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# Crop species diversity in smallholder farms in Western Kenya and their contribution to food security

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## Key messages

- During the pre- and post-harvest seasons, cereals & starchy roots were equally important in both districts, with slightly higher importance during the post-harvest season.
- Next to own production, markets & existing social networks are important household food sources in the study areas.

## Background

- With promotion of simplified cropping systems, agrobiodiversity is under pressure to decrease.
- There is replacement of mixed farms with monoculture systems.
- Mixed farms represent a source of high agrobiodiversity that can be utilized to tackle food insecurity (Fig.1).

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Fig.1: Examples of mixed farms

## Research questions

(i) How does crop diversity on smallholder farms of different agro-ecological zones vary with seasonality?

(ii) Where do foods that are consumed within the surveyed households mainly come from?

## Methodology

- All present plant and animal species grown/reared for food were documented and individuals counted on 30 purposively selected smallholder farms in six villages of Mumias and Vihiga districts, Western Kenya (M1).
- A Summed Dominance Ratio (SDR) was calculated using relative densities and relative frequencies for each of the edible plant species & summing up values per food category.

Smallholder farms, pre-harvest season (T1)

- Repeat of M1.
- Reporting of sources of food consumed for the last five times the household had eaten the product (the time span for the last five times ranged from 24 hours to a few months, depending on product & frequency of consumption).

Smallholder farms, post-harvest season (T2)

## Results & discussions

- 62 different edible plant species were reported at T1, while 60 were represented at T2.
- Despite smaller farm sizes, Vihiga farms had consistently higher, or equal, SDRs of cereals and fruits (Fig.2).
- In both districts, the main food sources were own production and markets, but also family and friends for the food groups 'roots/tubers' and 'fruits' in Vihiga district (Table 1).

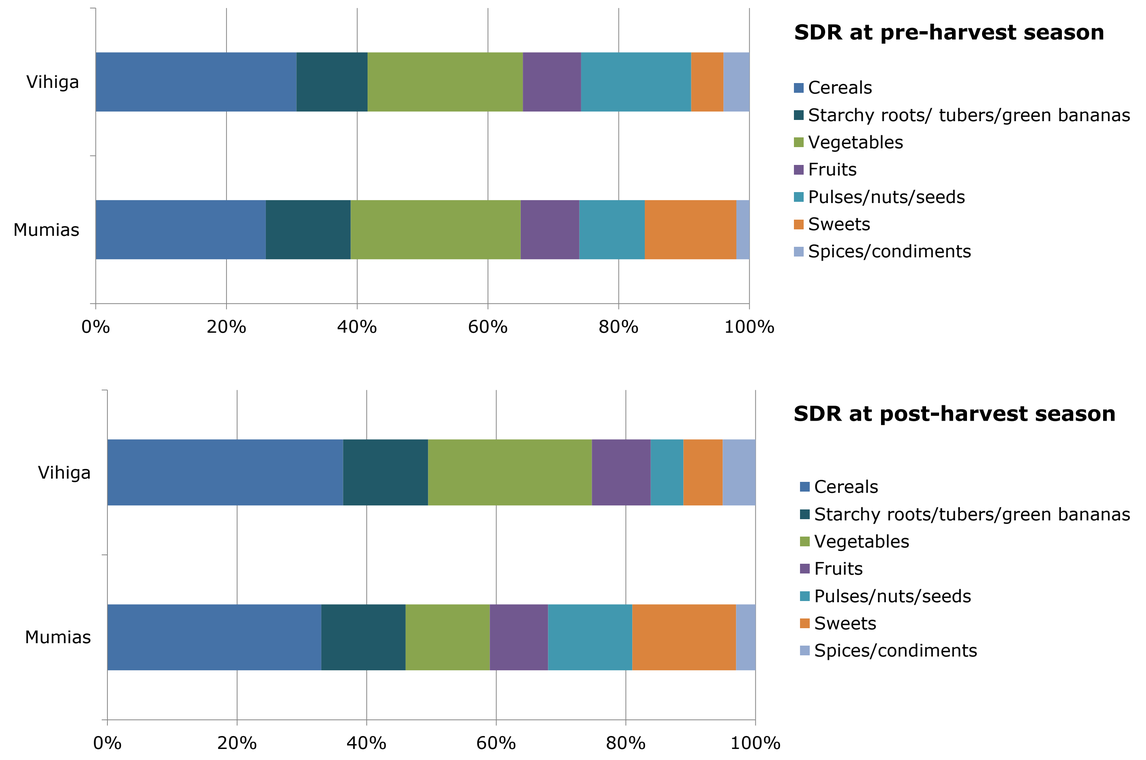


Fig.2: Summed Dominance Ratio (SDR) of food groups in Mumias and Vihiga districts at pre-harvest and post-harvest seasons, N = 15 per district

Table 1: Food sources of households in Mumias and Vihiga districts at post-harvest season, N = 15 per district

| | Food Sources in Mumias | | | | Food Sources in Vihiga | | | |
|---|---|---|---|---|---|---|---|---|
| **Food Category** | Farm (%) | Market (%) | Family and friends (%) | Total (%) | Farm (%) | Market (%) | Family and friends (%) | Total (%) |
| | 39 | 53 | 8 | 100 | 47 | 52 | 1 | 100 |
| | 52 | 23 | 11 | 86* | 60 | 9 | 24 | 93* |
| | 65 | 25 | 9 | 99* | 71 | 22 | 7 | 100 |
| | 33 | 36 | 16 | 85* | 47 | 12 | 40 | 99* |
| | 76 | 17 | 4 | 97* | 81 | 9 | 9 | 99* |
| | 13 | 37 | 1 | 51* | 28 | 15 | 13 | 56* |
| | 75 | 5 | 20 | 100 | 23 | 36 | 17 | 76* |
| Coffee | 17 | 16 | 0 | 33* | 17 | 15 | 11 | 43* |

* Some total values do not add up to 100% as the recall period did not add up to the last five times as they were less frequently consumed

- Maize, a staple in the region, was not sufficiently available on farms year-round, so markets were the main cereal source.
- In Vihiga, sourcing from family & friends exemplified the importance of working social networks for food exchange.

## Conclusions & recommendations

- Smallholder farmers utilize multiple channels to attain household food security.
- Different food procurement channels need equal consideration in extension, research and development.

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