ENI CBCMED
Cooperating across borders in the Mediterranean

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NATIONAL TECHNICAL UNIVERSITY OF ATHENS

INNOMED-UP

Output 4.2

CCI SMEs' clustering roadmaps for each city

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

BIRZEIT UNIVERSITY

cooperativa sociale
CRESM
centro ricerche economiche e sociali per il meridione

EPEM
EPEM S.A. ENVIRONMENTAL PLANNING ENGINEERING AND MANAGEMENT

Città di Prato

comune di PRATO

FUTURE PIONEERS
Empowering Communities

INNOMED-UP

Promoting UPcycling in Circular Economy through INNovation and education for creative industries in MEDiterranean cities

Work Package (WP4): INNOMED-UP model
Output 4.2: CCI SMEs' clustering roadmaps for each city

Activities:	**A 4.2.1**	Mapping of CCI value chains and existing interactions with CE models
	A 4.2.2	Mapping of existing connections and networks in the CCI Sector of each city
	A 4.2.3	Drafting of 6 clustering roadmaps (one per each participating city)

Output Participating Partners:	National Technical University of Athens (NTUA), Greece	Lead Beneficiary (BEN) WP1 Coordinator
	Environmental Planning Engineering and Management (EPEM SA), Greece	Project Partner 1 (PP01)
	Municipality of Prato (MoP), Italy	Project Partner 2 (PP02)
	Centre for Economic and Social Research for the South of Italy (CRESM), Italy	Project Partner 3 (PP03)
	Municipality of Tunis, Tunisia	Project Partner 4 (PP04)
	Birzeit University (BZU), Palestinian Authority	Project Partner 5 (PP05)
	Future Pioneers for Empowering Communities' Members in the environmental and educational fields (FPEC), Jordan	Project Partner 6 (PP06)

INNOMED-UP

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Thematic objective:	A.2 Support to education, research, technological development & innovation
Priority:	A.2.2 SMEs access to research and innovation
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1 ACTIVITY 4.2.3: DRAFTING OF 6 CLUSTERING ROADMAPS (ONE PER EACH PARTICIPATING CITY)

1.1 ATHENS

1.1.1 Summary

During the 3rd and 4th Semester of implementation of Innomed-Up project NTUA Research team (LB) in collaboration with EPEM (PP1) have proceeded with a survey in the Historical center of Athens (A 4.2.1 & A 4.2.2), involving 30 CCI SMEs [18 Crafts SMEs, 10 Design SMEs and 2 Makerspaces]. It was conducted with an online questionnaire, covering three research axes: [1] Location and networking, [2] Value chains and [3] Circular economy and leading to interesting findings that helped design the Clustering Roadmap for Athens.

The **key challenges** of the Athens' Strategy development are:

- The **maintenance, strengthening, support and networking** of CCI SMEs in the historic center of Athens - which despite the adverse conditions (financial crisis / pandemic) are still a dynamic economic activity and a pole of attraction.
- The integration and / or upgrade of **circular practices** in CCIs that can creatively produce suggestions and practices that will bring about positive immediate and indirect results.
- The drawing of **new and external knowledge** from the research/ educational sector and experts on Circular Economy but also the training of CCI SMEs on the use of **new technologies and smart tools** to accelerate innovation and boost their competitiveness.

The **expected outcomes** from the implementation of the Clustering Roadmap in Athens are:

- Creation of Innovative products that apply circularity principles
- Access of CCI SMEs to knowledge and innovation through training programs
- Creation of horizontal and vertical collaborations within the cluster, but also promotion of the concept of collaboration
- Increased awareness in the community around environmental issues and waste management
- Promotion of a local brand from which CCI SMEs will benefit further

1.1.2 A. Analysis of components and layers based on the Survey

The methodology followed at this stage of the research program is organically linked with the overall methodology followed until now, organized in consequent geographic scales. NTUA Team conducted the survey structured in three research axes: [1] Location and networking, [2] Value chains and [3] Circular economy. The questionnaire was compiled in Greek in Google forms and was sent to 40 CCI SMEs via e-mail. Some interviews were conducted in person via telephone or in the framework of a visit. The 40 CCI SMEs were carefully chosen from the database of potential beneficiaries that was compiled during the Mapping phase (A 3.2.2). With constant monitoring during the survey, NTUA team's goal was to maintain the proportions, found as representative of each category of creative activities in the Municipality of Athens. As a result NTUA Team managed to obtain answers from 30 SMEs belonging in three main categories: 18 Crafts SMEs, 10 Design SMEs and 2 Makerspaces.

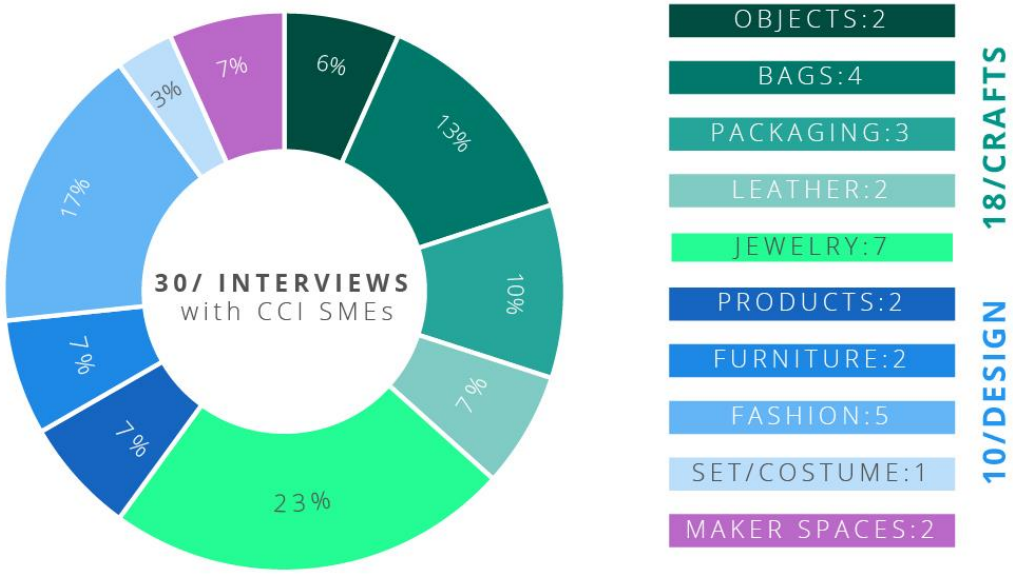


Figure 1: Categorization of participants in the Survey conducted in Athens

1 BASIC INFO

Most of the interviewees are sole proprietorships, small partnerships or cooperatives

More are **women than man** (60-40%) – and Mostly **up to 40 years** old

All (entrepreneurs and employees) are graduates of basic **education** and hold degrees in either higher education or technical schools

The vast majority employ at most **1-2 employees**

These SMEs seem to be **viable due to their small size** which has not exposed them to risks (debts to banks, suppliers, etc.), they produce **unique products** that make them competitive and **flexible in adapting** their production to new conditions.

2 LOCATION AND NETWORKING

The **premises** in which they operate are usually rented. When it comes to workshops and offices they do not exceed 50 sq.m. and are located on floors, while the shops (which often co-house the workshops of entrepreneurs) reach 100 sq.m. and are located on the ground floor.

The **establishment** of these companies in their current positions begins from the late 1990s until very recently. Most of those stationed elsewhere were previously located within the historic center or around the historic center. The **reasons for relocation** are wide ranging from the fact that they wanted to achieve greater visibility or collaborations and end with the fact that forced relocations were made due to change of uses (e.g. Airbnb).

On location advantages, most said they are **centrally located** which are easily accessible to the public, developing partnerships, **increasing visibility opportunities**, installation costs are low, while those who work with precious materials their head points provide security. As for the disadvantages, many

initially state that they do not face any disadvantages. Most highlight the problem of **difficult access by car (their supplies, etc.)** and **lack of infrastructure**. Most do not consider relocating.

In terms of network utilization, **production networks seem to have a higher impact** - ie the development of collaborations at the level of the production process. Raw material networks also have a relatively high impact. **Social networks have an extremely high impact**, eg the coexistence of friends, colleagues, etc. creating multiplier results. Di**stribution and promotion networks have a low impact** as institutional support networks are rather non-existent.

These networks have a **greater impact on economic benefits**, access **to knowledge and information as well as product promotion** (through customer development, etc.) **while networks for access to innovation and technology have very low dynamics**.

All are members of institutions (associations, chambers, etc.), while in informal associations and initiatives very few participate and usually have to do with the ideas of the cooperative economy or environmental awareness.

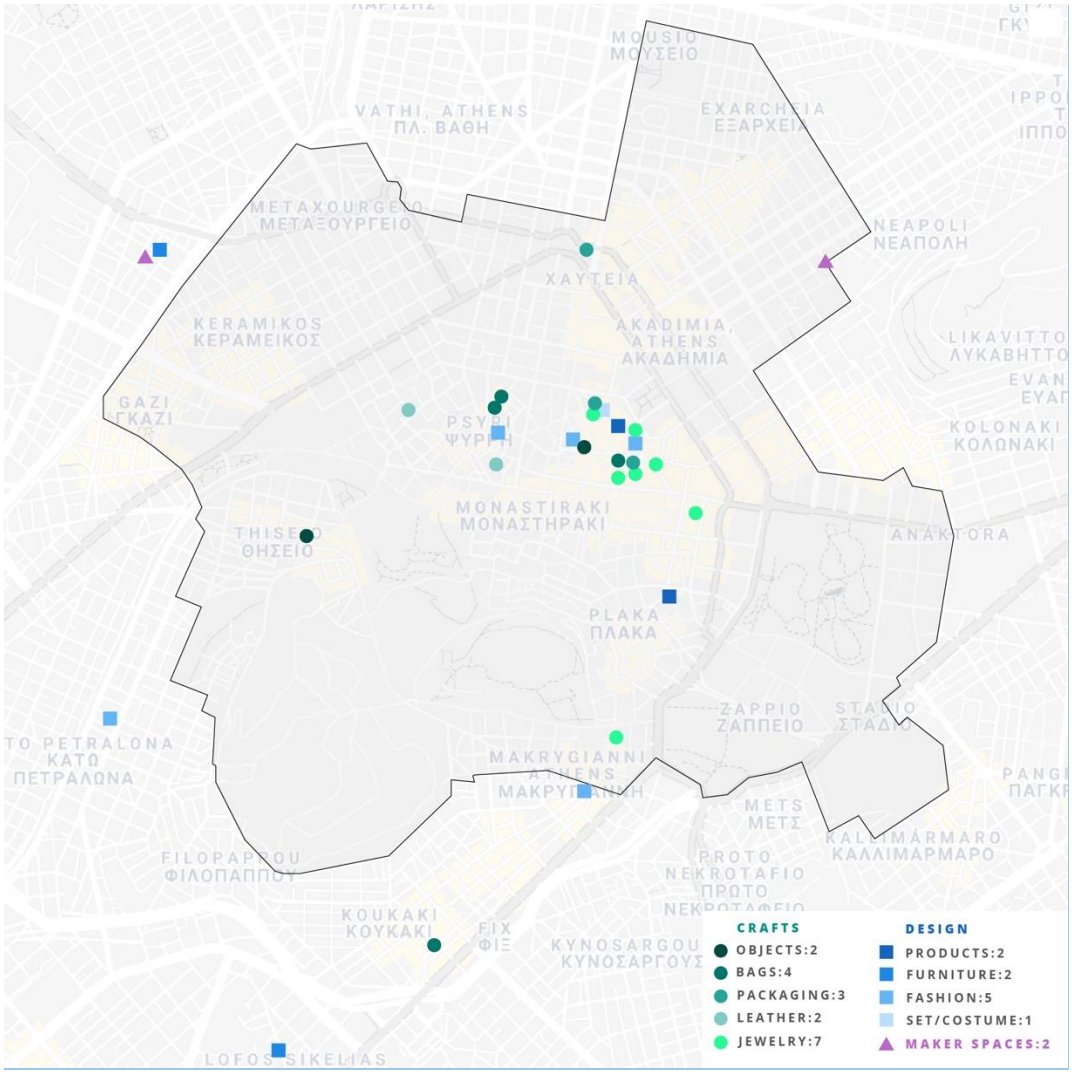


Figure 2: Map of interviewees - Location of 30 CCI SMEs in the Historical center of Athens

3 VALUE CHAINS

In general, companies present the following productive stages:

1 conception / idea / design
2 research / experimentation
3 production of pattern, original, mold
4 supply of raw materials and reproduction
5 packaging / distribution

Most entrepreneurships cooperate **at some stage of production with other small and medium enterprises**. The cooperation concerns either the stage of conception (idea, design), the production (supply of raw materials, assignment of a production process that requires specialized mechanical or electronic equipment), or the packaging.

Horizontal collaborations (joint production or promotion of products) **are less common** and are mainly found **in companies that have the philosophy of cooperation** or have adopted and acted on a common vision (e.g. **environmental awareness**).

Most business partnerships **are located within the city center** and are often located in other parts of the city.

Raw materials with greater demand are: metals, wood, paper, leather, fabric remnants, yarn, plastic (in various forms).

The main produced **waste** is: paper, shavings, plastics, leather, remnants.

Scarcity of raw materials due to adverse conditions (pandemic) in the supply chain is also mentioned as an emerging problem. Pandemic has led to shortages on many raw materials, whereas the price of raw materials is increasing and many SMEs face shortage challenges through the supply chains.

Most **face a lack of support** (technical, institutional, and financial) for growth in **foreign markets**.

Most people use more **hand tools** for their production but often also use digital or mechanical equipment. The use of **new technologies & digital media** is used mainly for the design and distribution of products and less for their production. However, many SMEs are interested in using new digital technologies in the production phase. The main obstacles to achieve this are the lack of funding and institutional support in R&D, and other financial problems in obtaining digital equipment.

4 CIRCULAR ECONOMY

Most are interested in or already incorporate circular practices into their activities. But there is a significant percentage who do not know how to do it even though they would like to.

The key tools needed to integrate circularity **are financial incentives and networking with SMEs that already apply circular economy practices.** While the **main obstacles are the lack of know-how and the lack of institutional support.**

Finally, most do not know of other SMEs that apply a circular economy to their business.

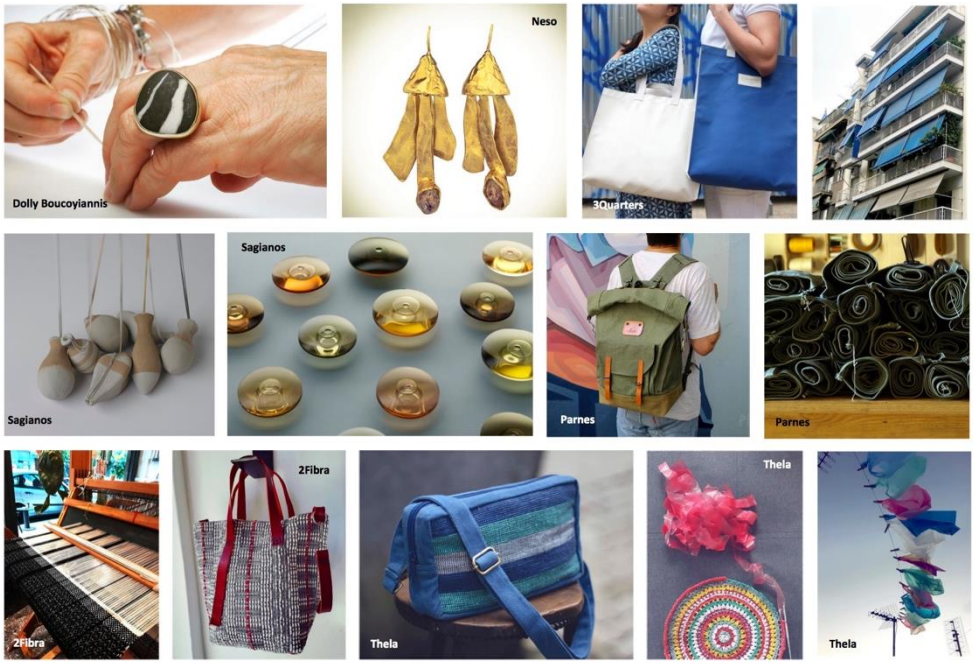


Figure 3: Documentation pictures from interviewees' online presence

1.1.3 B. Roadmap strategy development

The **key challenges** that Athens' Strategy development deals with are:

- The **maintenance, strengthening, support and networking** of CCI SMEs in the historic center of Athens - which despite the adverse conditions (financial crisis / pandemic) are still a dynamic economic activity and a pole of attraction.
- The integration and / or upgrade of **circular practices** in CCIs that can creatively produce suggestions and practices that will bring about positive immediate and indirect results.
- The drawing of **new and external knowledge** from the research/ educational sector and experts on Circular Economy but also the training of CCI SMEs on the use of **new technologies and smart tools** to accelerate innovation and boost their competitiveness.

More specifically, CCI SMEs **goals** through the implementation of the Cluster should be the following:

- A new perception of materials (reduce/manage waste, reduce raw materials, develop secondary material markets);
- Shifting towards innovation and implementation of new technologies;
- Development of clusters and networks;
- Implementation of good practices;
- Creation of new job opportunities and becoming more competitive.

Thus, the main **objectives** of the cluster should be:

The integration of circular processes in the productive cycle of specific categories of SMEs with traditionally remarkable presence in the historical center of Athens, such as **jewelry, clothing, textile, leather and accessories** (e.g. bags).

The collaboration of traditional creative SMEs as mentioned above, with younger creatives, such as **designers, architects, artists, makers**, with the purpose of exchanging knowledge about traditional techniques and on the other hand introducing new innovative processes in the creation of services and products.

The participation of the above SMEs in a **circularity cluster** established in the center of Athens, with the deployment of innovative **smart tools** such as a collaborative digital platform, a smart bicycle, smart bins etc. A suitable institutional framework as well as supportive measures and other provisions would be considered necessary for future steps and consolidation of the cluster.

The design of a **repository of secondary materials** with the purpose to re-distribute them among the participating SMEs in order to reuse them in innovative products and services. The repository will have to be both physical and digital. According to the size and nature of these materials they may be disposed of in the relevant bins established in the historical center, or remain at the premises of their owners until someone claims them.

The participation of the relevant SMEs in **specially designed training courses** in order to familiarize with the concept of circular economy, the means to promote it within their business models, the available innovative methods of production based on circularity and the benefits for their business, through the creation of a new profile and branding. It is considered of high importance the establishment of **synergies** with educational and research institutions and the constant provision of updated specializations.

The promotion of **cross border collaboration and knowledge transfer**, that is one of the main goals of the program as a whole, will be facilitated through the collaborative platform that will be developed in order to bring together all participating SMEs in Mediterranean level and promote their collaboration and exchange of experiences, methods and techniques.

The access to **financial support and funding opportunities**, both at international and national level, through the operation of info points, that provide information and consulting. Additionally, implementation of the specific founding tools designed by the program.

Finally, to promote **increasing awareness**, not only among the SMEs, but more importantly in the community as well as the visitors of the Historical Center of Athens, about the importance of Circular Economy, and the crucial issue of its support and spread at local, national and international level. This target can be achieved through the Awareness campaigns and the Social media development, but also through the implementation of the Pilot Cluster in the Historical center of Athens, that may serve as a "living" paradigm for other areas or cities. Very valuable will be the evolution of a strong brand around this cluster -also with a potential touristic impact- that will be communicated through upgraded marketing, extroverted activities and participation in other events.

1.1.4 C. Implementation of Roadmaps

After the completion of the surveys, NTUA research team has managed to obtain very useful information on: the **workflow** of the selected CCI SMEs, the **raw materials** that are of great importance for their workflow and finally the **waste** that they produce and whether and how they process this waste. The survey also provided useful insight on **circular principles**: i.e. how and to what extent circularity has already been incorporated in the CCI SMEs workflow and what are the future potentials. It has been considered of great importance to try and relate the produced waste with the workflow of the CCI SMEs that participated in the survey with the aim to find interconnections between waste and materials and the possibilities to relate the CCI SMEs in “Circles of Creativity”.

Moreover, what has been decisive in the design of the roadmap is the design of the **smart tools** and their restrictions.

More specifically the **restrictions** pointed out by the design team of the **Smart Bin** are:

- Size and weight of waste not to exceed certain limitations
- Preference for secured location in order for the bin not to be stolen or vandalized
- Possibility of connection to WiFi
- Possibility to be used by one or more CCI SMEs
- Use of digital media (eg QR code) for awareness purposes

The restrictions pointed out as regards the design and use of the Smart Bicycle are:

- Need for a specially trained person to operate the bicycle
- Size and weight of waste to be transferred not to exceed certain limitations
- Limitations in the sorting procedures

Thus the compilation of the Clustering Roadmap for Athens should bear in mind the following:

- Selection of materials based on preliminary research
- Preferred locations of Smart Bins either in the space of SMEs or more massive but guarded areas
- Cooperation with Awareness Campaigns and design of appropriate visualization
- Exploration of the possibility of finding a sorting area
- Exploration of the possibility to hire a person to operate the cluster
- Active involvement and enhancement of the role of the Stakeholders

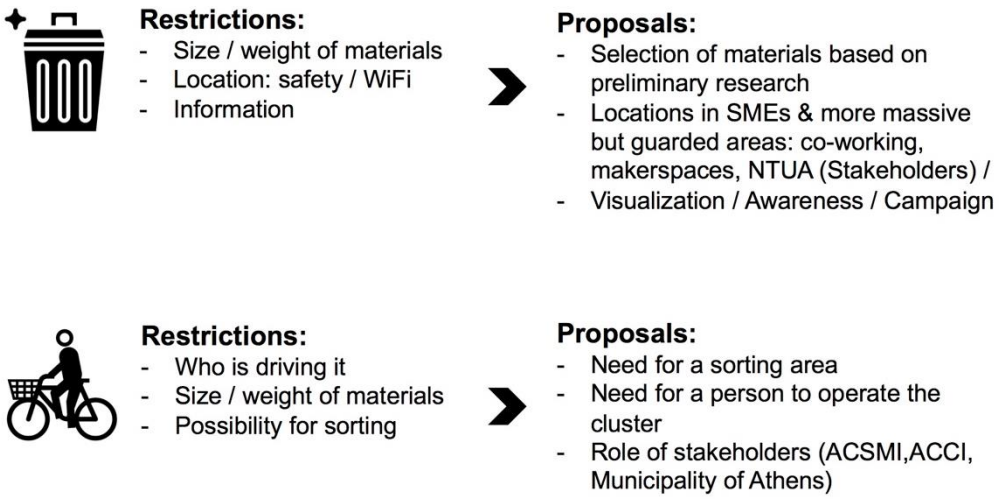


Figure 4: Restrictions posed by the design of the Smart tools and general principles to be followed for the Roadmaps

In the following text you will be able to understand the proposed steps and timeframe for the implementation of the Roadmap in Athens.

STEP 1: Specification of waste typologies / secondary raw materials

The materials that have been specified by the survey as most common **waste** produced by the CCI SMEs located in the Historical Center of Athens are the following:

1. Paper
2. Plastics
3. Leather
4. Fabrics
5. Metal parts
6. Electronic waste
7. Wood remnants

STEP 2: Evaluation of matching opportunities with CCI SMEs

The waste material of one CCI SME could potentially become a (secondary) raw material for another CCI SME. Thus, an important step would be to search and facilitate "matching opportunities" for CCI SMEs in order "creative upcycling" to take place, through the extensive use of the smart tools. In the following table we provide an attempt of evaluation of these matching opportunities based on the potential of the produced waste to be used as raw materials by the respective CCI SMEs according to their workflow.

Waste To Raw Materials	CRAFTS					DESIGN				MAKER SPACES
	Objects	Bags	Packaging	Leather	Jewelry	Products	Furniture	Fashion	Set – Costume	Maker spaces
	[2]	[4]	[3]	[2]	[7]	[2]	[2]	[2]	[1]	[2]
Paper	*		*				*		*	*
Plastics	*	*	*		*	*	*	*		*
Leather		*		*	*			*		
Fabrics		*	*					*		*
Metal Parts		*		*	*					
Electronic waste	*				*					*
Wood remnants	*					*	*		*	*

Figure 5: Evaluation of the matching potential between produced waste and their use as secondary materials by the selected CCI SMEs [positive evaluation of potential]*

STEP 3: Further cooperation with CCI SMEs

For the future actions of the program the research team aims to further delve into this topic by conducting semi-structured **interviews** with the involved CCI SMEs, discussing the development of innovative products created by the upcycling of available waste. The interviews aim to plan in more detail the participation of CCI SMEs into specific “Circles of Creativity” of the pilot cluster by creating matching "duos" or "trios" of collaborating CCI SMEs. Thus, the produced waste of one CCI SME could supply another with secondary materials for developing upcycled products, establishing the "Circles of Creativity" in the historic center of Athens.

STEP 4: Socio – Urban Circularity Workshop

An important facilitator to this end will be the organization of the **Socio-Urban Circularity Workshop**, which will help to forge in more depth the relationships with the potential beneficiaries and further enrich the research on their workflow and potential incorporation of circular methods. An additional goal of the workshop is to facilitate a further involvement and collaboration of the stakeholders (ACSMI, ACCI, Municipality of Athens etc.) of Innomed-Up.

STEP 5: Definition of Smart Bin Locations

After the definition of the waste typologies that are being produced by the CCI SMEs that have participated in the survey, the next step is to define possible **locations** for the bins that will be used to collect these secondary materials.

Having in mind the restrictions derived by the design of the bin, the research team has evaluated potential locations and has concluded into the following proposed locations.

In the following scheme we present an overview of the proposed locations of the Smart Bins, according to the type of waste material. In each material there have been defined two or more possible locations, mostly in the premises of CCI SMEs, but also some other locations with larger potential to reach the

attention of the greater public, such as the municipal Makerspace POIO, the co-working space Impact Hub, the School of Architecture, the Thiseos Arcade and the Praxitelous Arcade.

Figure 6: Potential locations of Smart bins according to waste typology

The final locations that will be defined during the Pilot Cluster will have to be further evaluated through more specific criteria such as the feasibility of implementation at the exact time of the realization of the Pilot Cluster. Therefore, the potential bin locations are expected to be reduced from 16 to 10.

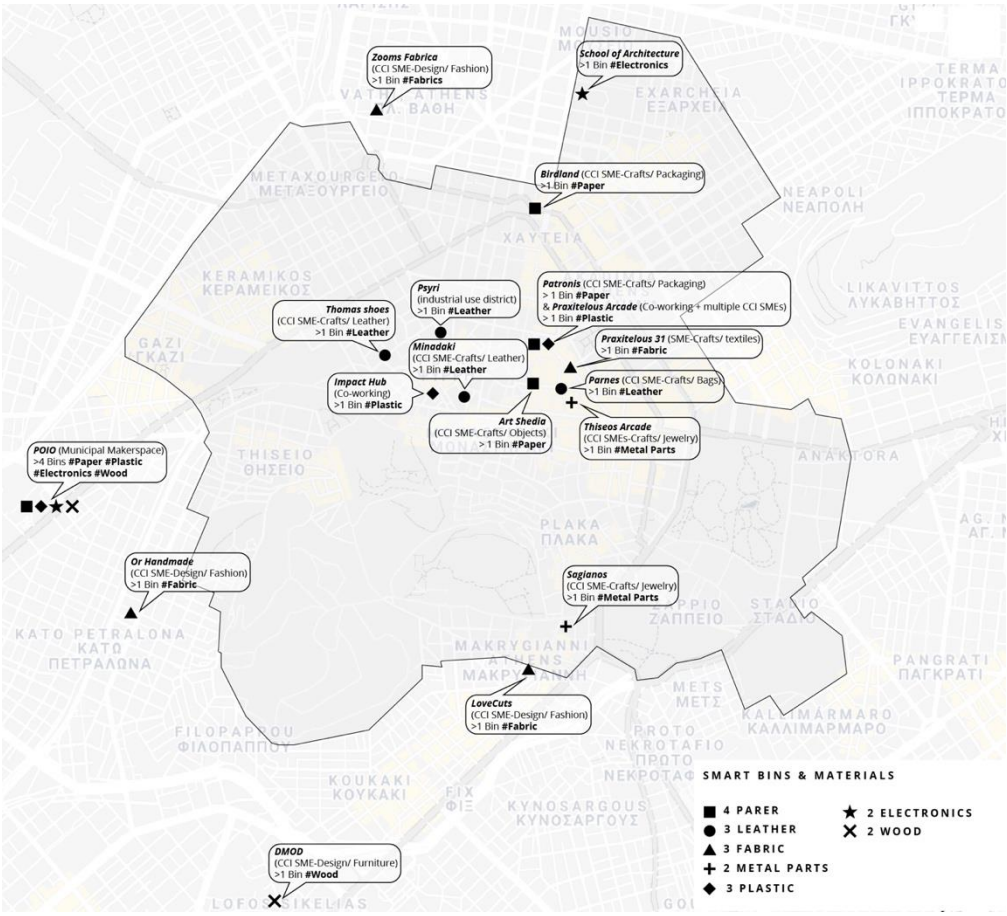


Figure 7: Map of proposed locations of Smart bins according to waste typology

STEP 6: Selection of CCI SMEs to participate in the Pilot Cluster

Based on the survey conducted on CCI SMEs in the historic center of Athens, the pilot cluster will involve a number of local CCI SMEs with the aim to enhance their business models with innovative circular practices, design and produce innovative products and will use waste as secondary raw materials.

The **criteria** of selection of these SMEs are:

- Location in the Historical Center of Athens or close to its perimeter
- Willingness to participate in the training programs
- Compatibility with the waste material that are proposed for the cluster
- Potential to design and produce innovative products based on circularity principles

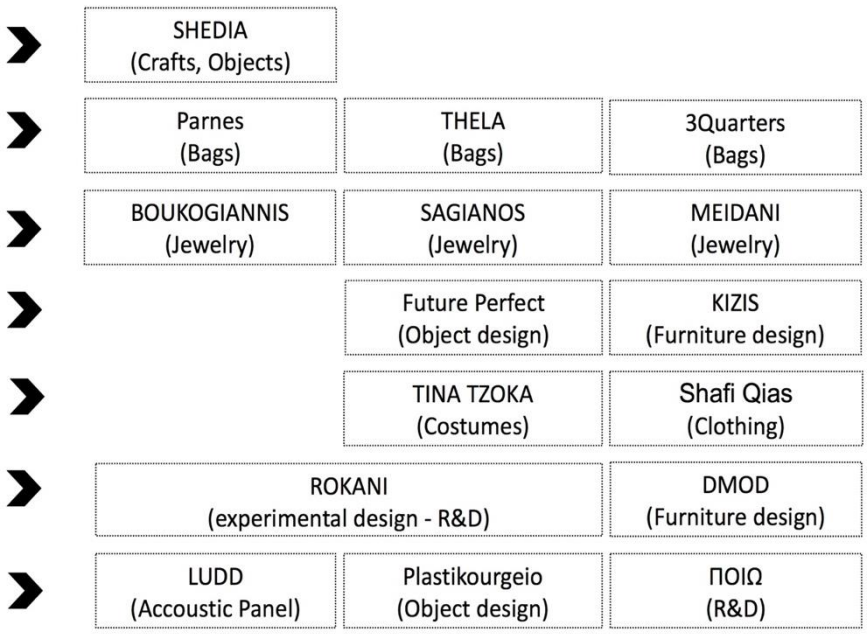


Figure 8: Preliminary selection of CCI SMEs and schematic design of "Circles of Creativity"

STEP 7: Involvement of Stakeholders and Marginalized groups

Stakeholders will play a key role within the cluster such as chambers, the Municipality of Athens and the Ministry of Development. Each one could add value to the cluster either by spreading the project's objectives to the members, or by providing policy tools or by consulting to technical issues.

Marginalized groups have been included in the cluster design: microSMEs owned by women refugees and a NGO supporting homeless people – SHEDIA - will participate in the pilot cluster of Athens.

STEP 9: Establishment of the cluster

Defining the exact waste material that will be channeled from each Smart Bin to each CCI SME. Choosing the routes of the bicycle that will deliver the materials to the CCI SMEs.

The beneficiaries that will participate in the cluster will be asked to deliver innovative products with the use of these materials as well as design new business models.

Expected outcomes:

After the implementation of the Pilot Cluster in Athens, the expected outcomes are:

- Creation of Innovative products that apply circularity principles
- Access of CCI SMEs to knowledge and innovation through training programs
- Creation of horizontal and vertical collaborations within the cluster, but also promotion of the concept of collaboration
- Increased awareness in the community around environmental issues and waste management
- Promotion of a local brand from which CCI SMEs will benefit further

1.2 PRATO

1.2.1 Summary

The Municipality of Prato, PP2 of the INNOMED-up project, has contacted 30 SMEs to participate in a survey which was delivered through an online questionnaire. Responding firms had been formerly involved in the INNOMED-UP SWOT PEST analysis or in other projects of the Municipality of Prato dealing with sustainability.

The main outcomes of the survey are:

- most firms are historical enterprises established before the 2007-2008 crisis;
- these firms derive a major advantage from their location by establishing synergies and networking with other firms and suppliers; on the other hand, the main disadvantages are the poor visibility and high operating costs;
- most enterprise benefit from accessing: technology, information and knowledge, finance, clients and promotion (in this priority order)

Regarding Value Chains and Circularity, most firms work with other SMEs to manage the productions phases: product development, purchase of raw material, yarn production, warehousing, promotion, distribution and selling; some of them do research and testing to develop new products, even in collaboration with customers, and have thereby developed new processes or specialized machines.

Most of the surveyed firms would like to be supported to expand their networks in order to:

1 open to new markets and business opportunities
2 discover new market opportunities
3 discover new suppliers of raw materials
4 maintain the production levels throughout the year
- most understand the value of technology & digitalization at all production stages
- the most used materials are: Wool, Cotton, Polyester, Linen, Nylon or Acrylic
- waste like Textile waste, Plastic, Paper / cardboard, Wood, Metal is collected directly from the firms by special waste management companies

Most firms feel that circular economy principles could be embraced through the following main incentives (in this priority order):

1 Financial support
2 Networking with experienced firms
3 Promotion of CE products
4 Innovative equipment
- and by overcoming the following obstacles:
1 Lack of knowledge/ expertise
2 Lack of institutional support
3 Operational difficulties during the transition

4 Lack of interest for CE products from the consumers' side

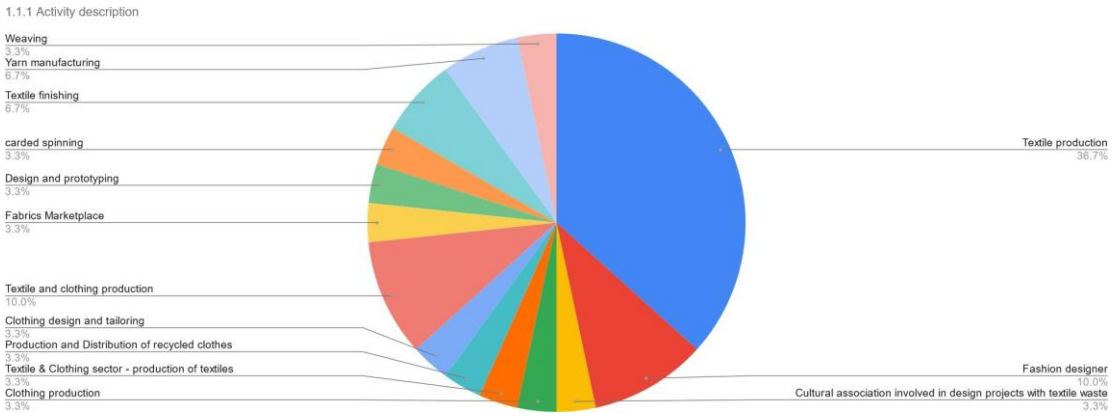
1.2.2 A. Analysis of components and layers based on the Survey

The Textile & Clothing sector or Fashion gives job in Tuscany to about 130 thousand people: 115 thousand in the areas of fashion in the strict sense (textiles, garments, tanneries, footwear, leather, jewelry), 1800 in the production of machines and 12,800 in the service sector (wholesale and brokerage). That means that the 7.7% employment overall Tuscan operates in the sector, or in related activities: mechanical parts, business services, transport and retail. Within the manufacturing industry, the fashion sectors cover almost 40% of employees and realizes an added value that exceeds 5.5 billion euros. No other region reaches values so high: the Tuscany is the region of fashion. A datum of fact also confirmed by exports that in 2019, it is estimated, have exceeded the 15 billion placing the Tuscany in the head in Italy for export, surpassing in value absolute even the Lombardy.

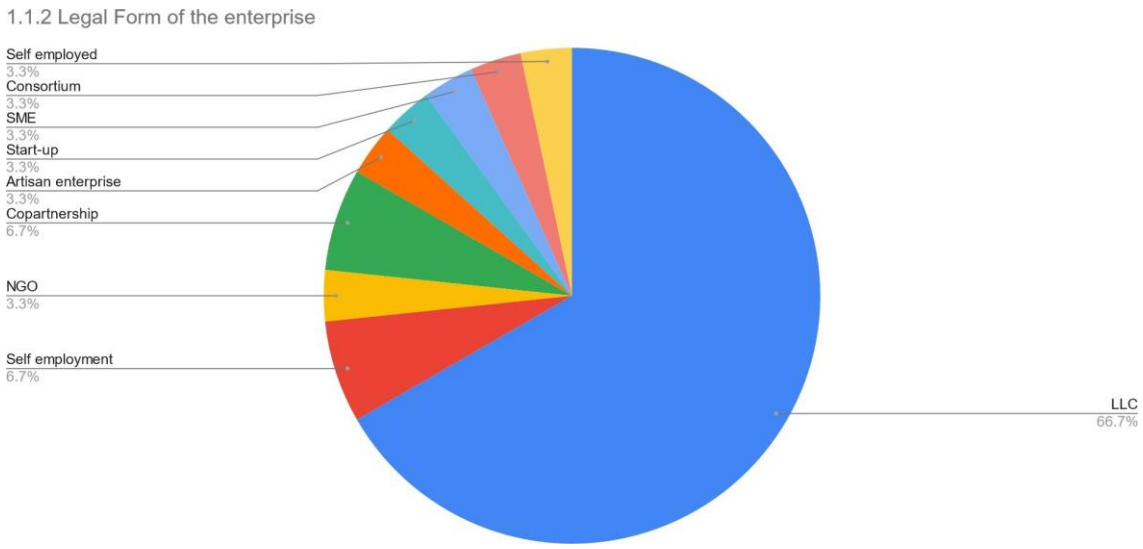
The survey performed under Activity 4.2.1 focuses on a restricted number of SMEs that well represent the current situation in the T&C district of Prato. The following are the main results of the survey that the Municipality of Prato has conducted, by contacting 30 SMEs to participate in an online survey through a questionnaire.

Basic information

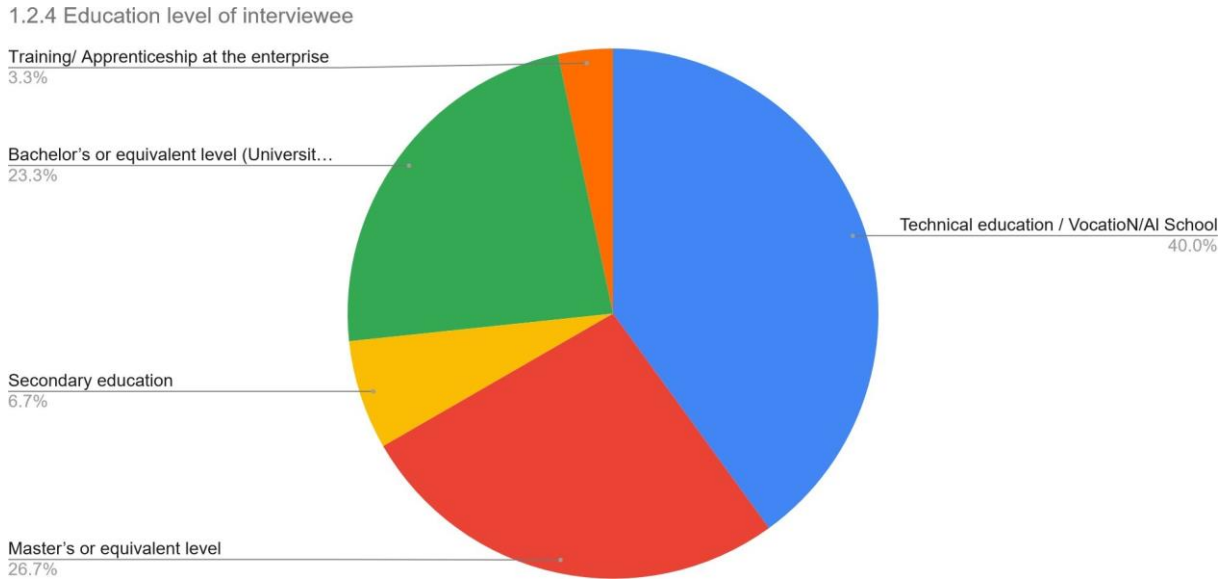
Activity description - the working sector of the enterprises is provided in the following chart. Most firms are active in textile production (36,7%), secondly in fashion design (10%) and Textile & Clothing (10%). The remaining firms are active in different stages of T&C production:



All surveyed firms are located in the Prato industrial district or in its neighborhood. Their legal form is mostly that of an LLC (around 67%), with one (53%) or maximum one (40%) owner, of mostly male gender (77%), with an evenly distributed age between 30 and 65 years old

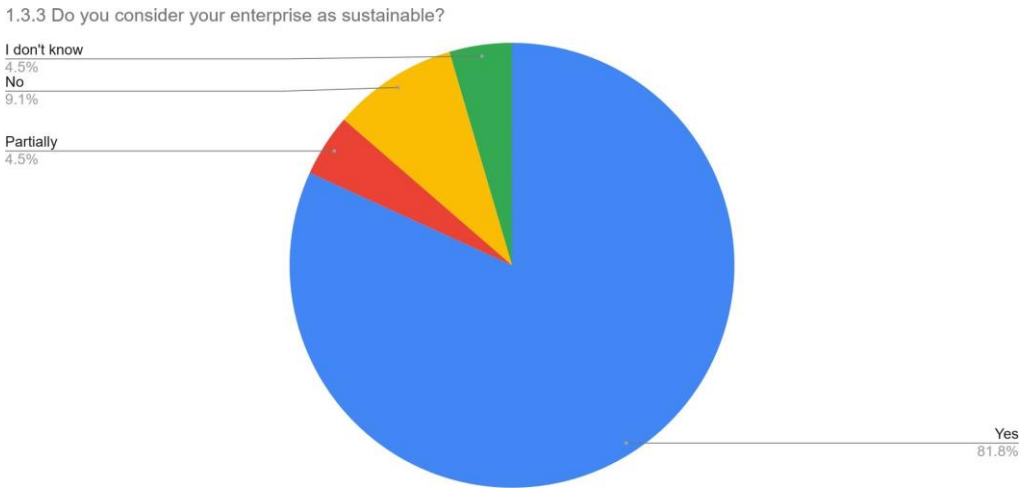


The education level of the interviewee is in the majority technical (40%), or at bachelor (23,3%) and master (26,7%) levels. To assess the educational level both at the managerial and technical (workers') levels is important to estimate what extent the circular economy could be adopted.

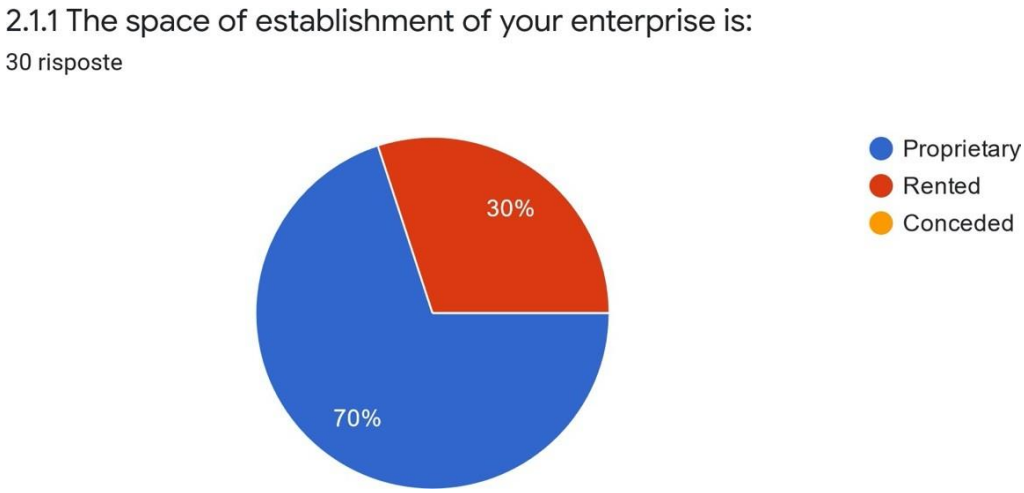


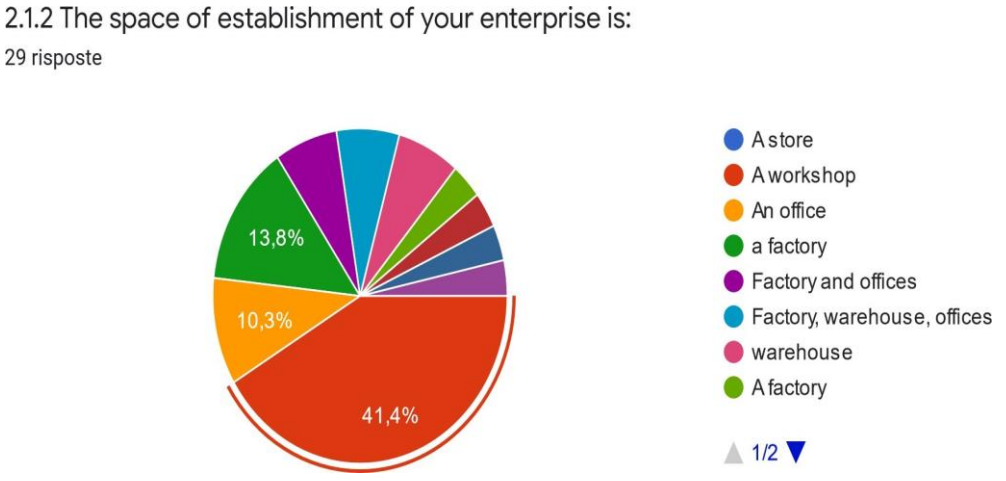
The number of workers in the firms ranges between mostly micro enterprises (up to 10 workers) and small enterprises (up to 50 workers). Workers do own Basic or Advanced Computer skills (digital design software, digital manufacturing software, etc.), or Mechanical Equipment Operation skills, but show lower skills in Basic and Advanced Arts & Crafts. Half of the enterprises consider themselves to be traditional (or family) businesses.

The majority of the enterprises considers itself sustainable (81,8%):



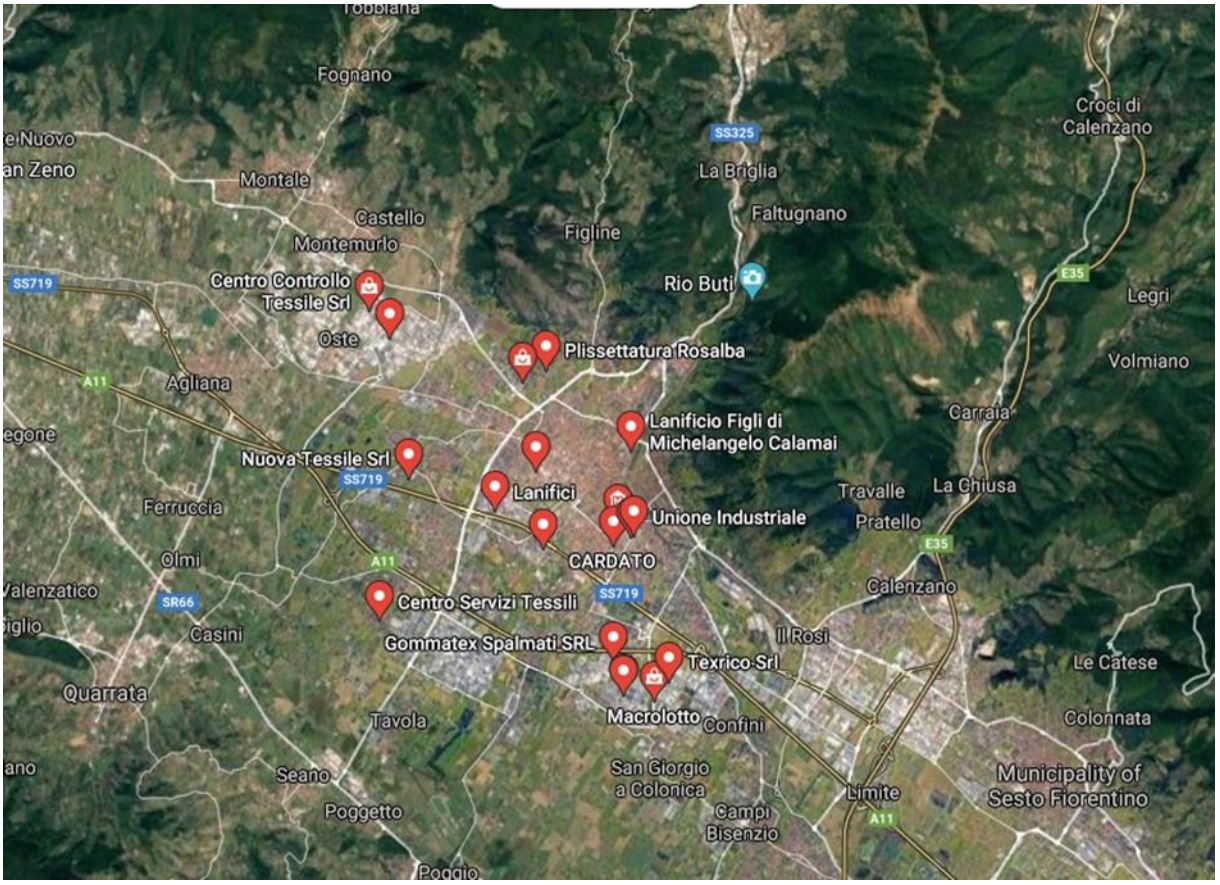
Most of them own the space where they are established (70%), which is often structured as a workshop (41,4%):





Most enterprises were established after World War II. The surface they cover depends upon the phase of production they handle. Their surface ranges between 80 and 2000 sqm.

This map indicates the geographical location of some (not all) textile firms in Prato and neighborhood:



1.2.3 B. Roadmap strategy development

Key challenges

The surveyed enterprises belong to a sector in Tuscany that has suffered most from the blows of globalization and the economic crisis of 2008. On the other hand, they have been able to resist and reassert themselves, above all thanks to requalifying production and boosting exports. Adopting the CE is part of this collective effort. The enterprises that were surveyed belong to the sectors that we commonly refer to as the fashion system, particularly textile and clothing, which in Tuscany developed and established themselves during the years of the economic boom, then undergoing ups and downs over the years. Recycling and up-cycling has been a constant feature of this industrial district.

Nowadays, the Textile-Clothing sector is in great difficulty being very much affected by the pandemic and the related containment measures. The risk of significant production and employment downsizing is concrete and imminent, with serious repercussions on the entire national economy. The current scenario is highlighted by the analysis carried out by the Italian National Fashion Industry Association Study Center which confirmed that the Textile-Clothing supply chain lost 23.7% of turnover in 2020 compared to 2019, i.e. in value - 13.3 billion of turnover.

Focal areas

The structural interventions needed to reshape and relaunch the supply chain focus on three operational levels:

1. Emergency interventions, to be activated immediately and aimed at safeguarding professionalism and facilitating restructuring processes, allowing both to address the delicate social issue of leaving work and that of the entry of new professionals required by the sector in the coming years.

2. Medium-term strategic interventions for the implementation of the effects relating to the qualifying areas of circularity, creative innovation, digitization and recovery of sectoral competitiveness.

3. Long-term strategic interventions, in strengthening and completing the measures envisaged in the previous phase, eminently structural, in the areas of promotion, training and retraining of human resources.

As regards adopting the CE, the existing legislation doesn't favor the adoption of the CE. Textile & Fashion firms in Prato do produce huge quantities of textile waste and scraps, which are unfortunately considered as special waste by law, which makes it costly and cumbersome to dispose of it or use for recycling.

One key asset to exploit is the widespread distribution of creative and lively Textile, Clothing and Fashion Design enterprises all over the city. The former Industrial Area Macrolotto Zero next to the city centre, will be the focus of the pilot actions, as it combines textile mills with CCIs and is the ideal target for the INNOMED-UP project.

For this we will skip theoretical approaches and models to concretely create circular value chains for new economic and social opportunities. Alternative outflows for textile waste and second-hand clothes are being investigated, to create new markets and products for more environmentally conscious customers.

Pilots will exploit the know-how to recycle materials, particularly textiles, owned by textile firms in Prato, while simultaneously mobilizing in a joint effort citizens, entrepreneurs, the administration and the policy makers. Political support will be searched to remove regulatory, technological and competitivity (e.g. third countries lower manufacturing costs) barriers to the adoption of circular principles and CE-based innovative business models that can profit on new markets through circular value chains.

The pilots will take into account the following SWOT factors:

STRENTHS	WEAKNESSES
- Phases of the production chain are spread yet close to each other. - Strategic location of firms. - Great technical and design competence. - Tradition and creativity. - Strong knowledge of production processes. - Added value of Made in Italy. - Strong and widespread entrepreneurial spirit. - Early adoption of the Detox protocol. - Centralized industrial waste water purifier by GIDA - Innovative companies have reactedbetter to the Covid emergency.	- Lack of a research center with technical and managerial skills that can serve the T&C District. - Delay in the digitalization of business & production processes - Dispersion of subcontractors that prevents synergies. - Few synergies with the Chinese community and poor integration with the packaging district. - Poor managerial preparation of new entrepreneurial generations. - Little bargaining force. - Progressive reduction of employees in the textile & clothing sector. - Poor communication skills of the product's quality (lack of a Prato brand). - Fragmentation and isolation of T&C SMEs.
OPPORTUNITIES	**THREATS**
- Use of a Prato brand could generate added value - Reshoring of production and supply chains - Growth of the internal European market - With the increased sensitivity on sustainability issues, creation of a recognizable label, which refers to sustainability - Foreign visitors could fuel industrial tourism - Organization of transport system with Interport and intermodality. - 5G experimentation - Legislative changes at EU level - Development of eco / bio-based products and raw materials - Increased consumer sensitivity towards eco products - At the international level, large companies are moving towards Detox	- Political decision makers do not fully grasp the needs of the district - International economic stagnation. - Cost of raw materials. - Dependence from abroad for the supply of used clothes and rags (also due to national legislative barriers). - Customs' protocols too restrictive to export products to some markets. - Collapse in consumption and decrease in exports. - Loss of phases in the supply chain due to closures. - Increase in unemployment and use of social safety nets. - Poor protection of "made in" by Europe - Bad reputation of the textile sector considered too polluting. - Partial interpretation of the meaning of circular economy

1.2.4 C. Implementation of Roadmaps

Prato's roadmap to develop the pilots is in line with similar roadmaps developed by the EU Urban Agenda for the Management of Circular Resources in the cities.

To enable the municipality and T&C businesses to identify and exploit new opportunities that may help to speed up the transition towards a circular economy in terms of resource efficiency in the value chain, requires a shift from urban waste management to urban resource management. Thereby, waste management will not become completely obsolete, but the primary focus will shift to waste as a secondary resource. To achieve this, the proposed roadmap is as follows is structured along three lines:

Mapping stakeholders and materials

This includes the mapping of materials and material flows (e.g. quantities, flowrates, owners, stakeholders involved, availability, quality, etc.) and the mapping (and profiling) of specific CCIs that can interconnect with other economic and social actors to deliver the innovative circular practices. The facilitation of CCIs and SMEs to access innovation and innovative business models, and the promotion of social inclusion and sustainable communities in the pilot areas, is being pursued through the Circular Economy course that has involved a multiplicity of economic, social and civil actors, and through the further dissemination of the learning material the course has produced.

- The criteria for the selection of participants in the clusters will be:
- Active participants in the former seminars of the project like the INNOMED_UP SWOT PEST workshop
- Active participants in the INNOMED_UP Circular Economy Course currently underway

Other stakeholders as needed to integrate the pilots (brokerage agents, suppliers of secondary resources, etc.)

Pilot implementation plan

The definition of an implementation plan for the pilots, identifying actions and tools to support the creation of a new product and market, is underway by the course participant with the support of the MoP (Prato City). The plans will be assessed together with CE experts in September. At that time the following will be decided:

- placement and specific use/application of clustering smart tools (eg bins, bicycle etc) and their interaction with CCIs SMEs activities (locations of the participants, the locations of the Smart tools and the networks / connections that will be evolved, raw materials that will be exploited)
- the terms and means of cooperation between CCIs SMEs (eg cooperation and exchange of raw materials by pairs of SMEs or in small networks of SMEs with relevant activity)
- the participating stakeholders & their role towards the SMEs access to innovation & new business models and the social inclusion

- the expected outcomes (innovative products, collaborations, networks)will be decided.

Monitoring system

A system that will monitor the essential features (materials, stakeholders, processes, outcomes, product offer and demand, etc.) of the pilots to support and evaluate the implementation of the plans, so as to ensure the achievement of the circular transition at the city scale.

In synthesis, the steps of the clustering roadmap could be described as follows:

1. lay the basis for the transition to the circular economy by analyzing the setting for the pilots, that is, what are the material flows, the main stakeholders, the interested social and economic parties, etc.

2. select the priority flows and the related relevant actors

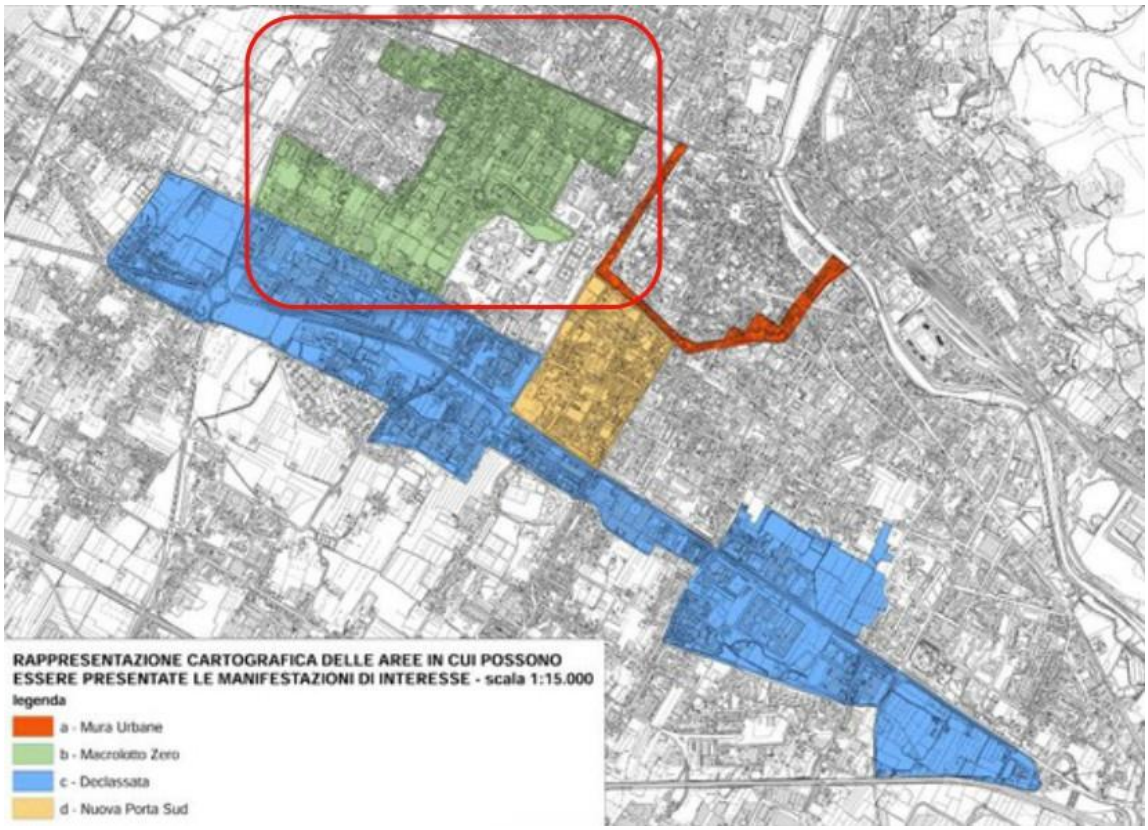
3. define the core and scope of the pilot, by identifying the most promising activities to deliver new circular products

4. define the pilot project and get it evaluated (by the CE expert, by the MoP)

5. execute the pilot project with the cluster of actors

6. use monitoring indicators to verify progress towards the objectives of the pilot.

The following maps represent the Macrolotto Zero, a major target area of the city's policies to recover resources for new uses. This originally urban industrial area is now one with the greatest concentration of immigrants, active and extinguished textile mills, and CCIs, that have become the focus of several revitalization and recycling initiatives of the municipality. This area has accordingly been chosen as the main focus area for the INNOMED-UP pilots in the city of Prato.



Detail maps of the Macrolotto Zero area (red rectangle) in the context of the Prato City

1.3 PALERMO

1.3.1 Summary

CRESM team had conducted a survey targeting 26 SMEs, mainly in the city of Palermo. The research team used questionnaires provided by NTUA to mapping of existing connections and networks in the CCI sector and the mapping of CCI production chains and their possible combination with Circular Economy models.

In the city of Palermo, most of the artisan realities are today made up of a new generation of small artist-craftsmen concentrated mainly in the historic center area. There are very few activities characterized by real commercial companies and with a number of employees higher than the simple family management. In Palermo resists a tradition of metalworking, very often transmitted between family generations. Most of these new artisans are organized in the legal form of non-profit associations, they pay a lot of attention to environmental sustainability, to the reuse of waste materials of all kinds, but they cannot be considered fully organized and participating in the cycle of the Circular Economy.

The main focus in INNOMED-UP Palermo/Sicily will be the Crafts of: Textile, Woodcraft, Papercraft, Pottery and Ceramics, Glass, Stones and others, Building sector, Vegetal Fibers.

Smart tools placement will be mainly concentrated in the Centre of Palermo, where the most part of enterprises are located and where the interaction with the waste collection service could be optimal

The roadmap aims to create collaboration between CCI SMEs by creation of “clusters” of SMEs that collaborate with each other to launch new distinctive products or to raise the quality of existing ones.

The objective is to see both vertical and horizontal cooperation between SMEs through “clusters”, and the main stakeholders will be the associations of enterprises (Regional), Environmental Associations and Garbage service operators. Stakeholders’ main role will be collaboration in awareness campaigns on recycling and circular economy.

The expected outcomes are a new set of innovative, creative, cultural and eco-friendly or “zero impact” products by the involved SMEs. Setting and piloting smooth wastes supply chains and conducting visibility and awareness campaigns for CCIs and CE issues is also of major expected outcomes.

1.3.2 A. Analysis of components and layers based on the Survey

CRESM conducted a survey targeting 26 SMEs, mainly in the city of Palermo. The research offers a cross-section of very different and disconnected realities and networks, sometimes unknown to each other even at a short distance, as in the historic center of Palermo, but in the future with the right training and an activity of information and promotion can represent an important possibility for the Sicilian economy.

Main results of interviewing 26 SMEs in Palermo were the followings:

About Palermo and Sicily

The industrial sector of Sicilian SMEs has almost disappeared, heavy industries such as FIAT or Keller in the metropolitan city of Palermo have closed for some time and, with them, a large number of connected SMEs have also closed. Due to the COVID-19 pandemic, another 8,000 jobs in the craft sector have also been lost in the past twelve months.

In the city of Palermo, most of the artisan realities are today made up of a new generation of small artist-craftsmen concentrated mainly in the historic center area. There are very few activities characterized by real commercial companies and with a number of employees higher than the simple family management. In Palermo resists a tradition of metalworking, very often transmitted between family generations. Most of these new artisans are organized in the legal form of non-profit associations, they pay a lot of attention to environmental sustainability, to the reuse of waste materials of all kinds, but they cannot be considered fully organized and participating in the cycle of the Circular Economy.

The themes of CE are often confused with the simple choice of environmentally friendly materials and are not associated with the actual production system. There are many original and commendable craftsmen aiming for economic self-sufficiency, but with little effective network capacity and little prospect of market expansion.

These small associations rely too much on tourism in the historic center, and obviously have suffered more than others from the COVID-19 pandemic and the absence of tourists.

Most of the managers of the associations of artisans are men, with an average age of 35-45 years with other training (degree). Women are few even if they too have a high level of education. For both men and women the most popular degree is the one in Architecture and Design.

However, the majority of interviewees, especially the companies with the greatest economic impact, learned their skills from their parent and with an apprenticeship in the company.

Well-rooted attempts to set up networks of associations, if on the one hand they have given legal cover to small and widespread artisan shops, promoting their birth, on the other hand they have had the limit of preventing their real development above a specific roof. For this reason there is a frequent change between closed artisan shops and new openings.

In addition to the companies / associations based in the metropolitan city of Palermo, it was decided to also consider those entities which, despite having their registered office in other areas of Sicily, also regularly operate in the territory of Palermo.

Companies with an interesting economic dimension, with a good number of workers and with a true entrepreneurial vocation, are mainly family-run and have existed for several generations as Syfar Srl, Cooperativa Guglielmino, Inox2000 Srl, Cooperativa Valle dell'Oreto. Eastern Sicily, and in particular the province of Catania, seems to be more suited to enterprise within the themes of CE.

Another interesting fact to mention is the good percentage of companies that experiment with new materials or carry out research to recover ancient eco-sustainable materials to be reintroduced on the market.

A problem common to all is the lack of an effective support network, dialogue with and between entities is difficult and there is a lot of distrust in the sharing of information and processes, in words everyone wants to network, but in reality everyone plays for itself and, with some exceptions, did not indicate networks of territorial SMEs belonging to their area.

Most of the interviewees do not declare that they depend on third parties (SMEs or other): the production process, of any type, is almost always included entirely within the same company or workshop. Waste treatment takes place according to local regulations, hardly anyone reuse their waste. Those who try forms of reuse do so on very small quantities and never as a codified production process.

All associations and companies are interested in studying the issues of the CE, but there is a problem of lack of clarity. Furthermore, the lack of clarity on the regulations, the distrust of the institutions and the inefficiency of the public bureaucracy make the general picture even more difficult.

For example, the innovative start-up Rinnova Srl, which is experimenting with new techniques and new products made with the Posidonia Oceanica aquatic plant, has been waiting for the authorization of the Sicilian Region for over 15 months to take the beached plant, currently legally classified as waste to be disposed of in landfill.

Common to all associations and companies is the strong need for new and clear regulations along with public economic aid, especially in the current context caused by the COVID-19 pandemic.

The surface of the spaces varies according to the type of activity and the type of materials used. There are small artisan shops ranging from 40 to 60 sqm, up to companies with industrial warehouses and agricultural lands of several hectares. The benefit of networking is almost absent in the respondents. The associations are part of some networks, the commercial enterprises are registered with the chamber of commerce, but there is no work or choral support, this culture is lacking and consequently any benefits are also lacking.

Most companies undertake the following production stages: product conception, material procurement, product realization. Farms related to agriculture use warehouses for product stocks and rely on specific orders. Metal companies produce to order, while small artisans, who need little space, freely produce their creative objects and offer them for sale.

Most of the collaborations with other SMEs are related to the supply of materials, there is no real collaboration. Smaller entities often collect materials independently, while other companies produce what is needed by themselves and close the entire production cycle within the same company.

The type of raw materials used is obviously different with respect to the type of company. The small artisans mainly use clay, wood, plant materials. Mechanical companies use iron, steel, brass. The bio-architecture companies use earth and hard minerals (granite, lava stone).

Generally there is no difficulty in finding the materials. The only exceptions are the company that has linked its activity to the reuse of the Posidonia Oceanica aquatic plant, whose withdrawal currently depends on special authorizations; the other exception is the company that processes cork, a material in itself very rare in Sicily and bound by special regulations.

SWOT Analysis

Political • Local PA are the nodes of transition, many of the laws already in place are enough to catalyze a radical economic change. • The economic impact is not only necessary but urgent to shift economies toward more social justice and employment. • In the current shifting situation there are risks of allowing illegal and unsustainable practices to benefit from greenwashing, and sneak in funding opportunities.	Economic • Currently society is paying the price of dysfunctional management of resources, it's quite immediate to generate economic benefits from transition to CE both on public administration level and for the private companies. • Most examples show positive outcomes that encourage in scaling up the process however the capital for it is mostly lacking. • Guidance is mandatory for implementing solutions, expertise is needed on the Sicilian territory to inform and guide investments
Social • The social presence of craftsmen in the historical center and the interest of the younger generation in contributing to the transition are favorable forces that can accelerate Sicilian CE. The social fabric is able to absorb many SMEs and Green jobs. • The narrative should always pair sustainable development and social justice, often these two concepts are perceived in opposition, given the repressive nature of certain laws and campaigns. However the poorest layers of population are the ones that could improve easily through a social involvement in the CE.	Technological • Infrastructures are lacking in the green sector, however few exceptions exist in Sicily. • Low-tech solutions are equally effective and often immediately implementable drawing from traditional techniques (construction) and natural processes (composting, bio-digestion). • Technology should be implemented in the monitoring sector as well, open data and transparency from PA are mandatory steps in citizen awareness.

1.3.3 B. Roadmap strategy development

Palermo Vision is "Circular Economy equals Social Engagement" by a deeper involvement of local society (starting from the most disadvantaged layers) together with PA and local SME to enhance reuse and stop the filling of landfills and export of garbage. Acknowledging the leading role of CCI SME, Social sector and Universities in rethinking objects and business and consumption models.

To achieve this goal, we need to:

- Support PA, Enterprises Associations and Environmental Associations to widen the involvement and sensitization of SMEs and local population towards Circular Economy Principles

- Support Clustering and technical assistance of SMEs in Innovation, Research, Recycling, Marketing, Design through the creation of specific “Innovation Hub”

- Establish cross-border cooperation schemes in innovation, external knowledge inclusion and clustering with EUMC cities.

There is still little awareness of what Circular Economy is and still little use of digital technologies, both in the design phase and in the production phase. Small artisans very rarely use digital machines, while those few who use them come from a type of education that in itself approaches topics such as 3D modeling and the use of numerical control machines. The largest companies, but also the most environmentally sustainable ones, seem to have a greater awareness of the help that can be received from new technologies. The common problem is the legislation for waste disposal, the costs are very high but the services are inefficient. The current situation is an incentive to dispose of waste illegally, this is unfortunately a very frequent practice for both businesses and ordinary citizens. Almost everyone is interested in learning more about the topic, but often only for economic onvenience, both as a economic saving for waste disposal and as the possibility to reiceve monetary incentives. At the same time, there is great distrust of public institutions and about the alleged innovations proposed. In properly commercial enterprises there is the fear of having new laws imposed on the production cycle that aggravate costs. A possible solution could be to accompany the innovations imposed by governments with the help of "chaperones" who support companies in a renewal without initial costs or that at least these costs lead to actual economic as well as environmental benefits.

1.3.4 C. Implementation of Roadmaps

From SWOT & PEST analysis and Strategy Design conducted in WP4, we noticed that we need a double approach towards PA and SMEs:

Towards PA:

Information and formation for PA is urgent given the changing legal framework and the lack of expertise within PA, unions and cooperatives offer their know-how to support this process. Starting from employers' organizations there needs to be a strategy that rewards citizens and good practices. Monitoring and rewards are enough to change habits and implement laws. Formation is crucial since the awareness is already there but there are little opportunities for implementation. In Sicily there are very little experiences of industrial transition to CE and most of the garbage is being processed elsewhere, PA only collect but do not process waste, losing all the potential income. PA are wasting a lot of resources on inefficient practices that’s why they need to be guided by entrepreneurial projects leaning toward CE. The Green New Deal approved in Europe already implies a development of PA approach.

Towards SMEs:

In the meanwhile the strategy of involvement of SMEs in future clusters will follow the following the example of partner BZU (Palestine):

Group of SMEs:

- Diversity
- Within supply chain radius
- Ready for trying new models

SMEs owners:

- Commitment
- Young generations
- Enthusiastic for green values
- Experienced

SMEs Products:

- High quality
- Potential for expansion in local market
- Already engaged in recycling / upcycling activities or have potential to do so
- Doesn't affect the environment
- CCI value and aspects

SMEs as a business:

- Location and Spatial conditions
- Potential for innovative products
- Have social impact

The previous selection will also decide about the placement and specific use/application of clustering smart tools (e.g. bins, bicycle etc.) and their interaction with CCIs SMEs activities (locations of the participants, the locations of the Smart tools and the networks / connections that will be evolved, raw materials that will be exploited):

Supporting the relation and collaboration between PA and CCIs SMEs, Inclusion, Innovation and Environment is one of our strategic objectives, and to guarantee smart sustainable businesses and to

adopt the Internet of Things techniques, a new technology of smart tools (e.g. bins, bicycle) will be present to serve the SMEs needs of waste and to promote a smooth supply chain of need materials for the new presented innovative products.

The participating stakeholders and their role towards the SMEs access to innovation and new business models and the social inclusion:

Main stakeholders will be Local Authorities (PA, Public Agencies), Trade Unions and Enterprises Associations, but also Universities/Academies and Media agencies.

Their role can be concluded as follows:

1- Collaborate in awareness campaigns on recycling and circular economy.

2- Expand and develop communication internally and externally by initiating new business linkages and connection networks between SMEs, decision makers and green CCIs fans and supporters. .

3- Applying the roadmaps.

4- Promote pilot clusters through their connection networks and digital channels for better visibility and accessibility.

5- To cooperate with the Info-Point at NOZ (Nuove Officine alla Zisa- New Workshops at Zisa) to support CCis SMEs and creating an umbrella for CE players.

The expected outcomes (innovative products, collaborations, networks):

1- Social inclusion and wider connections and networks.

2- Innovative, creative, cultural and eco-friendly products that have been appropriately priced, packaged and delivered

3- Fair access to Technology and Smart Tools.

4- Cooperation schemes between SMEs in both vertical and horizontal levels.

5- Regional and international marketing opportunities.

6- Capacity enhancement of SMEs owners in Innovation, Marketing, Product Design, Eco- Design and Green entrepreneurship.

7- Business mentoring and e-tools

1.4 TUNIS

1.4.1 Summary

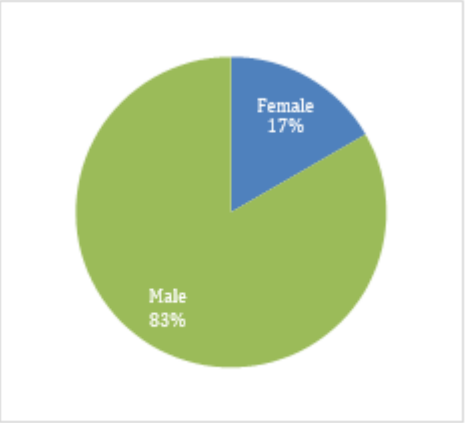
The 13 hundred years Medina, was chosen by the Municipality of Tunis to be the geographic focus of INNOMED-Up project. Medina's souks, have been the trade center for arts and crafts, ever since its foundation around the 8th century. Shared economy and cluster economy, have always been an integral part of Medina's business model. Mediterranean migrations settled in the Medina at different eras, moving in the Medina with their craft skills, to convert it into a souk, with interdependent micro-business, each with a specific skill, at small workshops in Medina's hidden alleys; contributing to product production, until the final product is sold on the main souk shops.

Today INNOMED-Up brings, new much needed dynamics, to this well-established clustering tradition. Medina's circular economy clustering roadmap, brings Medina's souks, new opportunities, that invests in existing unused available resources, into new clustering opportunities, that could preserve local manual intelligence, reduces generated waste, brigs in a new socio-economic dynamic and hence a more resilient Medina.

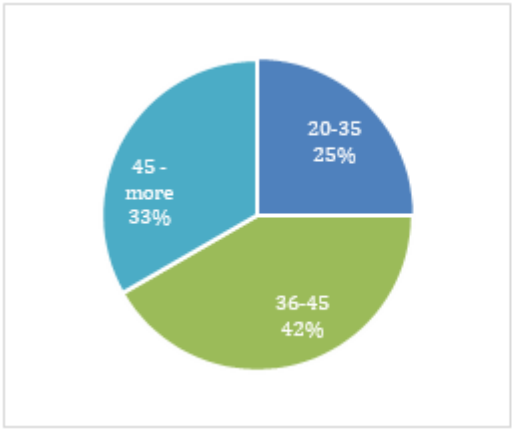
An important amount of data, related to circular economy opportunities, from hundreds of artisan workshops in Medina, was gathered, analyzed and shared with start-ups and SMEs to design Tunis's first circular economy cluster roadmap. The roadmap, includes three opportunities; a new paper waste management process, composting for cafes and guesthouses in the Medina, and finally the design of a new business model for municipal owned abandoned buildings.

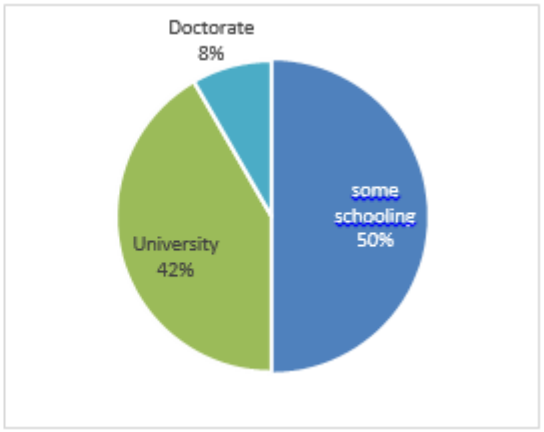
1.4.2 A. Analysis of components and layers based on the Survey

Following the INNOMED-Up survey, we have found that Medina SMEs are 83% led by men and 17% led by women. Despite the fact that women businesses seem low, this is considered progress, taking into account that traditionally Medina's souks and urban spaces, are traditionally male dominated, but depends tremendously on women labour, which is often homebased and informal. Souks such as Chachia Souk, or the red boiled men's headwear, nevertheless the important women's manual labour involved in the production of Chachia, is never seen on trading groups. This trend is changing slowly, with women led businesses occupying some workshops in the Medina today, and found thanks to INNOMED-Up.

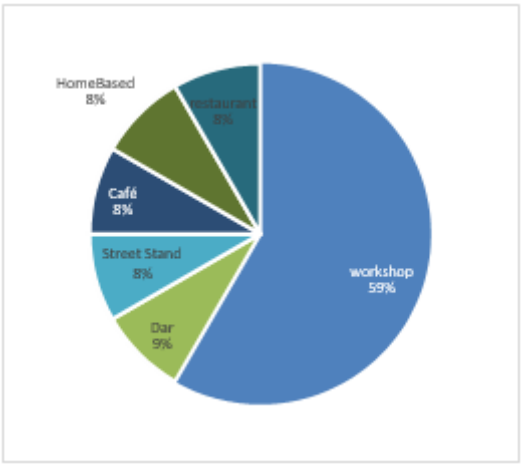


The age groups of artisans, business owners and traders in the Medina, seem show that the economic dynamic impacts all age groups, with 25% age 20 to 35 and 42% age 36-45 and 33% are over 45 years of age. As with education level, 50% have attended school and 42% have a university degree.



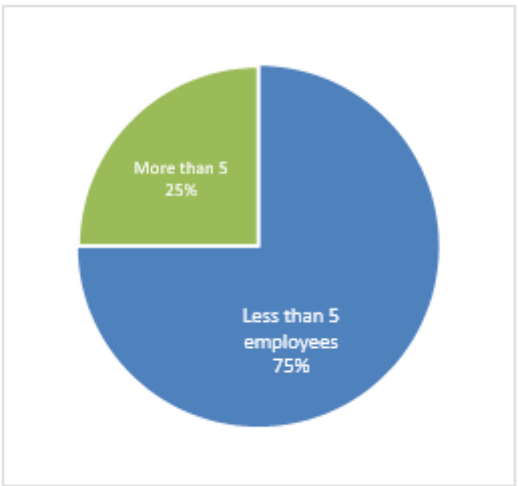


As with regards to existing business, within central medina, Municipality of Tunis survey found that 59% of existing businesses are artisan production workshops, 8% are restaurant, 8% are cafes, 8% are street stands, 8% are homebased businesses, and finally 9% are Dar's which includes all sort of traditional home repurposing projects, such as guesthouses, cultural centres or NGO working spaces.



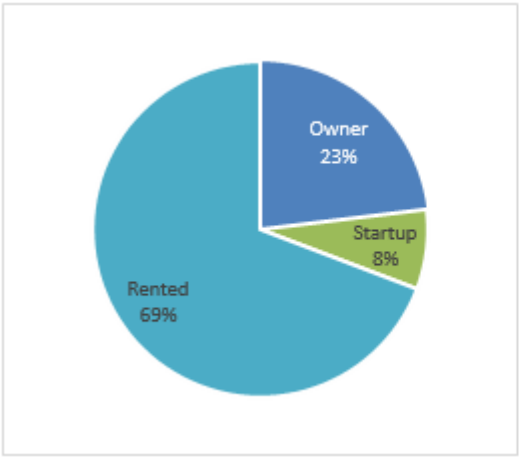
Out of all surveyed Medina based businesses, only 25% have more than 5 employees, and 75% have 5 or less employees, which is probably the reality of Medina based businesses since it's foundation, which further supports the need for clustering to create shared economy, as a business model for better financial sustainability and growth.

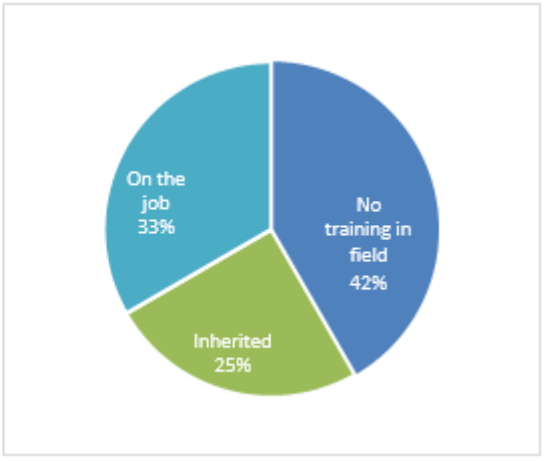
The interviewed artisans during INNOMED-Up survey, showed that 33% gained craft knowhow on the job, 25% had the craft knowledge passed down from generation to generation, and 42% had no training in the field of practice.

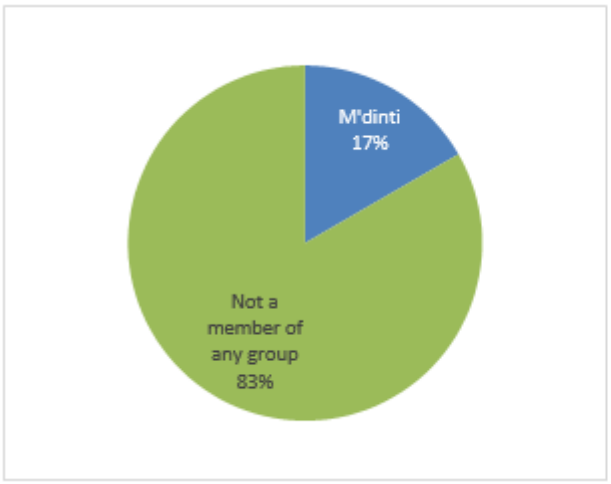


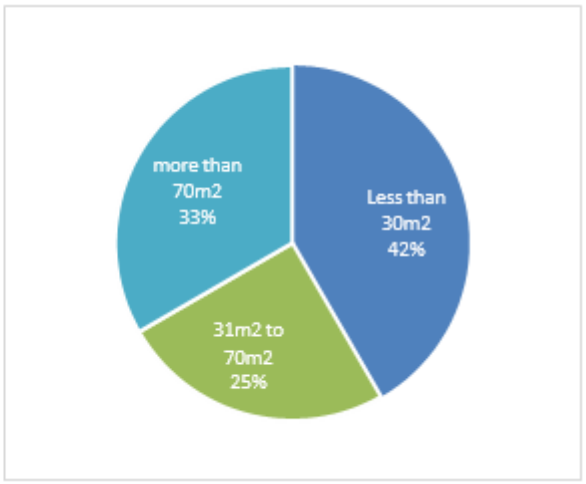
As with regards to location or working space ownerships, only 23% of interviewed business own their place of work, 8% are start-ups with no permanent address, and the majority or 69% rent their working space. As with actual space size, the majority of 42% have less than 30m2 and 25% have a working space of between 31m2 to 70m2 and only 33% work in a space that is more than 70m^2.

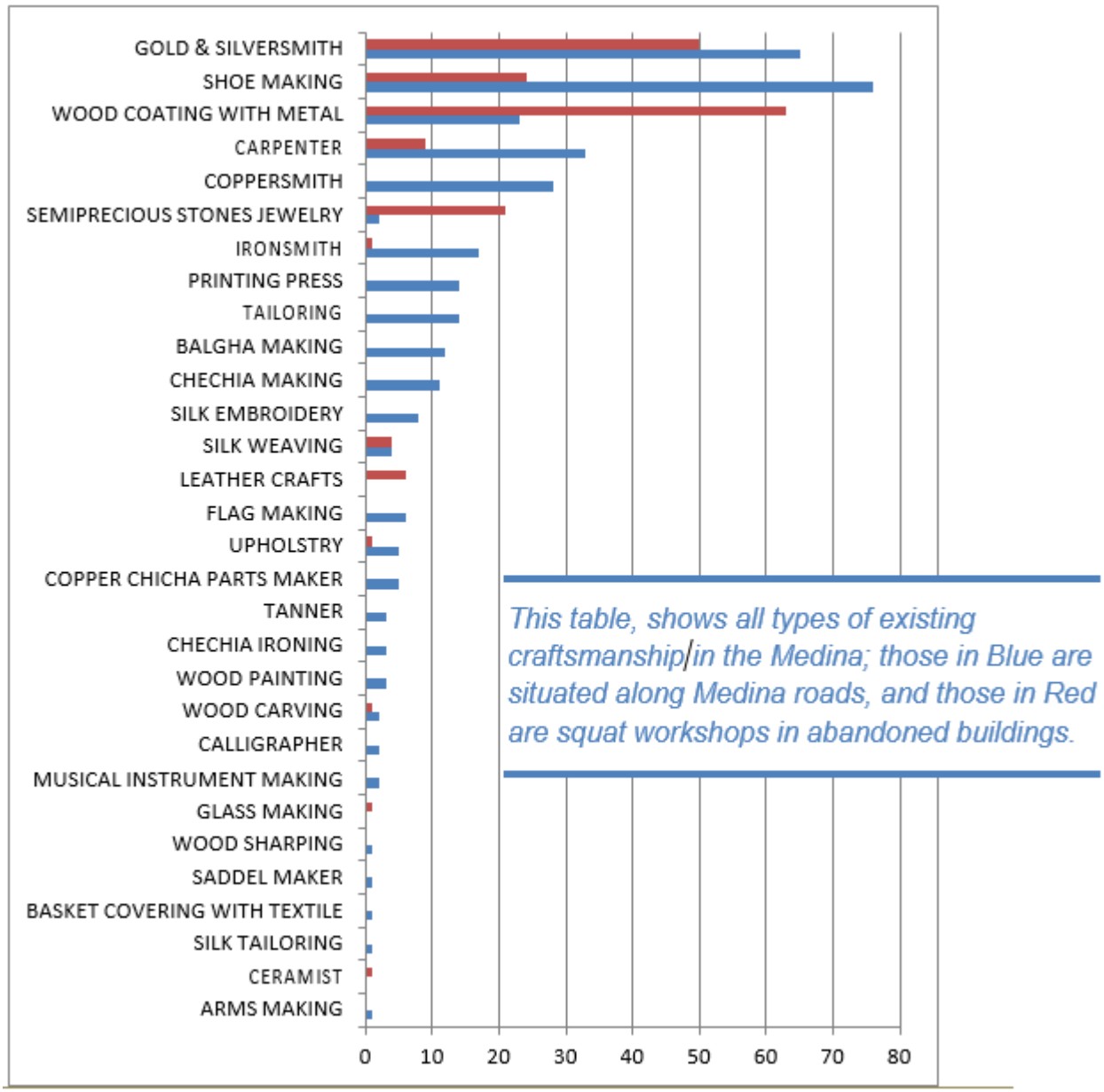
Despite the fact that the Medina's souks were organized in artisan cooperatives, that managed most of Souk's governance aspects, today the corporate system have unfortunately disappeared, due to many factors, leaving 83% of business owners in the Medina today with no affiliations. Lately an economic group, called M'dinti, uniting multi- sectorial businesses, has become more appealing to Medina's business owners, as an economic lobby to defend their businesses, but also to sustain and grow the economic dynamics of the Medina.


Owner
23%
Startup
8%
Rented
69%


On the
job
33%
No
training in
field
42%
Inherited
25%


M'dinti
17%
Not a
member of
any group
83%


more than
70m2
33%
Less than
30m2
42%
31m2 to
70m2
25%


GOLD & SILVERSMITH
SHOE MAKING
WOOD COATING WITH METAL
CARPENTER
COPPERSMITH
SEMIPRECIOUS STONES JEWELRY
IRONSMITH
PRINTING PRESS
TAILORING
BALGHA MAKING
CHECHIA MAKING
SILK EMBROIDERY
SILK WEAVING
LEATHER CRAFTS
FLAG MAKING
UPHOLSTRY
COPPER CHICHA PARTS MAKER
TANNER
CHECHIA IRONING
WOOD PAINTING
WOOD CARVING
CALLIGRAPHER
MUSICAL INSTRUMENT MAKING
GLASS MAKING
WOOD SHARPING
SADDEL MAKER
BASKET COVERING WITH TEXTILE
SILK TAILORING
CERAMIST
ARMS MAKING
0
10
20
30
40
50
60
70
80
This table, shows all types of existing craftsmanship in the Medina; those in Blue are situated along Medina roads, and those in Red are squat workshops in abandoned buildings.

1.4.3 B. Roadmap strategy development

Various scenarios emerged from the INNOMED-Up survey, related to potential Pilot Cluster opportunities in the Medina of Tunis, which would need careful implementation design, taking into account the challenges outlined by SMEs with experience in circular economy or upcycling, which were similar to challenges faced by start-ups with ecologically sensitive ventures.

Challenges faced by young investors in the fields of circular economy could be summarized in 3 main points:

1. **Promoting** an **upcycled product**, required much more marketing effort than market promoting a normally produced product. The circular economy investor, no matter how small or big, is obliged to promote the whole concept of circular economy, to create local market demand, which is often time consuming and hence costly.

2. Often upcycled products, require important volumes, to ensure **financial sustainability** of entrepreneurship ventures in circular economy. This often requires longer time commitment of the entrepreneur, to reach breakeven or even profit making. Due to this challenge, often entrepreneur in upcycling convert their ventures into NGO, to adapt business model for a more financially resilient venture.

3. Finally **local legislation**, especially collaborations with local governments, require important administrative process, which demands time, effort and paper work; and since local governments are the most important potential clientele for circular economy entrepreneurs, their ventures remain unscalable faced with very demanding processes to collaborate with localities.

Nevertheless, INNOMED-Up has helped, brought those challenges on a table uniting the municipality of Tunis with young start-ups, active in circular economy and pilot cluster scenarios, in the Medina of Tunis will include some of the solutions.

For the development of roadmap strategy, important considerations were made, to ensure that identified circular economy opportunity areas. Those considerations include using ‘Ecole de la Proprete’ as base for logistical assistance to SME cluster members, and review of alternative administrative processes, to improve links between municipality and start-ups and civil society, in a way that helps leverage potential environmental outcomes.

Cluster road mapping, will also depend on Medina’s artisan workshop generated waste types and volumes; which will be carefully analyzed, during the pilot cluster phase, using smart tools. Gathered volume and type of waste data, will help estimate financial outcomes of entrepreneurship ventures’

that use them, and this will help have a much better view of the economic feasibility, and what volumes are needed for a more financially resilient business model.

Municipality of Tunis abandoned buildings, which were mapped at the onset of INNOMED-Up, are now being evaluated as potential contributors to project roadmap; either as spaces for urban gardening or composting, or through legislative adaptation to improve building repurposing and hence contribution to Medina's socio-economic dynamic.

Finally, the union of informal plastic collectors, has been invited to become part of the INNOMED-Up roadmap, to improve working conditions of collectors through better understanding and collaboration with the Municipality of Tunis, but also to include new opportunities in other material collection (such as paper) and research new supply chains, that empowers new vulnerable communities.

1.4.4 C. Implementation of Roadmaps

Today Borj Chakir, Tunis's public dump, welcomes over 750tons of waste per day, Borj Chakir has reached its full capacity, and its closure is planed early next year. In the meantime, the municipality of Tunis, and all municipalities in Tunisia, need to urgently rethink their waste management, which cannot continue to be, taking waste from point A to point B. There have been previous attempts in waste sorting, in other urban quarters of Tunis, but sorted waste, ended up meeting again at the public dump, due to nonexistence of recycling, upcycling supply chains or circular economy clusters.

Nevertheless, INNOMED-Up presents an excellent opportunity to test small scale circular economy operations, to find solutions that are up-scalable, financially sustainable and match Medina's reality as well as community expectations. Also, Medina's creative cultural industry richness, allow for various and diverse roadmaps. Some complex and some have great potential to leverage.

One success factor, that the Municipality of Tunis, perceives as essential for the success and the implementation of the pilot cluster, especially taking into account Medina's dense residential area, is community involvement. Medina's community is an integral part of roadmap success, and hence INNOMED-Up awareness campaigns, will need to go hand in hand with pilot cluster implementation.

Two abandoned historical buildings, were chosen as case studies, for historical building repurposing. Those are Fondok el Henna and 36 Rue des Andalous. Fondok el Henna is a historical building, is urgent need for restoration, but has a very important artisan dynamics, with shoe makers, silver weavers and coppersmith, using Fondok's small rooms as their production workshops. The building is non existing for the national archives and ASM Tunis; and is a very interesting case, where artisans claim they are the owners, through an informal multi-ownership status, that lasted for over 3 centuries. As with the 2nd

building case, 36 Rue des Andalous, it is a municipal property, of important size; part of which has fallen down, and blocked neighbors' entrance. The neighborhood has taken the municipality to court, and the municipality has taken a squatter to court, and the squatter is not taking the municipality to court. The case is being investigated, and a case study will be published with very important findings, that reflect the complexity of century old real-estate challenges.

Those case studies, will have a tremendous importance, in terms of designing a methodology for the design of historical building repurposing strategy, and investigating the various public real-estate, legislatives, and drafting proposals to facilitate reuse for community purpose or other.

The Hafsia quarter in the Medina of Tunis, which was El Hara, or the Jewish quarter; is now the most important flea market in Tunis. Hafsia market is well known for its diversity of clothing, shoes and house supplies, from table cloth to old lamps. The souk generates important unsold clothing waste which could become a source of economic income, for women homebased weavers, but weaving with old cloths, to produce the Tunisian traditional 'Zarbia shoualek' a mat made of rags. Rest to be evaluate, the amount of clothing waste generated, and would it be sufficient to create a financially sustainable business model.

Two other potential roadmaps are composting of coffee shop bio-waste and upcycling of municipal paper waste. Roadmaps for those two circular economy opportunities, is currently under investigation and smart tools will be used for those 2 clusters, and that also to be defined before end of summer.

With regards to SMEs selection criteria, we will evaluate presented cluster ideas into 3 areas. The first will be related to the cluster itself, which takes into account material used, in relationship to Medina's waste, also how the cluster operates as a supply chain model, and finally the use of smart tools within the clustering process. The second criteria will be based on the actual business model, which includes product outcome, market needs, marketability and business potential, as well as the potential financial results, including costs and expenses and estimated market size of first 3year operations. Business modelling also includes, communications and market access plans. The final selection criteria, will be based on the entrepreneurial thinking of cluster leader, and this could be evaluated through their motivation and past experience of cluster leader or cluster team, sensitivity to the environmental and social cause and their willingness to work in cluster, share, learn and document pilot experience.

The use of smart tools will be of great concern during cluster roadmap implementations, since survey outcomes proved that most Medina based business owners, do not have mobile phones, and access the internet only once or twice a day. Nevertheless, the Municipality of Tunis will soon sign an MOU with Ministry of higher education and scientific research, through which collaborations will be designed to create student opportunities, in smart tools design, building and cluster integration. The municipality's 'Ecole de la Proprete' will also provide important space, and tool to allow for smart tools, building, storage to become a technical exchange platform, during and after INNOMED-Up end.

1.5 HEBRON AND NABLUS CITIES

1.5.1 Summary

BZU team had conducted field research targeting 37 SMEs in cities of Nablus and Hebron in addition to relevant stakeholders and key informants like CoC and Municipalities. The research team had also built on previous results of O 3.1, O 3.2 and O 4.1 and used questionnaire provided by NTUA for mapping of existing connections and networks in the CCI sector and the mapping of CCI production chains and their possible combination with Circular Economy models.

Most of SMEs in Nablus and Hebron were located in the city center and the owned by women. The spatial distribution has had a clear impact on creating a gap between SMEs and the surrounding suppliers, clients, supportive organizations and cooperation at the artisans. This led to the conclusion that value chains need to be strengthened and supported in order to create connection networks and promote visibility and accessibility.

Most participating SMEs apply principles of circular economy and recycling at different stages of production, in different levels depending on the nature of work, availability of waste raw materials and technical skills. However, there is a clear gap between value of recycling practices perceived by customers and manufacturers.

Hebron and Nablus Vision is “Creative and cultural industries are reusing existing resources and bringing cultural industries to our daily life’s needs” by Revitalizing creative and cultural industries through innovation and circular economy models and cross-border cooperation.

The main focus in INNOMED-UP Palestine will be the Crafts of: Textile, Woodcraft, Papercraft, Pottery and Ceramics, Glass, Jewellery/accessories, Seashells, Stones and others, in addition to Sculpture and Fashion/Embroidery

Smart tools placement have been proposed based on the geographical location of CCI SMEs and their random distribution at both cities and some of their villages, and aimed to achieve easier access to the smart tools, better interaction and to optimize waste collection routes.

The roadmap aims to create collaboration between CCI SMEs by creation of “clusters” of SMEs that collaborate with each other to launch new distinctive products or to raise the quality of existing ones.

The dream is to see both vertical and horizontal cooperation between SMEs through “clusters”, and the main stakeholders will be national bodies like Chamber of Commerce (CoC), Governorates, Ministry of Tourism and others.

Stakeholders’ main role will be collaboration in awareness campaigns on recycling and circular economy.

The expected outcomes are to propose innovative, creative, cultural and eco-friendly products that have been appropriately priced, packaged and delivered by CCI SMEs. Setting and piloting smooth wastes supply chains and conducting visibility and awareness campaigns for CCIs and CE issues is also of major expected outcomes.

1.5.2 A. Analysis of components and layers based on the Survey

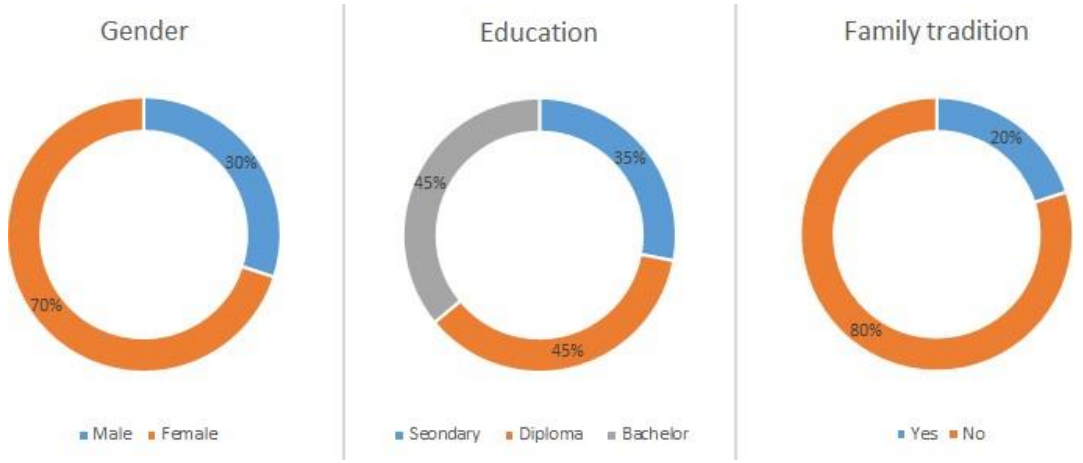
BZU team had conducted field research targeting 37 SMEs in cities of Nablus and Hebron in addition to relevant stakeholders and key informants like CoC and Municipalities. We have also built on previous results of O 3.1, O 3.2 and O 4.1 and used questionnaire provided by NTUA.

Our researchers were able to conduct face-to-face interviews with SMEs owners before lockdowns in order to study the following aspects:

- Location and Networking
- Value Chains
- Circular Economy

Main results of interviewing 20 SMEs in Nablus city were the followings:

Basic classifications of interviewees in terms of Gender, Education level and Business based on family tradition are shown in charts group 1:



Charts group 1: Basic classifications of interviewees in Nablus

Nablus SMEs have been established between 1984-2019, and only 25% of them employs labor force since 80% are private entities and owners mostly depend on self-practice and experience rather than receiving education in their specific sectors.

The main business activities are shown in Chart 2:

Chart 2: Main business activities in Nablus

➢ **<u>Location and Networking- Nablus</u>**

We found that 75% of SMEs are located in the city of Nablus, others are inside surrounding villages with 55% homebased settings and 70% own their properties with 60% plan to relocate in the future due to small working areas varies from 2m² – 130m² and one facility located on 3500 m².

Only 45% expressed positive impact of the current location on the work itself, and they are taking advantage of existing networks as follows:

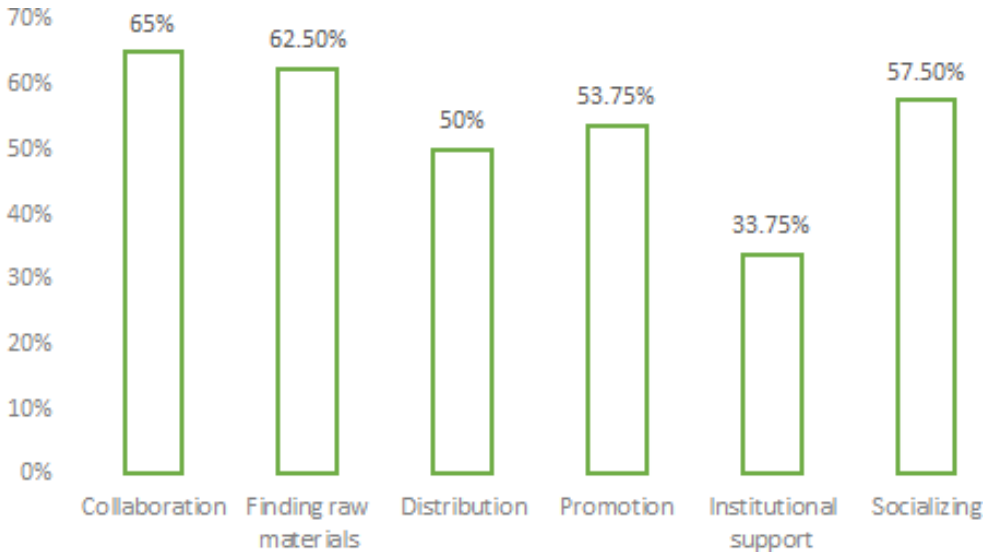


Chart 3: Advantage of existing networks – Nablus SMESs

SMEs showed interest in collaboration and networking due to benefits shown in chart 4:

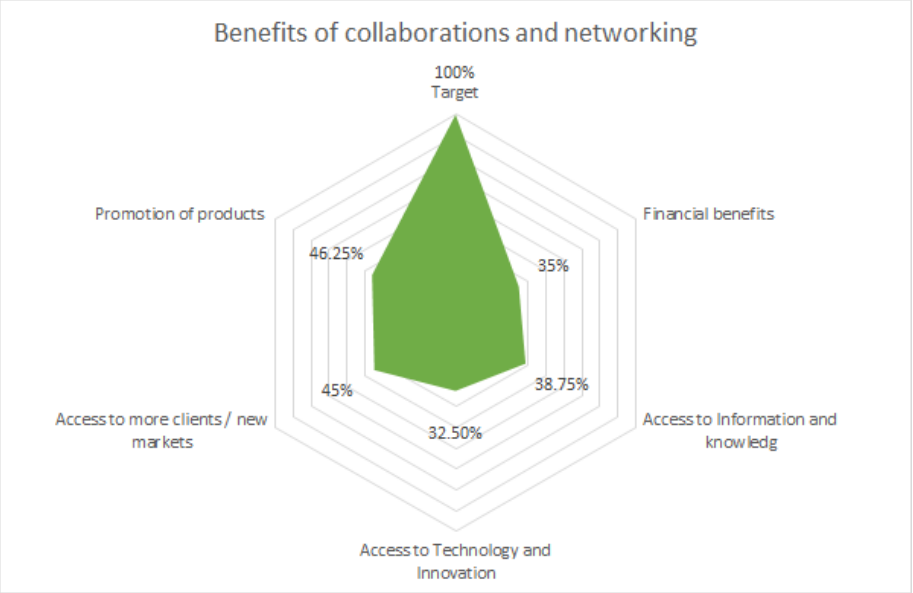


Chart 4: Benefits of collaboration and networking-Nablus

Only 20% of SMEs are members in professional associations like Chamber of Commerce with 70% participation in other institutional initiatives. Half of SMEs are cooperating at the stage of production, but almost one third of them are cooperating in procurement and sales activities. The fact that SMEs are located in nearby place like building, neighborhood or area of city helps in such cooperation when all SMEs are aspire for networking and cooperation in an international level.

- **Value Chains and Circularity-Nablus**

SMEs are mainly relying on hand tools with very limited use of digital and e-equipment. The following chart 5 shows detailed results of SMEs production tools:

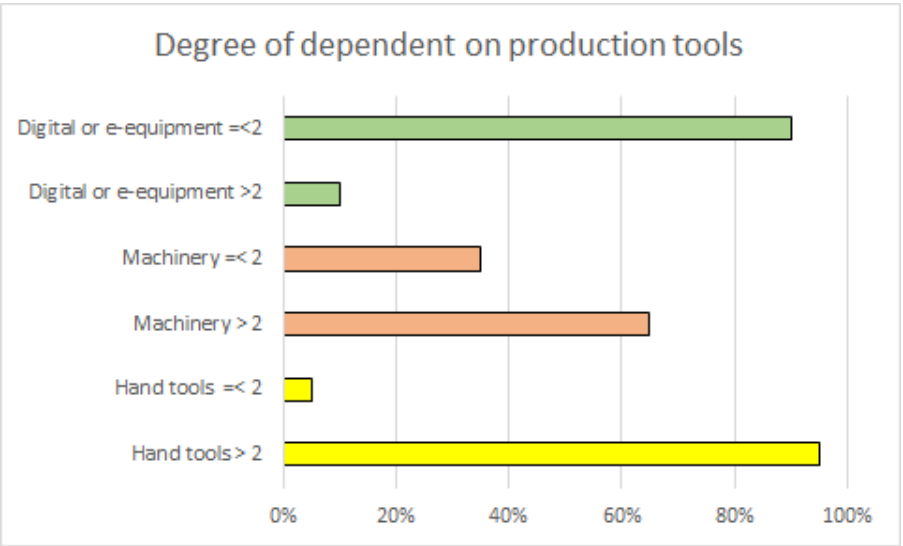


Chart 5: Degree of dependent on production tools- Nablus

Two third of SMEs are relying on technology in different stages when 80% of them are facing difficulties in obtaining raw materials.

Chart 6 shows how SMEs see future possibilities to adopt CE principles and what incentives would be the most effective for doing so:

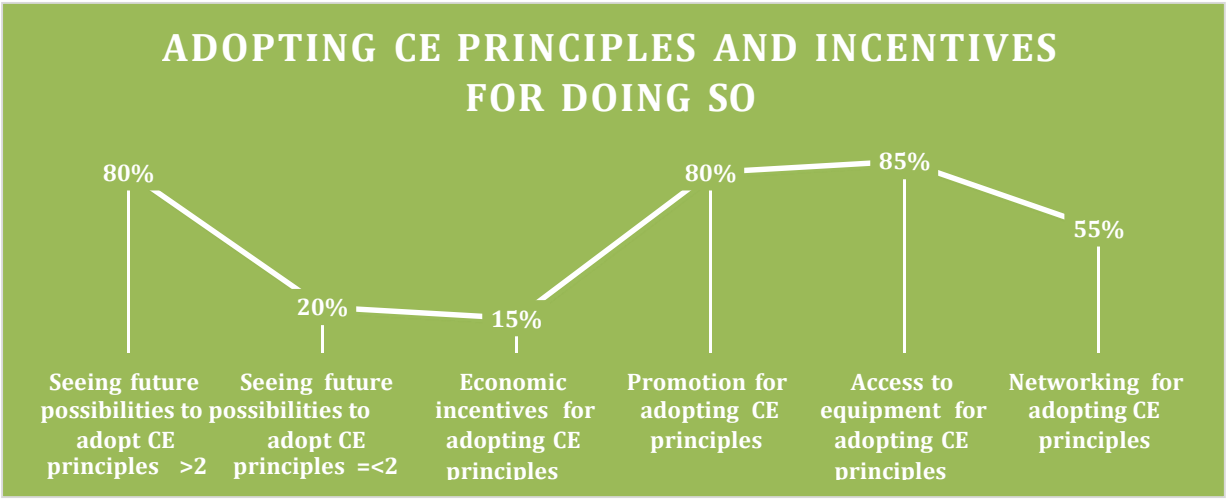


Chart 6: Adopting CE principles and incentives for doing so- Nablus

Lack of institutional support is the major obstacle of adopting CE principles, half of SMEs lack the knowledge needed and two third does not have operational capacities or their customers do not establish interest in CE products.

On the other hand, 75% of SMEs that are adopting CE principle are aware of green value.

Nablus SME's map is illustrated in Chart 7:

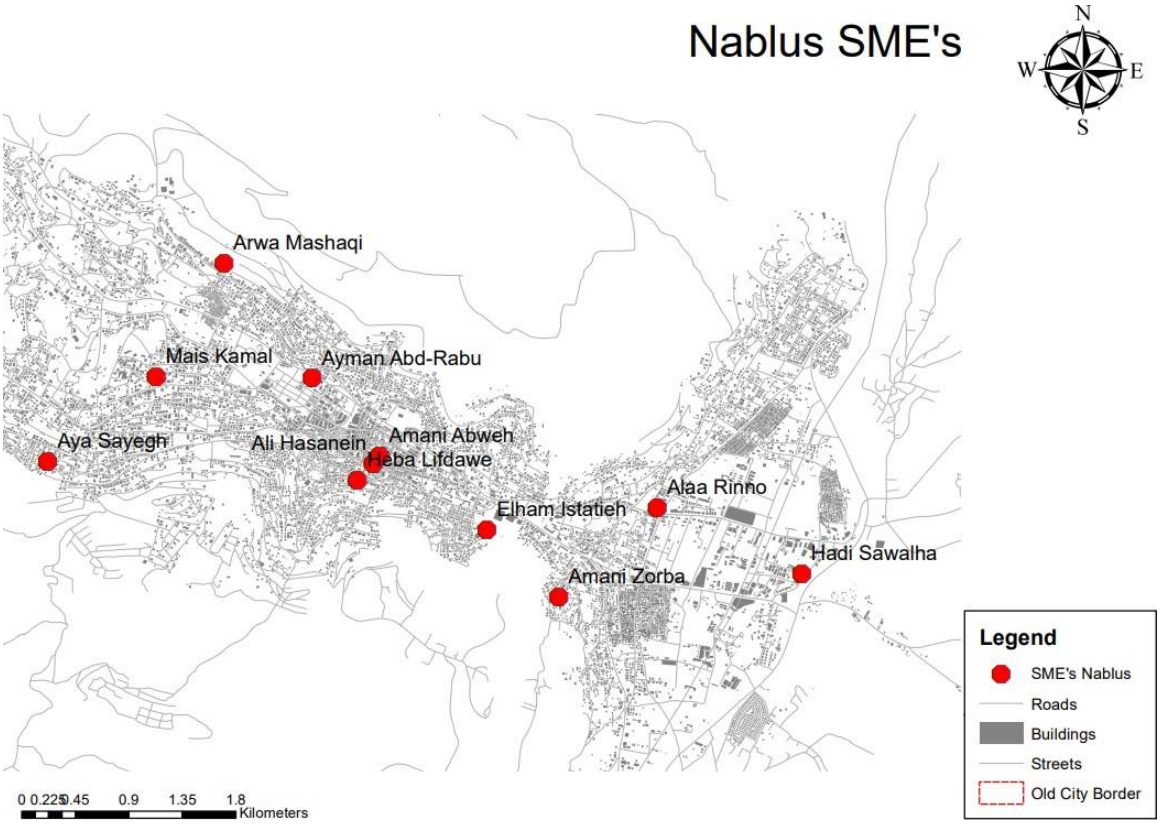
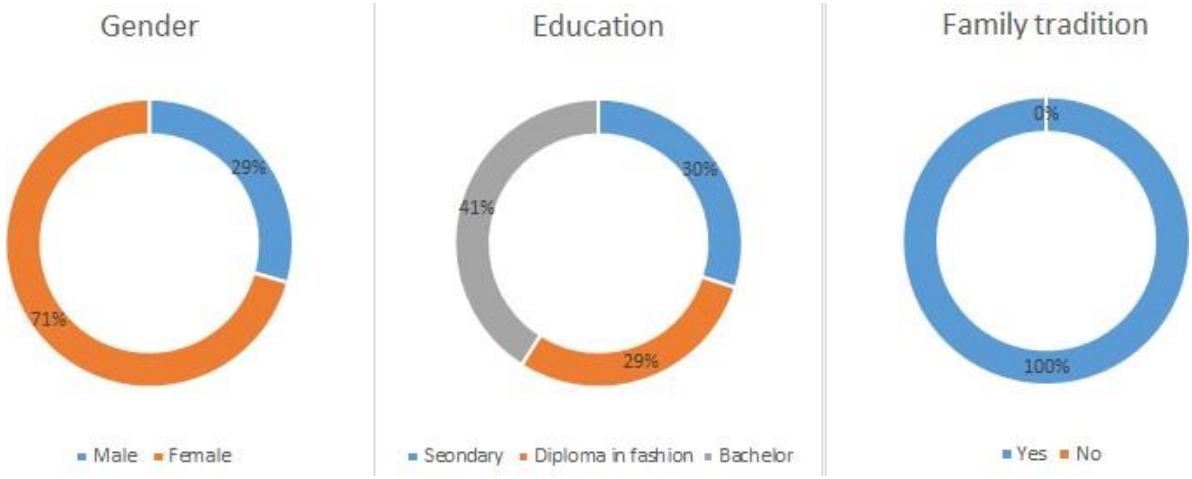


Chart 7: Nablus SME's locations map

Main results of interviewing 17 SMEs in Hebron city were the followings:

Basic classifications of interviewees in terms of Gender, Education level and Business based on family tradition can be shown in charts group 8:



Charts group 8: Basic classifications of interviewees in Hebron

Hebron SMEs have been established between 1997-2020, almost half of them have been established after 2013, and only 5% employ labor force since 95% are private entities and 65% of owners received training in the specific sector and were involved in capacity building programs like: Marketing, Project Management and Design.

More than 75% of SMEs are owned by only one person and their business activities can be demonstrated in chart 9:

Chart 9: Main business activities in Hebron

- **Location and Networking- Hebron**

We found that 28% are located in Old City, which is targeted by development and solidarity projects of different organizations and touristic activities, all others are distributed in radius of 1-3 km from the center, with 52% homebased settings and only 17% have their own showrooms.

About 5% of the artisans indicated that they want to change their location, in order to display their products.

About 47% of craftsman considered location of their work as having a high positive influence and 17.6% considered location has very low influence on their work.

The main advantage of existing networks in the area of SMEs is socializing, other aspects can be shown in chart 10:

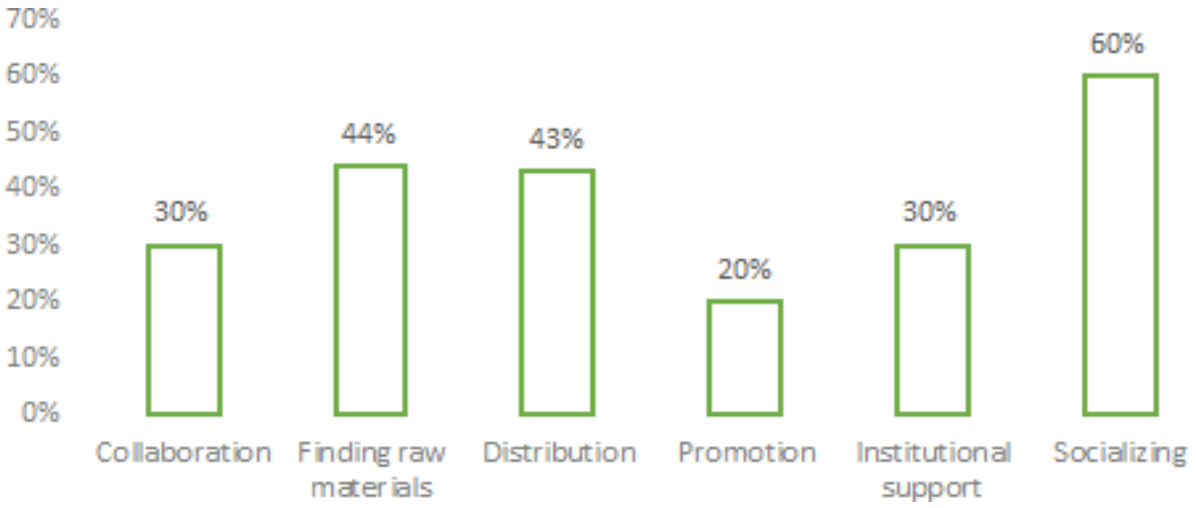


Chart 10: Advantage of existing networks- Hebron SMEs

SMEs showed interest in collaboration and networking due to benefits shown in chart 11, the major benefit is Access to more clients/markets:

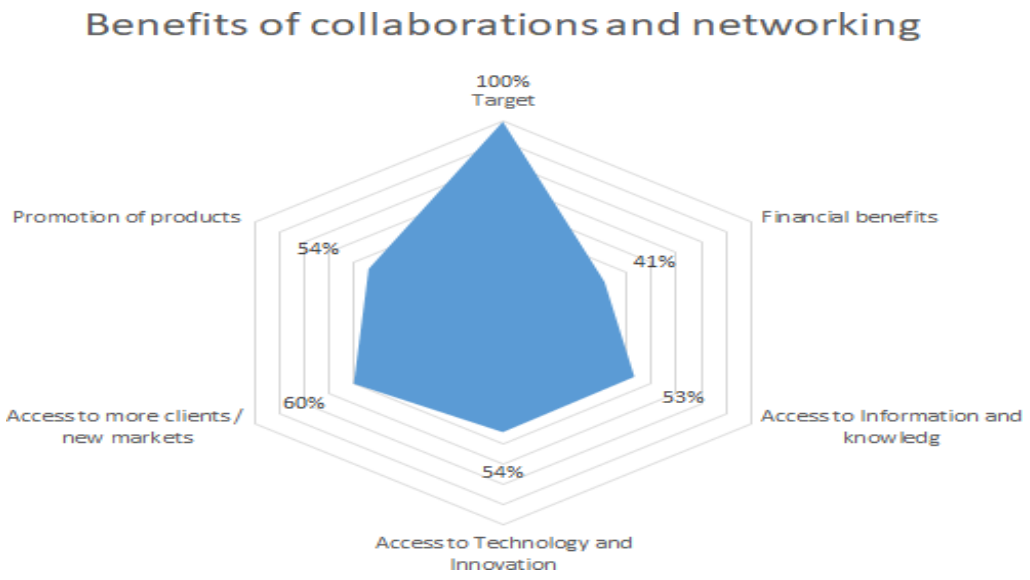


Chart 11: Benefits of collaboration and networking- Hebron

Only 53% of SMEs are members in professional associations like Chamber of Commerce with 88% participation in other institutional initiatives such as The Red Crescent, the Child Protection Association, the Health Work Committees, the Child Save Society/Childhood Dreams Foundation, Polytechnic University, Business Development Incubators, the Palestinian National Foundation for Economic Empowerment, Ministry of Social Development, Leader Foundation and Alqattan organization.

About 89% of SMEs are cooperating with other SMEs, and only 11% are doing so, especially in sales and marketing and at the stage of production.

All craftsmen want to build networking connections abroad in order to market the products and Learn about similar experiences who work in the same field.

- **Value Chains and Circularity-Hebron**

SMEs are basically using hand tools in production as detailed in chart 12:

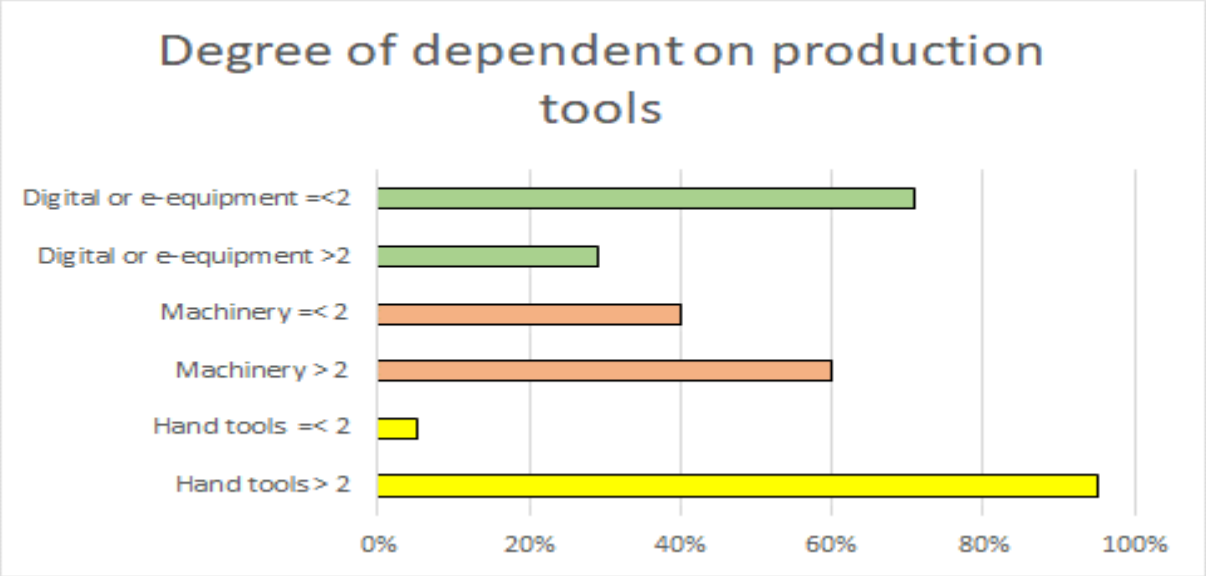


Chart 12: Degree of dependent on production tools-Hebron

The role of technology & digitalization in the production stages is in content creation, production an dissemination as in chart 13:

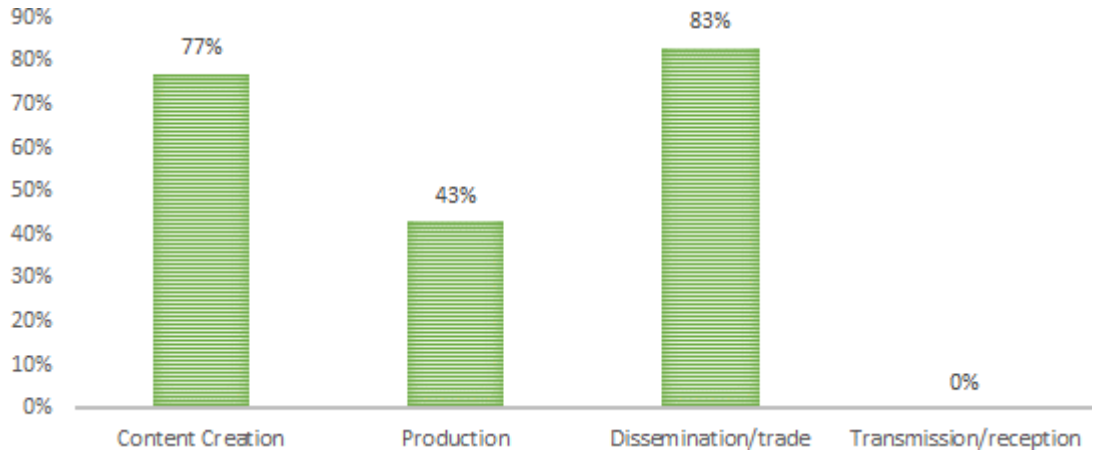


Chart 13: the role of technology and digitalization-Hebron

About 47% of craftsmen have difficulty in finding some important raw materials for their business, such as sponges, adhesive, Seashells and some types colors.

About 88% see incentives that can help their enterprises to adopt CE principles as Economic, Promotional, Access to innovative equipment and Networking with similar SMEs which have already gone towards CE.

The main obstacles for enterprises in the process of adopting Circular Economy principles are both operational and marketing, see chart 14:

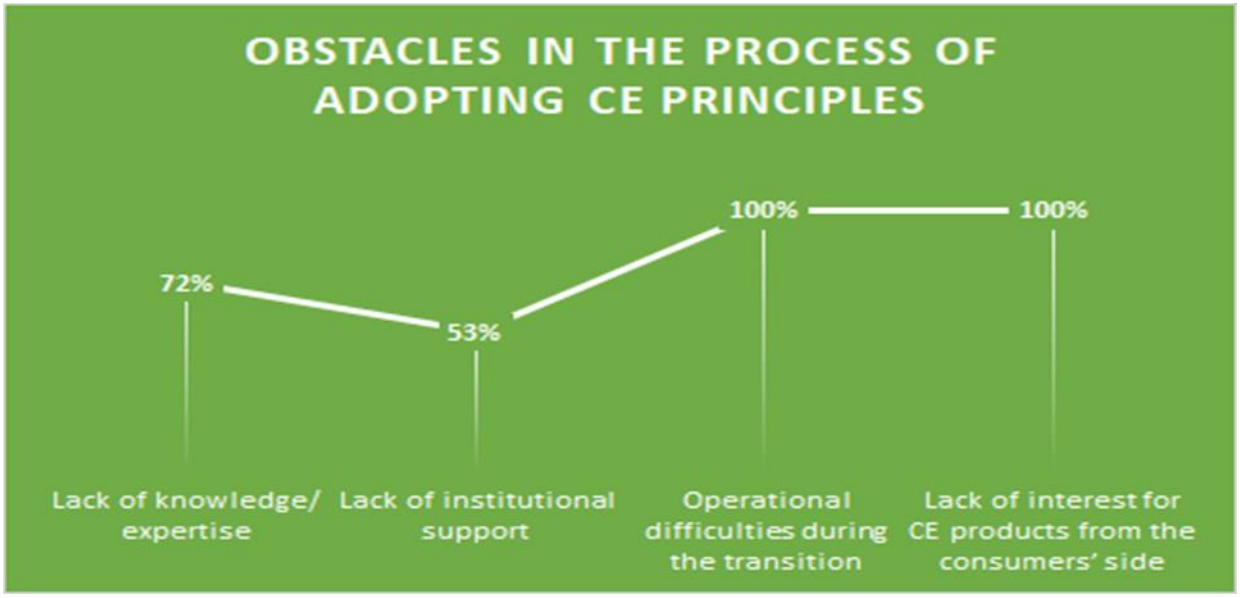


Chart 14: obstacles in the process of adopting CE principles - Hebron

Hebron SME's map is illustrated below:

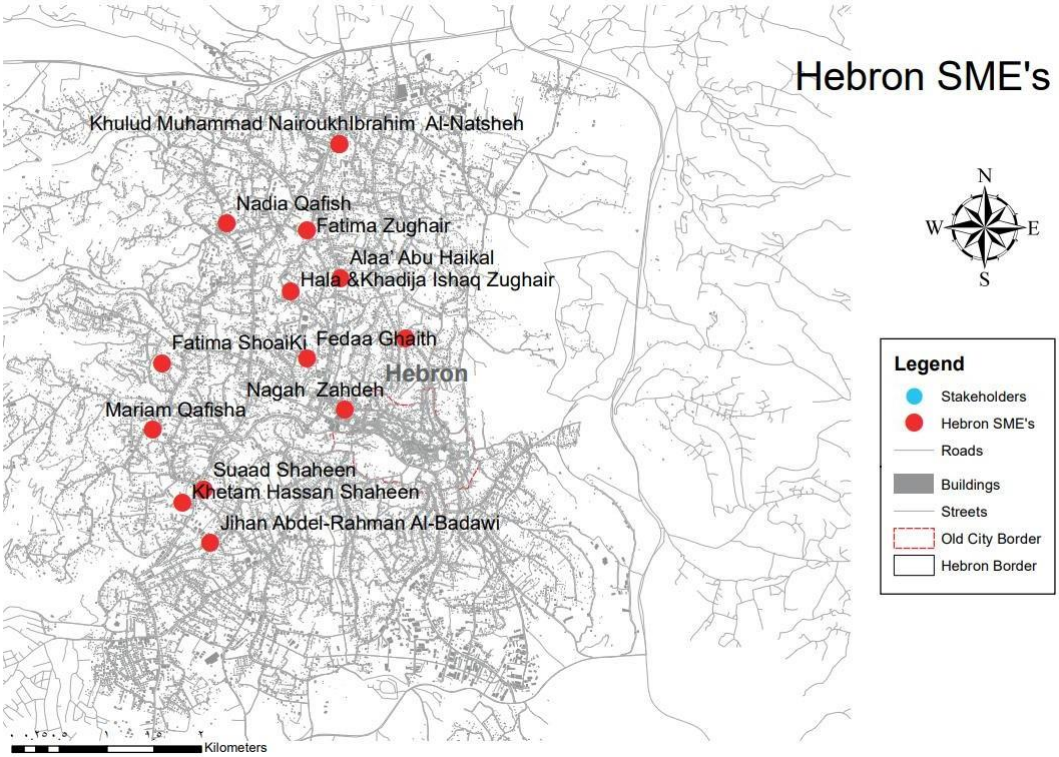


Chart 15: Hebron SME's map and locations

1.5.3 B. Roadmap strategy development

Hebron and Nablus Vision is "Creative and cultural industries are reusing existing resources and bringing cultural industries to our daily life's needs" by Revitalizing creative and cultural industries through innovation and circular economy models and cross-border cooperation. To achieve this goal, we need to:

- Develop clear, smooth and sustainable supply chains of wasted materials from the existing sources
- Cluster Capacity Enhancement of SMEs in Innovation, Research, Recycling, Marketing, Design, Production and Pricing
- Encourage key stakeholders to prepare the ground for a sustainable eco-system for the purpose of promoting, and overcoming obstacles standing in front of this sector
- Promote the sector by awareness campaigns
- Establish cross-border cooperation schemes in innovation, external knowledge inclusion and clustering with EUMC cities

The Palestinian CCI sector has an important role among various domestic industries because of its role in promoting the narration and culture of the Palestinian people. The industry has also been a critical part of the local tourism sector that is built on historic Palestine's location, history and religious significance for the three monotheistic religions.

On the one hand, the local Palestinian market is still promising if SME's can change their strategy of product development and customer segmentation. INNOMED-UP so far activities and research showed that CCI SME's have a great potential in both Tourism (for international markets) and Households goods (for local and international markets); this potential will be empowered by new developments of practical, usable, well produced and price competing products.

The cluster will help in research the local and international markets looking for new needs and transforming them into opportunities.

On the other hand, Nablus and Hebron CCI SMEs are using waste materials of: Plastic, Textile, Wood and furniture, Carton and Cardboards, Metals, Paper, Glass, Stones, Leather, Accessories, Toys, Pottery, Ceramic, Wool, E-waste and others. Resources of solid waste in West Bank are (1) Household waste (2) Agro waste (3) Industrial waste and (4) Construction waste

Therefore, by developing clear, smooth and sustainable supply chains of these wasted materials from the existing sources together with building the capacity of SMEs in Innovation, Research, Recycling, Marketing, Design, Production and Pricing, CCI sector will be able to go one step further and be significantly revitalized. This will be achieved through the training program and the clustering roadmap.

This vision will need some more support form key stakeholders like CoCs, EQA, Universities, Media and other bodies in order to prepare the ground for a sustainable eco-system for the purpose of promoting, and overcoming obstacles standing in front of this sector like: export, IP law enforcement, public

awareness and tax exemptions. Project team had started such cooperation especially with CoC and municipalities.

Most SME's expressed positive trends in terms of sustainability of their projects due to some market facts that traditional accessories are required for all ages and at all times; also females' accessories will always be in demand especially for social events. All this combined with the talent of local artisans and unique techniques of production and willingness to keep this tradition by the next generations.

The main focus in INNOMED-UP Palestine will be the Crafts: **Textile, Woodcraft, Papercraft, Pottery and Ceramics, Glass, Jewellery/accessories, Seashells, Stones and others, in addition to Sculpture and Fashion/Embroidery** because they are a minority and didn't have the opportunity to be engaged in any intervention in the past. Hence, we wil be working on building the capacity of those SMEs aiming to engage them with CE practices and developing their product innovation skills push them towards marketing activities that will lead to build role models for other craftsmen from same or different cities to go in the same track.

A major challenge of local CCI SMEs is over 50% are homebased businesses. Although there are several advantages of this situation like flexible working hours, low operations costs and being in the center of cities, but this situation affects on the smoothness of the supply chain because the workshops are not located specialized industrial zones that can benefit from waste of surrounding facilities and would carry high transportation costs. Limited access to customers and show rooms, far from professional networks and sales points and lack of inventory space are also challenges related to homebased facilities.

Over 70% of artisans are women, and this would lead to challenges in material handling and networking with large organizations and factories that would produce big quantities of waste. This also would lead to limited ability to host male customers/artisans inside the workshop.

Over 90% of artisans are using hand tools rather than machinery and e-equipment, this also would affect the quality and standardization of finished goods, and negatively affect the production cost.

More than 50% of artisans have limited access to raw materials due to lack of cash, exporting regulations from Israeli side and other regulatory issues.

We can summarize roadmap for pilot clustering and involvement of smart tools as follows:

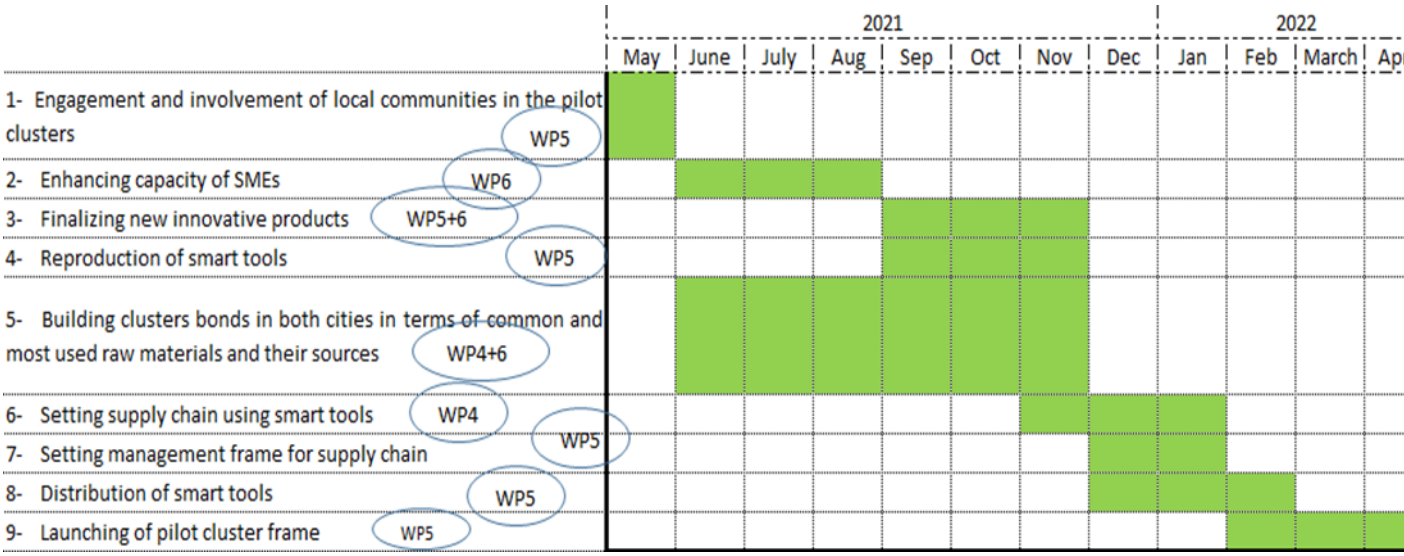


Chart 16: Roadmap for pilot clustering

1.5.4 C. Implementation of Roadmaps

Tradition, Tourism and Circular Economy are the main themes of our intervention. We will use those themes to facilitate SMEs access to innovation and innovative business models, and this will lead to promoting social inclusion and sustainable communities in the pilot areas.

According to State of the art Review conducted in WP3, Hebron and Nablus have enough solid waste to be targeted by CCI SME's but we need to work on creating a sustainable supply chain for providing them with solid waste in suitable form to be processed and in competing prices. We also need to build SME's capacities in developing new products that can absorb wider range of wastes in order to create products with higher value and more suitable for customer needs.

From SWOT & PEST analysis and Strategy Design conducted in WP4, we noticed that the local market is still promising if SME's can change their strategy of product development and customer segmentation. CCI SME's are basically producing secondary products like Gallery items, but not a daily usable/consuming products, and by doing so, they are neglecting the needs of the local consumer who needs **practical, usable, well produced and price competing products**.

According to Methodological Framework conducted in WP3, Nablus CCI SMEs usage of waste is from **Plastic, Textile, Wood, Paper and Carton, Metals, Pottery, Glass and batteries**. Where Hebron usage of waste is from **Wood, Textile, Furniture, Glass, Stones, Metals, Paper, Leather, leaves, Toys, Pottery, Ceramic, Wool and Seashells**.

The general criteria of selection of the participants at the clusters:

Group of SMEs:

- Diversity
- Within supply chain radius
- Ready for trying new models

SMEs owners:

- Commitment
- Young generations
- Enthusiastic for green values
- Experienced

SMEs Products:

- High quality
- Potential for expansion in local market
- Already engaged in recycling / upcycling activities or have potential to do so
- Doesn't affect the environment
- CCI value and aspects

SMEs as a business:

- Location and Spatial conditions
- Potential for innovative products
- Have social impact

The placement and specific use/application of clustering smart tools (eg bins, bicycle etc) and their interaction with CCIs SMEs activities (locations of the participants, the locations of the Smart tools and the networks / connections that will be evolved, raw materials that will be exploited):

Reconciling CCIs, Innovation and environment is one of our strategic objectives, and to guarantee smart sustainable businesses and to adopt the Internet of Things techniques, a new technology of smart tools (e.g. bins, bicycle) will be present to serve the SMEs needs of waste and to promote a smooth supply chain of need materials for the new presented innovative products.

As the detection, surveillance and management of waste is one of the primary issues of the present era and the cities of Palestine in particular, the smart tools in Hebron and Nablus will help in managing waste smartly with less efforts, cost and time. These Smart tools will have a tracking system, which enables participated SMEs to reach and interact with them easily, and to plan their daily/weekly/monthly pick up schedule.

Based on the geographical location for the CCI SMEs and their random distribution at both cities and some of their villages, and in order to achieve easier access to the smart tools, better interaction and to optimize waste collection routes, The placement will be as follows:

Nablus:

- Materials to be collected: Plastic, Textile, Wood, Paper and Carton, Metals, Pottery, Glass and batteries
- Locations:
  - The municipality of Nablus at the city center
  - Environmental Quality Authority office
  - Supermarkets / hyper markets (e.g. Shini, Leil Nahar, Bravo, Al-tal al akhdar)
  - Eastern Industrial Zone facilities (e.g. The National Carton Industry Co.).
  - Connections between SMEs and Private sector organizations will be set to provide a sustainable and continuous supply chain.

Hebron:

Materials to be collected: Wood, Textile, Furniture, Glass, Stones, Metals, Paper, Leather, leaves, Toys, Pottery, Ceramic and Wool.

- Locations:

Facility	Expected Waste
Royal Plastics	Plastic
Super Tex	Fabrics
Ard Al-Mared	Wood, fabrics, sponge
Hirbawi Textile	Embroidery
Qafesheh Stone Saw	Small stone cuts
Hirbawi mattresses	Fabric, sponge
Abu Sneineh Crystal	Glass, ceramic
Tamimi Ceramic	Pottery
Hetcho papers	Paper
Chamber of Commerce	Paper, carton

The terms and means of cooperation between CCIs SMEs (eg cooperation and exchange of raw materials by pairs of SMEs or in small networks of SMEs with relevant activity):

Based on networking levels between CCI SMEs detected via **4.2.1 & 4.2.2 CCI SMEs clustering roadmaps questionnaire**, and its perceived weakness, and their desire to strengthen the relationships among them, the focus will be made towards stimulating these companies for developing better business linkages on multi-levels:

1- Creation of "clusters" of SMEs that collaborate with each other to launch new distinctive products or to raise the quality of existing ones. We will work on one group in each city in order to encourage collaborative work on innovative products and apply the concept of sharing experience. We might need to identify some smaller groups in specific sectors where we have sufficient number of SMEs like Textile and Embroidery.

2- Encouraging the vertical cooperation on the level of production according to the need and nature of work of each SME.

3- Encouraging the horizontal cooperation on the level of procurement of raw materials, exchange of waste and the sale of finished products.

4- Collaboration in managing and protecting the smart tools.

5- Collaboration in sorting received waste and channeling it to appropriate targets.

The participating stakeholders & their role towards the SMEs access to innovation & new business models and the social inclusion:

Main stakeholders will be national bodies like Chamber of Commerce (CoC), Governorates, Ministry of Tourism, Environmental Quality Authority (EQA), in addition to Universities and Media agencies.

Their role can be concluded as follows:

1- Collaborate in awareness campaigns on recycling and circular economy.

2- Expand and develop communication internally and externally by initiating new business linkages and connection networks between SMEs, decision makers and green CCIs fans and supporters. .

3- Helping SMEs owners in access to Technology, Finance, Innovation and new business models.

4- Some of stakeholders (e.g. Nablus Municipality and Hebron CoC) will mainly help in the implementation of the roadmaps and the use of smart tools.

5- Facilitate project team connections with SMEs.

6- Applying the roadmaps.

7- Promote pilot clusters through their connection networks and digital channels for better visibility and accessibility.

8- To establish a special incubator for SMEs and creating an umbrella for CE players.

The expected outcomes (innovative products, collaborations, networks):

1. Innovative, creative, cultural and eco-friendly products that have been appropriately priced, packaged and delivered
2. Smooth wastes supply chains
3. Better visibility and awareness raising regarding CCIs and CE issues.
4. Fair access to Technology and Smart Tools.
5. Improvement in SMEs' competitiveness and productivity.
6. Cooperation schemes between SMEs in both vertical and horizontal levels.
7. Regional and international marketing opportunities.
8. Social inclusion and wider connections and networks.
9. Capacity enhancement of SMEs owners in Innovation, Marketing, Product Design, Eco- Design and Green entrepreneurship.
10. Business mentoring and e-tools.

Nablus SME's and stakeholders map is illustrated below:

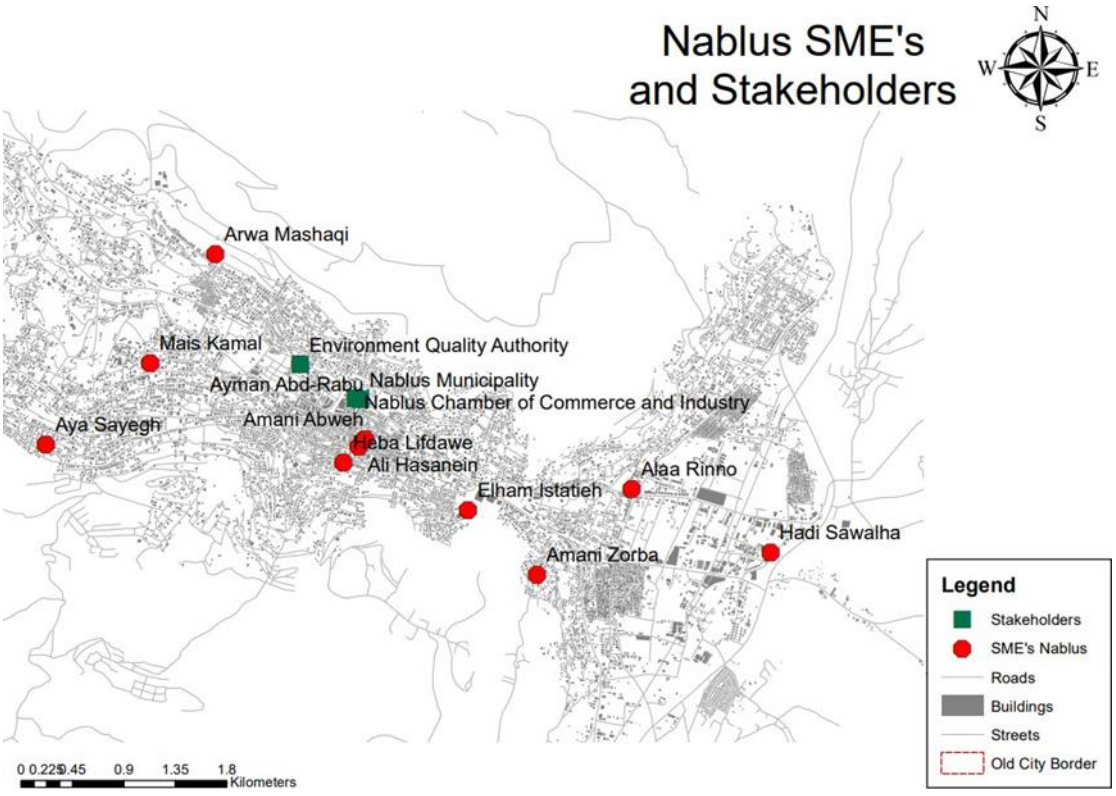


Chart 17: Nablus SME's and Hebron locations

Hebron SME's and stakeholders map is illustrated below:

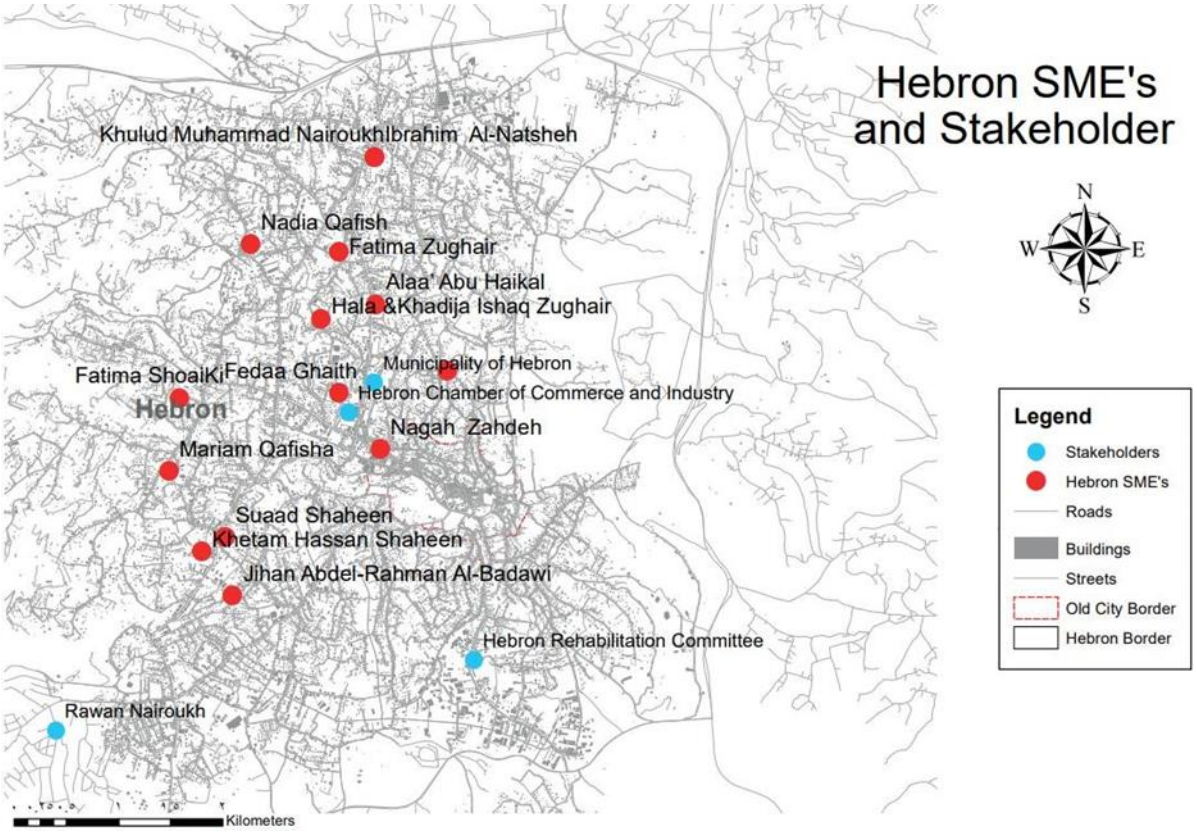


Chart 18: Hebron SME's and Hebron locations

1.6 IRBID

1.6.1 Summary

The circular economy is still an emerging topic in Jordan, where few initiatives have been established by some NGOs and entrepreneurs aiming to promote circular economy concept and approach. These initiatives represents important building blocks that the INNOMED-UP project can capitalize on, to establish practical and tangible initiatives in circular economy, and encourage its adoption at various levels. Despite the importance of these initiatives, but various challenges and obstacles are facing the circular economy and SMEs in Jordan at legal, institutional, technical and financial levels.

Irbid city is the second largest metropolitan population in Jordan after Amman, and is located about 70 kilometers north of Amman. The city economy is dependable on the services sector primarily, that is directly or indirectly related to the higher education institutions. In addition, it is considered the cultural capital of Jordan, and contains one Qualifying Industrial Zone.

Recently, several small and medium businesses have been established, achieving a considerable success in creative industries. However, Irbid market for creative industries remains small in scale and struggles to get access to the international stage. Therefore, various challenges have to be overcome for these businesses to sustain.

In order to understand the situation, a survey was conducted by Future Pioneers, Jordan's partner of the INNOMED-UP project to spotlight on the fact that SMEs are regularly complaining about the lack of sustainable sponsorship from companies or banks. Most of the SMEs owners rely on recycled materials from solid waste residues of public waste plans. It should be always noted that SMEs can afford only little quantities of input at each transporting order. They also might buy input materials from wholesalers in Irbid, which is expensive and might be affected with the quality restrictions according to what is available at the wholesalers.

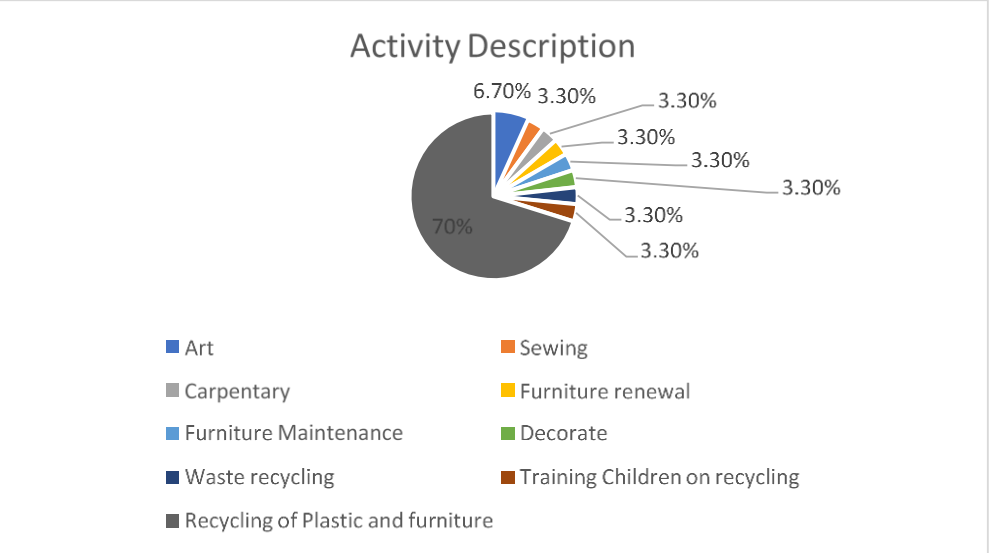
A major conclusion is the necessity to conduct more efforts to raise awareness about circular economy, and its importance to sustain SMEs. In addition, making circular economy relevant and accessible to SMEs and their customers is a priority as well as to provide concrete advice about how businesses should get involved.

1.6.2 A. Analysis of components and layers based on the Survey

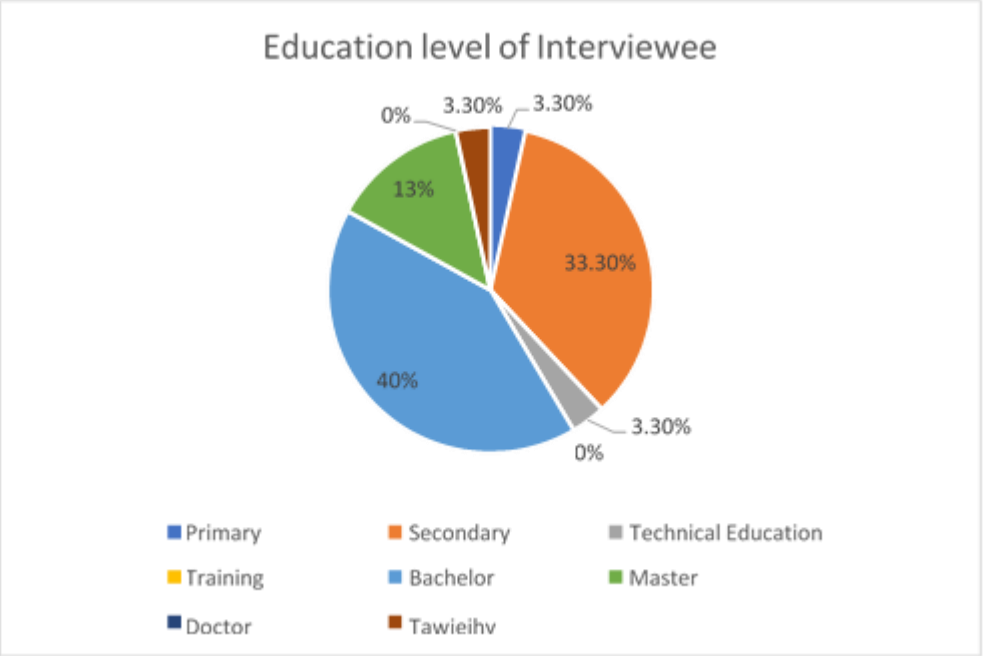
The survey was conducted to measure the knowledge, practices and attitude toward adopting circular economy principles among 31 enterprises working in different sectors in Irbid governorate. Main results are:

General Results:

- 38% of interviewed SMEs are private sector



- The majority of the SMEs personnel interviewed are working in plastic and furniture recycling.

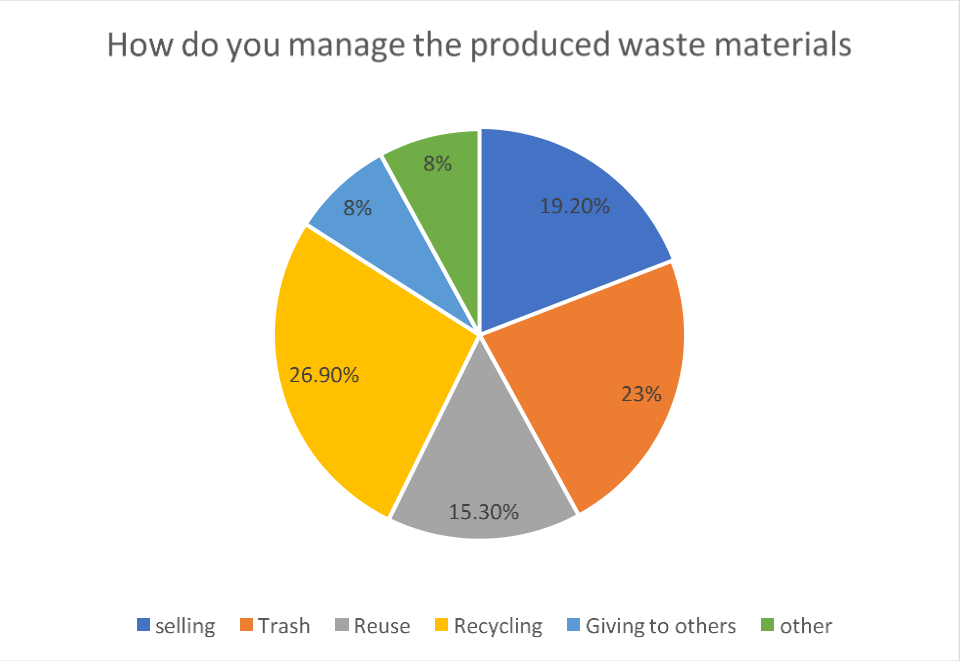


- 72% have received education relevant to the specific business sector.
- 61% of the interviewed SMEs employ staff who have technical skills in advanced arts and crafts
- 45% of the SMEs are based on tradition
- 20.7% said that the benefits of collaborations and networking are the financial benefits while 20% said it the new markets

- 66.6% said that they are not a member in any professional chamber/ association

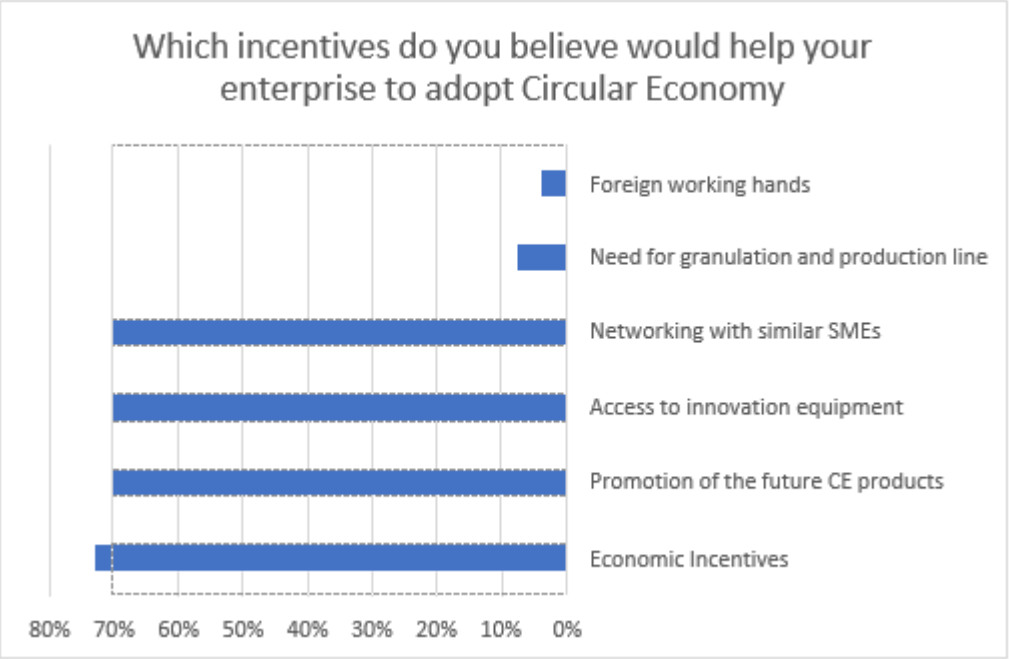
Value Chain:

- 50% of the interviewed SMEs work with other SMEs to add parts to the final stage
- 53% collaborate horizontally with other SMEs of the same activities
- 22% of the collaborating SMEs are located in the same area while 18.6% in the same building while 18.6% said it's abroad.
- 87.5% of the SMEs said that they are interested in enhancing their network with abroad
- 35% of the SMEs are using machinery in their work
- 45.5% of the SMEs do not have difficulties in finding the raw materials while 40.9% have difficulties.

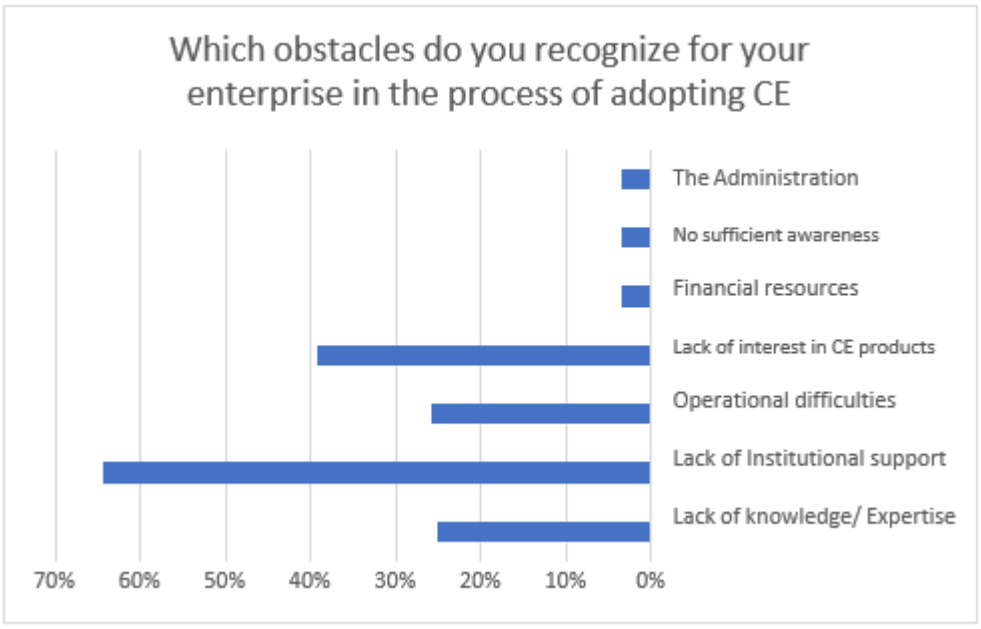


- When the SMES asked "How do you manage the produced waste materials of your enterprise ", 29.6% said its recycling, 23% said its Trash while 19.2% said its selling

- **Circular Economy:**



- When the SMES asked "Which incentives do believe would help your enterprise to adopt circular economy principles: ", 72% said its economic incentives, 69% said it's the promotion of the future CE products, while 69% said its access to innovation equipment, and same % said its networking with similar SMEs



- When the SMES asked "Which obstacles do you recognize for your enterprise in the process of adopting circular economy principles" 65% said it's the lack of the institutional support, 39% said its lack of interest in CE products, 25% said its lack of knowledge, while 25% said it's the operational difficulties

- 45% of the interviewed SMEs are aware of other CCI SMEs and they consider them innovative.

1.6.3 B. Roadmap strategy development

One of the most important challenges facing the application of Circular Economy (CE) is the lack of governmental vision, which will encourage and support the investment in the CE field and the lack of commitment of various institutions to adopt this concept. In addition, weak legal setup in means of the present environmental laws prohibit smooth inclusion of the concept of economic circular, especially for importing products, as Jordan is a consumer country in general. On the other hand, the lack of knowledge about the circular economy framework and benefits of the circular economy has been identified as one of the barriers to the implementation of circular economy practices among SMEs, besides to the monopoly of the current linear design of products and the lack of infrastructure and supporting secondary raw material market among others barriers of circular economy business model implementation.

The availability and cost of raw materials is another challenge, not to mention the availability of stores for raw materials and for products.

The focal areas will be Irbid market for creative industries. Main sectors will be

- Furniture
- Plastic
- Carpentry
- Waste recycling
- Sewing
- Textile
- Plastic
- Glass
- Wood
- Decorate

We are here aiming at **making Irbid City a model in Circular Economy in Jordan.**

The General Goal is to adopt circular economy approach to achieve Zero waste production through an enabling environment of the CCI SMEs.

Specific Goal

1. Stregthen the production and performance of the CCI SMEs in Jordan to adopt the CE principles
2. Advocay and lobyying among relevant authorities to amend the legislataltions to provide legal and financial support to the CCI SMEs
3. Provide opprtunities for exchanging expereince and market linkages at national and international levels

Irbid market for creative industries remains small in scale and struggles to get access to the international stage. The survey spotlight on the fact that SMEs are regularly complaining about the lack of sustainable sponsorship from companies or banks. It is clear; more effort is still needed to raise awareness of the CE; to make it relevant and accessible to SMEs and their customers, and to provide concrete advice about how businesses should get involved.

They also lack support and guidance from the responsible technical and administrative authorities, such as the municipality, the Ministry of Environment, and others. There is also a lack of cooperation between them. More efforts should be invested in creating frameworks for networking, coordination, and exchanging information among themselves and with the relevant technical and administrative authorities. It may be useful to establish a platform for information exchange and networking in the municipality or one of the chambers of commerce or industry.

1.6.4 C. Implementation of Roadmaps

The main criteria for the participants selection is represented by:

1. Their existing businesses and their relation to the circular economy field
2. Their willingness to adopt circular economy into their businesses

3. Their willingness to commit to the project trainings and best practices produced
4. Their willingness to cooperate with other actors such as the producers of the raw materials, the municipality and others.
5. Location of their business which must be in Irbid governorate
6. Their willingness to employ more people and improve their livelihood

Future pioneers has signed an agreement with Municipality of Irbid, Irbid Commerce of Trade and Irbid Commerce of industry to facilitate the network, connections and cooperation with the waste producers and these SMEs. This agreement will facilitate and support the application of the clustering smart tools and the interaction with CCIs SMEs activities. Based on that, the following will be applied:

1. Smart bins will be located at the factories in order to collect waste which will be used by the SMEs. This smart bins tool will be an added value especially that it will send alerts to these SMEs once filled so uptake will be scheduled and coordinated based on a clear roadmap.
2. Smart bicycles: a coordination mechanism will be established between SME and the targeted factories to use these tools to facilitate waste collection.
3. A reduction on the waste collection fees (up to 50%) owed on the "profession license" for SMEs that are committed to supporting (CE) programs.

Through the planned training activities and through the signed MOUs, FPEC will organize the relation between the waste producers and the SMEs that produce CE products. In addition, FEPC has published the info-point which will enable SMEs to reach funding entities and create synergies among. This will help to strengthen the collaboration, exchange of raw materials, and information.

FEPC has initiated an awareness campaign which is a continuous activities aiming to raise knowledge and education on circular economy. Through this campaign, more cooperation will be established between CCIs SMEs.

The participating **stakeholders** are:

1. Municipality of Irbid
2. Irbid Chamber of Commerce
3. Irbid Chamber of Trade
4. Ministry of Environment
5. Ministry of local Administration
6. Factories
7. SMEs

According to the conducted SWOT-PEST workshops for the relevant stakeholders, we found out that the **Key factors** and **high priorities** (SWOT-PEST matrix) are mainly:

Political • Willingness of the government of Jordan represented by the MOE to adopt, promote and implement CE concept through the MOE strategy and waste….etc. • Political instability in the countries surrounding Jordan, which will affect the government priorities. • Bureaucracy and conflicts in Waste Management industry by government. • limitation in the entire infrastructure of the CE, including legislation, laws, procedures, standards, M&E, marketing, guiding incentives, and even budget allocations, to apply this concept in a practical way by the public. • Intellectual property protection and its relation to CE improvement in Jordan. • Incentives, taxes and pricing issues which is connected with improving CE in Jordan	**Economic** • Government intervention in the CE development. • The lack of a budget allocated by the government for activities carried out in the area of the CE may impede or affect the adoption of the concept of a circular economy by the private sector, enterprises and individuals. • Efficiency of financial markets. • Infrastructure quality in waste management industry. • Competencies and skills level of workforce in Waste Management industry. • Labour costs and productivity in the economy. • Economic growth rate in Jordan. • Inflation vs interest rate
Social • The lack of knowledge in the concepts, methodologies and mechanisms of implementing CE remains an important barrier and perhaps the issue that hinders its implementation in a professional technical way. • Cultural cohesion, attitude and perceptions toward CE. • High unemployment rate and the high competition with the refugees it seems that there is a decline in the culture of shame that prevailed among youth on professional and handicraft work (as they preferred well-dressed office work).	**Technological** • Available technologies for CE in Jordan • Impact on value chain structure in Industrial Goods sector

Accordingly, the main roles for the stakeholders will be to reflect the above results, mainly:

- Facilitate the network, connections and cooperation with the waste producers and these SMEs.
- Facilitate marketing of the CE products.
- Facilitate access to finance
- Facilitate access to external knowledge to accelerate innovation
- SMEs will develop their internal capabilities and access to capacity building programs
- Amend the laws to support the adoption of CE practices and support the sustainability of SMEs working in this field.

The expected outcomes (innovative products, collaborations, networks)

- Solid cooperation between waste producers and the SMEs,
- Create a sustainable network between the SMES, SMEs and waste producers,
- Facilitate adopting the CE best practices
- Having new generation of SMEs that can produce high quality of CE products, can market them and secure sustainability
- Having more comprehensive support from the local authorities and the private sector
- More visibility for CE products, and their benefits at economic and environmental levels

Irbid will be main the location of the participants. The locations of the Smart tools and the Networks and connections will be clearer after conducting the technical training for these participants who will be divided into groups based on their sector