

Identification and Prioritization of Major Constraints of Crop Productivity and Production System in the Case of Melokoza District of Southern Ethiopia.

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ABSTRACT

Ethiopia is an agrarian country and agriculture is the leading sector as source of income, employment and foreign exchange and national economic growth is determined by the performance of agriculture.

The livelihood of over 93% of the people of Southern Nation Nationality and peoples Regional state of Ethiopia dependent on agriculture; however, agricultural system in the region is at subsistence level.

Much effort has been put to produce or adapt agricultural technologies that would help to boost production and productivity but only few technologies

adopt by the end users. Because, technologies might have not be driven from the real need of the end users. A top bottom approach that dominantly centered researchers/ professional attitudes has been followed.

For the successful research and development, an agro-ecology based evaluation is crucial to know the specific farming system production practices and problems and technology needs of farmers.

In this line, an assessment study was conducted in melokoza district in Gamo Gofa zone of SNNPR.

The rain fall pattern is bimodal. Major crops grown in the area are Maize Teff Rice Barley Sorghum Wheat Sesame Common bean, Faba bean, Field pea, Enset ,Irish potato, Sweet potato,Taro, Banana, Mango, Avocado, Hot pepper, Aframomum correrima, Ginger, onion, garlic and Coffee.

Keywords: Agricultural Problem Identification and Prioritization, Production Constraints, Melokoza Agro Ecology, and Agricultural Technologies.

INTRODUCTION

Ethiopia is an agrarian country and agriculture is the leading sector as source of income, employment and foreign exchange and national economic growth is determined by the performance of agriculture. Agriculture employs more than 70 percent and contributes 30 to 60 percent of the gross domestic product (GDP). Agriculture output also is used as an input for industries so it can stimulate the growth of industrialization (7).

In SNNPR, 90 percent of the total population depends on agriculture as a source of cash income, home consumption, as industry inputs and for export purpose. The survey report which was conducted at regional level jointly by Southern Agricultural Research Institute (SARI) and Bureau of Agriculture in 2008 shows that the yield obtained from the local cultivars is too

low. And in many parts of the region, lack of improved crops varieties and associated improved management and protection practices are some of the major constraints in the crop production systems; i.e. farmers in many remote areas of SNNPR even do not know the existence of the new crop varieties.

To resolve these specific agricultural productivity constraints, several works have been done at regional level. Massive movement to test suitability of the existing technologies on different crops has been carried out in different agro-ecologies and the best technologies were pre-scaled up in some localities of the region (2). Even though only few localities like melokoza with limited number of technologies were reached in the last few years, unappreciable improvement in crop productivity was realized in the target areas.

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To advance improvement of crop productivity in targeted areas, continual identification of the best and suitable crop technologies appeared to be essential (5).

Research focused areas of AGP-II are demandable for export and import substitution, food security, commercial, home consumption and local market crops. Accordingly for the purpose of research inputs for AGP -II and for further research intervention, Arbaminch Agricultural Research Center Crop research Process team has been conducted formal and informal survey to identify and prioritize key problems and constraints related with a fore mentioned purpose; crop production and marketing system in the mandate area of the program, i.e. Melokoza .

Key crops produced in the mandate area are Cereal, Pulse and oil, coffee and spices, and Horticultural crops. During the survey, problems were identified and prioritized using formal survey (field visit, observation and conducting focus group discussion with farming communities) and informal survey conducted discussion with different level of experts and extension workers. Survey results were obtained (gaps were identified) and research directions were indicated. So it is better to remind all stalk holders for the flexibility of the survey information based on any new ideas and problems that come up with time may be due to climatic change, agronomic improvement and other factors according to justified reasons.

Objectives

To identify, prioritize and generate information about crop production problems in the mandate areas of the program for further study.

METHODOLOGY

Description of the Study Area

Altitude, temperature and rainfall distribution of the woreda

Category	Melokoza	
	min	max
Altitude	501	2500
Temperature	15.1 oc	27.5 oc
rainfall	750 mm	1500 mm

Source: Melokoza woreda agricultural office.

Soil Types

Soil types	Melokoza
Clay	15%
Clay loam	50%
Sandy loam	35%

Source: Melokoza woreda agricultural office

Agro ecology of the area

Category	Melokoza
High land	29.73%
Mid land	32.43%
Lowland	37.84%

Source: Melokoza woreda agricultural office

Methods

The survey was conducted by cluster based on agro-ecology at Gamo Gofa zone, Melokoza district in Southern nations, nationalities and people's regional state (SNNPR).

Major factors that hinder production and productivity of key crops like Cereal, Pulse and oil, coffee and spices, and horticultural crops were identified for further research inputs.

Data were collected through small group discussion with farmers (youth, women and men) development agents, other stakeholders and from secondary data; to identify and priorities key factors that affect crop production, productivity, marketing system and other related problems and also, opportunity were considered in the mandate area of the program.

Primary data were collected through discussion among the disciplinary based sub-groups and the corresponding farmers sub groups (youth, women and men). The discussion was guided by the checklist prepared by the program and issues raised during discussion were incorporated. Visual observations were also made at farm level.

Upon completion of sub group level discussion, information particularly crop production and production related constraints identified by each sup groups of farmers were summarized together. Then, informant's farmers were gathered as one group and summarized series of constraints had been briefed to them and then they ranked the problem by agreement in order of their importance.

All farmers' practices and data related with local cultivars and improved varieties, cropping calendar, farming system and factors related to major crops of the area was identified and mentioned as a source of information for further studies.

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Fig1. Discussion with farmers.

RESULTS AND DISCUSSION

Crop Production

Major Crops Cultivated and Cropping System

The major crops grown in the area includes Maize, Teff, Sorghum, Rice, Barley Wheat, common bean, Enset, Cassava, Sweet potato, Irish potato, Taro, Coffee, Pepper, ground nut, Mango, Avocado and Banana. The area has two cropping seasons’ autumn and summer.

Common cropping systems practiced in area are sole cropping and intercropping. Farmers grow crops for home consumption, seeds and income generation. As there are diverse farming systems in the area, the production problems are also diverse.

Farmers mentioned series of problems that affects the productivity of the existing crop varieties as Maize lethal necrosis disease (MLND), and stalk borer on maize and sorghum head smut on sorghum and maize, ear rot on maize, leaf blight on common bean, bacterial wilt on Enset and Banana, anthracnose on mango and avocado, bird attack on sorghum, erratic rainfall, Weevils and rats are storage pest on different crops. In general the key informants strongly emphasized that the major crop production constraint like, Disease, Storage

pest, lack of disease resistant varieties and low cost and market demand that forces farmers not to give attention for the production.

Table1. Crops Cultivated in Autumn and Summer

AUTUMN	SUMMER
Maize	Maize
Sorghum	Barley
Common bean	Wheat
Sweet potato	Rice
Teff	Enset
Ground nut	Avocado
pepper	Banana
onion	Mango
garlic	Coffee

Method of Seed Selection and Maintenance

According to the interviewed farmers seed selection is generally done by selecting plants with large cobs / and big seed size and large head/long spikes at field condition this is for cereals. For pulse, seeds are selected after threshing from those plants which have good looking seeds and free from disease/insect pest. The selected plants in case of cereals especially, maize and sorghum are harvested separately, tied together and hung over smoking places whereas selected plant of beans would be threshed and mixed/ treated with ash in order to protect it from weevils and other storage pest infection.

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Table2. Improved and local Crop Varieties cultivated in the area

Crops	Improved	Local
Maize	BH140,BH540,BH661	Maize (no specific name)
Teff	kuncho	Jilga,bukula,tsama,jemisha,manize,dufa uha, Dara, abi and sergegna.
Rice	Not identified	Not identified
Barley	No improved	Duha, Borena, Woriwocho, Napha, and Kandaze
Sorghum	No improved	Red (Boba, Gemba, Mutsa, Orda & Delka), White (Gersha, Dare, philkeso), and Gray (Dulko),
Wheat	Dampe , Digelu	Kenya, Red wheat
Sesame	Humara-1	Black seed
Common bean	Red wolaita	Sholara(buraburae), Black, Muta, Awalansae or Bekshitata
Faba bean	No	Dawro(Orda), Habsha
Field pea	Tegegnech	Ater,Habesha,Botahiringa, Donkolo
Enset	No	Kaya, Halko, Anka, Bukuma, Gena, Tsobaka, Geretsa, Geribae, Haleko, Echerea, Budisa, Kerta, Dufa, Babisula, Gadimea, Dimota, Gaymutsa, Mazae, Zinkae, Getaro, Kayaka, Tema, Tipla, Wazamecha, Zhurzharra, Burkima, Gayka, shoka
Irish potato	Unidentified varieties	Zoao(Red), Botha(white).
Sweet potato	Unidentified varieties	Red and white
Taro	No	Botsaboyna, kawo, Zergae, Gara, chulo, Bunchira, Gabit, Cika, Pila, Goba, Dudana, Diam
Banana	No	Kenya, Asmera, Habesha
Mango	No	unidentified
Avocado	No	unidentified
Hot pepper	Mareko fana	mitmita
Aframomum corrorima	No	okoshae
Ginger	bolbea	Gara, Gobe, Chulae, Dima
onion	Red bombea	No
garlic	unidentified	unidentified
Coffee	7410 and 7210	Dorka, Orda and Zanga

Note: local varieties are named according to their language.

Agronomic Practices

Land Preparation

All farmers use manual / oxen plowing for land preparation. The land is tilled 2-4 times until it gets ready for seed sowing /planting depending on crop types and nature of land. Major constraints of land preparation and planting as mentioned by the key informants are livestock diseases, erratic nature of rainfall, shortage of farm implements and labor. According to interviewed farmers, the common cropping systems practiced in the study area are mono cropping but sometimes intercropping is used. Both broadcasting and row planting are practiced in the area. Sorghum, Rice, Barley, Wheat and Teff are broadcasted whereas maize and common bean are planted in row. Common bean is planted being mixed with maize and for most of the crops cultivated the rate is unknown.

Fertilizer Use

Farmers reported that they apply urea and DAP fertilizers only for maize production in the locality. Both types of fertilizer are applied at the rate of 100kg/ha each. But the time of application is different. Both DAP and UREA are applied at the time of planting if sufficient rainfall is exist during planting but if no sufficient rainfall they use split application for UREA i.e. 50% during planting and the rest 50% after 45 days.

Farming Practice /Mechanization

Various traditional implements are used in the area for different activities. The major implements include manual and axe plow. According to interviewed farmers 'manual plow' is used for digging and cultivation where as 'oxen plow' is used for digging the virgin. These implements are conventional, less effective, time consuming and laborious. The sources of farm implements are local markets.

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Table 3. Farm Operation Calendar in Major Crops

Crop	Land preparation	Sowing/planting	Harvesting
Maize	January 15-febraury 30	March 1-march 20	August 15-30
Teff	June 01-30	July01-sep-15	December 20-30
Rice	January 01-feb 01	March 01-20	August 15-20
Barley	June 01- july 15	july 15-august 30	December15 -Janaury30
Wheat	June 01- july 15	july 15-august	December30 -Janaury30
Sesame	Janaury01-30	February 01-15	July10-20
Common bean	Febraury 01-15	Febraury 15-30	March 20-30

Storage, Processing and Marketing

Farmers in the study area store their harvested crop and crop products mainly in granary made of wood /bamboo which lead to entrance of storage pest (weevil and rats). Weevil is the common storage pests in the locality. With regard to marketing, the farmers revealed that the area is potential for diverse crop production they have surplus production for sale. Rice and maize are sold in large quantity for merchants in local as well as in urban market at laha town. Maize is sold in large quantity to earn money to cover input price. The farmers in the area utilize root and tuber crops in the form of boiled form but in case of cassava in both forms (Boiled and powdery form) and sold them to pay fertilizer cost. Maize is susceptible to maize lethal necrosis disease and weevil and usually sold immediately after harvesting as result of weevil the farmers are forced to sell it in cheap price. Traditional way of harvesting leads to injury of the fruit such as Mango and Avocado as a result the price of the product is low at market.

CONCLUSION AND RECOMMENDATION

Ethiopia is an agrarian country and agriculture is the leading sector as source of income, employment and foreign exchange and national economic growth is determined by the performance of agriculture.

The livelihood of over 93% of the people of Southern Nation Nationality and peoples Regional state of Ethiopia dependent on agriculture; however, agricultural system in the region is at subsistence level. Much effort has been put to produce or adapt agricultural technologies that would help to boost production and productivity but only few technologies adopt by the end users.

There are a number of production constraints which occurs at different section of production like in cropping system, method of seed selection and maintenance, land preparation, weeds and weeding, fertilizer use, storage, processing and marketing of the products in the studied areas. Providing improved varieties of different crops and Minimizing pre and postharvest losses of cereals and horticultural perishables crops is a very effective way of reducing the area needed for production and/or increasing food availability. Solving the pre and postharvest food distribution problems in a given area will require cooperation and effective communication among all the research, extension, and industry personnel involvement. So that, there should be strong relationship between research, extension, and industry personnel involved for reducing these production, marketing and technological problems.

Finally adoption of improved technologies which helps in production and marketing of these agricultural products are very essential in the studied area.

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