



**ACTED**

# Circular Agriculture Assessment

## Detailed Findings

Lebanon - 2022

By ACTED, LOST, Arc-en-Ciel

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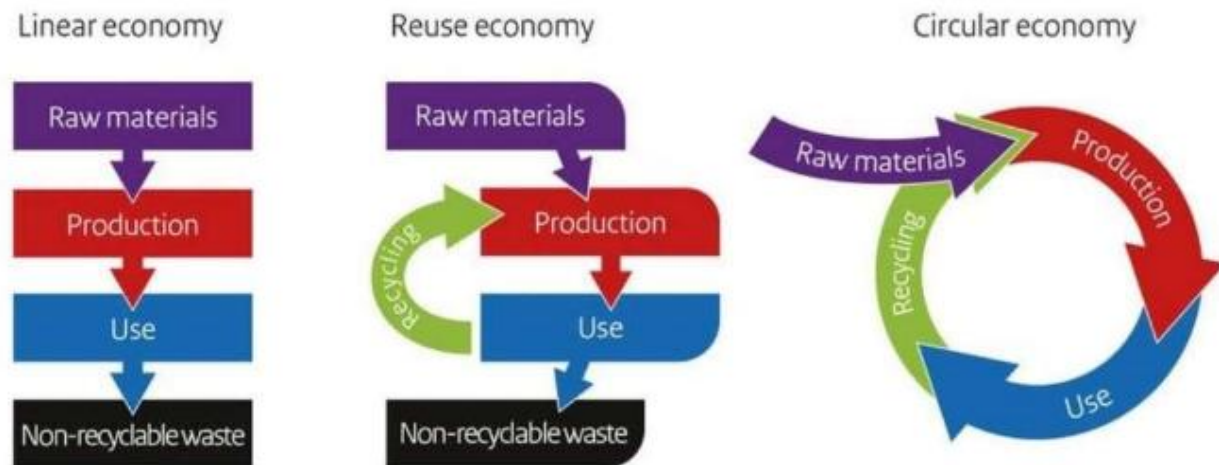
# Introduction

- For decades, the Lebanese economy, including the agriculture sector, has been suffering from low competitiveness and an uncondusive business environment. Today, the compounded impact of the Syrian conflict, the financial and economic downturn, the consequences of the COVID19 pandemic and Beirut explosion have subjected Lebanon to crises of massive magnitude.
- The agriculture sector employs almost 4% of the Lebanese workforce, directly or indirectly contributes to the income of 170,000 households, and is one of the main employers for Syrian workers. FAO estimates indicate that the value of agricultural output in 2020 will be 38% lower than in 2018 due to limited accessibility of imported inputs as a result of the liquidity problem and the devaluation of the Lebanese Lira, as well as farmers' reduced access to loans. The reduction of sales due to the COVID lockdown is likely to further reduce farmers' income.
- The macroeconomic situation worsens the situation for vulnerable groups, directly contributing to rising poverty and food insecurity, and increase competition for services and jobs in vulnerable areas. This also exacerbates rising Lebanese-Syrian and Intra-Lebanese tensions in vulnerable regions.



# Introduction

- A Traditional Linear Economy focuses on extractive industries and manufacturing processes that generate waste. Such a system has large environmental costs, as well service costs related to managing the waste produced by the economy.
- A Circular Economy on the other hand, promotes holistic solutions that move beyond collection and sorting of waste through infrastructure investments. Circular economy models that focus on cascading and return of materials either to the soil or to industrial production systems are important to ensure sustainable resolution to the waste crisis in the country while also creating jobs and reducing environmental degradation.



# Introduction

In 2019, ACTED conducted a nationwide circular economy assessment, including the agriculture sector. The main findings and conclusions were as follows:

- In the bio-waste value-chain, while most household-level composting systems are not currently viable, there are opportunities in the agro-business and manufacturing sectors to introduce anaerobic digesters to produce liquid fertilizer and biogas.
- Cost-recovery is possible if economy of scale can be achieved, and if the fertilizers produced are branded and marketed to compete with imports.
- Installing biodigesters and equipping industry with the technical skills to use them will have the dual benefits of reducing agricultural waste and branding it as a valuable resource.
- Supporting cooperatives and smaller enterprises to recycle agricultural waste and create value-added products, both for local consumption and export, would benefit the environment while creating employment opportunities, especially in the dairy, fruit and vegetable sectors.
- Market demand is currently unable to be met, while farming remains an important industry for Lebanon which can provide income generating opportunities to both poor Syrians and Lebanese farmers.





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# SECTION 1

## Key Findings

Farmers

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# Key Findings

## Topic 1: Seed Use, Perception, Supply

- In 2021, farmers mostly bought imported seeds/seedlings from a distributor, while also saving seeds/seedlings from their plants.
- Due to the economic crisis, farmers cannot always afford their usual source of seedling
- Overall there is a negative perception around the quality and productivity of seeds/seedlings saved from own plants
- Imported seeds/seedlings are reported to be less affordable, or not affordable at all, in 2021



# Key Findings

## Topic 2: Input Use, Perception, Supply

- Farmers mostly use store-bought fertilizer with standard NPK ratios, urea, store-bought animal-based organic fertilizer and locally composted animal manure. If they use compost or organic fertilizers, they tend to add non-natural inputs.
- Sources of fertilizers include local input supply shop, agricultural companies, and to a lower extent NGOs.
- Farmers are missing skills and knowledge on adequate composting practices.
- They are less able to afford fertilizers in 2021, and thus tend to use less in their farming.
- Farmers have diversified sources of compost and composting techniques.





# Key Findings

## Topic 2: Input Use, Perception, Supply

- Overall, farmers lack information and awareness on composting practices.
- Availability and affordability of agrochemical and natural inputs decreased between 2019 and 2021.
- Farmers have negative perceptions on natural inputs in terms of productivity, quality and efficiency compared to agrochemical inputs.
- However, knowing that agrochemical inputs are more expensive, farmers would be willing to use locally-produced natural inputs if they were cheaper.
- Farmers are loyal to specific inputs brands/suppliers such as Debbane, Robinson, Unifert.



# Key Findings

## Topic 3: Livestock Feed Supply

- Imported animal feed was less/not affordable in 2021.
- Farmers have a negative perception of locally produced animal feed in terms of quality but not in terms of nutritious contribution, and would be willing to use it if it came at a lower price than imported animal feed.



# Key Findings

## Topic 4: Water Use and Supply

- Around 50% of water needs of farmers were met in 2021, and expenditures on water supply represent less than 50% of the farmers' costs.
- Wells/bore well on farm is farmers' main water source and also reported as the most contaminated one.
- Farmers overall do not treat the water they use for irrigation.
- Farmers would be willing to use treated greywater or wastewater if at a lower cost, even though there are still negative perceptions around their use.
- Farmers are open to using renewable energy on farms (especially solar energy) if they are properly informed and can cover the costs.



# Key Findings

## Topic 5: Land Management

- If they possess the financial means, farmers normally check land and soil parameters through lab testing.
- Farmers primarily use tilling, border planting and terracing as land management practices.
  - Trainings on these practices were mostly provided by NGOs.
- Farmers are informed about the possibility of having a profitable farm with polyculture.



# Key Findings

## Topic 6: Post Harvest

- Farmers sell post-harvest goods directly to the distributor, sell it to a food processor, or store it in their farm/warehouse without a freezer.
- For the most part, they own or rent their transportation means, which are motorized but not always refrigerated.
- Compared to 2019, farmers have less capacities to afford cooling and transportation.
- Farmers are not always able to sell their harvesting product, for which they apply different uses
  - fruits & vegetables are the value chains with most potential for post-harvest valorization
- Post-harvest loss mostly leads to reduced ability to purchase inputs for the next season.
- Farmers cannot valorize waste because they lack machinery, knowledge, skills, etc.



# Key Findings

## Topic 7: Machinery Repair

- Main constraints faced by farmers for agricultural machinery repair are the cost of spare parts and services.
- Farmers usually know and trust local repairmen.
- Spare parts are mostly procured and imported from abroad.



# Key Findings

## Topic 8: Governance & Representation

- Farmers mostly get information on farming practices through local or international NGOs.
- They also get information on chemical inputs and seeds from large agricultural companies.
- An estimate of less than 50% of farmers receive information/support from extension centers.





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# SECTION 2

Key Findings

Regulations

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# Key Findings

## Regulations

- Few standards/regulations existing for the local production of inputs or the use of local inputs (apart from shops needing to be registered), the process is not as demanding as for export.
- There are standards for the import of specific inputs such as fertilizers, etc.
- Lack of clarity regarding existing standards for types of compost.
- Imported seeds are regulated.
- No specific regulations in terms of seeds distribution apart from shops registrations
- Several regulations exist for the import of animal feed.
- As for the local production of animal feed, there are no standards but production factories are subject to control and need to be registered.



# Key Findings Regulations

- No regulations on the distribution/ use of animal feed.
- Regulations exist in food processing facilities but are not necessarily linked to water pollution , only large certified farms have standards.
- Renewable energy in farms and cooperatives are only done by individual initiatives and there are no specific regulations so far.
- There are conditions/procedures to follow for compost and use of manure/surplus from agriculture waste but there are no regulations.





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# SECTION 3

## Assessment Objectives & Methodology

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# Objective and Scope of the Assessment

**Overall Objective:** To understand how to promote the transition from resource intensive and environmentally harmful agricultural practices towards more sustainable practices which can also improve farmer revenues and reduce waste, taking into account the current ongoing crisis in Lebanon.

**Scope:** Nationwide across all 7 governorates.

## Theme 1: Farmers Quantitative Survey

**Objective:** Understand small and medium size farmers practices in relation to seeds, inputs, livestock, etc. and whether those include local production or local practices, as well as their willingness and perception of sustainable practices and the type of challenges they are facing.

## Theme 2: Regulations Qualitative Survey

**Objective:** Understand the agricultural regulations background in Lebanon, what are the existing and upcoming regulations related to inputs, seeds, machinery, livestock, water and electricity.

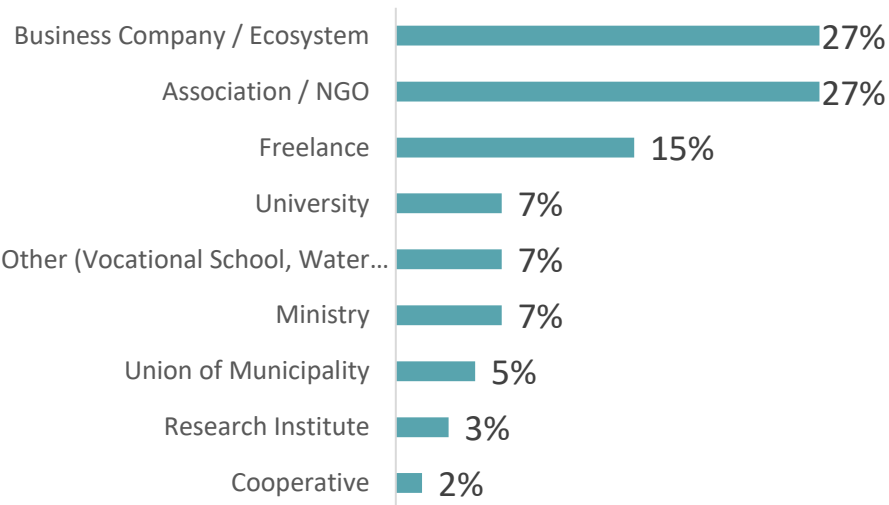


# Methodology

## Quantitative Survey of Farmers

A total of 59 Key Informants (KI) in the agricultural sector were interviewed, with their backgrounds consisting of the following:

Key Informants' Profile



Data collection took place between February & May of 2022, conducted by enumerators from ACTED, LOST, and Arc-en-ciel.

Enumerators from all 3 NGOs were trained online by one of ACTED's AME Officers (AMEO). Data collection took place mostly via phone (76%) and in-person (24%).

**Sampling:** at least 5 Key Informant Interviews (KII) per location, and at least 3 surveys filled out per topic.

Whenever a KI provided information at a «Nationwide» level, their answers were counted across all governates.

# Methodology

## Quantitative Survey of Farmers

A total of **116 entries** were collected through a quantitative questionnaire, providing information on farmers' practices across all governorates.



- Lengthy questionnaire, with KIs lack of availability and willingness to dedicate one hour to conduct the assessment.

- Lengthy process to gather relevant information from all 7 governorates as a result of the geographic scope of the assessment (nationwide).
- Lack of capacity of KIs to provide accurate figures when asked about average amounts of costs, %, etc., leading to findings that cannot be used.
- Lack of capacity of some KIs to provide full technical information, resulting in a high number of responses that are « Don't know/No response » in the charts and findings.
- Some KIs were not able to provide information on all topics, resulting in some topics having less entries than others and needing to be considered more cautiously as they are less representative of farmers' practices (Topic 3-Livestock, Topic 7-Machinery Repair)

# Methodology

## Qualitative Survey of Farmers

- Survey was qualitative with open-ended questions.
- Total of 9 Key Informants from different backgrounds in the agricultural sector (Chamber of Commerce, MSME, Syndicates, Ministry of Agriculture, Ministry of Environment, extension center) were surveyed.
- Data collection between March and April of 2022 was conducted by enumerators from ACTED, LOST, Arc-en-ciel.
- Interviews were recorded and then transcribed and translated by the enumerators.
- Data collection mostly took place via phone/zoom (8) or in-person (1).

### Limitations:

- Though the questionnaire was short, its nature of being open ended caused some KIs to lack time or willingness to complete the assessment.
- Due to technicality of the subject (regulations), lack of knowledge of some respondents, thus leading to a small amount of relevant responses or people not able to provide answers to some questions





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# SECTION 4

## Detailed Findings

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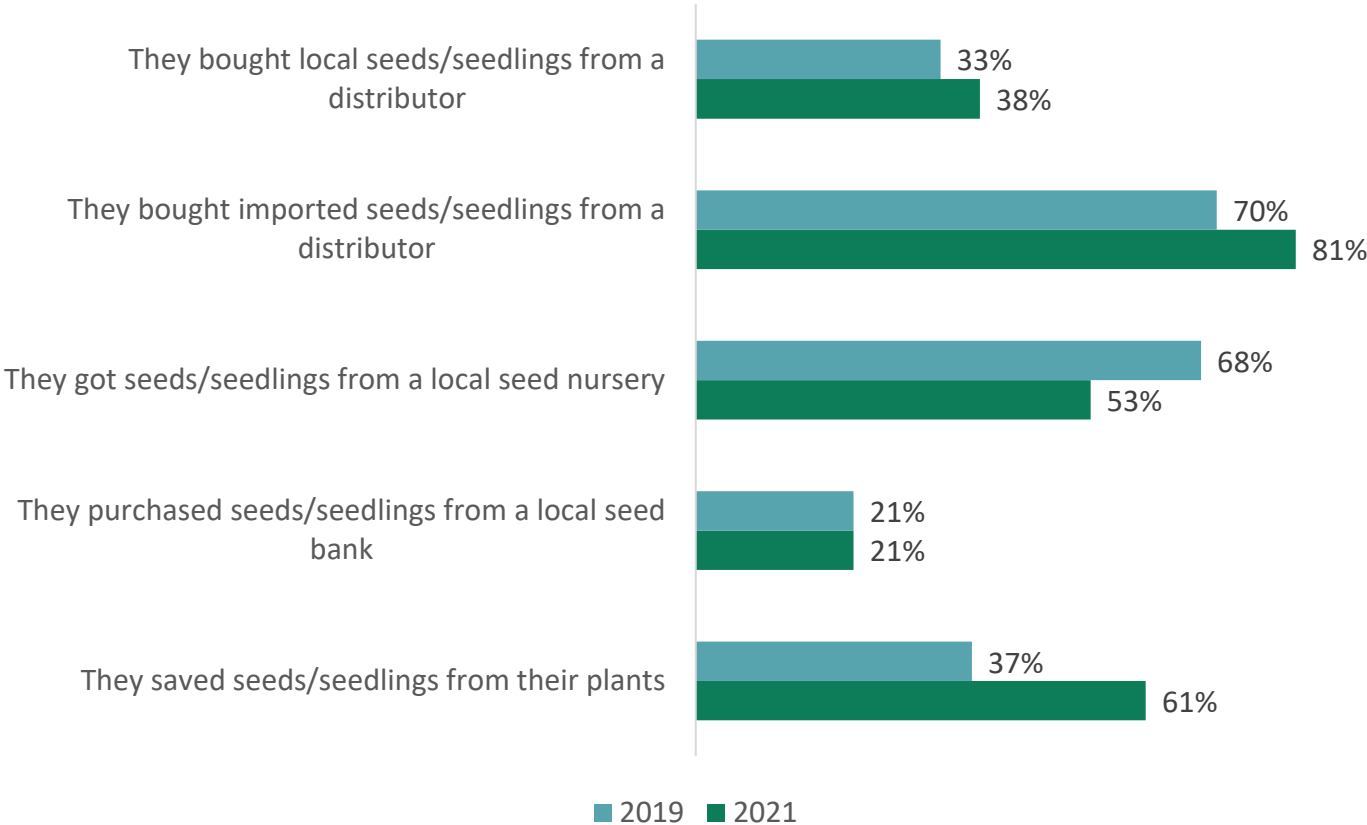


# Topic 1: Seed Use, Perception and Supply

*94 entries*

# Evolution of Sources of Seeds and Seedlings Between 2019 and 2021

Farmers' main sources of seeds and seedlings in 2019 vs. 2021



# Evolution of Sources of Seeds and Seedlings Between 2019 and 2021

- According to the KIs, a vast majority of farmers across Lebanon bought imported seeds/seedlings from a distributor both in 2019 and 2021 (with a small increase of 15% between 2019 and 2021).
  - In 2021, imported seeds seemed to be the main source of seeds/seedlings for farmers (cited by 81% KIs).
- In 2021, more farmers saved seeds/seedlings from their plants compared to 2019 (+62%).
  - 60% of KIs reported this as one of the 3 main sources of seeds/seedlings in 2021.
- Only a few farmers bought local seeds/seedlings from a distributor in 2019 (32%) and 2021 (38%).



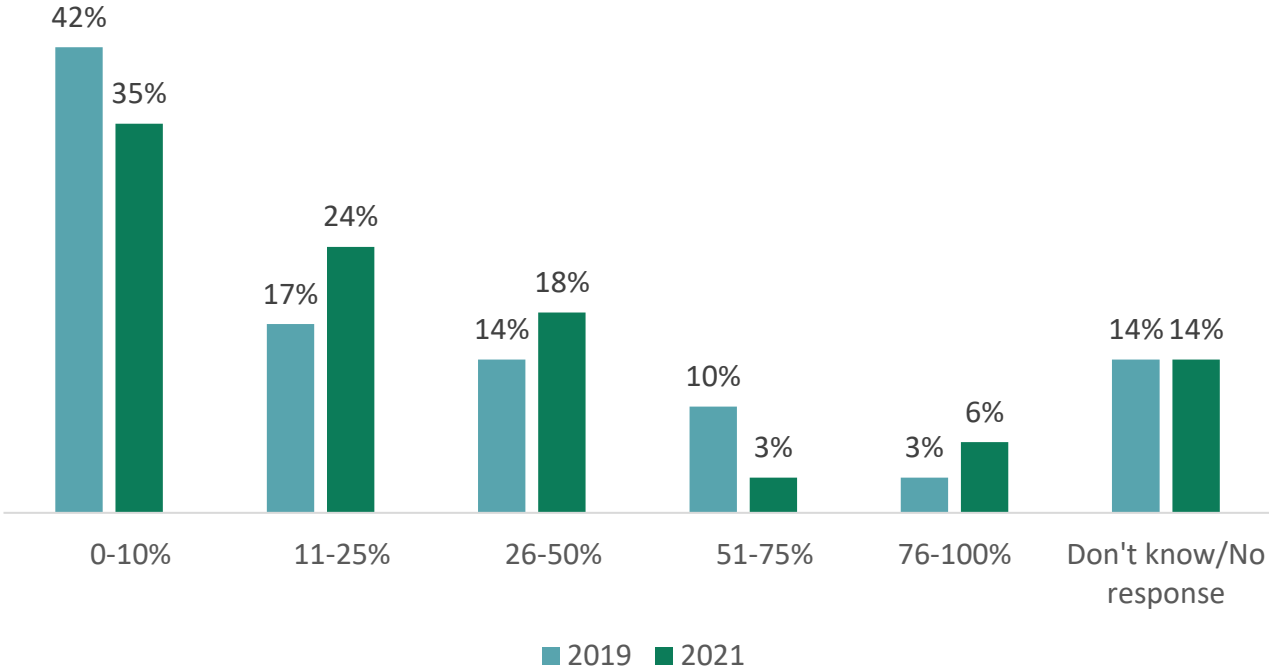
# Evolution of Sources of Seeds and Seedlings Between 2019 and 2021

- Overall, there doesn't seem to be any major change in the source of seeds/seedlings used by farmers between 2019 and 2021, apart from an increased percent (62%) of farmers saving seeds/seedlings from their own plants.
- A bit more than half of the respondents (55%) however stated that farmers have changed their main source of seeds/seedlings in the past year, all citing as the main reason that they could no longer afford their previous source of seedlings.



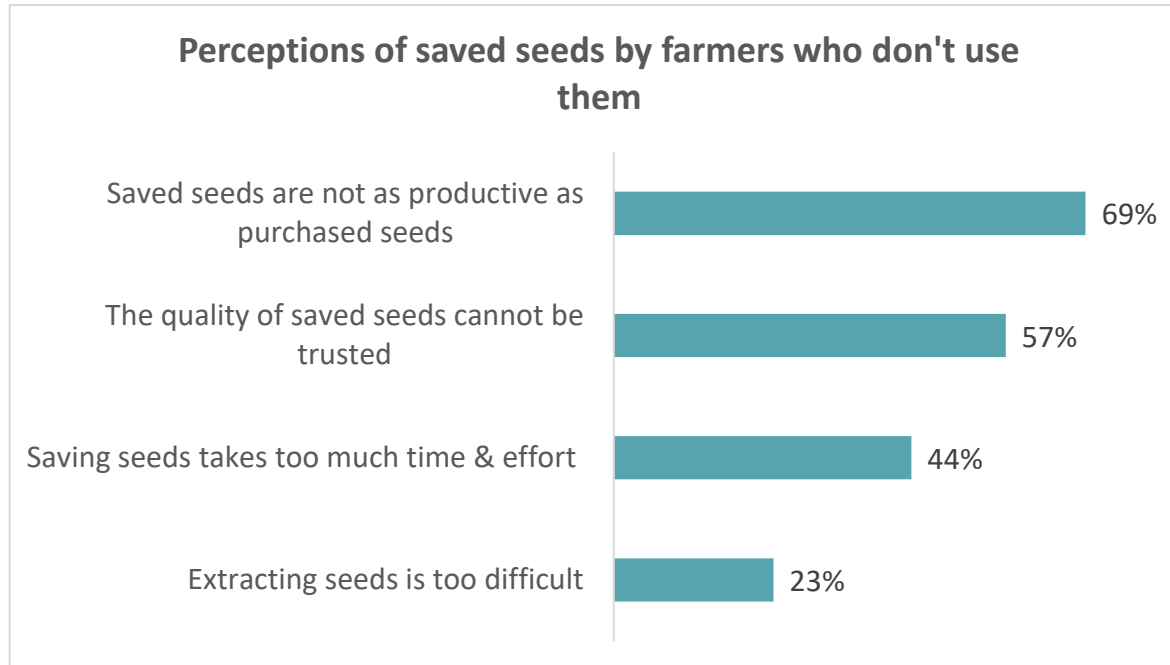
# Farmers' Use of Seeds/Seedlings from their Own Plants or Local Nurseries

What estimated percentage of farmers use seeds/seedlings saved from their plants or from a local nursery?



# Farmers' Use of Seeds/Seedlings from their Own Plants or Local Nurseries

- An estimated 53% of farmers use seeds/seedlings saved from their own plants or a local nursery
- The following reasons explain why other farmers do not follow this practice :



# Affordability of Seeds

- 53% of the respondents stated that seeds/seedlings were no longer affordable at the time of the interview.
- 33% stated that they were less affordable than in 2019, thus highlighting the difficulty of farmers to afford seeds due to the ongoing economic crisis in Lebanon.
- 13% declared that affordability was the same as in 2019.
- 1% stated that it was more affordable than 2019.



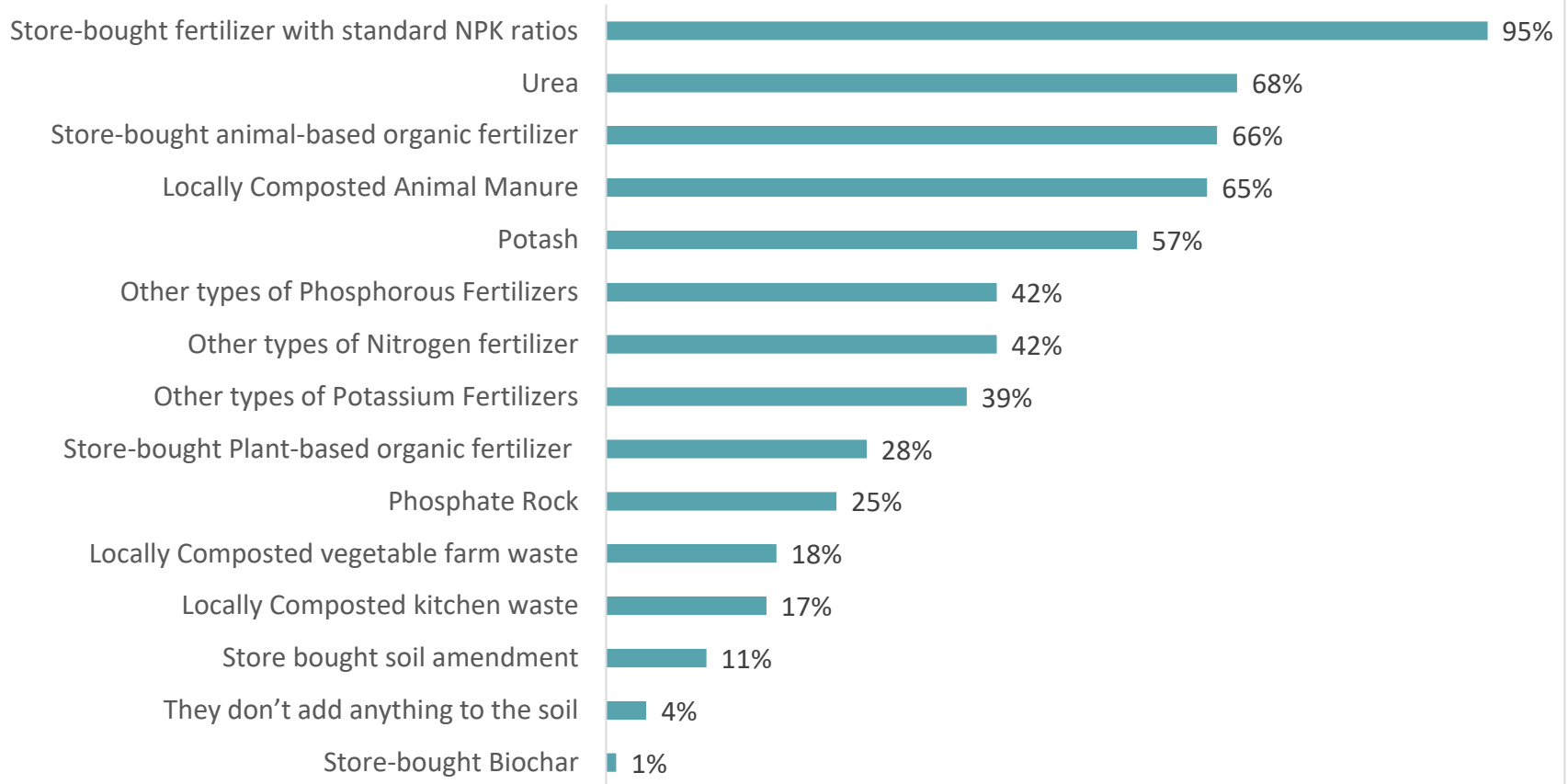
# Topic 2: Input Use, Perception and Supply

*93 entries*



# Fertilizers

## Fertilizers applied by farmers on their soil



# Fertilizers / Use of inputs

- Farmers primarily use: store-bought fertilizer with standard NPK ratios (95%), urea (68%), store-bought animal-based organic fertilizer (66%) and locally composted animal manure.
- The KIs reported that when farmers use compost and/or organic fertilizers, they tend to pair them with non-natural inputs such as pesticides (73%), herbicides (68%), fungicides (60%), weedicides (53%).
- Overall, 83% of KIs reported that farmers who compost/wish to compost on their farm are missing the skills and knowledge on composting practices, showing a lack of education in this field (especially in South, Nabatieh, Mount Lebanon, North).



# Use of Fertilizers

- Overall, KIs reported that farmers tend to use too much fertilizers (56%), while others reported that they didn't use enough (24%). 20% reported that they used an adequate quantity of fertilizers.
- However, 81% of KIs also reported that farmers bought/used less fertilizers in 2021 compared to 2019, all citing affordability during the economic crisis as the main reason



# Origin of Fertilizers

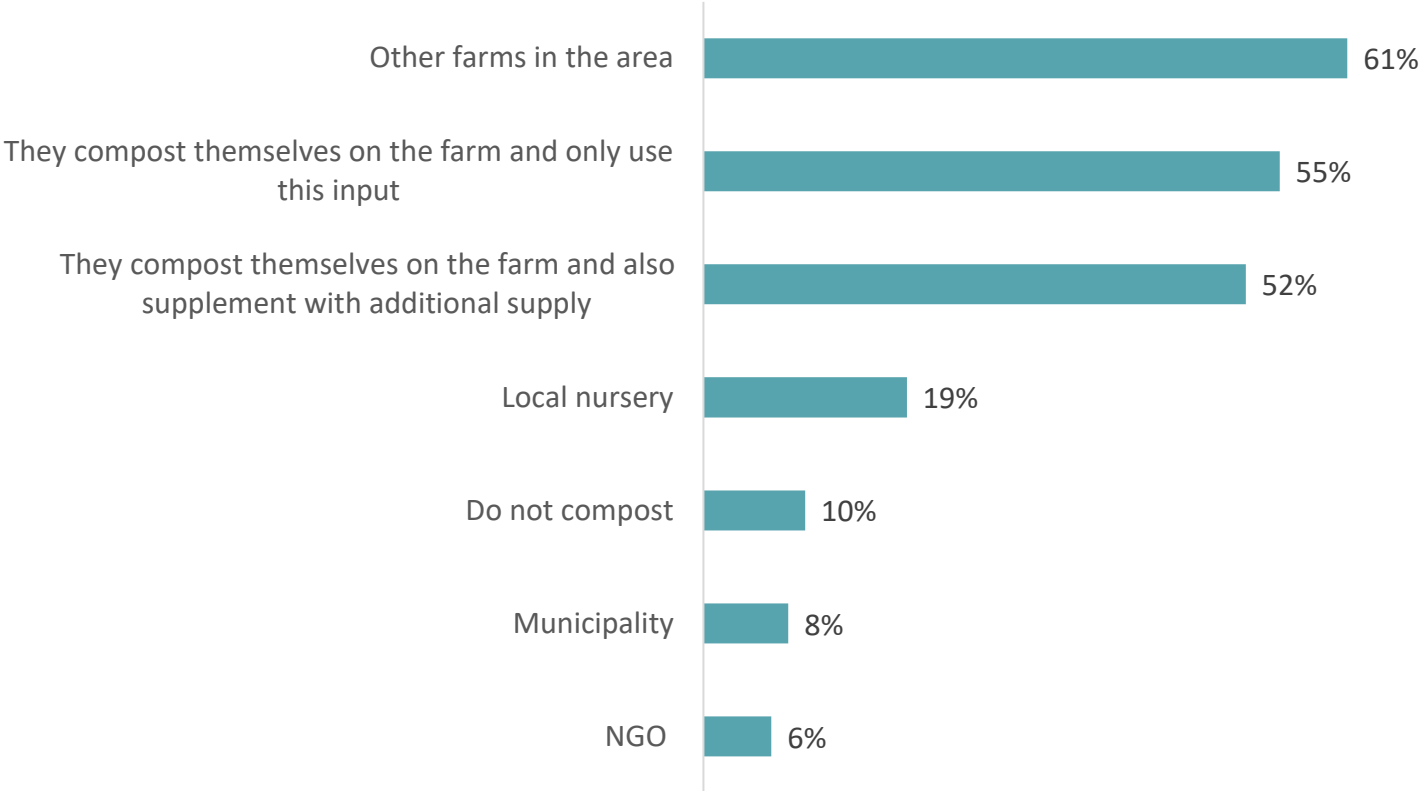
As per the KIs, farmers mostly buy/get their fertilizers from:

- Local input supply shops (78%); mostly the case for South & Nabatieh
- Agricultural companies (Unifert, Debbane, Robinson Agri) (73%) ;mostly the case for Bekaa
- NGOs (23%)



# Origin of Compost

If farmers use composted animal manure, kitchen waste or farm waste as inputs on their farm, where do they get the compost from?



# Origin of Compost

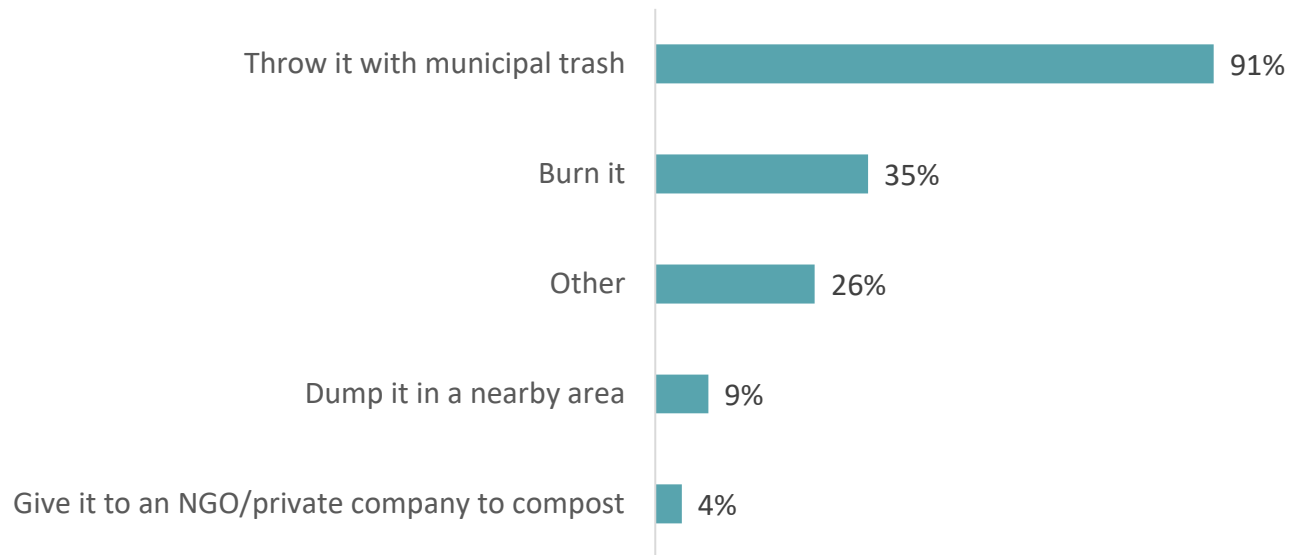
## Origins of compost per location:

- In Akkar, farmers mostly compost on their farm and add external supplies.
- In Baalbeck and the Bekaa, farmers either use their composts on their own farms, or sometimes supplement themselves with additional compost from other farms.
- In the South and Nabatieh, they either compost on the farm and supplement with additional supply or get compost from other farms in the area.
- In the North, farmers mostly get their compost from other farms in the area.
- When they compost on their farms, farmers mostly do **aerobic** (36%) and **anaerobic** (28%) composting, while **vermicomposting** or **biochar** don't seem to be well-known nor used. However, it is noteworthy that 28% of the KIs were not able to specify what type of composting farmers used.



# Other Uses of Agricultural Waste

If farmers DON'T compost on their farm, what do they do with their kitchen, agricultural and livestock waste?



Disposing of kitchen, agricultural and livestock waste with municipal trash seems to be the main practice used by farmers accross all governates.

« Other » included mostly selling the waste.



# Perception of Compost as a Source of Farm Input

Farmers who don't use composted animal manure, kitchen waste or farm waste as inputs on their farm mostly do so for the following reasons:

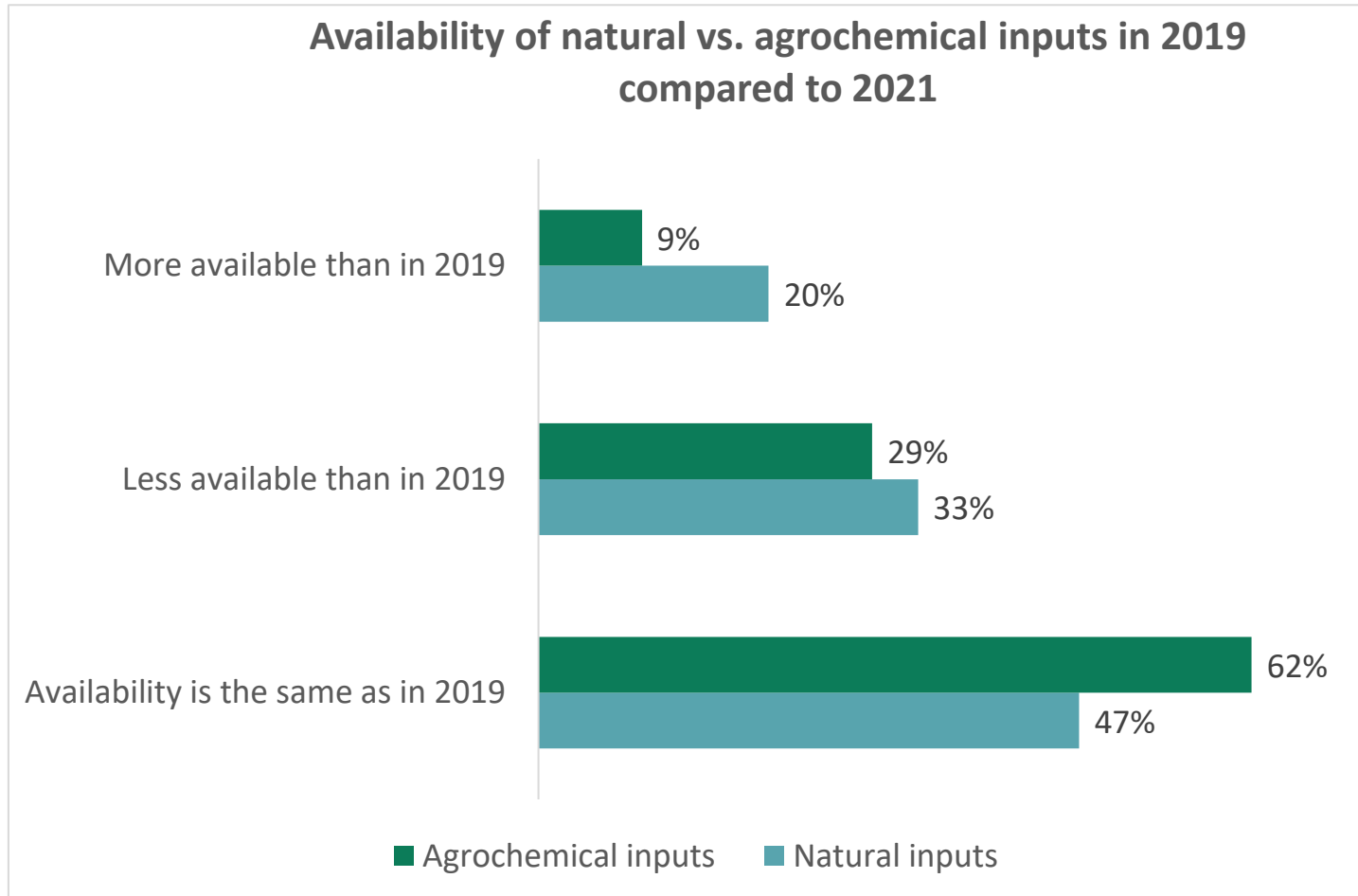
- They lack information on its productivity (51%)
- They lack knowledge on the process (45%)
- They lack awareness on its good impact on the environment (32%) or lack information on its ability to protect against diseases and pests (28%)
- To a lower extent, they don't see the need for it (9%) or don't like the appearance of compost (3%)

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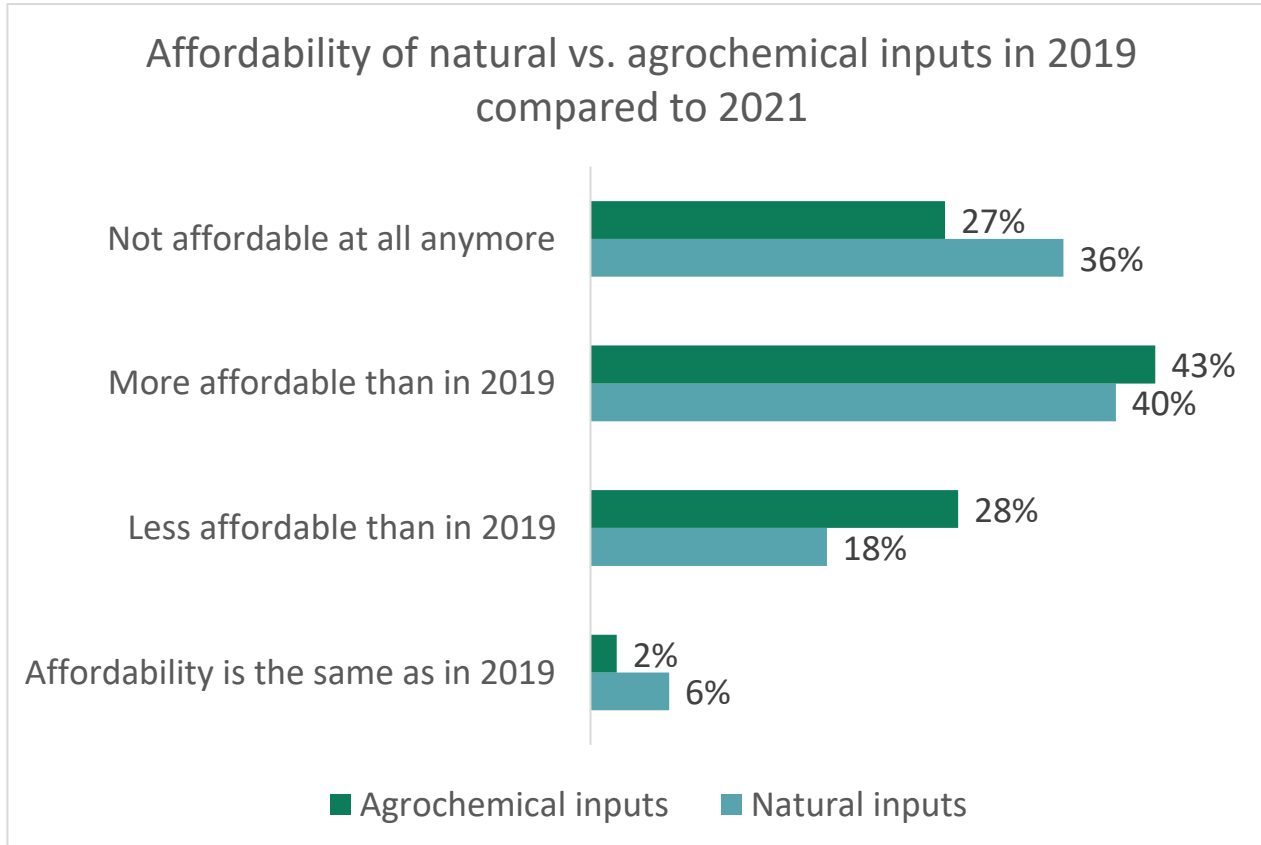




# Availability of Inputs



# Affordability of Inputs



# Natural vs. Agrochemical Inputs

Perceptions of farmers on natural versus agrochemical inputs:

- 90% KIs reported that farmers' perception is that natural inputs are of lower quality than agrochemical inputs.
- 91% KIs reported that farmers' perception is that natural inputs are not as productive as agrochemical inputs.
- 93% KIs reported that farmers' perception is that natural inputs are worse at pest and disease control than agrochemical inputs.



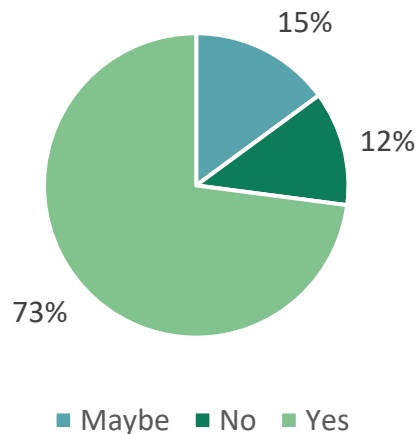
# Imported versus Locally Produced Inputs

- 95% KIs reported that farmers' perception is that locally-produced inputs are of lower quality than imported inputs.
- 96% KIs reported that farmers perception is that locally-produced inputs are not as productive as imported inputs.
- 83% KIs reported that farmers' perception is that locally-produced inputs are worse at pest and disease control than agrochemical inputs.
- Overall, KIs reported that the imported inputs are more expensive that the locally-produced inputs:
  - 32% reported that they cost 1.5 times more
  - 33% reported that they cost more than twice more
  - 30% reported that they cost twice more



# Natural vs. Agrochemical Inputs

If quality locally-produced natural inputs were available at a lower price than imported agrochemical inputs, would farmers be willing to use locally-produced natural inputs?



46% KIIs reported that farmers tend to prefer a specific input brand/supplier (citing mostly Debbane, Robinson, Unifert), mostly because they have used those brands for a long time and trust their results.

Value chains for which farmers would be willing to use locally-produced natural inputs: mostly vegetables (89%), fruits (84%), and cereals (81%), followed by leafy greens & aromatic herbs (51%), livestock (46%) and nuts (35%).



# Topic 3: Livestock Feed and Supply

*36 entries*

# Sources of Livestock

Main sources of livestock of farmers as cited by the Kis:

- They grow their own feed/have their own pastures (9/25, 36%)
- They buy locally-produced animal feed from local agricultural shops (8/25, 32% cited it first)
- They buy imported feed from a distributor (8/25, 32% cited it first)



# Imported vs. Locally Produced Animal Feed

- All KIs reported that imported animal feed is less affordable or not affordable at all anymore for farmers in 2021 compared to 2019.
- However, overall KIs reported that farmers tend to perceive that locally-produced animal feed is of lower quality than imported animal feed, even though a majority (64%) reported that farmers perceive that locally-produced animal feed is as nutritious as imported animal feed.
- 32% mentioned locally-produced animal feed is not as nutritious as imported animal feed.





# Sources of Livestock

- If farmers use organic animal feed, KIs reported that they mostly get it from other farms in the area, or produce it themselves on the farm and only use this feed.
- If farmers produce animal feed themselves, they mostly produce pasture.
- Overall, 61% of the KIs reported that if quality locally-produced animal feed was available at a lower price than imported animal feed, farmers would be willing to use locally-produced animal feed. The remaining KIs were not able to provide an answer on this.



# Topic 4: Water Use and Supply

*82 entries*

# Water Sources

Farmers' top 3 sources of water:

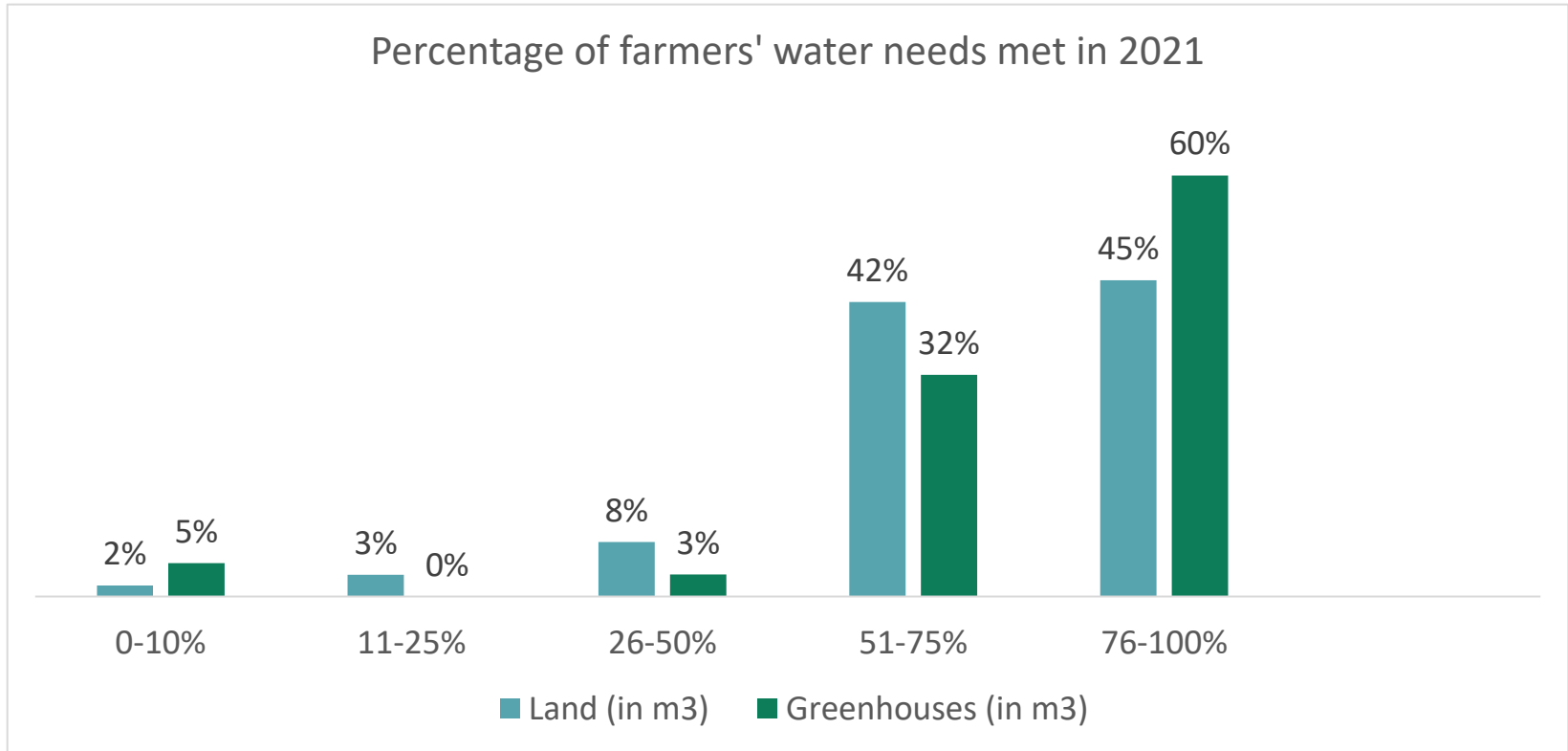
- Wells/bore well on farm (cited by 82%)
- Rain water collected and stored in farm (41%)
- Concrete irrigation canals from the Water Establishment (40%)

In Akkar, Nabatiyeh and the South, rainwater was cited as the 2<sup>nd</sup> main source of water.

KIs reported that farmers who collect and store rainwater on their farm mostly used ponds with bio-membrane liner as a storage technique.



# Water Needs



Across all governorates, around half of the KIs reported that farmers' water needs for land and greenhouses were not fully met in 2021.

## Water costs & debt:

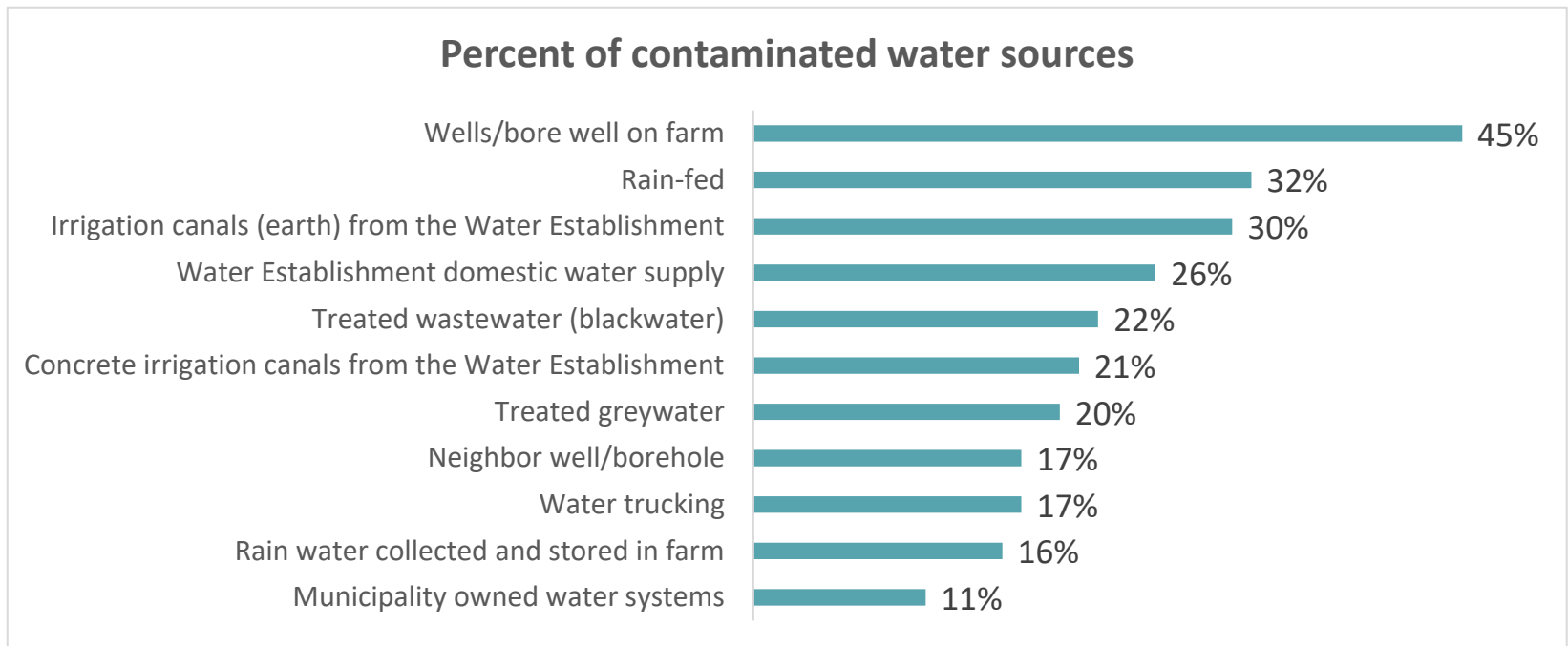
- Around 81% of KIs reported that less than 50% of the farmers' costs are spent on water supply on average in 2021.
- 60% of the KIs reported that overall, farmers are not currently in debt due to water costs.
- 30% of KIs reported that up to 24% of the farmers are currently in debt due to the cost of water – this was mostly reported for the governorates of Baalbek, Bekaa and South.

## Rainwater harvesting:

- KIs overall stated that a very small amount of farmers have a working rainwater harvesting system in place, but a majority of them stated they knew how to use and maintain it.

# Contaminated Water Sources

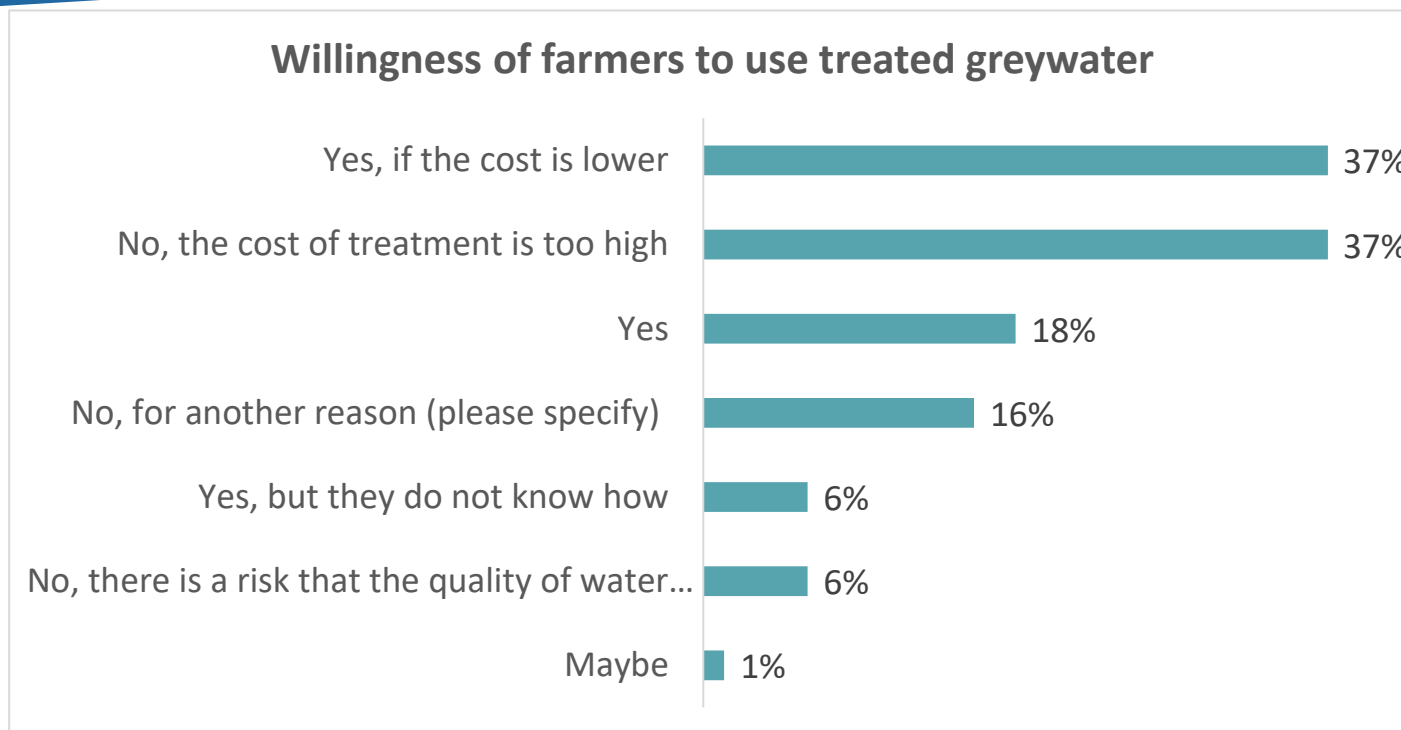
Overall, 93% of KIs reported that farmers do not treat the contaminated water they use for irrigation.



This graph highlights that wells/bore wells on farm, previously cited as the main water source in many locations, is the most contaminated one.

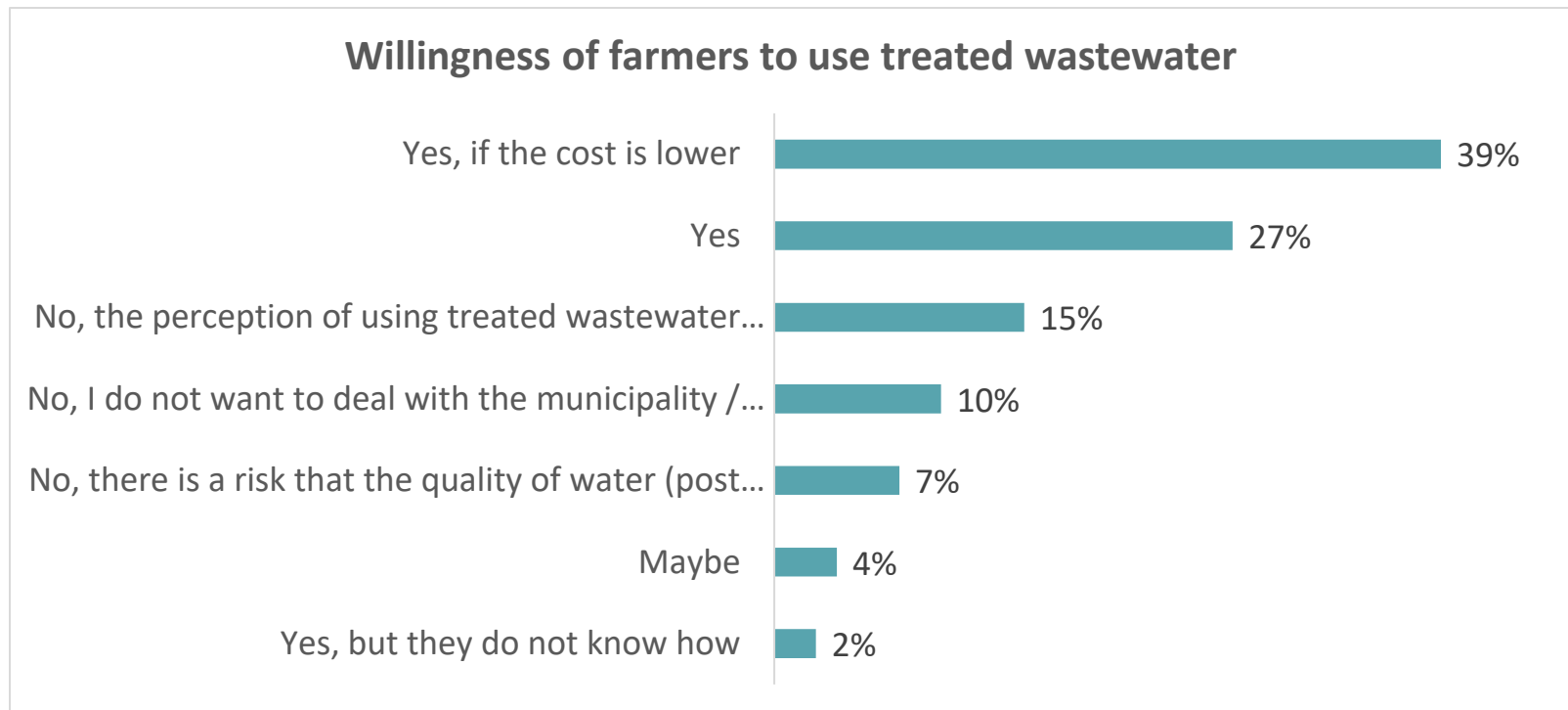


# Willingness of Farmers to Use Treated Greywater



Overall, most of the KIs reported that farmers would be willing to use treated greywater (water from household use, excluding toilets) for irrigation, specifically if the cost is lower. However, 36% also reported that the cost of treatment is too high.

# Willingness of Farmers to Use Treated Greywater

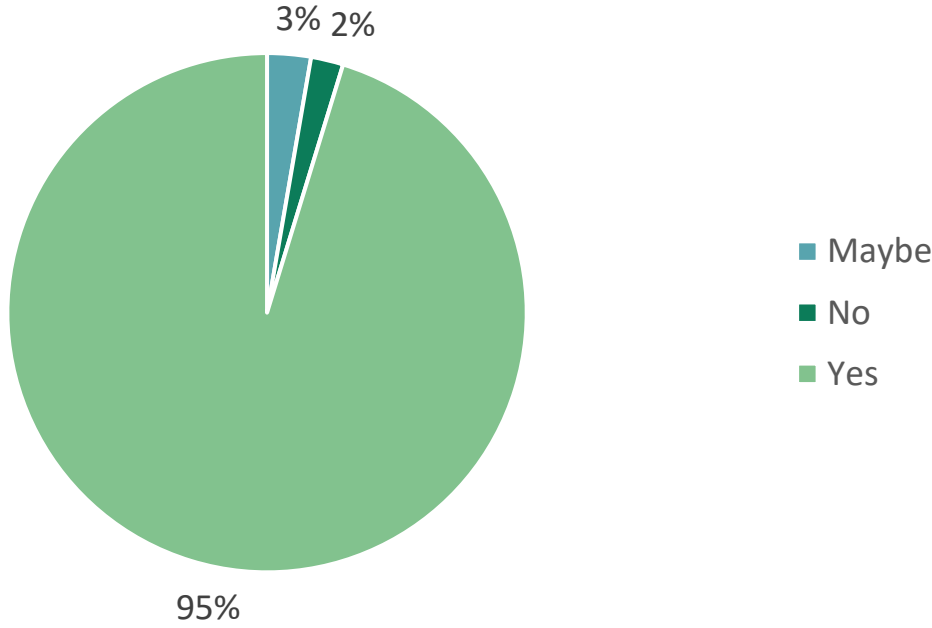


Overall, **63% KIs reported that farmers would be willing to use treated wastewater** (wastewater = sewage) (Wastewater treatment is a process used to remove contaminants from wastewater and convert it into an effluent that can be returned to the water cycle), however some still have negative perceptions of wastewater, even when treated.

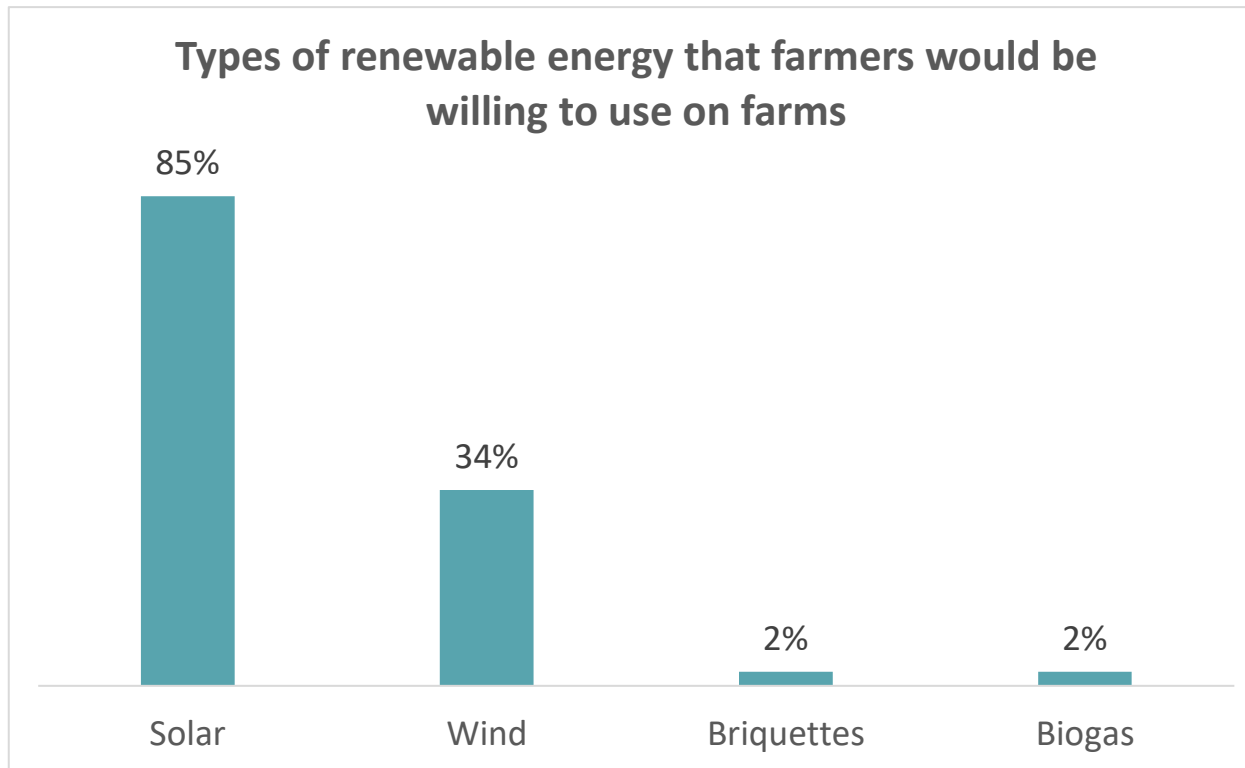


# Renewable Energy

Are farmers willing to use renewable energy systems on farms?



# Types of Renewable Energy



This graph demonstrates the current over-reliance on solar power in terms of renewable energy, while other solutions are under-developed and not well-known.



# Barriers to Renewable Energy

- Almost all KIs explained that the main barrier to the use of renewable energy on farms was the high installation costs.
- 23% also reported that farmers may have a lack of information on renewable energy.

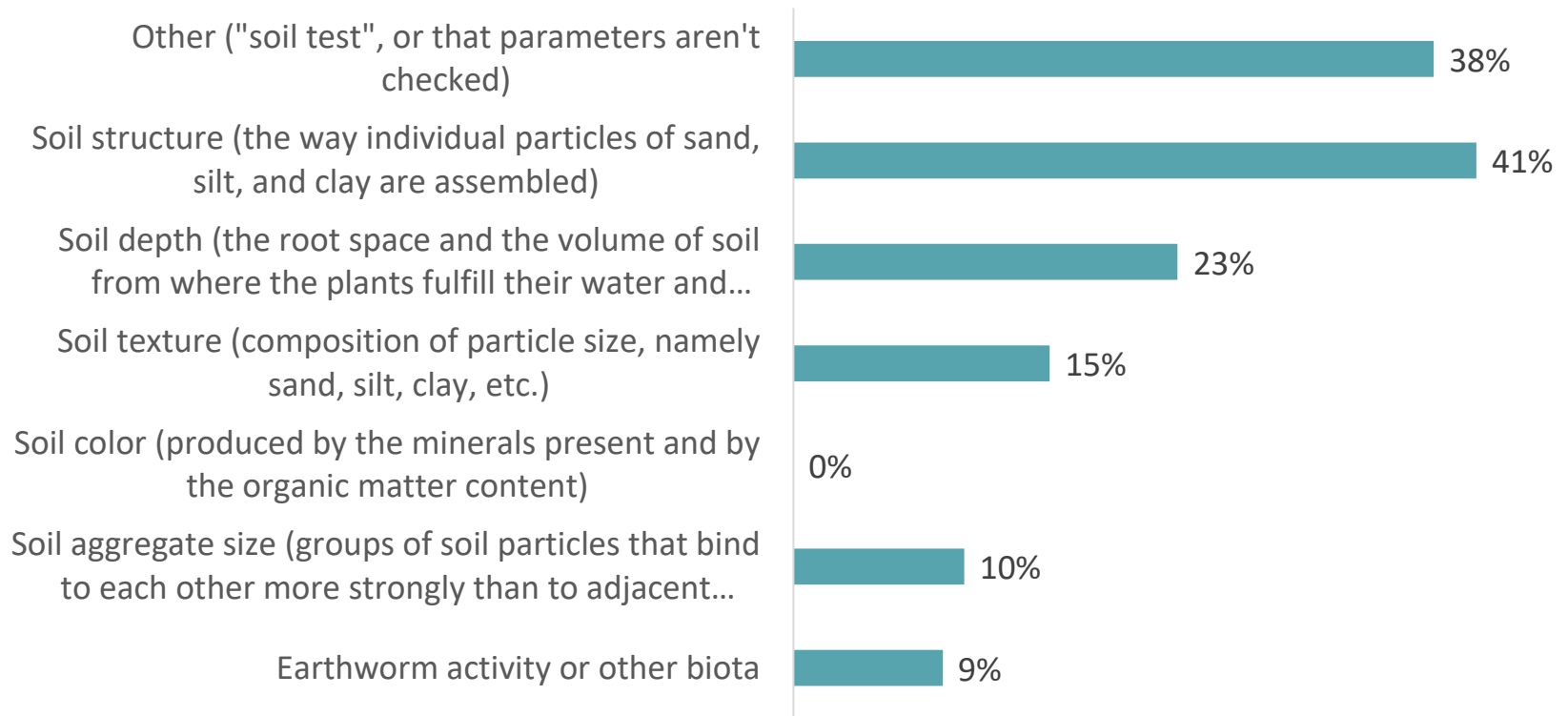


# Topic 5: Land Management

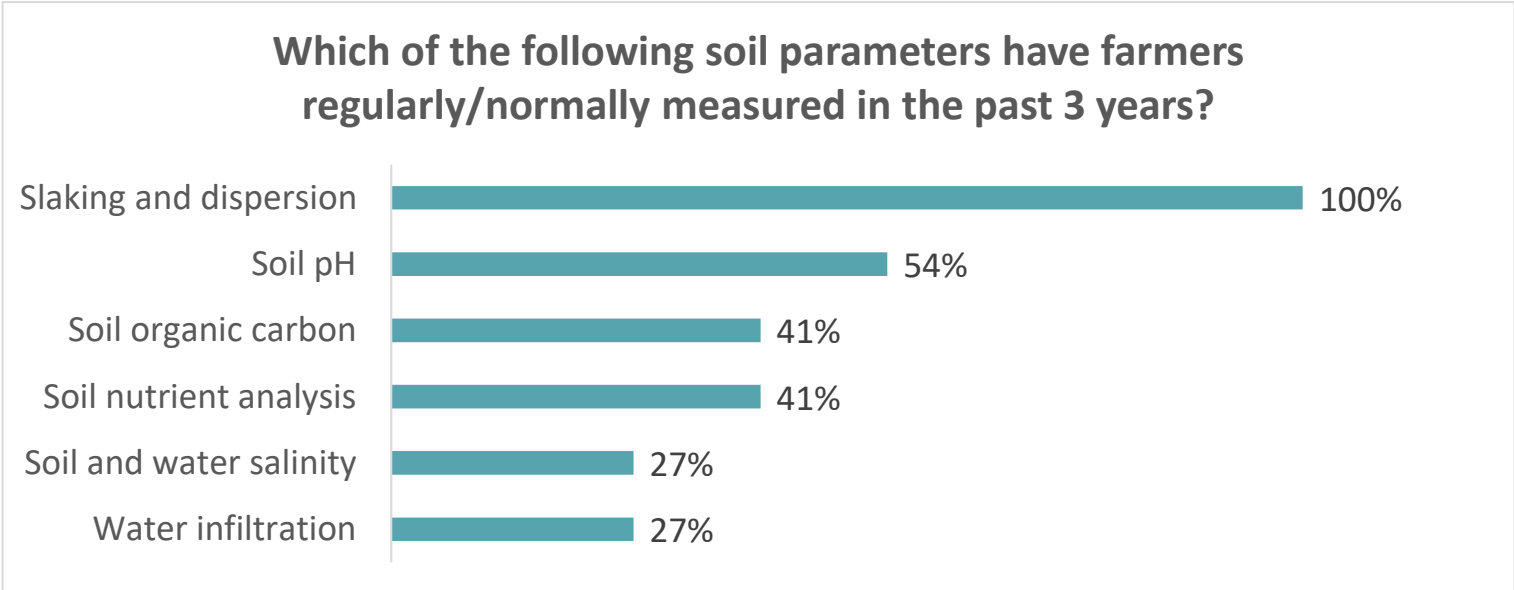
*79 entries*

# Checking of Parameters

## Parameters checked by farmers on a regular basis (at least every 6 months) through visual inspection of the soil on their farm



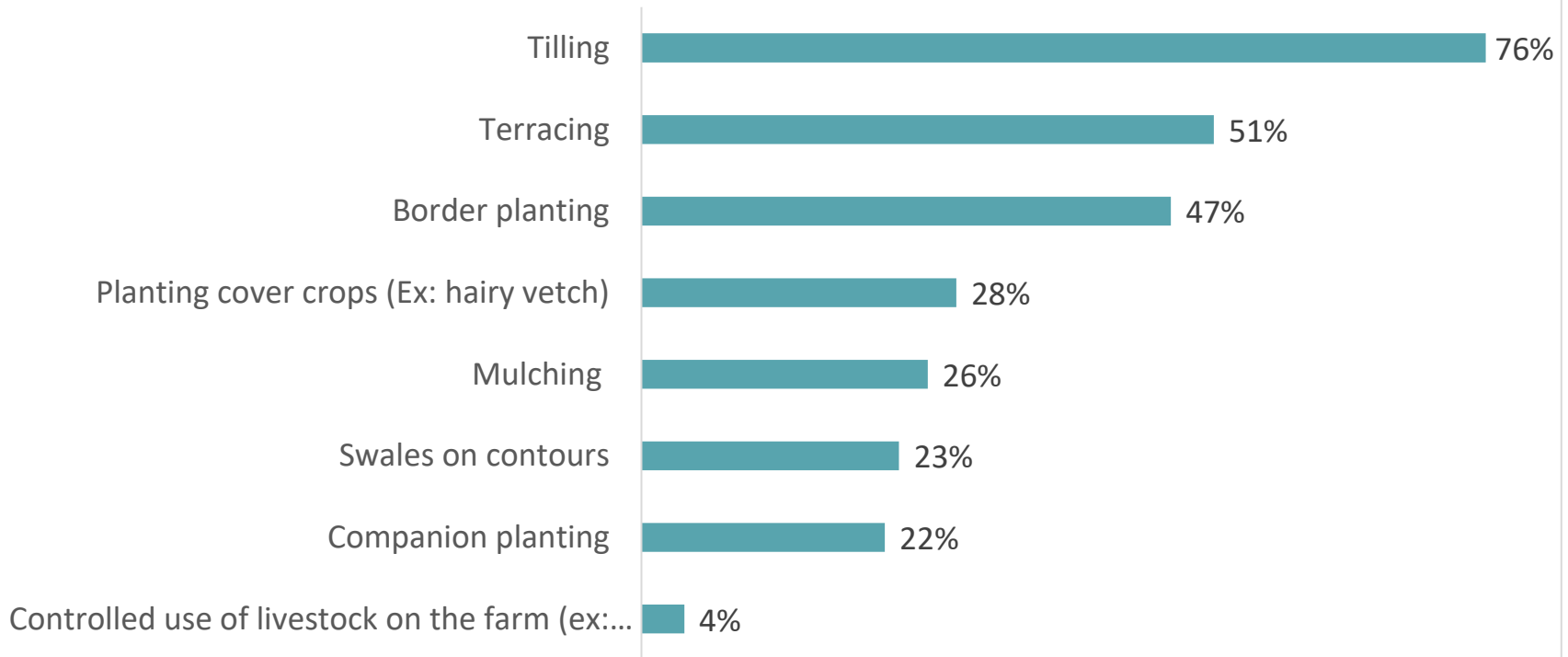
# Soil Parameters



72% of the KIs reported that farmers check those parameters through a lab, and 20% stated that they do so sometimes/not regularly. If they don't check it, it's mostly because they can't afford to check.

# Land Management Practices

Land management practices used by farmers



Overall, farmers mostly use **tilling** (76%), **border planting** (51%) and **terracing** (47%) as land management practices across all Governorates.



# Land Management Trainings

- Overall, 60% of the KIs reported that farmers received a training on some of these practices before (mostly on tilling and planting cover crops)
  - This figure decreased in Akkar and the South.
- Most trainings were given by NGOs.





# Perception of Polyculture

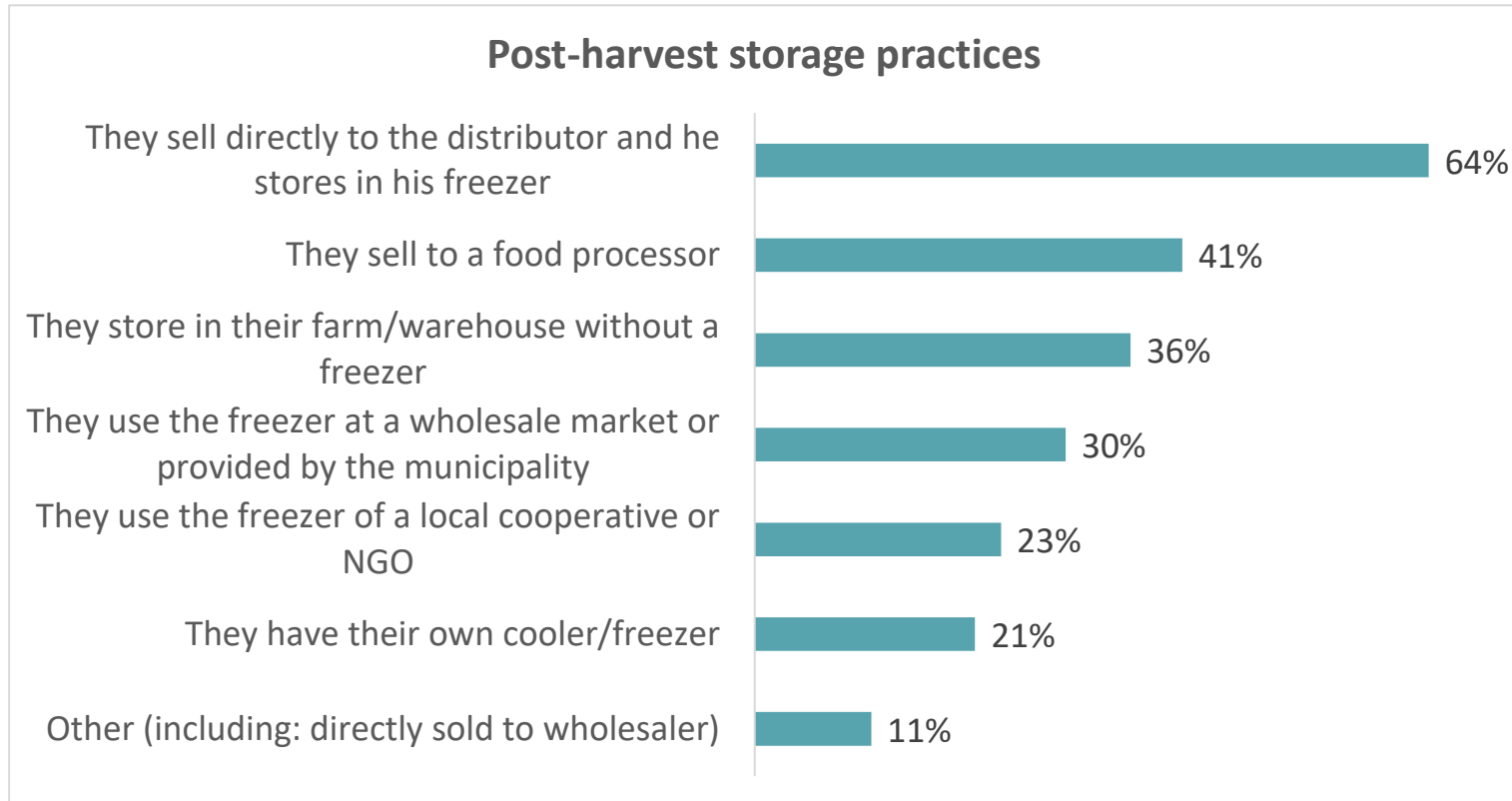
- 52% of KIs reported that farmers think it is possible to have a profitable farm with a polyculture, with the remaining 48% reporting otherwise.
- Among those who don't think it is possible, several reasons were cited:
  - “It is hard to harvest crop with polycultures; I prefer using one machine to harvest all the crops at the same time”(37%)
  - “It is hard to maintain land with polycultures; I will have to apply many different inputs if I have many crops” (31%)
  - “I don't have the knowledge to grow many different crops on my land” (31%)
  - “I can't sell my produce if I only have small quantities of many types of crops” (25%)



# Topic 6: Post Harvest

*81 entries*

# Post-Harvest Storage



Most farmers across Lebanon seem to be selling their post-harvest directly to the distributors, who then place them in freezers. In Nabatiyeh, farmers store them themselves in their farm/warehouse without a freezer.



# Crop Transportation in 2021

The means of crops transportation in 2021 were ranked by the KIs from the most common situation to the least common:

1. Farmers own their means of transportation.
2. Farmers rent or lease their means of transportation from a local company or cooperative.
3. Farmers rely on their buyers' means of transportation
4. Farmers rely on a solidarity/personal network to borrow/share transportation means.
5. Farmers don't have access to any means of transportation



# Transportation

## Means of transportation:

- 100% of respondents stated that in 2021, post-harvest transportation means are motorized across Lebanon, but only 59% of them have been reported as refrigerated.

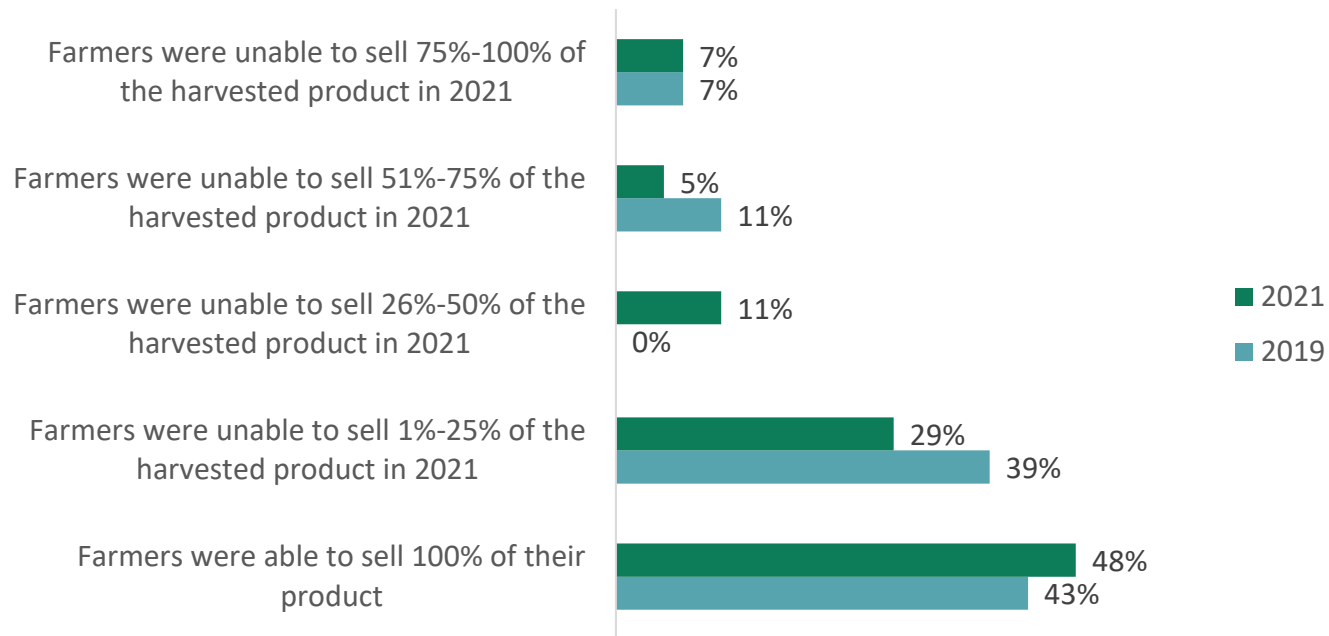
## Capacity to Afford Cooling and Transportation: 2019 vs. 2021:

- 55% of respondents reported that less farmers could afford cooling in 2021 compared to 2019, while 33% reported that the situation had not changed, and a minority (12%) reported that more farmers could afford it.
- 54% of respondents reported that less farmers could afford transport in 2021 compared to 2019, while 46% stated that the situation hasn't changed.



# Ability to Sell the Harvested Weight: 2019 vs. 2021

% of the harvested weight that farmers were unable to sell

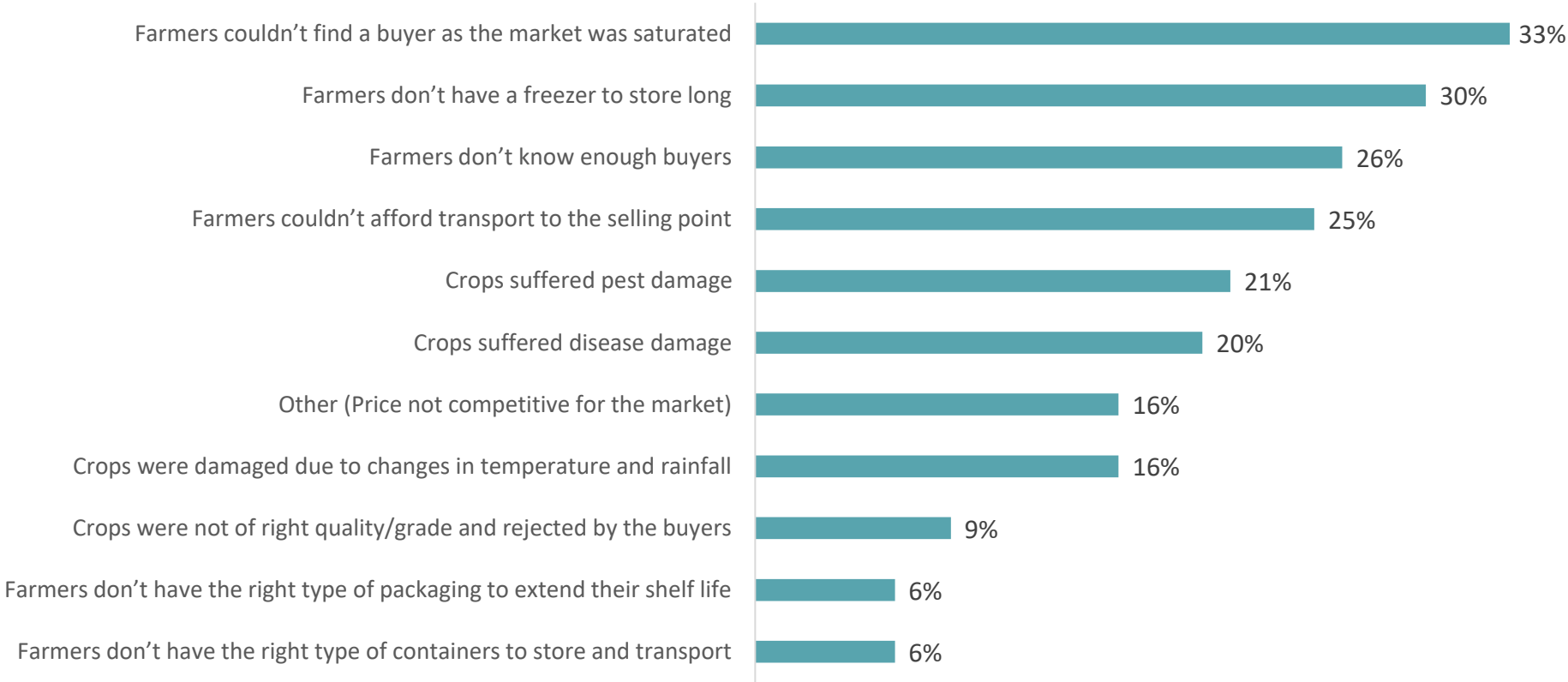


The above graph doesn't show any major difference in the percentage of harvested weight that farmers were unable to sell in 2019 and 2021.



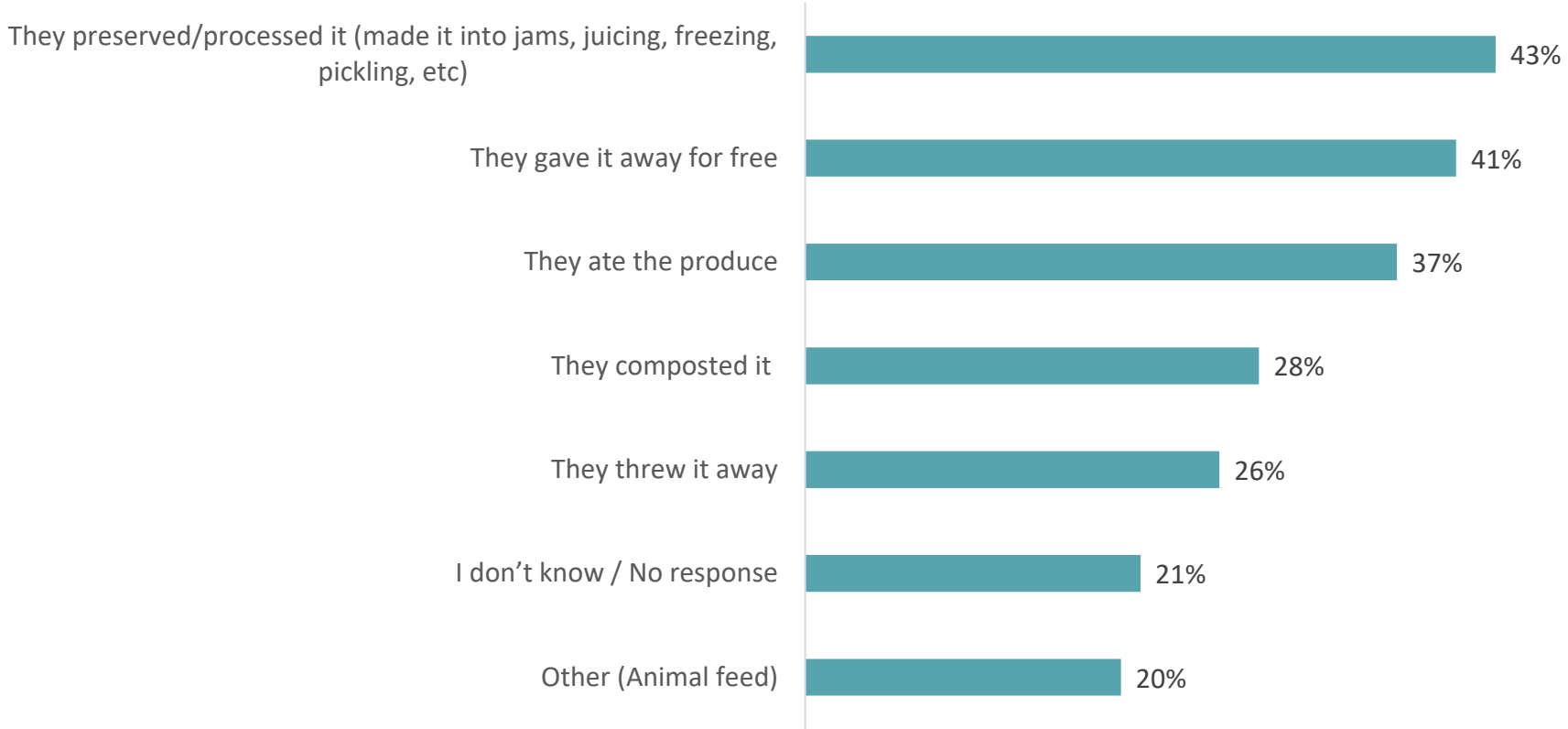
# Challenges to Selling Harvesting Product

## Reasons for not selling harvesting product



# Uses of Crops When Unable to Sell

Main 3 uses of crops that farmers were unable to sell in 2021



41% of the KIs reported that farmers gave away the crops they were unable to sell for free, while more than ¼ of the KIs (26%) reported that farmers threw them away.



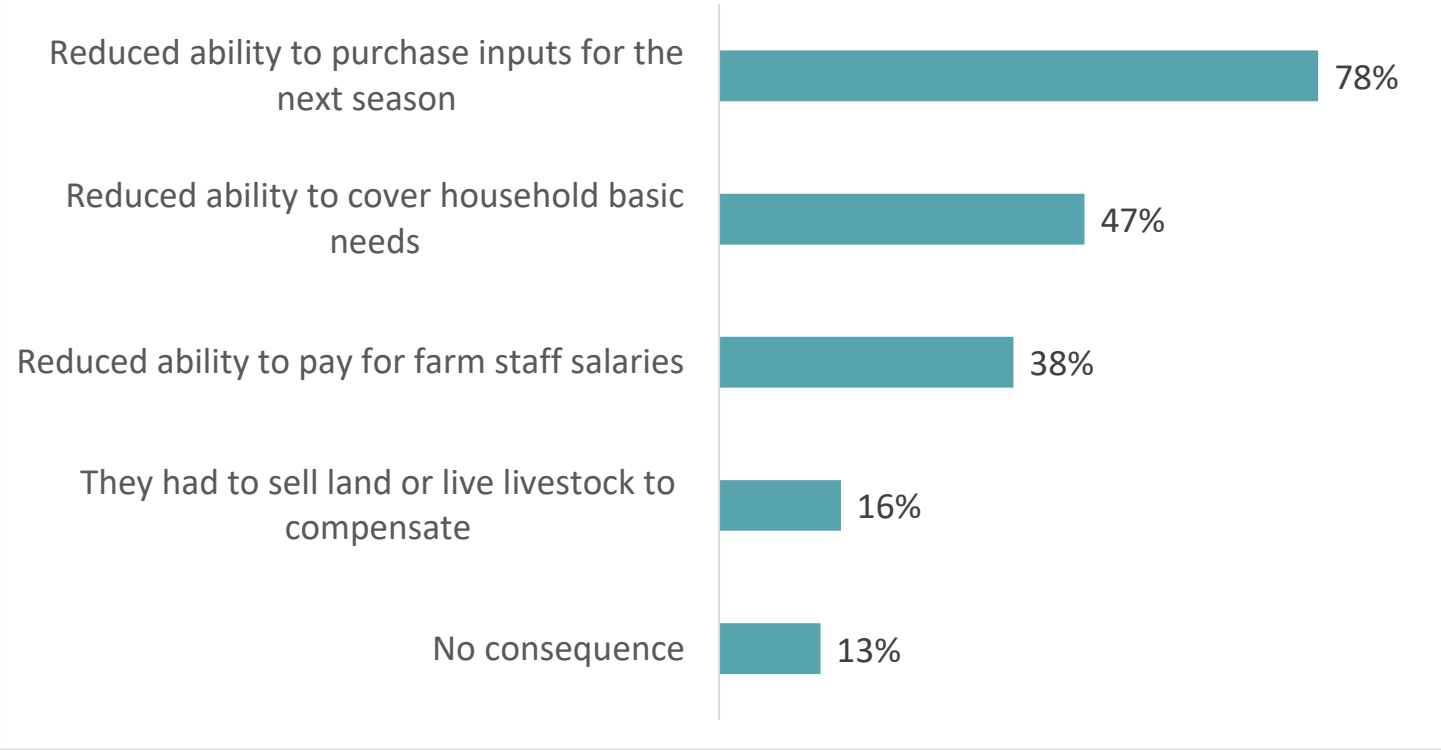
# Use of Post-harvest Waste

- If farmers threw the waste or burnt it, it was mostly composted of vegetables
- If they preserved/processed the waste, they mostly used the following techniques: food processing, dehydrating, juicing, drying.
- If they preserved the food, most farmers were able to sell it afterwards (93%). Processed food and juice are the types that sell best. If farmers are not able to sell, it's because they produce low quantity or because markets are saturated.
- If farmers were able to sell the preserved food, overall, they were not able (43%) to sell at a higher price than the raw post-harvest product.



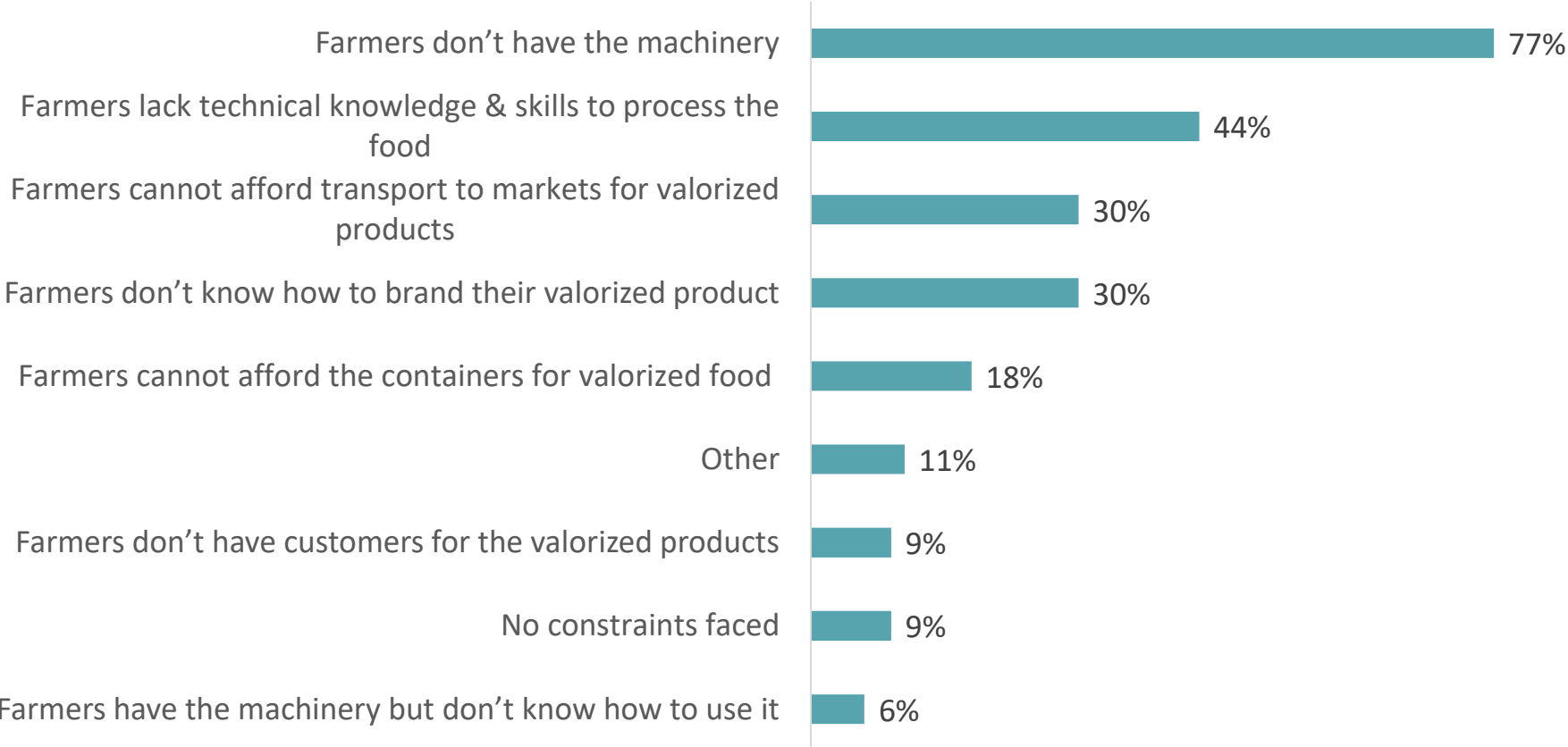
# Consequences of Post-Harvest Loss

## What were the consequences of the loss of post-harvest products on farmers?

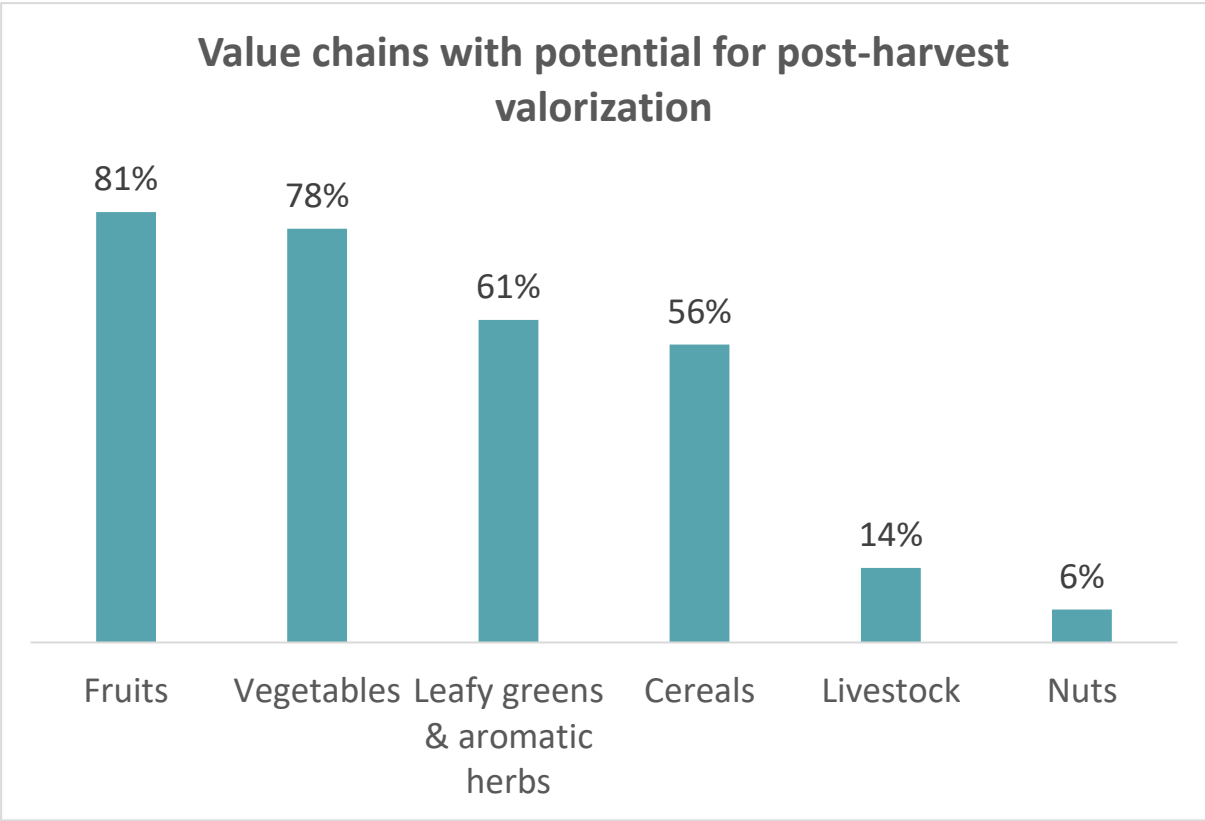


# Constraints to the Valorization of Waste

## Main constraints faced by farmers to valorize more waste



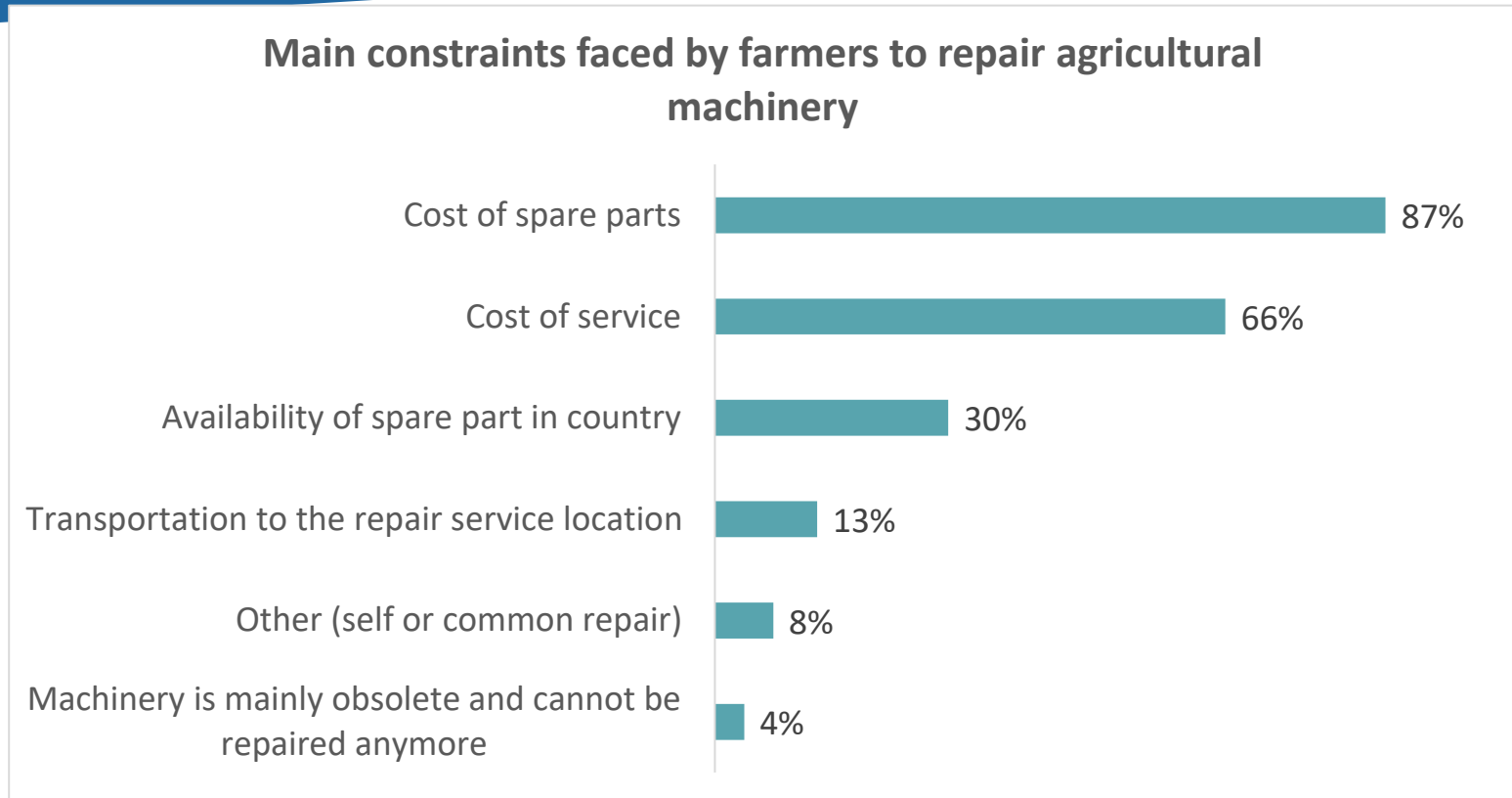
# Post-Harvest Valorization



# Topic 7: Machinery Repair

*54 entries*

# Agricultural Machinery Repair Constraints

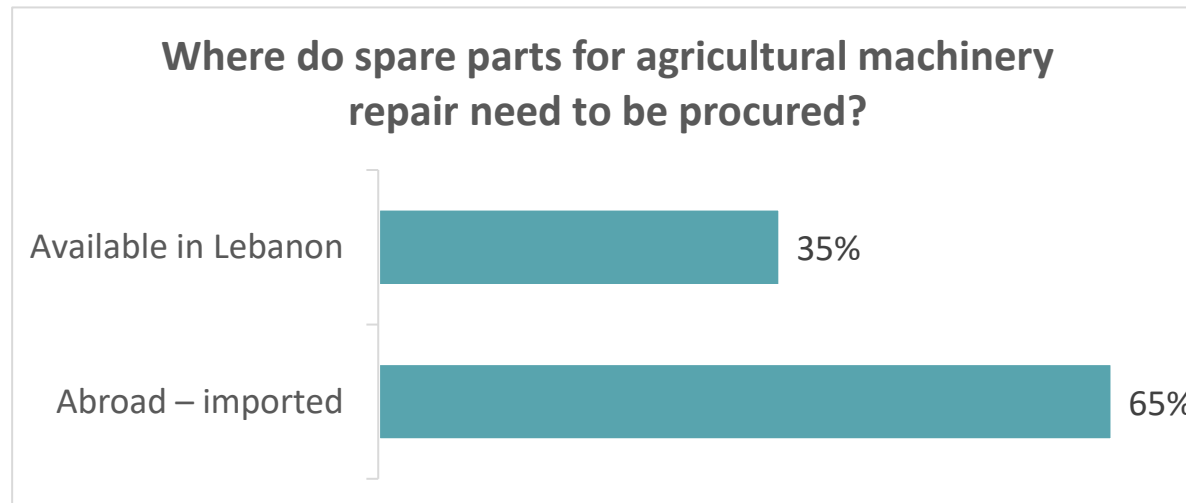


In Nabatiye and the South, cost of spare parts and cost of services are both equally constraints. Machines needing repairs mostly consist of harvesters (61%), food processing machines (35%) and ploughs (30%).



# Local Repairmen

- Most respondents (87%) stated that farmers usually know of local repairmen for agricultural machinery, which apparently are well trusted by farmers.
- Procurement of machinery repair:

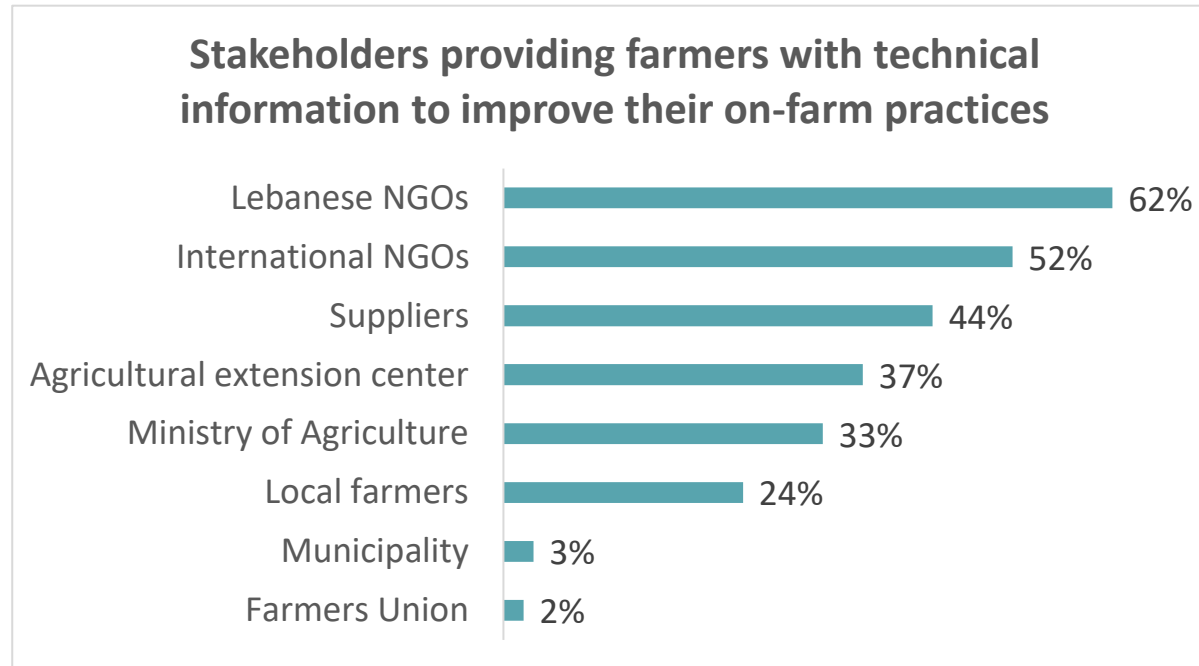


# Topic 8 Governance / Representation

*98 entries*



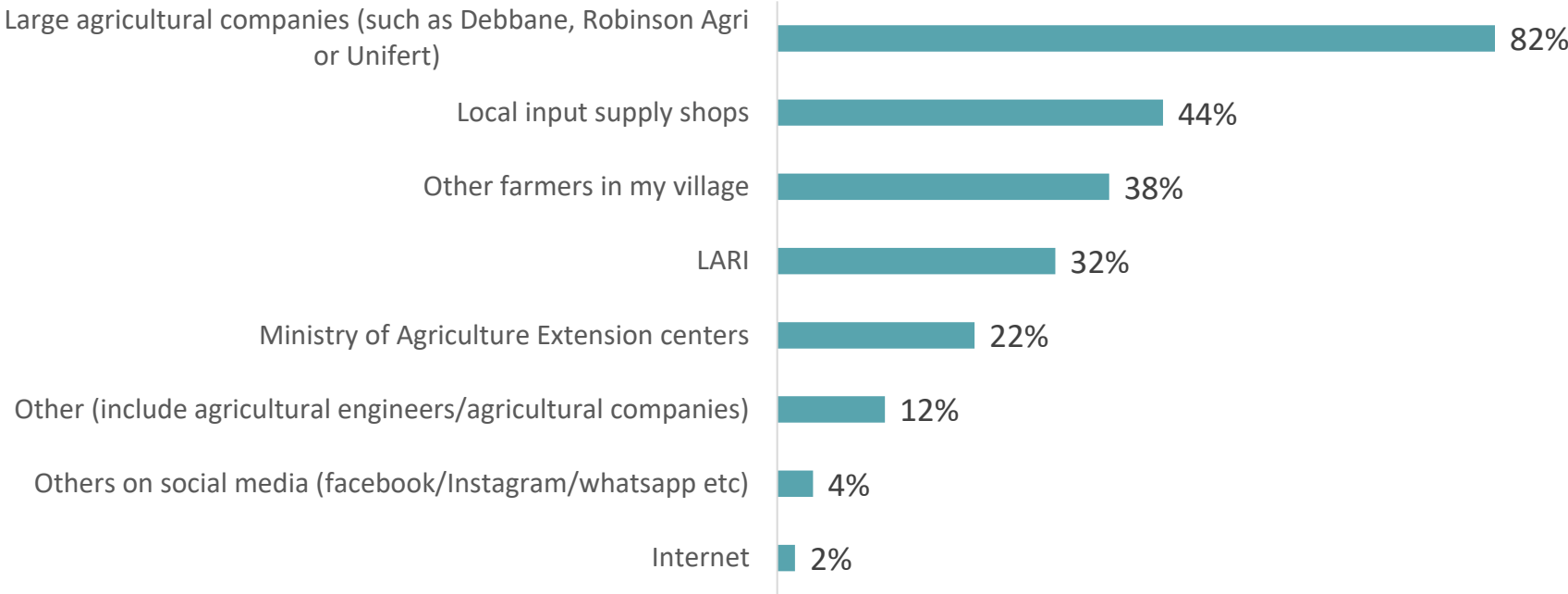
# Sources of Technical Information on Farm Practices



- In Akkar, INGOS and suppliers come first
- In the North, local & international NGOs provide equally
- In Nabatiyeh, INGOs and MoA come first
- In South, Lebanese NGOs come first

# Sources of Information on Chemical Inputs/Seeds

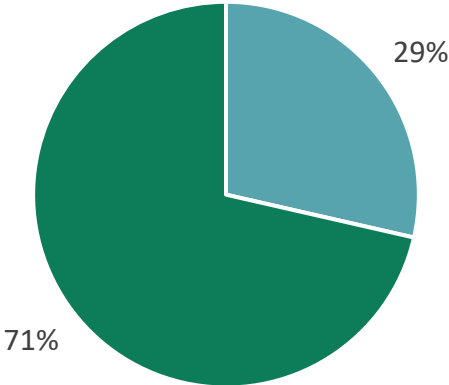
## Sources providing technical information to improve farmers' on-farm practices



Large agricultural companies are the main source across all governorates.

# Support from Extension Centers

Do you receive information/support from the Agricultural Extension Center?



■ Yes ■ No





**ACTED**

# SECTION 5

## Detailed Findings

### Regulations

**ZERO** EXCLUSION  
CARBON  
POVERTY

# Topic 1 - Regulations on Inputs

# Key Features of Regulation on the Local Production of Inputs

- Existing set of regulations put in place by the MoA related to the import/export of certain fertilizers, pesticides, chemicals and their toxicity levels .
  - (Constant check up are being done, government agents regularly check those point of sales to make sure no illegal product is being sold).
  - These can be found in agriculture pharmacies, the MoA did set specific regulations regarding this matter
- Agreement between different Arab countries regulating what can be exported in order to have a fair market between the exporters
- No specific regulations on local production of inputs in Lebanon, same for organic inputs:
  - There are specific regulations, but nothing tailored for local production.
  - One of the reasons = no local production of inputs in Lebanon



# Key Features of Regulation on the Import of Inputs

- There are standards for local agricultural practices, but they are not precise and demanding as they would be for export because of the lack of accountability.
- Having a seed bank or a few organizations preparing and producing the seeds would be a benefit.
- Registration of some inputs (fertilizers, pesticides, seeds...).
- Standards for specific materials (fertilizers , especially nitrogen-based) as some elements are banned.
- Obligation to register as cooperatives/organizations in order to import inputs.
- Need for increased control on price and quality of inputs (so far done by the private sector).



# Regulatory Barrier to Vermicompost, Aerobic Composting, Anaerobic Composting, Biochar

- Existence of a national fertilizer committee (supported by experts from field)
- Entity importing Vermicompost, needs to be registered and mention to the committee the risks it might provide to the ecosystem, from where it is importing...
- No regulatory barriers for this type of compost
- Obstacles in obtaining licenses due to the lack of clear legislation in the relevant ministries – production process limited to individual initiatives (without registration)





# Key Features of Regulation on the Use of Inputs for the Local Market

- There is no control over the use of inputs locally (3/9), only imported inputs must be registered to check the quality
- Shops selling local inputs need to be registered, but no specific information about the inputs they sell
- Lebanon mostly depends on imported inputs, rather than local inputs



# Topic 2 - Regulations on Seeds

# Key Features of Regulations on the Import of Seeds

## Local seed saving / multiplication:

- Regulations exist on the following: variety of seeds, germination rate, viability of the seeds, and good storage conditions

## Seeds import:

- Follows regulations, conditions & classification
- Same as for inputs: standards of materials (fertilizers, especially nitrogen-based)
- Prior permission must be obtained to import seeds, within specific specifications, on the basis of which these seeds are monitored after their arrival and planting.
- Agency needs to be registered
- MoA monitors & approves the importation of these seeds



# Key Features of Regulations on Seeds

## Distribution:

- No strict regulations nor monitoring of seeds distribution
- Distribution is under responsibility of the importing companies
- Agricultural engineers, pharmacies and coops/organizations need to be registered to be able to distribute
- Each region/area has its own standards in terms of distribution/inputs, suppliers

## Use:

- No regulation set for the use of seeds but validity dates must not be expired
- Not allowing GMO seeds - there are specific regulations for Funghuns
- Storing should be done according to specific specifications (there shouldn't be any moisture)



# Other Notes on Seeds

- Suggestion of creating a seed bank in Lebanon (ex: someone producing tomatoes should be able to produce seeds and deposit them in the bank) in order to lower the cost of seeds for farmers and have a natural production cycle (Head of the Syndicate of Agricultural Workers in Lebanon).
- Farmers would need to be trained on the procedure to multiply the plant seed; (how to extract the seed, how to process it and store it). Like that, farmers can produce their own seeds and do not need to outsource their raw materials, which will lower the cost of production and they can improve their crops.
- Such trainings should be provided, along with follow ups as well.



# Topic 3 - Livestock Feed Regulations

# Regulations on the Import of Animal Feed

- Quality control standards available on the types and levels of Aflatoxin and other compounds found in the feed.
- Standards on conditions for mass agriculture (having a fixed level and quantity of nutrients and certain elements)
- Standards apply on the percentage of moisture, starch, protein and the amount of permissible impurities.
- The import process is regulated in accordance with the Animal Feed Import Decision 884/1, which sets the specifications for imported cereals and feed. This decision details the definition of feeds, who is entitled to import and how this process is carried out.
- Prior permission to import hay and feed for health reasons is needed due to the possibility of bacterial or viral contaminants traveling with the imported product.



# Key Features of Regulations on Local Production of Animal Feed

- No standards or need for a license/permission to produce local animal feed.
- Registration of factories that produce feed capsules.
- The registered factories (producing feed capsules) are subject to control over the raw materials used and the production process.
- Environmental management criteria tackling the composition of the product, the type of grinding used, raw materials, ratio adapted by the farmer etc...





# Key Features of Regulations on Animal Feed

## Distribution:

- No specific regulations set for the distribution of animal feed.
- In the case when there are feed support projects undertaken by the Ministry of Agriculture, the Ministry takes care of the distribution of these feeds according to the number of livestock owned by the livestock breeder.

## Use:

- No specific regulations.
- Certain standards set by Libnor, an animal feed brand free from heavy metals.
- The choice of animal feed depends on the animals that the farmer is raising, and it also depends on the experience of the farmer and the veterinarian supervising the farm.



# Topic 4 – Water Regulations

# Key Features of Regulation on the Control of Water Contamination Levels in Farms and Food Processing Facilities

- The farms and food facilities must obtain a health registration document; however, this does not address the aspect of water pollution.
- Food facilities must obtain a health registration, which prohibits the use of water unfit for human consumption/use.
- Food processing facilities have many regulations: follow-up, registration, check up, importation and exportation
  - These are all monitored in collaboration with the Ministry of Industry.
- Irrigation regulations at the farm level do not exist except for some certified farms. (2/9)
- Food processing facilities have their own standards set by the Department of Economics, Health and Industry and LIBNOR.
- In agriculture, large companies have standards that concern the level of bacterial and physico-chemical contamination of the water.



# Key Regulation on the Use of Treated Greywater/Wastewater for irrigation and/or Food Processing Purposes

- MoA has a set of regulations on the level of minerals, constituents and elements, such as BOD - to make these suitable for agriculture.
- Food processing factories are forced to have a water treatment unit in order to obtain a license from the Ministry of Environment.
- For food processing, the water should be 100% clean, not recycled.



# Topic 5 - Renewable Energy Regulations

# Key Features of Regulation on the Production of Renewable Energy in Farms & Cooperatives

- There are individual initiatives only and no regulatory frameworks.
- There are no specific regulations set yet - regulations usually are developed when it becomes a common practice, people started seeing its benefit after the crisis.
- If the renewable energy chosen is wind power, the person needs an EIA for the noise it generates.
- For solar energy, the person needs to obtain a permission especially if they are sharing the land/roof with someone else.
- There are no regulatory incentives for the production of renewable energy in farms and cooperatives, apart from few incentives provided by NGOs.



# Key Features of Regulations on the Distribution of Renewable Energy in Farms & Cooperatives

- Farmers can use their own power and send the extra electricity to EDL, but this is not applicable in all areas.
- Regulations are set by region, the know how of the distributor and the efficiency of the service he/she is offering.
- At government-level, there are no regulations related to the distribution of renewable energy in farms and cooperatives.

## Other:

- The cost of renewable energy is too high for small and medium-size farmers: most often, they cannot afford this type of investment, and they wouldn't be able to purchase it without support from the government or organizations.
- This responsibility falls under the Ministry of Energy rather than Agriculture



# Topic 6 - Agricultural Waste



# Key Features of Regulation on the Use of Compost from Agricultural Waste

- When it comes to commercial compost, there are regulations, case by case dossiers studied at the level of national committee, and specific documents and information
- Regulations on the composition of compost
- There are some regulations to be followed concerned with the source of raw materials, efficiency of the compost and applied quantities, knowledge of the farmer (how to use? how much?...)
- Any person who wants to produce any kind of fertilizers should follow specific conditions, for example the percentage of nitrogen and potassium and many other specifications



# Key Features of Regulation on the Use of Manure/Use of Surplus from Agricultural Waste

- There are certain regulations/guidelines to be followed concerning the source of manure, its storage, and its quantity.
- Follows Ministry of Industry regulations
- There are no regulations but there is a procedure to follow. In case it is being produced for trading purposes, it should be packed in a certain way that would also show all information and characteristics written on . A certain percentage must be followed because everything sold at the agricultural pharmacies should be checked.
- There are no regulations related to distribution of compost/manure from agricultural waste
- Certain regulations are to be followed related to geographical distribution, their end use and the type of crops.



# Topic 7 - Machinery

# Key Features of Regulation on the Repair of Agriculture Machinery & Food Processing Machinery

- Existing regulations are just followed by the certified farms.
- There are no standards to be followed related to farm machinery.
- Certain standards are to be followed on the knowledge of the technicians or repairmen, availability of spare parts, and introduction of these skills in the agricultural curricula on a university and technical school level.
- For food processing machines, they should follow certain standards that ensure hygiene and food safety.

