

OTA PROJECT
Socio-Economics Component

**An assessment of the primary coffee processing practices in the
North Rift Valley region of Kenya**

Kenya Report

By

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1.0 Introduction

Kenya produces wet processed mild Arabica coffees and accounts for about 1% of the world supply. Within the country coffee is grown in three main regions, namely:

- East of Rift Valley (comprising areas around Mt Kenya, the Aberdare ranges and Machakos)
- Western (comprising of Kisii highlands, Mt Elgon area and the North Rift valley districts)
- Taita Hills at the coast.

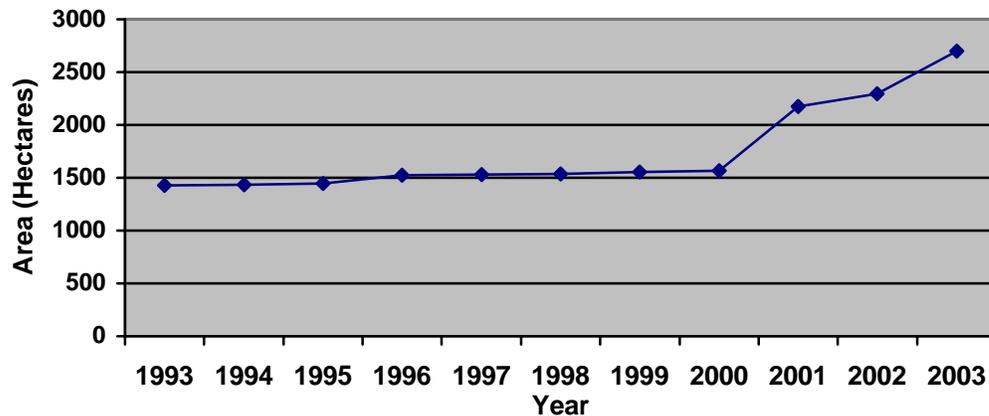
Of the estimated 170,00 hectares of land under coffee, the East of Rift Valley accounts for about 82%, Western for 17% and the Taita Hills for only 1% (ANNEX 1).

Over the last 10 years the North Rift Valley has increasingly become important as far as the future of coffee production in Kenya is concerned. First, over half of all new plantings in the country in the last decade have been in the region. Consequently area under coffee production in the region grew by 89% (from 1425 ha to 2698ha) between 1993 and 2003 (Fig 1). Moreover, has further coffee expansion potential that is favored by relatively large farm holdings coupled by suitable climatic and soil conditions.

Besides, the erratic performances of the previously predominant dairy and maize enterprises had jolted farmers into enterprise diversification and the crop of first choice has been coffee.

This survey was prompted by the desire for a deeper enquiry into the processing practices after a rapid appraisal in November 2003, revealed processing practices and arrangements that appeared unique and divergent from practices elsewhere in Kenya. Further to generate outputs that may inform research activities in the context of the ongoing Global Project on the Prevention of Mould Formation in Coffee.

Fig 1: Area under coffee production in the North Rift valley Region of Kenya



2.0 Objectives of the Survey

- To determine the extent of on-farm primary coffee processing
- To establish reasons that have promoted this practice
- To assess the divergences from recommended processing practices
- To propose interventions in order to limit the effects of the constraints and capture the opportunities towards quality coffee production

3.0 Data and information sources

Data and information for collected at two stages

1. Interviews with coffee extension staff in the region. Besides getting opinion of the officials on various aspects of coffee production secondary information on coffee production and marketing was also collated.
2. The second stage involved visits to pulping units and interviews with their operators/owners using a structured questionnaire. Overall, 47 out of the targeted 60 units were visited. The survey coincided with the picking/processing period and the team was also able to capture further evidence of the practices in photographs.

4.0 Categories of processing units

According to the records at the coffee Board of Kenya there were about 250 registered coffee processing units in the North Rift region (CBK, 2003)¹. These processing units were in two categories

- Category 1: Pulping units that are communally owned by farmers under the auspices of the co-operative societies
- Category 2: Pulping units that are independently owned by farmers

During the survey however, it was evident that the number of on-farm processing units was indeterminate as some of the farmers who were supposedly operating under the co-operatives were actually processing their own coffee and delivering parchment to their respective co-operatives for marketing. During the survey therefore, the team broadened the definition of the on-farm processing units to include this latter group.

A total of 47 processing units were visited during the survey (Table 1). Out of the 40 on-farm processing units, 18 marketed their coffee independently and the rest delivered parchment to their respective co-operative societies for onward marketing. Only about 30% of on-farm processing units had a coffee farm whose size was 2.0 hectares (the licensable threshold)² or more.

All the on-farm units has been in operation for periods ranging between 1 and 13 years

¹ According to the extension staff some of those licensed were actually dormant

² Under the current coffee laws (Coffee Act No 9 of 2001)

Table 1: Distribution of processing units visited during the survey

District	No. of units visited		Total
	Co-operatives	On-farm	
Trans-Nzoia	4	22	26
Nandi	2	10	12
Uasin Gishu	1	8	9
Total	7	40	47

5.0 Individualized coffee processing

Farmers gave three main reasons for undertaking own processing (Table 2)

Table 2: Reasons for processing own coffee

Reason	No. of respondents	Percentage
Absence of a communal processing unit	19	48%
Higher and prompt payments	10	25%
Desire to work independently	11	27%

Nearly half of the farmers visited would have opted for communal processing units if they existed within their localities. The rest would continue processing own coffee in order to achieve either prompt/higher payment or a have higher decision making latitude by working independently.

6.0 Coffee processing practices

In the traditional coffee growing areas in Kenya, elaborate coffee processing protocols have been in place for many years. Indeed in these areas certain basic equipment, structures and skills are a pre-condition for the licensing and operation of of a coffee-processing unit.

In the North Rift Valley however, this holds true only in the few co-operative based processing units. For instance, Kapretwa Farmers Co-operative Society, runs one of the largest coffee factory in the region (Box 1)

Box 1: Kapretwa Coffee Factory

Built by colonial settler in 1964 years, Kapretwa factory was acquired by the Kapretwa Farmers co-operative Society in 1968 and currently offers centralized coffee processing for its 436 members. The factory has a 4 discs and 2 re-passers pulper with a capacity of 4000 kg of cherry per hour and a similar set on standby. During the peak of the season the factory operates on only one of the disc with a throughput of less than 2000kg per day.

The factory is however poorly maintained. Most of the discs have not been re-sprayed for along time leading to the mixing of parchment and pulp; fermentation tanks have huge cracks, and the waste disposal pits have not been dredged for many years. Drying table were falling apart and store leaky



Drying tables at Kapretwa Factory

Amongst the on-farm processing units, various aspects of coffee processing were characterised by ingenuity, innovation and improvisation.

6.1 Coffee pulping

The predominant processing technology amongst the on-farm based units is hand pulper (Box 2). The hand pulpers have capacities that range between 250 to 300 kgs per hour. For a category whose average production was about 4,900 kg per season (lasting about one and half months), the hand pulper technology would be adequate if all other constraints were mitigated.

The hand pulpers are either owned independently or co-owned and shared in rotation by groups of between 3 and 4 farmers.

In other instances farmers would temporary lease pulpers, carry them do their farms, pulp their coffee and then return them to their owners. An average fee of Ksh 1.70/kg of

cherry was charged under this arrangement. The cost of all the other processes including the pulping labour would be borne by the lessee

In areas where farmers could neither access a hand pulper nor afford to pay for pulping services, a lot improvisation and creativity was deployed (Box 2)

Box 2: Coffee pulping methods – North Rift Valley- Kenya



i) Hand operated pulper

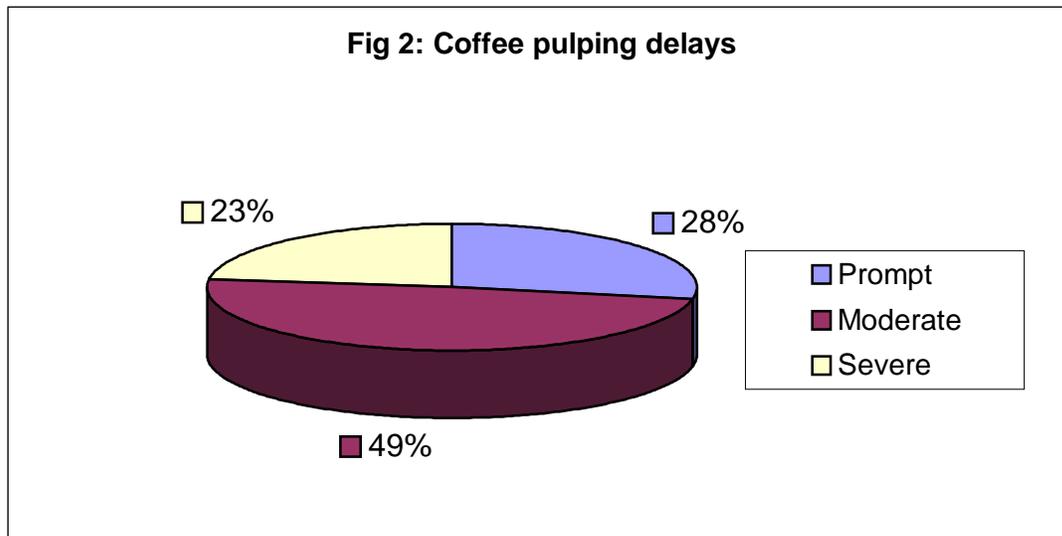


ii) Improvised pulping

Delays in pulping were also recorded. Indeed only 28% of the farmers visited managed to pulp within 2 hours after picking. Nearly half of the farmers 49% pulped within 4-10 hours and a further 23% experienced severe delays that range from 17 to 60 hours.

The delays in pulping were attributed to lack of access to a pulpers and shortage of labour. The latter was especially exacerbated by simultaneous maize harvesting activities in the region.

In one co-operative based processing unit (Chebukaka), the team encountered heaps of coffee that had been gone unpulped for over one week due to a breakdown of the water supply system.

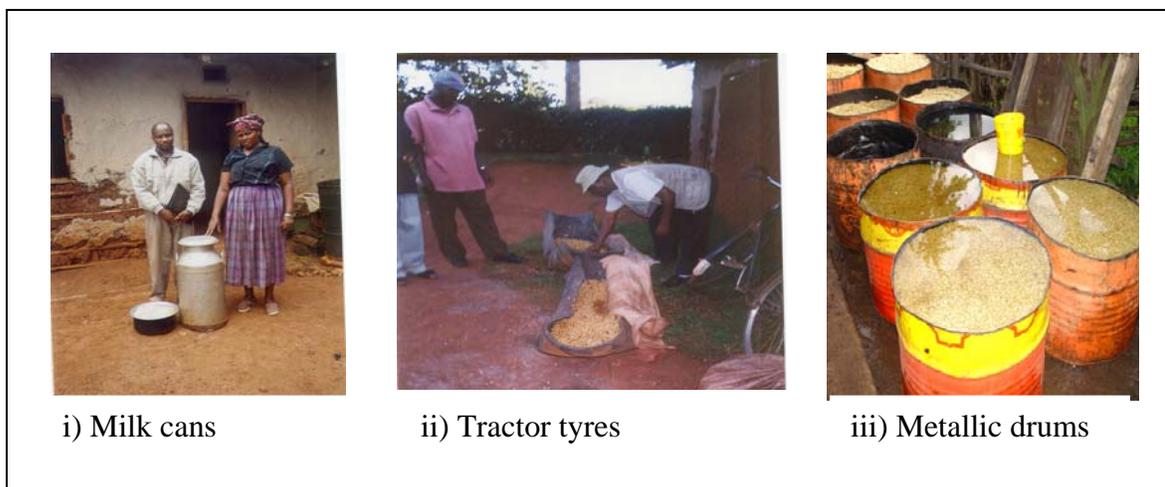


6.2 Fermentation

On-farm processing units in the North Rift valley region face serious challenges at the fermentation stage. Besides pulping, this was one other area that farmers have attempt to overcome constraints by improvising and at times coming up with what would aptly be described as novel ideas.

Not in a single case did the team come across farmers using the conventional fermentation. Instead farmers were using all manner of containers: old tractor tyres, milk cans, wooden troughs, synthetic bags, plastic drums and sufurias. Some however skipped this stage and moved straight to washing and drying (Box 3)

Box 3: Some of the containers used for fermentation of coffee in the North Rift Valley region



Farmers were generally aware about the fermentation process but the periods taken in this process were diverse. One quarter of the farmers visited undertook the fermentation process for the recommended 72 hours. The rest took various periods ranging from 12 hours to 60 hours (Table 3). The average deviation from the recommendations was 17 hours.

Table 3: Coffee Fermentation period in hours

Time taken to ferment coffee	No. of respondents	Percentage
12-8 hours	9	23%
24 –36 hours	7	18%
48-60 hours	14	35%
72 hours (recommended)	10	25%

6.3 Washing

Save for the co-operative processing units which have washing channels, in all the on-farm units visited, washing of coffee after fermentation was done in the same containers used for fermentation. However, in one area in Turbo, Nandi district farmers use donkeys

to ferry their coffee for washing some 10 kilometres away. The parchment is then taken back to the homesteads for drying

6.4 Processing water

Nearly all (98%) of the processing units visited indicated that they had adequate water for coffee processing. The sources of water for processing were however diverse as shown below (Table 4). Most of the processing units visited had sunk wells and shallow borehole near the homesteads. The water is used both for domestic chores as well as for processing coffee.

Table 4: Sources of water for coffee processing

Source	No. of respondents	Percentage
Rivers and streams (Direct)	16	40%
Wells/Boreholes	22	55%
Piped water	2	5%

At the time of the survey however, one co-operative society (Chebukaka) was severely constrained due to the frequent breakdown of its water supply system. In addition to the coffee that had been pulped but could not be washed, coffee was also rotting in farms as the factory system had clogged up. Indeed this case was a manifestation of the vulnerability of centralized coffee processing to failure of systems (Box 4).

Box 4: Impact of prolonged lack of water at Chebukaka



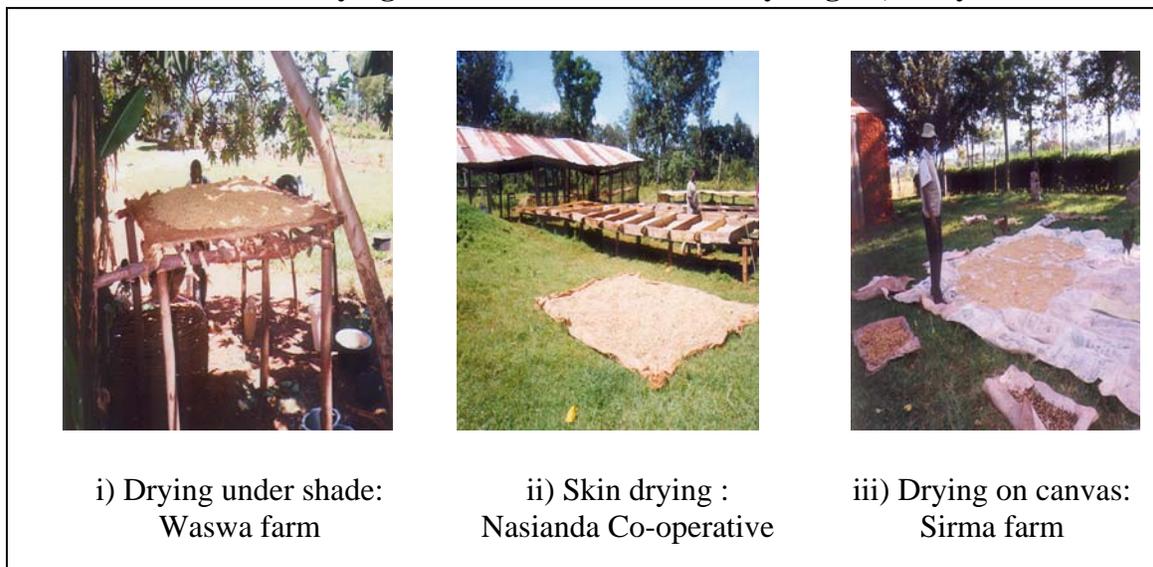
NB: The coffee above had stayed for over a week in the fermentation tanks as there was no water to take it through the washing channels

Drying of coffee during wet processing is a two-stage process, skin drying and parchment drying.

However, in the North rift valley region the delineation of the two processes was only apparent amongst the co-operative processing units.

Once again the team came across some drying innovation by farmers. For instance at Waswa farm (Box 5) the farmer had devised a way of gradual drying of her coffee gradually the banana shade. This ensured coffee did not come across direct sunlight and therefore did not crack. This practice according to the farmer was effective and had been adopted by other farmers in the locality.

Box 5: Various coffee drying methods –North Rift Valley Region, Kenya



Some of the drying practices however put the coffee at the risk of contamination and rewetting. In one case, for instance, coffee drying was being undertaken on a canvas that was spread on the ground. The canvas would be left uncovered overnight, exposing the coffee to the vagaries of the weather.

In the cooperative based units piling of coffee on the drying beds was common, leading to uneven drying. It was clear that most of the staff were unaware of the need to occasionally turn the coffee.

6.6 Coffee storage

Coffee storage also presented a major challenge to most farmers. In all cases save for the co-operatives, there were no custom designed stores for coffee.

Being a traditionally a maize producing area, there was an observable tendency for farmers to store coffee alongside maize.

Farmers were largely unaware of issues like ensuring coffee is out of contact with the floor or the need for store roofs to be free of leakages. However as in other aspects of processing there storage innovations too. One such innovation was recorded at Mokoyet farm (Box 6). The farmer used stacked removal trays. This made it easier to move the coffee from the store to the sunshine when need arises. The farmer would also respond fast also in case of a drizzle, hence avoid rewetting.

Box 6: Coffee storage practices by farmers in the North Rift valley Kenya



i) Stacked removable trays: Mokoyet farm



ii) Maize cum coffee store: Kering farm



iii) Elevated store: Kapkimwok farm

6.7 Waste disposal

Waste disposal problems were more apparent amongst the cooperative units that in the on-farm units. Out of the 7 units visit only 2 had functional disposal mechanism. Though the waste disposal facilities had been installed at construction, they had progressively fallen into a state of disrepair.

Wastes disposal amongst the on-farm processing units however posed no major concern. A majority (73%) had adequate disposal mechanisms³. Moreover, unlike the co-operative units, most of the on-farm based units were located away from water stream and rivers

7.0 Access to extension and training

Access to extension and training on processing practices was poorest amongst the co-operatives. Out of the 7 co-operative units visited only one had at least one of the staff trained on processing. Further enquiry, attributed the low access rate to high staff turnover and lack sponsorship.

65% of all the operators of on-farm processing had accessed some training on coffee processing. Coffee Research Foundation had the biggest coverage (62%), followed by the Ministry of agriculture (35%). Coverage by farmer organisations was a meagre 3%.

Asked whether they have had contact with the extension staff by way of advisory visits in the previous two years, 40% of the respondents answered in the affirmative. The frequency of the contacts with the extension staff was described as very often by 31% of the respondents, often by 44% and occasional by 25%.

Given that most training and extension materials are prepared with a mindset that is orientated towards the conventional coffee processing practices, it was not clear whether past training and extension activities have been relevant to farmers in this region

8.0 Challenges and opportunities

It was evident from the survey that coffee processing situation, and indeed the whole question of coffee production expansion in the North Rift Valley region presents enormous challenges and opportunities for the coffee sector in Kenya.

³ The disposal mechanism in most of the farms involved decomposting for use as manure

8.1 Challenges

Looking at the processing practices captured during the survey several challenges can be discerned.

- The urgent need for research to work with farmers in order to validate the effectiveness of some of the processing improvisations e.g. fermentation of coffee in tyres and milk cans, in turning out quality coffee.
- The ensure that farmers are sufficiently sensitised and do appreciate of the need for proper drying and storage in minimising mould formation
- The need to understand fully the balance of benefits and risks associated with individualised vis-à-vis communal coffee processing
- The need to make training and extension messages relevant to farmers practising non-conventional processing practices.

8.2 Opportunities

Two innovations by farmers stand out as possible opportunities that need to be further understood and harnessed. These are

i) Individualized processing

Individualized processing for members belonging to co-operatives currently is disallowed in the current coffee laws. However, the practice seemed to thrive as an acceptable alternative to communal processing in the North Rift valley region. It is an arrangement that need to be explored further especially in areas where communal processing facilities have collapsed.

ii) Innovative processing practices

Some processing of the innovative practices could pass as good practices. There is need to validate and upscale them so that more farmers could benefit

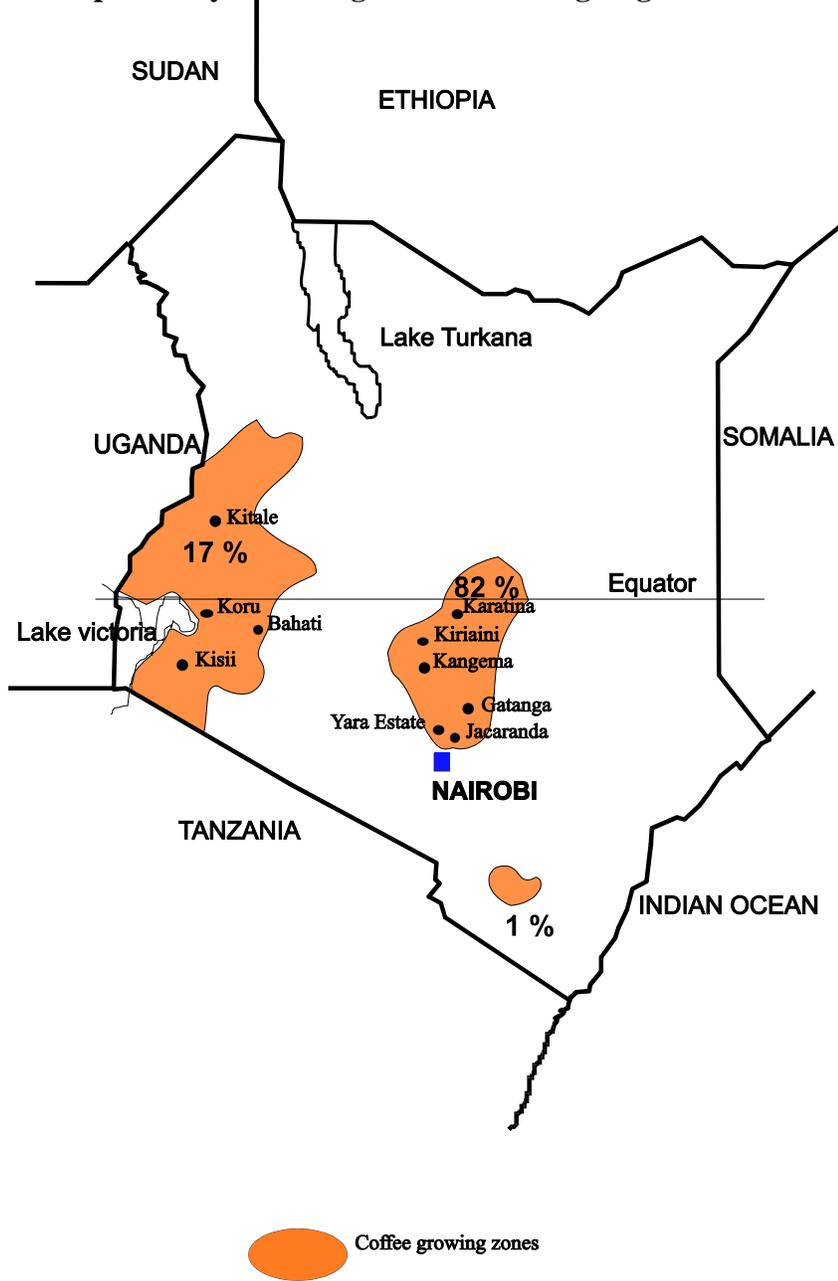
9.0 Conclusion

The growth impetus of coffee farming in the North Rift Valley region is not about to even out. Consequently more hectares of coffee in the region will come into maturation in the coming years and further strain an already deficient system. There is need to mitigate any negative impact of the current processing practices before they eventually manifest in the quality of coffee offered to the market.

10.0 References

1. Coffee Board Of Kenya (2003). Growers Register, Nairobi
2. Government of Kenya (2001). Sessional Paper No. 2 of 2001 on Liberalization of the coffee Industry. Government printer, Nairobi
3. Government of Kenya (2002). *Coffee Ac (No 9 of 2001)*. Government Printer, Nairobi.

ANNEX 1: Map of Kenya Showing Coffee Growing Regions



Scale = 1: 12,672,000