# Northeast SARE Partnership Grant

## Increasing Efficiency and Decision-Making Capability of Small, Socially Disadvantaged, and Minority Farmers

### Annual Report (2022)[1]


Submitted by:

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[1] A cooperating farm that includes but is not limited to stinging nettle, corn, amaranth, eggplant, globe amaranth, onion, mustard green, and yam in a small piece of land. The farm also practiced making compost and container gardening.

**Project team**

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## Education & Outreach Activities and Participation Summary

- Consultations: 75
- Curricula, factsheets, or educational tools: 5
    - Needs assessment survey: 1
    - Specialty and ethnic crop survey: 1
    - End of the project survey: 1
    - Crop diversity recording: 1
    - Farm recording format: 1
- Journal articles: 1
    - 1 submitted to the online publication 'AgEconSearch'
- On-farm demonstrations: 2
    - Compost making: 1
    - Rainwater harvesting: 1
- Online/in-person training: 5
    - Cooperating farmers: 5
    - Community specialist: 5
- Published online newsletter: 2
- Tours: 3
    - Peer-to-peer farm visits
- Presentations: 5
- Workshops/field days: 3
    - Peer-to-peer farm practices
- Number of farmers who participated in education and outreach activities: 22
- Number of agricultural educator or service providers reached through education and outreach activities: 15

## 1. Project goal

The goal of this project is to enhance the technical and economic efficiency of small, socially disadvantaged, and minority (SSDM) farmers through learning how to make informed decisions, develop an evidence-based farm business plan, and adopt economically sustainable practices to optimize farm revenue.

## 2. Background

Smallholder, socially disadvantaged, and minority (SSDM) farmers across the U.S. have been at the crossroads of survival in their agricultural profession, and those of Maryland are no exception. The SSDM farmers have been daunted by ever-increasing challenges as they strive to make a living from farming - a sustainable source of household income. Despite the importance of small-scale farms in the U.S., evidence suggests they are declining in number. A significant portion of small-scale producers have been abandoning farms they have inherited or owned, or both. According to GICA (2011), the trend of abandoning inherited and owned farms has been increasing over the past 40 years. Moreover, the farms are owned and managed by elderly farmers. The 2017 Census of Agriculture (NASS, 2022) shows that the average age of the principal operator of farm in the U.S. is 57.5 years. In Maryland, farms are also largely managed by elderly people (2012 USDA Ag Census cited by umd.edu, 2021), with the principal farm operator averaging 57 years of age. The next generation (iGeneration or Generation Z) seems to be reluctant to jump into agricultural professions due to a lack of competitive or lucrative returns. Moreover, farmland has become increasingly expensive for potential younger farmers wishing to enter the agricultural field or expand their operations. Thus, the economic sustainability of SSDM farmers, who work hard to bring fresh produce to the kitchen tables, is in a vulnerable situation.

In a chain effect, the loss of small farms, and thus the farm-land, dries up markets for the sale of commodities, which adversely affects local employment. According to the GICA (2011), farmers' share of the retail food dollar has been steadily decreasing due to influence of the brokers, high transaction costs, and a lack of direct access to market outlets. Farmers received only about $0.20 of each food dollar spent by consumers compared to $0.41 in 1950 and $0.31 in 1980. The willingness of the SSDM farmers to contend in agriculture is greatly challenged by deficiencies in demand-driven knowledge and skills, access to hands-on and experiential learning opportunities, market information (product pricing, supply, and demand), market access, and a lack of continuous outreach and education. A needs assessment survey of beginning farmers in Maryland conducted by the University of Maryland Extension in 2012, revealed that access to land, marketing and financing were the high-ranking issues reported by the beginning farmers (Dill et al., 2012). This evidence alone may not reflect the reality and the needs of SSDM farmers in the present context, as there is a limited availability of such documentation on these farmers.

Considering the challenges and problems stated above, this study proposed to conduct the following evidence-based approaches to support and enhance the technical and economic efficiency of small, socially disadvantaged, and minority (SSDM) farmers of Maryland to optimize their farm revenues:

i) Needs assessment to reveal the hierarchy of needs,
ii) Hands-on training on basics of farm economics and management,
iii) Farm data recording and analysis,
iv) Data-driven production plan,
v) Specialty crop market survey,
vi) Market survey analysis and comparison with secondary sources,

vii) Develop a marketing plan,
viii) Support services to the selected specialty crops farms, and
ix) Establish connections between producers and consumers.

## 3. Methodological approach

The project team at the University of Maryland Eastern Shore (UMES), with financial support from the Northeast SARE, conducted an exploratory case study to investigate the situation and scope of urban agriculture. The research team, in collaboration with other UMES researchers and local farmers, identified 14 SSDM farmers from five counties of Maryland: Anne Arundel, Baltimore City, Baltimore, Somerset, and Wicomico. These farmers were engaged in urban agriculture, community gardening, and herbal farming. A project initiation meeting was held in Baltimore (Picture 1), at which a semi-structured baseline survey was administered for the purpose of problem identification and needs analysis, as well as to collect farmers' background information, farming experiences, size and scale of farming, and reasons for farming. The instrument consisted of a five-point Likert scale, open- and close-ended, multiple-choice questions, and demographic information. In addition, the researchers conducted an in-person interactive workshop, an online survey, email and telephone communications, and farm-field visits. Findings from the baseline survey were used by the researchers to provide support services, as well as conduct farm management, data recording, crop diversity, rainwater harvesting, compost making, and marketing initiatives to enhance participant farmers' capacities to sustain farming.

Picture 1: Project initiation meeting with some Northeast SARE farmers in Parkville, Baltimore (December 11, 2021).

In October 2022, a specialty crop diversity survey and a market survey were implemented in October 2022 to study the crops grown in the farmers' fields and the availability of specialty crops and their prices in the local market. At the end of the project, a post-evaluation survey was administered to assess the impact of the project as well as the perception of participating farmers about the outcomes. The post-evaluation survey assessed the project's usefulness on various aspects of agricultural production such as reducing cost of production, maximizing farm revenue, mitigating agricultural risk, developing entrepreneurship, farm planning and budgeting, and managing resources.

## 4. Analytical approach

The data collected through the quantitative survey was examined using Excel and SPSS software. Because the study was exploratory in nature, at that stage, the research team primarily focused on descriptive analysis. At every step of the project, wherever appropriate, the research team strictly followed the ethical guidelines for the voluntary participation of the respondents, and to protect their privacy and confidentiality. The results are presented below.

## 5. Results

5.1 Farmers' background characteristics

Fourteen farmers from five counties were conveniently identified (Table 1) for the project. A large majority of them were from Baltimore (nearly 43%) and Somerset counties (36%). The farmers belonged to a diverse group of ethnic minorities: Hispanic/Latino (7%), White/Caucasian (7%), Non-Hispanic/Latino (7%), African American (15%), and Asian (64%). Thirty-six percent of them were women. Their ages ranged from 26 to over 60 years.

Table 1: Background characteristics of farmers (n=14).

| Characteristics | Percent |
|---|---|
| Gender | |
| Female | 35.7 |
| Male | 64.3 |
| Age group | |
| 26-34 | 14.3 |
| 35-44 | 35.7 |
| 45-50 | 7.1 |
| 51-59 | 35.7 |
| Over 60 | 7.1 |
| County of residence | |
| Anne Arundel | 14.3 |
| Baltimore | 42.8 |
| Somerset | 35.7 |
| Wicomico | 7.1 |
| Race/ethnicity | |
| Black or African American | 14.3 |
| Hispanic or Latino | 7.1 |
| White | 7.1 |
| Asian | 64.3 |
| Non-Hispanic Latino | 7.1 |

5.2 Farmer types and farming experiences

According to Table 2, nearly 86% of the farmers reported that they were seasonal farmers and only 14% reported that they were part-time farmers. Among the 14 farmers, 50% had more than 10 years of experience in farming, followed by 36% with 1-5 years of farming experience. Nearly 86% of them reported that they farmed in backyard kitchen gardens, and the remaining 14% reported they farmed in community gardens. Over 71% reported that they do not keep any farm records. The average farm size was only 1.20 acres, with a median size of 0.38 acres. The farms ranged from 0.06 acres to a high of 11 acres (only one farm).

Table 2: Farmer types and farming experiences (n=14).

| Involvement type | Percent |
|---|---|
| Part-time | 14.3 |
| Seasonal | 85.7 |
| Farming experience | |
| Under 1 year | 0 |
| 1-5 years | 35.7 |
| 6-10 years | 14.3 |
| More than 10 years | 50.0 |
| Scale/type of farming | |
| Backyard kitchen garden | 85.7 |
| Community garden | 14.3 |
| Keeps farm record | |
| Yes | 28.6 |
| No | 71.4 |

5.3 Reasons for farming

Table 3 revealed that for nearly 79%, their primary reasons for farming were (a) outdoor and physical activity, and (b) to produce for family consumption. Fifty-seven percent reported that their primary reason was for supplemental household income, which was followed by passing time (50%), educational benefit of learning about farming (14.3%), and for tax benefits (7%).

Table 3: Primary reasons for farming (n=14).

| Primary reasons | Percent |
|---|---|
| Outdoor and physical activity | 78.6 |
| For family consumption | 78.6 |
| For supplemental income | 57.1 |
| Time passed | 50.0 |
| Educational purpose | 14.3 |
| For tax benefits | 7.1 |

5.4 Farm enterprises

A large majority (93%) of the farmers reported that they cultivated vegetables (Table 4). Nearly 36% of them reported fruit farming, followed by 14% raising poultry, and 7% raising animals and ducks.

Table 4: Did you grow any vegetables, fruits or raise animals (n=14)?

| Farmers cultivated | Percent |
|---|---|
| Vegetables | 92.9 |
| Fruits | 35.7 |
| Medicinal/herbal plants | 28.6 |
| Poultry | 14.3 |
| Flowers | 14.3 |
| Peacock | 7.1 |
| Ducks | 7.1 |
| Shell | 7.1 |

The list of vegetables, fruits, specialty crops, ethnic/minority and herbal medicinal plants reported by farmers are provided in Appendix 1 through 5, respectively. The top five most grown vegetable crops were tomato, spinach, beans, eggplant, and chili (Appendix 1). Apple, pear, and fig were among the fruit crops reported. Poultry, ducks, and peacocks comprised the reported birds being farmed. We found it interesting that one farmer was cultivating a total of 16 vegetable crops.

5.5 Crop diversity

The crop diversity survey administered to the participating farmers (n=16) in 2022, shows that they reported growing 50 different specialty and ethnic crops (vegetables, fruits, medicinal plants, pulses, and cereals) in their fields (Table 5). Of these, 33 were vegetable crops, 10 were fruit crops, 5 were medicinal plants, 3 were pulses and 2 were cereals, as reported by the farmers[2] (Appendix 6 provides a detailed list of crops). Chili, cucumber, pumpkin, and tomato were cultivated by almost all farmers (93.8%). These vegetable crops were followed by eggplant (87.5%), and okra, beans, spinach, and bitter gourd, each grown by 81.3% of the farmers. Among the fruit crops, banana was reported by 43.8% of the farmers followed by peach and apple (25%) (for crop diversity list refer to Appendix 6).

Table 5: Number of crops reported by farmers (n=16).

| Crops | Number |
|---|---|
| Vegetables | 33 |
| Fruits | 10 |
| Medicinal plants | 5 |
| Pulses | 3 |
| Cereals | 2 |
| Total* | 50 |

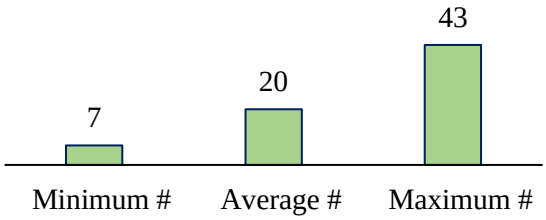
*3 crops counted in multiple groups.

Nearly 44% of the farmers reported 10-19 crops, followed by 37.5% of them reporting 20-29 crops and 12.5% reporting 30 or more crops (Table 6). On average, a farmer reported growing 20 different crops, with a minimum of 7 and a maximum of 43 crops (Figure 1).

Table 6: Crop diversity in farmers' field (n=16).

| No. of crops | Farmers % |
|---|---|
| Below 10 | 6.3 |
| 10 to 19 | 43.8 |
| 20 to 29 | 37.5 |
| 30 and above | 12.5 |

Figure 1: Number of crops on grown by a farmer (n=16).




5.6 Needs assessment survey

A semi-structured needs assessment survey was administered to 14 farmers from five counties (including Baltimore City) in Maryland. The purpose was to conduct a situation analysis to assess and prioritize farmers' needs. The instrument consisted of

[2] *Soybean and mandre cowpea are counted as both vegetable and pulse crops. **Buckwheat is counted as both vegetable and cereal crops. Thus, the total number of crops is counted as 50.

various topics such as problems experienced by farmers, timing of training, learning modules, education materials and resources measured using a five-point Likert scale. The results are discussed below.

*5.6.1 Problems experienced by farmers*

Table 7 shows the distribution of responses of farmers about the types of problems they had experienced and their importance, ranging from extremely important (weighted 5) to not at all important (weighted 1). Based on the responses, an average index[3] was estimated, which shows the rank or the hierarchy of each problem. The higher the average index, the more important the problem.

Table 7: Problems experienced by farmers (%) in farming (n=14).

| Problems | Extremely important | Very important | Moderately important | Slightly important | Not at all important | Index value |
|---|---|---|---|---|---|---|
| 1. Cannot afford farm machinery | 78.6 | 7.1 | 0 | 14.3 | 0 | 4.5 |
| 2. Lack of capital | 78.6 | 7.1 | 0 | 7.1 | 7.1 | 4.4 |
| 3. Lack of access to land | 71.4 | 14.3 | 0 | 14.3 | 0 | 4.4 |
| 4. Not enough land | 64.3 | 21.4 | 7.1 | 7.1 | 0 | 4.4 |
| 5. Lack of access to credit | 71.4 | 14.1 | 0 | 7.1 | 7.1 | 4.4 |
| 6. Lack of access to internet | 71.4 | 14.3 | 0 | 7.1 | 7.1 | 4.4 |
| 7. Lack of production knowledge and skills | 14.3 | 64.3 | 14.3 | 7.1 | 0 | 3.9 |
| 8. Lack of access to market and sales outlets | 21.4 | 50.0 | 14.3 | 14.3 | 0 | 3.9 |
| 9. Not enough farm management skills | 14.3 | 50.0 | 28.6 | 7.1 | 0 | 3.7 |
| 10. Lack of information to start farming | 7.1 | 78.6 | 0 | 7.1 | 7.1 | 3.7 |
| 11. Lack of access to a farm mentor | 14.3 | 64.3 | 0 | 21.4 | 0 | 3.7 |
| 12. Lack of knowledge about basics of farm economics | 0 | 64.3 | 28.6 | 7.1 | 0 | 3.6 |
| 13. Lack of direct access to markets | 14.3 | 28.6 | 42.9 | 14.3 | 0 | 3.4 |
| 14. Lack of agricultural knowledge and skills | 14.3 | 28.6 | 35.7 | 21.4 | 0 | 3.4 |
| 15. Lack of farm records | 21.7 | 28.6 | 14.3 | 35.7 | 0 | 3.4 |
| 16. Lack of farm business planning | 0 | 35.7 | 57.1 | 7.1 | 0 | 3.3 |
| 17. Lack of farm data analytical skills | 7.1 | 42.9 | 21.4 | 21.4 | 7.1 | 3.2 |
| 18. Lack of access to relevant educational materials | 0 | 35.7 | 14.3 | 50.0 | 0 | 2.9 |
| 19. Lack of produce processing facility | 0 | 14.3 | 42.9 | 42.9 | 0 | 2.7 |
| 20. Lack of family labor to support farming | 14.3 | 14.1 | 7.1 | 50.0 | 14.3 | 2.6 |
| 21. Shortage of labor in the market | 0 | 14.3 | 21.4 | 64.3 | 0 | 2.5 |

Of the 21 problems identified, farmers grouped them in a hierarchy of 12 clusters based on index values. The average indices show that – inability to afford farm machinery and equipment was at top with a score of 4.5, followed by a lack of capital (4.4), lack of access to land (4.4), lack of access to credit (4.4), lack of access to internet (4.4), and not enough land (4.4). This was followed by the lack of direct access to

[3] Items measured in a 5-point Likert scale - extremely important/useful weighted 5 to not at all important/useful weighted 1. The priority index was calculated as: [(n*5) +(n*4) +(n*3) +(n*2) +(n*1)/N]. n is the number of responses in each column and N is the total number of samples (here participant farmers).

markets and sales outlets (3.9), and production knowledge and skills (3.9). At the bottom were shortage of labor in the market (2.5), lack of family labor to support farming (2.6), lack of products processing facility (2.7), lack of access to educational materials (2.9), and lack of data analytical skills (3.2). This descending index value indicates their priority/preference ranking. Both the preference ranking and problem hierarchy showed the importance of the problems in a similar direction.

*5.6.2 Learning modules and educational materials for minority and beginning farmers*

Reducing the knowledge gap for small-scale, minority, and beginning farmers is of paramount importance for sustaining farming. Thus, we also assessed the importance of various learning modules and educational materials through the needs assessment survey. Of the listed 13 learning modules and educational materials listed, farmers ranked them in eight categories (Table 8). The descending index value, which is the preference ranking, is as follows: digital learning video (4.3); comprehensive training manual (4.2); one-to-one consultation, peer-to-peer interaction, and hands-on training (3.7); extension publications (factsheet, flyer, brochure, pamphlet, and newsletter (3.6)), webinar, interactive meeting, workshop, and training (3.5); and YouTube video (3.5). These learning modules and materials were followed by farm visit/tour, field days, and one-to-one counseling with an index of 3.4; virtual presentations/learning (3.1); and the least useful learning module, a radio, and a TV program (2.7).

Table 8: Farmers' report of useful learning modules/materials to increase knowledge and skills (n=14).

| Learning modules/materials | Extremely useful | Very useful | Moderately useful | Slightly useful | Not at all useful | Index value |
|---|---|---|---|---|---|---|
| 1. Digital learning video | 42.9 | 50.0 | 0 | 7.1 | 0 | 4.3 |
| 2. Comprehensive training manual on business management of agricultural enterprise | 35.7 | 57.1 | 0 | 7.1 | 0 | 4.2 |
| 3. Peer-to-peer interaction | 28.6 | 42.9 | 0 | 28.6 | 0 | 3.7 |
| 4. One-to-one consultation | 28.6 | 42.9 | 0 | 28.6 | 0 | 3.7 |
| 5. Hands on training | 7.1 | 71.4 | 7.1 | 14.3 | 0 | 3.7 |
| 6. Extension publications (Fact sheet, flyer, brochure, pamphlet, newsletters) | 7.1 | 57.1 | 21.4 | 14.3 | 0 | 3.6 |
| 7. Webinar, interactive meeting, Workshop and training | 14.3 | 50.0 | 7.1 | 28.6 | 0 | 3.5 |
| 8. YouTube or Video | 7.1 | 57.1 | 14.3 | 21.4 | 0 | 3.5 |
| 9. Farm visit/tour | 14.3 | 50.0 | 0 | 35.7 | 0 | 3.4 |
| 10. Field days | 14.3 | 35.7 | 28.6 | 21.4 | 0 | 3.4 |
| 11. One-one counseling | 7.1 | 57.1 | 0 | 35.7 | 0 | 3.4 |
| 12. Virtual presentations | 0 | 42.9 | 21.4 | 35.7 | 0 | 3.1 |
| 13. Radio and TV program | 7.1 | 21.4 | 7.1 | 64.3 | 0 | 2.7 |

*5.6.3 Learning resources of minority and beginning farmers*

Based on importance, farmers ranked the seven learning resources that were necessary to update, build, and strengthen their knowledge gap (Table 9). The estimated index value[4] shows that partnership with the local farmers' markets, local food chain, and the community garden was at the top with an average score of 4.0. Subsequently, farmers' organizations e.g., farmers' groups, commodity groups, farmers' association and educational events such as interactive workshops and meetings, hands-on training,

[4] Importance of learning resources measured as - extremely important (5) to the least important (1).

farmers' conferences (3.9); in-person training and education e.g., consultation and counseling (3.8); incubator farms (3.9); digital training materials, for instance video (3.5); and virtual training such as farmers' school (3.4) were ranked in descending order based on their index values.

Table 9: Farmers' report of the importance of resources (n=14).

| Resources | Extremely important | Very important | Moderately important | Slightly important | Not at all important | Index value |
|---|---|---|---|---|---|---|
| 1. Local partnerships (farmers' market, local food, community garden) | 42.9 | 21.4 | 28.6 | 7.1 | 0 | 4.0 |
| 2. Farmers' organizations (farmer's association/cooperatives) | 14.3 | 71.4 | 7.1 | 7.1 | 0 | 3.9 |
| 3. Educational events (workshop, training, meeting, conference) | 7.1 | 78.6 | 7.1 | 7.1 | 0 | 3.9 |
| 4. Training and education (in-person) | 14.3 | 57.1 | 21.4 | 7.1 | 0 | 3.8 |
| 5. Incubator farmers | 7.1 | 71.4 | 7.1 | 7.1 | 0 | 3.8 |
| 6. Digital training materials | 7.1 | 50.0 | 28.6 | 14.3 | 0 | 3.5 |
| 7. Virtual training | 7.1 | 50.0 | 21.4 | 21.4 | 0 | 3.4 |

*5.6.4 Timing of training*

Half of the participating farmers indicated a preference for multi-session weekend workshops, compared with 36% reporting the multi-session weekday workshops (Table 10). Likewise, 29% of them favored a one-day weekend workshop over a one-day weekday workshop (14.3%). The results imply that farmers prefer weekend training programs to weekday training programs. Moreover, participants preferred shorter but multiple weekend sessions to a single day-long event.

Table 10: Timing of training reported by farmers (n=14).

| Programs | Percent |
|---|---|
| Multi-sessions weekend workshops | 50.0 |
| Multi-sessions weekday evening workshops | 35.7 |
| One-day weekend workshop | 28.6 |
| One-day weekday workshop | 14.3 |

5.7 Hands-on training on basics of farm economics and management

Based on the findings of the needs assessment survey, the team organized hands-on trainings on the basics of farm economics and farm management. The trainings focused on lowering production costs by introducing the least-cost techniques such as proper allocation of scarce resources, efficient use of limited resources, application of farmyard manure, compost making, and rainwater harvesting for irrigation.

5.8 Farm data recording and analysis

Farm data recording and analysis involved designing the data recording format, educating the project participants about the need and importance of data and maintaining data on crop biodiversity, inputs used, output produced, household consumption, and sales.

5.9 Data-driven production plan

The project facilitated the participating farmers to revise their conservative backyard production plans using the production, consumption and sales data. Most of the participating farmers started to consume fresh produce at home, and sell of surplus production (marketable surplus) to supplement household income.

5.10 Specialty crop market assessment survey

*5.10.1 Markets assessment*

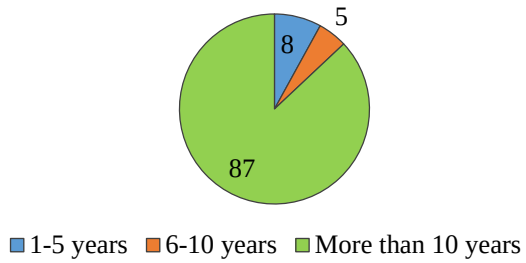
A specialty crop market assessment survey was conducted in seven locations - six locations in Maryland and one location in Pennsylvania (Table 11). The survey mainly focused on farmers' markets. A total of 41 vendors (farmers selling their products) were surveyed. In some locations, individual farmers sold their fresh produce at the farm gate, from the truck, and from a booth independently. However, the farmers market in Baltimore City consisted of several vendors and commodities other than fruits and vegetables. Of the total, just over three-quarters of the vendors were in Baltimore City followed by 10% in Princess Anne, and 5% in Fruitland. Almost all (95%) of the vendors were in Maryland and only 2.5% were in Pennsylvania.

Table 11: Name and locations of the markets (n=41).

| Locations of vendors | Percent |
|---|---|
| Farmer market, Baltimore City, MD | 75.6 |
| Princess Anne, MD | 9.8 |
| Fruitland, MD | 4.9 |
| Dorchester, MD | 2.4 |
| Baltimore County/Downtown, MD | 2.4 |
| Salisbury, MD | 2.4 |
| Fresh produce market: Buchanan Valley, PA | 2.4 |

Eighty-seven percent of the markets were in operation for over 10 years (Figure 2). Slightly over 5% of them were in operation for 6-10 years, and nearly 8% of them were in operation for 1-5 years.

Figure 2: Number of years of operation (%), (n=38).




Virtually 94.9% of the respondents reported that the main reason for operating a market was to supplement household income (Table 12). Similarly, 71.7% of them reported making a profit and 66.3% said that the market was a family tradition. Among other reasons, nearly 60% of them mentioned that the market was operated to pass the time, followed by 10% for tax benefits, and around 8% for promoting specialty crops.

Table 12: Reasons for operating markets (n=39).

| Reasons for operation | Percent |
|---|---|
| To supplement household income | 94.9 |
| Profit making | 71.7 |
| Family tradition | 66.3 |
| To pass the time | 59.1 |
| For tax benefits | 10.3 |
| Promoting specialty crops | 7.8 |

All respondents reported they had their own production for the market. Twenty-seven percent of them reported that the produce was supplied from retail stores (Table 13). Only 19.5% and 14.6% of the respondents respectively reported that the produce was supplied by the contact farmers as well as by the general farmers.

Table 13: Product suppliers to the market (n=40).

| Source of produce | Percent |
|---|---|
| Own production | 100.0 |
| Retail stores | 27.5 |
| Contact farmers | 19.5 |
| General farmers | 14.6 |

*5.10.2 Problems experienced by vendors*

Seventy percent of vendors ranked a lack of access to credit (index 4.6) as an extremely important problem they face in operating a specialty crop market (Table 14). This was confirmed by 25% of respondents who rated it as very important. The other four major problems followed - a lack of capital (index 4.2), not enough market management skills (index 4.2), a

lack of market data analytical skills (index 4.1) and a lack of family labor to support this market (index 4.1). The distribution of other problems with the index value are provided below.

Table 14: Problems faced by vendors/farmers (%) while operating specialty crop markets (n=40).

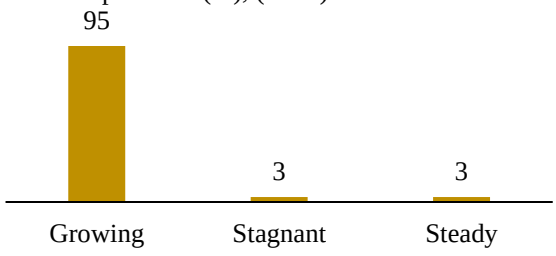
| Items | Extremely important | Very important | Moderately important | Slightly important | Not at all important | Index value |
|---|---|---|---|---|---|---|
| Lack of access to credit | 70.0 | 25.0 | 0 | 0 | 5.0 | 4.6 |
| Lack of capital | 57.5 | 30.0 | 0 | 2.5 | 10.0 | 4.2 |
| Not enough market management skills | 52.5 | 30.0 | 2.5 | 12.5 | 2.5 | 4.2 |
| Lack of market data analytical skills | 30.0 | 50.0 | 20.0 | 0 | 0 | 4.1 |
| Lack of family labor to support this market | 22.5 | 65.0 | 10.0 | 0 | 2.5 | 4.1 |
| Short supply of specialty and ethnic crop | 13.3 | 66.7 | 13.3 | 0 | 6.7 | 3.8 |
| Cannot afford establishing agri-market | 25.0 | 30.0 | 40.0 | 2.5 | 2.5 | 3.7 |
| Lack of information to start agri-marketing | 32.5 | 22.5 | 30.0 | 12.5 | 2.5 | 3.7 |
| Shortage of labor in the market | 22.5 | 35.0 | 30.0 | 10.5 | 2.5 | 3.7 |
| Lack of direct access to producers | 20.0 | 35.0 | 30.0 | 12.5 | 12.5 | 3.6 |
| Lack of agri-business planning | 7.5 | 50.0 | 30.0 | 10.0 | 2.5 | 3.5 |
| Lack of access to relevant market-related educational materials | 2.5 | 27.5 | 65.0 | 2.5 | 2.5 | 3.3 |

Table 15: Problems farmers wanted to improve in the specialty crop market (n=41).

| Problems | Percent |
|---|---|
| Expensive inputs | 63.4 |
| Expensive parking | 43.9 |
| Expensive spot | 41.5 |
| Labor shortage | 36.6 |
| Labor expensive | 34.1 |
| Expensive machinery | 19.5 |
| Long drive | 9.8 |
| Drought | 2.4 |
| Sustainability of market | 2.4 |
| Food safety synergy | 2.4 |
| Increased city activities | 2.4 |
| Location or changed neighborhood | 2.4 |
| Lack of water for irrigation | 2.4 |
| English (language) problem | 2.4 |
| Lack of finance | 2.4 |
| Declining market | 2.4 |

Vendors/farmers were asked to list major problems based on their experience to improve the specialty crop market (Table 15). Slightly over 63% of them reported expensive inputs, followed by expensive parking (43.9%) and expensive rental space (41.5%) as the top three problems farmers wanted to improve upon in the specialty crop market. Other problems were labor shortage (36.6%) and expensive labor (34.1%). Regarding the scope of specialty and ethnic crop markets, 95% of the participants reported that they were growing. Only 3% each reported that they were either stagnant or steady (Figure 3).

Figure 3: Scope of specialty and ethnic crop market (%), (n=40).



*5.10.3 Local market prices for specialty crops*

The project assessed the availability of specialty crops (fruits and vegetables) and their prices in the local markets. Price information was gathered from 41 farmers (vendors) who were engaged in different local markets at various locations. Information about the availability of specialty and ethnic crops (vegetables, fruits, and medicinal herbs) collected through the market survey are presented in Appendix 7.


Picture 2: UMES Extension and Northeast SARE assisted vegetable selling booth in Towson, Maryland (May 07, 2022).

Administering a market survey was a bit complex when it came to collecting prices of available produce in a standard format. This is because of different units used by the vendors to sell the same product. Thus, we have presented the prices in whatever units and standards the products were sold in the market, such as price per bunch, per quart, per pound, per box, per pot, per pint, per basket, and per piece. For example, as common commodity, tomatoes, were sold per quart, per pound, per box, per pot, and per pint. These per unit prices will be useful to the producers, sellers as well as the customers.

## 6. Learning outcomes

The following are the project outcomes achieved.

1. Improved technical and economic efficiency of participating farmers. The project investigated the factors inhibiting small, socially disadvantaged and minority farmers from allocating limited resources efficiently and making informed decisions (refer to project outcomes – knowledge and skills, production, consumption, sales, and household income).
2. Enhanced farmers' capacity to record farm data and monitor farm performance (refer to project outcomes – marketing, consumption, and household income).
3. Developed farmers' capacity to prepare a farm business plan (refer to project outcomes – water harvesting tanks, compost making, cropping intensity, and marketing initiatives).
4. Studied the scope and market potentials of specialty and ethnic vegetables (refer to project outcomes – market price, cropping intensity, and niche marketing).

## 7. Impact and outcomes of the project intervention

A post project evaluation survey was administered to 22 participating farmers to assess the impact of the project interventions. The following indicators were used to measure the impact of the project.

7.1 Delivery of production inputs and services
7.2 Change in knowledge and skills
    7.2.1 Usefulness of peer-to-peer interactions and networking
    7.2.2 Usefulness of training and specialists to producers
7.3 Change in behavior and action
7.4 Building entrepreneurial capability
7.5 Technology adoption

7.6 Increase production and productivity
7.7 Increase intake of fresh vegetable consumption
7.8 Mitigating production, marketing, and financial risks
    7.8.1 Market mechanism initiated
    7.8.2 Marketing network initiated
    7.8.3 Niche marketing promoted at the street festival
    7.8.4 Project contribution to agricultural risk mitigation
    7.8.5 Marketing of ethnic vegetables
    7.8.6 Crop biodiversity increase
7.9 Reducing production cost
    7.9.1 Rainwater harvesting
    7.9.2 Making compost
    7.9.3 Lowering the production cost
7.10 Networking peer-to-peer and peer-to-specialists
7.11 Training and peer-to specialist interactions/counseling/consultation
7.12 Increasing farm revenue
7.13 Developing data-based farm planning and budgeting
7.14 Connecting producers and consumers with the market
7.15 Making sustainable use of limited and scarce resources.

The results of the survey are described under the subsequent headings below.

7.1 Delivery of production inputs and services

The project distributed various production inputs and materials to the participating farmers (Picture 3). These inputs were distributed as per the needs assessment survey. Table 16 shows farmers' responses in receiving various production inputs (token supports) from the project. Nearly 91% of them received farm-yard manure and fertilizers and slightly over 86% of them stated that they received crop seeds/seedlings, garden soil and hand tillers. Similarly, 68.2% responded that they received garden tools, and 45.5% received water harvesting tanks. Nearly one-third (31.8%) of them received plant feed (growth enhancers). Hedge shears (big and small), wheelbarrows, and weed cutters/mowers were distributed to a limited number of farmers. However, the farmers have made a consensus to share the tools or equipment as a group resource so that all of the farmers can use them when needed.

Picture 3: Farmers receiving full cart-load of manure for urban gardening at Tractor Supply (May 7, 2022).

Table 16: Production inputs received by the farmers (n=22).

| Inputs | Percent |
|---|---|
| Manure and fertilizers | 90.9 |
| Crop seeds/seedlings | 86.4 |
| Garden soil | 86.4 |
| Garden tools and equipment | 68.2 |
| Water harvesting tanks | 45.5 |
| Plant feed (nourishments) | 31.8 |
| Chemicals (insecticides, pesticides, and herbicides) | 27.3 |
| Hand tillers | 18.4 |
| Hedge shear - big | 9.1 |
| Hedge shear - small | 9.1 |
| Wheel barrow | 4.5 |
| Weed cutter/mower | 4.5 |

## 7.2 Change in knowledge and skills

The project assessed whether the participating farmers gained any knowledge and skills from this project. All the project participants (100%) reported that they gained knowledge on exploring marketing opportunities (Table 17), and nearly 96% of them indicated that they gained knowledge in reducing production costs, peer-to-peer networking, and networking with service providing institutions. This was followed by farm revenue maximization (86.4%), entrepreneurial skills development (81.8%), and farm management practices (72.7%). Knowledge gains were also reported for production risk mitigation (59.1%), resource management (63.6%), the importance of data recording (63.6%), and data-based farm planning (68.2%).

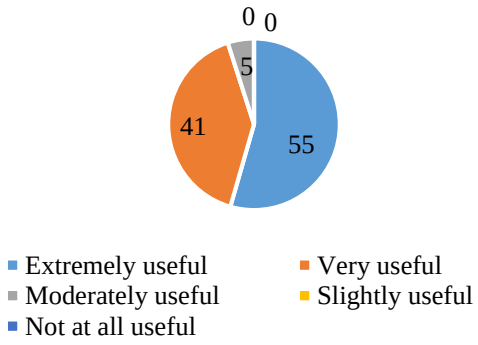
Table 17: Knowledge and skills gained by the participant farmers (n=22).

| Assessment Indicators | Percent |
|---|---|
| ▪ Exploring marketing opportunity | 100.0 |
| ▪ Reducing cost of production | 95.5 |
| ▪ Peer-to-peer networking | 95.5 |
| ▪ Networking with service providing institution | 95.5 |
| ▪ Farm revenue maximization | 86.4 |
| ▪ Entrepreneurship development | 81.8 |
| ▪ Farm management practices | 72.7 |
| ▪ Data-based farm planning | 68.2 |
| ▪ Importance of data recording | 63.6 |
| ▪ Resource management | 63.6 |
| ▪ Production risk mitigation | 59.1 |

## 7.3 Change in behavior and action

Of the total 22 participating farmers, all of them reported that their participation in the project was very useful in bringing positive changes in behavior/action pertinent to sustain urban gardening (Figure 4). One example of behavior change was the adoption of a rainwater harvesting technique in a farmer's garden.

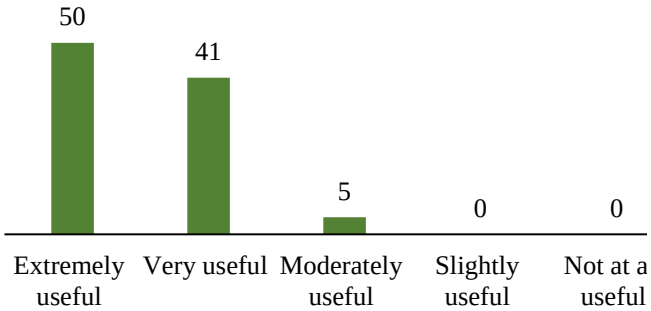
Figure 4: Usefulness of farmers' participation in the project to bring positive changes in behavior/action (%), (n=22).




## 7.4 Building entrepreneurial skills

Ninety-six percent of the project farmers described that the support was extremely useful (50%), very useful (41%) or moderately useful for enhancing knowledge and skills pertinent to entrepreneurship development (Figure 5).

Figure 5: Entrepreneurship development (%), (n=22).




## 7.5 Technology adoption

The following technologies were supported and promoted in project farmers' fields.

*7.5.1 Promotion of two-tier system of vegetable production*

Promotion of a two-tier vegetable production system using local resources. Farmers grow leafy vegetables on the ground and creepers on the first level (open roof) to maximize the use of limited space.

Picture 4: An example of a two-tier vegetable production system. Basil, hot red chili, banana, and flower on the ground and pumpkin, bitter gourd, cucumber, beans, chayote on the open ceiling/roof.

*7.5.2 Rainwater harvesting (refer to 7.9.1)*
*7.5.3 Making compost of garden/home/lawn byproducts (refer to 7.9.2)*
*7.5.4 Application of locally available materials (wooden/rope/wire net/fence: tendrils and trellis) (refer to 7.5.1, Picture 6, 12a-12d, 7.15)*
*7.5.5 Container gardening*

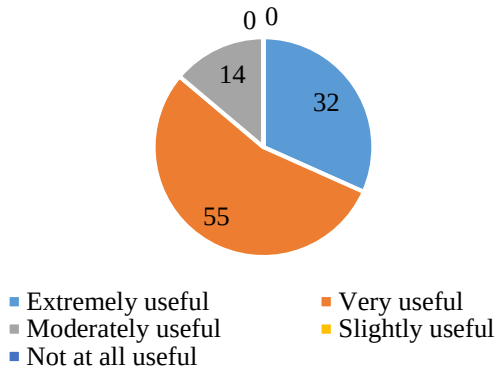
Picture 5: Helping project farmers expanding container gardening. Growing Asian ethnic red-hot chili (Akabare dalle khursani (Nepali name) in the containers.

Picture 6: Project farmers are encouraged to grow various ethnic vegetables, fruits, and flowers in using the discarded containers (colocasia, red-hot chili, marigold, eggplant, and many other crops in the picture).

7.6 Production and productivity increased

Increasing the production efficiency of small and minority farmers was one of the objectives of this project. Nearly 32% of the participating farmers in the post evaluation survey (n=21) reported that their involvement in the project was extremely useful, followed by 55% very useful, and 14% moderately useful to increase farm production of the selected specialty and ethnic vegetables (Figure 6).

Figure 6: Usefulness of farmers' participation to increase production (%), (n=21).




Picture 7: Northeast SARE farmers with fresh farm produce (tomatoes, hot red chili, bitter melon, long chili, and cowpea) preparing to take it to the market, packaged and labeled.

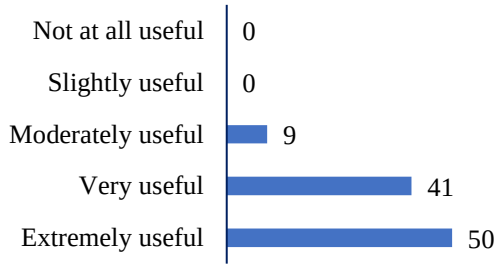
Picture 8: Vigorous red-hot chili (Akabare dalle khursani, Nepali name). Project farmers harvested multiple times from the same plant.

Picture 9: Tane bodi -Nepali name (beans) giving a bumper crop in a wasted piece of land on the trellis of locally available materials.

7.7 Increased consumption of fresh vegetables

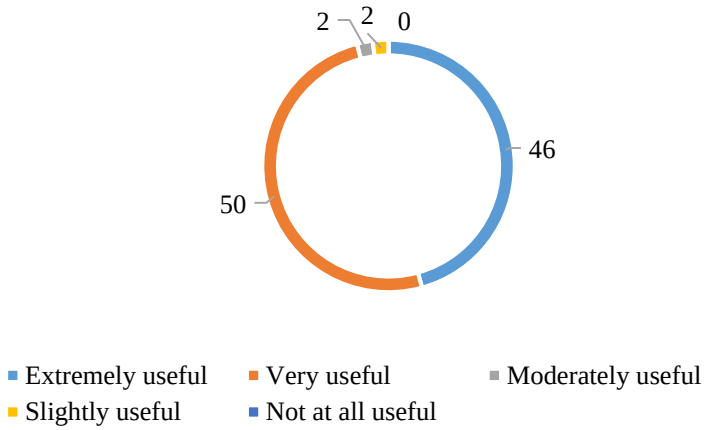
The project was expected to increase the consumption of fresh produce at home (farm-to-fork). With the production of diversified specialty and ethnic crops in the home garden, the farmers reported that their involvement in the project was extremely useful (50%), followed by very useful (41%) and moderately useful (9%) in increasing their intake of various types of fresh produce (Figure 7) at each meal at home.

Figure 7: Increased consumption of fresh produce due to project interventions (%), (n=22).




Fifteen participating farmers reported a 25% (equivalent to $10,500.00) and 5 farmers reported 15% (equivalent to $2,000.00) increase in consumption of fresh produce at home during the project period. The increased intake was due to increased production in the backyard garden. All the farmers reported that their participation in the project activities was useful in increasing their intake of fresh produce at home as a result of the project interventions (Figure 9).

7.8 Mitigating production, marketing, and financial risks.




All of the farmers responded that the project was useful for strengthening their production, marketing, and financial risk management capacity (Figure 8).

Figure 8: Agricultural risk mitigation (%), (n=22).

*7.8.1 Market mechanism initiated*

The project facilitated the farmers in exploring available local markets and market-related information, such as entry requirements, operating hours, and locations. Simultaneously, the project encouraged them to take advantage of any of the following marketing outlets to maximize sales.

1. Niche marketing of ethnic vegetables
2. Direct marketing of products
    a. Selling directly to retail store
    b. Setting up a roadside market
    c. Entering farmers' markets
    d. Inviting consumers to visit the farm and harvest their own purchases (like U-pick)
    e. Advertising to initiate community-supported greens production

f. Selling at the farm gate
g. Connection to the seasonal markets
h. Collecting products and selling from a combined stall

3. Connecting local to festivals
4. Peer-to-peer networking
5. Peer-expert networking
6. Labeling of products
7. Disseminating product information

Linking farmers with various market outlets to sell their produce was another goal of this project. Farmers described that their participation as extremely useful (46%), very useful (50%) and moderately useful (5%) in linking them to various market outlets (Figure 9).

Progress in marketing initiatives confirmed that farmers were able to sell their produce at the local festivals, the farm gate, farm to family, and farm to contact consumers. The amount of direct sales reported by participant farmers during the summer of 2022 was $1,700.00. The products sold were mainly vegetables such as mustard greens, tomatoes, amaranths, green beans, cucumber, dill, pumpkin, pumpkin tendrils, bitter gourd, red hot chili, squash, and long chili (Picture 10).

Picture 10: Project assisted marketing stall in Towson, Maryland at the street festival.

*7.8.2 Marketing network initiated*

As mentioned earlier, farmers were linked to various market outlets such as local community markets, festivals and customers. As a result, farmers were able to sell their produce at the local festivals, the farm gate, farm to family, and farm to contact consumers. The total amount of sales through direct marketing reported by the participating farmers during this summer (2022) was $1,700.00.

*7.8.3 Niche marketing promoted at the street festival*

Marketing of some specialty and ethnic vegetables at the street festival was eye opening to hundreds of minority families (Asian, African, and Latino). The stall served as a perfect Extension stall while informing potential consumers as the source of fresh produce in the community, types of specialty vegetables and family marketing opportunities. As per the anecdotal assessment, the market demand of such vegetables seemed to be huge. However, meeting at least a small fraction of such a demand is both a major challenge and an opportunity for the producers.


Picture 11a: A consumer checking her wallet to secure her portion of preferred ethnic vegetables.


Picture 11b. Ms Kemika Bhandari, Community Specialist, helping farmers to maximize their sales at the street festival. Onlookers rushing to buy fresh produce produced by Northeast SARE project farmers. The demand exceeded the supply.


Picture 11c: Ms Bhandari, Community Specialist for the project on Increasing Efficiency and Decision-Making Capability of Small, Socially Disadvantaged, and Minority Farmers, University of Maryland Eastern Shore (UMES), UMES Extension setting up a market stall for farmers.

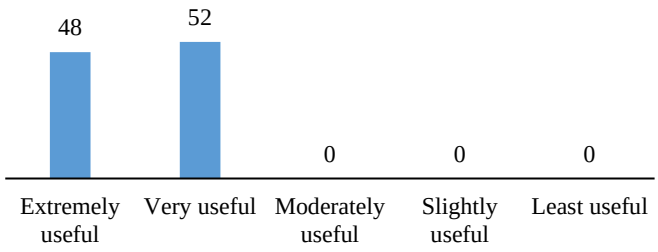

Picture 11d: Buyers rushing to secure their preferred ethnic fresh vegetables at the street festival in Towson, Maryland.

Picture 11e: Most preferred Asian chili (Akabare dalle khursani, Nepali name) red-hot chili, amaranth (latteko saag in Nepali).

*7.8.4 Project contribution to agricultural risk mitigation*

Crop diversification was one of the most important strategies for reducing farm risks. All the farmers reported that their participation in the project was extremely useful (48%), followed by very useful (52%) in minimizing the risk in farming, which helps to lower risks in agricultural production (Figure 9).

Figure 9: Usefulness of farmers' participation in the project for risk mitigation (%), (n = 21).




*7.8.5 Marketing of ethnic vegetables*

The project farmers practiced both crop diversity and crop intensity while cultivating ethnic vegetables. Both practices minimize insect infestation and spread out production, financial, and marketing risks spread over to cultivated crops. The potential demand of ethnic vegetables was proved by the amount of vegetables sold at the street festival in Towson, Maryland, and through other marketing outlets. Project farmers cultivated several ethnic and specialty vegetables and flowers in the same field during the same period (refer to pictures 12a-12d below).

*7.8.6 Crop biodiversity increased*

Figure 12a and 12b: Cultivating climbing (creeper) vegetables using the available wire net fence on the property line (pumpkin, yam, eggplant, marigold, makhamali (Nepali name), 3-types of stinging nettle on the lower left picture) and gorgeous mustard greens, beans, red hot chili, and pumpkin in the right picture.

Picture 12c: Tite karela (Nepali name) or bitter gourd/melon – a widely consumed ethnic vegetable, which is also considered for 'medicinal value'.

Picture 12d: Two-tier vegetable production by a project farmer - chayote and bitter melon on the open ceiling and ethnic red-hot chili underneath.

The crop diversity survey administered to the participating farmers (n=16) shows that 50 different specialty and ethnic crops (vegetables, fruits, medicinal plants, pulses, and cereals) are grown in their fields[5] (Figure 10). Of the total crops, 33 were vegetables, 10 were fruits, 5 were medicinal plants, 3 were pulses, and 2 were cereals (refer to Appendix 6 for detailed list). Specifically, chili, cucumber, pumpkin, and tomato were cultivated by most of the farmers (93.8%), followed by eggplant (87.5%) and okra, beans, spinach, and bitter gourd each 81.3%. Among fruits, banana was reported by 43.8% of the farmers, followed by peach and apple (25%). On average, a farmer reported growing 20 different crops, with a minimum of 7 and a maximum of 43. Nearly 44% of the farmers reported 10-19 crops, followed by 38%

[5] *Soybean and cowpea are counted as both vegetable and pulse crops. **Buckwheat is counted as both vegetable and cereal crops.

of them reporting 20-29 crops, 13% of them reporting 30 or more crops, and 6% reporting fewer than 10 crops (Figure 11).

Figure 10: Number of crops cultivated by the project farmers (n=16)

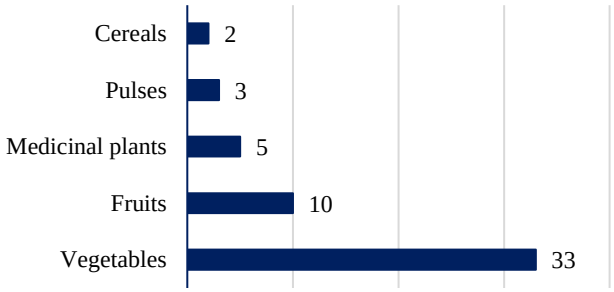
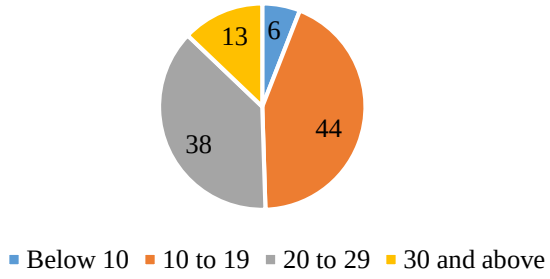



Figure 11: Crop diversity - farmers reporting number of crops grown (%), (n=16).




Picture 13a and 13b: Crop diversification. Sugarcane, amaranths, mustard green, pumpkin, two-types of stinging nettle, eggplant, and collard (in the left picture). Banana, fig, flower, stinging nettle, lemon, and colocasia (in the right picture).

Pictures 13c: Crop diversification. One of the project farmers cultivating several vegetables (mustard greens, tomatoes, red hot chili, beans). Banana, apple, pomegranate, grapes and flowers in a single piece of land.

Picture 13d: Crop diversification. Increasing crop diversity to reduce production and financial risks. Nearly a dozen vegetables can be seen on the same piece of land.

7.9 Ways and means of reducing production cost

*7.9.1 Rainwater harvesting*

To meet the challenge of water scarcity, the project promoted water harvesting technology by distributing rainwater harvesting tanks to the farmers. Of the total 22 participating farmers, nearly half (46%) of them reported receiving a water harvesting tank (Table 16). Our experience suggests that the project could not meet the demand for water harvesting tanks due to budget deficit. Each urban gardener requested at least two tanks to lower the production cost by reducing the water bills.

Picture 14a: Rainwater harvesting technology adopted by project farmers – an indigenous rainwater harvesting technology to irrigate vegetables, fruits, and medicinal herbs to increase profit margin of the kitchen garden by significantly reducing the water bills. Tomato, apple, and peach trees on the side of water storage tank. Rosedale, Baltimore.

Picture 14b: Northeast SARE project purchased 10 water harvesting tanks (1000 gallons capacity) for the 10 dedicated project farmers.

*7.9.2 Compost making in the garden*

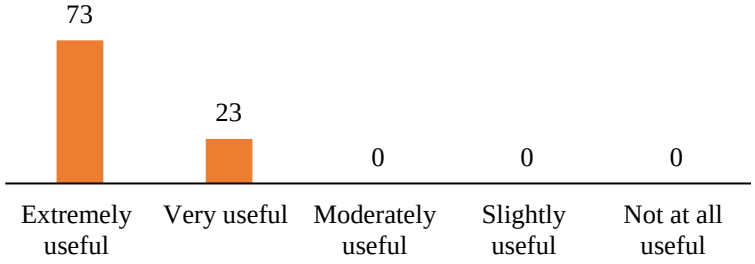
Making compost was also promoted to the farmers. It is expected that the production of compost in the garden by project farmers will increase soil productivity, conserve moisture, and lower production costs. The project intends to find ways to improve this traditional way of making compost.

Picture 15a and 15b: Promoting compost in the urban gardens is one way to lower the production costs. The project will continue to improve the process of making compost even after the project ends.

*7.9.3 Project contribution to lowering the production cost*

Lowering the cost of production to enhance economic efficiency was one of the goals of this project. In total, 96% (Figure 12) of the farmers that their participation in the project helped them reduce the cost of production. Seventy-three percent of them said their participation was extremely useful, and 23% said their participation was very useful in lowering the cost of production.

Figure 12: Reducing cost of production (%), (n=22).




7.10 Peer-to-peer networking

Peer-to-peer (P2P) interaction was one of the preferred learning modules, as reported by the participating farmers in the needs assessment survey. Of the 13 modules listed, they ranked P2P learning as the third most useful module for improving their knowledge on farming effectively. The P2P interaction was either extremely useful, very useful, or moderately useful in enhancing knowledge and skills about agricultural production for all the participating farmers, which was confirmed by an index value of 4.3 (Table 18).

Table 18: Usefulness of peer-to-peer interaction to enhance knowledge and skills (%), (n=22).

| Items | Extremely useful | Very useful | Moderately useful | Slightly useful | Not at all useful | Index value |
|---|---|---|---|---|---|---|
| Knowledge | 40.9 | 50.0 | 9.1 | 0 | 0 | 4.3 |
| Skills | 36.4 | 54.5 | 9.1 | 0 | 0 | 4.3 |

Picture 16a: A woman operated farm: Peer-to-peer interaction in the field.

Picture 16b: A family operated farm: peers-to-specialist interaction in the field.

## 7.11 Training and peer-to-specialist networking

The participating farmers described the usefulness of training sessions and peer-to-peer interactions to enhance their knowledge and skills about agricultural production (Table 19). Almost all farmers reported that training events were either extremely useful, very useful, or moderately useful to enhance knowledge and skills about agricultural production, processing, and marketing. This was confirmed by the index values of 4.5 and 4.3, for knowledge and skills respectively.

Picture 17: Farmers in an indoor training session on data recording, crop biodiversity, farm economics, and management in Parkville, Baltimore (August 15, 2022).

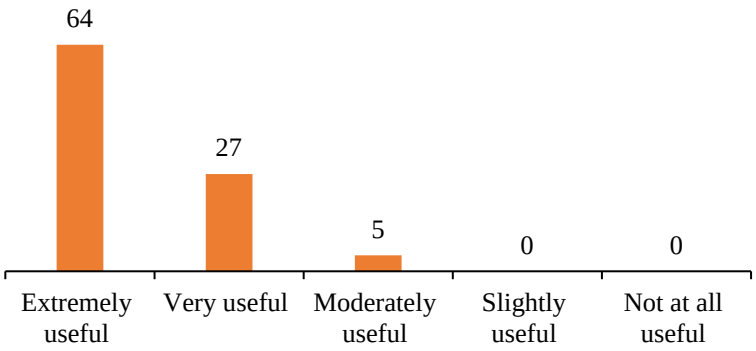
Table 19: Usefulness of trainings to enhance knowledge and skills (%), (n=22).

| Items | Extremely useful | Very useful | Moderately useful | Slightly useful | Not at all useful | Index value |
|---|---|---|---|---|---|---|
| Knowledge | 54.5 | 40.9 | 4.5 | 0 | 0 | 4.5 |
| Skills | 36.4 | 54.5 | 9.1 | 0 | 0 | 4.3 |

The results discussed earlier provide strong evidence that both the training sessions and peer-to-peer interactions were useful to enhance knowledge and skills of smallholder minority farmers in Maryland.

Picture 18: Participants posing for a picture after the indoor training session on technology adoption, record keeping, crop biodiversity, rainwater harvesting, compost making, and marketing of fresh produce (Parkville, Baltimore, August, 2022).

7.12 Increasing farm revenue

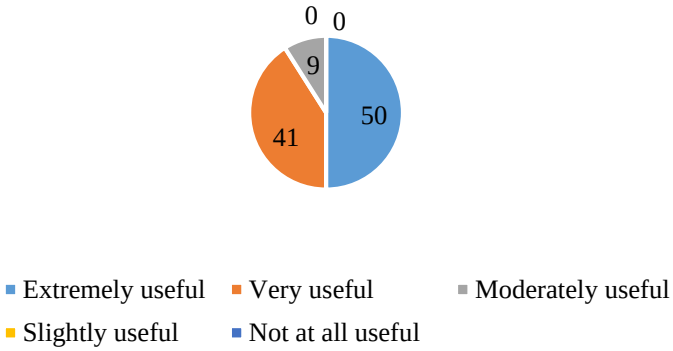



Sixty-four percent of the farmers reported that the support for production inputs was extremely useful for increasing farm revenue followed by very useful (27%) and moderately useful (4.5%).

Figure 13: Farm revenue maximization (%), (n=22).

Farmers initiated marketing of ethnic vegetables in various forms of market outlets as mentioned under sub-sections 7.8.1 and 7.8.2. Total direct sales of $1,700.00 were reported by five farmers. Simultaneously, 15 project farmers reported a 25% increase in fresh consumption, equivalent to $10,500.00, and 5 farmers reported a 15% increase in fresh consumption, equivalent to $2,000.00, during the project period. Thus, indirect economic benefit from the vegetable sales was equivalent to $12,500. In total, the project increased the farmers' household incomes through vegetable production by about $14,200.00.

Figure 14: Usefulness of farmers' participation in the project to increase household income (%), (n=22).

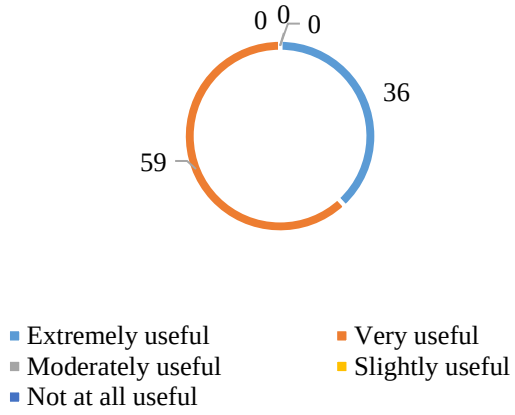



In the post evaluation survey, 50% of the farmers reported that their participation in the project was extremely useful, followed by 41% very useful, and 9% moderately useful in increasing household income (Figure 14).

7.13 Data driven farm planning, and budgeting

Participating farmers stated that the support they received to acquaint them with farm planning and budgeting process and methodology was extremely useful (36%) followed by very useful (59%). Project farmers outlined their production and marketing plan based on the generated data about production, consumption, and marketing.

Figure 15: Farm planning and budgeting (%), (n=22).



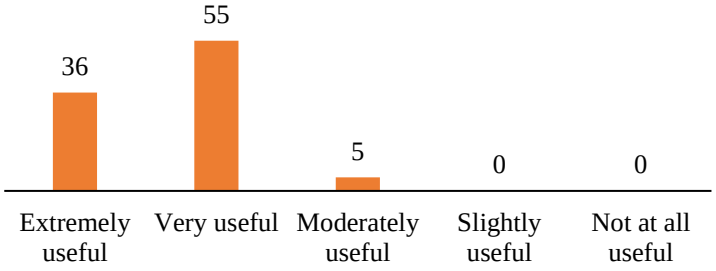

7.14 Connecting producers and consumers with the markets

The project facilitated the establishment of link between producers (suppliers) and consumers (buyers) to work together to increase production and supply of fresh produce, increase fresh intake, initiate dialogue to revise production, supply schedule, and expected quantity to the markets/consumers. As a result of the project initiation and intervention, some of them were connected to potential markets, thereby revising their production plan to sustain fresh produce production in the urban gardens. The revised plan will help them to harvest more, consume more, and supply more to the market.

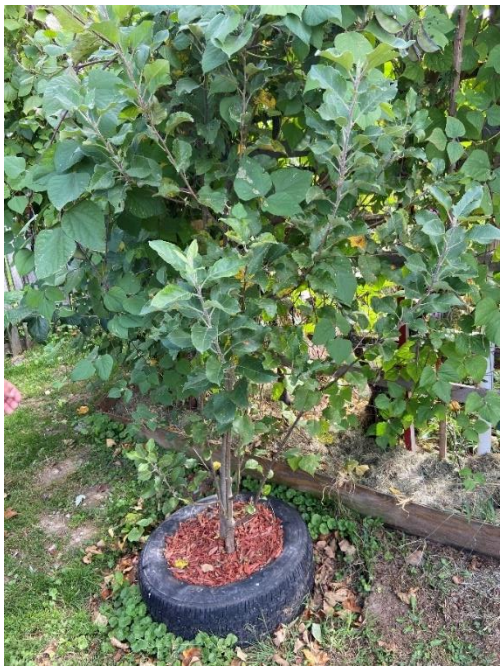
7.15 Making sustainable use of limited and scarce resources

Ninety-six percent of the project farmers confirmed that the project support was extremely useful (36%), very useful (55%) and moderately useful (5%) for managing scarce and limited farm resources while practicing mixed farming intensively (Figure 16).

Figure 16: Making sustainable use of limited and scarce resources (%), (n=22).



Picture 19a: Project farmers were encouraged to use local materials for fencing and trellis for climbers, growing vegetables, and trees.



Picture 19b: Container gardening (efficient use of limited production resources (water and manure) making best use of locally available resources.

**8. Presentation in conferences**

8.1 Lila B. Karki, Prem Bhandari, Yeong Nain Chi, and Suzanne W. Street (2022). Agricultural Problems Hierarchy and Rational Decision-Making: A Case of Minority Urban Farmers in Maryland. Association of Nepalese Agricultural Professionals of America (NAPA), 3rd Biennial International Conference, Atlanta, Georgia, May 27-29. *Abstract and oral presentation.*

***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

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***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

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***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

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***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

**9. Publication in online e-Newsletter**

9.1 UMES Extension helps Bhutanese American farmers through Northeast SARE grant: CONNECTION, University of Maryland Eastern Shore, August 17, 2022.

https://wwwcp.umes.edu/sans/connections/august-2022/umes-extension-helps-bhutanese-american-farmers-through-northeast-sare-grant/?utm_source=Connections%21+Newsletter&utm_campaign=398d5deeea-

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***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

9.2 UMES Extension facilitates marketing opportunities for urban growers of ethnic vegetables (2023). Connection online newsletter, January 23.

https://mail.google.com/mail/u/0/?ui=2&ik=7c66a70b05&view=lg&permmsgid=msg-f%3A1755844996468867112&ser=1

**10. Online Journal Submission**

Lila B. Karki and Prem Bhandari (2023). Rational Producers and Risk Diversification: A Case of Urban Gardening in Maryland. Submitted to AgEconSearch. Research in Agricultural and Applied Economics. https://ageconsearch.umn.edu/pages/?page=submit&ln=en

***Acknowledgement:*** *The study was funded by the Northeast Sustainable Agriculture Research and Education (SARE) Program-competitive partnership grant in 2021.*

**11. Working progress on journal publication**

The following two articles are in progress. They are expected to be published by May, 2023.

- Impact of Urban Gardening on the Household Economy of Minority Farmers in the Changing Social Context. University of Maryland Eastern Shore, Maryland.
- Socially Disadvantaged and Minority Farmers' Needs and Capacity Building Expectations. University of Maryland Eastern Shore, Maryland.

**12. Research conclusions**

The project aimed to enhance the technical and economic efficiency of small, socially disadvantaged, and minority (SSDM) farmers by strengthening their knowledge and skills to make informed decisions, develop evidence-based farm plans, and adopt economically sustainable practices to optimize farm income.

The project accomplished the following activities: (i) a needs assessment, (ii) hands-on training on the basics of farm economics and management, (iii) farm data recording, and data-driven production plan, iv) a specialty crop market survey, (v) market survey analysis, (vi) marketing initiatives, (vii) supporting production inputs, and (viii) end of project 'impact assessment' survey.

***Positive changes***
*Outreach service expanded.* The project was initiated with 14 SSDM farmers, which was increased to 22 during the project period.

*Farmers gained knowledge and enhanced skills.* Based on the findings of the baseline needs assessment study, the project conducted several training events such as in-person discussions, peer-to-peer and peer-specialist interactions, field visits, focus group discussions, in-person and Zoom counseling to enhance knowledge and skills of the farmers.

*Technical and economic efficiency strengthened.* The project strengthened farmers' technical and economic efficiency by (i) enhancing their capacity to allocate limited resources efficiently and make informed decisions, (ii) strengthening their knowledge and skills to record farm data and monitor farm performance such as production, consumption, and marketing, (iii)) developing their capacity to prepare a data-driven farm business plan, iv) increasing cropping intensity and crop diversity, v) encouraging them to install rainwater harvesting technology, vi) educating and expanding compost making, and vii) linking them to markets to sell their marketable surplus.

*Technology adoption.* The participating farmers:

- Expanded rainwater harvesting, compost making, and two-tier production system,
- Intensively integrated mixed farming for risk diversification and risk mitigation,
- Initiated marketing of surplus produce to mitigate production, marketing, and financial risks.

***Impact of the project***

The post-evaluation findings confirmed that their participation in the project was useful for:

- developing entrepreneurial skills,
- developing data-driven planning,
- managing limited resources efficiently,
- reducing cost of production,
- mitigating risks,
- improving farm production and increasing consumption of fresh products,
- maximizing farm revenue and increasing household income,
- continuing farming,
- securing socio-economic and technical benefits
- changing their behavior/action, attitude, and enthusiasm to sell produce in the market,

    - 15 farmers collectively reported $1,700.00 in sales, primarily through direct marketing during the summer and the fall of 2022;
    - 20 farmers reported an increase in fresh vegetable intake, respectively by 25% (15 farmers) and 15% (5 farmers), which was equivalent to $12,500.00 during the project period (2022);
    - direct and indirect economic benefits from the production due to the project intervention was $14,200.00.

Farmers benefited from the enhanced knowledge, skills, and acquired experiences gained from the project to continue farming.

**13. Assessment of project approach / areas of further study needed:**

- This project focused on a small group of farmers-primarily-Asian-American (64%). Therefore, the findings should be considered with some care. In the future, the team suggests studying a larger sample of a representative and inclusive group of farmers from other counties in Maryland.
- This case study identified farmers conveniently due to absence of a sampling frame. Thus, in the future, first, the team would like to prepare a reliable sampling frame of farmers in the selected counties of Maryland. Then, the team proposes to select a more representative group of farmers for applying more rigorous inferential statistical analytical methods for internal validation as well as to obtain more generalizable conclusions (external validation).
- This is a one-time cross-sectional case study. In the future, the team proposes to make it a longitudinal (panel) study to obtain more meaningful results (conclusions).
- At this stage, the team has created several data collection instruments such as (a) baseline study to collect background information of farmers as well as for understanding hierarchy of needs and problems, training modules, and training areas perceived by the farmers, (b) market survey, (c) crop diversity survey, and (d) farm data recording format. While these instruments have been very useful in understanding what the project intended to explore and investigate, the team plans to standardize these instruments for a larger group of representative SSDM farmers.
- In terms of analysis, the team could present only descriptive results at this time. The team plans to design instruments to record more specific data such as production costs, revenue and profits, marketing margins, and level of technical and economic efficiencies and analyze them using rigorous approaches.
- The team envisions to test the efficacy of the training modules such as in-house trainings, peer-to-peer interactions, and farmer-expert interactions.
- The team intends to develop additional instruments to measure cropping intensity, cropping diversity, and economic efficiencies that arise from multi-tiered mixed farming systems practiced by farmers to mitigate production, marketing, and financial risks.

**14. Who would benefit?**

- The findings of this study are quite useful for the state or county level extension personnel who are working with the SSDM farmers of Maryland. However, these findings are also useful to other Northeast SARE states and many other states of the U.S.
- University research faculties, extension specialists, research personnel, extension educators, and policy makers who are primarily engaged in specialty and ethnic crops (vegetables, herbs, and fruits) concerned with SSDM farmers.
- Students and faculties of agricultural universities working with extension program.
- United States Department of Agriculture (USDA)
- For those willing to do research with Asian communities/farmers.

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## APPENDIX

Appendix 1: Types of vegetables cultivated by farmers (n=14).

| SN | Crops cultivated | Farmers (%) |
|---|---|---|
| 1 | Tomato | 50.0 |
| 2 | Spinach | 42.9 |
| 3 | Beans | 35.7 |
| 4 | Eggplant | 35.7 |
| 5 | Chili | 28.6 |
| 6 | Onion | 21.4 |
| 7 | Coriander/Cilantro | 21.4 |
| 8 | Okra/Ladies Finger | 21.4 |
| 9 | Zucchini | 21.4 |
| 10 | Pepper | 21.4 |
| 11 | Bitter Gourd/melon | 28.6 |
| 12 | Pumpkin | 14.3 |
| 13 | Cucumber | 14.3 |
| 14 | Carrot | 14.3 |
| 15 | Garlic | 14.3 |
| 16 | Cauliflower | 14.3 |
| 17 | Mustard green | 14.3 |
| 18 | Bottle Gourd | 14.3 |
| 19 | Bitter melon/Gourd | 14.3 |
| 20 | Swiss Chard | 14.3 |
| 21 | Potato | 7.1 |
| 22 | Corn | 7.1 |
| 23 | Mushroom | 7.1 |
| 24 | Radish | 7.1 |
| 25 | Pea | 7.1 |
| 26 | Broccoli | 7.1 |
| 27 | Colocasia/Taro | 7.1 |
| 28 | Chamsur/Garden Cress | 7.1 |
| 29 | Snake Gourd | 7.1 |
| 30 | Smooth Gourd | 7.1 |
| 31 | Ash Gourd | 7.1 |
| 32 | Collard | 7.1 |
| 33 | Celery | 7.1 |
| 34 | Asparagus | 7.1 |
| 35 | Cabbage | 7.1 |
| 36 | Turnip | 7.1 |

Appendix 2. Fruit growers (n=14).

| SN | Fruits grown | Farmers (%) |
|---|---|---|
| 1 | Apple | 21.4 |
| 2 | Pear | 14.3 |
| 3 | Fig | 7.1 |

Appendix 3. Specialty crops growers (n=14).

| SN | Crops cultivated | Farmers (%) |
|---|---|---|
| 1 | Tomato | 71.4 |
| 2 | Onion | 50.0 |
| 3 | Pumpkin | 50.0 |
| 4 | Eggplant | 50.0 |
| 5 | Beans | 50.0 |
| 6 | Carrot | 50.0 |
| 7 | Spinach | 42.9 |
| 8 | Okra | 42.9 |
| 9 | Cucumber | 35.7 |
| 10 | Garlic | 35.7 |
| 11 | Radish | 28.6 |
| 12 | Swiss chard | 28.6 |
| 13 | Collard | 28.6 |
| 14 | Sweet Potato | 21.4 |
| 15 | Greens | 21.4 |
| 16 | Broccoli | 21.4 |
| 17 | Cauliflower | 21.4 |
| 18 | Bitter Melon | 14.3 |
| 19 | Celery | 14.3 |
| 20 | Asparagus | 7.1 |

Appendix 4. Ethnic crop growers (n=14).

| SN | Crops cultivated | Farmers (%) |
|---|---|---|
| 1 | Eggplant | 42.9 |
| 2 | Spinach | 35.7 |
| 3 | Okra | 50.0 |
| 4 | Peppers | 57.1 |
| 5 | Bitter Melon/Gourd | 7.1 |
| 6 | Red Rice | 7.1 |
| 7 | Bottle Gourd | 7.1 |
| 8 | Ash Gourd | 7.1 |
| 9 | Snake Gourd | 7.1 |
| 10 | Smooth Gourd | 7.1 |
| 11 | Colocasia/Taro | 7.1 |
| 12 | Chamsur/garden cress | 7.1 |

Appendix 5. Herbal medicinal plant growers (n=14).

| SN | Crops cultivated | Farmers (%) |
|---|---|---|
| 1 | Coriander/Cilantro | 42.9 |
| 2 | Ginger | 28.6 |
| 3 | Dill | 28.6 |
| 4 | Basil | 21.4 |
| 5 | Mint | 21.4 |
| 6 | Parsley | 21.4 |
| 7 | Paprika | 21.4 |
| 8 | Rosemary | 21.4 |
| 9 | Fenugreek | 14.3 |
| 10 | Turmeric | 14.3 |
| 11 | Ginseng | 14.3 |
| 12 | Fennel | 14.3 |
| 13 | Melon | 7.1 |
| 14 | Spinach | 7.1 |
| 15 | Oregano | 7.1 |
| 16 | Sorrel | 7.1 |
| 17 | Pokeweed | 7.1 |

Appendix 6: Crop biodiversity in farmers' field (n=16).

| SN | Crops | Crop type | Farmers (%) |
|---|---|---|---|
| 1 | Chili | Vegetable | 93.8 |
| 2 | Cucumber | Vegetable | 93.8 |
| 3 | Pumpkin | Vegetable | 93.8 |
| 4 | Tomatoes | Vegetable | 93.8 |
| 5 | Eggplant | Vegetable | 87.5 |
| 6 | Okra | Vegetable | 81.3 |
| 7 | Beans | Vegetable | 81.3 |
| 8 | Spinach | Vegetable | 81.3 |
| 9 | Bitter gourd | Vegetable | 81.3 |
| 10 | Mustard greens (Broad leaf)/Patsaag | Vegetable | 75.0 |
| 11 | Bell pepper | Vegetable | 62.5 |
| 12 | Potatoes | Vegetable | 62.5 |
| 13 | Chuchhe Karela (tukkreke/Barela) | Vegetable | 62.5 |
| 14 | Stinging nettle | Vegetable | 62.5 |
| 15 | Eskus (chayote) | Vegetable | 56.3 |
| 16 | Radish | Vegetable | 50.0 |
| 17 | Gourd | Vegetable | 50.0 |
| 18 | Coriander/cilantro | Vegetable | 50.0 |
| 19 | Onion | Vegetable | 43.8 |
| 20 | Titebee | Vegetable | 43.8 |
| 21 | Dalle (Akabare) chilli | Vegetable | 37.5 |
| 22 | Tori ko saag (Green mustard) | Vegetable | 37.5 |
| 23 | Karkalo (colosasia) | Vegetable | 31.3 |
| 24 | Garlic | Vegetable | 25.0 |
| 25 | Carrot | Vegetable | 25.0 |
| 26 | Cabbage | Vegetable | 18.8 |
| 27 | Mandre Cowpea | Vegetable/ pulse | 18.8 |
| 28 | Soybean | Vegetable | 12.5 |
| 29 | Buckwheat | Vegetable/ cereal | 12.5 |
| 30 | Ash gourd (Kubindo) | Vegetable | 12.5 |
| 31 | Bantarul (Yam) | Vegetable | 12.5 |
| 32 | Collard | Vegetable | 6.3 |
| 33 | Squash | Vegetable | 6.3 |
| 34 | Banana | Fruit | 43.8 |
| 35 | Peach | Fruit | 25.0 |
| 36 | Apple | Fruit | 25.0 |
| 37 | Pear | Fruit | 18.8 |
| 38 | Watermelon | Fruit | 18.8 |
| 39 | Grapes | Fruit | 12.5 |
| 40 | Kimbu | Fruit | 12.5 |
| 41 | Darim | Fruit | 12.5 |
| 42 | Orange | Fruit | 12.5 |
| 43 | Lapsi | Fruit | 6.3 |
| 44 | Parijat | Medicinal plant | 31.3 |
| 45 | Timbur | Medicinal plant | 18.8 |
| 46 | Dudmane | Medicinal plant | 12.5 |
| 47 | Gurzo | Medicinal plant | 12.5 |
| 48 | Kadam | Medicinal plant | 12.5 |
| 49 | Masyang | Pulse | 25.0 |
| 50 | Maize/Corn | Cereal | 43.8 |

- Total number of farmers reporting: 16
- Total number crops reported: 50
- Average number crops grown: 20
- Minimum number of crops grown: 7
- Maximum number of crops grown: 43

Appendix 7: Market price of specialty and ethnic crops in the local markets (October 2022).

| SN | Crops | $/bunch | $/qt | $/lb | $/box | $/pot | $/pint | $/basket | $/piece |
|---|---|---|---|---|---|---|---|---|---|
| | **Apple** | | | | | | | | |
| 1 | Apple (honey crisp) | - | - | 3.25 | - | - | - | - | - |
| 2 | Apple (delicious) | - | - | 2.25 | - | - | - | - | - |
| 3 | Aronia berries | - | - | - | - | - | 6.00 | - | - |
| 4 | Arugula (baby) | - | - | 9.00 | - | - | - | - | - |
| 5 | Arugula | - | - | 11.67 | - | - | - | - | - |
| | **Basil** | | | | | | | | |
| 6 | Basil | 2.67 | - | | - | - | - | - | - |
| 7 | Basil plant | - | - | - | - | - | - | - | 0.50 |
| 8 | Basil (Purple) | - | 4.00 | - | - | - | - | - | - |
| 9 | Basil (Red and Thai) | 2 | 4.00 | - | - | - | - | - | - |
| 10 | Basil (Thai) | - | - | - | - | 5.00 | | | |
| 11 | Basil (lemon) | - | 4.00 | - | - | - | - | - | - |
| 12 | Basil (Italian) | - | - | 11.50 | - | - | - | - | - |
| 13 | Basil (Sweet Italian) | - | - | - | - | 5.00 | - | - | - |
| 14 | Basil (African Blue) | - | - | - | - | 5.00 | - | - | - |
| | **Beans** | | | | | | | | |
| 15 | Beans (green) | - | 3.50 | - | 4.00 | - | 5.00 | - | - |
| 16 | Beans | - | 5.00 | - | - | - | - | - | - |
| | **Beets** | | | | | | | | |
| 17 | Beets (red) | 3.0 | - | - | - | - | - | - | - |
| 18 | Beets (golden) | 4.0 | - | - | - | - | - | - | - |
| 19 | Beets (4/mutha) | 4.0 | - | - | - | - | - | - | - |
| | **Peppers** | | | | | | | | |
| 20 | Bell peppers | - | 4.00 | - | 5.00 | - | - | - | 0.75 |
| 21 | Yellow pepper | - | - | - | - | - | - | - | 1.00 |
| 22 | Green peppers | - | - | - | - | - | 4.00 | - | 0.99 |
| 23 | Bell pepper (yellow) | - | - | - | - | - | - | - | 0.50 |
| 24 | Bell peppers (small) | - | - | - | - | - | 3.00 | - | - |
| 25 | Bell peppers (red) | - | - | - | - | - | - | - | 1.00 |
| 26 | Pepper | - | - | - | - | - | - | - | 0.75 |
| 27 | Cayene pepper | - | - | - | - | - | 4.00 | - | - |
| 28 | Cubanelle pepper | - | - | - | - | - | - | 2.00 | - |
| 29 | Peppers (Shishito) | - | 5.00 | - | - | - | - | - | - |
| 30 | Peppers (Shishito) | - | 2.00 | - | - | - | - | - | - |
| 31 | Poblano peppers | - | 4.00 | - | - | - | - | - | 0.27 |
| | **Berries** | | | | | | | | |
| 32 | Blackberries | - | 7.08 | - | 4.00 | - | 6.00 | - | - |
| 33 | Blueberries | - | 5.00 | - | - | - | - | - | - |
| 34 | Raspberries | - | - | - | 6.25 | - | - | - | - |

| SN | Crops | $/bunch | $/qt | $/lb | $/box | $/pot | $/pint | $/basket | $/piece |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Bottle Gourd | - | - | - | - | - | - | - | - |
| 36 | Broccoli | - | - | - | - | - | - | - | 3.00 |
| 37 | Cabbage | - | - | - | - | - | - | - | 2.00 |
| 38 | Carrot | - | 4.00 | - | 4.00 | - | 3.00 | - | 1.00 |
| | **Cantaloupe** | | | | | | | | |
| 39 | Cantaloupe | - | - | - | - | - | 3.00 | - | 3.33 |
| 40 | Cantaloupe (yellow) | - | - | - | - | - | - | - | 3.00 |
| 41 | Cantaloupe (French) | - | - | - | - | - | - | - | 3.50 |
| 42 | Cherokee (purple, large) | - | - | 4.49 | - | - | - | - | - |
| 43 | Chive | 2.00 | - | - | - | 5.00 | - | - | - |
| | **Chili** | | | | | | | | |
| 44 | Chili (light green long) | - | - | - | - | - | 3.00 | - | - |
| 45 | Chili (red organic green) | - | - | - | - | - | 3.00 | - | - |
| 46 | Chili (large green) | - | - | - | 3.00 | - | - | - | - |
| 47 | Chili (long green) | - | - | - | 3.00 | - | - | - | - |
| 48 | Chili (green) | - | - | - | 3.00 | - | - | - | - |
| 49 | Chili (jalapeno) | - | - | - | 3.50 | - | 4.00 | - | 0.33 |
| 50 | Coriander/Cilantro | 2.67 | - | - | - | - | - | - | - |
| 51 | Crazy catnip | - | - | - | - | 5.00 | | | |
| | **Cucumber** | | | | | | | | |
| 52 | Cucumber | - | 4.00 | - | 3.50 | - | 3.00 | - | 1.00 |
| 53 | Cucumber (short, round) | - | - | 2.50 | - | - | - | - | - |
| 54 | Dill | 2.67 | 4.00 | - | - | 5.00 | - | - | - |
| | **Eggplant** | | | | | | | | |
| 55 | Eggplant | - | - | | 3.00 | - | - | - | 1.90 |
| 56 | Eggplant (large round) | - | - | - | 5.00 | - | - | - | - |
| 57 | Eggplant (round, long mix) | - | - | 2.50 | | - | - | - | - |
| 58 | Eggplant (purple) | - | - | - | - | - | - | - | 2.00 |
| 59 | Eggplant (white) | - | - | - | - | - | - | - | 2.00 |
| 60 | Fennel | - | - | - | - | 4.00 | - | - | - |
| 61 | Fenugreek | - | - | - | - | - | - | - | - |
| 62 | Fig | - | - | - | - | - | 8.00 | - | - |
| 63 | French sorrel | - | - | 11.00 | - | - | - | - | - |
| 64 | Garlic | 2.00 | - | - | 3.00 | - | - | - | - |
| 65 | Garlic bulb | - | - | - | - | - | - | - | 1.00 |
| | **Grapes** | | | | | | | | |
| 66 | Grapes | - | - | | 6.25 | - | - | - | - |

| SN | Crops | $/bunch | $/qt | $/lb | $/box | $/pot | $/pint | $/basket | $/piece |
|---|---|---|---|---|---|---|---|---|---|
| 67 | Grapes (seedless) | - | - | - | - | - | - | 6.00 | - |
| | **Kale** | | | | | | | | |
| 68 | Kale | 3.00 | 2.00 | - | - | - | - | - | - |
| 69 | Kale (green boar) | - | - | 12.00 | - | - | - | - | - |
| 70 | Kale (red boar) | - | - | 11.50 | - | - | - | - | - |
| 71 | Kale (Lacinato) | - | - | 11.50 | - | - | - | - | - |
| 72 | Kohlrabi | - | - | - | - | - | - | - | 2.00 |
| 73 | Lemon grass | | - | - | - | 12.00 | - | - | - |
| | **Lettuce** | | | | | | | | |
| 74 | Lettuce (Mesclun) | 4.00 | - | 11.00 | - | - | - | - | - |
| 75 | Lettuce (green leaf) | 4.00 | - | - | - | - | - | - | - |
| 76 | Lettuce (red leaf) | 4.00 | - | - | - | - | - | - | - |
| 77 | Lettuce (head leaf) | 4.00 | - | - | - | - | - | - | - |
| | **Melon** | | | | | | | | |
| 78 | Bitter Melon | - | - | - | - | - | - | - | - |
| 79 | Bitter Melon/Gourd | - | - | - | - | - | - | - | - |
| 80 | Melon (small) | - | - | - | - | - | - | - | 8.00 |
| 81 | Melon (medium) | - | - | - | - | - | - | - | 10.00 |
| 82 | Melon (large) | - | - | - | - | - | - | - | 8.00 |
| 83 | Melon (seedless green) | - | - | - | - | - | - | - | 5.00 |
| 84 | Melon (Canary) | - | - | - | - | - | - | - | 6.00 |
| 85 | Melon (Sugary baby) | - | - | - | - | - | - | - | 6.00 |
| 86 | Watermelon (seedless) | - | - | - | - | - | - | - | 7.00 |
| 87 | Mesclun | - | - | 12.00 | - | - | - | - | - |
| | **Mint** | | | | | | | | |
| 88 | Mint | 3.33 | - | | - | - | - | - | - |
| 89 | Mint (Julep) | - | - | - | - | 5.00 | - | - | - |
| 90 | Okra | - | 3.00 | 5.00 | 4.00 | - | 3.75 | 4.00 | - |
| | **Onion** | | | | | | | | |
| 91 | Onion | - | - | - | - | - | - | - | 2.00 |
| 92 | Onion (green) | 1.75 | - | - | - | - | - | - | - |
| 93 | Onion (red) | - | - | 2.50 | 3.50 | - | - | - | - |
| 94 | Onion (white) | - | - | 2.50 | 3.50 | - | - | - | 0.75 |
| | **Oregano** | | | | | | | | |
| 95 | Oregano | 2.00 | - | - | - | - | - | - | - |
| 96 | Oregano (green) | - | - | - | - | 5.00 | - | - | - |
| | **Parsley** | | | | | | | | |
| 97 | Parsley | - | - | - | - | 5.00 | - | - | - |
| 98 | Parsley (Italian) | 3.67 | - | - | - | - | - | - | - |
| | **Peach** | | | | | | | | |

| SN | Crops | $/bunch | $/qt | $/lb | $/box | $/pot | $/pint | $/basket | $/piece |
|---|---|---|---|---|---|---|---|---|---|
| 99 | Peach | - | 5.00 | 3.65 | 4.38 | - | - | - | 7 |
| 100 | Peach (yellow) | - | - | - | - | - | - | 7.00 | - |
| 101 | Peach (white) | - | - | - | - | - | - | 7.00 | - |
| | **Potatoes** | | | | | | | | |
| 102 | Potatoes (white) | - | - | | 4.00 | - | 3.00 | | - |
| 103 | Potatoes (red) | - | - | | 4.00 | - | - | 4.00 | - |
| 104 | Potatoes (purple) | - | - | - | - | - | 4.00 | | - |
| 105 | Purslane | - | - | 12.00 | - | - | - | - | - |
| 106 | Radish (Cherry bell) | 4.00 | - | - | - | - | - | - | - |
| 107 | Red Rice | - | - | - | - | - | - | - | - |
| 108 | Rhubarb | - | - | | 5.00 | - | - | - | - |
| | **Rosemary** | | | | | | | | |
| 109 | Rosemary | 2.00 | - | - | - | 5.00 | - | - | - |
| 110 | Rosemary plant | - | - | - | - | - | - | - | 0.50 |
| 111 | Sage | 2.00 | - | - | - | - | - | - | - |
| 112 | Spinach (baby) | - | - | 10.25 | - | - | - | - | - |
| 113 | Spring mix | - | - | 12.00 | - | - | - | - | - |
| | **Squash** | | | | | | | | |
| 114 | Squash | - | - | 2.00 | - | - | - | - | - |
| 115 | Squash (yellow) | - | 3.00 | 1.50 | - | - | - | - | 1.00 |
| 116 | Squash (green) | - | 3.00 | - | - | - | - | - | 2.00 |
| 117 | Squash (orange) | - | - | - | - | - | - | - | 1.00 |
| 118 | Squash (Pattypan) | - | 3.00 | - | - | - | - | - | - |
| 119 | Stinging nettle (sisno) | - | - | - | - | - | - | - | - |
| 120 | Sweet Potato | - | - | 2.50 | - | - | - | - | - |
| 121 | Swiss chard | 4.00 | - | - | - | - | - | - | - |
| | **Thyme** | | | | | | | | |
| 122 | Thyme | 2.00 | - | - | - | - | - | - | - |
| 123 | Thyme (English) | - | - | - | - | 5.00 | - | - | - |
| | **Tomatoes** | | | | | | | | |
| 124 | Tomatoes | - | - | 3.25 | | | - | - | - |
| 125 | Tomato (green) | - | - | | 4.00 | - | 5.00 | - | - |
| 126 | Tomato (vine ripe) | - | 5.00 | - | - | - | - | - | - |
| 127 | Tomato (cherry) | - | 3.33 | | 4.67 | | 4.50 | - | - |
| 128 | Tomato (Eastern Shore) | - | 4.50 | - | 5 | - | - | - | - |
| 129 | Tomato (large size) | - | 5.00 | 4.25 | - | - | 5.00 | - | - |
| 130 | Tomato (large red) | - | 5.00 | - | - | - | - | - | - |
| 131 | Tomato (red) | - | - | - | 4.00 | - | 5.00 | - | - |
| 132 | Tomato (orange) | - | - | - | 5.00 | - | - | - | - |
| 133 | Tomato (large) | - | - | 4.49 | - | - | - | - | - |

| SN | Crops | $/bunch | $/qt | $/lb | $/box | $/pot | $/pint | $/basket | $/piece |
|---|---|---|---|---|---|---|---|---|---|
| 134 | Tomato (Mountain fresh red) | - | - | 4.49 | - | - | - | - | - |
| 135 | Tomato (brand wine, large) | - | - | 4.49 | - | - | - | - | - |
| 136 | Tomato (salad) | - | - | - | - | - | 3.50 | - | - |
| 137 | Tomato (Heirloom) | - | - | 3.50 | 5.00 | | | - | - |
| 138 | Tomato (Roma) | - | - | - | - | - | 5.00 | - | - |
| 139 | Tomatoes (small) | - | - | - | - | - | - | 5.00 | |
| | **Zucchini** | | | | | | | | |
| 140 | Zucchini (yellow) | - | 4.00 | - | 5.00 | - | 4.00 | - | - |
| 141 | Zucchini (green) | - | 4.00 | - | 5.00 | - | 3.50 | - | - |
| 142 | Zucchini (orange) | - | - | - | - | - | 4.00 | - | - |
| 143 | Zucchini | - | 4.00 | 2.90 | 3.00 | - | - | - | - |
| 144 | Ginger | - | - | - | 3.50 | - | - | - | - |