Small Farmers for Global Food Security

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The Demise and Reinvention of Moral Ecologies in Indonesia

By
Thomas Reuter and Graeme MacRae

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This book is dedicated to the small farmers who provide Indonesia and the world with most of its healthy food, acting from a sense of moral commitment to the communities of which they are a part.

Among them, we particularly would like to commemorate the life and work of the late Pak Paiman Hadi Supatmo, a farmer and activist whose dedication to sustainable community agriculture was exemplary.

May this book inspire a generation of young farmers to continue in their wake.

Next page: Traditional rice barn in Lautem, Timor Leste

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Part 1

The Crisis of Rice-Farming in Bali

Left: High-quality traditional rice variety shown by an organic farmer

1

Introduction: Anthropological Approaches to the Study of Food Systems in Indonesia and Beyond

Thomas Reuter and Graeme MacRae

Why Food Systems Should Be Studied Holistically

If anyone still doubted the precarity of the world's food systems, recent crises such as the COVID-19 pandemic, the Ukraine conflict and extreme weather events keep reminding us of the escalating food security risks already emerging in the 21st century. It is a moral indictment that hundreds of millions of people have been food insecure throughout the last century, which happened during extended periods marked by a surplus in global food production. For a brief period, in the two decades leading up to the year 2014, the fact that the number of people subject to starvation was nevertheless shrinking gradually gave us some cause for hope, and provided at least a partial answer to this moral indictment. From that year onward, however, ever more serious climate change impacts and other factors drove up food prices and led to an 18 percent rise in global hunger by 2018 (FAO 2018), well before the Covid-19 crisis. From 2019 to 2022, the number of undernourished people grew even more drastically, by as many as 150 million.[1] The Russian attack on Ukraine in 2022, similar to the pandemic, has further accelerated the decline in food security, but this not the basic structural cause for the world's food supply challenges.

The deeper structural causes of hunger and malnutrition are based on

1 See https://www.actionagainsthunger.org/the-hunger-crisis/world-hunger-facts/

escalating problems in food demand, supply and distribution. Demand is increasing with a growing world population as well as increasing per capita consumption, mostly among the rising middle classes, of bridging economies. Supply issues are related to the degradation of agricultural land and depletion of water reserves, and an increasingly severe and ever accelerating ecological crisis that is restricting food production capacity. Severe escalation of economic inequality, especially since about 1980, along with the price effects of food market capture by a cartel of dominant global food corporations is restricting food access for people in developing countries and for the poor and lower middle classes in wealthy countries (Reuter 2021). During the Covid-19 lockdowns, for example, the more decisive of these three clusters of issues was distribution, that is, food access. Sudden mass lay-offs in developing countries threatened millions of precarious urban workers with starvation almost overnight (no income and few or no savings), whereas disruptions in actual food supply were moderate except in a few regions that happened to be already devastated by climate-change related drought at the time. As far as the Ukraine conflict is concerned, the dominant issue was a disruption of global supply chains for some important food groups and, just as importantly, of the supply of energy – which raised production costs dramatically by increasing the cost of fuel, fertilizers and other inputs. The resulting food price rises were most problematic for the poor, who were least able to absorb the extra costs. Inequality was thus the underlying structural issue.

Our current global food system is designed for profit rather than the survival and welfare of all, and this fundamental market failure will become ever more obvious as supply is disrupted by climate change and the long-term destructive impact of unsustainable farming on soil, water and other so-called "environmental services". We thus observe a complex interplay of ecological and socio-political factors threatening food systems, spanning across demand, production and distribution.

There are also important feedback loops within food systems that have turned increasingly negative in recent years. For example, while food production is itself a victim of global warming, it also contributes about one third to the total global carbon emissions that are the cause of global warming in the first place. Industrialised agriculture also impinges massively on natural ecosystems by occupying about 50% of the world's habitable land, using about two thirds of the available water, and creating ever more demand for land use change and deforestation in places like Indonesia, Brazil, DR Congo and Bolivia (FAO 2009), causing

massive carbon emissions in these countries. The extractivist approach of contemporary mainstream agribusinesses has left us with a global food system that is not just precarious in terms of food security, but also unsustainable for the planet's life support system as a whole and thus harmful to its own future prospects.

Food systems are not simply about producing and distributing food, they also determine what kind of food is available for consumption. The contemporary industrialised food system leans heavily toward the production of high sugar-, starch- and oil-content foods, and towards hyper-processing. Promoted through relentless and often misleading advertising across all available media, the food industry has spread unhealthy dietary habits first in the US and Europe and later around the entire world, with very severe consequences for the incidence of and mortality from non-communicable diseases (NCDs), such as diabetes (Type 2), cardio-vascular disease, and obesity. This too is a form of malnutrition. The mortality from NCDs is particularly high in developing countries that are not well equipped to manage patients afflicted by these chronic diseases.

Food Systems, we therefore argue, must be understood holistically, as part of larger social and natural systems. Unfortunately, they rarely are considered in such a holistic way. A narrow understanding of food systems is arguably the main driver of the "poly-crisis" (Lawrence et al 2023) we now face, and this must change. Our approach to food systems therefore differs from how this topic is usually approached by agronomists, who tend to focus more on the maximization of production.

For our holistic food system studies we draw on the holistic ethnographic fieldwork approach that is the key methodology of cultural anthropology. This method is ideally suited to gaining a complete picture of systemic interactions, in this case relating to all aspects of food production, distribution and consumption.

In this book we present a collection of ethnographic food system studies based on our own research, conducted mainly in Indonesia but also in India and Timor Leste; some of it individually from the early 1990s onward and some undertaken as part of a major joint project from 2017 until the present. These individual studies, like food systems themselves, are interconnected but also localised. While it is possible and important to speak of a global food system, wherein far flung system elements are connected through trade, labour migration and by other pathways, food systems exist at multiple scales. At these different levels, food systems feature webs of connectivity at various levels of density, with the most

dense connections generally at the local level. National food systems operate under specific national agriculture and food policies, in many cases within a specific climatic zone, such as tropical Indonesia. Local food systems are even more densely woven, based on local micro-ecological conditions, operated by local groups of people with specific languages and cultures whose lives are embedded in specific social structures and political histories.

The anthropology of food systems often begins from a local perspective, looking at food pathways from farm to fork, spoon or chopstick, from unique eco-systems to unique social systems, from culturally specific production to distribution and consumption, from local food culture and rituals of commensality to food preparation and local diet. This holistic bottom-up approach has the distinct advantage that it avoids the risk of unjustified generalisations and abstractions, which all too often inform policy decisions that treat all local food systems the same, and thus treat them poorly. It shows that scalability is limited and that diversity must be embraced as specific adaptations to specific, ever changing circumstances across all dimensions of food systems.

Part of these circumstances, nevertheless, is that local food systems are very much embedded in national ones, which are in turn embedded in regional and global systems. These connections and interdependencies are revealed at the local level, for example, when farmers have to decide whether to produce for export or local markets, and as their lives are impacted, often severely, by the gyrations of those markets, changing national policy or World Trade Organisation rules, or by farm subsidies paid to competing farmers in other countries. In short, our anthropological approach is to look at food systems from multiple local perspectives that can then be compared and contrasted, but always with an eye toward the larger systems in which they are embedded, for better or worse, and on which they depend in various ways and to varying degrees. This is how we understand holistic food system studies.

Food Sovereignty: A Moot Issue of Food Politics

Given the multiple scales at which food systems operate, the issue of food security (Pinstrup-Andersen 2009) too becomes a matter of scale. The pursuit of food security at the national, regional, local or household level is often referred to as food sovereignty. We understand food sovereignty as the endeavour within specific levels of food systems to reduce

dependence on other countries, regions, localities or households for a secure food supply. In a negative sense this can lead to food nationalism and associated trade restrictions. Such restrictions can endanger other food systems for whom food sovereignty is not achievable, or food systems that experience a momentary crisis of production, for example, in the wake of increasingly frequent severe weather events. On the positive side, the food sovereignty movement inspires self-responsibility and diversified, localised production, distribution and consumption, which shortens supply chains and creates resilience in the face of future supply crises. This does not necessarily mean hostility to food trade, where such trade is obviously beneficial.

Anthropological interest in food goes back a long way. It has ebbed and flowed with changes of emphasis and style, but food sovereignty has been a prominent theme. In 2002, Sidney Mintz and Christine du Bois identified several main themes in the anthropology of food, of which one was "food insecurity". But they also concluded that the job was far from complete and that while "anthropologists are in a good position to make useful contributions to food policy … they have not taken full advantage of this opportunity" (2002:111). A few years earlier Johan Pottier (1999:vii) had likewise identified food security as a global issue to which much policy was directed, but was often not well grounded in bottom-up understandings of the foodscapes of those at whom it was ostensibly aimed. This, he argued, was an opportunity for anthropology to (re)establish and (re)affirm its relevance to the pressing challenges of the contemporary world (1999:7-10). The term "food sovereignty" does not appear in either of these early works, but it was by this time already well established in activist discourse as a counter-model to top-down approaches to food security.

Since then globalization of the world's food systems has continued apace, food security has become an issue of international concern, debates about food policy have intensified and food sovereignty has gained increasing currency as a counter-discourse to top-down models of food security. At the core of these debates are firstly questions about the costs and benefits of the industrialization, globalization and corporatization of food production and distribution systems; secondly, interpretations of the nature, extent and causes of present food (in)security/ies around the world; thirdly, the most appropriate strategies for meeting the undeniable challenges of future food provisioning at local, national and global levels, and finally the crisis of rural/agrarian decline and distress, especially in

poorer parts of the world. All four questions are the subject of deeply polarized debate.

On one side is a view shared by multinational food corporations, an international network of research institutions and international agencies such as the World Bank, FAO and INFAD, and implemented by many national governments: that the only realistic path to future food security is through large-scale, high-tech, input-intensive, industrial agricultural methods combined with a global system of procurement and distribution managed by privately-owned capitalist enterprises. On the other side is a vision shared largely by local communities, organisations of small farmers and consumers, NGOs and academic researchers not affiliated to the international agri-food research system: that the global food system must be built from the bottom up - comprised of multiple agricultural systems and food cultures built on foundation of local ecologies and communities and aspiring to maximum food sovereignty (Uphoff 2002:8-9, Schanbacher 2010:25).

Food sovereignty has evolved a comprehensive ideology and set of practices seeking to re-join production, distribution and consumption or, as Perfecto et al (2009:211) put it, to combine "ecological", "agricultural" and "social movement" arguments, but from the bottom up - at the level of local ecologies and communities. The most widely agreed definition is that from the first International Food Sovereignty Forum in Nyelene, Mali, in 2007 as "the right of peoples, communities, and countries to define their own agricultural, labour, fishing, food and land policies … appropriate to their unique circumstances."[2] This is in turn based on La Via Campesina's pioneering definition a year earlier, at the World Food Summit in Rome. The concept was developed explicitly as a critique of, and alternative to top-down globalized models of "food security" but also as a practical way of addressing the consequences of global processes by way of local action. It is also "good to think with" as a model for critical analysis of food problems at all levels. In this sense we see food sovereignty as a useful tool for holistic, systemic analysis of food systems and for locally grounded action. It has thus inspired many food ethnographies and simultaneously served as a model for an engaged anthropology of food.

Food security is a core concept in the mainstream top-down approach while food sovereignty has become the lead idea in the small-scale

2 See http://nyeleni.org/spip.php?page=forumandlang=en

bottom-up approach. In the process both camps have picked up increasing loads of ideological baggage and these two "food world-views" often appear to be worlds apart with their proponents routinely talk past each other (Perfecto et al 2009:6,7, Pritchard et al 2014:59). One reason for this is that their views and analyses of food systems begin from different levels and scales. National policy and global markets look different when viewed from the bottom up, and local food traditions look different when viewed from the level of global distribution systems or national policy. While there is no shortage of research at both ends of this scale, there is surprisingly little that combines or integrates these disparate levels and scales of analysis. Consequently, the proponents of the debates appear often to have little common ground from which to even begin talking.

Less evident is work that spans across modes and levels of analysis: combining cultural approaches with political-economic ones, or viewing policy through the lens of local ethnographic studies. Top-down thinking and political-economic interests are implemented by way of policies and markets which are variously received, experienced, ignored, suffered or resisted at the grass-roots level, both by producers and consumers of food. Conversely, from the bottom-up, individuals and communities are exposed to both local and macro-level constraints and opportunities, often in innovative and creative ways.

This collection contributes to the task of filling this gap, by providing anthropologically conceived and ethnographically-driven investigations of global and national processes, policies, organisations and discourses as they intersect with the lives of local communities.

We seek to articulate the shifting and often uneasy relationships between local food practices and the larger political-economic contexts in which they operate. These larger contexts are themselves defined by tensions between market forces and the interventions of policy. At the three corners of this triangle (market, policy and local practice) we find motivations of commercial interest but also discourses and strategies recognisable (whether named or not) as "food sovereignty".

As soon as we interrogate discourses and strategies around issues of food security, we are reminded that "food" is itself a complex category – a system of systems, spanning phases from production to consumption (and waste), and thus inevitably embedded in broader frameworks of livelihood endeavours and cultural understandings. It is this awareness of and focus on integration and embeddedness that again anthropology shares with food sovereignty thinking.

While the axes between security and sovereignty, and between different scales of analysis provide conceptual and methodological anchors for our papers, what we seek to add here is a focus on practice. Our papers are situated on the common ground between anthropology and food sovereignty – of what David Mosse (2008), writing of development rather than food and citing Rosalind Eyben, has described as "a certain way of constructing and analysing problems and reflecting on the wider social and cultural context … critically engaging with the dilemmas of power and knowledge that shape the … system". We focus on the ways in which food sovereignty thinking, like the small farmers movement itself which has been promoting it, explicitly addresses the gap between research, policy and practice, and between global, national and local processes and communities.

All of the papers in this collection span these levels in one way or another – from the (inter)national to the ethnographic – showing how higher level processes work themselves out in the "friction" (Tsing 2005) of engagement with local communities and livelihoods. They also demonstrate the food sovereignty principle of providing global level insights as well as practical action from a base of local community and economies. This demonstration of the value of bottom-up ethnographic approaches is important, but even more so is this linking of levels, and attention to linkages that we see as a distinctively anthropological approach to the topic.

What we suggest here is a methodological convergence between the locally grounded bottom-up approaches and a systemic mode of thinking, research and practice across scales. This collection of papers illustrates what this can mean both for food policy and for the anthropology of food.

Our Involvement in the Anthropology of Food

Many of the articles collected in this volume began as papers at a series of panels on food systems organised by the authors at the annual conferences of the Australian Anthropological Society (AAS) and the Asian Studies Association of Australia (ASAA), as well as a number of other international conferences around the world. The first was a panel on "Food Sovereignty" at the AAS conference at the Australian National University in 2013. The subtitle of the panel was "Local and global solutions to human survival under deteriorating climatic conditions", stressing the relevance and indeed urgency of anthropological attention

to food. At this early panel we struggled to secure a sufficient number of speakers, but since then there has been a rapid growth of interest in anthropology of food. In 2017, our panel: *Production of the State and the State of Production: How food systems and states mak e and unmake each other*, at the AAS-ASAANZ-ASA joint conference on 'Shifting States' in 2017 required multiple sessions to accommodate all the speakers, and the sophistication of the general discussion had advanced considerably.

While in 2013 we still saw food policy and practice as a fallow field awaiting urgent anthropological cultivation, similar seeds were being sown across the world at the same moment. The most significant were a pair of conferences organised by the Yale Agrarian Studies Program and the International Institute of Social Studies in the Hague shortly before and after ours. These led to special issues of the Journal of Peasant Studies (Edelman et al 2014), *Third World Quarterly* (Alonso-Fradejas et al 2015) and *Globalisations* (Shattuck et al 2015), focusing the debate and taking it to a new level by exploring complexities and contradictions in the discourse and practice of food sovereignty as more ethnographic examples became available. Our own ongoing contribution to the debate, likewise, was not just analytical but based on empirical ethnographic research over many years, as detailed below.

Our Research on Food Systems in Indonesia and Beyond

We both began our research in Indonesia in 1993, in Bali. Thomas worked in the central highlands of the island, where the basis of the economy was a subsistence farming system in a process of transition to cash-cropping of fruit and vegetables in rainfed fields. Graeme worked in Ubud, then a secondary centre of tourism in south-central Bali, halfway between the coast and the mountains. While tourism was already becoming the mainstay of the local economy, it was set against a backdrop of irrigated rice-farming. For both of us the focus of our initial PhD research was broadly similar – on ritually and historically constituted cultural landscapes mapped and marked by networks of temples and ritual. In subsequent years, we both moved on to other interests – including politics, religion, social movements and architecture – in Java as well as Bali and, in Graeme's case, also India.

Around 2003, Graeme became interested in the economic plight of small farmers amid a rapidly growing economy increasingly dominated by tourism. This led to a few years of research and several articles which

form the first section of this book. As the problems of agriculture seemed so intractable, his focus then expanded to other sustainable development problems including waste management, climate change disaster recovery, cultural heritage and tourism itself. Meanwhile Thomas was working on social movements concerned with maintaining cultural and political sovereignty under the pervasive influence of tourism, modernism and globalisation in Bali and Java. He also became increasingly concerned about the emerging global environmental crisis, its implications for human futures and the ways in which anthropology could help address this crisis, one aspect of this was the threat to food systems (Reuter 2015). Around 2015 our interests thus reconverged on questions of food security and agricultural development, especially seen through a lens of moral economy.

We explored these themes in the conference panels mentioned and eventually obtained funding from the Australian Research Council for a joint project, entitled "Food Security and Sustainable agriculture in Indonesia: a moral economy approach." Our joint research began in 2017 and was extended until the end of 2023. A major outcome was a workshop at Gadjah Mada University in Yogyakarta in June 2022, involving around 50 participants, including farmers, NGOs, farmers organisations, extension workers, civil servants and academics.

While convening panels at international conferences and publishing articles in international journals, wanted all along to make the fruits of our research more widely accessible in Indonesia. The lively interest in our workshop and subsequent feedback from participants reminded us of this, and we decided to make amends. The formula was very simple – to collect, revise, edit, translate and publish a selection of our already published articles on agriculture and food security. A few days later we had initial meetings with prospective publishers and a translator. The present work is the result of this process.

Outline

This book is divided into four parts. The first consists of four articles on Graeme's early work on the crisis of rice-farming in Bali. This work gives historical depth to our description of Indonesian food systems and shows how today's problems have been developing over many years. Chapter 2 explores rice farming in Bali, a small island intensely developed through its success as a major global tourism destination and thus an unusually focused "laboratory" for the study of interlocking environment,

resource management and development issues. This chapter traces various patterns of (dis)articulation between local farmers, agricultural scientists, government departments, foreign aid agencies, expat residents and NGOs. Chapter 3 shows how agriculture, once the mainstay of Balinese economy and culture, has been marginalized by tourism-driven developmen t. The crash of tourism after the bomb attack in Kuta in 2002, however, revealed the vulnerability of an economy narrowly based on tourism and led to a rethinking of future economic development in which agriculture plays a more important role. One option is export-oriented production of cash crops and economies of scale, while the other consists of small-scale local initiatives for sustainable and/or organic production for local markets. This chapter argues that the island is at a critical turning point. Chapter 4 looks at traditional Balinese 'rice irrigation systems' or *subak*. Detailed ethnographic studies indicate that *subak* are complex and contested, so that continuity and change co-exist in a delicate, dynamic equilibrium. This paper examines an innovative and extraordinarily successful localized *subak*-led project to develop rice-cultivation in a more sustainable direction through a shift to locally produced organic compost. Chapter 5 looks at why the at first spectacular productivity gains of the Green Revolution have since slowed and even reversed, caused environmental problems, exhausted supplies of water and arable land and led to dependence on world markets. From the point of view of farmers themselves, it is their season-to-season economic survival that is at stake. In an economic environment dominated by tourism, Balinese farmers are marginalized but now are discovering unique market opportunities for premium and organic produce, which they pursue with varying degrees of success. One such project, the subject of this study, reveals the need for integrated studies of the entire rice production/marketing complex, especially from the bottom-up point of view of farmers. These chapters (2-5) and also Chapter 6 introduce some key case studies that will be described in detail on the first occasion, while referring back to these descriptions on subsequent mentions to avoid repetition.

Two of the main themes of these early chapters are the fundamental economic challenges facing small farmers, especially rice farmers and the failure of the top-down commercial-industrial model of agricultural development to meet the ongoing challenges of food security and agricultural development as they are experienced at a local level.

The second part of the book shifts focus to the "moral economies" (Scott 1976) in which food and agriculture are embedded and which became

a central element of our thinking about food security challenges. Chapter 6 begins by pointing out that while the provisioning of human societies is widely understood in terms of technological, ecological, and economic processes, and also somewhat less so as a social and cultural process, it is rarely recognised as a moral issue. The concept of moral economy was once strong in anthropology and rightly so, as it drew attention to the strong moral embedment of traditional agrarian economies, but faded from view, along with traditional societies themselves. In the analysis of radically changing agrarian landscapes, the moral dimensions of post-traditional agrarian economies have progressively become obscured. This also reflects the rise and past dominance of neoliberal economic doctrines, notwithstanding the fact that the great founders of economic theory, from Adam Smith to Max Weber, all emphasised the need for moral foundations in economic life. Their has been a renaissance of moral economy concepts in discussions of emerging, digitally facilitated 'sharing economies' (Botsman and Rogers 2010, Stephany 2025), but these discussions do not tend to consider historical transformations in agricultural production. The paper thus refers to recent transformations of the moral economy of rice in Bali and discusses a project of economic development in which the project's moral dimensions were revealed, if only in its failure. Chapter 7 argues that the desolate state of global ecosystems calls for a transformation towards new food systems that are not just productive but sustainable or, better still, regenerative. The call is for a new 'moral ecology', in other words, a new way of relating to nature in a responsible manner. This necessary transformation is being prevented until now by a dominant modernist ecology that has sought to maximise production and economic gain, irrespective of the eco-social cost. Its proponents point to the looming threat of global food shortage and call for even greater production maximisation. Proponents of the opposing, regenerative environmentalist position argue that high productivity can and must also be sustainable and socially responsible. In practice, however, compromises are inevitable and such compromises produce plural ecologies at the local level. Using the island of Java as a case study, this paper explores ways in which both traditional and contemporary notions of 'moral' ecologies are now re-emerging. The paper describes a regenerative agriculture movement that has grown in Java over the last two decades, carrying on from a long tradition of resistance to modernist ecologies. While evoking traditional ecologies and associated values, this movement is not opposed to modern technology and science and has

been influenced by modern environmentalism. Overall, the case study illustrates how postmodern "plural ecologies" are hoping to deliver high productivity, secure livelihoods and food security, as well as a balanced coexistence with and appreciation for nature. Chapter 8 notes that food systems in Indonesia and other developing countries have witnessed a rapid change in production, trade and consumption patterns. The central highlands and north-eastern coast of Bali are one such system, with centuries of documented regional trade relations between coastal and highland communities whose food products were complementary. The paper explores how this regional food system operated, and how modernization since the 1990s has compromised biodiversity, ecological sustainability, social resilience and food security. Greater attention to the moral dimension of food systems, it is argued, will contribute to more successful agricultural development and food security programs in Indonesia and beyond.

Part 3 looks at social, cultural and political dimensions of food and agriculture in Indonesia. Chapter 9 describes how, from 1966 onward, Indonesia's government took steps to industrialise agriculture, following a model promoted by the global biotech research complex and development agencies. More recently, alternative approaches favoured by local grassroots organisations and NGOs seek solutions grounded in moral economic systems based on communal solidarity, small-scale production, local knowledge and the localisation of distribution and consumption networks. To illustrate the viability of these alternatives, we explore new Indonesian farmers' movements that seek to produce high-yield, high-quality, low-cost food using ecologically responsible food production methods and 'symbiotic cooperation' strategies founded upon a moral economy ethos. Our case studies contribute to a model for a worldwide transition to socially and ecologically sustainable regional food systems. Chapter 10 looks at how the impact of the same movement towards a more sustainable way of living is reflected in new trends in religion. Similar to progressive political movements, the programs of many religious and spiritual groups today are converging around a shared commitment to address the impending global ecological crisis. The chapter explores this convergence by looking at the impact of environmentalist thought on religious discourses in modern Indonesia, and comparing this to similar trends elsewhere. The research shows that the environmental movement is causing a transformation in how people understand the character and practical relevance of religion and spirituality today. For some eco-spiritual

groups, a heightened environmental awareness has become the central tenet of their monistic religious cosmology. The socially much broader based shift, however, is towards more ecological religious cosmologies within the mainstream of major world religions. Islam and Christianity now officially accept that other forms of life have a right to exist and that humanity has a custodial obligation to protect nature. This new outlook rectifies the previous tendency within dualist religions to view nature as vastly inferior and servile to human interests. It is simultaneously a rejection of materialist-scientific cosmologies widely prevalent in late modern consumer societies, which deny any notion of the sacred. This trend in the world's religions toward a re-evaluation of the cosmological status of humanity in relation to nature and the sacred may help improve the prospects of the global environmental movement. Chapter 11 notes that all is not well with agriculture in Southeast Asia. The productivity gains of the Green Revolution have slowed and even reversed and environmental problems and shortages of water and land are widespread. World markets are also shaping the dynamics of national agricultural economies. But from the point of view of farmers themselves, it is their season-to-season economic survival that is at stake. Bali is in some ways typical of agricultural economies in the region, but it is also a special case because of its distinctive economic and cultural environment, dominated by tourism. In this environment, farmers are doubly marginalized. At the same time the island offers them unique market opportunities for premium and organic produce. The chapter examines the ways in which these opportunities have been approached with varying degrees of success. It focuses especially on one project that has been successful in reducing input costs by conversion to organic production, but less so in marketing its produce. It argues finally for more integrated studies of the entire rice production and marketing complex, especially from the bottom-up point of view of farmers. Chapter 12 argues that Indonesian food security policy suffers from a fundamental internal contradiction – between neoliberal pressures towards more integration into the global market-based food system geared towards profit, and an intractable residual commitment to national self-sufficiency in staple foods. While this contradiction presents itself in technical and economic terms, it is fundamentally a matter of culture and ideology. The article addresses this contradiction by way of a study of key Indonesian metaphors of food security, among which the most central is *lumbung* – the traditional rice barn. *Lumbung* of various kinds have been a central pillar of food security across the archipelago

since ancient times and still serve in many contexts as a metaphor for food security at various levels. While this '*lumbung* culture' may have 'hindered' attempts to integrate Indonesia more fully into wider circuits of market exchange, it has to some extent protected its food system from the growing vulnerabilities of climate, resource/environmental stresses, and pandemics. Chapter 13 looks at the serious threat climate change poses to agricultural production and food security in Indonesia. This threat arrives at a time when global, regional and national food security are already subject to other adverse trends, creating the potential for a perfect storm. The paper looks at existing challenges and the additional impact climate change will have. It then examines how the sector contributes to GHG emissions, how it could mitigate climate change by reducing its own emissions, and even help absorb some emissions from other sectors. Mitigation, however, will not be enough. The 21st century is very likely to witness 2-3°C of global warming, even if all pledges to the Paris Agreement were to be honoured. The paper therefore also outlines an adaptation strategy to make Indonesia's agriculture more resilient and its food supply more secure, and concludes with a concise list of recommendations to policy makers.

Part 4, finally, looks at food systems beyond Indonesia which may serve as a point of comparison. Chapter 14 looks at the global issue of seed cartels. The industrialisation of agriculture has drawn farmers around the world into the vortex of a commercialised global food system. This has caused a massive decline in traditional farming, which tends to be small-scale, organic, biologically diverse and sustainable. It has instead favoured mechanised farming on large land holdings, using monocultures, aggressive cultivation methods and external inputs in unsustainable ways. This paper focuses specifically on tensions around corporate appropriation of the world's seed supply and small farmer's counter movements for seed sovereignty, as a key aspect of this broader struggle between these stakeholders. It argues that the unrolling of a reformed, second-generation Green Revolution based on GMO seed technologies will expose farmers to further risks and deepen their disempowerment, while careful use of open source hybrid seeds or traditional varieties will increase food sovereignty. Chapter 15 notes that, in July 2013, India passed a Food Security Ordinance designed to guarantee cheap grain for the poor – who comprise about two thirds of the population. This was largely in belated recognition of a level of child malnutrition exceeding that of the entire African continent. This massive food insecurity has

been the flip-side of spectacular economic growth, largely in urban areas, which has created one of the largest middle-classes in the world. The previous policies, which prioritised and enabled this economic growth, reversed decades of previous policy prioritising national food production and rural development. Associated corporatisation and 'neoliberalisation' of agriculture caused widespread 'agrarian distress', manifesting most dramatically in epidemic levels of farmer suicides. One of the few exceptions to this pattern has been the foothills of the Himalayas, where agriculture has been relatively insulated from national policy changes and food sovereignty has remained largely in the hands of local communities. But this has not been without challenges of economic under-development, out-migration, environmental degradation and, most recently, the floods of June 2013. The paper argues that the cultural ecologies of the hills provide a more positive model for rural development, based on traditional agriculture and local food sovereignty.

Chapter 16 concludes by asking how food systems can be understood more completely than has been the case so far, notably by adopting a social science and specifically an anthropological perspective. From this perspective, different peoples' relationship to nature or "ecologies" are cultural artifacts, historically constituted and subject to change. We argue that a radical change took place in the 20th century which has created an unsustainable food system and taken us to the edge of disaster, and that a similarly deep shift has to happen in the 21st century if we are to meet these challenges.