# Kenya County Climate Risk Profile Annex: Kilifi County

## Annex 1

### Crop and Livestock Indicators in Kilifi County

The following graphs provide more detailed information about aspects of production ad productivity for some of the main value chain commodities considered in this profile.

**Table 1**: Crop and Livestock/ Animal Production in Kilifi County

| **Crop or Livestock Value Chain** | **Production** *(90 kg bags)* | **Value** *(KSh)* |
|---|---|---|
| **Crop** | | |
| Dry Maize | 232,810 | 703,086,200 |
| Cow pea | 23,287 | 144,845,140 |
| Cassava | 137,938 | 282,221,148 |
| Mango | 113,841 | 34,801,193.7 |
| **CROP TOTAL** | **1,164,953,682** | **1,164,953,682** |
| **Livestock/ Animal Product*** | | |
| Milk *(millions litres)* | 44,585 | 1,139,100,000 |
| Beef *(Kg)* | 36,498 | 6,201,600,000 |
| Mutton Production *(Kg)* | 2,861 | 442,240,000 |
| Eggs production *(trays)* | 431,886.30 | 129,560,000 |
| Poultry Meat Production *(Kg)* | 542,615.63 | 81,390,000 |
| Fish *(Kg)* | 443,689 | 41,666,000 |
| Honey Production *(Kg)* | 58,030 | 12,690,000 |
| Pork Production *(Kg)* | 902 | 880,000 |
| **LIVESTOCK TOTAL** | | **8,049,126,000** |

**Source**: GoK (2013)

# Annex 2

## Climate analysis

For the current study, past trends and future projections of precipitation- and temperature-related hazards, such as flooding events (including flash floods) and drought during the growing season were analyzed. The growing season was defined as follows: the First season (Season 1) is the 100-day wettest period during the months of January to June, while the Second season (Season 2) is the 100-day wettest period during the months of July-December. In the case of floods, the focus was on heavy precipitation events during the First and Second season, defined as the 95th percentile of daily precipitation. For each pixel, the 95$^{th}$ percentile of daily precipitation distribution conformed of 100 wettest days per season per year was calculated. Then we identified the 95 extreme percentile, value which was plotted in time series[1]. Fluctuations in heavy precipitation events can have important consequences on water availability for agriculture, by impacting drought and flood events.

To assess the degree of adequacy of rainfall and soil moisture to meet the potential water requirements for agriculture, the focus was on drought stress, represented by the maximum number of consecutive days in each season where the ratio of actual to potential evapotranspiration (ETa/ETp) is below 0.5. This was calculated for each pixel per season per year[2] by evaluating soil's water capacity and evapotranspiration in order to define the number of days that could undergo a level of stress.

Two Representative Concentration Pathways (RCPs) were used, also known as the four greenhouse gas concentration (not emissions) trajectories adopted by the Intergovernmental Panel on Climate Change (IPCC) for its fifth Assessment Report (AR5) in 2014. The two RCPs, RCP2.6 and RCP8.5, are named after a possible range of radiative forcing values in the year 2100 relative to pre-industrial values (+2.6 and +8.5 W/m2, respectively). The pathways are used for climate modelling and research. They describe two possible climate futures, considered possible depending on how much greenhouse gases are emitted in the years to come. RCP 2.6 assumes that global annual GHG emissions (measured in CO2-equivalents) peak between 2010 and 2020, with emissions declining substantially thereafter. In RCP 8.5, emissions continue to rise throughout the 21st century.

[1] In this case, we only used precipitation as input file.
[2] In this case, as input files we used maximum temperature, minimum temperature, precipitation, solar radiation, and water capacity of soil.

# Annex 3

## Adaptation options in Kilifi, as identified in the ASDSP

Various adaptation strategies were identified by stakeholders and residents of Kilifi County in the Government of Kenya's "Agricultural Sector Development Support Programme (ASDSP)" of 2014. The table below compiles these results and disaggregates them by percentage of the population using each practice, as well as percentage based on the gender and age of the head of the household.

**Table 2:** Adaptation strategies adopted in Kilifi County

| Adaptation strategy | Value chain | Value chain link | Inputs | Results | Challenges |
|---|---|---|---|---|---|
| Crop diversification (e.g. introduction of ABE chillies) | All | Production | Seeds, Fertilizers | Increased income from ABE chilies | Large number of farmers in the County; limited extension services |
| Genetic Materials (e.g. short maturity crops) | All | Production | Seeds, Fertilizers | Increased yields | Costs of inputs, implementation |
| Water harvesting | All | Production | Water Pans, Negarims, Zai-Pits, Sunken Beds, Water Tanks | Increased yields, reduced animal movements, reduced conflicts, reduced distances to water points | Some of the soils are very porous and cannot hold water; lack of funds to establish some of the adaptations |
| Tree planting | All | Production | Seedlings | Improve microclimate and reduce heat stress; reduce deforestation | Lack of seeds; lack of water; high demand of seedlings |
| Soil conservation | All | Production | Labour, Construction materials | Improve water retention, reduce soil erosion | Cost of soil conservation measures |
| Value addition | Cassava | Post-harvest | Chippers, Frying equipment | Increased incomes | Lack of funds to buy equipment |

**Source**: GoK (2014)