Assessment of Challenges of Horticultural Crops Production due to COVID-19, in Arsi Zone, Oromia, Ethiopia

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ABSTRACT

Currently, COVID-19 pandemic disease has a great capacity to increase the food insecurity of the country due to preventions of resources mobilization and movement restriction that may affect crops production, inputs and products transport. Survey was conducted during April, 2020 on current Novel Coronavirus (COVID-19) outbreak pandemic disease challenges on horticultural crops production in Arsi zone on six districts which located at different agro-ecologies. Data were collected by preparation of semi-structured questionnaires, interviews and through personal observations. The respondents have 100% information about COVID-19 pandemic disease form different information sources and they have been discussed with their families about the challenges of COVID-19 on the horticultural crops production. The respondents would be faced shortage of seeds/planting materials, lack of fertilizers, and chemicals from the market due to the impact of COVID-19. Most of the respondents, have no any others opportunities to obtain seeds, fertilizers and chemicals. As a result it was concluded that, the households required more advice, motivation, awareness creation and training from agricultural experts and other stockholders.

Therefore, to mitigate this problem it was recommended that, awareness creation and training for farmers on production of horticultural crops at their garden and in large scale and the government should pay due attention on supplying of agricultural inputs with good accessibility and affordability on time for producers.

Key Words: - Impact of COVID-19, Horticultural Crops, Production

1. INTRODUCTION

The current novel coronavirus (COVID-19) outbreak was originated from wild food wet market in Wuhan and has rapidly spread across China and cover almost all countries of the world (WHO, 2020). Almost all of the world countries have engaged control of movement in the country or from border entrance of the pandemic (COVID-19). COVID-19 pandemic having a significant impact on supply chains and logistics, for farmers as evidenced by closed borders, national lockdowns, movement restriction, and office workers minimization. This was having unreceptive effects on agricultural production, inputs deliverance and supply, commodities supplying to the market and market fluctuation as a result many populations will be vulnerable for food security (ILO, 2020). Over the world intermediate inputs include fertilizer, pesticides, seeds, feeds and power. Disruptions in the supply of these inputs are likely to result in reductions in outputs and, depending on the importance of these inputs for specific outputs, in potentially large supply interruptions (FAO, 2020).

Ethiopia, being one of the developing countries trying to address the diverse needs of its people, is currently at the verge of the epidemic. The government is currently showing high commitment to contain the epidemic before it causes significant damage to the community (FMOH, 2020**)**. And the

country has a variety of climate and soil types that can grow diverse horticultural crops for home consumption and foreign markets. Currently, the majority of the horticultural crop's product comes from the smallholder farms. Though, movement restriction due to COVID-19 has caused reduction in availability and timely distribution of agricultural inputs, lack of daily labor from market, limitation of social teamwork within farmers like *Debo Wonfel* and others to minimize the problems during shortage of labor from market. Machines or farming tools essential for farmers and irrigation water facility pay attention in long- and short-term intervention to increase the productivity of the farmers because those horticultural crops are mostly irrigation-based crops (Sirawdink *etal*., 2020). Mostly, Ethiopian farmers produce cereal crops food and production habit of farmers are cereal crops, but, horticultural crops are neglected. However, traditionally different fruits and vegetables, banana, papaya, apple, cabbages, potato, onion, enset, tomato, pepper, shallot has been produced by small farmers but recently exotic ones are also becoming important in commercial production (Selamawit and Tesfaye, 2019).

Though, in Ethiopia COVID-19 is now spreading in fast that can consequences and limit transportation facilities, market chains, daily laborer availabilities, seeds/planting materials, input supply and others can/may be required urgent responses. Therefore, it needs attention to plan to supply agricultural inputs, seeds/planting materials, machinery/ farming tools, labor, modern storage facilities and market possibilities to solve food insecurity in the country during COVID-19 pandemic. This action research was generating valuable information on the impact of COVID-19 on horticultural crops production (vegetables and fruits). The document taking in to consideration the possible tackling parts including production, inputs, labour,

handling, storage, processing, distribution and marketing and consumption. Therefore, the objective of this survey study was to assess the challenges of horticultural crops production due to COVID-19 pandemic disease.

2. METHODOLOGY

2.1.Area Description

Arsi Zone is found in the central part of the Oromiya National Regional State. The zone astronomically lies between 60 45' N to 80 58'N and 380 32 E to 400 50' E. It shares borderlines with the Regional State of Nations, Nationalities and People of Southern Ethiopia and also shares borderlines with East Shewa, Bale and West Hararge Zones. Asela is the capital town of the Zone. It is located at 175 km from Finfinne on Finfinne-Adama-Bale Robe main road. Having the total area of 23881 Km^2, it accounts for about 7 percent of the total area of the Regional State of Oromiya. The Zone receives abundant and well-distributed rainfall both in amount and season, which is conducive for different types of vegetation growth and agricultural activities. On average, the Zone gets a monthly mean rainfall of 85mm and an annual mean rainfall of 1020 mm, and the mean annual temperature of the Zone is found between 20-25^{0}c in the low land and 10-15^{0}c in the central high land. The major soil types are Chromic and Pellic Vertisols. The major food crops produced in the Zone are cereals, pulses, oil seeds and others. Other crops include vegetables, fruits, root crops and stimulants are also grown, (Yazachew and Kasahun, 2011).

2.2.Sampling Procedure

Districts in Arsi Zone were divided in to three clusters based on agro-ecological zone (Highland, Midland and Lowland). Sample was collected from six districts namely Tiyo, Limu and Bilbilo, Lode Hetosa, Robe,

Ziway- Dugda and Merti woredas purposively based on agro ecology and production potential of horticultural crops. In the same fusion, two peasant associations were selected from each district for data collection as a representative sample .Therefore, the data were collected from six districts and twelve peasant associations. From each peasant association ten households were selected randomly, so, 120 households were used for data collection.

2.3.Data Collection.

The Survey was conducted during April, 2020 year**.** Data were collected from primary sources. Primary data sources incorporated the entirely the situations of challenges and opportunities of COVID-19 pandemic disease on horticultural crops productions through semi-structured questionnaires and interviews. Face to face interviews were carried out by researchers at household level for a one week to exploit detail information from the respondents using questionnaires.

2.4. Data Analysis

The collected data were screened, checked for its fullness and coded. All filled questioners data were entered in to SPSS version 20 statistical software. The quantitative data were analyzed through descriptive statistic methods (tabulated, chart and percentage) as presented in the results. Whereas the qualitative data collected by different data gathering tools were analyzed using narration.

3. RESULTS AND DISCUSSION

3.1.Basic information of households

The results were indicated that, about 92.5% of the respondents were male while the rest 7.5% were female. In addition, the age of respondents ranged from 20 to 29 years with a percentage of 33.33. About 86.67 % of the sample respondents were married and the remaining, 12.5% and 0.85% single and divorced, respectively. Table one describes that about 51.67% of the sample respondents were primary school 28.33%, secondary school 15.00%, cannot read and write, 3.33% certificate, and the remaining 1.67% attended vocational school. The major incomes of respondents were 99.17% from farming and 0.83% from farming and trading. Similarly, 53.33% of the respondents were produce horticultural crops on the area of 0.1-0.5ha and the remaining 25.85%, 10.00%, 6.67% and 4.17% were produced on the area of <0.5ha, 0.5-1ha,>=1ha and 0.05-0.1ha, respectively (Table 1). The result was supported by (Gezai, *et.al.,* 2020) which was reported as the sex distribution among the respondents was 69.7% men and 30.3% women on tomato post-harvest losses. The result clearly showed that the age range of the household remained within productive age (15 and 64 years) (Birhanu, 2011). Although, (Gezai *et al.,* 2020), studied that, among the respondents of the study area 39.4% was married and, majority of respondents (50.5%) attended primary school and those respondents have different income sources.

Table 1. Basic information of households

Source of Variable		Agro-ecology							
		High land		Mid-land		Lowland		Total	Total %
		Freq.	Percentage	Freq.	Percentage	Freq.	Percentage		
Sex	Male	37	94.9	35	89.7	39	92.9	111	92.50
	Female	2	5.1	4	10.3	3	7.1	9	7.50
Age	20-29yrs	11	28.2	15	38.5	14	33.3	40	33.33
	30-39yrs	6	15.4	13	33.3	12	28.6	31	25.83
	40-49yrs	12	30.8	4	10.3	5	11.9	21	17.50
	50-59yrs	6	15.4	5	12.8	4	9.5	15	12.50
	>=60yrs	4	10.3	2	5.1	7	16.7	13	10.83
Marital Status	Single	3	7.7	9	23.1	3	7.1	15	12.50
	Married	36	92.3	29	74.4	39	92.9	104	86.67
	Divorce	0	0	1	2.6	0	0	1	0.83
Education level	Cannot read & write	5	12.8	8	20.5	5	11.9	18	15.00
	Primary school	22	56.4	21	53.8	19	45.2	62	51.67
	Secondary school	10	25.6	9	23.1	15	35.7	34	28.33
	Vocational school	1	2.6	0	0	1	2.4	2	1.67
	Certificate	1	2.6	1	2.6	2	4.8	4	3.33
Major income	Farming	39	100	38	97.4	42	100	119	99.17
	Farming and trading	0	0	1	2.6	0	0	1	0.83
Area of horticultural crops production	<0.05 ha	8	20.5	17	43.6	6	14.3	31	25.83
	0.05-0.1ha	1	2.6	1	2.6	3	7.1	5	4.17
	0.1-0.5ha	27	69.2	15	38.5	22	52.4	64	53.33
	0.5-1ha	2	5.1	3	7.5	7	16.7	12	10.00
	>=1ha	1	2.6	3	7.5	4	9.5	8	6.67

3.2. General information of COVID-19 on Horticultural Crops Production Activities

All households have full information (100%) about COVID-19 pandemic disease and 40.4% and 11.67% of respondents get information from radio and television and the rest of the respondents were from friends, health workers and agricultural extension agents. Moreover, the survey result revealed that, 82.5% of the respondents were discussed with their family about the impact of COVID-19 on horticultural crops production activities. Similarly, the survey of respondents indicated that, 59.17% of respondents were responded that, as COVID 19 pandemic disease were strongly affecting their farming activities and the remaining 31.67%, 8.33% and 0.83% of the respondents were responded as the effect was very strongly, seldom and never affect, respectively (Table 2). To mitigate such problems short and long-term agricultural extension services should be held with major activities of horticultural crops production. Similarly, Sirawdink *et.al,* 2020, was reported that, as possible impact of COVID-19 on Ethiopian extension is related to prohibitions of market gathering that disconnect farmers from the cash economy

Table 2. General information of COVID-19 on Horticultural Crops production activities

Source of Variable		Agro-ecology							
		High land		Mid-land		Lowland			
		Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Total Freq.	Total %
Have you any information about covid-19	Yes	39	100	39	100	42	100	120	100.00
	No	0	0	0	0	0	0	0	-
Sources of information about CVOVID- 19	Radio	10	25.6	15	38.5	24	57.1	49	40.4
	Friends	0	0	2	5.1	0	0	2	1.67
	Health workers	0	0	1	2.6	0	0	1	0.83
	Television	6	15.4	6	15.4	2	4.8	14	11.67
	Agri. agent workers	0	0	1	2.6	0	0	1	0.83
	Radio, Friends and Television	2	5.1	3	7.7	3	7.1	8	6.67
	Radio, Friends, health workers, Television & agricultural .workers	9	23.1	3	7.7	4	9.5	16	13.33
	Radio & friends	3	7.7	6	15.4	4	9.5	13	10.83
	Radio, friends & Television	7	17.9	2	5.1	1	2.4	10	8.33
	Radio & Television	2	5.1	0	0	4	9.5	6	5.00
Have you discussed the impact of COVID-19 on horticultural crops production?	Yes	29	74.4	33	84.6	37	88.1	99	82.5
	No	10	25.6	6	15.4	5	11.9	21	17.5
Would you think about COVID-19 affect your farming activities?	Never	0	0	0	0	1	2.4	1	0.83
	Seldom	7	17.9	1	2.6	2	4.8	10	8.33
	Strongly	31	79.5	22	56.4	18	42.9	71	59.17
	Very strongly	1	2.6	16	41	21	50	38	31.67

3.3. Challenges and Opportunities of Horticultural Crops Production due to COVID-19

As the analyzed results (Table 3) showed that, 76.67 % of the respondents can produce vegetable crops at their garden to keep themselves from COVID-19 transmission while 23.33 % were not. Similarly, 57.5 % of the total respondents have a fear to obtain seeds/planting materials to produce horticultural crops while, 42.5 % of the respondents can obtain it. This is indicated that obtaining planting materials of horticultural crops is one of challenges due to COVID-19 pandemic disease in highland and middle land agro-ecologic areas while it was not in lowland agro-ecologic zone. As indicated in table 3, 85.83 % and of the respondents challenged on their horticultural crop production due to COVID were due to shortage of fertilizers, chemicals & labor and the reaming 14.17% were challenged with shortage of fertilizers and chemicals but not with labor. Because of these, 85.83 % of the total respondents have said that there were no opportunities if shortage of planting materials, fertilizer and chemicals may occur. In contrary, 64.17 % of the respondents have said that, COVID-19 pandemic has no challenges on obtaining farm machinery for their horticultural production. Therefore, however there is an opportunity to obtained seeds from an open markets, fertilizer, chemicals, and labor are great challenges on horticultural crop productions as a result of locked down transportation due to COVID-19 pandemic and the farmers have no any opportunities. Most probably, movement restriction due to COVID-19 has caused reduction in availability and delay of timely distribution of agricultural materials and inputs. Similarly, according to Sirawdink*, et.al*., 2020 report lockdowns due to the pandemic in input producing countries could affect delivery/transport of the inputs, which could in turn delay their supply to Djibouti port and to end users within the country. Moreover, ATA, 2015 and Rachele, 2020,

reported that, the country build capacity to produce agricultural inputs; example fertilizer demand could be met by completing construction of local fertilizer blending plants which is one the goals to raising productivity and encouraging commercialization to reduce poverty and food insecurity. Similarly, FAO, 2020, revealed that, disruptions in the supply of agricultural inputs are likely to result in reductions in outputs, in potentially large supply interruptions.

Table 3. Assessment of challenges and opportunities due to COVID-19 on Seeds/planting materials, fertilizers, chemicals and farm machineries accessibility for farmers

Source of Variable		Agro-ecology							
		High land		Mid-land		Lowland			
		Freq.	%age	Freq.	%age	Freq.	%age	Total	total %
Can you produce vegetables at your garden to minimize COVID-19 transmission	Yes	36	92.3	28	71.8	28	66.7	92	76.67
	No	3	7.7	11	28.2	14	33.3	28	23.33
Would you get seeds/planting materials due to COVID -19	Yes	7	17.9	17	43.6	27	64.3	51	42.50
	No	32	82.1	22	56.4	15	35.7	69	57.50
From where did you get seeds/planting materials?	Open market	25	64.1	38	97.4	31	73.8	94	78.33
	Government organization	12	30.8	1	2.6	10	23.8	23	19.17
	NGOs	1	2.6	0	0	1	2.4	2	1.67
	Exchange	1	2.6	0	0	0	0	1	0.83
Is it get farm machineries easily due to COVID-19?	Yes	16	41	32	82.1	29	69	77	64.17
	No	23	59	7	17.9	13	31	43	35.83
What problems due you expect due to COVID-19	Shortage of fertilizers and chemicals	6	15.3	9	23.1	2	4.8	17	14.17
	Shortage of fertilizers, chemicals & labor	33	84.7	30	76.9	40	95.2	103	85.83
Any opportunity you have if shortage of seeds/planting materials, fertilizers and chemicals?	Yes	9	23.08	3	7.69	5	12.7	18	15
	No	30	76.92	36	92.31	37	87.3	102	85

3.4.Available Extension Services to Minimize the Impacts of COVID-19

As the results indicated in table 4 showed that variation results were observed across agro-ecological areas but the overall average is indicated that, 50.83 % of the respondents obtaining professional supports during COVID-19, while 49.17 % of the respondents were not supported by agricultural extension agents. Because of this from the total, 50 % and 0.89% of the respondents were dissatisfied and highly dissatisfied, respectively on professional support given by agricultural experts, while 30 % and 19.17 % were satisfied and highly satisfied respectively. The survey result was showed that, COVID-19 pandemic disease has negative impact on movement and technical support of agricultural experts. Additionally, awaking of DA's and collaboration for have better data and to take suggested mitigation measurements and enhances their capacity for effective delivering of service to the farmers. Sirawdink *et.al,* 2020, reported that as, during pandemic period loose linkage was observed among the government bodies, including zonal and district administrators and among other relevant stakeholders. Similarly, ILO, 2020. Showed that, providing access to unemployment benefits and social assistance for agricultural workers who lose their jobs or whose hours are cut is also critical to cushion the impact of the crisis

Table 4. Assessment of availability of agricultural expert supports to farmers to minimize the Impact of COVID-19

Source of Variable		Agro-ecology							
		High land		Mid-land		Lowland			
		Freq.	%age	Freq.	%age	Freq.	%age	Total	Total %
Do get professional support from agricultural experts after COVID-19 pandemic?	Yes	21	53.8	14	35.9	24	57.1	59	49.17
	No	18	46.2	25	64.1	18	42.9	61	50.83
Satisfaction level on agricultural experts support	Highly satisfied	9	23.1	2	5.1	12	28.6	23	19.17
	Satisfied	13	33.3	12	30.8	11	26.2	36	30.00
	Dissatisfied	17	43.6	24	61.5	19	54.3	60	50.00
	Highly dissatisfied	0	0	1	2.6	0	0	1	0.83

4. CONCLUSIONS

In conclusion the survey was conducted during April, 2020 on challenges of horticultural crops production due to current novel coronavirus (COVID-19) outbreak pandemic disease on six districts of Arsi zone. Hence from the result obtained, the following conclusion was drown that on basic information of respondents were observed that the most of household are male and their age is in between 20-29 years. Most of the respondents are directly participating on farming activities to generate income and they have full information about COVID 19 pandemic disease from different information sources. They were discussed with their family on the challenges of COVID 19 pandemic disease effect on farming activities as it was strongly challenged them. There were no opportunities to get seeds/planting materials, fertilizers and agro-chemicals if the problem of corona virus disease is continued. COVID-19 was disrupting some activities in horticultural production activities and supply of inputs and seeds/planting material, processing activities and marketing of horticultural crops. There were disruptions in supply of seeds/planting materials, agricultural inputs and supply of products to the markets due to transportation problems.

5. RECOMMENDATIONS

The possible mitigation of impacts of COVID-19 has been recommended considering the implications along the supply of inputs and productions elaborated as follows: Awareness creation about the pandemic and supplying of agricultural inputs like seeds/planting materials, fertilizers, farming machineries and agro-chemicals with good accessibility and affordability on time for producers.

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