

## **Analysis of Plant Production Development in Yemen 2010-2023**

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### **Abstract**

*The present paper deals with study and spatial variations in Plant production in Yemen. This study is an attempt to discuss and analyzes the development and grow of Plant production in Yemen between of 2010-2023, by using Deductive method and Arc GIS software the study concluded that:*

- 1. Plant production is the backbone of the agricultural sector in Yemen. A study of the economic history of Yemen shows that the agricultural sector has been the most important sector in the Yemeni economy since ancient times and continues to this day.*
- 2. Plant production is the major component of the value of agricultural production in Yemen, which contributed 63.9% of the value of agricultural production during 2023.*
- 3. During 2010 the production of Plant was 5583462 tons of the total Production of Agriculture, but in 2023 droops to 3901611 tons of the total Production of Agriculture in Yemen.*
- 4. In 2010 Hodeidah Governorate occupied the first rank in production with 1545749 tons; Sana'a Governorate came in second in rank where the production was 519603 tons, followed by Dhamar Governorate with 378304 tons. Haijah ranked fourth with 377915 tons and Taiz ranked fifth with 357546 tons.*
- 5. In 2023 there have been developments and changes between the Governorates in Yemen Hodeidah Governorate occupied the first rank with total production of 1031352 tons, Sana'a Governorate occupied the second place with 324634 tons, and Taiz Governorate ranked third with 281436 tons, The fourth, fifth and sixth were, Hadramout, Haijah and Marib with productions of 256376, 239604, 231107 tons respectively. Dhamar Governorate ranked Seventh.*
- 6. The plant production was excellent in 2010, and in the development and increase of the state's existence and political stability before the Arab Spring revolutions and after 2011 and as a result of political and economic instability due to the war and power struggle in the country. Yemen, plant production has decreased.*

**Keywords:** *Agricultural development; Agricultural geography; Plant production.*

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## 1. Introduction

Agriculture played an important role in the economies of different states and regions and is one of the components of the productive sectors of industry and mining (Meselhi, F.M., 1994, p-33). Yemen is famous since ancient time for agriculture; the term used by the Romans was (ARABIA FELEX) which means Arabia Felix or green Arabia. (Termisi, A. 2004, p-4).

Yemenis were famous since ancient times in building agricultural terraces on the high mountains even below in valleys, and in the reconstruction of what were destroyed during flash flood and heavy rain as shown in photo 4.1-2. In view of the importance of agriculture in the Yemeni economy it has attracted the attention of the government of Yemen (GOY) to a great extent. It has established many agricultural projects especially in infrastructure such as building dams, establishment of the Agricultural Research Corporation, and establishment of Agricultural Credit Bank; and the five-year development plans were drawn up for the advancement of this sector.

The present work is attempted to study the plant production of Yemen and role of environmental factors in the distribution of crops. During the year 2010 and 2020 there has been considerable changes in agricultural land use and crop combination in Yemen.

## 2. Statement of the problem:

The study tries to address the following questions:

1. What are the changes in plant production in Yemen 2010-2023?
2. What are the challenges of plant production in Yemen 2010-2023?

## 3. The objectives of the study:

The study attempts to carry out the following:

1. To analyze features of plant production in Yemen.
2. To Explain the challenges of plant production in Yemen 2010-2023.

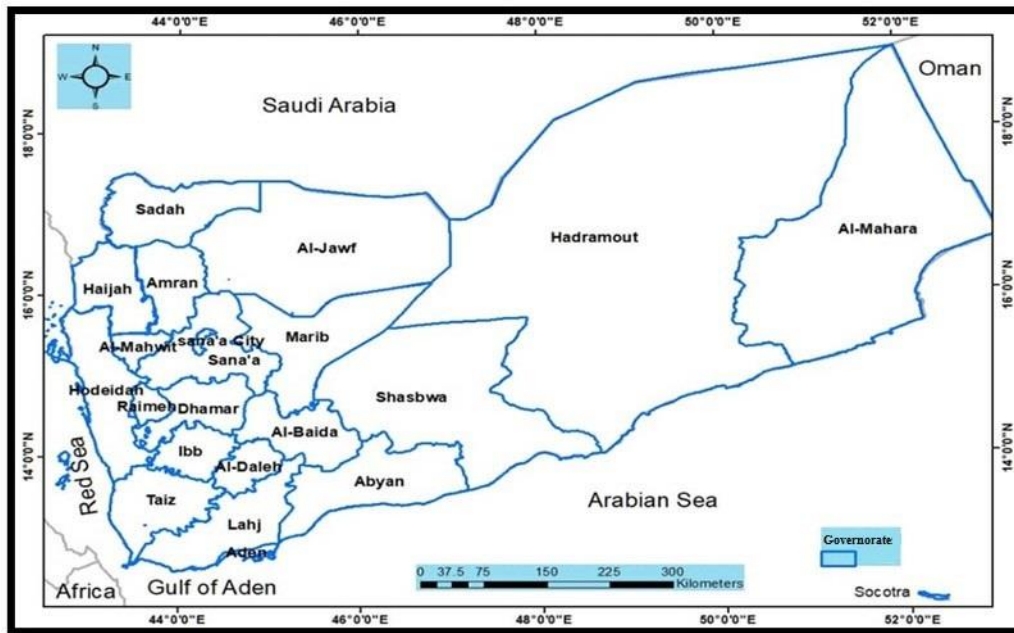
## 4. Methodology of study:

1. Deductive method and Arc View techniques used to analysis plant production in Yemen.
2. Data sources of secondary sources, statistics and economic geography of the Central Statistics Office and Yemen National Information Center, Yemen and the Ministry of Agriculture, statistical yearbooks, 2010,2023.

## 5. Study area:

The Republic of Yemen is situated in the southwestern area of the Arabian Peninsula within Latitudes 12° - 20° North of the Equator and between Longitudes 41° - 54° East of Greenwich. The area of the country is about 5, 27,973 km<sup>2</sup>. Yemen is bordered by Saudi Arabia in the north, by the Arabian Sea and Indian Ocean in the south, by the Red Sea in the west and by the Sultanate of Oman in the east Map 1.

Map: - 1 Location of Yemen



## 6. Importance of the plant production:

Agriculture is the backbone of life in Yemen. A study of the economic history of Yemen shows that the agricultural sector was the most important sector of Yemeni economy since ancient times and still is to this day. Agricultural sector occupies first place among the various productive sectors in the national economy, due to the weakness of all sectors except the oil sector. Agricultural sector in Yemen not only influences the economy, but also the way of life, and plays an important role in the environmental fields also as is evident from:

The plant production contributes towards for preserving the environment and creation of ecological balance and increasing green space and works towards protection, utilization and maintenance of natural resources that can otherwise deteriorate and goes waste increasing the area of drought, desertification and loss of fertility elements in the soil.

1. The plant production factor is relative to the stability of the population and specific factor of internal migration and works to reduce the rates of social and economic problems (crime, delinquency, exploitation capabilities).
2. The plant production works towards reducing the proportion of rural poverty and destitution.
3. The Plant production constitutes a large part of non-oil exports. (Republic of Yemen; Ministry of Agriculture and Irrigation; 2010- 2023, p-70).

## 7. The structure of the agricultural sector in Yemen:

The structure of the agricultural sector in Yemen consists of three components, which together represent the agricultural sector. These elements are plant production, animal production and fish production. The researcher will analyse these components of the agricultural sector to demonstrate their contribution to agricultural production as well as to the value of agricultural production.

## 8. Plant production:

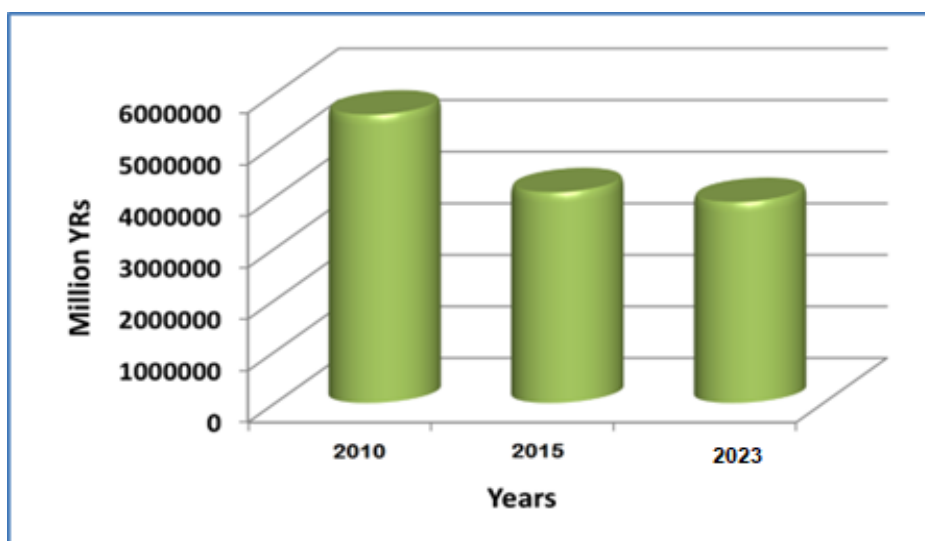
The Plant production is the major component of the value of agricultural production in Yemen, which contributed 63.9% of the value of agricultural production during 2018; while livestock production contributed 27% to the value of agricultural production. The value of plant production is the sum of the values of food grain crops, vegetables, legumes, fruits, fodder and cash crops; while the value of livestock production is the sum of the values of total red meat, milk, poultry and fish table 2 shows that the plant production 5583462 tons has become in 2023 to about 3715443 tons a percentage of 63.9% of the total value of agricultural production and thus ranked first; either animal production has been 29261 tons in 2010 and has become 198212 tons in 2023 and 27% of agricultural production and thus ranks second, The fisheries sector third with 9% due to the low contribution of the fisheries sector in agricultural production to the lack of attention and good planning to exploit this great wealth despite having the coast of Yemen with a length of 2500 km; in addition to that Yemen has 110 island in the Red Sea and Arabian Sea (Al-Haifan,2004.p 40-100).

Table -2 Agricultural production during 2010-2023

Item	Years			%
	2010	2015	20203	
Production of Plan	5583462	4078172	3901611	63.9%
Production of Livestock	29261	39805	198212	27%
Production of fish	10719	23919.3	49496	9%
Total Production of Agriculture	130244	320101	852212	100%

Source: Republic of Yemen; Ministry of Agriculture and Irrigation; the annual report of the agricultural sector for the year 2010, 2023, Sana'a.

Figure-1 Value of plan production during 2010-2023



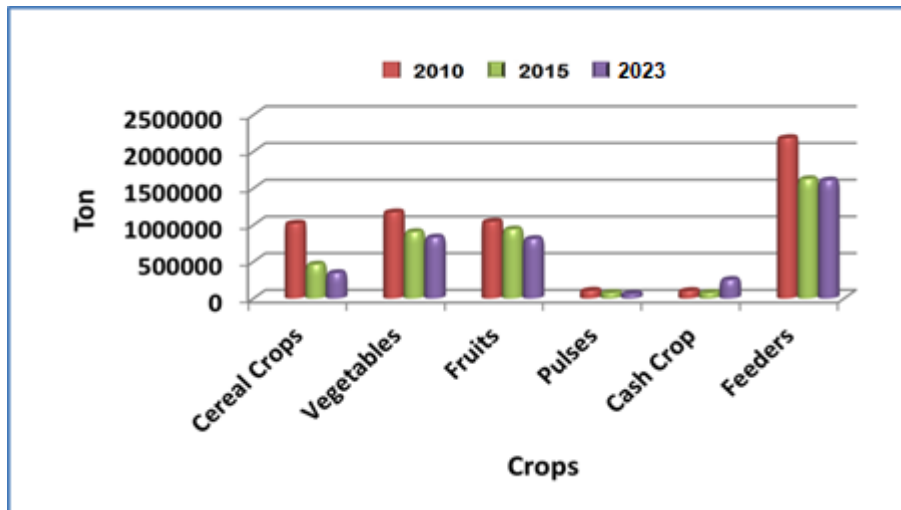
According to the statistics from the Ministry of Agriculture in 2010 - 2023 (table 3 and figure 2) we find the difference of area and production in plan production from year to year as follows:

Table-3 Area and the production of agricultural crops during 2010 -2023 (Hectare – ton)

Crops	Year	2010	2015	2023
Cereal Crops	Area	927,303	585,658	504,737
	Production	1,012,945	460,246	344,648
Vegetables	Area	92,581	69,616	63,502
	Production	1,165,014	902,852	828,293
Fruits	Area	94,049	91,447	85,708
	Production	1,036,862	938,523	808,433
Pulses	Area	49,552	40,889	37,927
	Production	98,161	75,988	62,486
Cash Crop	Area	90,665	80,288	74,778
	Production	94,679	77.017	65.8306
Feeders	Area	166,034	137,730	131,415
	Production	2,175,801	1,623,546	1,605,753
Total	Area	1420184	1005628	898067
	Production	5583462	4078172	3889028
Development of plan production		5	3.7	3.5

Source: Republic of Yemen; Ministry of Agriculture and Irrigation, the annual report of the agricultural sector for the year, 2010, 2015,2023, Sana'a

Figure -2 Productions of plants crops during the period. 2010 -2023



### 9. Cereal crops:

Yemeni agricultural sector is characterized by controlling of the cereal crops, and most of the cultivated land crops are maize, millet, which represent, in addition wheat. The cultivated crops depend mainly on rainfall, leading to the fluctuation in the level of production from year to year. The area and production of cereal crops fell from 1,012,945 tons in 2010 to 460,246 tons in 2015, and dropped to 344,648 tons in 2023., due to the relative scarcity of surface water resources, following of old techniques, weak transportation and marketing systems and the transfer of most of the farmers to the cultivation of qat at the cost of cereal crops. (Republic of Yemen, General Center for Studies and Research, 2010,2023, p-2-69).

### 10. Vegetable crops:

This group is characterized by its dependence on permanent springs and wells, and dams for irrigation. Therefore the production of vegetables has been decreased of production, and were cultivated in 92,581 hectares in 2010, which decreased to 63,502 hectares in 2018.their production decreased from 1,165,014 tons in 2010 to 828,293 tons in 2023, and the reasons for this decreased might be result of political and economic instability due to the war and power struggle in the country. Yemen, plant production has decreased, and, as well as the decreased of use of chemical fertilizer and pesticides, thus decreased the vertical expansion, thereby decreased the production of vegetables.

### 11. Fruit crops:

Yemen is famous for cultivation of different types of fruits. Perhaps the most famous is the Yemeni grape which is excellent quality. Fruits are grown in areas where water is available, such as plains or rely on wells and dams. The area under cultivation of fruits has decreased 94,049 hectares in 2010 to 85,708 hectares in 2023.The fruit production has decreased from 1,036,862 tons in 2010 to 808,433 tons in 2023, the reason for the decrease in the area and production of fruits is the low purchasing power of the citizen is and the migration from villages to the city and the inability of farmers to market their agricultural products due to the land, sea and air blockade on Yemen and the imposition of taxes on local agricultural products and the spread of poverty.

## **12. Cash crops:**

This group includes coffee, qat, cotton, oil crops and tobacco. Despite the critical importance of this group the cash crop industry is not fully developed in terms of cultivated area and production stages. The cultivated area of cash crops in 2010 was 90,665 hectares and reached 74,778 hectares in 2023.

The production decreased in 2023 to 65.8306 tons while in 2010 was 94,679 tons. This decreased is due to the inability of farmers to market their agricultural products due to the land, sea and air blockade on Yemen and the imposition of taxes on local agricultural products.

## **13. Feeder:**

The local sources of feed in the Republic of Yemen are rangeland, and agricultural residues - cultivated forage - feed concentrates. The feeder cultivated area was 166,034 hectares in 2010 which decreased in 2023 to 131,415 hectares; the production decreased from 2,175,801 tons in 2010 to 1,605,753 tons in 2023.

## **14. Pulses:**

This group includes beans, lentils, broad beans, fenugreek and others. Despite the importance of this group to the Yemeni people, it has not achieved great development in productivity and the reasons could be increased production of qat, as well as lack of rain. The cultivated area under legumes was 49,552 hectares in 2010 which decreased to 37,927 hectares in 2023; the amount of production decreased from 98,161 tons in 2010 to 62,486 tons in 2023.

## **15. The geographical distribution of plants products:**

There is a difference in geographical distribution of crops in Yemen from one governorate to another. Also, there is a difference in the quantity of production and area during 2010-2023. From the (table 4-5 and the map 2-3) we can see the following:

1- Crops in Yemen include Cereal Crops, Vegetables, Fruits, Pulses, Cash Crop, and Feeders. Area and production differ from one Governorate to another. In 2010 Hodeidah Governorate occupied the first rank in production with 1545749 tons; Sana'a Governorate came in second in rank where the production was 519603 tons, followed by Dhamar Governorate with 378304 tons. Haijah ranked fourth with 377915 tons and Taiz ranked fifth with 357546 tons.

2- In 2023 there have been developments and changes between the Governorates in Yemen Hodeidah Governorate occupied the first rank with total production of 1031352 tons, Sana'a Governorate occupied the second place with 324634 tons, and Taiz Governorate ranked third with 281436 tons, The fourth, fifth and sixth were, Hadramout, Haijah and Marib with productions of 256376, 239604, 231107 tons respectively. Dhamar Governorate ranked Seventh.

## **16. Production of Plant in Yemen:**

It is evident from the above that the production and productivity of almost all the crops have been decreased in Yemen. It is a famous place in agriculture, according to agricultural censuses during 2010 to 2023, but the production of crops is dwindling. Some of the instances can be mentioned which are as follows:

1. During 2010 the production of Plant was 5583462 tons of the total Production of Agriculture, , but in 2018 droops to 3901611 tons of the total Production of Agriculture in Yemen .
2. The Plant production is the major component of the value of agricultural production in Yemen, which contributed 63.9% of the value of agricultural production during 2023.
3. During 2010 the production of cereal crops was 1,012,945 tons of the total crop production, but in 2023, it was 344,648 tons of the total crop production in Yemen.
4. In 2010 the production of fruits was 1,036,862 tons of the total crop production, whereas in 2023 it decreased to 808,433 tons of the total crop production in Yemen.
5. In 2010 the production of vegetables was 1,165,014tons of the total crop production, whereas in 2023 it decreased to 828,293 tons of the total crop production in Yemen.
6. In 2010 the production of cash crop was 94,679 tons of the total crop production, whereas in 2023 it decreased to 65.8306 tons of the total crop production in Yemen.
7. In 2010 the production of pulses was 98,161 tons of the total crop production, whereas in 2023 it decreased to 62,486 tons of the total crop production in Yemen.
8. In 2010 the production of feeders was 2,175,801 tons of the total crop production, whereas in 2023 it decreased to 1,605,753 tons of the total crop production in Yemen.

Table-4 Yemen governorate wise Production-2010 (Production in tons)

SL. No.	Governorate	Cereal Crops Production	Vegetables Production	Fruits Production	Cash Crop Production	Pulses Production	Feeders Production	Total Production
1	Hodeidah	209,596	168,668	288,052	48,291	37,195	793,946	1545749
2	Sana'a	107,803	118,400	160,290	6,933	14,037	112,140	519603
3	Dhamar	111,113	178,674	22,270	473	5,110	60,664	378304
4	Ibb	85,001	128,875	7,710	809	3,600	19,206	245201
5	Taiz	55,428	164,237	31,490	617	2,088	103,686	357546
6	Marib	28,363	81,313	85,600	3,743	3,324	108,301	313987
7	Hajjah	97,849	17,674	186,527	2,615	6,459	66,791	377915
8	Al-Baida	24,527	24,686	4,210	441	639	10,636	65139
9	Sadah	19,920	10,753	56,341	1,693	352	115,647	204706
10	Al-Mahwit	19,014	3,850	8,119	1,612	3,280	3,358	39233
11	Lahj	16,141	12,162	17,243	3,283	173	147,730	196732
12	Abyan	27,023	51,818	28,392	13,097	203	121,741	242274
13	Hadramout	34,413	48,148	43,141	2,319	4,898	177,109	310028
14	Al-jawf	64,441	61,191	30,099	1,750	3,412	103,142	264035



15	Shabwa	12,539	26,117	14,023	2,131	47	151,873	206730
16	Al-Mahara	452	2,158	3,531	45	99	16,142	22427
17	Aden	221	2,440	704	135	99	11,556	15155
18	Amran	71,778	45,351	21,690	504	625	18,477	158425
19	Al-Daleh	10,277	3,929	870	26	9,401	4,490	28993
20	Sana'a City	2,571	13,641	16,528	26	66	2,220	35052
21	Raimeh	14,475	929	10,032	4,151	3,054	26,946	59587
22	Sokatra	0	0	0	0	0	0	0
Total		1,012,945	1,165,014	1,036,862	94,679	98,161	2,175,801	5583462

Source: Central Statistical Organization (CSO), Republic of Yemen, Statistical Yearbook for the Year 2010, National Account (2010) P4-60.

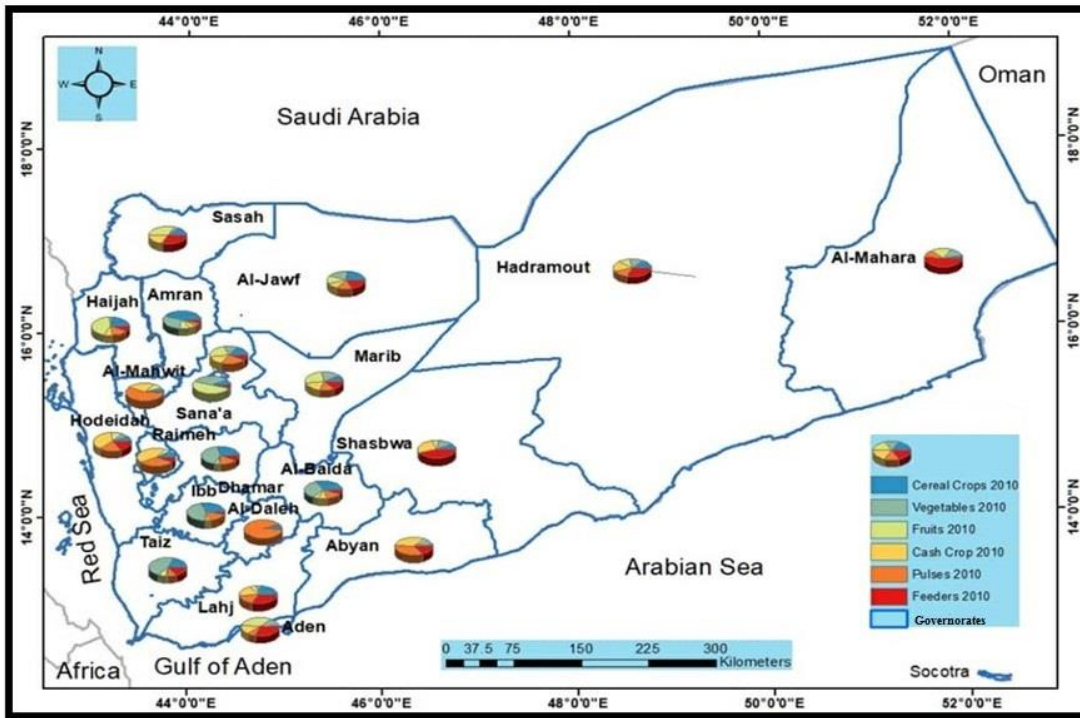
Table- 5 Yemen Governorate wise production-2023 (Production in tons)

SL. No.	Governorate	Cereal Crops	Vegetables	Fruits	Cash Crop	Pulses	Feeders	Total
		Production	Production	Production	Production	Production	Production	Production
1	Hodeidah	82,902	99,347	222,952	29,928	21,603	574,620	1031352
2	Sana'a	20,459	72,129	120,028	42335	9,893	59,790	324634
3	Dhamar	28,955	124,335	19,328	12935	3,034	37,822	226409
4	Ibb	37,184	102,938	6,009	18604	2,640	14,685	182060
5	Taiz	23452	138,361	24,491	13201	377	81,554	281436
6	Marib	14248	57,487	73,125	4050	2,603	82,197	233710
7	Haijah	21,962	11,381	127,579	21440	4,787	52,455	239604
8	Al-Baida	4,644	14,336	2,679	23412	303	6,924	52298
9	Sadah	4,513	6,039	49,460	9605	273	109,254	179144
10	Al-Mahwit	6,146	2,620	5,669	6516	1,898	2,310	25159
11	Lahj	4,758	8,113	15,847	10390	125	117,997	157230
12	Abyan	8,636	33,000	18,973	10582	70	78,383	149644
13	Hadramout	18,373	52,520	43,076	2,158	3,429	145,820	256376
14	Al-jawf	33,177	47,169	24,597	3305	2,241	75,922	186411
15	Shabwa	7,554	17,577	12,267	2154	46	107,124	146722

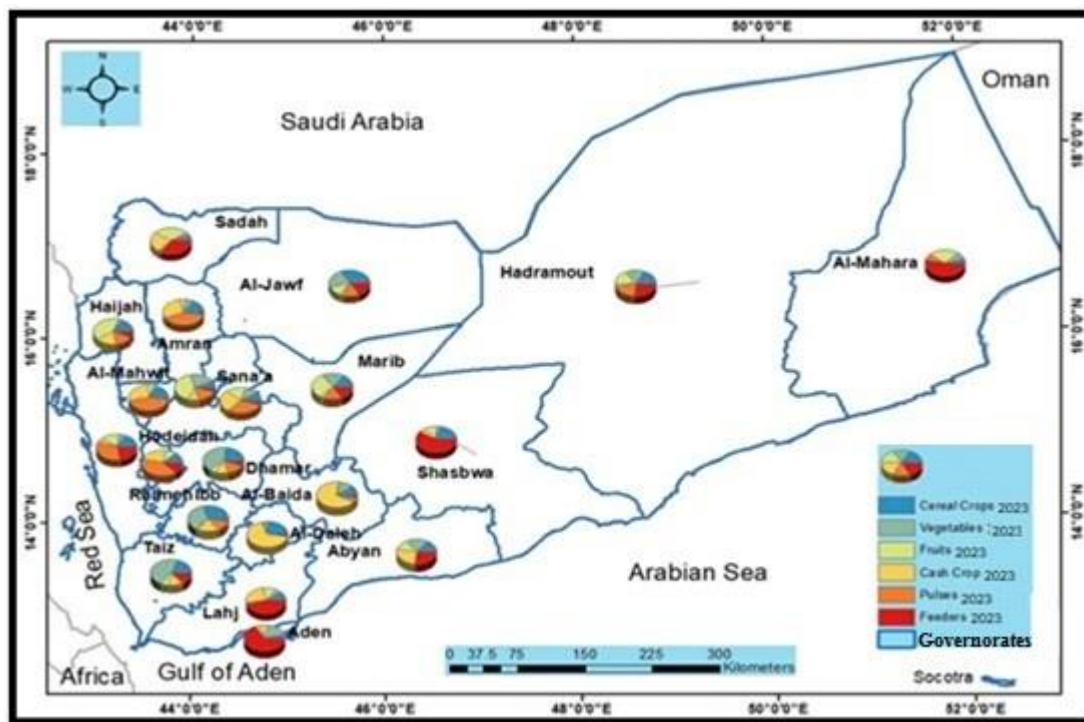
16	Al-Mahara	184	1,057	2,661	33	39	12,527	16501
17	Aden	84	1,104	435	96	44	7,293	9056
18	Amran	19,158	27,198	16,952	26811	6,670	13,595	110384
19	Al-Daleh	3,500	1,975	528	7072	39	1,563	14677
20	Sana'a City	1,079	9,202	13,640	1409	460	3,645	29435
21	Raimeh	3,680	405	8,137	5962	1,912	20,273	40369
22	Sokatra	0	0	0	0	0	0	0
Total		344648	828,293	808433	251998	62,486	1,605,753	3901611

Source: Central Statistical Organization (CSO), Republic of Yemen, Statistical Year-Book for the Year 2018, National Account (2023) P-2-65.

Map- 2 Geographical distributions of plants products in Yemen during 2010



Map -3 Geographical distributions of plants products in Yemen during 2023



## 17. Conclusion:

Through the analysis of plant production in Yemen, the study concluded the following results:

1. Plant production is the backbone of the agricultural sector in Yemen. A study of the economic history of Yemen shows that the agricultural sector has been the most important sector in the Yemeni economy since ancient times and continues to this day.
2. The Plant production is the major component of the value of agricultural production in Yemen, which contributed 63.9% of the value of agricultural production during 2023.
3. During 2010 the production of Plant was 5583462 tons of the total Production of Agriculture, but in 2023 droops to 3901611 tons of the total Production of Agriculture in Yemen.
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8. In 2010 the production of vegetables was 1,165,014 tons of the total crop production, whereas in 2023 it decreased to 828,293 tons of the total crop production in Yemen.
9. In 2010 the production of cash crop was 94,679 tons of the total crop production, whereas in 2023 it decreased to 65,830 tons of the total crop production in Yemen.
10. In 2010 the production of pulses was 98,161 tons of the total crop production, whereas in 2023 it decreased to 62,486 tons of the total crop production in Yemen.
11. In 2010 the production of feeders was 2,175,801 tons of the total crop production, whereas in 2023 it decreased to 1,605,753 tons of the total crop production in Yemen.
12. The plant production was excellent in 2010, and in the development and increase of the state's existence and political stability before the Arab Spring revolutions and after 2011 and as a result of political and economic instability due to the war and power struggle in the country. Yemen, plant production has decreased.

### **18. Recommendation:**

The findings of the study have several implications for policymakers and recommendations towards the development of plant production sector in Yemen. There must be attempts to develop plant production and to increase its production and that should be done in the following ways:

- a) To encourage research in the field of agriculture, there should be researches concerned with the nature of soil as well as modern ways of agriculture.
- b) It is necessary to establish more center's as well as private institutions that are interested in agricultural affairs and to enhance agricultural awareness.
- c) There must be an enterprise for establishing public agricultural fields in Yemen especially in eastern and western areas, which that have a vast land and as they constitute the basis of agricultural economy in Yemen.
- d) There must be an establishment of water blocking and dams in order to lessen the use of underground water and to make use of rainwater and to spread awareness among the farmers on how to use fertilizers as well as making use of modern ways of irrigation.
- e) Stopping the war between Yemenis and the political struggle for power, lifting the land, sea and air blockade imposed on Yemen and preparing the internal and international situation for the reconstruction of Yemen.

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