Coordination and Crop Planning in Local Food Systems

Considerations for Local Aggregators, Coordinators, and Distributors

The information provided in this publication could be useful for organizations working with networks of agricultural producers to coordinate, aggregate, distribute, and market local foods. Some of these organizations could be food hubs, producers' cooperatives, and any other type of organization coordinating supply and demand of local foods. Some of the principles covered in this publication could also be useful for farmers market managers and planners. Because these organizations could be for business or nonprofit organizations, we will refer to them simply as "organizations" in this publication.

Planning and coordination are key to the successful operation of local food systems. This publication covers

- why it is important to plan,
- some recommended practices for coordinating and tracking demand and supply,
- good practices for working with buyers and producers, and
- coordinating volume and timing of production.

While this information may not apply to all types of operations, the principles can be adapted to your operation.

Crop Planning in Overall Strategic Planning

Production planning should not be isolated from the overall strategic planning of the organization; it should be part of the overall planning process. Regardless of the stage of the organization or business (e.g., newly formed or in operation for a few years), it is important to have a strategic plan—a roadmap to guide operations and business decisions and help keep in mind the long-term picture. An assessment of the current condition of the operation and its surrounding environment (e.g., competitors, consumers, trends in the market, capabilities, and infrastructure) can help inform the planning process.

It is important to have a clear vision of your organization's mission—that is, the need or gap in the market it was created to fill (e.g., help producers gain access to markets, supply local or healthier foods in a particular region). Having specific, measurable, achievable, realistic, and time-bound (SMART) goals will help you measure your progress. The organization's mission and goals should be used to help guide daily operations, including production planning, procurement and sales, and general strategies (such as marketing, financial, and operational strategies). The strategic planning process should also help you identify potential risks (e.g., demand gaps, supply shortages, declining prices, lack of infrastructure). Strategic planning should be an ongoing process, and crop planning should be a part of it.

Local Food Systems: Linking Supply and Demand

Food coordinators, aggregators, and distributors link the supply of local producers with the demand of buyers for local products. The purpose is to increase access to consistent markets for small- to medium-scale producers and to provide locally produced foods for buyers. In some cases, organizations that act as coordinators also provide some additional services including grading, handling, packing, processing, distribution, cold storage, and transportation. Organizations could own or lease the infrastructure needed or contract out some of the services. In other cases, organizations may not operate the supply chain (aggregation and distribution operation), but rather act as facilitators through marketing and coordination only (Diamond and Barham, 2012). While different models are used by organizations working in the local or regional food systems, **Figure 1** shows a simple and general representation of a local food model that connects supply and demand.

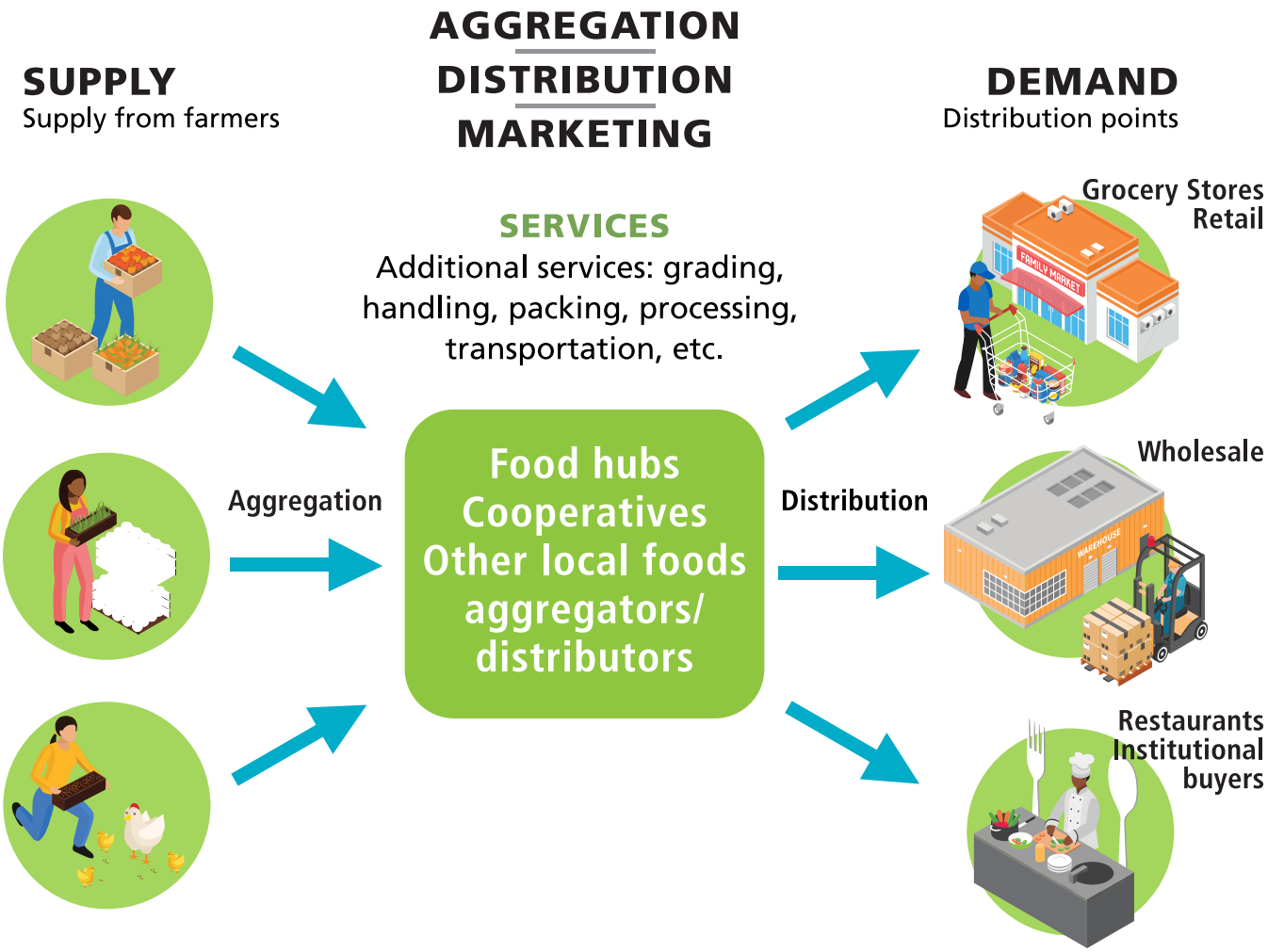

Figure 1. Example of a general local food system linking supply from local producers and demand for locally produced products.

A key function of these types of organizations is connecting supply and demand. Many food hub operators have identified balancing supply and demand as one of their main challenges (Barham et al., 2012). Being able to match demand and supply is key to a successful operation. To accomplish this, it is necessary to have a good understanding of both supply and demand sides, to quantify them, and to meet their needs. Organizations operating in the marketplace should have a good inventory management and recordkeeping system in place that allows them to forecast and balance demand and supply and to keep track of product (inventory) movements/transactions.

A successful organization should strive to have enough suppliers to meet buyers' demand for crop varieties, volume, quality, and other product attributes (Diamond and Barham, 2012). It should also have enough buyers to create a good outlet for growers' products and maintain the viability and vitality of the market. In some cases, outside partnerships with other organizations may be needed to provide complementary services like transportation, storage, and packing (Diamond and Barham, 2012).

Production Planning: Why Is It Important?

Organizations need to ensure that they can meet buyers' demands, supplying a variety of products consistently and reliably. Reliability is an important aspect of fostering buyer loyalty. Planning also prevents a glut (excess supply) of unsold products, which can result in lower prices and lower profits for growers. In general, planning increases the efficiency of the market, making it work better for both producers and buyers.

Planning allows organizations to plan for and sustain future growth, to test and introduce new crops (products), and to identify and plan for future infrastructure and capital investment needs (Diamond and Barham, 2012). Planning for and managing growth can be a challenge in this type of enterprise (Barham et al., 2012). The more prepared an organization is, the more they can react to market signals and take advantage of any emerging market opportunities.

Assessing Demand and Working with Buyers

It is important to understand and assess the demand for the products moved by your organization. Given the perishable nature of many agricultural products, you must avoid accumulating product that cannot be moved in the marketplace relatively quickly. A good practice is to identify a market (buyers) for the products that are being offered by the organization before committing to the growers. Identifying a market allows the organization to reduce risk for itself and the growers. Another element to help manage risk from price variability is to negotiate a price point or price range with both buyers and growers.

When working with buyers, you must know what they want in terms of the type of crops, varieties, services, quality, packaging, experience, and credence attributes. Evaluating buyers' operating scales, the type of market in which they operate, and their final consumer will also be helpful in understanding quality and pricing factors when working with those buyers. A good assessment of the buyer can help you serve them better and meet their needs.

Educating buyers about value is also important, particularly when prices for locally produced products are not as competitive as prices offered in high-volume bulk transactions. Fostering sales of local foods for growers may require educating buyers about the value of buying local and supporting local producers and businesses. In addition, creating a demand for differentiated products like organics, sustainably produced products, higher quality products, and locally produced or state-branded products (e.g., Genuine Mississippi brand) could help diversify the operation and serve more buyers and growers. Evaluating the market environment (trends, target customers, competition) will help you formulate a market strategy for the operation.

Before the production season begins (usually the first month of the year or earlier), start meeting with buyers to quantify demand for the upcoming year or season. Ask buyers how much they are willing to commit to buy from you. If possible, try to negotiate prices with buyers, as locking down a price (or a price range) may help bring producers on board. Use this information in crop planning and scheduling activities.

Having a tracking system in place is important. If the organization does not have access to specialized software, develop a spreadsheet to keep track of demand needs, supply, and inventory. Spreadsheets provide enough flexibility to create an adjustable template that works for small- to medium-size operations for a low cost. For example, **Figure 2** provides an example of a simple and very general spreadsheet that could be used to track buyers' commitments to buy products. The spreadsheet template could contain the following information: list of buyers and how much volume (units) they are committing to buy, time (date or weeks), and crops (variety or planting

	Tomatoes												Cucumbers											
	Month				Month				Month				Month				Month				Month			
Buyers	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4
Buyer 1																								
Buyer 2																								
Buyer 3																								
Buyer 4																								
Buyer 5																								
Buyer 6																								
Buyer 7																								
Buyer 8																								
Buyer 9																								
Projected demand																								
Projected yield																								
Projected area needs																								
Projected supply																								
Demand gap																								

Figure 2. Example of a spreadsheet to track weekly demand from buyers.

Note: Projected area needs = demand (units) / yield per area (units)

Demand gap = projected demand – projected supply

information could also be included). On the bottom, you could include the total needs for each crop, variety, or planting. Including yield information in this spreadsheet could also help estimate and visualize the potential area (acreage or production units) that will be needed.

It is important to maintain an open line of communication with buyers. There may be occasions when growers have additional product they need to sell, or when buyers need extra product. Ongoing communication with buyers and producers will allow you to coordinate and meet those needs as they arise.

Assessing the Supply Potential and Working with Producers

Before crop planning, it is important to gain a good understanding of potential suppliers (producers). Some producers will operate at a smaller scale than others, they may have different levels of knowledge in producing different products, and they may or may not have access to infrastructure (e.g., cooling, refrigerated transportation, cold storage, etc.). Depending on how far away they are from the aggregation facility, this may limit their ability to supply fresh products to the organization—and if products are not cooled after harvest and are not refrigerated, the quality of the product will be affected. Understanding these factors can help you plan for handling and processing products from these growers. In some cases, aggregators offer complementary services to producers to improve the efficiency of the supply chain and to help producers participate in the larger marketplace. *However, it is important to keep in mind that transportation logistics and access to infrastructure may be a challenge, particularly in largely rural areas.*

Crop production planning needs to be informed by the market demand for those crops—that is, buyers' needs. Seasonality of production is an important factor to take into consideration during the crop planning process. Buyers may demand products year-round, so it is important to assess producers' capacity to extend the harvest season (e.g., protected agricultural production using high tunnels, greenhouse production). When the limiting factor is producers' access to infrastructure, part of the planning process may require working with collaborators to facilitate producers' access to needed infrastructure and knowledge/skill development. The volumes moved by the organization and the production planning process will also be restricted by the organization's infrastructure and capacity (Diamond and Barham, 2012).

Crop Planning

Crop planning requires quantifying the crops (varieties, plantings) and volumes that each producer is willing to supply. Organizations use different methods to communicate and coordinate production with growers. The planning process could include meetings with all producers where they propose (bid on) what crops they will produce for the organization, and it could be done via one-on-one meetings, phone calls, email, or survey. Each organization can find a method that works best for them.

In the absence of specialized software, you can use a spreadsheet to coordinate supply and to track what, how much, and when farmers have committed to producing. A simple example is shown in **Figure 3**. Information about the total demand and supply could be added to identify demand gaps or excess supply. In cases where there are demand gaps that are not being met by your supply estimations, you could encourage your producers to help fill the gap, or, alternatively, you could invite new producers to fill the gap. When there is excess supply—for example, many producers wanting to grow the same crop—develop a system to assign priority based on seniority, the reliability of producers, and the quality of products supplied. In some cases, producers may need to compromise and collaborate on the crops planted and the timing of their planting. It is important to identify strategies to coordinate production of the different crops to balance supply and demand. Not being able to meet buyers' demand (lack of reliability) may affect relationships with buyers in the future.

It is important to recruit and retain the right balance of producers to provide buyers with a diversified selection of products during an extended period of time. Historical transaction records could be useful in identifying products that are in higher demand and analyzing if there is an opportunity to increase the volume for those products. Also, it can help identify opportunities for new crops or varieties. To introduce new crops, varieties, and products, establish small trials with producers willing to test production and the market. Trialing new crops and varieties may be particularly important when working with restaurants and chefs that may demand new varieties.

Extending the Harvest Season

Producers can benefit from extending the harvest season to capture higher prices during low-supply periods during the off season (or beginning and end of the harvest season) (Roos and Jones, 2012; Bachmann, 2005). You can extend the harvest season with protected agricultural

	Tomatoes												Cucumbers											
	Month				Month				Month				Month				Month				Month			
Grower	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4	Wk1	Wk2	Wk3	Wk4
Grower 1																								
Grower 2																								
Grower 3																								
Grower 4																								
Grower 5																								
Grower 6																								
Grower 7																								
Grower 8																								
Grower 9																								
Total supply																								
Projected yield																								
Planting area committed																								
Projected demand																								
Supply gap																								

Figure 3. Example of a spreadsheet to track production commitments from growers.

Note: Projected area needs = demand (units) / yield per area (units)

Supply gap = projected supply – projected demand

systems like high tunnels, greenhouses, and indoor production (Sánchez, Lamont, and Orzolek, 2007). Another method for extending the harvest window is succession planting, which consists of planting at intervals so that crops are ready for harvest at different times (Holloway, 2018). Another option is to use crop varieties with different planting and harvest dates in order to supply crops for a longer period. In your planning spreadsheet, you could include the planting dates for each producer to coordinate dates to harvest (dates to maturity), harvest interval, and volumes available each week. You could also develop a system to remind producers about planting (seeding or transplanting) dates approaching for the crops they have committed to growing. Seed catalogs can guide some of this coordination process.

Other Planning Considerations

Product Specifications and Quality Standards

The planning process requires that product specifications and standards be identified and communicated to producers so they can plan accordingly. Product specifications include size, shape, and level of blemishes and imperfections allowed. It is also important to coordinate and communicate food safety standards, assurances, or required certifications (e.g., Good Agricultural Practices certification).

Transportation and Logistics

The planning process can also include strategies to ensure producers have access to adequate infrastructure to maintain the quality of the products (e.g., access to post-harvest cooling facilities, cold storage, or refrigerated transportation). The organization could identify whether these are services it could provide or if there is an opportunity for partnering with other entities to facilitate transportation and logistics.

Production Planning Agreements or Contracts

Each organization has its own model for managing relationships with producers. While some organizations do not use official contracts, using some type of agreement can be useful. Contracts and agreements allow buyers and suppliers to share some of the risk when a price (or price range) is established for the season. It also helps producers reduce the risk of product placement as they secure an outlet for their products. Contracts and agreements are also useful to ensure that delivery obligations, including volume, quality standards, and delivery schedules, are met.

Records

Having a good recordkeeping system is essential for planning and coordinating activities. Maintain records about transactions, communication with producers, planting and harvesting dates, food safety, and certifications to inform your decisions. The better the records are, the easier it will be to use them for decision-making and protection if any problem arises. Records are also key for traceability purposes, which is an area of great interest in the industry today.

Timing of Production Planning

Planning should be an ongoing process. Formal assessment and quantification of demand requirements and supply potential for the following season should start in the winter. While it may be difficult to get a commitment from buyers and suppliers earlier in the process, you can analyze historical and most recent transaction data to forecast needs and identify crops in higher demand. Planning early allows for time to recruit new buyers and sellers as needed. It also helps to identify potential problems and strategies to address them. For example, if a crop fails, identify growers that could supply extra product, or if there is excess supply, identify buyers who could accept more product.

Assisting Producers with the Planning Process

The organization is likely to work with growers with different skill sets. In many cases, producers may not be used to planning their production schedules around a demand calendar with specific requirements. Thus, it is important to provide technical assistance to producers on how to plan their crop plantings, rotation, and harvest. Develop spreadsheet templates that producers can adjust to fit their operation's needs. Producers could also receive training regarding production standards and specifications, grading, handling, and food safety assurance, which are all part of the planning process to supply a product that the market demands.

Communication is Key to Coordination

Communication with both buyers and growers is key to a successful production planning process. In some cases, growers may not be able to meet their production commitment because of crop failure or other reasons. Encourage growers to communicate any problems that arise to the organization so an alternative supplier can be found to meet commitments with buyers. Create an alert system (e.g., emails, texts, etc.) to remind growers of deadlines.

It is important to share information with producers about the operation. Irrespective of what the organization's pricing and service charging model is, it is important to be transparent about prices and fees with producers and buyers. Clear and consistent communication about quality assurance and product standards is also needed. In some cases, producers may be required to sort, grade, wash, and pack the product before bringing it to the aggregation center. All of these details should be communicated and agreed upon with producers ahead of time.

Summary

- Balancing supply and demand is key to running a successful local foods operation.
- Strategic planning and crop planning should be an ongoing process. Quantification of supply and demand needs for the upcoming season should start during the current season or beginning of the year, at the latest.
- Use a spreadsheet to track inventory, buyers' demand needs, and suppliers' commitments.
- Crop planning may involve identifying strategies to extend the harvest window (e.g., use of protected agriculture, succession planting, etc.).
- Good recordkeeping is essential for analyzing the operation's performance and planning for future capital investment needs.
- Good communication with both buyers and growers is key to a successful production planning process.

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