

## Transformation of our food systems – the making of a paradigm shift

“Today, decisive action is no longer ‘an option’, it’s an imperative”

Eleven years ago, the *International Assessment of Agricultural Knowledge, Science and Technology for Development* (IAASTD) provided a powerful evidence-based call to shift from dominant, resource-extractive and input-intensive approaches to agriculture (referred to as “business as usual”) and significantly transform our agriculture and food systems. The IAASTD was authored by over 400 scientists and development experts from more than 80 countries, sponsored by five United Nations agencies and the World Bank, approved by governments in 2008 and published in 2009. It provided an extensive array of policy options to shift course away from business as usual, towards biodiversified agroecological practices that place small farmers – who produce the majority of the world’s food – and their knowledge systems at the center [1]. The IAASTD also identified actions to address power imbalances embedded in global and national political, economic, research and trade systems and institutions that were found to entrench the inequities responsible for persistent poverty and hunger in the world.

A new collection of essays – *Transformation of our food systems: the making of a paradigm shift* – synthesizes the results of over a dozen international assessments that have been published in the intervening decade and provides critical updates on emerging trends in climate change, biodiversity, health, human rights, corporate concentration, resource grabbing and equity that affect the future integrity and viability of the world’s agri-food systems. Integrating insights provided by peasant and Indigenous communities and findings of UN and other multi-stakeholder analyses, the authors have articulated the following current and emerging trends and key messages.

### Trends in agriculture and food systems

#### Climate change

The climate emergency is getting worse, risking damaging the natural resource base on which agriculture depends, with grave consequences for food security. The agri-food system, largely in its industrial manifestations from production to consumption, is responsible for 21-37% of total anthropogenic greenhouse gas emissions, with 14-28% of the total corresponding to agriculture and land use [26]. Climate change adversely affects biodiversity, while biodiversity loss (deforestation) exacerbates climate change [11, 17, 26]. Agriculture remains one of the main contributors to climate change, through, for example, nitrous oxide and methane emissions associated with agrochemical and industrial livestock production [26]. In contrast, agroecological and Indigenous methods of farming and sustainable grazing practices that regenerate soil biology, sequester carbon and provide critical food and habitat for wild species, offer promising pathways towards both climate change mitigation and adaptation [11, 17, 21, 24, 26].

#### Biodiversity

Threats to biodiversity have intensified, driven in large part by industrial agriculture and unsustainable extraction of natural resources, resulting in dramatic declines in species abundance and richness [9, 11, 17]. These losses have resulted in reduction of essential ecosystem services such as water and climate regulation, pollination and pest control [17]. The diversity of domesticated and wild varieties of crops and animals has also declined, reducing system resilience to perturbations and stresses. The loss of some forms of biodiversity (for example, phylogenetic and functional diversity) can permanently eliminate future options [11]. In contrast, highly diversified, well-managed systems that initiate an agroecological succession support greater species diversity, while meeting communities’ food and livelihood needs [11, 17].

<sup>1</sup> Numbered references herein refer to individual chapters in the book. Please also refer to the numbered chapter list provided at the end of this document.

### Pandemics

Recently emerged infectious diseases can be tied directly or indirectly to changes in agriculture or land use associated with industrial agriculture [12]. Logging, mining and intensive plantation agriculture allow wild pathogens that would normally die off in natural forests to propagate more widely across susceptible populations of people or livestock. These spillovers are exacerbated by poverty and austerity programs affecting environmental sanitation and public health, and can easily spread worldwide through the global food chain [12]. Pandemics also present a serious threat to Indigenous peoples' lives and cultures, with subsequent loss of knowledge systems and technologies. Intensive livestock operations near city centers also provide fertile locations for the evolution and spread of pathogens that jump from wild to domesticated species.

### Health, nutrition and diets

New research has provided a deeper, more complex understanding of what constitutes health, with increased recognition of the interconnected impacts on human health of nutrition, diet, environment, exposure to pesticides and emergence of new pathogens, as well as sociopolitical and economic factors such as inequality, migration, conflict, weak regulatory environments and policy inertia [12, 19, 22, 23]. The positive interlinkages between healthier diets, as a result of food and nutritional diversity, and holistic and diversified sustainable production systems such as agroecology and agroforestry, have meanwhile become clearer [19, 22]. Considerable evidence indicates that ultra-processed food products that have replaced nutrient-dense foods are core drivers of obesity, which has doubled since the publication of the original IAASTD report, while non-communicable diseases now form a greater proportion of disease burden. Additionally, industrialized meat production systems and overconsumption in industrialized nations have brought negative consequences for health, the environment and climate change. Globally, undernutrition has increased over the past five years and has not been reduced substantially since IAASTD.

### Corporate concentration

Trends in industry consolidation identified by the IAASTD have not only continued, but intensified, with global food and agriculture-related industries becoming even more concentrated [4, 14]. The market share held by the top four firms globally in 2019 is 40 percent or higher in an increasing number of sectors: agrochemicals (65.8 percent), animal pharmaceuticals (58.3 percent), commercial seeds (53.2 percent), and farm equipment (46.2 percent) [14]. Vertical integration is accelerating, including through digital capture of entire agri-food systems in the form of emerging technology platforms offering tailored integrated packages consisting of (so-called) precision agriculture and decision-making tools that make autonomous decisions about chemical inputs and seeds, cultivation measures and harvesting, transport and marketing of commodities. Further, asset management firms that act as dominant players investing in food and agricultural industries, and persistent power asymmetries in international food and commodity supply chains, have further reduced competition and inhibited policymakers' ability and will to protect farmers and rural communities from loss of political, economic and market space [4, 5, 6, 14]. As these transnational corporations become increasingly powerful, they exert greater influence over public policy and the research sector, while remaining largely unregulated as they set prices to their advantage [6] (e.g. determining prices that farmers pay for inputs and receive for their outputs, as well as retail prices that consumers pay). Meanwhile, "dumping" agricultural goods at below-cost of production continues, in the absence of policies to protect farmers' food and livelihood security, and little use of market mechanisms to valorize agricultural ecosystem services and reflect the social and environmental costs of production [5, 6].

### Resource grabbing

Throughout the past decade, national and transnational corporations in the agri-food sectors have conducted highly successful campaigns to acquire land (e.g. through large-scale "land-grabbing"), obtain control of seeds and genetic resources, capture digital data and control institutional and public narratives about agriculture, food systems and "development" [4, 8, 10, 14, 27]. The extension of conventional "resource-grabbing" into intellectual, digital and social domains, paired with the increasing political influence that has accompanied corporate consolidation, has enabled industry players to

shape agri-food systems to their benefit [4]. Transnational agribusinesses position themselves, their technologies and products as offering ideal solutions to global concerns, oppose regulations that might constrain product sales and frequently co-opt the language of deeper systemic change put forward by others, often with active support from states but to the detriment of local communities [27]

#### Human rights, equity and food sovereignty

Adoption of the United Nations Declaration on the Rights of Peasants and other people working in Rural Areas (UNDROP) in 2018 was an important milestone. It vests peasants and other groups working in rural areas with rights that need to be respected, protected and fulfilled, and recognizes their contribution to conserving and improving biodiversity as well as food security [15]. UNDROP reaffirms the universality of all human rights, in particular the 2007 UN Declaration of the Rights of Indigenous Peoples (UNDRIP). The rights, vision and agency of peasants, pastoralists, fishers, small-scale livestock keepers, women, Indigenous and forest peoples are therefore at its foundation and are central to the transformative change that is required in agriculture and food systems [15, 19, 24, 27]. Nevertheless, entrenched socio-economic and political inequities persist, undermining the health, diets, livelihoods, cultures, intergenerational transmission of local and Indigenous knowledge, and secure access to food and control over resources required by both rural and urban communities to ensure their food sovereignty and well-being [10, 17, 26, 28].

#### Agroecology

Since IAASTD, numerous transdisciplinary studies, UN and intergovernmental processes have recognized the transformative potential of agroecology to promote food and livelihood security, sustainable diets, environmental health, social, economic, ecological and climate resilience, and social equity [17, 19, 24, 28, 29]. It is now generally agreed that agroecology is critical to address deepening food systems-related crises. Growing evidence indicates that agroecology provides a paradigm for and multiple pathways towards a more just and sustainable food system [29]. Its positive contribution to climate mitigation and adaptation and biodiversity conservation has been established [24]. For agroecology to now reach its full potential, it must honor the principles and practices of interculturality, transdisciplinarity and Indigeneity [1, 24, 27].

These trends and updates indicate that the systemic flaws and vested interests that continue to prop up a failing industrial agriculture and food system have not been adequately or successfully addressed. As a result, too little progress has been made over the past decade, while crises have worsened. In the absence of serious commitment to changing course, multiple biophysical, ecological and socio-economic crises have accelerated. Human activities continue to degrade the natural resource base and – driven to a great extent by multinational corporations and governments lacking the political will to adequately regulate these corporations – are now pushing us past planetary boundaries. As industrial agriculture expands into remote natural areas, new pathogens jump species and, as with COVID-19, can lead to devastating global pandemics [12]. On the other hand, there are beacons of hope, based on agroecological principles, Indigenous approaches and co-creation of knowledges, emerging from the grassroots that are showing multiple paths forward towards a true transformation of the food system [15, 27, 28, 29].

## Key Messages

### Key message I

**“Business as usual” is (still) not an option. A radical transformation of food systems is necessary.** In many respects, the IAASTD got it right. Significant institutional, political and structural changes must be undertaken at local, meso (territorial) and global scales if we are to escape the deadly consequences of today’s accelerating and converging climate and biodiversity crises and succeed in radically transforming the systems that have pushed us to breach planetary boundaries and undermine the natural systems on which human survival depends [3, 13, 17, 26].

**Key message 2**

**Failure to make progress at national and global levels is due primarily to lack of political will, power imbalances and system lock-ins.** These lock-ins include: path dependency, export orientation, expectation of cheap food, compartmentalized, short-term or linear thinking, “feed the world” or technological fix narratives, inappropriate measures of success (focusing for example on simple economic metrics such as GDP or single crop yield that fail to value social and natural capital and neglect to quantify true costs), opposing agendas from corporate actors, limited donor vision, fear of failure and concentration of power [11, 13, 14, 17, 22, 28].

**Key message 3**

**We cannot solve today’s multiple, converging and accelerating crises with uni-dimensional, linear, reductionist or mechanistic responses. We need, rather, to embrace a food systems approach with solutions that have multiple, converging and positively reinforcing outcomes that bring beneficial synergistic effects across multiple domains** [2, 9, 11, 22, 24, 25, 26, 28, 29]. Transformative agroecology, for example, is not only productive, resilient, adaptable and profitable, but also focuses on agency, democracy, equity, rights and ecological renewal [24, 25, 29]. Indigenous approaches such as Buen Vivir, sumak kawsay, Ubuntu and swaraj, provide ways of knowing and being (epistemologies and ontologies, respectively) that offer holistic, multi-dimensional pathways towards a viable future, including, often, recognition of the rights of Mother Earth [1, 27]. Bringing agroecological and Indigenous approaches together in conversation offers a powerful way forward, rooted in interculturality and respect [1, 22]. These and other holistic and multifunctional systemic approaches also support progress toward the Sustainable Development Goals (SDGs) and stand in sharp contrast to the limited benefits offered by narrow technological fixes such as genetically modified crops and new genetic technologies that do not address underlying agronomic deficiencies, inequitable power dynamics or the dominant social and environmental constraints to sustainable production [8, 9, 18, 25].

**Key message 4**

**Progress towards a livable and viable future requires deeply participatory democratic processes and cannot be attained without attention to basic rights – in particular the rights of farmers, women, Indigenous peoples and other people working in rural areas** [1, 3, 10, 15, 19, 24, 25, 27, 28, 29]. Implementing a rights-based approach requires enacting legislation and measures to promote and protect these rights, strong policy commitment to the obligations established in human rights law such as UNDROP and UNDRIP, and addressing the power asymmetries and inequities that impede these rights [15]. Fulfilling human rights requires replacing corporate and elite control over land, seeds, water and other productive and natural resources with cooperative ownership and other democratic models such as those based on principles of circular and solidarity economies. It also requires centering the leadership, vision and experience of women, peasants, fishers, pastoralists, small-scale livestock keepers, farmworkers, Indigenous peoples and others working in rural and urban areas [1, 7, 9, 15, 16, 20, 22, 25, 27, 28]. Deep changes in governance are needed to foster their inclusion, participation, empowerment and agency, including recognition of territorial systems of communal, collective and customary self-governance [3, 15, 16, 19, 23, 24].

**Key message 5**

**Stabilizing climate and reversing trends in biodiversity losses requires transforming agri-food systems toward agroecological systems, reducing food waste and loss as well as meat consumption in most regions, and prioritizing and valuing natural, social and human capital** [9, 11, 13, 17, 19, 23]. Societies must work within the realities of ecological limits and planetary boundaries, while economic systems – as one among many aspects of socio-cultural organization – must be adapted to serve rather than drive society [3, 13, 27]. Governments and civil society will need to redirect and shape policies, research, extension and market incentives away from dominant models of input-intensive industrial agriculture and towards diversified, knowledge-intensive systems that mitigate climate change and regenerate and conserve the natural resource base [5, 9, 11, 18]. An intercultural “dialogue of knowledges” between Indigenous and agroecological pathways and local practices can support the political, social, ecological and cultural shifts necessary to promote resilience, social equity and planetary health [1, 27].

**Key message 6**

**Promotion of healthy, diversified and sustainable diets can both reduce the major forms of malnutrition and offer multiple reinforcing co-benefits to human and ecological health.** A holistic and transdisciplinary approach to health-protective food systems will enable communities to grow culturally acceptable, accessible, affordable, safe and healthy food, protect farmers and food system workers' well-being, conserve natural resources, and protect biodiversity and the critical ecosystem functions on which society depends [19, 22, 23]. Today's expanded understanding of health and "food safety" necessitates a bold and comprehensive regulatory approach that tackles longer-term threats to human, ecosystem and environmental health posed by current production systems. This approach requires overcoming funders' and policymakers' resistance to change that arises from conflicts of interests, attachment to familiar but overly simplistic interventions, aversion to battling vested commercial interests, and attraction to false promises of easy solutions [22].

**Key message 7**

**Rebalancing power in the agri-food system requires action to both curtail the power of dominant corporations and large businesses that underpin the industrial food system and to provide space for different trade and marketing systems that empower and allow small-scale and peasant farmers, Indigenous peoples, women, and rural and urban communities to flourish.** Governments should utilize measures, including competition and anti-trust regulations, to reverse trends in corporate concentration [4, 14]; redirect subsidies and incentives away from unsustainable practices and towards agroecological practices [5, 24]; support short supply chains, territorial markets and distribution infrastructures and locally-managed interactive rural-urban linkages [11, 20]; use public procurement of agroecological produce and artisanal foods to build or rebuild these markets and infrastructures [11]; and revise institutions, policies and regulations shaping ownership and control over resources, ensuring farmers' secure access to and control over land, water, genetic, intellectual property and other resources [15, 24]. Valuable approaches include participatory and territorial management planning processes that center Indigenous peoples, women and youth [15, 16, 23, 27, 29], and that ensure seed sovereignty through, for example, farmer-to-farmer seed exchange [1, 24, 26, 28].

**Key message 8**

**Systems transformation requires a re-visioning and re-centering of values of equity, reciprocity and solidarity; principles of democracy, justice and collectivity; and the recognition that humans exist within, not outside of, nature.** The process of transformation also implies re-valorizing the local, socio-cultural, biodiverse and resilient [11, 17, 23, 25].

Over a decade ago, the IAASTD presented "options for action." Today, decisive action is no longer "an option;" it's an imperative. The COVID-19 pandemic has moreover laid bare the inequities, system failures and dangers of today's dominant, globalized and increasingly corporatized food and agriculture systems that have concentrated profits in the hands of a few, while simultaneously driving global climate, biodiversity and health crises towards their tipping points. What is inarguable is that today's multiple accelerating crises demand transformative change. Ample evidence now exists that such change is not only possible but is already happening on the ground in communities and countries around the world.

*Transformation of our food systems* offers evidence that our most promising ways forward lie in a pluriverse of cultures and solutions; the respectful co-creation of diverse knowledges; and the collective visioning, re-imagining and implementing of systems of fair and democratic governance that rebalance power, restore ecological integrity and prioritize social justice and human and ecosystem health within planetary boundaries.

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