Rachel Kyte
CGIAR Fund Council Chair and
World Bank Group Vice President and Special Envoy for Climate Change

Remarks as prepared for delivery
August 27, 2014

Remarks of Rachel Kyte
CGIAR Fund Council Chair
World Bank Group Vice President and Special Envoy for Climate Change

CRAWFORD FUND 2014 ANNUAL CONFERENCE:
Ethics, Efficiency and Food Security: Feeding the 9 Billion, Well
August 27, 2014 | Canberra, Australia

"Achieving Global Food Security: Building a new food system where nutrition, climate change and sustainability collide"

Good morning. It's an honor to be here at Parliament House to speak at the Crawford Fund's Annual Conference on Global Food Security representing CGIAR, in my capacity as Fund Council Chair, and as Vice President and Special Envoy for Climate Change at the World Bank Group.

First, let me stress that CGIAR greatly values the longstanding partnership and support of Australia and the Crawford Fund. Your leadership on international agricultural research and its role in tackling some of the world's most pressing development challenges has been invaluable.

Today I want to focus on a fundamental and daunting challenge – how to nutritiously feed the world's growing population in uncertain times.

To feed and nourish the 9 billion people who will be living on the planet by 2050, farmers will need to produce as much food as they have over the past 8,000 years, and do so without destroying or taking a hefty toll on the environment.

And yet we are already failing to feed today's population. One in eight people suffer from chronic hunger and more than a billion people – the majority women and children – are undernourished. Most of these people live in Africa and South Asia, two regions of the world that are particularly vulnerable to the impacts of climate change and urbanizing in an unprecedented rate.

Hunger exacts a terrible toll. When a child is hungry or malnourished, it stunts their physical and mental development. Their ability to learn is compromised, and those who survive face a life of diminished earnings and productivity. This creates the vicious cycle of poverty that extends from generation to generation, preventing not only people but countries from realizing their true potential.

Increasingly, all forms of malnutrition, from stunting to obesity demand our attention.

We tend to think of obesity as a rich-country problem, but according to the FAO the number of overweight and obese people in developing countries - 904 million - has more than tripled since 1980 and has now overtaken the number of malnourished - 842 million.[1]

A study published in *The Lancet* earlier this month found that one-third of the world's population is now overweight or obese, and 62 percent of these individuals live in developing *countries.*[2]

Meanwhile our cities are growing at breakneck speed. 70 million people move into urban areas in developing countries each year. In the space of 30 years, two billion people will move to urban areas in emerging economies, doubling the global urban population. Built-up urban areas will increase by 1.2 million square kilometers; which is nearly triple the global urban land area in 2000.

---

[1] Stevens, G. A., Singh, G. M., Lu, Y. et al., 2012. 'National, regional and global trends in adult overweight and obesity prevalences'. *Population health metrics,* 10(1), p. 22.

[2] Global, regional, and national prevalence of overweight and obesity in children and adults during 1980—2013: a systematic analysis for the Global Burden of Disease Study 2013 The Lancet, http://www.thelancet.com/journals/lancet/article/PIIS0140-6736percent2814percent2960460-8/fulltext

As urban people become increasingly affluent, their food preferences change rapidly. When incomes rise, people tend to eat more meat. In low and middle-income countries, meat consumption is projected to grow 75 percent from 2005 to 2050, reaching 30 kilograms per person per year.[3]

This growing demand has major environmental consequences. For every one kilo of change in demand for meat, up to 10 kilos of additional feed is required, intensifying pressure on crop lands and forests, and increasing emissions.

A CGIAR-funded study found that beef and dairy cattle account for 77 percent of all global greenhouse gas emissions from livestock, but animals in the developing world require more food to produce a kilo of protein than do livestock in wealthy countries. And ruminants, such as sheep and goats, require up to 5 times more feed to produce a kilogram of protein as meat, than as milk.[4]

In Africa, where most livestock graze on marginal land and crop residues, feed efficiency is low and emission intensity is high. CGIAR research found that cattle foraging in arid areas can release the equivalent of 1,000 kilos of carbon for every kilo of protein they produce, or 100 times the emission intensity recorded in parts of the developed world.[5] This raises questions about how to balance food wants and needs with those of the environment, and how to balance individual choice with costs to the community.

At the same time as we must understand the shifts in demand for food, we musy grapple with challenges in supply, namely the extraordinary levels of food waste in our broken food system.

---

[3] C.M. Finlayson, A.G. Spiers, *Global Review of Wetland Resources and Priorities for Wetland Inventory* (Wageningen, The Netherlands: Wetlands International and the Environmental Research Institute of the Supervising Scientist, 1999) section 3.4; World Resources Institute et al., World Resources 2000-2001 (Washington, DC: 2000) p.104.

[4] Study produced by scientists at the International Livestock Research Institute (ILRI), the Commonwealth Scientific and Industrial Research Organization (CSIRO) and the International Institute for Applied Systems Analysis (IIASA), with funding from ILRI and the CGIAR Research Program on Climate Change, Agriculture and Food Security, published December 2013: http://www.ilri.org/ilrinews/index.php/archives/12353. Read the full paper in the Proceedings of the National Academy of Sciences: Biomass use, production, feed efficiencies and greenhouse gas emissions from global livestock systems, http://www.pnas.org/content/early/2013/12/12/1308149110.full.pdf+html?sid=a83094e2-a56b-4560-bb22-73944eacb660

[5] Ibid.

As the World Bank Group's Food Price Watch pointed out earlier this year,[6] the world loses or wastes one quarter to one third of all food produced for people. In North America and Europe, roughly 95−115 kilos of food per person are wasted annually, compared with 6−11 kilos per capita in Africa and in South and Southeast Asia.[7]

In Africa, an information tracking system shows that 10 – 20 percent of grain is lost prior to processing, amounting to billions of dollars in terms of production value. If these losses and waste were avoided, 48 million people could consume more than enough calories to sustain them each day for a year.[8]

There are many different reasons for the waste, but behind them all is a broken food system. A lack of roads, refrigeration and storage means a lot of food never makes it from the farm to the market. Perversities in business models, regulations and consumer appetites result in more waste between market and home. And prices, a culture of excess, and attitudes that reflect the fragility of our food system mean more waste at our family dinner table or favorite restaurant.

And last but not least, our food system must adapt to climate change - the threat intensifier - as well as reduce its own contribution to that threat.

Climate change and its impacts, such as more frequent and severe heat, drought and floods, are expected to intensify; diminishing crop yields even more significantly than we're seeing today.

The latest science predicts that if we continue down the "business as usual" path, we will be living in a 2°C warmer world by the 2030s, and that agricultural productivity would drop even further as weather patterns become more extreme. Globally, cereal yields could decrease by one-fifth. And in Africa, the most food-insecure region of the world, farmers' yields could decrease by up to 50 percent.

---

6 *Food Price Watch* February 2014 Issue 16 World Bank Group, Washington DC http://www.worldbank.org/content/dam/Worldbank/document/Povertypercent20documents/FPWpercent20Febpercent202014percent20final.pdf

7 *Cutting food waste to feed the world,* 11 May 2011, FAO Rome: http://www.fao.org/news/story/en/item/74192/icode/

8 Estimate from the African Postharvest Losses Information System, source is: World Bank and FAO (Food and Agriculture Organization of the United Nations), Missing Food: The Case of Postharvest Grain Losses in Sub-Saharan Africa (Washington, DC: World Bank, 2011).

In a four degree warmer world, currently predicted by the end of the century, over 10 percent of South Asia's agricultural land is projected to be flooded, with a 10 percent intensification of storm surges and one meter level sea rise.[9]

Warming and acidification threaten our ocean resources and fish stock and livelihoods - especially in the developing world, where more than 1 billion people depend on fish for most of their animal protein.[10]

Over 700 million people rely on aquatic agricultural systems for their income.[11] Many of these poor farmers, fishers and herders live in coastal zones and along river floodplains, making them vulnerable to sea level rise and extreme weather events. In South East Asia alone, about 138 million people live on coasts and within 30 kilometers of a coral reef.

The challenges from waste to warming, spurred on by a growing population with a rising middle class hungry for meat, are leading us down a dangerous path.

Unless we chart a new course, we will find ourselves staring volatility and disruption in the food system in the face, not in 2050, not in 2040, but potentially within the next decade.

A business-as-usual approach to agriculture is no longer an option. It will not enable us to feed and nourish the world's growing population, nor to protect the planet.

To chart a new course we first need to face the fact that agriculture and land use change are responsible for 30 percent of greenhouse gas emissions. They have to move from being a part of the problem to the core of the solution.

---

[9] World Bank. 2013. *Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience.* A report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics. Washington, DC: World Bank

[10] *FISH TO 2030: Prospects for Fisheries and Aquaculture,* WORLD BANK REPORT NUMBER 83177-GLB, Summaries and link to report: http://dialogues.cgiar.org/blog/the-challenges-of-the-global-fish-food-system/, http://www.ifpri.org/blog/fishing-answers

[11] CGIAR Research Program on Aquatic Agricultural Systems, http://www.cgiar.org/our-research/cgiar-research-programs/cgiar-research-program-on-aquatic-agricultural-systems/

That doesn't mean that mitigation should come at the expense of production. In fact, I'm suggesting the opposite. I am talking about increased efficiency leading to lower emissions per calorie or kilo of food.

It's time for a shift in our approach to agriculture. We need to move to an integrated, holistic approach that enables us to build a new food system where nutrition, climate change and sustainability come together and feed an increasingly urbanized population.

At the heart of this solution is what we term "climate-smart agriculture," an approach that refutes the idea that preserving vital natural resources, reducing carbon emissions, and nourishing people is a zero-sum game. It offers farmers a future, a path through uncertainty. Climate-smart agriculture offers a triple win: increased productivity, improved resilience, and greater climate change mitigation.

But what does a triple win mean in practice?

- First, sustainably increasing productivity means increasing food and nutrition security by producing more food in way that does not come at the expense of the environment.
- Second, enhancing resilience means reducing farmers' exposure to short-term risks and shocks - such as drought, pests and disease; improving the capacity of smallholder farmers to adapt in the face of longer term stresses like shortened seasons and erratic weather; and building healthy ecosystems.
- And third, lowering agriculture's footprint means reducing greenhouse gas emissions for each calorie or kilo produced, avoiding deforestation from agriculture, and increasing carbon storage.

Climate-smart agriculture combines sustainable intensification, producing more and better food with fewer resources, with a landscapes approach, so that progress on farms does not come at the expense of forests, streams, and biodiversity – the loss of which will impact farmers' productivity and resilience down the line.

The reality is if we continue to fund crop expansion on the one hand, and natural resources conservation on the other, outside of a landscape approach, we will cancel ourselves out.

In Uganda, farmers are practicing climate-smart agriculture by intercropping two key cash crops, banana and coffee. Banana captures atmospheric carbon dioxide, enriching soil carbon stocks while mitigating climate change. And its permanent canopy, roots and mulch prevent soil erosion and degradation. Research by CGIAR's International Institute for Tropical Agriculture shows that shade from the taller banana trees could cool coffee plants by at least 2°C – a huge plus in a warmer world. And by intercropping, farmers can earn significantly more income.[12]

This poses major challenges to the research community - to how we conduct research, what we research, who carries out the research and the levels of committed funding. After falling behind the curve, silo'd in crop based research, we now see partnerships asking different questions and clearly focused on the cross cutting challenges posed by population demands, nutrition needs, climate challenges, environmental limits and urbanization.

A case in point is rice, which feeds almost half the world's population. Some 65 percent of the world's rice is produced in the great deltas of Asia, where one hectare currently provides food for 27 people. By 2050, one hectare, which will be massively impacted if sea levels rise as the planet heats up, will need to support at least 43 people.[13] It's an impossible task with existing rice varieties. Its an impossible context outside an effort to manage whole water basins differently and aggressively move to reduce emissions.

That's why some of the best scientific minds in the world – including scientists from the Australian National University, CSIRO and CGIAR's International Rice Research Institute – are trying to convert rice's 3-carbon metabolic pathway of photosynthesis into a 4-carbon, or C4 pathway, so the plant can absorb sunlight faster. The C4 pathway, coincidentally, was first discovered here in Australia by a CSIRO scientist.

---

[12] International Institute of Tropical Agriculture (IITA), Banana Can Protect Coffee from the Effects of Climate Change, http://www.iita.org/search/-/journal_content/56/25357/1978657, Banana-Coffee Mix Boosts Farmers' Incomes by 50 percent, http://www.iita.org/search/-/journal_content/56/25357/50032

[13] In search of a new strain of super rice, http://www.chinadailyasia.com/asiaweekly/2014-06/06/content_15138936.html

If researchers succeed in turbocharging the plant's engine, the new rice variety would need less water and fertilizer but yield 50 percent more grain than the best current varieties.[14]

Climate smart agriculture is also about resilience, helping poor and vulnerable people cope with the negative effects of climate change and weather related stress.

In Bangladesh, where over 20 million people suffer from malnutrition and nearly one-third of the population is living in poverty, CGIAR's WorldFish Center is helping women produce their own food by transforming unused ponds into fish farms; dramatically increasing food security, nutrition, and incomes.[15]

This initiative highlights the importance of providing women with equal access to critical resources, technology and knowledge. Women make up 43 percent[16] of the world's agricultural workforce. Yet women farmers tend to have smaller plots with poorer soils, insecure rights to land, and significantly less access to fertilizer, improved seed, credit, and other tools to gain more from the land. They are more vulnerable to climate change and natural hazards, and are less able to adapt.

It is estimated[17] that giving ALL farmers equal access to productive resources could increase agricultural output in developing countries by as much as 2.5 to 4 percent.

In Climate-Smart Villages – sites in Africa and Asia where researchers, development partners, and farmers come together to test agricultural innovations – CGIAR and its partners are empowering women to adopt climate-smart technologies and practices. And they're

---

[14] Designing rice for the 21st century, Sheehy JE, Mitchell PL. 2013. Designing rice for the 21st century: the three laws of maximum yield. Discussion Paper Series 48. Los Baños (Philippines): IRRI, The Development of C4 Rice: Current Progress and Future Challenges, http://c4rice.irri.org/

[15] Report on the 'Women-Led Participatory Action Research on Homestead Challenged Pond Aquaculture' project: http://www.worldfishcenter.org/featured/participating-research-equips-bangladeshi-women-valuable-knowledge-and-skills

[16] World Bank. 2012. World Development Report 2012: Gender Equality and Development. World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/4391

[17] Ibid., pp 5

succeeding.[18]

We have seen the partnership yield important impacts. CGIAR and ACIAR, for example, have collaborated with developing country scientists to reduce poverty and hunger; including by developing and disseminating improved crop varieties in East Timor and Iraq, boosting fishing productivity in the Pacific, and improving agricultural practices in southern Africa.[19]

Last year, Australia and other dedicated investors helped CGIAR reach a major milestone – doubling annual funding to $1 billion. It's money that has helped millions of farmers and consumers avoid hunger and poverty.

We need to capitalize on the vast potential of agricultural research. So CGIAR has set another ambitious goal – doubling our funding again; this time to $2 billion by 2020.

What I'd like to leave you with today is an invitation to join us in pursuit of this goal. It's vital. The stakes are high.

As Lloyd's of London, the insurance giant, makes clear in its report "Feast or Famine," food insecurity will be one of the greatest risks to global society over the next 10 years.[20] Whether big business, small farmer, or government policymaker, we all need to take responsibility for creating a food system that is climate-smart, people-focused and planet friendly. The world's future security is at stake.

Thank you.

---

[18] CCAFS, Empowering women farmers in Haryana to combat climate change, http://ccafs.cgiar.org/research/annual-report/2013/empowering-women-farmers-haryana-combat-climate-change, Gender, power and climate information in Nyando, Kenya, http://ccafs.cgiar.org/blog/gender-power-and-climate-information-nyando-kenya

[19] Working with the CGIAR," ACIAR *Partners* magazine, July – October 2009.

[20] Lloyd's of London, Feast or Famine: Business and Insurance Implications of Food Safety and Food Security, 2014, http://www.lloyds.com/the-market/tools-and-resources/research/exposure-management/emerging-risks/emerging-risk-reports/business/food-report