Analysis and prioritisation of climate smart post-harvest food loss reduction interventions

A new approach towards Food Loss and Waste including Greenhouse Gas Emissions presented during 2nd All Africa Postharvest Congress & Exhibition in Ethiopia

By identifying Food Loss and Waste and related Greenhouse Gas Emissions[1] per product category and activity along the chain in the different regions in the world, policy makers and the private sector can identify and prioritise the key opportunities for Food Loss and Waste and Greenhouse Gas Emissions reduction. This was said by Hans Hoogeveen, ambassador and permanent representative of the Netherlands to the UN Organizations for Food and Agriculture in Rome, in his presentation on the new hotspot analysis towards Food Loss and Waste developed by Wageningen University & Research.

Reducing post-harvest Food Loss and Waste (FLW) is considered one of the essential developments for improving food security. Especially developing countries with prevailing small holder farmers do not only have largest challenges with respect to food security but are also face high FLW percentages in the post-harvest chains (Gustavsson *et al.*, 2011). Reduction of FLW goes beyond food security. FLW also contributes significantly to the increase of Greenhouse Gas Emissions (GHGE). According to Wageningen University & Research (WUR) most recent scientifically founded data, FLW contributes to 20 to 25% of food production related GHGE.

During the 2nd All Africa Postharvest Congress & Exhibition at the headquarters of the African Union Commission in Ethiopia Wageningen University & Research had the opportunity to share in several sessions the newly established approach as developed in the Climate Change, Agriculture and Food Security (CCAFS) project. This high-level analysis specifies **Food Loss and Waste** and related **Greenhouse Gas**

[1] The greenhouse gas emissions include the ones due to primary production and international transportation of the food items

Emissions per product category and activity along the chain in the different regions in the world. Hans Hoogeveen, recommended the approach in his keynote speech in the opening session and as a panelist because it looks beyond the loss volumes and includes GHGE and therefore will affect future policy agendas related to climate change.

New Hotspot analysis can support policy makers taking the right decision

From a climate perspective, all food loss and waste do not induce equal emissions. Bovine meat, dairy, and rice are top greenhouse gas emitting food categories. Naturally, not all countries in the world have the same climate footprint and same amount of losses per crop category. Currently, the top 3 polluting countries are China, India, and the United States of America. Apart from Nigeria, African countries still have a relative low climate footprint compared to countries in Industrialised Asia, South- and South East-Asia, Europe and the US.

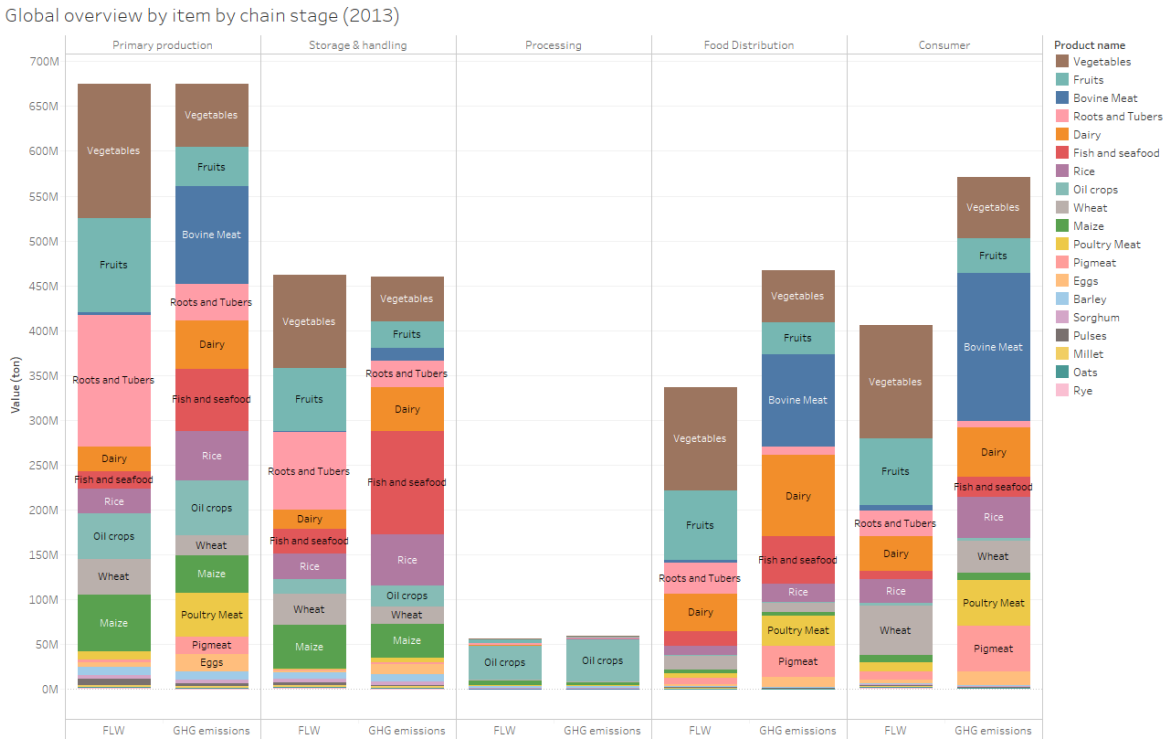

Figure 1*: The global overview of FLW and associated GHG emissions per person (Guo et al., 2019)*

But, Africa does have high loss volumes of staple food crops like roots and tubers.

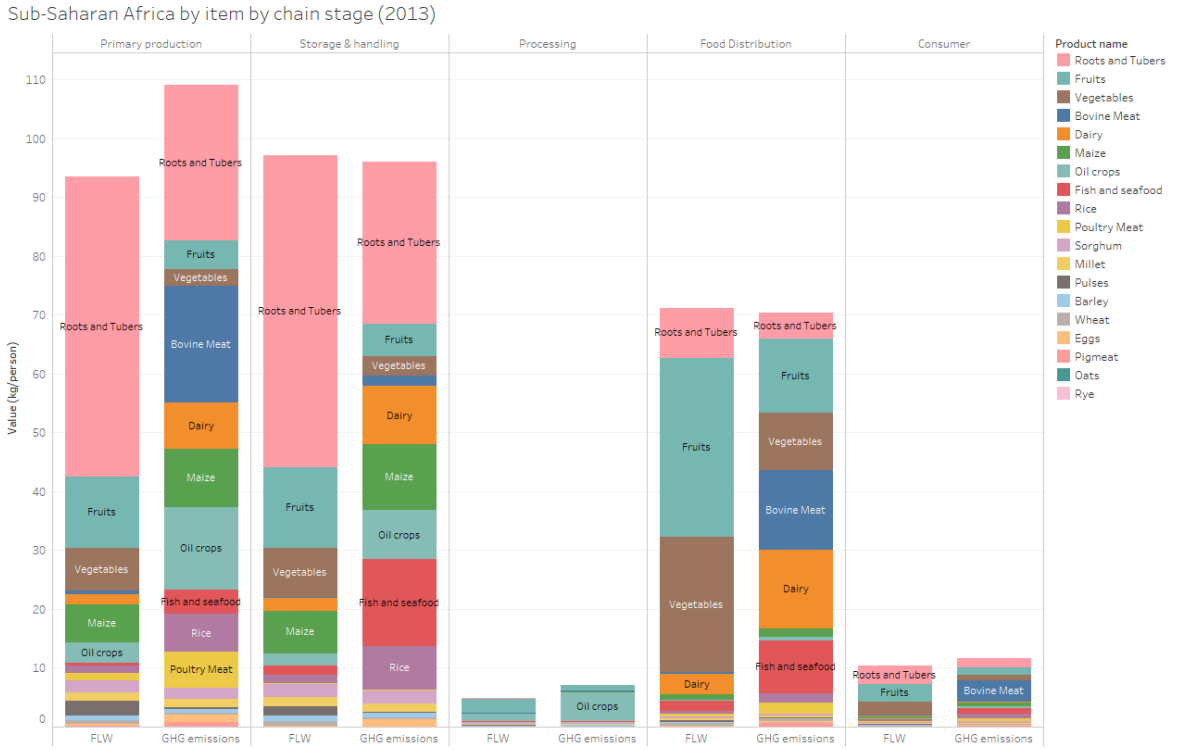

Figure 2: *The overview of FLW and associated GHG emissions for Sub-Saharan Africa per person (Guo et al., 2019)*

In the context that approximately 1 in every 5 people of the population of the African continent is undernourished and climate change is a present and growing threat to food security and nutrition in Africa (FAO and ECA. 2018), reduction of FLW should be appointed as a high priority area. Our hotspot analysis shows in which stage of the supply chain major losses and emissions occur and stipulates the most critical crops. Based on the hotspot analyses policy makers and the private sector can identify and prioritise the key opportunities for FLW and GHGE reduction and define intervention strategies to reduce FLW and the associated GHGE. Next to that, the hotspot analysis shows what happens if dietary patterns are changing. Africa for instance has a growing middle class moving into the big cities. It is known from other places that this kind of migrations go hand in hand with a change of diets. Increased consumption of milk and bovine meat of this growing middle class is the prediction in Africa. This is likely to go along with an increase of African's FLW related GHGE. With current FLW percentages for those food categories this would also induce huge FLW induced GHGE. Therefore, interventions in these supply chains are essential to lower the losses.

Avoiding unwanted trade-off's of FLW reductions by using the ACGE Calculator for identifying the most optimal interventions for reducing FLW as well as related GHGE

It is broadly believed that reducing FLW significantly contributes to reducing environmental impacts (amongst which GHGE). Reducing FLW by half (in line with United Nations' Sustainable Development Goals, UN 2015) is expected to substantially contribute to net GHG reductions. Many including Springmann *et al.* (2018) estimate that "halving food loss and waste would reduce environmental pressures by 6–16% compared with the baseline projection". Only through analysing the cumulative impacts along the chain, comparing the current and intervened chain, net effects can be adequately estimated. Well intended interventions to reduce FLW can go along with negative trade-off's like the increase of GHGE through additional use of fuel or energy for cooling, packaging material use, modality shift for transportation from boat to air etc. With WUR's recently developed decision support Agro-Chain Greenhouse Gas Emissions Calculator (ACGE Calculator) WUR can guide industries and policies makers to identify the most optimum interventions considering the expected net effect on FLW and GHGE.

More information

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Data sources Figure 1 & 2

- FAOSTAT: Food Balance Sheets and Detailed Trade Matrix
- Porter et al. (2016): FLW %, GHG emissions factors