Cassava Production, Processing and Utilization in South Western Part of Ethiopia

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Authors’ contributions

This work was carried out in collaboration between both authors. Author AG designed the study, conducted the research and wrote the first draft of the manuscript. Author MB conducts the research and managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

Cassava is a root crop grown and consumed in south western part of Ethiopia. A survey was conducted to assess the production status, processing and utilization of cassava in three zones in South Western part of Ethiopia. A total of 63 farmers from five Cassava producing Districts were randomly selected for interview. A well-structured questionnaire was administered to individual respondent. The survey result showed that most of the farmers on average allocated less than 0.25ha of land for cassava production and none of the respondents were used improved cassava varieties. More than 86% of the farmers sold fresh cassava while others sold after processing. Of the interviewed farmers 98.4% of the respondents had awareness about hydrogen cyanide content of cassava and conducted different removal measures. More than half of the interviewed farmers responded that most of cassava produced in the area was used for home consumption. Less than 40% of them were used for both market and home consumption. Of the total farmers, 53% of the farmers consumed cassava by boiling and frying, while the others consume either by boiling or frying.

Keywords: Cassava; consumption; processing; production.
1. INTRODUCTION

More than half a billion people in the world use Cassava (*Manihot esculenta* Cratz) as an essential part of their diet and important carbohydrate source. In several African countries cassava used as source of income for farmers [1]. Cassava is a very important food crop in the tropics, that is, at latitudes of 30° and from sea level to 1800 m. The principal economic products are its roots. Cassava leaves also have excellent potential and is extensively used in Africa and Asia, as either human food or animal feed. Cassava is the fourth most important commodity after rice, wheat and maize, and is a basic diet of many millions of people [2].

In Ethiopia, Cassava is grown in almost all parts of the country. But bulk of its production is situated in South, South Western and Western parts of the country [3]. It is mainly cultivated by small resource poor farmers on smallholding plots of land. Cassava is one of potential root crop which has a significant contribution to the livelihood of small scale farmers and creates business and employment opportunities for farmers and commercial agents [4]. It is both a food security crop and a source of household income. It is increasingly becoming a source of industrial raw material for production of starch, ethanol, waxy starch, bio-plastics, glucose, bakery and confectionery products, glue, among others [5]. Cassava is one of the most important food crops in Ethiopia that constitute a considerable portion of the daily diet of the people and also serves as one of the major source of carbohydrate [3]. In Ethiopia, most of the varieties produced were local varieties which are low yielding, late maturing, bitter type and containing high hydrogen cyanide level [6].

However, in Ethiopia, it is considered as less important and cassava is planted at the backyards and farm borders as fences. Its consumption and processing in Ethiopia is in a primitive stage as compared to many African countries [7]. It is known that cassava-based diets have been associated with two neurological disorders: tropical ataxic neuropathy (TAN) and Konzo. Both occur to people whose diets are largely restricted to high-cyanide cassava. When raw cassava or inadequately processed cassava was consumed, different symptoms of health problem happened to the consumer [8]. Apart from HCN cassava contains anti-nutrients like tannin, oxalate and phytate which inhibit the absorption of minerals to the body [9]. For Ethiopians, the consumption of cassava as food is of immense importance and regarded as the food security crop for millions of people [7]. Currently there is no adequate information on production, processing and utilization of cassava in South-Western part of Ethiopia as well as in the country as a whole. Therefore, the aim of this study was to fill the information gap on cassava production, processing and utilization in South Western part of Ethiopia and to avail the information for future intervention.

2. RESEARCH METHODOLOGY

2.1 Description of the Study Area

The survey was conducted in five districts in Benchmaji, Sheka and Majang zones of South Western part of Ethiopia. The study areas were North Bench and Meinit Shasha woredas from Benchmaji; Sheko and Yeki woredas from Sheka and Godere worera from Majang zones.

Bench Maji and shaka zones are found in the Southern Nations, Nationalities, and Peoples’ Region (SNNPR) of Ethiopia. Bench Maji is bordered on the south by the Ilemi Triangle, on the west by South Sudan, on the northwest by the Gambela Region, on the north by Sheka, on the northeast by Keffa, and on the east by Debub Omo. The Omo River defines much of its eastern border with Debub Omo. The administrative town of Benchi Maji Zone, Mizan Aman, is about 561 km far away from the capital city Addis Ababa, Ethiopia. The geographical coordinates of the Bench Maji lies between 6° 14' 60.00” N and 35°09’ 60.00” E with altitudinal ranges of 500 to 3000 m.a.s.l.

Sheka zone is bordered on the south by Bench Maji, on the west by the Gambella region, on the north by the Oromia region, and on the east by Kafa Zone of SNNP. The administrative center of Sheka is Masha, which is about 661 km from Addis Ababa. The geographical coordinates of the study area lie between 07° 07.494’ to 07° 52.301’ N and 35° 16.576’ to 035° 39.516’ E with altitudinal ranges of 950 to 2780 m.a.s.l.

Majang Zone, found in Gambella Region, the zone is bordered with Sheka and Bench Maji zones of SNNPR in its Southeastern part, Ilubabor zone of the Oromiya region in its Northern and Agnwak zone of Gambella in its Western part. Meti town is the capital city of the zone. The geographical coordinates of the study area lie between 07° 07.494’ to 07° 52.301’ N
and 035° 16.576’ to 035° 39.516’ E with altitudinal ranges of 550 to 1260 m.a.s.l.

2.2 Sampling Techniques and Methods of Data Analysis

Both primary and secondary data were collected. The data comprised qualitative and quantitative parameters. A pre tested structured questionnaire was developed to collect primary data to obtain information directly from the producing farmers. A total of 63 households were purposively selected for interview.

Secondary data were collected from Teppi Agricultural Research Center and Zone and Woreda Agriculture offices. The data were coded, entered, and analyzed in Statistical Package for Social Scientists (SPSS20). Descriptive statistics including frequencies, means, minimum, maximum and standard deviations were used to present the collected information.

3. RESULTS AND DISCUSSION

3.1 Demographic Characteristics of the Respondents

Distribution of the respondents according to sex revealed that 71.4% of the sampled cassava farmers were male while only 28.6% were female. The age distribution data revealed that middle age people (21-40) engaged more in cassava production than the young under twenty years and the old over forty-one years Table 2. According to Ethiopia Age structure, this category of people falls into early working age and prime working age, and are expected to be energetic and productive (world-fact book).

Table 1. Sample size

| Woreda (District) | Freq. | Percent |
|-------------------|-------|---------|
| North bench       | 12    | 19.05   |
| Meinit shasha     | 9     | 14.29   |
| Sheko             | 14    | 22.22   |
| Yaki              | 9     | 14.29   |
| Godere            | 19    | 30.16   |
| **Total**         | **63**| **100** |

Table 2. Age and education status of the respondents

| Age      | Freq. | Percent | Education           | Freq. | Percent |
|----------|-------|---------|---------------------|-------|---------|
| Below 20 | 8     | 12.70   | Illiterate          | 15    | 23.81   |
| 21-30    | 29    | 46.03   | Adult education     | 1     | 1.59    |
| 31-40    | 15    | 23.81   | Primary school (1-8)| 39    | 61.90   |
| 41-50    | 7     | 11.11   | Secondary school (9-12)| 8     | 12.70   |
| Above 50 | 4     | 6.35    |                      |       |         |
| **Total**| **63**| **100** |                      | **63**| **100** |

Table 3. Marital status of the household

| Marital status | Freq. | Percent |
|----------------|-------|---------|
| Married        | 56    | 88.89   |
| Single         | 6     | 9.52    |
| Divorced       | 1     | 1.59    |
| **Total**      | **63**| **100.00** |

Table 4. Household farm characteristics

| Particulars               | Mean | Sd  | Min | Max  |
|---------------------------|------|-----|-----|------|
| Land owned (ha)           | 2.21 | 2.39| 0.20| 17.00|
| Cassava production experience(years)| 7.85 | 6.32| 1.00| 30.00|
| Yield (Qt/ha)             | 330.64 | 432.05| 50.00| 3000.00|

Source; Survey result, 2015
The field survey showed that 23.81, 61.9 and 12.7% of the respondents had no formal education, primary education, and secondary education, respectively. None of the respondents had been joined higher education. According to Oghenerioborue et al. [10] since farmers have to rely on the informal education received from their parents, the low educational background might affect the level of their performances on Cassava production.

In this study, the average landholding for households was 2.21 ha. Farmers have land that ranges between 0.2 to 17 hectare and 33.33% of the farm households have an area above 2 hectares of land.

The average year of cassava farming experience of households was 7.85 years. The minimum experience was 1 year and the highest farming experience was found in 30 years, this indicated that cassava was introduced before 30 years in the study areas.

### 3.2 Cassava Production Trend

Cassava was introduced into the surveyed area long years ago. According to Feleke [11], cassava was introduced by some NGOs to drought prone areas of southern part of the country primarily to fill the gap for subsistence farmers due to failure of other crops. Farmers in surveyed area had up to 30 years of experience on cassava production. Although its first introduction in to the country is not yet known, the crop had been growing in South, South West and Western part of Ethiopia for several years [5]. In surveyed areas the land allocated for cassava production was very low as compared to other crops produced in the area. More than 86% of the respondents allocated less than 0.25ha of land for cassava production. This was evidenced by; only 3.5% of farmers were allocated more than 0.5ha of land for cassava production. Similar result reported by Tesfaye et al. [5] stated that the mean land holding of sample household allocated for cassava production is...
production was 0.20 ha. This implied that most of the farmers in the area have no or little awareness about cassava production and its use. But, now a day the country population is becoming high and demanding the commercial farming on food security crop like Cassava.

Majority of farmers (85%) in the study area planted cassava on both “Meher” and “Belg” season, while others produce only during “Meher” season. The data collected from the field showed that neither organic nor inorganic fertilizers were applied to produce Cassava. Out of the interviewed farmers 43.5% and 21% were practicing intercropping and sole cropping respectively, while 35.5% of the farmers used cassava as a live fence around the home and border of other cereal crops farm. None of the sampled farmers applied any form of fertilizer to increase the yield of cassava but relied on cropping systems [10]. Row planting was not a common practice in the area, few farmers used spacing varied from 0.5m*0.5m to 2m*2m, but more than 73% of the farmers did not know the spacing they used to plant Cassava.

Even though there are different cassava varieties released by research centers in the country, 100% of the farmers grow local varieties in the study areas. According to the work done somewhere the adoption rate of the farmers for the improved cassava varieties in average was only 30% [5]. But, the current result showed that none of the farmers used released cassava varieties. Production of cassava in Ethiopia has different constraints and opportunities, among which shortage of improved varieties is the first and the most important one [3]. This indicated that the extension system on cassava crop was very limited.

3.3 Cassava Processing and Utilization

Cassava was produced in the study area for home food consumption and to a little extent for market purpose while a quantity left from consumption. Among the respondents more than 60% of the farmers produce cassava for home consumption while others produce for both market and home consumption Table 6. This indicated that most of the cassava produced was consumed by producers themselves. From the product, 86.4% of the farmers sold fresh cassava while 13.6% of them sold a value added product following local processing technique.

Among various ways in which people could consume cassava, 42.86%, 6.35% and 50.79% of the respondents were consuming cassava in boiled, fried and both boiled and fried forms respectively Table 7. Most (82.3%) of the farmers consumed cassava solely while the other 17.7% of the respondents were blending with other crop products like maize, sorghum, etc in the form of bread, Enjera and Genfo.

During utilization the main concern of the consumer is the hydrogen cyanide content found in Cassava. Of the interviewed farmers 98.4% were aware of hydrogen cyanide content in cassava. To overcome this problem farmer’s conducted different removal measures. Sixty five percent of the farmers remove hydrogen cyanide by boiling fresh root or frying. Some (22.2%) of the farmers remove hydrogen cyanide from cassava products before boiling or frying and 12.7% of the farmers remove by grating and sun drying of the cassava product Table 8. According to farmers response slicing of cassava product had significantly reduce the toxicity of hydrogen cyanide.

Table 6. Main purpose of growing cassava

| Purpose                              | Freq. | Percent |
|--------------------------------------|-------|---------|
| Home consumption                     | 38    | 60.32   |
| Both market and home consumption     | 24    | 38.10   |
| Others                               | 1     | 1.59    |

Source; Survey result, 2015

Table 7. Form of product used for home consumption

| Consumption form | Freq. | Percent |
|------------------|-------|---------|
| Boiled           | 27    | 42.86   |
| Fried            | 4     | 6.35    |
| Both boiled and fried | 32 | 50.79   |

Source; Survey result, 2015
4. CONCLUSION AND RECOMMENDATION

Cassava sub-sector is a good entry point for tackling poverty in Ethiopia. The production and utilization of cassava is increasing through time in different part of the county. Cassava is produced by almost all farmers found in the surveyed areas, and has very high consumption demand. This study has provided information on cassava production, processing and utilization in South Western part of Ethiopia. However, there are problems related to allocation of large area for cassava production and use of improved cassava varieties. Regarding cassava utilization large amount of cassava produced in the areas were consumed traditionally, without any value addition. The need to diversify consumable cassava products, improve the quality and standardization of existing products through improved technologies, and develop a recipe, cassava manual for use by nutrition extensions paramount important for wider cassava production and utilization.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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