

TANUJA KARNE

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Topic : CLIMATE CHANGE IN KENYA

### **COUNTRY INTRODUCTION :**

Kenya, officially the Republic of Kenya , is a country located in east Africa . With an estimated population of more than 53.33 million people , reflecting a 1.7 % increase from the previous year i.e. 2024 . In 2025, Kenya is projected to have a global population rank of approximately 26<sup>th</sup> and 7<sup>th</sup> most populous country in Africa. Kenya's capital and largest city is Nairobi. The second-largest and oldest city is Mombasa, a major port city located on Mombasa Island. And also Kenya's median monthly income is 76,198 KES (currency of Kenya is Kenyan Shilling ), or about \$ 590. Kenya is a multilingual country but widely spoken languages are Swahili and English. Besides , Kenya got independence from United Kingdom in December 1963, becoming a democratic and republic country. During Kenya's historical period, there was a heavy reliance on farming for economic output and employment. Post- independence efforts focused on transitioning from subsistence to scientific farming to boost national income and food security for a growing population. But, because of Factors like climate change and growing population , Kenya's agriculture decline contributed to global food insecurity primarily through increased food prices and decreased regional supply. Hence, it is very essential to look upon food security , it's challenges, and solutions, for that we must know about Kenya's Agriculture. Nowadays, Young people make up 84% of the unemployed population of Kenya.

### **AGRICULTURE IN KENYA:**

Agriculture is the backbone of Kenya's economy. In 1980, almost 80% of working Kenyans made their living by farming, compared with 75% in 2006. This decrease in Kenya's farming workforce stems from multiple factors and major is climate change. Over 500-1000 mm annual rainfall are considered productive for agriculture in Kenya. In Kenya, THE KENYA AGRICULTURE RESEARCH INSTITUTE (KARI) was established in 1979 as a semi- autonomous government institution to conduct research in various agricultural sectors. According to recent findings, over 40% of East Africa's soils are degraded, threatening agriculture, food security, and livelihoods. In Kenya, only 20% of croplands are arable, with an alarming loss of up to 26 tons of soil per hectare annually due to soil erosion. Furthermore, soil salinization affects 40% of irrigated land, jeopardizing food production and sustainability. Soil erosion is because of climatic changes like excessive rainfall and Soil salinization is due to poor irrigation practices. Overall, Kenya's agriculture is facing some challenges like climate change , poor irrigation practices , etc. and major challenge is climate change. Now, next topic is to justify how climate change plays important role in Agriculture and in global food security.

## **HEAVY RAINFALL ( CLIMATE CHANGE ) CHALLENGE FACED BY KENYANS :**

Kenya experienced a severe nationwide flood event between late March and early May 2024, with 42 out of 47 counties being affected by above-average rainfall, a situation sometimes referred to as the "Kenya flood case". The floods caused extensive damage to infrastructure and livelihoods, leading to widespread humanitarian concerns. Other countries, such as Nigeria, Cameroon, Niger, and Chad, also experienced significant flooding in 2024, though these events were distinct from the situation in Kenya. Because of climate change, heavy rainfall occurred in these countries and hence crop production was widely affected, the crops which were wasted during this heavy rainfall could feed someone who's needy but, in this case a very wide range of crops were destroyed and hence, this led definitely to global food insecurity.

The Kenya flood case involved widespread crop destruction, with estimates of over 168,000 acres of farmland ruined, affecting staple crops like maize, peas, and vegetables. Let me clear that 168,000 acres land ( destroyed land ) could feed approximately 35000 to 100,000 people. And if this land was destroyed then definitely food insecurity increased. Hence, we can say that disruptions to food security chains caused by weather events in one region can ripple outwards, affecting food availability in other parts of the world.

Lower crop yields in key agricultural areas like Kenya contribute to shortages and drive up food prices globally, as a supply is reduced relative to demand. To sum up, the combination of reduced food availability and higher prices in regions like East Africa exacerbates existing food insecurity, creating humanitarian challenges and increasing global food insecurity.

## **IMPACT ON DIFFERENT STAKEHOLDERS**

Heavy rainfall creates diverse impacts across stakeholders by damaging property, infrastructure, and crops, causing human and livestock casualties, disrupting essential services, and leading to economic losses and psychological distress, while also affecting ecosystems through erosion and pollution. Farmers, urban dwellers, government agencies, utility providers, emergency services, and ecological systems each experience these effects differently. To manage these impacts, stakeholders must collaborate on effective flood risk management, integrating early warnings and resilience-building measures for a collective approach to long-term community health. Mine innovation can also be used by even small stakeholders.

## **SOLUTIONS THAT WE CAN ACCEPT TO REDUCE SUCH PROBLEMS :**

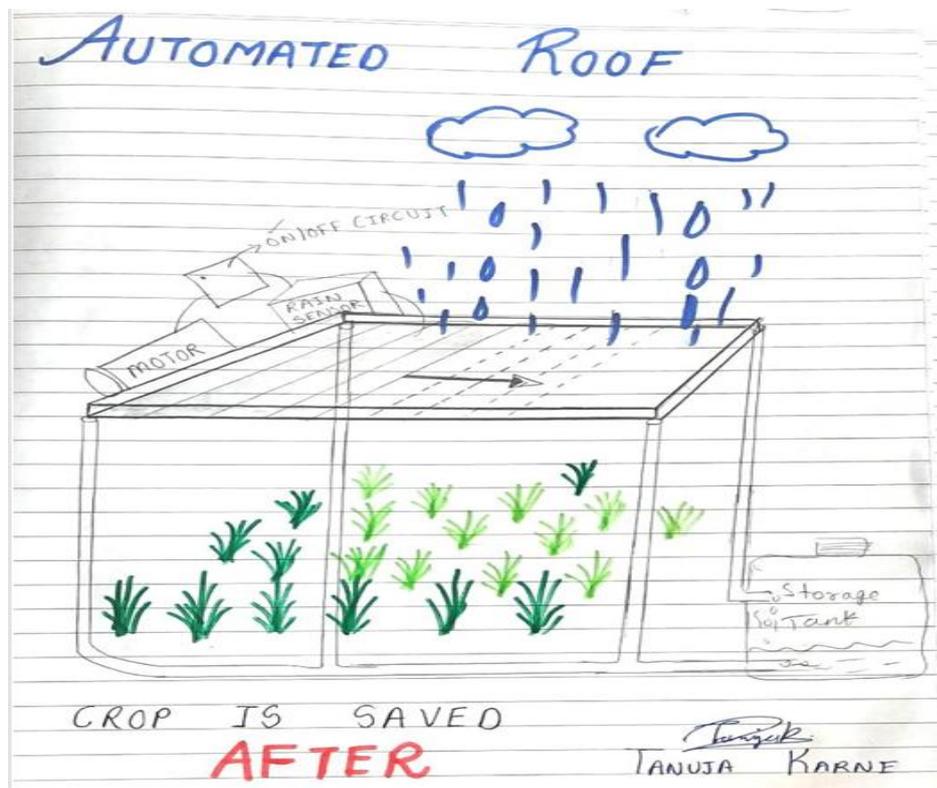
To mitigate heavy rainfall damage to crops, solutions include improving drainage infrastructure, promoting climate-smart agriculture (CSA) like contour farming, terracing, and mulching to enhance soil health and reduce runoff. Additionally, investing in food-resistant seed varieties and neglected crops, optimizing sowing times, implementing agroforestry, and leveraging early warning systems can significantly strengthen food security in Kenya and worldwide.

## MY INNOVATION :

As I already said that the crop which are destroyed can feed anyone needy . So, using today's cutting-edge technology we can do something to reduce this problem . So, what we can do is we can design an automated roof system . This roof system will contain the sensors to sense the rain intensity , whatever range of rain intensity we will enter in the sensors it will sense it , what I mean to say is , if we will enter the threshold rain intensity i.e. if rain intensity increases more that that threshold value , the crop will get destroyed , then after sensing that threshold value of rain intensity the roof will automatically get closed over the land and hence crop will be safe under roof from heavy rainfall, but , now question comes out , What about the rain water ? will it be wasted ? So, the answer is NO, definitely not, because with this roofing system we are going to connect the pipelines which will store the water in storage tank through pipes which will provide support to the roof. This was all about heavy rainfall, but , in , Kenya Drought is also one of the climatic change , so we can use the water from storage tank in case of water scarcity. To sum up , this AUTOMATED ROOF SYSTEM will help in such climatic changes ( both heavy rainfall and droughts ) to curb the crop destruction problem and ensure global food security. This is the system which can be accepted culturally as it has less risk and price too that is affordable for all types of farmers . So , this argument of affordability is also taken care of.

## MORE ABOUT THIS ROOFINGG SYSTEM :

This Roofing system will have the 5-7 years guarantee , it is made for 1-2 acre land , roof will be thin and made of waterproof materials and , not only this , but this is affordable to even the small farmers as it costs around 100,000 – 200,000 Rs (Indian rupees) and this is one time investment , the farmer will not have to replace machine in between , as it has 7 years guarantee. This can help farmers to protect crops from heavy rainfall even in their absence .



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