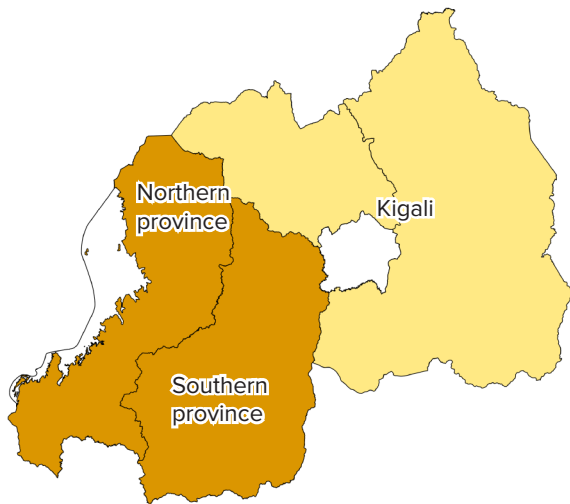


COFFEE PRODUCTION IN THE FACE OF CLIMATE CHANGE: RWANDA

KEY PRODUCTION AREAS IN RWANDA

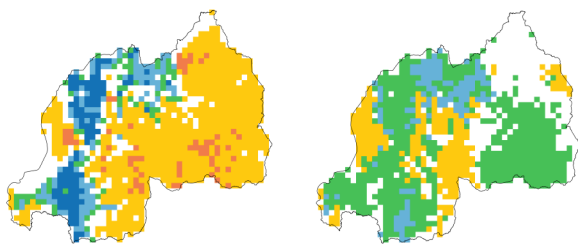
Arabica ■ Key provinces
■ Provinces with minor production



Coffee is produced across Rwanda. Production is concentrated in the Southern and Western Provinces, especially around Lake Kivu. Most coffee is produced at elevations between 1,000 and 1,700 m.⁽¹⁰⁾

Arabica

Robusta



■ ■ ■ ■ ■
 - Suitability +

Changes in suitability between today and 2050 ⁽¹⁷⁾

OBSERVED AND PREDICTED EFFECTS OF CLIMATE CHANGE IN COFFEE PRODUCING AREAS^(9,10,11)



Rising Temperatures

- Predicted increase in annual mean temperature by up to 2.5°C by 2050.



Changing Seasonality

- Dry spells during the rainy season
- Drier dry seasons



Changing Rainfall

- Highly variable rainfall
- Predicted change for annual rainfall ranging from -100 mm to +400 mm for 2000-2050.
- Increased rainfall in parts of the western, northern and southern provinces and reduction in the Eastern and parts of southern province



Extreme Weather Events

- More heavy rainfall events causing floods, erosion and landslides in particular in the western half
- Increased frequency of prolonged drought in the south & southeast
- Extreme winds and hail in highland areas

LIKELY IMPACTS OF CLIMATE CHANGE ON COFFEE PRODUCTION

- Land suitable for Arabica coffee is predicted to shift from 400-2,000 m to 800-2500 m. Losses at lower elevations will theoretically be offset by increasing climatic suitability at higher altitudes.⁽¹⁵⁾ However, highland areas are densely populated and contain natural forests which are partly protected. Moving coffee upwards would displace current land uses and cause deforestation.
- Coffee production is likely to be hit hardest in the Eastern Province, where droughts are more likely.
- Producers at lower altitudes could theoretically change to Robusta coffee. However, Rwanda's development strategy favors the production of high-value crops, including specialty coffee.
- An adaptation strategy, applicable to most of the current production areas is the establishment of shade trees or banana in coffee plots.

THE IMPORTANCE OF COFFEE IN THE RWANDAN AGRICULTURAL SECTOR^(1,2,3,4,6,13,14)

Coffee production and export in 2017/2018

- Arabica: 15,700 tons
- Robusta: 500 tons
- 99% of coffee is exported, mostly as semi-washed and washed

Area under coffee production

Arabica & Robusta
42,000 ha

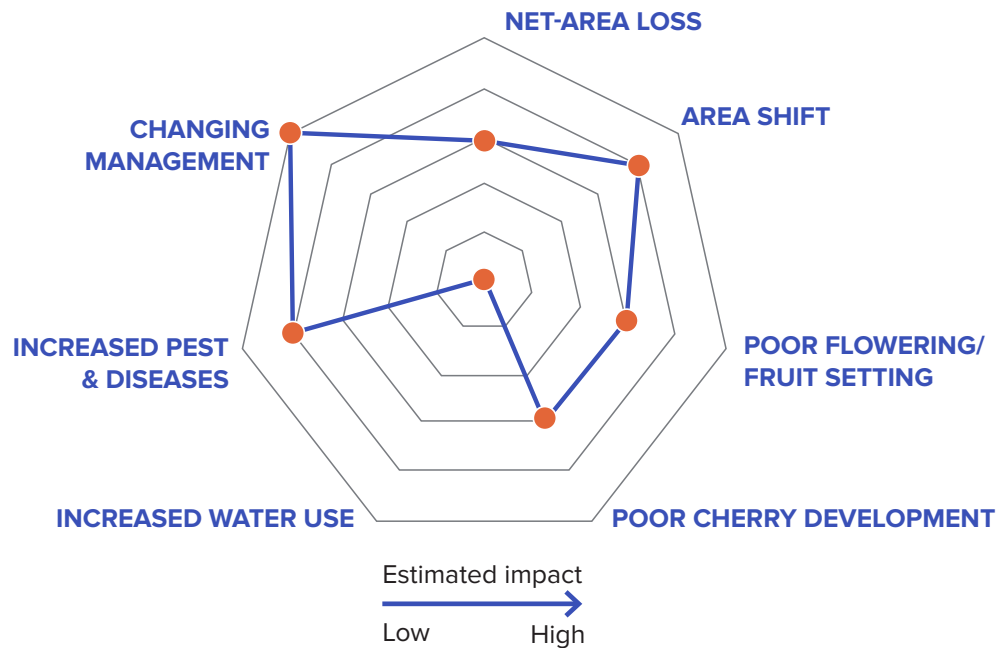
Farms

- 355,000 smallholder with average coffee farm size of 0.1 ha produce the majority of Rwandan coffee

Importance in the national economy

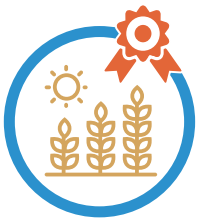
- Coffee generates:
- 7.1 % of export revenues
 - 1.4 % of gross domestic product

LIKELY IMPACTS OF CLIMATE CHANGE ON COFFEE PRODUCTION



- Higher temperatures will increase the altitudinal range of the Coffee Berry Borer, worsening the situation for producers who already face frequent losses by Coffee Leaf Rust and Coffee Berry Disease. Coffee Leaf Rust is likewise expected to affect coffee grown at higher altitudes.⁽⁸⁾ Better pest and disease management, including rejuvenation with resistant varieties, is crucial throughout Rwanda.
- Erratic rainfall at the beginning of the rainy season and dry spells during the rainy season would affect flowering and cherry development.
- Heavy rainfall events, including hail, will cause floods, soil erosion, and damage crops. Shade trees and soil and water conservation measures can help to reduce damage.

PRODUCTION STANDARDS AND PRACTICES



CERTIFIED PRODUCTION

- About 30% of production is certified by UTZ/Rainforest Alliance and Fair Trade. Starbucks, Nespresso AAA and 4C are also present in Rwanda.⁽³⁾
- Certified exports are about 30% of certified production.⁽¹³⁾



FARM PRACTICES

- Coffee is cultivated in monoculture or intercropped with food crops.^(4,12)
- Agro-chemicals are subsidized. However, input use, including organic, is low.^(5,7)
- About 25% of trees are more than 30 years old.⁽⁵⁾ The varieties cultivated in Rwanda are susceptible to all major pests and diseases.^(2,16)
- Farmers sell fresh cherries to central washing stations owned by cooperatives and private sector.⁽⁷⁾ Semi-washed coffee is processed at home.⁽³⁾



FARM ECONOMY

- The average yield is 0.4 tons/ha.^(2,13)
- Labor (family and hired) is the biggest cost factor (78%), followed by inputs (15%).⁽⁷⁾
- Losses of up to 50% caused by Coffee Leaf Rust, Coffee Berry Disease, Coffee Berry Borer are common.⁽³⁾
- Farmers receive 69% of FOB value.⁽¹³⁾

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