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THINK NAMIBIA

FACT SHEET ON:

Climate Smart Agriculture

The purpose of this fact sheet is to share information on the benefits of adopting Climate Smart Agriculture as a strategy to cope with challenges posed by climate change in Namibia.

Introduction

In Namibia, agriculture and forestry contributes 5.1% to the Gross Domestic Product (GDP) and livestock alone contributes 3.5% which is a contribution of 68.63 % to the Agricultural GDP (Namibia Statistical Agency's, 2012).

In addition, agriculture plays a critical role in the formal and informal economy supporting 70% of the population directly or indirectly through employment and income generation (Ministry of Environment and Tourism, 2015).

Crop production activities in Namibia are limited, mainly due to the arid climate and low rainfall patterns. Small-scale farmers use traditional methods of production that are characterised by low productivity (Ministry of Foreign Affairs of Finland, 2015).

This weakens the food security of the population and the dependence on rain-fed agriculture increases the vulnerability of farming systems and predisposes rural households to food insecurity and poverty.

It is projected that the reduction in crop yields will have devastating impacts on food security at both national and household levels. Under the current conditions, the agriculture sector in Namibia needs to grow by 4% a year to meet the food requirements for the expanding population (Ministry of Foreign Affairs of Finland, 2015).

In light of these challenges, Namibia needs to adapt its agricultural practices and increase the resilience of livelihoods to be able to withstand the challenges posed by Climate Change to sustain development and growth of the country. This is why Climate Smart Agriculture (CSA) is an important topic for discussion at all levels of the society.

Agriculture in the face of Climate Change

Agriculture is extremely vulnerable to climate change. Negative impacts of climate change are already being felt, in the form of reduced yields and more frequent extreme weather events. Substantial investments in adaptation will be required to maintain current yields and achieve the increases that are needed.

While there is significant variation across crops, regions and adaptation scenarios, the majority of models predict a yield reduction of more than 5% with around 10% of projections expecting yield losses of more than 25% (IPCC, 2014).

Agriculture is also a major part of the climate problem. It currently generates 19 – 29% of green house gas (GHG) emissions. Without action, that percentage could rise substantially as other sectors reduce their emissions.

What is Climate Smart Agriculture?

Climate Smart Agriculture (CSA) integrates the three dimensions of sustainable development (economic, social and environmental) by jointly addressing food security and climate challenges (FAO, 2009). In this view, Climate Smart Agriculture is composed of three main pillars:

1. Sustainably increasing agricultural productivity and incomes - Namibia needs to produce more food to improve food and nutrition security and boost the incomes of 70 percent of the Namibian population which relies on agriculture for their livelihoods.
2. Adapting and building resilience to Climate Change - there is need to reduce vulnerability to drought, pests, disease and other shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns.
3. Reducing and/or removing greenhouse gases emissions, where possible – there is need to pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to suck carbon out of the atmosphere *(FAO, 2009 and World Bank Group, 2014)*.

Main elements of Climate Smart Agriculture

CSA is not a set of practices that can be universally applied, but rather an approach that involves different elements embedded in local contexts (CGIAR, 2013). Elements which can be integrated in Climate Smart Agricultural approaches include:

- Management of farms, crops, livestock, aquaculture and capture fisheries to manage resources better, produce more with less while increasing resilience,
- Ecosystem and landscape management to conserve ecosystem services that are key to increase at the same time resource efficiency and resilience, and
- Services for farmers and land managers to enable them to implement the necessary changes.

How Can Agriculture be Climate Smart?

I. Crop production

Most of the Greenhouse Gas emissions of the agricultural sector are directly driven by the use of natural resources for instance new land being deforested or turned from grassland to crop land, use of fertilisers, livestock rearing and energy.

Fertiliser applications lead to the production and emission of nitrous oxide (N2O), whilst livestock especially cattle, produce methane (CH4) as part of their digestion (EPA, 2015). Increasing efficiency in the use of resources (simply put, producing more of a given output using less of a given input) is thus key to reducing emissions intensity per kilogram of agricultural output as well as to improve food security, especially in resource scarce areas.

In addition, agriculture is recognised as an important practice leading to high levels of deforestation, therefore if we reduce agricultural expansion through sustainable intensification on already cultivated land (increasing the output on the same piece of land without further deforestation), this could have a major lessening effect on rates of deforestation.

Can smallholder agriculture contribute to emissions reduction?

Smallholder agriculture has a rich and untapped potential for emissions reductions that are in the interests of farmers themselves. For example planting acacia trees in maize fields in Africa has led to yields even doubling, while the resilience of the soil to land degradation has been increased by improving its organic and nitrogen content, water retention capacity and microclimate moderation. At the same time, this is reducing soil carbon emissions by maintaining greenery and promoting tree growth and biodiversity, which provides a diversified habitat and a source of food for both wild and domesticated animals.

Source: IFAD, 2011

II. Livestock sector

According to Steinfeld et al., 2006; the livestock sector has expanded rapidly in recent decades and will continue to do so as demand for meat, eggs and dairy products is expected to continue to grow. Therefore, there is urgent need for improved efficiency and resource use of the livestock production systems, to both improve food security and reduce the intensity of GHG emissions.

Table 1, below summarises some climate smart practices that can be adopted in smallholder agriculture production in Namibia.

TABLE 1:
Climate-smart practices useful in smallholder agricultural production

Crop Management	Livestock management	Solid and waste management	Agro Forestry
• Intercropping with legumes • Crop rotations • New crop varieties (e.g. drought resistant) • Improved storage and processing techniques • Greater crop diversity	• Improved feeding strategies • Rotational grazing • Fodder crops • Grassland restoration and conservation • Manure treatment • Improved livestock health • Animal husbandry improvements	• Conservation agriculture (e.g. minimum tillage) • Contour planting • Terraces and bunds • Planting pits • Water storage (e.g. water pans) • Dams, pits, ridges • Improved irrigation (e.g. drip)	• Boundary trees and hedgerows • Nitrogen-fixing trees on farms • Multi - purpose trees • Improved fallow with fertiliser shrubs • Woodlots • Fruit orchards

Source: Neufeldt H, 2011

III. Reducing food losses in the supply chain

Food losses and waste in the supply chain also means that the GHG emitted during their production have served no useful purpose. This is especially true when the food has reached the end of the food chain, when the embedded emissions for transport and conservation/preservation are very high. This fact is ultimately a failure of economic and natural resource efficiency. Figure 2 below shows how food waste can be reduced.

"Global food losses and waste amount to a third of all food produced."
(Gustavsson et al., 2011)

TABLE 2:
Food Waste Pyramid
(Source: UNEP/FAO, 2013)

Conclusion

There is urgent need to transition from reflecting on the vast impacts food systems has on emissions that exacerbate climate change to seizing agriculture's potential to reduce that impact and adapt to a changing climate.

Glossary

Food security
A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life *(FAO. 2002)*.

Sustainable development
"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." - from the World Commission on Environment and Development's (the Brundtland Commission) report Our Common Future *(Oxford: Oxford University Press, 1987)*.

Sustainable intensification
Sustainable agricultural intensification is defined as producing more output from the same area of land while reducing the negative environmental impacts and at the same time increasing contributions to natural capital and the flow of environmental services *(Pretty, 2011)*.

Adaptation
The UNFCCC defines it as actions taken to help communities and ecosystems cope with changing climate condition. The IPCC describes it as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Gross Domestic Product
The monetary value of final goods and services—that is, those that are bought by the final user—produced in any country in a given period of time (say a quarter or a year).

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