K4D International Nature Learning Journey

Session 3: Agriculture, ecosystems and sustainable land use

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Dr Rachael Mcdonnell, Deputy Director General – Research for Development at the International Water Management Institute (IWMI) (Chair)

Agriculture is important for tackling hunger and nutrition and is an essential pillar of development. As it is also an important part of livelihoods in many countries it is understandable why there has been so much investment in farming systems. But we know that the current food production system in many countries can have a devastating toll on the environment, land ecosystems, water systems, and air quality.

Advances in agronomy ensure that we can have greater production and a greater chance of tackling hunger, but we know that this has come at a cost. There is a strong movement to embrace more nature-based solutions (NbS) within farming systems. This has been a part of the EU's framing for some time and is now coming into the development sphere. We need a systems-based approach in which nature alongside poverty prevention and nutritional needs are balanced.

Ed Davey, International Engagement Director of the Food and Land Use Coalition

Three key messages to share:

- The agriculture sector needs to go **negative** by 2050 if we're to reach the 1.5 degrees Paris Agreement goal – not just net zero.
- There is a major economic prize in the transition from today's system to an arguably better system for climate, people, livelihoods, biodiversity, and nutrition. The global food system has an economic value of 10 trillion dollars per year, and creates externalities in the region of 12 trillion dollars per year, so there's a delta between the value of the system and its global negative impact.
- Any such transition must be just and fair, so that it works for the people who produce our food we consume.

By 2050 the world needs to produce more food, even if many of us substantially change our diet. There will be a 56% food gap between the food we produced in 2010 and the food that we will need to produce in 2050. There is also a land gap of about 600 million hectares of land (for crops and pastures), between the amount of land that we have to produce food and the amount of land that we will need in 2050. Much of it is probably tropical forest at the moment that we need to avoid using if we are to achieve the goal of reducing emissions. There is a major greenhouse gas emissions gap - 11 gigatons mitigation gap that will be required from the agricultural and land use sector if we're to keep the Paris Agreement in sight.

The 2019 WRI report Creating a Sustainable Food Future highlights a menu of issues that need to change from the following areas:

- Reduce growth in demand for food and other agricultural products.
- Increase food production without expanding agricultural land.
- Increase and more sustainably manage fish supplies and where appropriate increase our productivity of aquaculture.
- Reduce GHG emissions from agricultural productions.
- Protect and restore natural ecosystems.

While food systems have performed well by some measures, there are significant failures in the current system and the case for reform is self-evident. Many of the world's poorest are farmers or fishers, with over 500 million farmers and fishers in poverty. 820 million people go to sleep hungry daily. Two billion people are overweight or obese. Women make up about 43% of the agricultural workforce but receive 5% of extension services. One third of food produced is wasted, making 8% of emissions. 80% of forest loss is due to agricultural use. 80% of large marine ecosystems subject to significant eutrophication.

We have an opportunity to transform food and land use systems for a more sustainable future. The WRI report discusses how to deliver a system that: creates a better environment, better health for more people, builds on inclusive development and gives food security to more people. New investment of up to $350 billion a year is needed to help societies achieve these goals. This investment could create huge annual opportunities for businesses in the sum of about $4.5 trillion. Business and the finance sector have a critical role to play in transforming food and land use systems.

Any such reform of the system must be fair, equitable and support the vulnerable. Farmers have to be at the heart of any reforms.

Susan Chomba, Director of Vital Landscapes, World Resources Institute: Transforming agriculture through NBS: An example from Africa

Agriculture, forestry and land use contribute to 24% of greenhouse gas emissions globally. Across different continents the figures are: Asia 44%, Latin America and the Caribbean 17%, Africa 15%, Europe 11%, North America 9% and Oceania 4%. The level from Africa is alarming because despite absolute emissions from the continent being relatively small, the agriculture system is highly inefficient, with many people suffering from hunger and food insecurity. There is at least 1.6% annual growth in emissions from agriculture. Livestock related emissions from enteric fermentation and manure contributes to nearly 2/3 of the total emissions that are produced in Africa. Burning of savannahs contributes 21% and is driven by smallholder farming systems.

Case study of natured based solutions (NbS) in Africa. We need to ask – NbS for what? What are we trying to solve? The climate crisis, biodiversity crisis, food insecurity crisis – or all of them?

In Niger there is a triple crisis of low income, vulnerability to climate risks, and insecurity from armed militias in the Sahel. However, it is a beacon of successful, sustainable and locally driven landscape restoration. Over five million hectares have been successfully restored in the Maradi and Zinder regions.

Susan was previously an employee of an organisation where land restoration was built on NbS. There was a practice of farmer managed nature regeneration (FMNR) including soil and water restoration, training farmers on vegetative propagation techniques for different trees to shorten maturity periods, gender integration and planting high value fruit trees for

income and nutrition. When working with smallholder farmers, need to focus on livelihoods and income generating activities as well as land health, otherwise deforestation will continue to happen.

There are no silver bullets fromNbS. It must be context specific. NbS for landscape restoration can have multiple outcomes for biodiversity, climate change and livelihoods. NbS will be scaled up in landscapes that are constantly shaped by millions of smallholder farmers. Farmers are key stakeholders, but each community is not one homogeneous group. There are also other state and non-state actors who may have different objectives for using NbS in the landscapes e.g., carbon offsets by private sector.

DISCUSSION

Is this agricultural innovation really beneficial or are we missing an opportunity to absorb carbon?
Agricultural innovation is critical, such as judicious use of pesticides and climate resistant seeds. Sometimes those innovations avoid some of the problems of the past. For restoration, carbon capture through tree-based solutions is possible. In a recent paper from Nature Based Solutions, Professor Natalie Seddon shows the potential of NbS for carbon capture, although potential does not necessarily mean it will be achieved. It really comes down to locally driven restoration practices. Local level innovations for carbon capture through NbS are a big potential, but what we are seeing are issues with the high emissions from livestock in Africa.

What kind of imagery is being portrayed by the images of farmers using basic equipment for farming?
Showing farmers using basic equipment is the reality and we can't run away from it. Access to water is vital and has transformed villages. However due to many complex challenges, the transition is not happening fast enough. We should be thinking about how we address the complex issues that the farmers are facing through NbS, governance, and markets. We can look at making lives better for famers in the Sahel over the next 10 to 20 years, which we hope will allow them to stay in the area rather than moving elsewhere.

We need to scale existing technologies, but we also need transformative approaches to reach the scales of the challenge. How are we going to scale NbS? How do we go to the landscape scale?
To achieve scale, you need political will, a groundswell of leadership from the bottom, together with an enabling policy environment, fiscal incentives, regulations and frameworks.

Need to make sure that scale is happening with the right distribution of benefits. What does scale mean for the livelihoods of the local people. Have we scaled the absence of poverty and empowerment of women? Need to ensure that we are not just scaling one aspect, but the ability to address the core challenges that the system is faced with.

What are the main constraints of triple wins (climate, nature and income), and how is it best to overcome these?
One of the major constraints is public consent, from communities and farmers themselves. The UK is three years into environmental land management schemes, which have had public money for public goods, and a national dialogue. However, this is still in the early stages and the kind of reforms needed require farmers to be on board with them, and yet there's a lot of grievances about whether they're effective and beneficial for farmers. The barrier to scale and to the triple wins is political leadership and bringing societies on board.

There are trade-offs within the system. When trying to promote income-generating activities that are based on nature – at what point are you leading to negative incentives of degrading nature itself? Need to look at from landscape scale, where we are able to address aspects of trade-offs and consider how the whole landscape is being managed. To realise scale with the triple win, need to look at it from the landscape scale, not from individual smallholder perspectives.

How far can urban farming contribute to what we're hoping to achieve under NbS?

NbS may not necessarily deliver at scale some of the goals that have been discussed but it is a critical part of the future. Cities can form a much stronger relationship with farmers in peri urban areas.

We must make use of all the productive systems we have in the urban and rural landscapes. Making urban areas more productive will be critical. For a continent like Africa with high rates of urbanisation, looking at how to make urban areas more productive is going to be critical. It won't solve the food systems problem, but every tool and space that can sustainably be used is going to be critical. Producing food where people are based will be vital so that we can shorten the value chain. We also need to think around how we can embrace the circular economy using treated water, recycling nutrients, etc.