**Agriculture and Value Chain Development Assessment in Nineveh plain and Duhok**



# Abbreviations

|  |  |
| --- | --- |
| FGD | Focus group discussions |
| KII | Key informant interviews |
| AVC | Agricultural Value Chains |
| ODK | Open Data Kit |
| IDP | Internally displaced people |
| ISIS | Islamic State of Iraq and Syria |
|  |  |
|  |  |

# Acknowledgments

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# Executive Summary

Agriculture sector is playing crucial roles in the Iraqi economy and its considered as the third largest employer and contributor to the country’s economy. Over last two decades, the activities of the sector greatly declined mainly due to the conflict, economic downturn, urban migration and state policies that have interrupted market dynamics which dramatically increased the country reliance’s on imports to meet the country’s food security needs. Improvement of the sector through needed interventions and supports to increase the quality and quantity of the produce to meet the country's demands and to develop a productive agricultural value chain is not only increasing opportunities for the smallholders enterprises to improve their economy, but also will increase the activities of the depressed enterprises and consequently will increase community (conflict affected rural populations) resilience and household food security. This report summarises the findings of an assessment conducted to determine the priorities requirements for Agriculture and Value Chain Development in Nineveh plain (Rabia sub-district / Sinjar districts and Sinun sub-district / Tel Afer districts) and in Duhok province (Faida sub-district / Sumel districts and Qasrok sub-districts/ Shekhan districts). The survey was conducted for three weeks through focus group discussions (FGD), key informant interviews (KII) with stakeholders and agricultural key actors and businesses owners (wholesale markets), comprehensive desk review and triangulation and synthesis. The data were collected through pre-formed questionnaire designed to fit with the scope and objectives of the work by using ODK mobile data technology with tablets that facilitated the data collection process.

The analysed data showed that there are great needs for capacity building of the farmers within the targeted locations of this study to increase the quality of their produce. This can be achieved through conducting condensed and comprehensive training courses for increasing their skills on proper farming, farm management, post harvesting and proper packaging of the produce, marketing and increasing their information on using chemicals (pesticides, herbicides) in order to increase the quality and quantity of the produce to compete with imports and to cover the locals needs. Besides, there is an urges needs for connection of farmers (producers) to market through contract (Contractual agreement) to accelerate the marketing process of farm produce and increase their incomes through decreasing in marketing and transaction costs and increasing the yields and assured prices. The main constraints that faced the local farmers to promote the quality of their produce are the difficulties in access to, and costs of inputs and services (subsidies, required seeds, pesticides, herbicides, vaccinations, extension services/ required skills, transport, cold storage). Identification and selection of enterprises for the support should be based on a clear business opportunity and the potential for scale and inclusive growth; interventions should be able to mitigate the identified constraints and ameliorate the marketing.

There is demand in the local markets for a good quality local produce where any excess is sold; producers need to expand the quality of their products and link to actors in the value chain. Increase linkages would allow producers to improve their capacities for better quality productions and access or link to larger market players for subsidies and investments.

# Organisational profile

## ZSVP:

- ZSVP (Zakho Small Villages Projects) as a local NGO established in 1991, is interested on community development to promote the ability of vulnerable groups of rural communities and help them for fair sustainable life.

- Due to the last crises raised in 2014 after control of ISIS to more than 30% of Iraq which was the reason behind of displacement of more than 4 million peoples from different governorates of middle and south of Iraq to KRI, ZSVP to follow up the changes and the crises conflicts have seen a big role through support of IDPs and refugees with Food aid assistance and NFI to save peoples and contribute toward the development and reintegration of crises affected groups (IDPS, returnees and Host community with women and youth) into their communities through supporting small agro-income generating activities and women empowerments in Duhok and Ninawa province area through:

- Improved long term income generation, job creation and other related livelihood initiatives for IDPs, Returnees and host communities, especially women, youth and other vulnerable groups.

## ZOA:

# Introduction

## Purpose of the study

Agriculture and Value Chain Development Assessment was conducted in Nineveh plain (Rabia and Sinun sub-districts of Tel Afer and Sinjar Districts, respectively), and in Duhok province (Faida and Qasrok sub-districts belong to Sumel and Shekhan Districts, respectively) to determine the gaps in livelihood sectors to identify priority needs and interventions for implementation livelihood projects in agriculture and value chain sectors through analyses of collected data related to farm productivities, agricultural practices, marketing and market linkages, and value chain development of products. This survey was conducted for three weeks through comprehensive desk review, focus group discussions (FGD) and key informant interviews (KII) with stakeholders (men and women) and triangulation and synthesis. The collected data were done through pre-formed questionnaire designed to fit with the scope and objectives of the work by using ODK mobile data technology with tablets that facilitated the data collection process.

## Background

In Iraq, the Agriculture sector is playing crucial roles in the country’s economy; after the government and the oil sector, agriculture is the country’s third largest employer and contributor to the economy[[1]](#footnote-1). 33% of the Iraqi population live in rural areas where the agriculture provides an important source of income and food security[[2]](#footnote-2). The unstable security condition, economic downturn, internal displacement, urban migration and conflicts that faced the country in past decade resulted in declining the activities of the sector[[3]](#footnote-3). Currently, the local’s demands for agricultural products are greatly relying on the neighbouring countries (imported stuff)[[4]](#footnote-4). Studies confirmed that poverty and hunger can be greatly reduced through supporting of the agricultural sectors and agriculturally-driven economic growth[[5]](#footnote-5). Rising productivity of the agriculture sectors stimulates growth in non-agricultural sectors through forward and backward linkages[[6]](#footnote-6).

## Agricultural Value Chains (AVC)

Agricultural Value Chains is set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product[[7]](#footnote-7). A value chain involves a set of actors and activities that add value to agricultural produce before it reaches to end-consumers. AVC vertically links or networks business organisations through processing, packaging, storage, transport and distribution[[8]](#footnote-8). It encompasses the flow of products, knowledge and information, finance and social capital and culminates in the final product for consumers while simultaneously determining price marks and distributing profits at its various stages[[9]](#footnote-9). Actors on the value chain include integrators, retailers, lead firms, turnkey suppliers, and component suppliers. In agriculture, the structure of a value chain is that of a pyramid, with farmers at the upstream, firms and middlemen in the middle, and consumers at the downstream[[10]](#footnote-10).

It has been found that the engagements of the smallholders’ farmers with developed value chains enabled them to promote their incomes sources and mitigate their risks and increasing their resilience.[[11]](#footnote-11). Development of agriculture value chains increases agricultural productivity, household welfare and build social capital[[12]](#footnote-12). Developing of agriculture value chains not only enable farmers to increase their incomes, but also increase the sustained demand for food production and constant the commercial relationships between sellers and buyers. Thus, AVCs should be seen as an important component of the strategy of doubling farmers’ income.

Due to the considerable variation within the agricultural value chains across countries and the agricultural products, extensive studies and survey need to be conducted to determine the gaps and area of interventions for development of agricultural value chains which will enable the producers (farmers) to gain a greater share of their value and assume fewer risks. Value chain analysis provides valuable insights into policy formulation and implementation[[13]](#footnote-13). According to Porter’s generic value chain (figure 1) different stages/activities are included in chain including: development and dissemination of plant and animal, genetic materials, input supplies, farmers’ organization, farm production, post-harvest handling, processing, provision of technologies, grading, packaging local and industrial processing, storage, transport, finance, and feedback from markets.

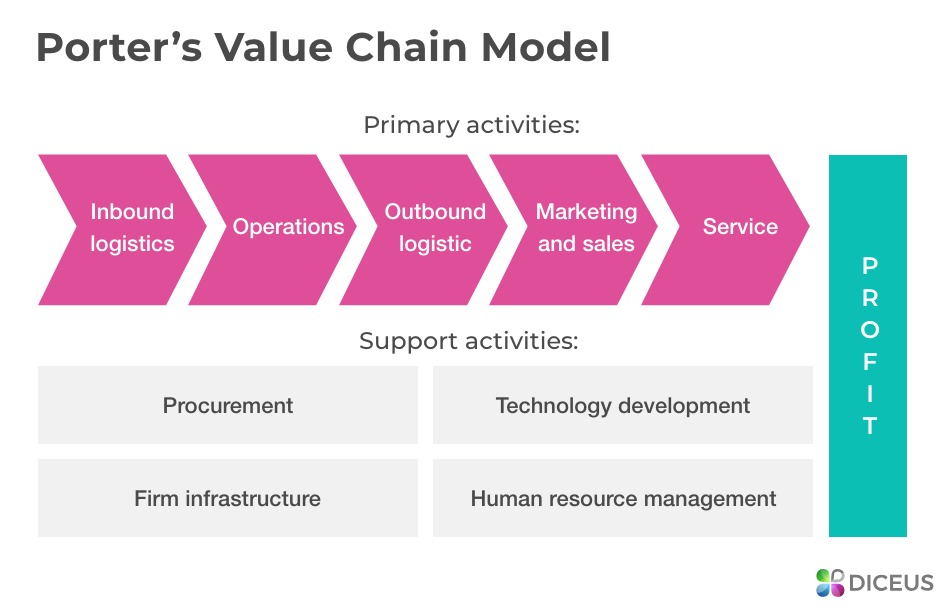


Figure 1: Porter’s Value Chain Model

Increasing demands for agricultural products of high-value crops and their processed products have increased the demands for expanding market opportunities not only by the farmers for selling their produce, but also by agribusiness entrepreneurs. The demands on the agricultural products are increasing as a result of increasing urbanization and foreign investments[[14]](#footnote-14). In context of the increasing demands on the high value crops, developing agriculture needs to be supported by development partners, agribusiness entrepreneurs, local stakeholders (governmental and governmental organization) in order to meet the increased demand for high-value crops and processed products[[15]](#footnote-15).The perspective of the nature of support is determined by the need for improving the competitiveness of the staple food subsector, including a move toward diversification and value addition. To determine the gaps in the needed supports and intervention this survey conducted in Nineveh plain and Duhok to identify the priority needs and interventions for improving livelihood projects (agriculture and value chain sectors).

## Required supports for successful agricultural value chains development

Based on the desk information (literature review) different inputs and interventions found to have crucial roles in successful agricultural value chains development; smallholder farmers can be supported to enter and benefit from AVCs through increasing their skills and improves access to the necessary information to move into new markets through conducting tailored training courses on modern agriculture practices and provision with assets necessary for effective and productive farming practices to meet the market requirements. Contract farming is one option has shown some success in linking smallholder farmers to AVCs. Transportation, markets, and other infrastructure need to be linked to production and market information to achieve better results. Comprehensive study and approach need to be conducted to identify key constraints and the necessary linkages among the key criteria for AVC development. Therefore, the present survey conducted to determine and focus on main requirements and the needed interventions for a successful agricultural value chain development in Nineveh plain and Duhok provinces.

## Access to the market and create market linkage

Regulated markets have played a supportive role in the development of value chains; farmers could realize better prices with improvement in regulated markets and transportation infrastructure. It has been reported that farmers earned higher net incomes when were linked with retailers for selling their vegetables. Besides, cooperative marketing found to promote the efficiency of marketing and provision of extension services to value chain actors. Connection of farmer (producers) to market linkages through contract (Contractual agreement or through informal linkages and ad hoc arrangements) found to accelerate the marketing process of farm produce and increase their incomes through decreasing in marketing and transaction costs and increasing the yields and assured prices .

# Methodology

ZSVP and ZOA undertook an agricultural and value chain development assessment in Nineveh plain and Duhok over a Three week period from the 1st – 21th November, 2020. The objectives of the assessment were to identify the gaps and opportunity to improve livelihood sectors in Nineveh and Duhok governorate and to formulate clear recommendations for future livelihood projects, based on report results and data analysis. The assessment applied a mix of market system analysis tools and approaches adapted to the context and time constraints, with a focus on both desk and field research. The field research was carried out by a team of two skilled data collectors trained initially one-day on data collection tools and techniques. The following data collection methods were utilised:

* + Focus Group Discussions (FGD) with men and women
  + Key Informant Interviews (KII)
  + Literature review
  + Triangulation and Synthesis
  + The team used a mix of methodologies, during the mission FGD’s were held at various occasion

A total of 78 KIIs were carried out with key actors within the target areas, and 39 FGDs were completed with specific target groups.

## Assessment limitations

Time was the primary constraint considering the scope and complexity of the study. However, the collected data was sufficient and aligned with designed goals of the assessment to identify priority needs and interventions for better improving livelihood sectors within the target areas.

## Study area (Target Area)

In each of the targeted province (Nineveh plain and Duhok), two sub-districts were chosen for conducting the assessment, the target areas in Nineveh plain were Rabia and Sinun sub-districts of Tel Afer and Sinjar Districts, respectively. In Duhok province, Faida and Qasrok sub-districts were selected which belong to Sumel and Shekhan Districts, respectively.

Rabia is a town in the north-west of Iraq, near the border crossing to the town of Al-Yarubiyah in Syria; it is a sub-district of Tel Afar. It lies on the border between Syria and Iraq and has seen a large displacement of the population a consequence of the ISIS control on the area. Rabia sub-district has (78) seventy-eight villages. In terms of population, it is inhabited by (84,000) eighty-four thousand inhabitants, about (14,000) of which are in the city center, while the rest are in villages. They consist of two ethnicities, the Arabs (mostly of Shammar clan) and Kurds[[16]](#footnote-16).

Sinun is a town located in the Sinjar District of the Ninawa Governorate in Iraq. The town is located north of the Sinjar Mount. The town has a population of 16798 in 2014[[17]](#footnote-17).



Figure 2: The map of the targeted area (location of study/Green) in Nineveh Plain where the assessment conducted in Rabia and Sinun sub-districts.

Qasrok is a town located in the Shekhan District of Duhok province in northern Iraq. Qasrok's residents are mostly Kurds with a small Assyrian minority. It has a population of 56,400 as of 2018[[18]](#footnote-18). Faida is one of the cities in Dohuk Governorate in Iraq. It is located in the south of the governorate on the western edge of the small mountain of Dahkan on the road leading to the city of Mosul.

The target areas were selected due to the high level of need in regards to livelihoods programming combined with a strong background in the agricultural sector. Besides, the two sub-districts of the Nineveh plain are representing the districts most affected by the recent conflict and score high on the humanitarian needs overall severity index in Iraq[[19]](#footnote-19) with significant density of internally displaced people (IDP) population and a high density of host community population who have recently returned.

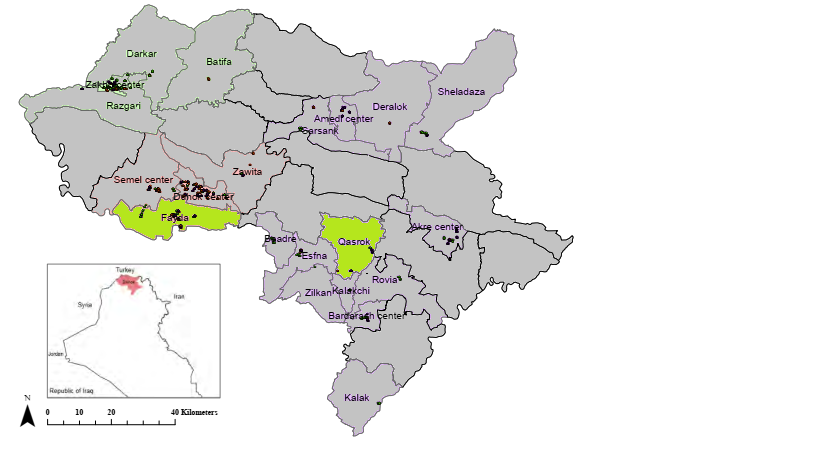


Figure 3: The map of the targeted area (target area/Green) in Duhok province where the assessment was conducted in Faida and Qasrok sub-districts.

During the data collection from the targeted location various methods were employed as detailed below.

|  |  |  |
| --- | --- | --- |
| **Location** | **Data Collection Methods** | **Samples size** |
| **Nineveh plain-Sinun** | Focus Group Discussion | **8** |
| Key Informant Interviews | **23** |
| **Nineveh plain-Rabia** | Focus Group Discussion | **8** |
| Key Informant Interviews | **21** |
| **Duhok- Faida** | Focus Group Discussion | **10** |
| Key Informant Interviews | **19** |
| **Duhok- Qasrok** | Focus Group Discussion | **13** |
| Key Informant Interviews | **15** |
| Total |  | **117** |

Note: for more information on the interviewees please see Annex 1, Page 31-35

# Results

## Satisfaction from farm productivity and marketing

The analyzed data found great differences between the two provinces, where the majority (82.2%) of interviewed farmers from Duhok provinces ( Faida and Qasrok sub districts ) were not satisfied from their productivities and farming in contrast to that interviewees from the Nineveh Plain (Rabia and Sinun sub districts) expressed their satisfaction from produce at rate of 87.5% (Table 1).

Table 1. Satisfaction of respondents from their your farm productivity and marketing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Satisfaction of respondents from their farm productivity and marketing | **Duhok**  **Faida and Qasrok sub districts** | | | **Nineveh Plain**  **Rabia and Sinun sub districts** | | |
| #  Respondents | **Response/value** | | #  Respondents | **Response/value** | |
| **Yes**  **Frequency/%** | **No**  **Frequency/%** | **Yes**  **Frequency/%** | **No**  **Frequency/%** |
| **45** | **8(17.8%)** | **37(82.2)%** | **56** | **49(87.5%)** | **7(12.5%)** |

The main reasons behind dissatisfaction of Duhok farmers are listed within the below

* Difficulties in marketing of their produce.
* High cost of fertilizer, seeds, pesticides and animals medicine
* Quality of the produce which unable to compete with the import
* Deficiency in irrigation water
* Land lease is too high

Besides, transportation facilities, lack of subsidies and proper marketing and inputs/ subsidies are considered as the main constraints that hinder their productivities. The interviewees claimed that their irrigation facilitates need to be supported in term of electricity and/or fuel for generator; however, farmers from Nineveh Plain received better support than that in targeted areas in Duhok province (Table. 2),.

Table 2. Main reasons behind dissatisfaction of the respondents from Duhok on their farming productivities

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Reasons** | **Duhok**  **Faida and Qasrok sub districts** | | | | **Nineveh Plain**  **Rabia and Sinun sub districts** | | |
| **#**  Respondents | **Response/value** | | | **#** Respondents | **Response/value** | |
| **Yes**  **Frequency/%** | | **No**  **Frequency/%** | **Yes Frequency/%** | **No Frequency/%** |
| transportation facilities | **44** | **4 (9%)** | **40 (91%)** | | **56** | **37(66%)** | **19 (34%)** |
| Irrigation Facilities | **37** | **23(62%)** | **14(38%)** | | **56** | **49 (87.5%)** | **7(12.5%)** |
| Proper Marketing and adoption of price support policy | **51** | **0(0%)** | **51 (100%)** | | **56** | **1(2%)** | **55 (98%)** |
| supplied with inputs / subsidies from the government | **45** | **2(4%)** | **43(96%)** | | **55** | **5(9%)** | **50(91%)** |

The subsidies were the farmers received from the local government / non -governmental institutions/ NGOs, did not meet the demands of interviewees, only few numbers of the interviewee received subsidies regarding to fertilizers, pesticides, herbicides (weeds) which were under their ambitions (Table 3).

Table 3. Kinds of subsidies received by the respondents (farmers) of targeted areas in Duhok and Nineveh Plain from local government or non -governmental institutions/ NGOs

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **kind of subsidy** | **From Government** | | | | **From Non-Government/NGOs** | | | |
| **Duhok** | | **Nineveh Plain** | | **Duhok** | | **Nineveh Plain** | |
| **#** | **%** | **#** | % | **#** | **%** | **#** | % |
| **fertilizers** | **2** | **29%** | **0** | **0%** | **1** | **20%** | **0** | **0%** |
| **land lease** | **0** | **0%** | **0** | **0%** | **0** | **0%** | **0** | **0%** |
| **transportation fees** | **0** | **0%** | **0** | **0%** | **0** | **0%** | **0** | **0%** |
| **pesticides** | **2** | **29%** | **1** | **14%** | **1** | **20%** | **0** | **0%** |
| **herbicides(weeds)** | **1** | **14%** | **1** | **14%** | **0** | **0%** | **0** | **0%** |
| **Marketing** | **1** | **14%** | **0** | **0%** | **1** | **20%** | **0** | **0%** |
| **spare materials** | **0** | **0%** | **1** | **14%** | **0** | **0%** | **0** | **0%** |
| **Electricity and/or fuel for generator** | **1** | **14%** | **3** | **43%** | **0** | **0%** | **1** | **13%** |
| **Total** | **7** |  | **7** |  | **5** | | **8** | |

## Training on sustainable (Climate Smart) agriculture practices

Through this assessment interviewees/ farmers were also asked whether they are using Climate-smart agriculture to overcome challenges posed by climate change and improve the quality and quantity of their produce to meet the local’s demands and secure their food security. 85% of the interviewees are not using Greenhouses. The rates of the used other approaches are listed in below table (Table 4).

Table 4. Rates of respondents who are using Climate-smart agriculture in Duhok and Nineveh Plain

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Climate-smart agriculture | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| **#**  Respondents | **Yes**  **Frequency/%** | **#**  Respondents | **Yes Frequency/%** |
| Uses of Greenhouses | **39** | **6(15.4%)** | **55** | **8(14.5%)** |
| Integrated management approaches to control pests and weeds | **93** | **30 (32)%** |  | **0%** |
| Using alternatives for fertilizer, pesticides and herbicides. | **93** | **27(29%)** |  | **0%** |
| Rely on locally adapted varieties and breeds to ensure their stability in the face of climate change | **93** | **33(35%)** |  | **0%** |
| Using of existing areas rather than expanding to new areas. | **93** | **3(3.2%)** |  | **0%** |

The interviewees from Faida and Qasrok sub districts expressed their dire needs for educational and extension services with regarding to adoption new technology in farming at rate of 96% compared to that reported at rate 34% by the interviewees from Nineveh plain as shown in below table (Table 5).

Table 5. Needs of y the respondents from targeted areas of the study sub districts for educational and extension services with regarding to adoption new technology

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Demands for uses of new technology in farming/ type of interventions needed | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| **#** respondents | **Yes**  **Frequency/%** | **#**  respondents | **Yes Frequency/%** |
| Needs for educational and extension services | **47** | **96%** | **56** | **34%** |

The training areas where the interviewees were suggested are listed in below table (Table 6).

Table 6. Requested training by the respondents

|  |  |  |
| --- | --- | --- |
| **Training types** | **Duhok**  **Faida and Qasrok sub districts** | **Nineveh Plain**  **Rabia and Sinun sub districts** |
| **Agriculture extension** | **25%** | **100%** |
| **Agriculture protection** | **25%** | **0%** |
| **Management** | **24%** | **0%** |
| **Marketing** | **26%** | **0%** |

## **Water efficient and sustainable irrigation practices**.

### Adopted Irrigation system

The interviewed farmers from both governments are using different irrigation systems at various rates as detailed in below table (Table 7). None of the interviewees use solar water pump system (Table 8). To a great extend the adopted Irrigation system are meeting the demands of the farmers.

Table 7.Adopted Irrigation system by the respondents within the targeted study areas

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Adopted Irrigation system** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| **No.** | **Percentage** | **No.** | **Percentage** |
| **Surface irrigation** | **30** | **48%** | **30** | **51%** |
| **Drip irrigation** | **22** | **35%** | **21** | **36%** |
| **Sprinkler irrigation** | **11** | **17%** | **8** | **14%** |
| **Solar water pump system** | **0** | **0%** | **0** | **0%** |
| **Total** | **63** |  | **59** |  |

However, some of the interviewees were not satisfy from their irrigation system (Table 8) which mainly due to lack of tubes or its bad quality, costs of good quality tubes, and poor pump quality with poor generators capacities, high cost of national electricity (77% and 71% of interviewed farmers from Duhok and Nineveh Plain, respectively are relying on national electricity for pumping while the rest are depending on their private generators’), needs for new wells with higher capacity than existing wells and needs for storage tanks for an efficient pumping.

Table 8. Satisfaction of the respondents from the efficiency and sufficiency of the sued irrigation system

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Efficiency and sufficiency of the sued system** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| Value | **Frequency** | **percentage** | **Frequency** | **percentage** |
| **Efficient and satisfied** | **31** | **84%** | **37** | **66%** |
| **Non-efficient** | **6** | **16%** | **19** | **34%** |
| **Total** | **37** |  | **56** |  |

To ameliorate the existing problems relating to the used irrigation systems, interviewees from Duhok suggested the following:

* Establishment of the drip irrigation system (well, storage tanks and tubes).
* Concreting their open channel system to avoid water losses
* Creating water dams to get benefit from the rivers and rain water.
* Provide subsidies to the farmers through providing them good qualities of tube and irrigation systems.
* Subsidies from government on the provided national electricity.

## Pests Promotion and facilitation of Integrated Pest Management

Regarding to the adopted integrated management system and available facilities for dealing and controlling pests among agricultural enterprises, less than half of the interviewees within the targeted areas have enough knowledge on dealing with the pests (Table 9).

Table 9. Dealing with the prevalence of the vegetables and crops, respondents knowledge about how to deals with pests

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Dealing with the prevalence of the vegetables and crops pests -Do you have enough knowledge about how to deals with pests?** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **10** | **27%** | **26** | **46%** |
| **No** | **27** | **73%** | **30** | **54%** |
| **Total** | **37** |  | **56** |  |

However, almost all of the interviewees are using pesticides, and the main sources for their supply are private sectors The interviewees recommended different training courses to skill up and increase their knowledge regarding protection their farms from pests, management their enterprises and marketing their produce(Table 10).

Table 10. Applying pesticides and their sources with the requirements of the respondents within the study areas for suggested training courses to increase their knowledge

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Applying Pesticides** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **37** | **100%** | **54** | **96%** |
| **No** | **0** | **0%** | **2** | **4%** |
| **Total** | **37** |  | **56** |  |
| **Source of the pesticides** |  |  |  |  |
| Governmental with subsidy | **1** | **3%** | **0** | **0%** |
| Privates sectors (local suppliers) | **36** | **97%** | **56** | **100** |
| **Total** | **37** | **100%** | **56** |  |
| **Uses of fertilizers** |  |  |  |  |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **37** | **100%** | **54** | **96%** |
| **No** | **0** | **0%** | **2** | **4%** |
| **Total** | **37** |  | **56** |  |
| **Type of fertilizers** |  |  |  |  |
| **chemical** | **37** | **100%** | **54** | **96%** |
| **natural (animals dungs)** | **0** | **0%** | **2** | **4%** |
| **Total** | **37** |  | **56** |  |
| **Needs for training courses on** |  |  |  |  |
| **Extension services** | **35** | **25%** | **23** | **74%** |
| **Protection** | **35** | **25%** | **0** | **0%** |
| **Management** | **34** | **24%** | **8** | **26%** |
| **Marketing of the produce** | **35** | **25%** | **0** | **0%** |
|  | **139** |  | **31** |  |

In terms of animals projects and enterprises, the adopted strategies and the used prophylactic measures are listed in below table (Table 11). Regarding to the sources knowledge of the interviewees on animals diseases, some of the interviewees based on the related directorates, and some other on their experiences.

Table 11. Used strategies, animals’ owners on animals’ diseases, sources of the used vaccines and medicines and the requirements of the respondents within the study areas for suggested training courses to increase their knowledge on dealing with animals diseases

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **knowledge on dealing animals diseases** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **3** | **8%** | **21** | **38%** |
| **No** | **35** | **92%** | **35** | **63%** |
| **Total** | **38** |  | **56** |  |
| **Reliance on the related directorate**  **(Veterinary) in detection diseases** | **#** | **%** | **#** | **%** |
| **Yes** | **36** | **97%** | **9** | **16%** |
| **No** | **1** | **3%** | **46** | **84%** |
| **Total** | **37** |  | **55** |  |
| **Uses prophylactic control program in**  **controlling of the animals disease** | **#** | **%** | **#** | **%** |
| **Yes** | **31** | **84%** | **55** | **100%** |
| **No** | **6** | **16%** | **0** | **0%** |
| **Total** | **37** |  | **55** |  |
| **Source of the vaccines and medicines** | **#** | **%** | **#** | **%** |
| **Governmental with subsidy** | **0** | **0%** | **0** | **0%** |
| **Privates sectors (local suppliers)** | **37** | **100%** | **52** | **100%** |
| **Total** | **37** |  | **0** | **0%** |
| **Needs for training courses on** | **#** | **%** | **#** | **%** |
| **veterinary extension** | **35** | **25%** | **23** | **74%** |
| **Protection** | **35** | **25%** | **0** | **0%** |
| **Management of animals project** | **34** | **24%** | **8** | **26%** |
| **Marketing of the produce** | **35** | **25%** | **0** | **0%** |
|  | **139** |  | **31** |  |

## Sources of used seed

In terms of the used seeds the interviewees were asked about their seeds sources and their satisfaction toward the productivities regarding to the quality and quantities; to a great extent they are relied on themselves through storing their seeds for the next season and on private sectors, while the government roles not meet their demands (Table 12). The farmers expressed their readiness to pay extra to get higher quality seeds for a better quality produce. Generally, the used seeds are characterized by their high germination rates, resistant to the local environmental conditions in term of the temperature, water supply and pests. Some of the interviewees claimed that the state provided seeds are poor quality and sensitives for diseases and pests.

Table 12. Source of the used seeds and satisfaction of the respondents within the targeted area of study toward the used seeds

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source of the used seeds** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| **#** | **%** | **#** | **%** |
| **Stored seeds** | **32** | **62%** | **37** | **59%** |
| **Privates sectors (local suppliers)** | **15** | **29%** | **26** | **41%** |
| **Governmental with subsidy** | **5** | **10%** | **0** | **0%** |
| **Total** | **52** |  | **63** |  |
| **Satisfaction from the quality of**  **Provided seeds by the private sectors** | **#** | **%** | **#** | **%** |
| **Yes** | **8** | **57%** | **25** | **96%** |
| **No** | **6** | **43%** | **1** | **4%** |
| **Total** | **14** |  | **26** |  |
| **Readiness of the**  **respondents**  **to pay extra for a good quality seeds** | **#** | **%** | **#** | **%** |
| **Yes** | **37** | **97%** | **48** | **86%** |
| **No** | **1** | **3%** | **8** | **14%** |
| **Total** | **38** |  | **56** |  |
| **Are there instructions from the**  **government on providing seeds?** | **#** | **%** | **#** | **%** |
| **Yes** | **18** | **45%** | **3** | **5%** |
| **No** | **22** | **55%** | **53** | **95%** |
| **Total** | **40** |  | **56** |  |

## Value chain development of products

To detect the gaps and priorities of a successful interventions to support livelihood projects (agricultural and animal) and to develop a productive and effective agricultural value chains in Nineveh plain and Duhok in order to increase earned net incomes of farmers and smallholders enterprises; this assessment included different key actors on the value chain include but not exclusively farmers, retailers, wholesale market owners and component suppliers. Regarding to the most required produce by the locals, the interviewed farmers showed their awareness about the locals’ need of the produce at rate 86% and 98% in Duhok and Nineveh plain, respectively. Besides, they claimed that their products able to cover up to 90% not only the local markets, but also are exporting their surplus to the nearby provinces (Table 13). Most of the produces are sold at the local whole sale markets.

Table 13. Awareness of the farmers on the most needed produce by the local markets and places where they sell their produce with way of dealing with surplus of the produces during the season

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Are you aware on the most**  **needed produce by the local markets** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **36** | **86%** | **55** | **98%** |
| **No** | **6** | **14%** | **1** | **2%** |
| **Total** | **42** |  | **56** |  |
| **Are the local demands covered by the local products?** | **#** | **%** | **#** | **%** |
| **Yes** | **42** | **91%** | **52** | **93%** |
| **No** | **4** | **9%** | **4** | **7%** |
| **Total** | **46** |  | **56** |  |
| **Markets where the farmers sell their product** | **#** | **%** | **#** | **%** |
| **At the wholesale market** | **39** | **46%** | **45** | **75%** |
| **Local small market** | **38** | **45%** | **14** | **23%** |
| **By retail** | **5** | **6%** | **1** | **2%** |
| **Other mentioned** | **2** | **2%** | **0** | **0%** |
| **Total** | **84** |  | **60** |  |
| **Way of dealing with surplus of the produces during the season?** | **#** | **%** | **#** | **%** |
| **Storing using refrigerator storage until the price and the demand increased** | **1** | **2%** | **1** | **2%** |
| **Exporting to the nearby provinces** | **39** | **95%** | **43** | **96%** |
| **Food processers (value chain)** | **1** | **2%** | **1** | **2%** |
| **Total** | **41** |  | **45** |  |

The conducted interviews (FGD/ KII) with the business owners and the agriculture wholesale markets revealed that the most of the locals’ products are present in surplus but in inferior quality which is often encountered the imports (listed in below table, Table 14) with its competitive prices especially most of the imports are from Turkey and Iran because of the low exchange rate of their currency against the dollar, currently. The interviewees stressed that the local farmers/ producers have problem in producing good quality of produce and packaging of their produces in a way where the good quality products often losses their marketing values when mixed with the lower quality products and this is very common among the local product. Besides, the consumers’ impressions and lack of trust about the local products are also anther constrain that are facing the marketing of the produces.

Table 14. List of the most commonly affected local produce within the study area by the imports

|  |  |
| --- | --- |
| **Duhok / Faida and Qasrok sub districts** | **Nineveh Plain/ Rabia and Sinun sub districts** |
| **Tomato** | **Tomato** |
| **Potato** | **Potato** |
| **Apple** | **Eggplant** |
| **Cucumber** | **Apple** |
| **Sesame** | **Orange** |
| **Melon** | **Watermelon** |
| **Pomegranate** | **Cucumber** |
| **Onion** | **Melon** |
| **Legumes** |  |
| **Chickpeas** |  |
| **Rise** |  |
| **Watermelon** |  |

To mitigate and overcome the constraints that encounter the marketing process of the local produces, below listed suggestions are recommended to be followed by the key actors, stockholders, agricultural enterprises.

**Suggestions for supporting local produce**

* Put restriction on the imports during the harvesting seasons
* Establishing of the storage to keep the local produce for other seasons
* Increasing quality of the local produce and properly packaging (quality and quantity).
* Establishing of the canning firms to deals with surplus of the produce and the second ranked produce
* Using of good quality seeds
* Gain buyer and consumer trust through proper packaging of the produce to compete with imports
* Increase awareness and marketing skills of the local farmers through conducting of tailored training courses
* Conduction agricultural extension services to sensitize the farmers on proper farming (planning cultivation) and avoid producing extra produce than that demand by the locals
* Farmers’ need to be supplied with subsides for better quality of the produce
* Providing of the farmers with greenhouse to increase the quality and quantities of their produce and throughout the year.
* Organizing of the produce through choosing the most requested produce by the locals, where in some areas all farmers produce the same type of vegetable/ frits which resulting in presence of the surplus than the local needs.
* Facilitate of transporting of the local produce to the middle and southern parts of Iraq.
* Avoid using expire medicine
* Increasing skill of farming and using of advance agricultural technology under a proper supervisions

However, farmers are claiming that inferior quality of their produce is mainly due to the listed factors in below table (Table 15).

Table 15. Main reasons that associated with inferior quality of their produce within the study targeted areas

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reasons behind inferior quality of the produce** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| Lack of subsidies or required funds for expanding and development the existing farm (agricultural and animal farming) | **4** | **22%** | **4** | **44%** |
| Lack of the required instrument and facilities (Vehicle, Fuel, Repairing and storage facilities) | **4** | **22%** | **3** | **33%** |
| Lack of processing facilities (Machines, factories, Electricity, Packaging, Marketing). | **4** | **22%** | **2** | **22%** |
| Logistics (Vehicle, Fuel and Storage). | **4** | **22%** | **0** | **0%** |
| Retail (Shop rent, Labour, Advertising) | **2** | **11%** | **0** | **0%** |
| **Total** | **18** |  | **9** |  |

## Increase quality of the produce

Interviewees/ farmers and smallholders enterprises were asked whether they are using or adopting the required strategies for increasing the quality of their produce to meet the local demands and compete with imports at their competitive prices, the below table (Table 16) summarizes the responds of the interviewees. Most of the interviewees within the study areas are using pesticides in agricultural and animals projects where they purchase them from local suppliers.

Table 16. Used strategies by the farmers to increase the quality of their produce

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Do use chemical materials (pesticides or medicine in case of animals’ product) in production process?** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **34** | **92%** | **54** | **96%** |
| **No** | **3** | **8%** | **2** | **4%** |
| **Total** | **37** |  | **56** |  |
| **Source of the used chemicals** | **#** | **%** | **#** | **%** |
| **Government** | **1** | **3%** | **2** | **4%** |
| **Privates sectors (local suppliers).** | **34** | **97%** | **52** | **96%** |
| **Total** | **35** |  | **54** |  |
|  | **#** | **%** | **#** | **%** |

Besides to using chemicals for controlling the pests and animals diseases, the interviewees suggested below for better quality of the produce.

**Farmers’ suggestions for increasing the quality of their produce**

* Conducting tailored training courses to increase their knowledge on proper farming and better yielding of good quality produce.
* Training courses on proper marketing and packaging of the produce
* Providing farmers with new agricultural technology/ smart agricultural technology (greenhouses with the required farming equipment) for practicing throughout the year.
* Supervision of farmer projects by scientific/ professional staff
* Linking of the farmers to the markets through technology
* Subsidizing farmers through providing them with required agricultural inputs such as good quality of seeds, fertilizer, pesticides, herbicides, animal medicines.

## Improve post-harvest handling and storage facilities

According to Porter’s generic value chain, proper post harvesting and storing of the produce are considered as important activities in developing AVC; accordingly the interviewees within the study areas in Duhok province and Nineveh plain were asked about their current knowledge and needs for training courses to increase their skills and building their capacities and their requirements in terms of facilities for proper threshing of crops and storing spaces for produce until their prices up. Not all of the interviewees were familiar with the post harvesting handling process; some of them expressed their dire needs for training courses for increasing skills on how to increase the quality of grain, storing yields at post harvesting in accurate way to avoid losing of produce, and on food hygiene/ preventative measurements, for more detail, their responses are listed below in (Table 17).

The main constraints that encounter the farmers at post harvesting time and that hinder them from transferring their yields after harvesting to avoid on-farm losing through birds, rodents, pests and to give more time for further drying are the lacking of the transportation facilities, and the absence of subsidies by the state side.

**For overcoming the post harvesting issues that faced the farmers, below are their suggestions**

* Conducting good post harvesting handling and storage training courses
* Providing farmers with new technology and with knowledge on post-harvest technology.
* Increase farmers knowledge in term of food hygiene
* Intensive training course on how to use pesticides and their side effects
* Subsidizing farmers through reducing the costs of electricity, good quality seeds, fertilizers, pesticides, herbicides and transportation.

Table 17. Understanding of the respondents on post-harvesting process of their yields and their requirements for educational training courses to build up their capacities

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Do you know how to get high quality grain on-farm** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **34** | **81%** | **40** | **73%** |
| **No** | **8** | **19%** | **15** | **27%** |
| **Total** | **42** |  | **55** |  |
| **Needs for training and educational / extension courses on how to get high quality grain on-farm** | **#** | **%** | **#** | **%** |
| **Yes** | **8** | **100%** | **15** | **100%** |
| **No** | **0** | **0%** | **0** | **0%** |
| **Total** | **8** |  | **15** |  |
| **Do you have facilities for proper threshing of crops?** | **#** | **%** | **#** | **%** |
| **Yes** | **13** | **31%** | **14** | **25%** |
| **No** | **29** | **69%** | **42** | **75%** |
| **Total** | **42** |  | **56** |  |
| **Do you have plan to store your crops post harvesting?** | **#** | **%** | **#** | **%** |
| **Yes** | **21** | **48%** | **51** | **91%** |
| **No** | **23** | **52%** | **5** | **9%** |
| **Total** | **44** |  | **56** |  |
| **Do you have enough space for storing of the produce?** | **#** | **%** | **#** | **%** |
| **Yes** | **4** | **9%** | **46** | **82%** |
| **No** | **41** | **93%** | **10** | **18%** |
| **Total** | **45** |  | **56** |  |
| **Do you have enough information on proper storing of the yields?** | **#** | **%** | **#** | **%** |
| **Yes** | **6** | **13%** | **38** | **68%** |
| **No** | **40** | **87%** | **18** | **32%** |
| **Total** | **46** |  | **56** |  |
| **Needs training and educational/ extension courses on proper storing?** | **#** | **%** | **#** | **%** |
| **Yes** | **38** | **97%** | **18** | **100%** |
| **No** | **1** | **3%** | **0** | **0%** |
| **Total** | **39** |  | **18** |  |
| **Do you have information on food hygiene /preventing postharvest losses?** | **#** | **%** | **#** | **%** |
| **Yes** | **10** | **22%** | **45** | **80%** |
| **No** | **39** | **87%** | **11** | **20%** |
| **Total** | **49** |  | **56** |  |
| **Need training and educational/ extension courses on preventing postharvest losses?** | **#** | **%** | **#** | **%** |
| **Yes** | **38** | **97%** | **9** | **82%** |
| **No** | **1** | **3%** | **2** | **18%** |
| **Total** | **39** |  | **11** |  |

## Create direct market linkages and linkages with processors

Farmers’ linkage with retailers and wholesale markets for selling their produce and the presence of cooperative marketing found to promote the efficiency of marketing and increase the net incomes of farmers and markets owners. The Presence of the market linkages through contract (Contractual agreement) is the most requested demand by the interviewees (producers) in targeted areas of both provinces. The linkage is needed to accelerate the marketing process of their produce. The majority of the interviewees are facing challenges in accessing buyers and they do not have formal relationships with them (contractual agreement). Besides, no institutional buyer found within the study area to facilitate the interaction/ linkage between the producers and markets owners that could enhance the marketing of the produce. Therefore, the interviewees are strongly recommended for linking them to the markets for easier selling their produce. The linkage is giving more incentive to farmers to increase their productivities in term of the quality and quantities. Some of the interviewees believe that the linkage will help them to get subsidies for transportations, storing of the surplus, or even will be helpful in transferring the produce from the farms to the consumers namely during curfew and restrictions on the movement as had been applied in past in the context of the COVID-19 applied instructions.

On the other side, the interviewees from Duhok (Faida and Qasrok sub districts) found that linking of the producers with the processors is essential (100%) and will help them to increase their incomes. The interviewees from Nineveh Plain (Rabia and Sinun sub districts) have different idea about the linkage as shown in below table (Table 18).

Table 18. Impression of the respondents on farmers- market linking/ farmers-linking with processors and its role in increasing their incomes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Do you encourage having a linkage with the large enterprises (processors)?** | **Duhok**  **Faida and Qasrok sub districts** | | **Nineveh Plain**  **Rabia and Sinun sub districts** | |
| value | **#** | **%** | **#** | **%** |
| **Yes** | **54** | **100%** | **8** | **30%** |
| **No** | **0** | **0%** | **19** | **70%** |
| **Total** | **54** |  | **27** |  |
| **Do you think that linking with large enterprises (processors) will increase you incomes?** | **#** | **%** | **#** | **%** |
| **Yes** | **54** | **100%** | **13** | **52%** |
| **No** | **0** | **0%** | **12** | **48%** |
| **Total** | **54** |  | **25** |  |
| **Do you have any linking with large enterprises (processors)?** | **#** | **%** | **#** | **%** |
| **Yes** | **54** | **100%** | **8** | **30%** |
| **No** | **0** | **0%** | **19** | **70%** |
| **Total** | **54** |  | **27** |  |

**Respondents’ expectations on the presence of the direct linkage with markets and processors**

* It will increase the farmers productivities and expand their net incomes
* Facilitating the marketing process of the produce
* The linkage will reduce the marketing stress on farmer
* It will guarantee the selling of farmer produce and will give them confidence to work harder without fear or negatively thinking about the surplus of the produce during the harvesting season.
* Subsidizing farmers with the required seeds, fertilizers and transportation of the produce

Will help farmer to organize their agricultural plan

# Conclusions and Recommendation

The local produce is unable to meet the demands of the locals and the local markets; it is usually encountered by the higher quality imported products at competitive prices. There are active productive farming enterprises within the study targeted areas but are often depressed due to the difficulties in marketing their surplus produces. Sub-optimal farming inputs reduce both of quality and quantities of the farming productivity. Access to, and costs of inputs and services (subsidies, required seeds, pesticides, herbicides, vaccinations, extension services/ required skills, transport, cold storage etc.) are most common constraints that encounter farmers to increasing the quality of their productions. Developing of successful AVCs inclusive of small farmers/ smallholders enterprises is an effective strategy to improve efficiency and value addition. Thus, AVCs should be seen as an important component of the strategy of doubling farmers’ income. Towards this, the following prescriptions are suggested:

1. Increasing the quality of the produces through supporting farmers/ smallholders with required inputs, services and innovative technologies for increasing the produce to meet the locals’ demands and develop competitive value chains.
2. Conducting agricultural extension training courses and marketing to sensitize the farmers/ smallholders toward the importance of creation and developing of effective agricultural value chain in order magnifying their incomes.
3. Promotion of analytical capacities of the local farmers/ smallholders for a sustainable and effective development of agricultural value chain.
4. Building the capacity of the farmers toward effective post harvesting process.
5. Creation formal linking between the farmers and markets/processors through sensitizing stakeholders on importance of linkage to reduce the transaction costs and guarantee marketing of the produce to increase the net incomes of included actors of linkage.

Unstable security situation and economic recession that faced the country in general and the target areas of the study in specific have exposed farmers to unfamiliar vulnerabilities and challenges. To deal with these challenges, the farmers need to improve their performance and competitiveness through the following recommendations and suggestions:

Recommendations

1. Using of diversified and innovative upgradation strategies at different levels of value chain through provision of farmers/ smallholders technical and financial supports.
2. Transformation and up-scaling of local AVCs to higher levels to capture benefits of the expanding local markets to tackle and ameliorate the faced challenges.
3. Supporting smallholders (farmers and product sellers/ retailed sellers) through formation an institution to value chain governance in their favour through working with local government to reinforce their role to provide a secure environment and to reduce goods importation via policy and taxation rules.
4. Conducting sustainable training courses to scale up and promote the farmers/ smallholders capacities and facilitate their access to technology and larger markets.
5. Increasing the quality of the products through provision of the farmers’ subsidies for building efficient irrigation system, good quality of seeds for better quality yields.
6. Conditional establishing or rehabilitation of the existed (depressed) factories for fruits canning or for tomato paste production to deal with the surplus of the produces and to mitigate the losses of the farmers/ smallholders enterprises during the productivity seasons.

# Annexes

## Annex 1: List of people interviewed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| # | **place** | **Full name of**   **interviewee s** | **Position/work** | **location** | **Type of the interview/ number of people during discussion** |
| 1 | **Qasrok** | Mohammed Slih Hassan | Village leader(Mukhtar) | Qasrok | FGD (4 people) |
| 2 | **Qasrok** | Nawzat Mohammed Sito | Director of agriculture | Qasrok | FGD (7 people) |
| 3 | **Qasrok** | Ali Omer Ali | Village leader(Mukhtar) | Melabrwan | FGD (2 people) |
| 4 | **Qasrok** | Shewket Mohmmed Resol | Village leader(Mukhtar) | Gerzangl | FGD (3 people) |
| 5 | **Qasrok** | Yousif Mohmmed Yeaqob | Farmer | Bastejory | FGD (5 people) |
| 6 | **Qasrok** | Hussin Abdulhadi Jeafer | Farmer and wholesale | Gende | FGD (8 people) |
| 7 | **Qasrok** | Asaad Tahir mohmmed Ali | Farmer | Mreba | FGD (3 people) |
| 8 | **Qasrok** | Abdulrhman Mohmmed Taha | Farmer | Keme | FGD (5 people) |
| 9 | **Qasrok** | Jalal Ahmed Hassan | Farmer and seller | Cirre | FGD (4 people) |
| 10 | **Qasrok** | Shaaban Fars | Whole sale market | Sumile | FGD (3 people |
| 11 | **Qasrok** | Ahmed Suliman | Whole sale market | Sumile | FGD (3 people/ |
| 12 | **Qasrok** | Idris Younis | Whole sale market | Sumile | FGD (3 people |
| 13 | **Qasrok** | Muhssin Suliman | Whole sale market | Duhok | FGD (3 people |
| 14 | **Qasrok** | Karzan Mohmmed Sali said | Mukhtar | Qasrok | KII |
| 15 | **Qasrok** | Sardar Jemil Hider | Mukhtar | Mereba | KII |
| 16 | **Qasrok** | Kamiran Abdulrahman | Mukhtar | kemye | KII |
| 17 | **Qasrok** | Abdulrehman Mahmod Omer | Mukhtar | Kfre1 | KII |
| 18 | **Qasrok** | Jameel Ali Abdulla | Mukhtar | Kfre2 | KII |
| 19 | **Qasrok** | Younis Hassin Meho | Farmer | Tlbzine2 | KII |
| 20 | **Qasrok** | Beshar Sadiq Remadan | Farmer | Mreba | KII |
| 21 | **Qasrok** | Ayob Younis Ahmed | Farmer | Telbzine1 | KII |
| 22 | **Qasrok** | Mohmmed Ameen Arab | Farmer | Melabrwan | KII |
| 23 | **Qasrok** | Karim remadhn | Farmer | kema | KII |
| 24 | **Qasrok** | Bassim Mohmmed | Farmer | Chra | KII |
| 25 | **Qasrok** | Mohmmed Omer | Whole sale market | Qesrok | KII |
| 26 | **Qasrok** | Salim Isamil | Whole sale market | Qesrok | KII |
| 27 | **Qasrok** | Bassim Mohmmed | Whole sale market | Chra | KII |
| 28 | **Qasrok** | Azad Mustafa | Whole sale market | Tenahi | KII |

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| # | **place** | **Full name of interviewee s** | **Position/work** | **location** | **Type of the interview/ number of people during discussion** |
| 1 | **Faida** | Imad Zekry Hassn | Director of agriculture | Faida | FGD (6 people) |
| 2 | **Faida** | Younis Ismail Ameen | Mukhtar | Nemrike | FGD (5 people) |
| 3 | **Faida** | Belawy Hezaa Ali | Farmer | Jembur | FGD (4 people) |
| 4 | **Faida** | Jassim Mohammed Reshid | Mukhtar | Jembur | FGD (3 people) |
| 5 | **Faida** | Ali Rashid Derwish | Mukhtar | Kreme | FGD (8 people) |
| 6 | **Faida** | Newaf Haza | Farmer representa | Jumbor | FGD (4 people) |
| 7 | **Faida** | Zerevan Mrjeed khelef | Farmer | sharia | FGD (4 people) |
| 8 | **Faida** | Nezar Birmoze Mohmmed | Whole sale market | Dumize | FGD (3 people) |
| 9 | **Faida** | Mohammed said | Whole sale market | Sumile | FGD (4 people) |
| 10 | **Faida** | Mohemmed Ali | Whole sale market | Sumile | FGD (3 people) |
| 11 | **Faida** | Martin Sarjon Jes | Farmer | Bakhtme | KII |
| 12 | **Faida** | Sadiq Mohmmed | Farmer /Mukhtar | Tlkhfshe | KII |
| 13 | **Faida** | Tahir Yassin Taha | Farmer /Mukhtar | Kumbez | KII |
| 14 | **Faida** | Qasid Abdulkarim | Farmer /Mukhtar | Zrava | KII |
| 15 | **Faida** | Hussin Suliman | Mukhtar | Keza | KII |
| 16 | **Faida** | Hamady Younis | Mukhtar | Rehmania | KII |
| 17 | **Faida** | Ibrahim Zenon Haso | Farmer | Kaske | KII |
| 18 | **Faida** | Bahzad Teli Ali | Farmer | Dumize | KII |
| 19 | **Faida** | Bashdar Sidqi | Whole sale market | Faida | KII |
| 20 | **Faida** | Ahmed Suliman | Whole sale market | Sumile | KII |
| 21 | **Faida** | Ahmed | Whole sale market | Sumile | KII |
| 22 | **Faida** | Khafar Ahmed Daxaz | Whole sale market | Sumile | KII |
| 23 | **Faida** | Abid Salim | Whole sale market | Domize | KII |
| 24 | **Faida** | Yuosif Kovan Mostafa | Whole sale market | Domize | KII |
| 25 | **Faida** | Salih Mehdi | Whole sale market | Sumile | KII |
| 26 | **Faida** | AbdulAziz Alyas | Whole sale market | Sumile | KII |
| 27 | **Faida** | Kovan Mustafa | Whole sale market | Sumile | KII |
| 28 | **Faida** | Husain Ahmed | Mukhtar | Faida | KII |
| 29 | **Faida** | Younis Ameen | Farmer | Faida | KII |

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| # | **place** | **Full name of interviewees** | **Position/work** | **location** | **Type of the interview/ number of people during discussion** |
| 1 | **Rabia** | Mohammed khuluf ali | Mukhtar | kursour | FGD (6 people) |
| 2 | **Rabia** | Mohammed shalash david | Director of agriculture | rabia | FGD (3 people) |
| 3 | **Rabia** | Aiead watted mhammad | Mukhtar | abokula | FGD (7 people) |
| 4 | **Rabia** | Tarq talaa izheman | Mukhtar | Tal werdan | FGD (8 people) |
| 5 | **Rabia** | Tarq aeed sutum | Mukhtar | Tal alhawa | FGD (6 people) |
| 6 | **Rabia** | Mohammed ayash rahail | Mukhtar | alabtakh | FGD (6 people) |
| 7 | **Rabia** | Khalid hammod melan | Mukhtar | alkharag | FGD (5 people) |
| 8 | **Rabia** | Rashid suaad akeel | Mukhtar | owaynat | FGD (10 people) |
| 9 | **Rabia** | Daham khabter okela | Mukhtar | kurran | KII |
| 10 | **Rabia** | Malik ahmad taha | Mukhtar | alsalmia | KII |
| 11 | **Rabia** | Ali hamad menasher | Mukhtar | Tal munef | KII |
| 12 | **Rabia** | Mohammed dawas taaen | Mukhtar | Tal ahyal | KII |
| 13 | **Rabia** | Abdalnaser muhammed sawed | Mukhtar | alshaalan | KII |
| 14 | **Rabia** | Dahush abd wady | Mukhtar | alelkana | KII |
| 15 | **Rabia** | Meshaal abdalla rakan | Mukhtar | jalbarat | KII |
| 16 | **Rabia** | Muwafaq jadoua sulaiman | Mukhtar | almummy | KII |
| 17 | **Rabia** | Fawaz ali khalid | Mukhtar | owayna | KII |
| 18 | Rabia | Falah hawry nahaar | mukhtar | um kaheef althanya | KII |
| 19 | **Rabia** | theyab ahmad mushaan | Mukhtar | alkebar | KII |
| 20 | **Rabia** | Hussen thary ghedan | Farmer | Rabia | KII |
| 21 | **Rabia** | Fawaz mubark suliman | Farmer | Rabia | KII |
| 22 | **Rabia** | Ali saleh aswad | Farmer | Rabia | KII |
| 23 | **Rabia** | Thany mokhlef okla | Farmer | Rabia | KII |
| 24 | **Rabia** | Jassem mohammed izayan | Farmer | Rabia | KII |
| 25 | **Rabia** | Khalid kuhmez ramadan | Farmer | Rabia | KII |
| 26 | **Rabia** | Hammad mutear hmud | Farmer | Rabia | KII |
| 27 | **Rabia** | Salih mahmmod khaluf | Farmer | Rabia | KII |
| 28 | **Rabia** | Hameed mohammed mahmood | Farmer | Rabia | KII |
| 29 | **Rabia** | Ahmad mohammed izayan | Farmer | Rabia | KII |

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| **#** | **place** | **Full name of**   **interviewees** | **Position/work** | **location** | **Type of the interview/ number of people during discussion** |
| 1 | **Sinun** | Shamo ahmad darweesh | Mukhtar | Rugh al gnuby | FGD (8 people) |
| 2 | **Sinun** | Darweesh murad | Mukhtar | Kri kori | FGD (9 people) |
| 3 | **Sinun** | Ibrahem hajy rasho | Mukhtar | amara | FGD (5 people) |
| 4 | **Sinun** | Hassan khury khaluf | Mukhtar | Qussen | FGD ( 6 people) |
| 5 | **Sinun** | Salam hasan purgys | Mukhtar | sorkan | FGD ( 7 people) |
| 6 | **Sinun** | Shihab khuder | Mukhtar | kahbal | FGD ( 5 people) |
| 7 | **Sinun** | Hajy abdo tarhe | Mukhtar | bahify | FGD ( 6 people) |
| 8 | **Sinun** | Hadi kity murad | Director of agriculture | sinun | FGD ( 9 people) |
| 9 | **Sinun** | Salim kasim kurmiz | Mukhtar | karmiz | KII |
| 10 | **Sinun** | Khaluf kasim ali | Mukhtar | qunei | KII |
| 11 | **Sinun** | Khero kasim omar | Mukhtar | khurbaa | KII |
| 12 | **Sinun** | Khudar Mohamed ahmad | Mukhtar | kurshabak | KII |
| 13 | **Sinun** | Esmail amro | Mukhtar | Aloroba | KII |
| 14 | **Sinun** | Jardo abdo majdy | Mukhtar | kurmary | KII |
| 15 | **Sinun** | Kreat mohammed omear | Mukhtar | kutan | KII |
| 16 | **Sinun** | Shifan khuder musa | Mukhtar | duhula | KII |
| 17 | **Sinun** | Sulaiman afdal | Mukhtar | huteen | KII |
| 18 | **Sinun** | Sadoon kasim elyas | Mukhtar | hurdan | KII |
| 19 | Sinun | khalif hassan | mukhtar | bakhlif village... | KII |
| 20 | Sinun | Ali khudeda khalif... | mukhtar.. | a data village... | KII |
| 21 | Sinun.. | Saeed barakat sallow | farmer | Sinun | KII |
| 22 | **Sinun** | Rihzan salim yousif | Whole sale market | Sinun | KII |
| 23 | **Sinun** | Farhan yousif husan | Whole sale market | Sinun | KII |
| 24 | **Sinun** | Dakhil sedo darweesh | Whole sale market | Sinun | KII |
| 25 | **Sinun** | Nazeer abdalla sameer | Whole sale market | Sinun | KII |
| 26 | **Sinun** | Hadi ali rasho | Whole sale market | Sinun | KII |
| 27 | **Sinun** | Abdalla Sameer khalil | Whole sale market | Sinun | KII |
| 28 | **Sinun** | Abas taalo salieem | Whole sale market | Sinun | KII |
| 29 | **Sinun** | Sgafan hajy | Whole sale market | Sinun | KII |
| 30 | **Sinun** | Nawaf ali hussun | Whole sale market | Sinun | KII |
| 31 | **Sinun** | Saeid khearo maho | Whole sale market | Sinun | KII |

## Annex II. Copy of the used questionnaire

**Tools and questionnaires for assessment agriculture, irrigation and food value chain in Nineveh Plain and Duhok Governorate**

|  |  |  |  |  |  |
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| **Questions for Key informant Interview (KII) and Focus group discussion** | | | | | |
| **Interviewee Description** | | | | | |
| Name of interviewee | Age | sex | Number of families/ Villagers | Marital state | Location |
|  |  | ☐ Male  ☐ Female |  | ☐Married  ☐ widowed  ☐ separated  ☐ Single |  |
| 1. **Increased productivity and marketing of farm produce**   Are you satisfied from your farm productivity and marketing? ☐ yes ☐ no  If No, why???  -Do you have transportation facilities to increase your productivities and marketing?  ☐ yes ☐ no  -Do you have Irrigation Facilities (canals, tube, well)? ☐ yes ☐ no  -Proper Marketing Facilities; is the local markets adopt (price support policy) and minimum prices is guaranteed to the peasants? ☐ yes ☐ no  Have you been supplied with inputs (as a subsidies from the government)? ☐ yes ☐ no  If yes, please mention the kind of subsidy?  ☐ fertilizers ☐land lease ☐ transportation fees ☐pesticides ☐herbicides(weeds)  ☐ Marketing ☐spare materials ☐ Electricity and/or fuel for generator ☐other  -Are there any directives or instructions from the government on the provided subsidies? Please mention them.  -Any kinds of subsidies from non-governmental bodies like NGOs, please specify them (kind of subsidy and NGO name)?  ☐ fertilizers ☐land lease ☐ transportation fees ☐pesticides ☐herbicides(weeds)  ☐ Marketing ☐spare materials ☐ Electricity and/or fuel for generator ☐other  Agricultural Education: Do you need agricultural education and extension services with regarding to adoption new technology in farming? ☐ yes ☐ no  Land Reforms: do you aware about the existing land legislations? ☐ yes ☐ no  Do you believe that distribution of the land by the state among the small and marginal farmers will be helpful in increasing productivity and marketing of farm produce? ☐ yes ☐ no  Any suggestion for productivity and marketing of farm produce: | | | | | |
| 1. **Training on sustainable (Climate Smart) agriculture practices**   Climate-smart agriculture is an approach to overcome challenges posed by climate change: to maintain or improve food security, to help farmers adapt to climate change, and to reduce the amount of greenhouse gases in the atmosphere.  Are you using Climate-smart agriculture practice; please selected the adopted strategy:  ☐Control pests and weeds using integrated management approaches.  ☐Apply compost, manure and green manure instead of increase use of fertilizer, pesticides and herbicides.  ☐Rotate crops with legumes to fix nitrogen and reduce use of artificial fertilizers.  ☐Use energy-efficient methods, such as solar power and biofuels instead of using machines that usually relies on fossil fuels – such as tractors and diesel pumps.  ☐ Using locally adapted varieties and breeds to ensure their stability in the face of climate change.  ☐ Using of existing areas rather than expanding to new areas.  -Do you Greenhouses? ☐ yes ☐ no  Please state the number:  -Size of the used green house in m2?    -Type of the greenhouses opened (no climate control system besides natural ventilation) or closed.  ☐ opened ☐ closed  -What is the most common type of the produced vegetables?  -Quantities of the produce; does it meet the local demands? ☐Yes ☐No  If yes, how to deal with the produce, marketing?  If no, why?  -System of the cultivation  ☐ throughout the years ☐ Seasonality ☐ periodic according the local demands  -Estimated Costs of each house in ID  -Quality of the used greenhouses  ☐ good quality (durable) ☐ poor quality  - Associated problem in not choosing the durable quality  ☐ high cost ☐ not available within the local market ☐ other  - The main Issues hindering maintaining of the used greenhouses  -Estimated Outcomes of each house/ year in ID?  -Associated problem in terms of quality of the Used tubes for the irrigation system:  ☐ Cost of the used tube ☐ quality of the used tubes ☐Lack of the funds ☐ Lack of the spare materials  -Do you need regular training courses on  ☐ Agriculture extension, ☐ Agriculture protection ☐ Management ☐ Marketing  -Do you usually relay on the related directorate (agriculture) in detection and confirmative diagnosis of the prevalent pests: ☐ Yes ☐ No  If no please mention the alternative and why?     1. Water efficient and sustainable irrigation practices.   Adopted Irrigation system  ☐Surface irrigation ☐Drip irrigation ☐ Sprinkler irrigation ☐ Solar water pump system  - Efficiency and sufficiency of the sued system?  ☐ Efficient and satisfied ☐ Non-efficient,  - Any problem in the used system?  - How to manage it, mitigation process?  Suggestions for improvement:  If the source of water supply is ground water (well), do you have any problem with the pumping,  ☐ Yes ☐ No  If yes, please explain the cause:  What is the source of the electric supply?  ☐ National supply ☐ Private electric generator ☐ Solar source ☐ Other | | | | | |
| 1. **Pests** **Promotion and facilitation of Integrated Pest Management**   **1.**Dealing with the prevalence of the vegetables and crops pests  -Do you have enough knowledge about how to deals with pests? ☐ Yes ☐ No  If yes, please specify the source of the information.  Are you applying Pesticides? ☐ Yes ☐ No  If yes, please specify, through Using ☐ Chemical (pesticides) ☐ Natural way  -Source of the pesticides; ☐ Governmental with subsidy ☐ Privates sectors (local suppliers).  If not, why?  ☐ lack of the required funds, ☐ lack of the required equipment,☐ lack of the required skills ☐ not available  Are you using fertilizers ☐ Yes ☐ No  If yes, type of fertilizers ☐ chemical ☐ natural (animals dungs)  If no, please specify why?  2.Dealing with the prevalence of animals diseases  -Do you have enough knowledge about how to deals animals diseases? ☐ Yes ☐ No  If yes, please specify the source of the information.  -Do you need regular training courses on  ☐ veterinary extension ☐ Protection ☐ Management of animals project ☐ Marketing of the produce  -Do you usually relay on the related directorate (Veterinary) in detection and confirmative diagnosis of the prevalent  diseases ☐ Yes ☐ No  If no please mention the alternative and why?  Are you following the prophylactic control program in controlling of the animals disease?  ☐ Yes ☐ No  If yes, please specify, through Using ☐ vaccination programs and medicine ☐ Natural way  -Source of the vaccines and medicines; ☐ Governmental with subsidy ☐ Privates sectors (local suppliers).  If not, why?  ☐ lack of the required funds, ☐ lack of the required equipment,☐ lack of the required skills ☐ not available | | | | | |
| 1. **Build sustainable seed systems in cooperation with the Government**   -Source of the used seeds?  ☐ Stored seeds ☐ Governmental with subsidy ☐ Privates sectors (local suppliers)  If it is from private sectors, are you satisfied with the used seeds in terms of quality, cost?  ☐ Yes ☐ No  If yes, could you please tell us about the:  -germination rate of the used seeds  - resistant to the local environment  If no please mention why?  -Are you ready to pay extra for a good quality seeds? ☐ Yes ☐ No  Are there any directives or instructions from the government on providing seeds? ☐ Yes ☐ No  If yes, could you please specify them  -  - | | | | | |
| 1. **Value chain development of products**   - Are you aware about the most needed produce by the local markets? ☐ Yes ☐ No    Are the local demands covered by the local products? ☐ Yes ☐ No  If yes, please mention where the farmers in Ninawa/ Duhok mainly sell their product?  ☐at the wholesale market ,☐local small market or ,☐by retail ,☐other mentioned  How do the farmers deal with surplus of the produces during the productive season?  - Storing using refrigerator storage until the price and the demand increases  - Exporting to the nearby provinces  - Food processers (value chain)  If not, please mention why?  ☐lack of subsidies or required funds for expanding and development the existing farm (agricultural and animal farming)  ☐lack of the required instrument and facilities (Vehicle, Fuel, Repairing and storage facilities)  ☐ lack of processing facilities (Machines, factories, Electricity, Packaging, Marketing).  ☐ Distribution/ Logistics (Vehicle, Fuel and Storage).  ☐ Retail (Shop rent, Labour, Advertising)  What is the main sources of the produce (agriculture or animals products including milk and meat product)  ☐ locally produced (inside the country/ others provinces)  ☐imported from the neighboring countries mainly turkey or Iran  - Demands on the local or imported are higher?  If imported is higher, why?  ☐Price expected reason ☐Quality  - What are the most common imported crops and vegetables type?  - From where? Could you please mention the country?  Traders opinion on the local and imported produce  -  -  Any factory for processed products in Duhok/ Ninawa and what kind of the product they are processing?  -  - | | | | | |
| 1. **Increase product quality.**   The quality of the produce  - ☐Good quality ☐poor quality  - If poor why?  -  - Suggestion for improvement of the produced quality  -  -  - Are chemical materials (pesticides or medicine in case of animals’ product) used in production process? ☐yes ☐no  If yes, where did u get it? ; ☐ Government ☐ Privates sectors (local suppliers).  -  -  - Knowledge on the used pesticides or medicine used?  -  -  - Traders at the wholesale market, do you aware about the possible contamination of the imported vegetable or any product from the neighboring countries? ☐ yes ☐no  If Yes how? ☐from the colour,☐ Firmness,☐ size ,☐odor ☐other | | | | | |
| 1. **Improve post-harvest handling and storage facilities**   -Have you a clear understanding of the grain quality that is required from a specific market opportunity? ☐ yes ☐no  If no, do you need training and educational/ extension courses?  - Do you know how to get high quality grain on-farm? ☐ yes ☐no  If no, do you need training and educational/ extension courses?  -Are you able to recognise when crops are mature in the field? ☐ yes ☐no  Do you need training and education/ extension courses?  -Are you harvesting on time? ☐ yes ☐no  If yes, do you have facilities? ☐ yes ☐no  If not, what kind of the facilities you need?  -Do you have facilities for proper threshing of crops? ☐ yes ☐no  -Do you have plan to store your crops post harvesting? ☐ yes ☐no  -Do you have enough space for storage of the produce? ☐ yes ☐no  -Do you have enough information on proper storage of the yields? ☐ yes ☐no  If no, do you need training and educational/ extension courses on proper storage?  -Do you have transportation facilities for transporting the crops as soon as possible from field to the homestead for further drying? ☐ yes ☐no  -Do you have information on food hygiene /preventing postharvest losses? ☐ yes ☐no  If no, do you need training and educational/ extension courses on preventing postharvest losses?  -Do you have any suggestions?  -  -  Have you received any support from the government (subsidies/logistic support)?  ☐ yes ☐no | | | | | |
| 1. **Create direct market linkages.**   Do you any challenge in accessing buyers? ☐ yes ☐no  If yes, Could you please verify them?  Suggestion for overcoming these challenges.  -  -  Do you have direct relationships with more formal buyers? ☐ yes ☐no  If yes, Could you please name/ specify your buyers?  ☐ restaurants and hotel chains ☐ supermarket and Chain stores  ☐ institutions, such as schools, army or hospitals  -Do you have any contract with them? ☐ yes ☐no  .  Is there any institutional buyer within the area? ☐ yes ☐no  Are you selling your produce to itinerant traders? ☐ yes ☐no  What are ways to facilitate effective market linkages?  ☐ Introduce buyers / suppliers to co-operatives directly  ☐ Work with buyers / suppliers on how to approach co-operatives  ☐ Approach buyers / suppliers on behalf of co-operatives | | | | | |
| 1. **Investigate local processing or linkages with processors**   -Do you encourage having a linkage with the large enterprises (processors)? ☐ yes ☐no  -Do you think that linking with large enterprises (processors) will increase you incomes?  ☐ yes ☐no  -Do you have any linking with large enterprises (processors)? ☐ yes ☐no  What are your expectations from the presence of such linkage?  -  -  -  -Type of the linkage  ☐Contractual agreement  ☐Informal linkages and ad hoc arrangements  -Is there any subsidy or support from the processors?  Type of support  ☐Seeds, ☐Fertilizer, ☐Agro-chemicals, ☐ Field preparation services, ☐supply of irrigation water, ☐produce transport, ☐Veterinary drugs, ☐Artificial insemination, ☐Animal feed. ☐Extension services | | | | | |

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