padmanabhan, Stephen Brush, Gabriel Nemogá, Bert Visser, Stephen Sherwood, Guntra Aistara, Matthias Jäger, Regine Andersen, Bert Visser, Martina Padmanabhan, Gabriel Nemogá, Stephen Brush, Guntra Aistara, Martina Padmanabhan

From "Agrobiodiversity: Integrating Knowledge for a Sustainable Future,"
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Cambridge, MA: MIT Press. ISBN 9780262038683.

distinguished. It is important to identify the actors involved, from local to global, to understand the power dynamics that influence the interactions among these various actors and their ability to influence or control the management of agrobiodiversity. The governance of agrobiodiversity and the power dynamics involved are increasingly crucial in the context of rapidly changing farming and food systems, especially in the context of globalization, migration, and urbanization. This chapter elaborates an emergent research agenda, focusing on aspects of power relations in agrobiodiversity governance, agrobiodiversity and food systems, nutrition, taste and health, and the governance of genetic information.

The Concept and Scope of Governance

Together with agriculture, agrobiodiversity has developed over the last 10,000 years, and in localities across the globe, multiple forms of governance have coemerged with this development. Agrobiodiversity relates to humans and their environments. It is the result of interactions between humans and nature, and thus it is simultaneously social and biological. Without humans, agrobiodiversity would not exist. Agrobiodiversity and seeds, as carriers of major agrobiodiversity components, are not mere material objects that exist outside of social relations: they are also sociobiological artifacts embedded in these relations. In particular, in small-scale and traditional agriculture, many people have intimate and strongly affective relationships with their environment and the agrobiodiversity embedded within it, as part of broader social systems and cultures (Nazarea 2006). While humans select plants for agriculture and food, the resulting crops and their ensuing biological and ecological consequences on the environment help to shape humankind. This seamless sociobiological character warrants speaking of agrobiodiversity as a highly relational product (see Chapters 12 and 13 as well as Zimmerer 1997:186–205). It requires not only describing, developing and conserving species, varieties, and traits in agricultural biodiversity, but also understanding the linkages between natural artifacts and the human activity involved in maintaining, losing, and further developing them.

The multifaceted, highly dynamic realities of agrobiodiversity mean that those interested in questions of governance need to understand the limitations and political implications of the complementary and sometimes contradictory instrumental and relational perspectives on seeds; that is, the understanding of seeds as a production input or as the subject of a social network, in which agrobiodiversity brings together production and social linkages (Caillon and Degeorges 2007). These linkages unfold between seeds and users, but they also occur among users (Leclerc and d'Eeckenbrugge 2012). The relational perspective, which largely has been neglected in the social research on agriculture and food, leads to at least two insights. First, when considering the social value and "life" of seeds, the identity and qualities of the seed take on specific significance for the user and can provide an important basis for shaping her or his

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identity and sense of being (Padmanabhan 2007). Second, with the perception of genetic resources as centers around which social networks emerge, seeds enter the realm of ownership, power, inclusions, and exclusions (Aistara 2011).

Moreover, agrobiodiversity is not a stable phenomenon; it is the result of continuously evolving interactions between people and their environments, and thus a product of the multifaceted coevolution of human societies and their biological environments. Therefore, conservation management approaches regarding agrobiodiversity need to recognize the essential role of ongoing processes in the field of practice—be it that of farming, marketing, and circulation of goods and services as well as crop utilization and food consumption (Brush 2000; Veteto and Skarbø 2009). Extracting and isolating agrobiodiversity from its natural environment greatly reduces its scope and capacity to coevolve. When extracted from its social or environmental context, for example, or when leaving a field or plate and entering a laboratory or gene bank, only a limited number of the multifaceted and highly nuanced sociobiological qualities of a seed survive. Nevertheless, new traits are unraveled and new uses of crops are developed in breeding and research, sometimes resulting in game-changers for farmers and consumers globally.

Not only do substantial differences underlie the science and governance of agriculture and food (Sherwood et al. 2016), there can also be substantial heterogeneity between modern and traditional peoples or practitioners outside the mainstream, with important implications for how people experience, think about, and seek to govern agrobiodiversity and seeds. In particular, for Indigenous and other native peoples, seeds and other life reproductive forms are not necessarily understood or experienced as a materiality or object; they may take on other, more inclusive and integrated meanings and expressions as well as spiritualities. Such views and beliefs can form a fundamental part of their autonomy, livelihoods, and collective identity. As such, socially inclusive, responsible agrobiodiversity governance demands that conservationists and scientists as well as policy makers find ways to create space for and accommodate the unique worldviews and needs of traditional peoples (Nemogá 2016). Many other family and smallholder farmers and their rural communities that contribute to the maintenance of agrobiodiversity and plant genetic resources share similar experiences and concerns.

In many communities, agrobiodiversity forms a major part of the living environments of farmers and often plays major roles in shaping cultural identity and food systems. The seeds maintained in such farming systems travel through social exchange networks with their own internal norms (Pautasso et al. 2013) and rules and within specific cultural and geographic spaces (Zimmerer 2003a). When seeds are brought from place to place, they may serve as markers of memory, place, and family ties, as well as embody sociobiological relationships between the people who nurtured and exchanged them, be it over shorter or longer periods of time and space (Nazarea 2005a, b). The social networks that people build through and around seeds also allow

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for the sharing of experience and knowledge concerning natural elements, such as the soils, microbes, pollinators, and other living organisms that form part of local agroecosystems and food production. In most cases, Indigenous communities and other traditional peoples do not seek to conserve agrobiodiversity, as such, nor for its own sake. They maintain their gardens, farms, and landscapes where their seeds help to secure certain livelihoods as well as ways of living and being. Through such processes, they come to affect, effect, and determine the agrobiodiversity that surrounds them and to which they are attached (Almekinders and Louwaars 2002).

In modern industrialized food production systems, in both developed and developing countries, farmers increasingly have become detached from the agrobiodiversity that originated and surrounds their crops and livestock. Seeds and livestock may feature traits that have been developed in remote locations and been acquired in commercial markets serving largely different ecosystems and divergent geographies. In this context, seeds have become dispossessed and commoditized, and hence, they are reduced to a store-bought input, not unlike fertilizers, pesticides, and equipment.

Historically, the collection, taxonomic classification, and adaptation of seeds and plants in accordance with practices in research and industry have often come to mean the separation of these seeds and plants from the sociobiological context in which they were domesticated as well as from the knowledge systems in which they functioned, effectively rendering their nuanced context redundant and irrelevant (see Chapter 6 and Kloppenburg 1988). To appreciate the role of agrobiodiversity and its relationship with knowledge systems, farming, and food production practices, the function of seeds and crop plants in small-scale and traditional agriculture must be understood in the situated context in which they historically developed and continue to function.

This reality poses a dilemma. The multiple ways in which people relate to agrobiodiversity reveal a myriad of lifestyles, visions, cultures, and beliefs as well as the social systems that help to determine how resources are owned, exchanged, and distributed. Rather than simply reflecting different views and experiences, these nuanced relationships reflect unique histories and different ways of living (Kohn 2015). Methodologically, such considerations lead to unique questions and a different type of research (Nemogá 2016). To appreciate fully the potentialities of agrobiodiversity and the wealth of options for conservation and governance, the physical, biological, social, and cultural contexts must all be taken into account and multiple worldviews need to be managed or accommodated; hence, other and new questions need to be raised and addressed.

Researchers wishing to work with people of unique experience and value systems must not only be respectful of multiple and sometimes incompatible worldviews, they must also have the willingness and ability to represent competing worldviews as equally valid, thus strengthening the unique

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plurality that historically gave rise to rich patterns of agrobiodiversity as well as promoting relationship building and trust implicit in a highly multicultural, cosmopolitan world. This requires a critical awareness of both the process and the outcome of research and governance as well as their political utilizations.

Governance and International Policies and Institutions

International instruments aim to provide a legal basis for mediating competing interests and methodologies. The recognition of Indigenous Peoples, for instance, is reflected in the United Nations Declaration of the Rights of Indigenous People, the International Labour Organization's Convention 169, the Convention on Biological Diversity (CBD), its Nagoya Protocol, and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Full implementation of these international legal instruments, and in particular the access and benefit-sharing regimes and the Farmers' Rights provisions contained in these instruments, is required to support and assist local and Indigenous communities and farmers in maintaining and conserving the agrobiodiversity that is part of their environments and cultures. This is essential to support the farmer-driven development and conservation of global biodiversity and the utilization of its components for the purpose of food and agriculture, and for global food and nutrition security. In addressing governance, the global framing of these instruments reflects the dynamics of agrobiodiversity in global socioeconomic and environmental changes (Andersen 2016, 2017; Zimmerer 2010; see also Chapters 6 and 8).

Researchers identified the cradle areas of domestication of major food crops almost a century ago, and this analysis rested in part on the geographical location of an abundance of biological diversity of crop species (Vavilov 1926a). In subsequent years, other regions of diversity were discovered elsewhere and linked either to different crops or to major crops as secondary centers of origin (Harlan 1992). Crop genetic diversity was recognized as a significant asset to the emerging science of crop breeding and to the farmers who maintained it. Indeed, the successful use of crop diversity soon led crop scientists to worry that diversity in crop species was vulnerable to loss—or "genetic erosion"—as newly created varieties replaced older and more diverse ones (Harlan and Martini 1936).

Four decades later, alarm was raised about significant loss of diversity in major crops that had been the centerpieces of the Green Revolution, in particular self-pollinating wheat and rice (Harlan 1975). The evidence of the loss of diversity was based on observing the spread of high-yielding varieties in the prime production areas. Few ecological studies of crop populations in the regions of crop diversity were available when gene banks were established,

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but such studies have now confirmed that agrobiodiversity continues to exist (Brush 2004; Zimmerer 1997) not only in relatively marginal agricultural areas, but also in more intensive agroecosystems (Chapter 8). The threat of genetic erosion was met by the collection of genetic resources stored *ex situ* in national and international gene banks. Accordingly, these resources have been available to crop breeders in the public and private sectors. In the meantime, various studies have shown that farmers' contemporary management of agrobiodiversity is highly resilient and that predicted loss of races, landraces, or genes has not necessarily materialized (de Haan et al. 2013; Perales and Golicher 2014; Zimmerer 2013).

From the earliest recognition of the potential value of crop diversity, crop genetic resources were treated as public goods in the public domain; that is, without specifying ownership and governed by open access (Fowler and Mooney 1990). Crop breeders, especially in the private sector, have opposed this treatment (Chapter 6). Breeders sought exclusivity and reward for their creative activities in using genetic resources to create novel varieties. Governments across the planet provided breeders' rights and, in some jurisdictions, patents as a form of intellectual property rights (Berland and Lewontin 1986). A series of laws and legal decisions provided this type of protection over the course of the twentieth century, with significant milestones being the establishment of the Union for the Protection of New Varieties of Plants (UPOV) in 1961, and the 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights of the World Trade Organization.

The legal system established in the 1960s, which allowed breeders to seek intellectual property while farmers' varieties were still treated as goods of the public domain, was challenged during the Food and Agriculture Organization's (FAO) negotiations of the International Undertaking on Plant Genetic Resources for Food and Agriculture, adopted in 1983 (Mooney 1983). This challenge was fortified by the fear of the rapid loss of diversity, and subsequently voiced in the negotiations that led to the adoption of the CBD in 1992 and the ITPGRFA in 2001. Most recently, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization was adopted in 2010 to ensure better implementation of the access and benefit-sharing provisions established under the CBD. Whereas the provisions of the International Undertaking on Plant Genetic Resources reflected the principle that genetic resources were part of the common heritage of humankind, this foundation was increasingly challenged during the late 1980s within FAO as well as in other international arenas. Critics of an unbalanced regime governing plant genetic resources for food and agriculture raised the following primary concerns (Bellon et al. 2005):

- The inherent inequity of contrasting property systems for farmers' varieties (open access, public domain) and breeders' varieties (various forms of intellectual property)

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- The loss of crop diversity from farming systems in cradle areas of domestication and elsewhere
- The poverty and economic marginalization of the smallholder farmers who continue to act as stewards of crop genetic resources

At the international level, the CBD replaced the principle of common heritage of humankind with that of national sovereignty over genetic resources and established a bilateral approach requiring agreements between countries owning these resources and users based on prior informed consent and mutually agreed terms. The ITPGRFA conformed to this principle but used it to establish a multilateral system of access and benefit sharing that specified continued public domain (open access) management for a list of 35 major crop species and 29 forage crops. The third development followed from both the CBD and the ITPGRFA: national systems of access and benefit sharing were established for the management of genetic resources embodied in biological diversity. Both the CBD and the ITPGRFA also had the objectives of stimulating local communities and Indigenous People to conserve the genetic resources that they manage and to provide a mechanism to address, at least partially, poverty and economic marginalization by giving economic value to their genetic resources.

An important achievement was the recognition of farmers' rights related to crop genetic resources in the ITPGRFA. However, these rights were not defined in any detail, and their implementation was left to national governments without further guidance other than three proposed measures: protection of traditional knowledge, the right to participate in benefit sharing, and the right to participate in decision making at the national level. Furthermore, the rights that farmers may have to save, use, exchange, and sell farm-saved seed were addressed but without giving specific directions or guidance regarding the implementation of those rights (for examples involving agrobiodiversity and the rights of Indigenous Peoples, see Chapter 12).

In this global policy context, the institutes of the Consultative Group on International Agricultural Research (CGIAR), established in the 1970s, were able to play a major role in addressing food security and preventing global hunger by developing and promoting new crop varieties and better agronomic practices, widely known as the Green Revolution. National agricultural research systems were provided with new materials which were then adapted to national needs and circumstances and grown over very large acreages across the developing world. Nevertheless, in particular the provision of higher-yielding crop varieties was the cause of genetic erosion in major food crops and the rise of new biotic and abiotic pressures as a result of homogenization of production methods and the promotion of higher level agricultural inputs (fertilizers and pesticides), thereby exemplifying the effects of major global trends in agricultural production outlined above. Bioversity International, formerly known as the International Plant Genetic Resources Institute, was to lessen and

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prevent the negative effects by promoting conservation, and from the 1980s it coordinated field collection missions and the establishment of gene bank collections across the CGIAR centers.

Currently, it is widely believed that the goals embedded in the international treaties and national laws, intended to stimulate use and conservation and provide economic compensation to stewards of genetic resources, have only partially been met (see Chapters 12 and 13). The loss of biological diversity and genetic resources for food and agriculture is generally thought to continue at a fast pace (Ahuja and Jain 2015), even though evidence for this assumption remains limited to date. Likewise, the poverty and marginalization of Indigenous People and other local communities that maintain crop genetic resources remains largely unaffected by the access and benefit-sharing systems at the national level (Peschard 2014). The emerging consensus is that these regimes have generally failed to create viable and sustainable means to address the loss of biological diversity or economic marginalization of stewards of genetic resources in agriculture (Carrizosa et al. 2004). Indeed, an impetus for negotiating the Nagoya Protocol was the perceived failure of the access and benefit-sharing systems generated by the CBD (Marion Suiseeya 2014).

Multiple Expressions of Governance

Governance of agrobiodiversity is defined by a set of relationships that influences the access to and conservation, exchange, and commercialization of agrobiodiversity and its components. Governance approaches, in particular, reflect initiatives that involve technology transfer (seeds embodying technology), levels and forms of participation by different stakeholders, and their ability to self-organize. Governance triggers policy and determines the course of action. Control over, access to, and use of agrobiodiversity form major expressions of governance at all levels (from the international to the local) and are reflected in rules and practices: from local markets to international legal instruments, and from barter and exchange of local varieties and their products to the development, regulation, and distribution of genetically modified crop seeds used by traditional and small-scale production systems to large-scale intensified production systems.

With regard to the management and conservation of agrobiodiversity, formal governance aims to regulate the access to agrobiodiversity and the use of its components, expressed in stakeholder actions, international legal instruments, and national legislation and regulations, and related policies. Not only the instruments referred to in the section above, but also seed policies and laws as well as intellectual property rights regimes are expressions of formal governance directly and expressly bearing on the management of agrobiodiversity. Implementation of these seed policies and laws as well as the intellectual property rights regimes is not necessarily in line with their intentions.

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Implementation may even be lacking, depending on financial resources and capacity of the countries concerned.

Beyond formal governance expressed in policy and law, informal governance is used in various forms by divergent actors. At the community level, cultural and social norms and the membership of groups holding collective cultural identities (e.g., Indigenous Peoples as well as social networks that connect different communities) determine the governance of agrobiodiversity as well as the way it is conserved and used. Informal governance has historically been, and continues to be, the main framework through which on-farm conserved diversity is reproduced and exchanged. Informal governance is also executed through markets through

- the commodification of seeds and the exclusive development of hybrid varieties binding farmers to seed companies,
- the creation of linkages between products and their origins (such as through geographic indications, e.g., basmati rice),
- the means and conditions of production (e.g., agroecological or organic products, direct purchasing, and fair trade), and
- the informal trade networks and farmers' markets that facilitate the movement of seeds.

Moreover, both formal and informal governance regimes themselves may reflect major societal developments, as in urbanization (consumers become detached from food production) and migration (food products and the crops and varieties from which these are derived are displaced to new environments and social contexts) (Chapter 8). In summary, governance operates along a continuum of formal and informal mechanisms and processes that together affect how individuals, communities, corporate groups, and governments relate to agrobiodiversity and determine the state of agrobiodiversity.

Governance reflects underlying value systems. For agrobiodiversity, conflicting approaches (e.g., "stewardship" vs. "ownership" approaches) toward governance based on divergent value systems and rationales can be distinguished (Andersen 2008, 2016). The stewardship approach represents the concept that agrobiodiversity belongs to the common heritage of humankind: genetic resources should be shared for the common good, as part of the public domain. The stewardship approach was regarded as the dominant rationale throughout the history of agriculture until the advent of intellectual property rights regimes in agriculture. By contrast, the ownership approach holds that establishing individual or collective ownership of genetic resources provides important incentives to promote breeding as well as the conservation and sustainable use of agrobiodiversity. Furthermore, ownership enables control over genetic resources covered by ownership rights for the holders of such rights, and it makes possible their trade as well as benefit sharing. One could argue that the ownership approach underlies not only intellectual property rights regimes but also the sovereign rights of nation-states reflected in the

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access and benefit-sharing concept embodied in the CBD and the ITPGRFA. A farmer-based approach, including proposed farmers' rights to seeds, has been formulated as a hybrid of the stewardship and ownership approaches (Brush 1991, 1992).

Whereas the stewardship approach embodies the recognition of and respect for the value of maintaining agrobiodiversity and is often grounded in collective responsibility, the ownership approach allows for extraction of agrobiodiversity and the commodification of its components, regardless of whether their use is sustainable or not. Both approaches can result in unforeseen effects. The stewardship approach may result in misappropriation of agrobiodiversity components by third parties and consequent tendencies toward strict protection and isolation, whereas the ownership approach may result in limitations to access and disincentives to share agrobiodiversity among farmers.

As intellectual property systems are costly institutions, the capacity of many developing countries that are often rich in genetic resources but poor in financial resources to develop and effectively use such systems is limited (Andersen 2008). This situation has resulted in power asymmetries, which have been met with much protest against intellectual property rights to genetic resource products from stakeholders in the Global South, along with the demands of securing control over the genetic resources through access and benefit sharing modalities.

It is clear that—as a consequence—these divergent formal governance approaches have been adopted at different geographic and temporal scales, and by different groups of actors. Whereas the access and benefit-sharing system under the CBD and the Nagoya Protocol can be said to be part of an ownership approach, the benefit-sharing system under the ITPGRFA is based on a derived rationale. Nation-states have placed some genetic resources in a multilateral system to provide access to all users, stating that access to genetic resources is the greatest of all benefits. The ITPGRFA does not establish owners of genetic resources in the multilateral system, but rather provides that benefits should flow to the farmers who conserve and sustainably use crop genetic resources. This may be seen as a reflection of the stewardship approach. Farmers' Rights, as addressed in the ITPGRFA, can be linked to both approaches depending on how they are interpreted and implemented (Andersen 2008, 2016). In reality, in many countries and policies both the ownership and the stewardship approach are recognized and respected to a variable extent, and both are enacted in new policy and legislation, even without sufficient recognition for the incongruities between the two approaches.

An unfounded assumption dominant among many scientists and policy makers is that a global shift from stewardship to ownership is bound to occur and will be irreversible, since this shift is necessary to create sufficient investments in breeding and will thus serve the goals of global food and nutrition security. A contrasting assumption prevalent among farmer organizations, scientists involved in the conservation and sustainable use of crop genetic

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diversity, and some civil society organizations, holds that the ownership approach will enable different actors to exclude each other from access to and use of their genetic resources. It will thereby reduce the legal space for all to safeguard food security and contribute to the conservation and sustainable use of crop genetic diversity (Andersen 2008; Salazar et al. 2007). Whereas the stewardship approach may seem most beneficial to maintain crop diversity *in situ*, the paradox of this approach is that without sufficient measures to prevent misuse, genetic resources and information from the public domain may be privatized and thus become subject to ownership. For a stewardship approach to succeed, it is therefore necessary to introduce measures to ensure that genetic resources and the knowledge associated with them remain in the public domain and cannot be misappropriated.

Initiatives based on the stewardship approach have been undertaken across the globe to document genetic resources developed and maintained by rural and Indigenous communities, as through the potato catalogues developed by the International Potato Center and local farmers from the Huancavelica and La Libertad regions in Peru (de Haan and Salazar 2006; de Haan and Villanueva 2015; Scurrah et al. 2013). The catalogues recognize farmers' contributions in maintaining the varieties and provide access to information about the potatoes and the people maintaining them.

The values underlying the stewardship and ownership approaches may be expressed as government regulations and community norms (formal governance) as well as incentives, motivations, and social recognition for particular forms of management of agrobiodiversity (informal governance). Actors in agrobiodiversity use and management might act from different worldviews and apply different rationales governing their decisions regarding the governance of agrobiodiversity. What appears as rational is very much tied to the institutional framing of any given situation and the motivations that individuals or communities hold. Some farmers will prefer their own landraces (also referred to as farmers' varieties to stress their explicit management) to higher-yielding modern varieties, knowing that modern varieties will often outperform landraces but that their own landraces offer better harvest security and yield stability in each season. Other farmers may prefer to grow their own landraces despite lesser yield because of a preference for certain tastes or textures that a given landrace displays (Birol et al. 2006; Chapter 15). These preferences are often related to culinary traditions and use, which form the core of cultural identity. Adivasi or Indigenous farmers of the Kurychia community in Kerala, India, for example, tie religious celebrations to a communal feast of landrace rice. A moral obligation to grow appreciated varieties or sentimental attachment to certain crops are among a range of motivations to encourage agrobiodiversity (Brush and Meng 1998). Framed in the rationality of the market, a diverse cropping portfolio might appear unprofitable. Nevertheless, when evaluated in light of other values beyond commodification, such a portfolio reveals a whole range of emotional, tacit, and spiritual relations, including additional

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embedded production "costs" that make sense to the people maintaining them (Chapter 15). Therefore, it is important to distinguish and recognize multiple motivations and to advocate for support of such choices in government policies and through other means of governance, such as payment approaches (Narloch et al. 2011a, 2013, 2017).

These distinct rationales underlying smallholder practices and commodification are also reflected in the balance between *ex situ* conservation and *in situ* management and conservation efforts, further elaborated below in the section on power dynamics.

Power Dynamics That Influence Governance

Considering how power dynamics influence the management of agrobiodiversity, it is initially important to identify the actors involved, from local to global. In this context, actors are understood as categories of persons or institutions that reflect on their interests, take positions, and start seeking influence over the processes relating to the governance of agrobiodiversity. Not all actors take a single position or seek to exert influence at all times.

Relative to the governance of agrobiodiversity, actors may be grouped into three major categories:

1. Private sector: seed companies, food processing industry, and retail concerns as well as some public research and breeding institutions having to recoup their investments from sales of their capacity and outputs that are involved in the study and use of components of agrobiodiversity and that seek influence in decision making.
2. Civil society: nongovernmental organizations, farmers' groups or organizations, organizations and groups of Indigenous People, and consumer organizations that also seek influence in decision making.
3. Public sector: politicians, government officials, and other policy makers as well as some public research institutions under direct government control and funding that respond to actors seeking influence by creating and/or implementing relevant policies and legislation.

All actors may function at local, national, regional, and global levels. Researchers, in particular, may play roles in each of these sectors. For instance, they may perform fundamental research, engage in public–private partnerships, contribute to plant breeding and seed development, carry out contract research for the private sector, advise NGOs and farmers as well as be active in government institutions (Baranski 2015b; see also Chapter 6).

While agency is traditionally understood as a human quality, some social science approaches also consider how nonhuman actors (e.g., seeds, plants, pollinators, and soil microbes) influence and mediate human relations and agrobiodiversity governance, thus displaying a kind of agency (Kirksey and

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Helmreich 2010; Kohn 2015). This is related to the broader philosophical question of whether nature and culture should be considered two separate realms or as a more intertwined nature–culture domain (Descola and Pálsson 1996). In the former perspective, humans as part of culture are considered to be dominant over nature, a stance that lends itself more easily to an ownership approach toward agrobiodiversity governance. In the latter perspective, humans themselves are considered part of nature along with other nonhuman actors—a stance that lends itself more easily to stewardship approaches to agrobiodiversity governance. The perspective in which humans see themselves as a part of nature and give agency to other natural life forms is prevalent in many Indigenous, native, and traditional peoples' cultural worldviews, and therefore important to a relational understanding of the governance of agrobiodiversity. We stress that this relation to nature cannot only be found in present-day traditional cultures but in ancient Western culture as well (e.g., the similarity between the concepts Pachamama and Gaia).

There are different ways of understanding the power dynamics that influence the interactions among these various actors and their ability to influence or control the management of agrobiodiversity. One approach (Andersen 2008) distinguishes between two forms of power: structural power and ideational power.

Structural power can be defined as the ability to shape and determine the structures of political systems within which states, their political institutions as well as public, private, and civil sectors can operate, in other words to shape and determine the rules of the game (Strange 1988). The exertion of structural power in our context aims to influence or control the management of agrobiodiversity as reflected in (a) political decisions regarding the conservation, access, and use of agrobiodiversity, and in particular (b) international agreements, codified as the conservation of biodiversity, the utilization of its components, and benefit sharing resulting from its utilization. The possibility to shape and determine the structures of political systems in relation to agrobiodiversity is not limited to politicians and policy makers, but extends to all other actors in the public, private, and civil sectors. The extent to which actors can be successful in their attempts to influence depends on their capacity and competence as well as their financial means and access to power. For example, multinational companies have greater resources and can therefore pursue their interests often with greater success than traditional agricultural communities and Indigenous Peoples. The privatization of components of agrobiodiversity in the form of intellectual property rights over plant varieties that has taken place during the last few decades can be considered a result of exerting structural power. Breeding companies have influenced political decision making to create a legislative framework conducive to allowing the privatization of plant genetic resources and promoting the use of private sector varieties, in particular through the establishment of intellectual property rights legislation

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covering plants and plant varieties, and seed legislation governing the registration, production, and distribution of varietal seed.

Ideational power, a term coined by Rosendal (2000), describes the power to exploit knowledge and promote certain norms and ideas (rather than influence policy and law). Exercising ideational power aims to influence the development and diffusion of certain knowledge, norms, and ideas, often by actors who share a common set of views, beliefs, and knowledge. The actors may reach from advocacy coalitions (Jenkins-Smith and Sabatier 1993, 1994) and other international expert networks (Haas 1992), which share a set of policy core beliefs or a certain knowledge base, to researchers and marketing specialists in the retail sector seeking to influence human behavior (e.g., global spread of fast food and soft drinks). Ideational power may be exerted to change consumer habits and to promote certain food habits as modern or comfortable, but may also take the form of social protest, coercion or shaming, information sharing, and social learning (Checkel 1999). The main sources of ideational power are the moral authority based on argumentation (e.g., campaigns for Fair Trade and Slow Food), or the analysis of human behavior and preferences (e.g., the spread of fast food, such as McDonald's and Coca Cola). As a further example, the development of the concept of access and benefit sharing during the negotiations of the CBD that stressed the ethics underlying the concept, may be regarded as the result of exercising ideational power (Andersen 2008; De Jonge 2011).

In responding to these different manifestations of power, the state may play an important role itself by exerting structural and ideational power and balancing the power influences within its various institutions. The extent to which the power dynamics described above translate into formal political decisions and their implementation and enforcement depends on the institutional capacity of the state. In turn, the institutional capacity of the state to respond properly is dependent on knowledge and expertise, human and financial resources, and leadership (political clout as well as inclusive decision-making processes) as well as the capacity to exclude law avoidance and malpractices and balance interests in a democratic manner (Hanf and Underdal 1998; Jänicke 1995). Over the last few decades, civil society (including NGOs, farmers' organizations, Indigenous Peoples' organizations) has striven toward an alternative policy and legal framework for the conservation and management of agrobiodiversity (Aksoy 2014). For a strong civil society to have influence on the decision-making process of the state and to contribute to the introduction and implementation of proper policy and legal frameworks, a strong and responsive state is a prerequisite. This phenomenon, in which civil society needs a strong opponent, has been labeled as the civil society paradox (Walzer 1992).

Power asymmetries are neither an accident nor an oversight, but rather a product of formal and informal processes. Asymmetries result in different levels of access and control over agrobiodiversity, but they also influence and structure relationships in rural communities with regard to the use of and

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property rights over land, water, seeds, credit, and information. Social dimensions (e.g., age, gender, caste, ethnicity) create power asymmetries, as the intersection of these categories determines the social appropriation of control and access, including over the use of agrobiodiversity and its components. The social collective must back the exertion of property or use rights. For this reason, it is essential to consider social stratification, internal power asymmetries, and possibly diverging interests within local communities. For instance, in the southern Kerala State of India, Indigenous Kurichya women are charged with preserving seeds of rice landraces but they have no control over the decisions of when and where to plant them. So, when Kurichya women have the chance to cultivate their own private fields, they tend to prefer nonlocal seeds from extension services or other external sources to avoid conflicts about the control over the landraces belonging to their Indigenous communities (Suma and Großmann 2017). Also, concepts developed in the context of the international agreements do not automatically resonate with local communities, which need time to understand the perspectives taken and the consequences of these concepts for their own living.

Yet another approach to the analysis of power relationships is provided by the Foucauldian tradition, according to which power is not really "held" by the state nor by any other actor (Foucault 1980). Rather, power in itself is essentially fluid, in perpetual circulation through society and dispersed among its actors, manifesting itself in every social interaction between or among various actor groups, as can be deduced from relevant discourse and practices. When repeated, these discourses and practices may reinforce themselves into particular narratives, which over time become more difficult to challenge, although counterdiscourses may also form in reaction. In this approach, because power is fundamentally unstable, one must analyze not only how power is manifested in various forms of agrobiodiversity governance, but also how the seeming stability of powerful actors and their narratives might be overturned. For instance, the collection of plants from their places of origin and their incorporation and description in collections and herbaria in the eighteenth and nineteenth centuries by European colonists can be analyzed as a set of practices and discourses whereby colonial rulers, who valued scientific knowledge over local knowledge and maintenance in collections over maintenance in local communities, exerted their power and reinforced discourses of superiority of Europeans over non-Europeans (Bonneuil 2002; Foucault 1994/1996). Such exertion of power has since been challenged, ultimately resulting in the re-appreciation of on-farm management of genetic resources and associated farming and knowledge systems in the CBD and ITPGRFA, and in the establishment of the concept of access and benefit sharing. It has also been successfully challenged, for example, in recent protests against the implementation of the European Common Catalogue of plant varieties in Latvia, which had originally excluded many varieties that had

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been cultivated during the Soviet era, until corrective legislative change, thus demonstrating the power of counterdiscourses even in seemingly unchangeable situations (Aistara 2014a, b). Furthermore, a more dynamic understanding of power allows us to investigate and explore how power circulates within and across different scales and how it changes relationships, for example, within local communities, and between communities and states. It allows us to analyze any intervention aiming to improve agrobiodiversity governance, including through legislative changes, and the relationships and balance between *in situ* and *ex situ* initiatives. Analysis and self-reflection on potential power asymmetries even in scientists' own initiatives is crucial for improving contributions from the scientific domain to agrobiodiversity governance.

Since the 1960s, power relations have also influenced the debate on the primacy of either on-farm management or *ex situ* management of plant genetic resources (de Wit 2016, 2017). Whereas technical arguments were often used to prioritize the one over the other, governance played a major role in how these two conservation approaches relate. *Ex situ* approaches are extractive, remove the genetic resources from farmers' fields and communities, and result in the use of collections that first and foremost serve the public and private breeding sectors. In contrast, on-farm approaches keep the access to and control of plant genetic resources in the hands of farmers and allow for a continued direct use by farmers of these resources. Clearly, opposing governance approaches serve different beneficiaries. Both the CBD and the ITPGRFA recognize the importance of on-farm management of genetic resources as being complementary to *ex situ* conservation efforts. Whereas the text of the CBD regards *ex situ* conservation of genetic resources as complementary to *in situ* conservation, many actors have since focused on strengthening *ex situ* conservation efforts; *in situ* management by smallholder farmers and Indigenous or traditional communities has only gradually gained more support (Jarvis et al. 2011; Visser et al. 2019; Oxfam Novib coordinated seed system initiatives). Yet, globally the funding for research and action supporting on-farm and *in situ* conservation is marginal compared to *ex situ* conservation.

In reality, *ex situ* conservation and *in situ* management and conservation are highly interlinked and complementary. Whereas *ex situ* conservation conditions may not be attainable in farming communities, gene banks will not be able to store the vast crop diversity occurring globally in farmers' fields. Landraces and farmers' varieties collected from farmers' fields represent a major share in the global gene bank collections, from which materials are made available to formal sector breeders, but are also repatriated to farming communities, for example, after biological disaster or political and civil unrest or made available to other communities in the same or other countries that may benefit from the adoption and adaptation of such varieties against the backdrop of climate change.

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The Impact of Changing Food Systems on Governance

The governance of agrobiodiversity and the power dynamics involved are increasingly crucial in the context of rapidly changing farming and food systems, where seeds are seen as an agricultural input without attention to the abovementioned relationships between people and agrobiodiversity. This is especially true in the context of globalization, migration, and urbanization, in both the developed and developing world, which has resulted in a homogenization of food patterns and food cultures (Khoury et al. 2014). Many crops and many varieties have disappeared from the diet. The increasing disconnect between food systems and seed systems, and between agriculture and food cultures, must be addressed by changes in agrobiodiversity governance in order to inspire both growers and consumers to use and value agrobiodiversity-rich and culturally inspired food products in their daily lives. The phenomenon of urbanization marks a profound change in human relationships to food. For the first time in history, the majority of people consume food without direct engagement in its production or, to a large extent, contact with its producers. In addition, the rise of urban-based interests of access to cheap and easily processed and prepared foods has had consequences outside the city for such issues as agricultural land use, the choice of crops and varieties, the diffusion of high-input technology, rural impoverishment and agrobiodiversity conservation.

The "food system" is commonly defined by the majority of its actors and in the literature as a suite of activities by which food is produced, processed, distributed, and consumed. The linear process is frequently referred to by flows from "farm to fork" or "soil to plate." Food systems are shaped by the social, economic, and environmental outcomes of this suite of actions through a complex set of private and public interests, influences, and conflicts. A simplified generic food supply chain might include the following elements. It starts with the mobilization of "inputs" for production, including land, labor, finance, seed, feed, pesticides, fertilizers, and machinery. Value accrues at the different stages along the chain, partly determined by the way that enabling conditions, such as subsidies, trade rules, transport infrastructure, and the norms of business are organized. Value creation along the food chain may result in strengthening of the food chain, but it may also create conflict between players within and between regions. Power is distributed among the various actors throughout the food system in different ways, depending on the context. In recent years, a concentration of negotiation power can be observed particularly at the retail and wholesale level, where processing results in a growing diversity of products that are manufactured from an ever-narrowing base of genetic and species diversity of the crops and animals used in producing these products.

While seeds are recognized as a major determinant for the crop in the field and the product on the consumer plate, the conditioning and facilitating role of other components of agrobiodiversity is often overlooked and undervalued. In

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identifying the current gaps in the governance of agrobiodiversity within the food system, greater attention and understanding must be paid to its complex nature, which extends far beyond seeds to include environmental factors, values, and knowledge systems. Often, these more hidden dimensions are major drivers of demand for agrobiodiversity. Whereas modern markets may offer potential, it is often within the domain of rural and farmer cuisine and informal markets that demand for diversity of unprocessed, fresh, and seasonal agrobiodiversity products tends to be particularly high (Skarbø 2014; Weismantel 1988).

Various examples can be found of initiatives that aim to introduce and strengthen the role of agrobiodiversity in the food chain. The Swiss foundation ProSpecieRara, for instance, collaborates with (a) breeders to preserve old varieties and develop new ones on their basis, (b) growers and seed savers to save and distribute a diversity of seeds and breeds, and (c) a supermarket chain to develop a logistical center capable of delivering products grown from those seeds and marked with the ProSpecieRara logo to draw the consumer's attention to the importance and attractiveness of biodiversity. Another example is the Andes Potato Park, established in the Andean mountains in the Cusco Province of Peru, where local farmers maintain native potato varieties and serve these to visitors in their restaurant. Many other such consumer-oriented initiatives can now be observed across the globe. The concept of a geographical indication (GI) has been showcased as an alternative market-based strategy to overcome the problem of increasingly anonymous food, and to reestablish the lost connection between rural producers and urban consumers. A GI is a distinctive sign that identifies a product from a given place whose quality, reputation, and/or characteristics are attributable to its origin (territory). The specificity of a certain category of GIs relies on the use of native plant varieties and animal breeds typical for a defined area that may be used to stimulate the protection and use of agrobiodiversity of that given place (e.g., Aprile et al. 2012). Marketing products from certain geographical origins through differentiating them from mainstream, anonymous products has the potential to begin to move toward turning abstract commodities into particular niche products, to capture added value, and to increase revenues for producers, since a segment of conscious and demanding consumers (in relation to product quality, health, methods of production, and agrobiodiversity and environmental concerns) are willing to pay a premium price, both in developed and many developing countries (Chapter 15). In addition, GIs may increase market transparency and reduce transaction costs. More participatory research is needed to identify and strengthen pathways of how to support networks of custodian farmers in developing countries through similar approaches. In many low- and middle-income countries, links between custodian farmers and markets are already being developed. Examples include the Chefs' Alliance movement in Peru, supported by the Peruvian Society of Gastronomy (APEGA), or emerging enterprises such as Pachaa in India which sell rice landraces. Furthermore, traditional

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production techniques can sometimes help to conserve agrobiodiversity, keeping traditional landscape features as well as avoiding land and soil degradation.

In this context, new efforts may be undertaken to increase "agrobiodiversity literacy" as a concept and to elicit and develop interest in the status of agrobiodiversity and the quality of its products, strengthening the use of designation of origin labels and food chain initiatives such as those of ProSpecieRara, APEGA, and Slow Food. These efforts may include the following activities:

- An agrobiodiversity label could be developed, where the underlying narrative builds on the GI concept but shifts its focus from place to the environment and the production system.
- Primary education may be utilized for the purpose of conferring narratives and associated values, noting the importance of sharing inspiring stories about the role of agrobiodiversity.
- Unfamiliar or forgotten flavors, tastes, and looks could be promoted through markets and restaurants (e.g., as practiced by the Slow Food movement), and neglected and underutilized crops could be brought back into the market and onto the consumer's plate.
- The connection to health issues might be further explored and used by promoting healthier or low-allergenic food.
- The role of gardeners and seed savers might be strengthened, noting that gardeners have played an essential role in preserving vegetable and fruit diversity in Europe and North America.

All these initiatives require facilitating and supportive policies and legislation. Thus, structural and ideational power can exhibit major influences to determine the playing field and its options. Actors that have played an important role in promoting agrobiodiversity and in changing the power relations include La Via Campesina (a global platform organizing small-scale producers) and the Slow Food movement that has worked through its product and farmers networks as well as the Chefs' Alliance and Terra Madre, which have focused respectively on the interconnectedness between local and short supply chains and local culture as well as a fair income for the farmer producer (see Williams et al. 2015). Youth engagement and education are equally important to maintain autonomous and vibrant links between custodians and farmer communities and their traditional food systems. This is particularly true for products that have little market demand beyond the local food system, such as landraces characterized by long cooking times, the need for elaborate processing, pungent flavors, and perishability.

Emergent Research on Governance

From the above analysis of the governance of agrobiodiversity, a number of research gaps and recommendations for future research directions have been

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deduced and are elaborated briefly below, without pretending that they form a coherent and exhaustive agenda.

A Note on the Conceptualization of Agrobiodiversity and its Governance

Awareness of the importance of human–biological interactions in agriculture and food production has increased as has consumers' appreciation of the quality and origin of their food and the conditions under which it has been produced. Given this development, a more inclusive conceptualization of agrobiodiversity is needed to better acknowledge the natural environment and all its components in which food production takes place as well as the human environment and food cultures that are rooted in this agrobiodiversity, and the knowledge and value systems that underpin such production processes and food cultures, including those of Indigenous Peoples. Such review could spark the development of a new narrative, paying tribute to biodiversity and place, to human diversity and culture, and promoting more pluralism and interconnections in agriculture and food systems. It also could contribute to initiatives designed to strengthen new public policy based on novel forms of consumer citizenship, contributing to a healthier, sustainable, and equitable future through more deliberate, strategic use of agrobiodiversity.

A Reflection on Methodologies Employed in Studying Agrobiodiversity Governance

For a meaningful research agenda involving interventions in agrobiodiversity management and governance, the research methodology must take into account the research topic and stakeholders. It should fit the research partnership with the men and women farmers, gardeners, and seed savers involved, from the formulation of the research problem to the reflection of one's role in the process. A research design based on participatory and action-oriented methods is a precondition for a wide array of meaningful agrobiodiversity research, whether involving the development of community seed banks or farmer seed enterprises, the improvement of local diets and nutrition, or the exercise of influence in local to international policy making. Methodologies should be developed and improved in such a way that these can be applied beyond anecdotal scale, and alliances with government as well as public and private sectors that up-scaling requires brings new government challenges that should be carefully addressed. Ideally, farmers and researchers should be involved from the beginning in the shared design of research projects, each bringing their assessments of the problem to the table. The next step of co-creation of knowledge requires the integrated use of different knowledge sources and capacities, perhaps from different disciplinary approaches or from different practitioners and stakeholder communities with divergent insights to produce an inclusive and coherent knowledge outcome. Furthermore, a co-evaluation of the research

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outcomes will secure the societal relevance of the analysis. It also requires self-reflection from the researcher and his or her motives of involvement as an inseparable part of the research. Because a multitude of plant, animal, and microbial species as well as associated practices and knowledge contribute to the way of life and worldviews of Indigenous Peoples, it is particularly important to analyze formal legal measures and policy mechanisms for the recognition of the special role of Indigenous communities in sustaining agrobiodiversity.

Along with the shift toward a relational approach to understanding biodiversity and studying it in a participatory manner, the following research questions emerge.

Asymmetries of Power Relations in Agrobiodiversity Governance

Who is invited to the table of policy debates and how are particular interests represented? Whose voice is heard, and how are different views and interests resolved? To what extent do initiatives to integrate agrobiodiversity into the food system recreate or challenge existing power asymmetries in the food system?

Rather than taking any intervention to preserve agrobiodiversity as inherently good, a relational approach requires that we analyze all interventions, ranging from legislative changes to *in situ* or *ex situ* initiatives and marketing campaigns, exploring the relative and shifting power dynamics between diverse actors in any given interaction, discourse, or practice. This may begin with tracing the relations among different historic actors, an analysis of the discourses and narratives through which the intervention is framed, and an evaluation of the perceptions of involved actors. Beyond counting the number of varieties or species conserved, exchanged, or marketed, researchers also must analyze resulting proliferations or shifts in power dynamics, in particular as relates to the rights and access to benefits of historically disadvantaged groups, such as Indigenous and traditional peoples. Needless to say, analysis and self-reflection on potential power asymmetries, even in a scientist's own initiative, is crucial for improving critical reflection and contributions from the scientific domain to agrobiodiversity governance, in line with the self-reflective, participatory approach to research management and governance systems prescribed above.

Agrobiodiversity and Food Systems

Food systems have undergone major transformations in past decades (Reardon et al. 2012), reflected in a trend toward capital-intensive food production, less diversity in crop species being traded, and longer supply chains to urban consumers in which basic ingredients undergo multiple transformations on their way to becoming final food products (Hawkes et al. 2012). It is of paramount importance how processes in food systems in a rapidly urbanizing world impact the governance of agrobiodiversity and where entry points to induce change can be found. More specifically, food systems research should address

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the key leverage points to support local and global food systems in ways that lead to enhanced use of and demand for agrobiodiversity, thereby triggering conservation. Such research should aim at field-tested recommendations of how we can balance the social and environmental footprint of food with viable family farming in vibrant rural communities with access by the urban poor to quality non-anonymous food. It may also address how engagement of consumers and civil society and advocacy groups can more effectively influence healthier and more sustainable diets and more sustainable food systems, and how people can support and facilitate initiatives lending more resilience to local and regional foods, improving and securing their place and status in the market. Such approaches would have to be complemented with research studying market-based strategies to overcome the problem of the commercialization of increasingly anonymous food and to reestablish the lost connection between rural producers and urban consumers. A related and more specific question would regard how both producers and consumers can become interested in promoting and recognizing the value of geographical indications. A policy question may address how governments can be made interested in introducing primary school curriculums that address the value of agrobiodiversity rooted in local environments and cultures.

Nutrition, Taste, and Health in Agrobiodiversity Governance

How are connections among the issues of agrobiodiversity, taste, and health understood by diverse consumer groups, including gastronomy and the food industry, and how may they be better integrated via agrobiodiversity governance? The need for studying relations generated and sustained in, among, and through agrobiodiversity, food, and human health—beyond simple nutritional indicators (e.g., also taking into account food flavor, taste, and cultural preferences)—calls for more nuanced, integral, and rigorous research on the governance dimension of these issues. Such approaches may be developed by building community inclusive agendas and developing more democratic, trustful relations with participants (rather than by visiting communities with refined research tools to collect data on additional variables). Gender roles should be part of the research agenda studying these relationships. To this end, researchers are charged with the responsibility of enabling ample involvement and participation of communities in the identification of local problems emerging from the relationship between agrobiodiversity and food, and nutrition and health issues, as well as in finding workable solutions that can contribute to an improved agrobiodiversity governance.

Governance of Information and Its Impact on Agrobiodiversity

Given the advent of genome editing and other technological developments, how will these new informational and molecular genetic capacities targeting the

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genomics and so-called omics of plant and animal diversity influence the power dynamics and governance of agrobiodiversity? In particular, how will these new biotechnologies exert influence on the still growing tension and deep historical controversies between the historic public ownership of genetic resources and patentable technology and private industry (Salter and Salter 2017)?

Commodification goes hand-in-hand with privatization of plant genetic resources and crop seeds. The use of intellectual property rights regimes (in particular claims of ownership over plants through patents and to some extent plant breeders' rights) as well as the focus of the private breeding sector on the development of hybrid varieties (requiring farmers to buy new seed each growing season) has led to the privatization of the access to and the use of genetic diversity. New technological developments, such as genome editing, are likely to increase the options for privatization by delinking access to genetic diversity from the physical access to a genetic resource. Instead, access to the DNA sequence information from public and private databases, and effective analysis of such information, will suffice in the future to develop new varieties. These may then be protected by intellectual property rights, even if new products have been developed using information from public databases only. This poses the need for the governance of information related to agrobiodiversity, rather than merely the governance of agrobiodiversity itself (Zimmerer and de Haan 2017), an issue that has been well recognized by policy makers addressing the implementation of the CBD and its Nagoya Protocol as well as the ITPGRFA. Without agreement on the governance of genetic information, fair and equitable benefit sharing, and hence the sense and survival of the current international agreements, the global governance basis provided by the CBD and ITPGRFA is at stake.

Agrobiodiversity lies at the heart of peoples' environments, their food production systems and livelihoods, and their diets and food experiences as well as their social and cultural identities. The governance of agrobiodiversity is in constant flux as new insights, technologies, and applications develop. It is a challenge to all stakeholders and actors to discover how they can contribute to an improved, more sustainable, plural, and equitable agrobiodiversity governance.

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