Module 6: Managing supply chains in green micro-business

Core of supply chain management

In our daily routines we often ask: 'What's for lunch today?' No matter what the answer is, none of the dishes will just appear out of nowhere. This means that the final product goes along a supply chain. Surely, micro-enterprises face various challenges in the rational organization of this process. However, this is one of the aspects, where the business can grow not just at the basic level, but also with its attitude towards being greener.

A **supply chain** is the network of all the individuals and organizations working together, resources, activities and technology involved in the creation and sales of a product, from the delivery of source materials from the supplier to the manufacturer, through to its eventual delivery to the end-user. The simplest definition is that it is about the management of the flow of services and goods from the point of origin to the point of consumption.

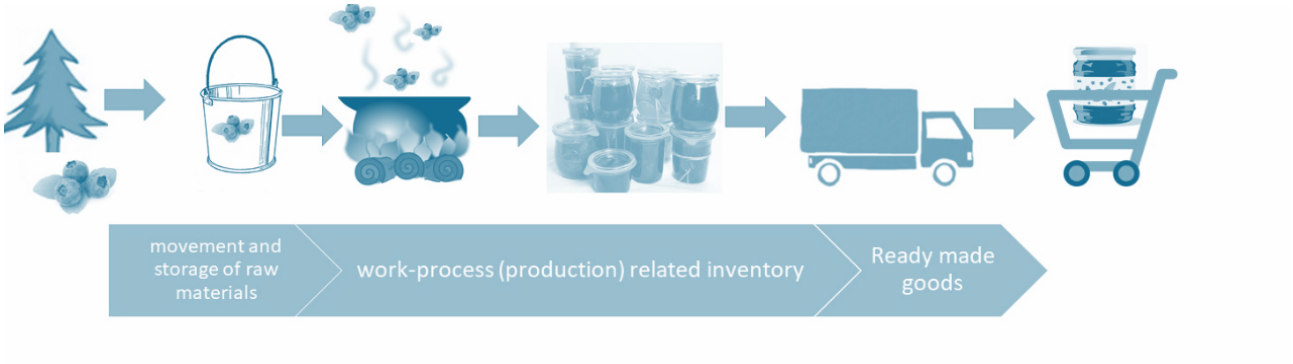

Figure 1. Conceptual model of supply chain

Supply chain management exists in every industry. It entails the planning and management of all activities involved in sourcing and procurement, conversion and all activities of logistics management. It also includes coordination and collaboration with partners, who can be suppliers, intermediaries, third party service providers and customers. It seems simple. However, behind each of the aspects there are several procedures, services and materials.

Supply chain management integrates supply and demand management within and across enterprises. Understanding and managing supply chains is an important issue for every business, as it is one of the tools to increase competitiveness and ensure higher levels of customer satisfaction.

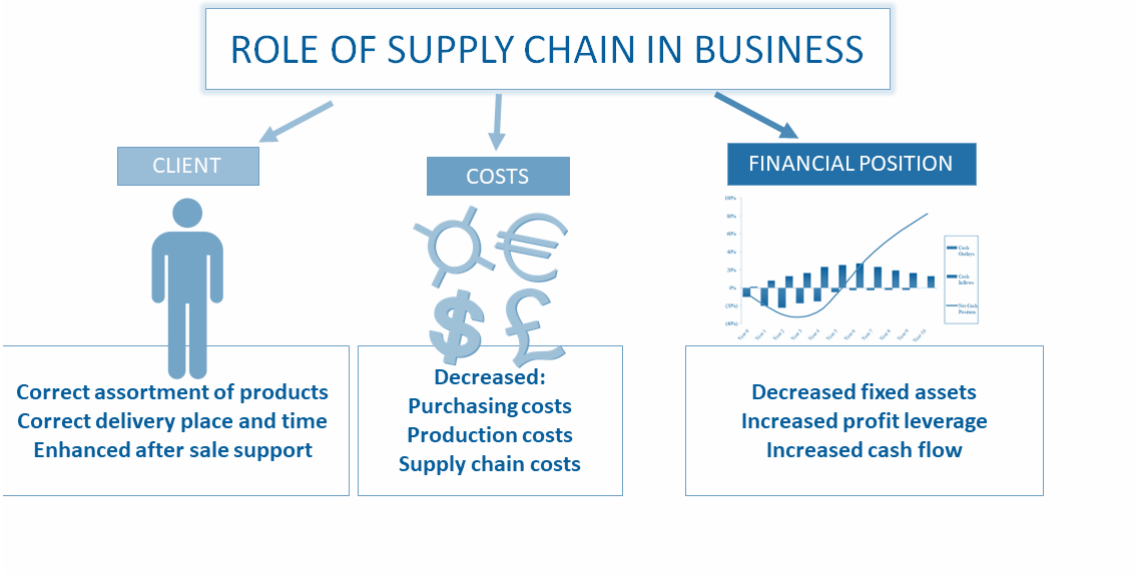

Figure 2. Role of supply chain management in business

Besides direct benefits for the entrepreneur, supply chain management plays a significant societal role. It helps to defend and sustain human life, it improves healthcare, protects from climate extremes, defends freedom and protects delivery of necessities. In addition, the concept of supply chain management is connected with improvement of life quality as it serves as a foundation for economic growth, improves living standards and creates jobs. Besides benefits of smart supply chain management, we have to admit that there are still global challenges in decreasing energy consumption and pollution.

Supply chain management entails two types of flows of the same importance. First, **physical flows**, which involve transformation, movement and storage of goods and materials. They are the most visible pieces of the supply chain. Secondly, **information flows** allow the various supply chain partners to coordinate their long-term plans and to control the day-to-day flow of goods and materials up and down the supply chain. In order to plan supply management correctly you need detailed data about both flows.

From the physical flow viewpoint, the supply chain system is characterized by such **processes** as sourcing, producing, storing and delivering. **Sourcing** is associated with the choice of vendors (domestic and foreign) or suppliers of raw materials, components, parts and products. It includes sourcing of all ingredients and packages. The spectrum behind these processes can be wide – from the raw material providers and designers till the packaging material and machines. Transportation and raw material storage should be included. In **producing** or "making", raw materials are turned into a final product, parts are assembled into a product, which could be sold to a customer. This is usually associated with a specifically equipped "production space" – factory, workshop, kitchen. **Storing** as a process includes inspection and sorting (quality assurance), packaging and labelling and other activities, which are implemented with the idea to link the product with delivering it to the customer. This process implementation needs a specifically equipped place (storage, packaging line), and an elaborated quality standard. **Delivering** is carrying out the order (delivery to the store, sending directly to a customer etc.). Services and aspects that should also be considered are transportation, customer services and postal or courier services.

Information flow entails exchange of specific information. Typical processes are forecasting and planning (data), negotiations, bargaining, coordination, agreements and decisions,

ordering and feedback. Management of information flow is strongly associated with development of the message or contents (e.g. ordering data, information about leftovers in storage) and tools and channels. The last aspect is nowadays much supported by digital solutions (e.g. specific software, cloud services, co-working digital platforms).

Strategically there are two types of supply chains. Under a **pull supply chain**, actual customer demand drives the process (the client calculates the quality and quantity), while **push** strategies are driven by long-term projections of customer demand (the producer calculates the quality and quantity).

In the table below, you can see a short glossary for the supply chain management.

Table 1. Short glossary for supply chain management

Supplies, commodities, goods, products and stock	All items that go through the supply chain flow
Users, patients, clients and customers	The people who receive or use supplies.
Consumption, dispensed, dispensed-to-user, usage data	Data of the quantity of goods actually given or used.
Service delivery point	Any facility where clients receive supplies.
Pipeline	The entire chain of physical storage facilities and transportation links through which supplies move from the manufacturer to the user (e.g. port facilities, warehouses, transport vehicles).
Lead time	Time between when the products are ordered and when received and available for use.
Requisition (pull) system	The personnel who receive the supplies, calculate the quantities of supplies required.
Allocation (push) system	The personnel who issue the supplies, calculate the quantities of supplies required.
Issues data	Information about the quantity of goods moved from one storage facility to another.
Product integration	Combining the management of some or all logistics functions for different product categories.
Supply chain integration	Improving approach that develops seamless linkages between the various staff, levels and functions within a given supply chain, in order to optimize customer service.

Challenges in supply chain management of micro-enterprises

When the micro-business owners were asked, why they find supply chain management challenging, the most common causes mentioned were:

1) Time and capacity (small number of employees, often family members, which leads to multitasking, lack of clearly defined responsibilities),
2) Lack of strategic approach (due to knowledge gaps or capacity, conceptually supply chain has not been seen as a one-way process), especially in strategic planning, sales, training of employees,

3) Lower bargaining power and limited financial resources. This can lead to technical and infrastructural limits.

Other factors to consider are lack of frameworks, to establish alliances, and underestimated role of digital solutions (considered as a tactic, not a strategic tool).

There are several **wastes and risks** in supply chain management. Any of those mentioned below can affect the end-result and effectiveness of the supply chain, which usually is associated with extra expenses and energy towards solutions.

- **Overproduction** occurs when the production quantity exceeds the ability to sell. This means concerns about how to store, manage and protect overproduction. It happens, if you produce goods just based on a forecast, not understanding of consumption, or the batch size is based upon a minimum order (quantity, "standard pack").
- **Transportation.** Each time a product is moved out of the storage, there is a risk of damage, loss, delay. Examples of this are lead time increase, logistics consolidation delays (chain reaction).
- **Motion.** Any movement of the parts or ingredients during the production process can be associated with risks of damage, wear and safety, often "human factor" is the matter. It happens because of mistakes in warehouse management, part-picking based upon a pick-list, part sorting, handling and receiving shipping documents, and data transfer of purchase and supply order.
- **Waiting** is the time spent by workers waiting for resources to start and accomplish their work, which can occur if forecast responses from the customers or suppliers are late, also waiting for the parts, ingredients, purchase and supply order amendments or agreements.
- **Over-processing** is the usage of more expensive resources than needed for the task, or adding features not needed by the end-user. For example, manual processing of purchase and supply orders for customers and suppliers, repeated work due to communication mistakes, poor management of resource planning tools (software, integration).
- **Inventory.** Raw material, work pieces or finished goods that are still on a "waiting line" to be finished, assembled, packaged etc. Typical examples are the safety stock buffer and excess and obsolete management of materials.
- **Defects** are deflections from quality or predefined standards that could affect the end-result. This can be associated with incoming parts and ingredients, also rejection from the supplier or return from the customer, errors in documents (outgoing, incoming), damages in transit.
- **Unutilized skills or talents** represent limits for knowledge flow, creativity, effort and talent. You can recognize this risk, if there are no questions about the process, standard, minimal responsibility, authority, initiative, or if new practices are implemented too slowly, but manuals and documentation are excessive, or the employees are disengaged from planning.

Tips for entrepreneurs to overcome supply chain management challenges

1. **Make it simpler**. Complexity of the supply chain caused by a large number of vendors and partners is often an issue. At the end, too much of the business owners' time is consumed with managing them. Think about how to reduce or limit the number of vendors and partners you have to manage. This trend has been observed

in business development. This way you will reduce the time for paperwork and the time and resources spent on management.

2. **Taylor a reliable network**. For a micro enterprise it is not always necessary to use financially consuming services or contract another service provider. Sometimes personal contacts and public space usage can be helpful. Friends, neighbours or good business partners can help with collecting or transporting raw material. Micro-business supply chain management is more than the contracts. Select your network partners based on similar values, potential for capability or strategic goals.
3. **You can move faster**. For a micro-business it will always be easier to adapt to changes (termination of contracts, setting up new production space), because the decision making chain is rather short. If there is a need to change something, just go for it.
4. **Consider the time, consider the environment**. Along with control of your time and your employees' time, consider outside influencers. They can be community leaders, relatives of employees, franchisors, mutual friends, local officials. Consider them also as potential resources and a part of your network, as they may have more power than you think.
5. **Share and integrate, go together**. The increased global competition, information availability and the development of new types of inter-organizational relationships are the key factors that force supply chain integration. You can improve it through partnerships, alliances, cooperation, trust, information and technology sharing. Make your selection based on similar values, business styles and mind-set principles. Collaborate on a long term.

Getting greener through supply chain management

More and more micro-businesses are embracing green supply chain management. They understand that reducing their carbon footprint by reducing inefficiency, optimizing resources and streamlining processes they can better manage the supply chain risks while improving the bottom line. However, developing and implementing environmentally friendly practices and processes require a certain kind of motivation or drivers. The drivers may come from inside of the organization or from outside (municipality, environmental agencies, trends in consumption, quality certification system owners). Green supply chain management and green strategies themselves can become a good pillar of the image and brand.

Green supply chain management can be defined as integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product, as well as the end-of-life management of the product after its useful life.

Green thinking as a combination of environmental, societal and economic values can be applied in any sub-process of supply chain management. Furthermore, one of the key issues is care of post-consumption or end-of-life process of products or services by the customers, in other words, the question what happens after the products have been used by the customer.

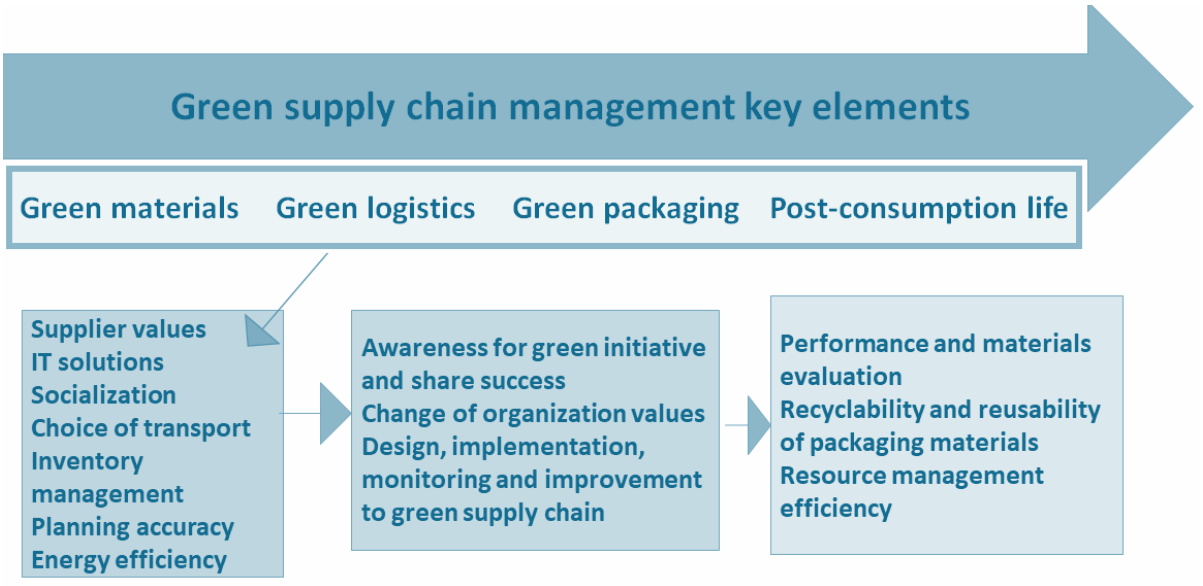

Figure 3. Creation of green supply chain management – aspects for thoughts, matters for changes

Green materials and ingredients (Green sourcing) are obtained with less possible or even zero environmental impact. The way from the origin is transparent. For example, if you want to make organic bread, you have to purchase organic ingredients (e.g. flour) and you have to be sure that the flour has been made from organic rye / wheat grown from organic seeds. Preference should be locally produced materials and ingredients. Sourcing should be ethical. For example, extensive forestry has a large impact on the local society and eco-systems.

Green logistics is the care about from where and how raw materials, ingredients and ready-made goods are transported, and the usage of transport with the intention to decrease use of fossil materials. So, the fleet or service should be considered, taking the most direct route, avoiding extra rides or rides with a not-packed car.

Green production is associated with energy efficient solutions starting from the buildings and machines and ending up with the "green code" for the employees. Parts, ingredients and machine usage should be safe for all employees and end-users.

Green packaging is based on the reduction of packaging, or no packaging at all where possible, or usage of biodegradable materials and care about post-consumer process with the intention to reduce landfill and to recycle and re-use packaging.

A good practice includes fair communication with consumers about the green aspects of your product. The consumer should be able to do an upstream tracking of the product. If the client has to assemble the product by him-/herself, this should be as simple as possible. High quality products are durable, their life can last longer (for example, a crib for a baby can be passed further within the family, even for generations).

The role of digitalization in the green supply chain management is very important. Usage of some, even rather simple tools, can influence the supply chain management. It can be helpful with efficient time usage and shortening the cycles of purchase orders and the lead time of delivery, which could mean fresher products delivered for the client, less effort and

resources for preservation, storage and protection. This can help to increase the efficiency of distribution planning schedules and ability to respond to urgencies. Usually digital solutions in a micro-business are used for purchasing (order, processing), customer service, customer order processing, inventory management, relations with vendors, integration with manufacturing, transportation and production scheduling.

The green supply chain management entails social aspects and values that represent sustainable thinking. This includes applying an ethical code towards employees (incl. hygiene and job security) and contractors through application of ethical norms of business and trade, applying honest principles of employing the local community. One of the effects is the development of infrastructure objects. Sustainable thinking means legal discipline, timely and legally payed taxes and charges and transparency of incomes as the basis of tax calculation. A common part of activities is investments, support and charity to local community, participation in NGO'S, and local and regional (also national and cross-border) development initiatives.

Other important ideas to think about in the context of green supply chain management could be found in Sustainable Development Goals (The 2030 Agenda for Sustainable Development, see also module 1).

Tips for entrepreneurs for implementation of green supply chain management principles

1. **Check**, **where you are spending the most.** The role of wise and green supply chain management is efficiency, so the costs are one of the first standing points, and usually they are referred to as smart planning. For example, if energy is used in production and storage buildings, you can switch to LED lighting, or installing solar panels can reduce power consumption and save money. Cut back on transportation spending by sharing services or using digital solutions.
2. **Be realistic in green goals.** Despite the fact that the situation in particular business environments cannot be supportive to the green goals, you and your enterprise are the ones who set guidelines. For example, you can evaluate aspects or initiatives that are most important to your business and what their impact on the environment is. If you add the stakeholders' (customers', suppliers', employees') values to this evaluation, you will have a more objective picture.
3. **Start from inside and assign responsibility for the environment.** Green supply chain management cannot be built in a day, everyone involved has to know what you expect from them and how their performance will be measured. Probably there will be need for training. At least in the beginning, this could take some more managerial energy, require monitoring and adjusting.
4. **Talk about that.** Let your employees know that green supply chain management is a priority and explain what that means to each of them. It can also be used in recruitment. Talk about it with other stakeholders, share your prospects, tell your doubts and concerns. Maybe they have solutions. Talk to clients. Especially the young generation is aware of environmental issues.
5. **Reach upper-hanging fruits**. Be ready to dig, to research and calculate for the best solutions, which will ensure that you remain going forward with green consciousness. This could mean examination of your suppliers, visiting their premises, checking if their values and efforts match with yours in real life, not just in words. You may include in the agreements a section about sustainability standards, or at least, that your

partners would provide you with data so you could know how their work affects the environment.

6. **Get it to the next level.** Use digital solutions**.** Consider using a cloud-based supply chain management system that can help you monitor the sustainability impact of everything, from product design to logistics. In addition, you probably would like to demonstrate your commitment to sustainability by getting a green business certificate.

Assignment

Green supply chain modelling

1. Supply chain definition

Choose one or two most important products or services of your enterprise. Define, which components of the supply chain to include in the initiative. For example, include inbound material, product distribution, manufacturing, partnerships, Internet features, management systems and organization structure.

2. Supply chain viewpoint

Define, how you see and imagine your supply chain. Is it end-to-end? Is it a push or pull system? Which products require extra effort? Waste and risks? Would you consider it to be greener? Which processes, aspects?

3. Development of green supply chain model

Take the challenge to create a draft of your product supply chain. (You can use sticky notes, digital tools or whatever is more preferable.) Emphasize green aspects. Define how it works, identify the lead time!

4. Quality development and competing

Identify, which components (whether processes or results) you could change and improve! Under which conditions could the improvements become realistic? Adjust your supply chain model after this revision!

Finally, revise your business model!