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Realizing the right to food in an era of climate change:
The importance of small-scale farmers

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Food and Sustainability

QUNO's work on Food and Sustainability aims to promote informed, balanced and thoughtful discussion about what agricultural systems are best suited to different circumstances and needs. We consider what policy space all countries – particularly developing countries – should maintain to ensure agriculture-related policies that support their overall development, food policy, agriculture, environment and social objectives. We seek to ensure that local communities are empowered to work towards resilient, equitable and sustainable food systems.

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SUMMARY

• Industrial agriculture is a major contributor to anthropogenic climate change, and in turn climate change threatens the viability of food production around the world.

• Adapting to changing growing conditions will require access to the full breadth of genetic, species and ecosystem diversity that exists and continues to evolve, along with the knowledge of what works under what conditions.

• Modern varieties can yield immense public benefit. However their dissemination is often accompanied by the erosion of on-farm genetic diversity, loss of associated local knowledge, and the abandonment of traditional farming practices. This undermines our critical capacity to adapt to already-changing conditions.

• In their roles as experimenters, innovators and custodians of agrobiodiversity, small-scale farmers are integral to the pursuit of global food security in an era of climate change.

• The field of agroecology recognizes the contributions of small-scale farmers and provides a framework for integrating local and scientific innovation systems and mitigating the negative environmental effects of industrial agriculture.

• Complementarity between local and scientific innovation systems is best achieved when small-scale farmers lead the development of research agendas and are actively involved in the research process.

• Proactive measures need to be undertaken to support small-scale, agriculturally biodiverse farming systems to secure local and global food security, and hence the right to food, in the future.

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Introduction

"We need to raise the status of small-scale farmers from 'most vulnerable' to 'most valuable' and reorient investment in agriculture towards the needs of those on the frontline of climate change and food production."

Agricultural biodiversity (agrobiodiversity) and the diversity of management practices employed within traditional farming systems provide small-scale farmers with the ability to cope with external stresses and fluctuations, be they environmental or market-related. In their roles as experimenters, innovators and custodians of agrobiodiversity and related management practices, small-scale farmers are integral to the pursuit of global food security, particularly in the context of climate change. Using a rights-based approach to protect and foster their adaptive capacity can provide a framework for spurring innovation, promoting conservation and raising the status of small-scale farmers from 'most vulnerable' to 'most valuable' - effectively re-orientating investment in agriculture towards the needs of those on the frontline of climate change and food production.

A rights-based approach to food security

States-parties to the International Covenant on Economic, Social and Cultural Rights (ICESCR) recognize the right to adequate food pursuant to article 11, and have undertaken a variety of measures to incorporate this right into constitutions, judicial systems, institutions, policies and programs and to ensure the right's progressive realization.[1] There are a growing number of courts willing and able to decide on cases involving the right to food violations, providing individuals with a means of pursuing a legal remedy in times of emergency.[2] But in addition to remedying past violations, what is needed are more proactive measures

1 O. de Schutter (2010). Countries tackling hunger with a right to food approach. Briefing note 1.

2 ibid. See cases in India, Nepal, Brazil, Argentina, Colombia, Switzerland, Paraguay and South Africa.

for ensuring that food will be both available and accessible in the future.

A rights-based approach[3] can help achieve these ends. The Committee on Economic, Social and Cultural Rights (CESCR) has affirmed that it is no longer sufficient for the right to adequate food to be limited to prevailing social, economic, cultural, climatic, ecological and other conditions.[4] States' obligations should now extend to the protection of the means for achieving food security under future and unknown scenarios. This means paying more attention to the threats facing agricultural production systems today and implementing measures that facilitate adaptation to these threats.

3 A rights-based approach to development is an approach to development promoted by many development agencies and non-governmental organizations (NGOs) to achieve a positive transformation of power relations among the various development actors. See the United Nations Development Group (UNDG) (2003). UN Statement of Common Understanding on Human Rights-Based Approaches to Development Cooperation and Programming.

4 CESCR General Comment No. 12: The Right to Adequate Food (Art. 11). para 7.

Industrial agriculture and climate change

Industrial agriculture is the system of chemically-intensive and fossil fuel-dependent food production developed in the decades after World War II and features large single-crop farms and animal production facilities. Industrial agriculture is a major contributor to climate change, biodiversity loss and the degradation of land and freshwater ecosystems,[5] and is pushing us beyond critical planetary boundaries.[6]

Both the expansion of agricultural land into new areas and the intensification of production have negative environmental impacts. Agriculture accounts for between 30 and 35 percent of global greenhouse gas (GHG) emissions[7] and almost one quarter

5 J.A. Foley et al (2011) Solutions for a cultivated planet, Nature 478: 337-342.

6 J. Rockstrom et al (2009). A safe operating space for humanity. Nature 461, 472-475; W. Steffen et al (2015). Planetary boundaries: Guiding human development on a changing planet. Science 347: no. 6223.

7 R. DeFries and C. Rosenzweig (2010). Toward a whole landscape approach for sustainable land use in the tropics. Proceedings of the National Academy of Sciences, USA, 107:19627-19632.

Photo credit: UK College of Agriculture, Food & Environment/Flickr

of anthropogenic GHG emissions.[8] Methane emissions from livestock and rice production, nitrous oxide emissions from fertilized land and the loss of carbon capture associated with tropical deforestation are the largest contributing factors.[9]

The effects of industrial agriculture are felt in two ways. First, it contributes to climate change and environmental degradation, which in turn threatens the viability of food production systems of all scales around the world.[10] Second, farmers' capacity to adapt to

8 P. Smith et al (2014). Agriculture, Forestry and Other Land Use (AFOLU). Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

9 J.A. Foley et al (2011) Solutions for a cultivated planet, Nature 478: 337-342.

10 O. de Schutter (2014). Final report: The transformative potential of the right to food. United Nations Human Rights Council: Geneva. A/HRC/25/57.

Box 1: Drivers of increased production

Population growth is commonly cited as the main driver of expansion and intensification, and the justification for investing in technology-based solutions for what is framed as a production problem.[1] But the world already produces plenty—roughly a third more food for each of us than in the 1960s.[2] Even after feeding to livestock a third of global grain production, 90 percent of all soy meal, and a third of the fish catch, there is still a global average of roughly 2,800 calories available per person per day.[3] Despite leaps in production, the overall number of people affected by chronic hunger has scarcely changed. We do face the challenge of growing populations but perhaps of more significance are the changing diets of these populations. With more wealth comes demand for resource-intensive products (such as dairy and meat) that require more energy to produce than a vegetarian diet. Right now the bulk of industrially produced grain crops goes to biofuels and to confined animal feedlots rather than food for the 1 billion hungry people. Increasing food production is necessary, but it is not sufficient if we are going to address food security, which at its core is about poverty and inequality.[4]

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1 See for example FAO, IFAD and WFP. 2014. The State of Food Insecurity in the World 2014. Strengthening the enabling environment for food security and nutrition. Rome, FAO.
2 FAOSTAT Food Production, Net Per Capita. Index 100 = 2004-2006. In the 1960s, the Index Number was between 75-77; whereas in 2010 it was 105. http://faostat.fao.org/site/612/DesktopDefault.aspx?PageID=612#ancor. FAO's estimate of calories available shows a 22 percent increase from the mid-1960s to 2007, the latest year for which data is provided.
3 For 2007, the most recent year available, the UN Food and Agriculture Organization estimates 2796 calories per capita per day. See FAOSTAT, Food Balance Sheets. http://faostat.fao.org/site/368/DesktopDefault.aspx?PageID=368#ancor
4 "At present, nearly half of the world's cereal production is used to produce animal feed, and meat consumption is predicted to increase from 37.4 kg/person/year in 2000 to over 52 kg/person/year by 2050, so that by mid-century, 50 percent of total cereal production may go to increasing meat production." Report submitted by the Special Rapporteur on the Right to Food, Olivier De Schutter to the UN Human Rights Council, December 2010, pg. 4. 40.9 percent of corn planted went toward fuel production in 2011/12; USDA Economic Research Service Feed Grains Database.

changing growing conditions may be impaired by the displacement of on-farm diversity by 'modern' crop varieties and farming practices. The loss of on-farm diversity depletes the very resources that are the foundation of our ability to adapt to global environmental change. In addition, the abandonment of diverse farm management practices associated with industrial agriculture erodes small-scale farmers' capacity to innovate in response to environmental and socio-economic changes.

We need to work on both fronts by reducing the environmental costs of food production while increasing the capacity of farmers to adapt to new growing conditions. This brief highlights agroecology as a useful framework for pursuing both of these ends simultaneously. Agroecological systems are said to be resilient when they can absorb external shocks such as environmental or market fluctuations.[11] As we will see, the multiple kinds of diversity present within small-scale farming systems - agrobiodiversity, local knowledge systems and diverse farm management practices - make them resilient. These are our tools for pursuing food security in an era of climate change.

The importance of agrobiodiversity

Box 2 highlights projected impacts of climate change on crop species. Projections vary significantly by region and the model used, and there is no consensus on whether net productivity gains may be achieved in some regions, such as in the temperate zone where growing seasons may be lengthened, or if increased sensitivity to disturbances will be felt everywhere, reducing crop production across the board.[12] Both incremental changes in growing conditions and increased frequency of extreme weather events will undoubtedly present immense challenges to production systems that may include several crop and animal species. The Fifth Assessment Report of the Intergovernmental

11 L. Carlisle (2014). Diversity, flexibility, and the resilience effect: lessons from a social- ecological case study of diversified farming in the northern Great Plains, USA. Ecology and Society 19(3): 45.

12 D.B. Lobell, W. Schlenker and J. Costa-Roberts (2011). "Climate trends and global crop production since 1980", Science, 333(6042): 616–620.

Box 2: Impacts of climate change on crop species

The Food and Agriculture Organization of the United Nations (FAO) asserts that in each of the IPCC's projected climate change scenarios the geographic distributions of crop species will be affected faster than they are able to migrate and adapt.[1] Changes in crops' lifecycle, migration patterns and population distributions have already been documented.[2] One change, such as a later flowering time, can have repercussions in other parts of the food system because the processes and species involved have co-evolved and are highly interdependent. Shifts in the ranges of pests and pathogens are also predicted, demanding that crop species develop immunities to unfamiliar biotic stresses.[3]

1 FAO (2010). Second report on the state of the world's plant genetic resources for food and agriculture. Rome.
2 Secretariat of the Convention on Biological Diversity (2010) Global Biodiversity Outlook 3.
3 FAO (2010). Second report on the state of the world's plant genetic resources for food and agriculture. Rome.

Panel on Climate Change (IPCC), while affirming that climate change will affect both crop yields and soil organic carbon levels, highlights the immense degree of uncertainty surrounding the net effects of climate change on agriculture because of how many factors there are to consider.[13] This uncertainty limits our capacity to respond through conventional channels of agricultural innovation (see Box 3 for further discussion on breeding for climate change).

13 P. Smith et al (2014). Agriculture, Forestry and Other Land Use (AFOLU). Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Box 3: The challenge of breeding for climate change

Crop breeders are faced with immense uncertainty as they try to keep pace with changing growing conditions. This uncertainty makes it difficult to predict which traits, such as such as new resistance to pests, diseases or greater tolerance to drought or saline soils, will be needed in the future.[1] Our current understanding of the genetic base of such traits likely to be required for environmental adaptation is incomplete,[2] and predicting which species have these genes, whether expressed directly or not, remains a challenge.[3] These genetic resources are arguably the most important natural resource for humanity today because without them we lose our ability to adapt to change and hence our ability to feed ourselves. Moreover, the development of a single new variety takes on average ten years, during which time breeders cannot practically evaluate their material under future growing conditions.[4] Conventional plant breeding is an imperfect, albeit highly sophisticated, process. On its own it represents an incomplete strategy for adapting agriculture to climate change, and needs to go hand-in-hand with efforts to support farmers' capacity to adapt to both gradual changes in growing conditions and extreme climate events.

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1 See E.C. Brummer et al (2011). Plant breeding for harmony between agriculture and the environment. Frontiers in Ecology and the Environment, 9(10): 561–568; R. Koebner, & R. Ortiz (2013). Fishing in the gene pool – how useful was the catch? Plant Genetic Resources, 11(03): 283–287.

2 See for example L. Cattivelli et al (2008). Drought tolerance improvement in crop plants: An integrated view from breeding to genomics. Field Crops Research, 105(1-2): 1–14.

3 See H. Khazaei et al (2013). The FIGS (focused identification of germplasm strategy) approach identifies traits related to drought adaptation in Vicia faba genetic resources. PloS One, 8(5).

4 M.A. Semenov and N.G. Halford (2009). Identifying target traits and molecular mechanisms for wheat breeding under a changing climate. Journal of Experimental Botany, 60: 2791-2804.

The best defence against unpredictability is diversity. The vast majority of diversity within and between species is maintained by farmers on-farm in the form of landrace varieties and crop wild relatives (CWR) adapted to local conditions (see box 4). However, the shift away from traditional production systems and the cultivation of landrace varieties,[14] particularly in favour of wheat, rice, maize and potato varieties,[15] has resulted in a loss of 75 percent of plant genetic diversity.[16] The Second Report on the State of the World's Plant Genetic Resources reports that this shift is the primary cause

"The best defence against unpredictability is diversity."

Photo credit: Biodiversity International/J. van de Gevel

14 Reports documented in FAO (2010). Second report on the state of the world's plant genetic resources for food and agriculture. Rome.
15 Reports documented in FAO (2010). Second report on the state of the world's plant genetic resources for food and agriculture. Rome.
16 D. Nierenberg and B. Halweil (2005). Cultivating Food Security, New York, W. W. Norton & Co.

of the overall net loss of on-farm diversity, and is most reported in the case of cereals where breeding efforts are most concentrated.[17] Wale et al (2011) explain that farmers have financial incentives to replace diverse sets of landrace varieties with monocultures of uniform, high-

Box 4: On-farm genetic diversity conservation

Gene banks house samples of living genetic resources, or *germplasm*, such as seed and other plant tissues where crop breeders and other researchers have easy access to them. While this *ex situ* conservation provides an important safeguarding function for the world's plant genetic resources and facilitates crop breeding, the drawbacks are well known. Only a very limited proportion of diversity can be accommodated, collections are difficult to maintain and samples can degenerate quickly, and what does get protected does not evolve along with its natural habitat, thereby undermining its value in terms of crop improvement.[1] The vast majority of genetic diversity is, and must continue to be, maintained *in situ* in the form of landrace varieties and wild species adapted to local conditions. In fact, *in situ* conservation is inherent to small-scale farming systems.[2] Together with the knowledge of what works under what conditions, on-farm conservation and management of genetic diversity represents the best defence against changing environmental conditions.

1 See for examples N. Maxted, B.V. Ford-Lloyd and J.G. Hawkes (1997). Complementary conservation strategies. In Plant Genetic Conservation: The In Situ Approach. Chapman and Hall, London; J.M. Iriondo, N. Maxted, M.E. Dulloo (eds) (2008). Conserving Plant Diversity in Protected Areas, CABI International, Wallingford, UK; D. Hunter and V. Heywood (eds.) (2011). Crop Wild Relatives: A manual for in situ conservation, Earthscan.
2 Wale et al (2011).

17 FAO (2010). Second report on the state of the world's plant genetic resources for food and agriculture. Rome.

yielding varieties, and abandon more diverse agricultural systems.[18] Repercussions will be felt in terms of nutrition, resilience to environmental stress and loss of traditional knowledge.

Modern varieties can offer immense public benefit. Paradoxically, however, breeding new varieties adapted to predicted climate change scenarios depends on the availability of genetic variation within and between crop species, while the dissemination of new varieties contributes to the erosion of this diversity. This is the case even when improved stress tolerance is achieved in climate change-affected areas. Particularly when the adoption of modern varieties is accompanied by higher input costs, indebtedness and the practice of producing monocultures of uniform, high-yielding varieties, farmers are left more vulnerable to environmental change and market fluctuations than they were to begin with.[19] The dissemination of modern varieties may thereby run counter to the goal of fostering resilience within agroecosystems. This relationship deserves careful consideration.

Local knowledge systems and diverse farm management practices

Small-scale farming systems represent far more than storehouses of genetic diversity - they are the foundation for collaboration and experimentation and where creative solutions to problems not yet defined can emerge. Small-scale farmers continually develop better ways of managing resources and overcome local challenges by synthesizing local and scientific knowledge systems and applying them to changing circumstances.[20] While vulnerable to the effects of climate change, small-scale farmers are highly responsive to change.

Local knowledge includes environmental and ethnobotanical knowledge (which tends to be highly sophisticated in the case of specific crops important to household food security and

18 E. Wale, A.G. Drucker and K.K. Zander (eds) (2011). The economics of managing crop diversity on-farm: Case studies from the genetic resources policy initiative. Routledge.

19 O. de Schutter (2009). Seed policies and the right to food: enhancing agrobiodiversity and encouraging innovation. A/64/170

20 Sanginga et al 2009

"Small-scale farming systems represent far more than storehouses of genetic diversity - they are the grounds where collaboration and experimentation take place and where creative solutions to problems not yet defined can emerge."

income), detailed histories of what has worked under what conditions based on generations of direct observation, and an understanding of how to integrate local and scientific knowledge systems.[21] Local knowledge informs the selection of farm management practices such as soil and water management, pest control, and crop selections, rotations and combination, reflecting local resource endowments and the nutritional and cultural requirements of local people.[22] Local knowledge exchanged through informal networks is selectively applied and modified by farmers according to their own unique and changing circumstances.[23]

Farm management practices are 'traditional' in the sense that they are deeply embedded within socio-cultural contexts, but are otherwise highly dynamic. Small-scale farmers continually experiment with new ways of managing scarce resources, and dealing with climate change is not a new concept.[24] Box 5 highlights the kinds of traditional practices employed within small-scale farming systems, in combinations specific to local contexts. Diverse management strategies protect biodiversity and environmental quality while at the same time contribute to food security and livelihood improvement. Existing practices provide good starting points for collaborations among farmers and researchers;[25] such an approach ensures that collaborations stay rooted in local realities and their outcomes are readily applied.[26] Field research

21 Beckford and Baker 2007

22 Eyzaguirre 2001; Shepherd 2001; Beckford and Baker 2007

23 Prolinnova Working paper - Waters-Bayer et al

24 Liniger et al 2011

25 FAO, 2009b in Liniger et al 2011

26 Waters-Bayer et al 2009

Photo credit: Kate Holt/Africa Practice

has demonstrated that farmer participation in experimental design is an effective way of bridging formal and informal innovation processes, synthesizing 'modern' scientific knowledge and methods with local expertise, goals and values.[27] Creative opportunities lie in the two-way sharing of ideas, products or methods between small-scale farmers and researchers in a non-prescriptive way.

"Farm management practices are 'traditional' in the sense that they are deeply embedded within socio-cultural contexts, but are otherwise highly dynamic."

27 J.A. Ashby (1984). Participation of small farmers in technology assessment: experiences with beans (phaseolus vulgaris L.) and rock phosphate. Centro Internacional de Agricultura Tropical: Seminarios Internos.

Box 5: Traditional farm management practices

Sustainable land use strategies include composting and manuring, rain water harvesting, smallholder irrigation management, terracing and other strategies for crops grown on slopes, agroforestry, integrated crop and livestock management, pastoralism, and sustainable forest management in drylands and rainforests.[1] Innovative strategies for reducing risk include diversifying resource bases (including crops and varieties, food procurement strategies and providing other goods and services), adopting new technologies, adjusting the timing and location of activities to suit changing conditions, and participating in conventional or alternative markets such as barter or informal exchange based on reciprocity.[2] These strategies insure farmers against production failure and allow them to attain more balanced diets, add value to agricultural products, and invest in technologies that improve the efficiency of labor, land or cash investment.[3] Other practices relating to nutrition, culinary traditions, and food preservation and processing contribute to on-farm diversity. [4]

1 Liniger et al 2011
2 Howard et al 2008
3 Liniger et al 2011
4 Howard et al 2008

The adoption of 'modern' varieties and farming practices is an active endeavour by small-scale farmers, not one done on their behalf. Introduced technologies are most useful when they are provided without proscriptions on use, allowing farmers the space and flexibility to experiment and adapt them to suit their needs and resource endowments.[28] However, scientists and researchers often underestimate the time, resources and expertise that farmers put into performing informal field trials and integrating successes into their mixtures of varieties and farming practices.[29]

28 Wettasinha et al 2014
29 Waters-Bayer 2009

Farmers' mixtures studied in Kenya, Peru and the Philippines contain both local and 'modern' varieties.[30] In some cases, farmers procure 'modern' varieties from outside of official dissemination channels by taking them from government demonstration plots and field stations to test at home, highlighting the level of interaction that goes on between formal and informal seed systems on the ground.[31] All of this work is largely undocumented and remains invisible to formal sector researchers,[32] perpetuating a long-standing tradition of casting small-scale farmers as implementers of instructions rather than innovators in their own right.[33]

"Scientists and researchers often underestimate the time, resources and expertise that farmers put into performing informal field trials and integrating successes into their mixtures of varieties and farm management practices."

In short, small-scale farming systems are integral to achieving global food security in an era of climate change not only for the genetic diversity they actively maintain, but for the capacity of the farmers who manage them to respond to changing circumstances through experimentation, adaptation and innovation. We therefore need a framework for harnessing and building on this capacity. Agroecology provides such a framework.

Agroecology

An alternative to the industrial agricultural model, agroecology has been promoted as a means of mitigating the environmental impacts of food production (including GHG emissions), while at the same time enhancing famers' ability to adapt to changing growing conditions. This approach

30 Berne Declaration (2014). Owning seeds, accessing food: A human rights impact assessment of UPOV 1991. Lausanne: Berne Declaration.
31 Ibid
32 Beckford and Baker 2007b
33 Chopra 2014

encompasses a wide variety of measures for increasing resource efficiency and lowering the use of external inputs.[34] At its heart is an understanding that on-farm genetic diversity, local knowledge systems and context-specific management practices are integral and inseparable components of resilient farming systems.

Agroecology and modern breeding are complementary,[35] to the extent that farmers have a high level of participation in the development of the research agenda and the selection of parent material, to ensure that improved varieties are well-suited to local conditions, the needs and priorities of small-scale farmers are reflected in breeding targets, neglected and under-utilized crops are included in breeding programs, and access to improved varieties are available without restriction. Participatory plant breeding builds upon and strengthens traditional knowledge. While some displacement of traditional varieties may occur, modern varieties incorporate the genetic diversity found within locally-adapted material. Informal seed systems continue to reinforce farmers' economic independence and resilience against new pests, diseases or environmental fluctuations.[36]

Agroecology and modern practices for improving land productivity and resource efficiency are likewise complementary. Local knowledge systems and culturally-embedded farm management practices are not replaced with a uniform, production-oriented model, nor a one-size-fits-all prescription for sustainable land use, but improved through collaborative research efforts. Agroecology is a means of supporting small-scale farmers in their roles as experimenters, innovators and custodians of agrobiodiversity.

Agroecology provides a framework to re-orient investment in agriculture to more accurately reflect the needs and priorities of small-scale farmers. Small-scale farmers are the first to feel the effects of climate change and the first to respond in creative ways. Many of them have lived and survived in marginal conditions over many decades or even centuries.

34 O. de Schutter (2010). Report submitted by the Special Rapporteur on the right to food. A/HRC/16/49

35 supra note 8

36 supra note 21

Box 6: Agroecology is gathering momentum

In his report on agroecology, former UN Special Rapporteur on the Right to Food Olivier de Schutter documented some of the growing evidence that agroecological approaches increase availability, accessibility, adequacy and sustainability of food production.[1] Agroecology has also featured within mainstream international fora on agriculture, most notably in the FAO's 2014 International Symposium on Agroecology for Food Security and Nutrition,[2] and is increasingly recognized within a broader scientific community as a way to improve the resilience and sustainability of food systems.[3] Proponents of this alternative approach highlight not only its obvious environmental benefits but a host of social and economic benefits. These include diversified diets and improved nutrition,[4] minimized costs of inputs for cash-strapped farmers and improved livelihoods, and the creation of employment opportunities due to more knowledge- and labour-intensive practices, thereby supporting rural development.[5]

1 O. de Schutter (2010). Report submitted by the Special Rapporteur on the right to food. A/HRC/16/49

2 Agenda available online at: http://www.fao.org/about/meetings/afns/en/

3 A. Wezel and V. Soldat (2009). "A quantitative and qualitative historical analysis of the scientific discipline of agroecology", International Journal of Agricultural Sustainability, vol. 7(1): 3-18.

4 F.A.J. DeClerck et al (2011). "Ecological approaches to human nutrition", Food and Nutrition Bulletin, vol. 32(, supplement 1): 41S–50S.

5 O. de Schutter (2014). Final report: The transformative potential of the right to food. A/HRC/25/57

Collaborations between researchers and farmers that co-create knowledge and complement and build upon innovation at the farm level have immense potential to improve both climate change mitigation and adaptation.[37]

37 L. Levidow, M. Pimbert and G. Vanloqueren (2014). Agroecological Research: Conforming or Transforming the Dominant Agro-Food Regime? Agroecology and Sustainable Food Systems, 38(10): 1127-1155.

RECOMMENDATIONS

The right to food should be interpreted to include the diversity that underpins future food security. In an era characterized by environmental, economic and other unpredictability and climate variability the world can no longer afford to limit its gaze to the current factors influencing food availability, accessibility and adequacy. Proactive measures need to be undertaken to protect agrobiodiversity, local knowledge and the diversity of farm management practices employed by small-scale farmers around the world, recognizing their ability to adapt. Having a rights-based legal framework and national strategies in place will help facilitate this.

With this interpretation, national and international policy makers should consider taking action to:

- ***Respect*** the right to food by refraining from acting in ways that contribute to the erosion of genetic diversity in an evolutionary context and the loss of local knowledge and management practices as they evolve in response to unpredictable change;

- ***Protect*** the right to food by ensuring third parties do not inadvertently undermine small-scale farmers working in in agriculturally biodiverse situations by contributing to the loss of diversity within crops, amongst crops and agroecosystems through the development and dissemination of modern crop varieties and farming practices;

- ***Support*** the right to food by adopting policies that encourage on-farm innovation and collaboration among farmers and formal sector researchers, and establishing national frameworks that support the viability of small-scale farming systems more generally. Guiding principles can be drawn from the burgeoning field of agroecology; and

- ***Fulfil*** the right to food by establishing political, economic, and social systems that proactively support and foster adaptive capacity to ensure the sustainability of the global food system and food security for all.

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