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How Do Disasters Shape Food Sovereignty in the Philippines? Exploring the Reciprocal Relationships between Food and Disaster

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ABSTRACT. Some disaster-food connections are obvious: floodwaters devastate roads, thereby interrupting the flow of food from producers to consumers; typhoon winds prevent fisherfolk from going out in their boats; and international food aid inundates local markets after major disasters. We believe that other food-disaster linkages are subtler, deeper, and perhaps more significant. This paper is a preliminary investigation into the critical roles that natural hazards can play in affecting the food security of a community, region, or state. We argue that, in a part of the world that experiences frequent and intense natural hazards such as the Philippines (Bankoff 2007), food and disasters are necessarily connected. Moreover, we contend that the food sovereignty concept, with certain caveats, is the most appropriate theoretical frame for analyzing this connection. This paper aims to synthesize relevant literature in the matters discussed above. Our objectives are (1) to contextualize the assertion that food sovereignty is a better concept than food security for dealing with the food-disaster connection, using specific examples in the Philippines; and (2) to demonstrate that two key principles of food sovereignty—emphasis on the local and self-sufficiency—need to be rethought and even temporarily suspended in preparation for, during, and after a disaster. The paper is based primarily on secondary data published in academic and grey literature. Given our linguistic limitations, our assertions and analyses are necessarily biased toward written accounts published in English.

KEYWORDS. Philippines · food security· food sovereignty · disasters · hazards · vulnerability

> "Natural disasters could make food markets volatile."– *The National*, January 12, 2011

Food and Disaster

Like the authors of the *Nyéléni 2007 Synthesis Report of the Forum for Food Sovereignty*, we maintain that food sovereignty is critical for reducing community vulnerability and for dealing with disasters, both before and after a hazard occurs. We point out, however, that the very definition of disaster[1] forces us to reexamine our concept of food sovereignty. Two key characteristics of disasters are (1) the exceeding of local capacity and (2) the resulting need for external help to enable communities to cope and recover. Thus the very nature of disasters poses an ideological challenge to food sovereignty discourse, in particular its emphasis on *local*. The 2007 Declaration of Nyéléni, prepared by over five hundred representatives of peasant, indigenous, artisanal fisherfolk, pastoralist and other organizations in more than eighty countries, advocates for *local* control of production, distribution, and consumption of food. It is true that in a pre-disaster (prevention) phase having a localized relationship with food can often make people and their livelihoods more resilient to natural hazards. However, a disaster situation demands a *loosening* or an *opening up* of the *local* criterion of food sovereignty. Thus, a more nuanced and scale-sensitive concept of food sovereignty—one that is not always so stringent on local production, distribution, and consumption is needed to better prevent, and cope with, future disasters.

Risk, Hazard, Vulnerability, and Disaster

Scientists within the risks, hazards, and disasters field have long studied "risk"[2] and how to manage it. In recent decades, these issues have garnered the attention of social scientists in emerging fields of global change, environment, and development studies (Cutter 1996; 2003).[3] The risk of a disaster is the combination of a hazard[4] (e.g., typhoon, earthquake, etc.) and human vulnerability[5] (e.g., decrepit infrastructure, poverty, etc.). Wisner et al. (2004, 49) present the following equation as one of the most fundamental ways to conceptualize risk:

$$\text{Risk} = \text{Hazard} \times \text{Vulnerability}$$

The amount of risk depends on both variables in the equation. The likelihood and intensity of a hazard play a role: a super-typhoon is riskier than a light rain shower. However, it is only when an exposed population and infrastructure (e.g., rice paddies, plantations,

farmhouses, field-to-market roads, granaries, etc.) are vulnerable that a hazard can lead to disaster. As such, disasters result from a combination of biophysical and social factors (Cutter 1996).

Not all hazards become disasters. A hazard can precipitate a disaster when it brings about a situation "which overwhelms local capacity, necessitating a request to national or international level for external assistance" (EM-DAT 2011). The recently passed Republic Act 10121, An Act Strengthening the Philippine Disaster Risk Reduction, further develops the concept of disaster as

> a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human, physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. (Government of the Philippines 2010)

This legal definition recognizes that people can take action to prevent hazards from becoming disasters. The conceptual space between hazards and disasters offers opportunities for action. Many facets of food sovereignty can help communities to stay safe in the face of frequent natural hazards, as well as to better cope with disasters.

Hazards, Vulnerability, and Food

Food plays an important role in both sides of the risk equation described above. Food production, distribution, and consumption influence both the *hazard* and the *vulnerability* variables. Indeed, even relatively small harmful changes to the resources and the economies in vulnerable areas can have significant effects on their food security (Bohle, Downing, and Watts 1994). We will not focus on hazards because in general there is not much that can be done to prevent hazards themselves, whereas there is much that enhanced food sovereignty can do to reduce vulnerability. For example, people may knowingly increase their vulnerability to landslides because they have no choice but to deforest or intensify farming on steep slopes to sustain their food needs. Similarly, migrants encroach upon precarious locations

along river banks in cities because these places enable them to sustain the daily needs of their families.

A Question of Food Sovereignty or Food Security?

> "Words are prisons, as well as searchlights and pigeonholes for what we see and apprehend." – Stibbs (1998, 203)

Which terms are chosen for food-disaster debates have implications on how questions are framed, which issues are prioritized, and how solutions are implemented. While both food security and food sovereignty are concerned with how to configure agricultural production to address the needs of the hungry and malnourished worldwide, the two concepts remain distinct (Lee 2007; Sheedy 2010).

The concept of *food security* is frequently defined in terms of achieving adequate food availability, access and use (World Bank 2007), sustainable production, and self-sufficiency (Lee 2007; Sheedy 2010). Self-sufficiency can be defined at various scales—for example, by using the household, community, regional, national, or global level as the unit of analysis (Lee 2007). Self-sufficiency can have different scopes—for example, it can examine net food imports and exports, or focus instead on rural livelihoods (ibid.). While few would disagree that access to food and sustainable production are imperative, there is a growing international movement calling for a more inclusive treatment of food issues.

The *food sovereignty* movement critiques the prevailing agricultural model, and proposes a reconfiguration of the food system. The movement demands "the removal of agriculture from the international trade system and rejection of agricultural biotechnology and industrial agriculture in favour of localized food production and the protection of rural livelihoods across all nation-states" (Lee 2007, 1). It recognizes injustices in the current system and aims to change it. Within a food sovereignty model, people and their governments, and not transnational corporations, reclaim responsibility of the functioning of the food system (Sheedy 2010) and ensure that agricultural policies are both congruent with sustainable development (Issaoui-Mansouri 2010) and supportive of the achievement of a nationally determined level of food self-sufficiency (Paré 2010).

Food sovereignty is a more appropriate framework than food security for exploring disaster-food linkages. A food sovereignty lens

not only reveals self-sufficiency, access, and sustainable production issues as they relate to disasters but also highlights the underlying cultural, ecological, and economic factors. The same factors that food sovereignty brings forward are the ones that can underlie a population's vulnerability to natural hazards. Thus, the remainder of this paper will focus on food sovereignty and disasters.

Before proceeding to the next section, a brief note on the issue of scale is warranted. Scale is central to our critique of the Nyéléni conception of food sovereignty. While scholars examine food sovereignty through various lenses—economic, political, social, cultural, activist, among others—the *scale lens* has been underutilized. According to Cash and Moser (2000, 110), scale is "any specific geographically or temporally bounded level at which a particular phenomenon is recognizable." Scale can refer to either spatial or temporal boundaries and is often defined for "a particular issue and for particular purposes" (ibid., 110).

The temporal and spatial dimensions of scale are relevant to both disasters and food sovereignty. For example, should food sovereignty of a disaster-affected area be defined spatially—that is, can a disaster-affected area be considered food sovereign if it receives help from neighboring communities? Alternatively, should it be defined temporally—that is, can a disaster-affected area be considered food sovereign if it is self-sufficient over the course of a year but not for the two months immediately following a disaster? As the very definition of disaster implies the need for nonlocal assistance, the question of "what is local?" jumps to the fore. It is thus critical to clearly define the scale at which food sovereignty does (or does not) occur. Therefore, while it provides a solid starting point, we propose that food sovereignty, as defined in the Declaration of Nyéléni, is too restrictive and may not apply in a disaster-prone area such as the Philippines, and moreover, that a more flexible reconceptualization of food sovereignty is needed.

Food Sovereignty and Disasters: The Philippine Case

The Nyéléni 2007 Synthesis Report singles out disasters as one of the principal threats to food sovereignty (Nyéléni 2007). This section explores interconnections of food sovereignty and disasters, both before and after the disaster unfolds.

Pre-hazard

> "An ounce of prevention is worth a pound of cure." – attributed to Benjamin Franklin

The old adage applies well to contemporary disasters. According to the aforementioned risk equation, human vulnerability must be present for a hazard to lead to a disaster. Actors at various scales—community, regional, national, international—can take many measures to reduce their vulnerability. These measures can be taken both before and after a hazard occurs. Fewer resources are needed to prevent a hazard from turning into a disaster, than to deal with it once it has taken place.

The frequency and brutality of hazards have pushed farmers and fisherfolk in the Philippines to develop preventative technologies and attitudes to deal with them. The examples below show how such measures are (often) supportive of food sovereignty.

Land-Use Patterns

The Ivatan, an ethnolinguistic group in the Batanes Islands on the northern tip of the Philippine archipelago, live in one of the areas of the country most frequently hit by typhoons. These islands are well known for their traditional houses with very thick stone walls made to withstand powerful storms. The frequent hazards have had a major impact on the area's traditional agricultural techniques. The Ivatan have traditional cultivation strategies that defy capitalistic profit-maximizing logic but are appropriate for their particular hazard-prone ecosystem. Bankoff (2003, 4-5, emphasis added) describes the land-use patterns adopted by the Ivatan as an adaptive food security measure in a hazard-prone area:

> Held to be the unfortunate consequence of equal inheritance among siblings, the division of land among all heirs is generally regarded as an almost "feudal" relic of an unreformed land system that restricts outputs, hinders economies of scale and obstructs the efficient deployment of labor. Such views may start from the erroneous assumption that the desired norm is larger fields that customary practices have somehow unwittingly undermined. On the contrary, land fragmentation among the Ivatan is regarded as an important mechanism for ensuring food security. Planting in widely scattered parcels minimizes the likelihood that an entire harvest may be lost to hazard and increases the chances of some food sources even in the worst of circumstances (Blolong 1996, 17). In societies exposed to the constant threat of hazard, such farming strategies

> make good sense from the perspective of *local farmers* who are *mainly engaged in minimizing risk rather than maximizing surplus* (Scott 1976).

This example illustrates how, in very hazardous areas, traditional farming methods are more appropriate than short-term profit-maximizing methods. Such privileging of producers—as central actors in the food system—over corporate demands, and the emphasis on local cultural and ecological factors, demonstrate the overlap of reducing vulnerability to disasters and food sovereignty. (Note that in the quoted text above, the authors use the term *food security* but given the meaning that they attribute to the concept, we would call it a form of *food sovereignty*.)

Agricultural Diversification

Biodiversity is an important component of food sovereignty, and can play a key role in making food production safer from natural hazards. Biodiversity, as defined in Article 2 of the Convention on Biological Diversity, is

> the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (CBD 2011a)

Agricultural diversification has been used as an adaptive farming strategy for centuries. This diversity is present at various scales: the genetic level (different crop varieties or animal breeds), the species level (different crop types on a single farm), and the ecosystem level (farm households that tend both rice paddies and home gardens). The commercialization and modernization of agriculture, especially the use of genetically modified crops, however, are changing cultivation strategies. Many traditional varieties of grains, vegetables, and fruits, as well as traditional livestock breeds are disappearing as farmers concentrate instead on a limited number of commercial crops (CBD 2008). This narrowing of crop and animal diversity increases agriculture's vulnerability to hazards. For example, if a region grows only bananas, a typhoon with powerful winds can eliminate that area's main livelihood. The impact of this atmospheric hazard would be less severe if there was more biodiversity; the area's banana trees might be destroyed, but farmers could rely on other crops or livestock for their survival.

Some Filipino nongovernment organizations like MASIPAG have programs to protect and increase agricultural biodiversity in the Philippines. This organization has been working with peasants for decades, creating local seed banks and campaigning against genetically modified organisms as well as for conserving and improving indigenous farm animals. These programs are "expected to increase farmers' food security and enhance their control over genetic resources and agricultural production" (MASIPAG 2008). For example, in one of their programs that focuses on diversifying crop varieties, the organization collected sixty-three varieties of corn on the island of Mindanao alone (MASIPAG 2008).

MASIPAG argues that diversity increases self-reliance for farm families. Specifically, a "diversified farm means that the risk of crop loss due to pests, diseases and calamity is minimized" because "[d]ifferent crops have different levels of resilience to pest and disease outbreaks and to extreme climatic events" (Bachmann, Cruzada, and Wright 2009, 23). Thus, biodiversity and income diversity help to secure food sovereignty on a temporal scale, by ensuring a more consistent cash flow and food sources throughout the year.

The food sovereignty lens highlights the impacts that localized food production can have on vulnerability to natural hazards. Food production in hazard-prone areas must be evaluated with criteria other than those measured in mainstream industrial agriculture. Over the centuries, food producers have developed pre-hazard prevention strategies that may lower short-term productivity but ensure long-term survival. The next section explores food sovereignty issues in the post-hazard phase.

Post-Hazard

The post-hazard stage begins at the onset of the hazard and has short-, medium-, and long-term impacts. As we saw in part 1, the production and gathering of food are clearly linked to food security and food sovereignty. Disasters interrupt this relationship. The impacts of the disaster vary depending on the type and location of disaster; preexisting vulnerabilities; the disaster-preparedness measures implemented prior to disaster; the livelihoods of people living in, working in, or dependent upon the affected area; the number of people living in, working in, or dependent upon the affected area; the loss of assets post-hazard; the extent to which the affected area is integrated into the food production

system; and underlying political and economic factors (Gutton 2009; WFP 2010).

At the onset of a disaster, access to food and water is extremely critical. In the medium to longer term, issues relating to livelihoods and self-sufficiency come to the fore. The 2006 Guinsaugon landslide in Southern Leyte, Philippines, illustrates how a disaster affected various levels of food sovereignty and food security at the village and municipal scales. It has had far-reaching food effects with implications for food sovereignty in both the short and medium terms.

On February 17, 2006, at approximately 10:30 am, a devastating 15 million cubic meter landslide wiped out the barangay (village) of Guinsaugon in the municipality of Saint Bernard, Southern Leyte, Philippines (Guthrie et al. 2009). Several geological, climatic, and cultural factors contributed to the vulnerability of the community, including heavy rainfall, geological activity (e.g., tectonics, earthquakes), tropical weathering (ibid.), and its status as a 4th class municipality[6] (Gutton 2009).

The human, environmental, and economic toll of the landslide was high. It claimed the lives of 1,221 people and displaced an estimated 19,000 others (Guthrie et al. 2009). The damage to the physical landscape was similarly destructive and extended into six other barangays. Philippine officials estimated there were PHP 92.2 million (USD 1.78 million) in infrastructure damage and PHP 22.6 million (USD 436,000) in agriculture damage (UN-OCHA 2007). The debris buried 250 hectares of the 300 hectare agricultural land and destroyed much of the arable land, food stocks, and seed stores in the barangay (Gutton 2009). The landslide also modified the hydrology of the area, which negatively affected the irrigation systems of rice paddies in Guinsaugon and neighboring barangays (ibid.).

After the landslide, relief aid flooded into the area. Government, nongovernmental organizations, and international relief agencies including the US Agency for International Development (USAID), the International Red Cross Society, and the Prem Rawat Foundation donated and distributed foodstuffs. These food supplies lasted several months, after which the victims were expected to provide for themselves. For the most part, the surviving residents of Guinsaugon and neighboring barangays remained in the municipality of Saint Bernard. The survivors were resettled in relocation sites several kilometers away from their old farms. As the majority of residents depended on farming for their livelihoods, they faced difficult choices: spend a large portion

of their day walking to and from their old farms, spend a large portion of their income on transportation to and from their old farms, or find a new source of livelihood (Gutton 2009).

The landslide affected food production, distribution, and consumption in the short and medium terms. Agricultural production dropped significantly due to physical changes to the landscape (e.g., debris covering the land) and to the distance between the relocation sites and the farms, effectively forcing farmers to spend less time cultivating. Bringing the agricultural products that farmers continue to produce in Guinsaugon to nearby markets has become more difficult than before as the landslide destroyed the old roads, footpaths, and bridges (Gutton 2009). Households modified their food consumption patterns after relocation as families opted to reduce subsistence-farming activities and to increase the portion of purchased foodstuffs in their diet.

Production

> "Crop, infrastructure damage hits P183M – disaster agency" – Inquirer.net, January 7, 2011

Natural hazards trigger disasters in that they significantly affect people when they destroy livelihoods in the short, medium, or long term. Livelihoods centered on food production are especially susceptible to natural hazards. Hazards disrupt various aspects of production by dislocating producers from their means of production, and by debilitating or destroying the means of production. Moreover, relief efforts can undermine the recovery of local production.

Disasters impact the means of production. Nearly all of the 721 households interviewed in a study[7] investigating the short-term impacts of the 2009 typhoons Ondoy (with international name Ketsana) and Pepeng (with international name Parma) on household food security lost a portion of their land, crops, and equipment (WFP 2010). The typhoons and subsequent flooding greatly affected the livelihoods of small-scale fish farmers. Mud filled 67 and 50 percent of fishponds in Regions 3 and 4-A, respectively (ibid.). The loss of productive assets of some fisherfolk in Region 4-A was so acute that they feared not being able to depend on fishing as their main livelihood (ibid.). These typhoons similarly affected the prospects for farmers in the North and in Regions 3 and 4-A who faced many challenges including a shortage of traditional seeds, improved seeds, funds, water, farm tools, as well

as productive lands that were still flooded, and high input prices (ibid., 16-17). On a national level the World Bank-led Post Disaster Needs Assessment estimated the cost of Ondoy and Pepeng at PHP 217.4 billion (USD 4,625 million) due to destroyed physical assets, associated losses of production, and other flows of the economy (ibid.). This estimate includes damage to infrastructure and lost industrial and agricultural production.

Access to the means of production may be limited, even if they were not destroyed. Fishing, for example, is vulnerable to atmospheric disasters such as typhoons not only because they damage fishing gear but also because they displace fish and prevent fisherfolk from traveling to their fishing grounds (Rodriguez 2010).

Households that depend primarily on agriculture and land for their livelihoods are disproportionately affected by disasters. Crittenden, Lamug, and Nelson (2003) describe such a scenario in Bacolor communities following the Mount Pinatubo volcanic eruption and subsequent lahars over the next five years. (Lahars are flowing mixtures of volcanic debris and water triggered by heavy monsoon and typhoon rains.) In 1991 prior to the eruption, nearly 10 percent of men in Bacolor listed their occupation under the agriculture category (e.g., landowning farmers, farmers working their own small plots, and farm laborers), but five years later this number fell to zero percent. As Crittenden, Lamug, and Nelson (2003, 131) put it, "the occupations most tied to local land. . .could no longer be converted into livelihood."

An effective strategy to reduce the impacts of and recovery from disasters is the diversification of income sources. Household and communities that engage in activities including craft making, charcoal making, honey collecting, and beer brewing, *in addition to their farming and fishing activities*, can have access to local food sources and can continue to generate income during and after a disaster. In other words, the importance of nonfarm income increases after disasters, which forces the temporary suspension of agricultural production (Wisner et al. 2004).

In some cases, however, some producers may actually *benefit* from disasters. Interviews conducted by one of the authors in October 2010 with small-scale fishermen in Laguna Lake demonstrate this point. The strong winds and floodwaters of typhoon Ondoy destroyed the majority of fish pens owned by commercial fishing operators in Laguna Lake, releasing thousands of mature, fattened, and commercially fed fish into the *commons* portion of the lake. Small-scale fishermen whose

livelihoods depended upon the fish they catch in the lake saw their catch and income increase up to tenfold after the typhoon. (Although none of the women in the community actually fished, several women owned fish pens and participated in other fishing-related tasks such as mending nets and selling fish.) When supply from commercial aquaculture producers dropped, the fishing efforts of small-scale fishermen met the demand of commercial buyers.

Distribution

> "Collapse of bridge affects delivery of products." –*Philippine Daily Inquirer*, May 11, 2009

Disasters can, literally and figuratively, create a gulf separating local producers from the people who wish to consume their products. Disasters can interrupt the movement of foodstuffs into and out of the affected areas. Damage to infrastructure, in particular to transportation infrastructure, can have immediate and longer-term impacts on affected communities. It may be difficult or impossible to bring food in and distribute it to disaster victims. If the affected community had large amounts of perishable foods (e.g., produce or fresh fish) ready to be transported out of the community when disaster struck, this foodstuff may not be able to leave the community. Moreover, it can take weeks, months, or even years to rebuild roads, thereby isolating the affected area and hindering economic development, integration with potential markets, etc.

Among the groups whose livelihoods are most affected at the distribution stage are local traders. The 2010 Emergency Food Security Assessment outlines the various immediate and short- to medium-term effects on traders in Ondoy- and Pepeng-affected areas following the floods (WFP 2010). Some traders lost up to 100 percent of their food stores. The costs of transportation, storage, and vegetables rose. (The latter was caused by the extensive damage incurred on vegetable farms in the North.) At the same time, the volume of their major commodities dropped significantly, which was attributed in large part to the food assistance distributed among flood victims. The major business-related constraints they faced were poor food quality (84 percent), high buying price (76 percent), lack of demand (75 percent), lack of credit (67 percent), irregular supply (67 percent), transportation challenges (53 percent), storage constraints (44 percent), and food aid (33 percent) (ibid., 22). Promoting local food sovereignty must therefore include

safeguards for the traders, both for their livelihoods as well as for their role in distributing food to other residents.

Articulating an appropriate role for food aid that promotes food sovereignty is critical. Without one, disasters will continue to undermine progress toward achieving food sovereignty because of the intimate relationship between disasters and external aid. Indeed, as noted earlier, a key characteristic of a disaster is that "a significant number of vulnerable people experience a hazard and suffer severe damage and/or disruption in their livelihood system in such a way that recovery is unlikely *without external aid*" (Wisner et al. 2004, 50, emphasis added).

Consumption

In a disaster, diets often change dramatically. There are many reasons for this: local markets close, roads to bring in food are blocked, relief agencies distribute whatever foodstuffs they have available, households have no money to purchase food, etc. (WFP 2010). These effects do not impact everyone equally. Depending on where they are residing, disaster victims will have differential access to different types of foods. For example, victims living in evacuation centers consume more relief food than victims residing elsewhere, who rely more on their own production (ibid.). Moreover, food may be distributed very unequally among members within a single family. Consumption issues also highlight the importance of scale when framing disaster-food issues.

After Ondoy and Pepeng, affected families adopted various coping strategies that affected their food consumption. A coping strategy is a

> short-term choice or decision [that] households are forced to take in order to cope and deal with and adapt to the onset of a new situation such as a natural disaster. These coping strategies are at most times considered negative offsetting [of] the threat to already vulnerable households' short and long-term food and economic resources. (WFP 2010, 14)

The WFP study found that households opted to consume less preferred or less expensive food (79 percent), bought food on credit (51 percent), decreased meal size (39 percent), borrowed food from neighbors and friends (37 percent), and reduced the number of daily meals eaten by adults (34 percent) (2010, 15). There were regional differences in the coping strategies, with the National Capital Region (NCR) and Region 4-A using more consumption strategies than the

other regions included in the study. Thus, NCR and Region 4-A can be seen as *less* food sovereign than the other affected regions. This inequality points to the issue of *scale* in consumption.

These results indicate that Ondoy and Pepeng affected consumption at various small-scale levels: household, evacuation centers, and barangay (village). The typhoons also affected consumption at the broader provincial and regional levels. These disasters had clear impacts on the self-sufficiency of certain levels of Philippine society, suggesting that such emergency events may require the temporary suspension of the *local* and *self-sufficient* criteria of food sovereignty.

Conclusion

Our brief exploration of the link between disasters and food demonstrates important ways in which natural hazards affect food sovereignty and vice versa. Effects are observed at a variety of scales (e.g., community, region, state) and at each stage of food production, distribution, and consumption. The intricate ties should not be viewed as impediments either to achieving food sovereignty or to averting or mitigating the impacts of disasters. Instead, these ties present opportunities for actors at each level.

To achieve food sovereignty, the Nyéléni 2007 Synthesis Report calls for the inclusion of victims and survivors of disaster in determining and leading the relief, recovery, and rebuilding efforts. Moreover, it argues for the inclusion of self-determination, which "ensure[s] ecological community-based management, reliant on traditional knowledge and lifestyles that increase the resilience of ecosystems to catastrophic events" (Nyéléni 2007, 4). Similarly, Wisner et al. (2004) articulate specific ways to achieve sustainable livelihoods and reduce vulnerability to disasters. These elements are also applicable to the parallel goals of increased food sovereignty and decreased vulnerability to disasters:

- diversifying income sources and agricultural production;
- building local support and risk awareness networks;
- improving local coping mechanisms;
- developing buffers of food, cash saving, and insurance;
- providing universal public education and health care;
- setting up local seed and animal banks;
- ensuring equitable access to critical resources including money, information, services, and natural resources;

-challenging structures that prevent the fair distribution of livelihood resources; and
-recognizing the role of local, municipal, state and other institutions in supporting sustainable livelihoods (352-253).

This paper has provided a broad overview of food-disaster linkages and offered a constructive critique of the concept of food sovereignty. We argued that, because the very definition of "disaster" implies a need for outside help, a more inclusive concept of food sovereignty is required. Food sovereignty discourse emphasizes the centrality of local in all stages of food production, distribution, and consumption. It privileges local actors and their agency.

The Nyéléni concept of food sovereignty and its emphasis on the "local" is too restrictive to be applicable to disaster-prone areas such as the Philippines. The examples we outlined highlight the need for greater flexibility toward the concept of food sovereignty. Emphasis on the local is meaningful in the pre-hazard phase: having a localized relationship with food can make people and their livelihoods more resilient to natural hazards. In the post-hazard phase, however, the local criterion becomes invalid. When a disaster occurs, local capacity to cope and recover is overwhelmed. It is therefore necessary for the affected areas to accept external help or risk exacerbating the negative impacts of a disaster.

This breach of food sovereignty norms indicates a need for reconceptualizing food sovereignty in disaster-prone areas, and revisiting the issue of scale. Perhaps the spatial and temporal boundaries of food sovereignty should be made more elastic.

For example, vulnerable areas could aim to regain food sovereignty within an agreed-upon time period after a natural hazard. Or, a larger share of the control over the types and distribution of relief foods could be held by local actors instead of external agencies. Moreover, there should be greater support for actors currently developing and implementing preventative disaster risk reduction measures to minimize setbacks to the area's food sovereignty when natural hazards occur. The subtler, deeper, and perhaps more significant relationship between food sovereignty and disasters, and how to build the capacity and agency of key actors, require further theoretical and empirical research.

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Notes

1. Republic Act 10121, An Act Strengthening the Philippines Disaster Risk Reduction, defines a disaster as "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources" (Government of the Philippines 2010).
2. Risk is the probability of harmful consequences or expected loss (lives, people injured, property, livelihood, economic activity, or environment) resulting from interactions between natural or human-induced hazards and vulnerable conditions (www.unisdr.org).
3. See Hewitt (1983) for a scathing critique of the dominant geophysicalist and technocratic reductionist view of disasters, and the impacts of this discourse on scientific research and national and international policies and programs.
4. A hazard is a potentially damaging physical event, phenomenon, or human activity that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation (www.unisdr.org). Hazards can be atmospheric (e.g., typhoon), seismic (e.g., volcanic eruption), biological (e.g., insect pests), or anthropogenic (e.g., nuclear meltdown).
5. Vulnerability is a set of conditions and processes resulting from physical, social, economic, and environmental factors that increase the susceptibility of a community to the impact of hazards (www.unisdr.org). For a discussion of vulnerability typologies, see Adger (2006), Kelly and Adger (2000), Smit and Wandel (2006), and Watts and Bohle (1993). Weichselgartner (2001) provides a synthesis of key contributions to vulnerability and disaster scholarship.
6. In the Philippines, municipalities are ranked according to their income level. A 4th class municipality has an average annual income of PHP 20 million to PHP 30 million (USD 600,000 to USD 645,000) in the three preceding years.
7. The Emergency Food Security Assessment was conducted by the World Food Programme, in collaboration with the Government of the Philippines, UNICEF, FAO, Save the Children, World Vision, OXFAM, ADRA, CFSI, and Christian Aid in November 2009. The study was done in both urban and rural affected areas of the Philippines, in particular in Regions 1, CAR, 2, 3, NCR, and 4-A.

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