

Business Innovation and Sustainable Development

-Urban Agriculture Maastricht-

Green Food Movement Maastricht

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Introduction: Urban Agriculture and Maastricht

Over the last decades, agricultural production systems have blossomed in urban and peri-urban areas in response to various economic and social evolutions. The city of Maastricht is nested in the very heart of the European Union, within the densely-populated Meuse-Rhine Euro region. Over the course of its long and turbulent history, the city has been shaped by many influences, resulting in a rich cultural heritage. In particular, Maastricht has nurtured a long and unique gastronomic and culinary tradition. In this respect, the city's gastronomic scene has been regularly hailed for its excellence. Maastricht is indeed home to five Michelin-starred restaurants along with scores of other restaurants serving specialities such as zuurvlees, huidvlees, or rommedoe cheese, establishing the city as a main culinary hot spot. The project that develops urban agriculture in Maastricht might be a formidable opportunity to promote local products and traditions, and, in turn, the city's cultural heritage. This perspective is even more relevant in the light of Maastricht's candidacy for being the 2018 European Capital of Culture. What is more, in the face of soaring food and commodities prices, developing urban agriculture makes sense economically and socially. The rationale lies in the capacity of urban agriculture to secure affordable, local, and quality food for Maastricht's population and restaurants. On a different note, urban farming is a remarkably relevant opportunity in terms of urban sustainability. A wealth of resources is available in the vicinity of Maastricht and yet remains untapped, while representing a cost for taxpayers.

Due to the dire need of specific infrastructure, the old Sphinx building has been identified with great potential as a location for sustainable urban agriculture. The Green Food Movement Maastricht (GFMM) proposed in this paper attempts to address the socio-economic needs of a future sustainable city of Maastricht. The project requires converting the Sphinx facilities into an urban farm operated by community workers. Also a market for local products and workshops is to be created. GFMM will be instrumental in rehabilitating unused buildings and revitalising the entire neighbourhood. What is more, the involvement of multiple stakeholders, including community workers, the municipality, and local associations, will contribute greatly to community welfare and social inclusion.

A socially-responsible and environmentally-friendly project, the GFMM has yet to be translated into a coherently articulated project with an economically-viable business model. Hence, the

following research question is suggested: *How can an urban farming project be coherently articulated and implemented in an economically-viable way in Maastricht?*

The purpose of this paper is to establish a business model that successfully integrates urban agriculture into Maastricht's socio-economic environment. To this end, the first section presents the literature regarding sustainability and its relation with urban farming. The second section focuses on framing the concept of urban farming before elaborating on GFMM's business model. In the final section, the emphasis is on the key success factors and their symbiotic relationships within the introduced business model.

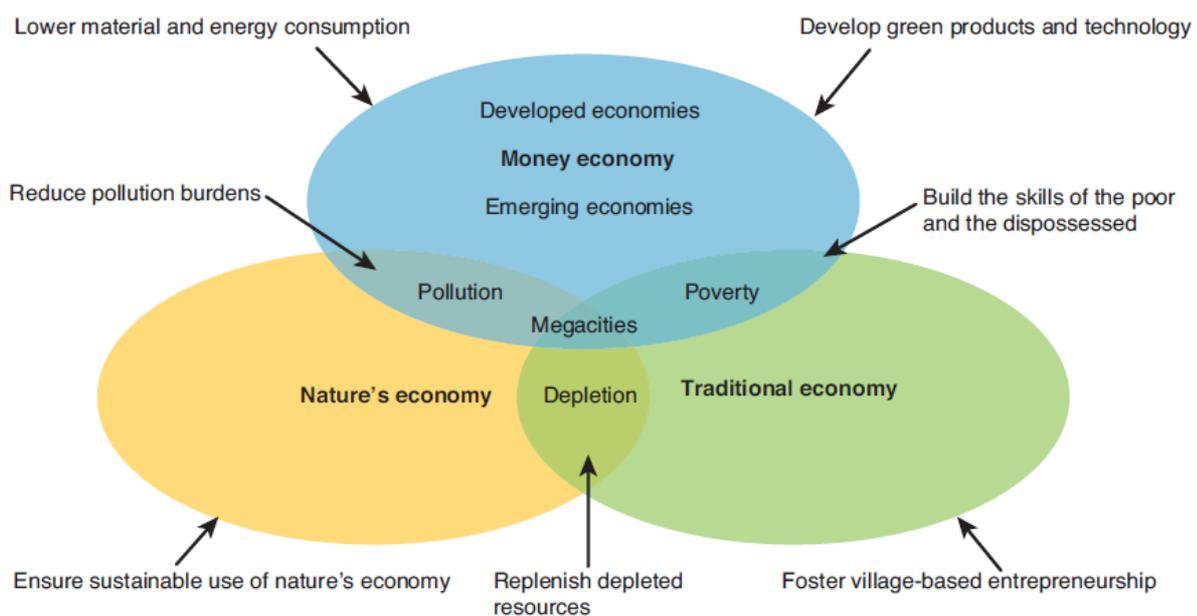
Section 1. Literature Review

1.1. Literature Review: Sustainability

The evolvement of consumers focusing on a lifestyle of health and sustainability (LOHAS) has caused a societal reorientation towards sustainable development. This is conditioned through increasing awareness of environmental impacts by means of increased CO²-emissions and the depletion of non-renewable energy sources (Z_punkt GmbH The Foresight Company, 2008). According to the Brundtland Commission, sustainable development is defined as that which "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987). Corporations are entitled to take charge and to lead sustainable development as they are the only ones possessing the necessary technologies, resources and global outreach (Hart, 2010). To create shared value (Porter & Kramer, 2011) – i.e. enhancing competitiveness by means of promoting economic value along with societal value – a broad range of stakeholders need to be integrated into the decision-making process for sustainable actions in order to legitimise the corporation in public (Bansal & Roth, 2000). This legitimisation is indispensable nowadays since society is formed by social media and transparency of information, which implies that adversarial public streams are harmful to the company's reputation (Hart & Sharma, 2004).

As indicated in Exhibit 1 below, to be truly sustainable, a project needs to contribute to each fragment of the triple bottom line: profit, people and planet. The notion of profitability is reflected in the money economy and can be achieved by increasingly efficient resource consumption as well as by disruptive clean technologies. The people aspect is represented in the traditional economy and focuses on the poor with the purpose of creating human capital and lifting the socioeconomic status of the poor (Karnani, 2007). The planet includes the nature's economy that encompasses all ecosystems around the globe. With the increase of world population and consequent consumption, non-renewable resources are no further an option. Hence, new patterns of consumption need to be established in such a way that consumption does not sacrifice nature and uses resources in an efficient way.

Exhibit 1. Dealing with worlds in collision (Hart, 2010, p.61)



This implies the necessity for whole-systems thinking – a cyclical cradle-to-cradle mindset for new technologies which is essential in order to comply with the new requirements imposed by the triple bottom line (Hart, 1997).

Two environmental strategy streams are identified. The first stream is “greening” which targets at the incremental improvement and efficiency gain in environmental performance of companies. The

second stream is “beyond greening” and aims at disruptive innovations that bear the potential to creatively destruct existing products and technologies from the bottom upwards. These innovations are typically characterized by a new product that is demanded by less wealthy or skilled layers of society and is hence of lower standard than already implemented products.

While established companies need to transform their running business step by step towards sustainability through a portfolio of strategies, new start-ups have the advantage of not being subject to corporate inertia. They can start from scratch with a completely new business model, targeted at beyond greening strategies that leapfrog intermediary solutions, which exclusively have the potential to contribute to greening activities. However, to establish themselves in the market start-ups need to balance incremental change perceived by society and disruptive innovation.

Start-ups have the potential to implement small-scale business experiments, e.g. in food production, by means of clean technologies which do not sacrifice the environmental well-being. This concept is named the “Green Sprout” approach. On the community level, a small business enters the market in a disruptive way and endangers the market share of big established suppliers, such as in the utility, food or material sectors. Even though this clean technology approach is on a small scale, it has the potential to revolutionize existing market as well as governmental structures bottom-up (Hart, 2010). A technique to successfully integrate their business into society and gain valuable insights for innovative ideas is radical transactiveness (Hart & Sharma, 2004). Non-traditional partners from the community should be sought. These can be civil society, community groups and local players who have the fundamental understanding of the needs and wants of their community (Hart, 2010). More specifically, Hart suggests the integration of fringe stakeholders, i.e. stakeholders that are not easily visible to the company since they do not have an active impact on the firm. These can be the poor, the less educated or the isolated societal groups that are not at the core of well-established stakeholder activities (Hart, 2010) since they do not directly impose power, legitimacy or urgency on the business (Mitchell, Agle, & Wood, 1997).

1.2. Literature Review: Urban agriculture and sustainable urban development

“[...] cities can be transformed from being only consumers of food and other agricultural products into important resource-conserving, health-improving, sustainable generators of these products. In particular, agriculture in towns, cities, and metropolitan areas can convert urban wastes into resources, put vacant and under-utilised areas into productive use, and conserve natural resources outside cities while improving the environment for urban living.”

Smit and Nasr (1992, p.141).

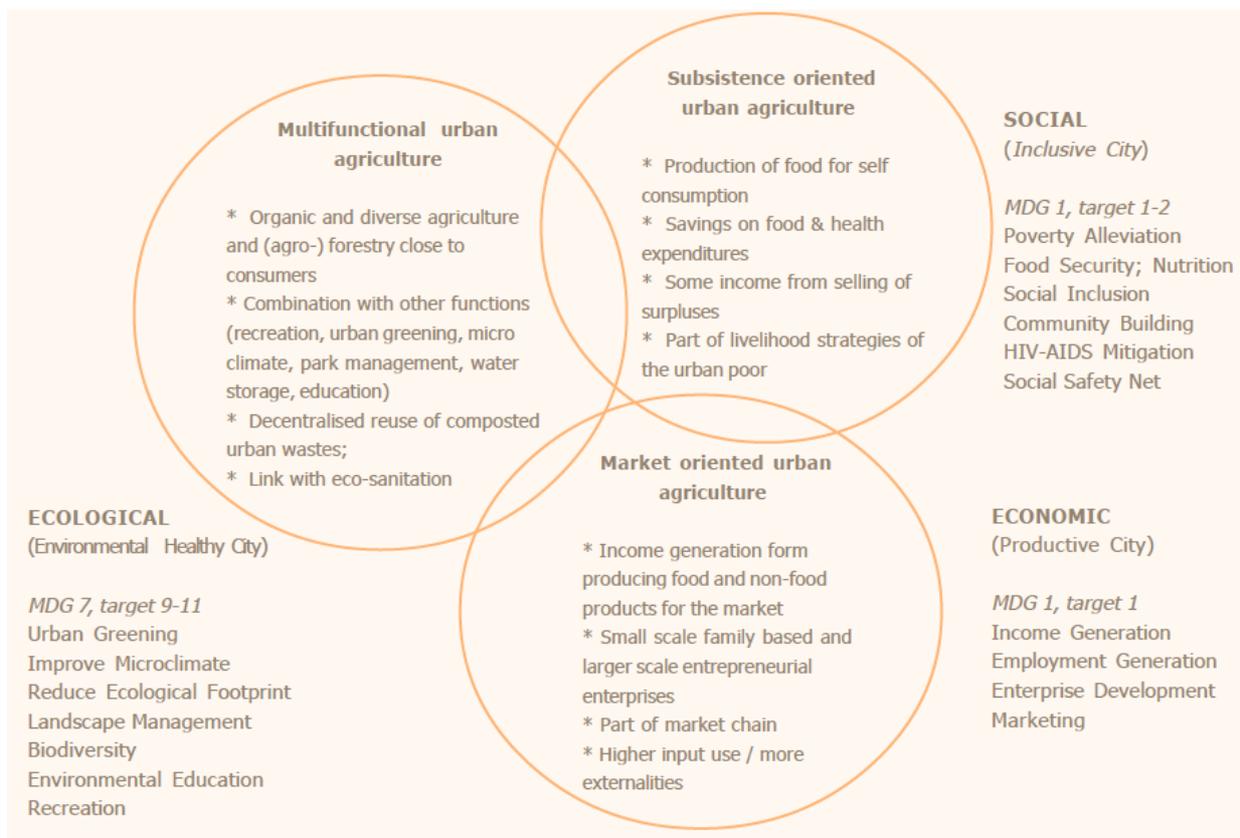
Consistent with Hart's (2010) “cradle-to-cradle” approach, Smit and Nasr (1992) develop a *closed-loop* vision of metropolitan areas in contrast with the long-standing and prevailing *open-loop* vision. A closed-loop approach puts the emphasis on (1) the management of wastes and (2) untapped or under-utilised urban resources with the expected benefits in terms of urban sustainability and environmental preservation. For that matter, scores of organisations, including the FAO and the UNDP, as well as academics (Smit et al., 2001; Deelstra and Girardet, 2000; Smit and Nasr, 1992) have been advocating widespread use of UPA.

Agenda 21, adopted in Rio de Janeiro in 1992, set out general principles to help countries to move towards “environmentally sound waste management” in a broader attempt to rally countries behind urban sustainability. In this respect, Cofie et al. (2006) argue that UPA can be instrumental in reducing urban organic wastes. They sketch out a win-win situation, part of the so-called “nutrient recycling loop” (See Appendix 1), in which composting would provide urban farmers with the necessary soil conditioner and mulch while minimising costs of landfills and solid waste management for municipalities. In addition, Buechler et al. (2006) argue that wastewater—including sewage drains, storm drains, or surface water to name but a few—can facilitate irrigation while saving freshwater to other uses. They note, though, that wastewater might have to go through sanitation processes in order to minimise health risks. In short, UPA can contribute “to transform waste into useful products rather than dump it” (Smit et al., 2001: 32).

UPA is increasingly understood as a powerful way to encourage sustainable urban development (SUD). Drawing on Richter et al. (2005) cited by Mougeot (2000), the essence of UPA does not lie

in its urban location but rather in the fact that it is embedded in and interacting with the urban ecosystem. At the confluence of urban economic, social, and ecological systems, UPA has been identified (FAO, 2008; van Veenhuizen, 2006; Cabannes, 2004; Dubbeling, 2005) as a main driver to “eradicate extreme poverty and hunger”, which is the first of the Millennium Development Goals (MDG), and “ensure environmental sustainability” (MDG #2) (See Appendix 2 for the complete list of MDG.; see exhibit 2). Additionally, Mougeot (2000) argues that UPA can have multi-level benefits: national level (e.g. food security, complementarity with rural agriculture, reduced transportation costs), regional (e.g. food supply, employment, etc.), urban (e.g. community welfare, revitalisation of areas, etc.), and household and individual levels (e.g. nutritional benefits, educational purposes, access to resources, etc.).

Exhibit 2. Urban farming at the confluence of urban economic, social, and ecological systems (van Veenhuizen, 2006; based on Cabannes, 2004; and Dubbeling, 2005).



As noted by Dubbeling and Merzthal (2006), “UPA takes place in a multi-sectoral environment” and as such “involves a wide range of often disconnected actors” (2006, p.20). Therefore, successful integration of UPA into a given urban system is the result of a concerted effort among multiple stakeholders. For instance, municipal authorities involved in urban planning should work closely with private companies while paying attention to the population expectations and doubts. In a similar fashion, they should equally reach out to public and/or private institutions for technical assistance and consulting advice (regarding health, economic feasibility/viability, etc.).

In short, UPA underlies (1) the capacity to leverage existing resources to be found in and around cities (Buechler et al., 2006; Cofie et al., 2006; Smit and Nasr, 1992); (2) the potential to complement rural agriculture (Mougeot, 2000); and (3) real opportunities in terms of sustainable urban development (SUD). Existing experiences across developing and developed countries have shown that UPA can successfully contribute to SUD. As depicted in the 2011 documentary *Urban Roots*, the city of Detroit, MI., epitomises a continuous endeavour to promote UPA in order to revitalise deprived areas. In those areas, UPA has been associated with reduced crime rates and increased home value. The city of Delft in the Netherlands provides another example of a successful integration of an UPA project into an urban ecosystem (Deelstra et al., 2006). The “Bieslandse Bovenpolder” plan has indeed gradually converted a mono-functional agricultural land in the outskirts of Delft into a multi-functional land. Since inception in 2006, the project has led to “a viable organic farm, an attractive recreational area, and has restored the opportunities for wildlife in the urban fringe” (2006: 43). Additionally, “combining land-use functions has also delivered extra income to farmers from unexpected resources” (2006: 43). Urban agriculture is thus a socially-responsible and environmentally-friendly option to nurture sustainable urban development with an underlying economically-viable rationale. Urban agriculture can be woven into the socio-economic environment of Maastricht—and more broadly of the Meuse-Rhine Euro-region—and match its unwavering commitment to “be an example for modern Europe”, and “become more sustainable from an economic point of view and increase the quality of life” (as mentioned on the website Euroregio 2018).

Section 2. Definition of Urban Agriculture

A multi-faceted and complex concept, urban and peri-urban agriculture (UPA) have attracted much attention in recent years as a way to nurture sustainable urban development (SUD). A growing body of literature on the matter has put a great deal of effort to outline the general underlying characteristics of UPA (FAO, 2007; van Veenhuizen, 2006; Mougeot, 2000). In this respect, Mougeot (2000) offers a clear, albeit somewhat narrow, definition of UPA:

“Urban agriculture is located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, and grows or raises, processes and distributes a diversity of food and non-food products, (re-) uses largely human and material resources, products and services found in and around that urban area, and in turn supplies human and material resources, products and services largely to that urban area.”

Mougeot (2000, p.10).

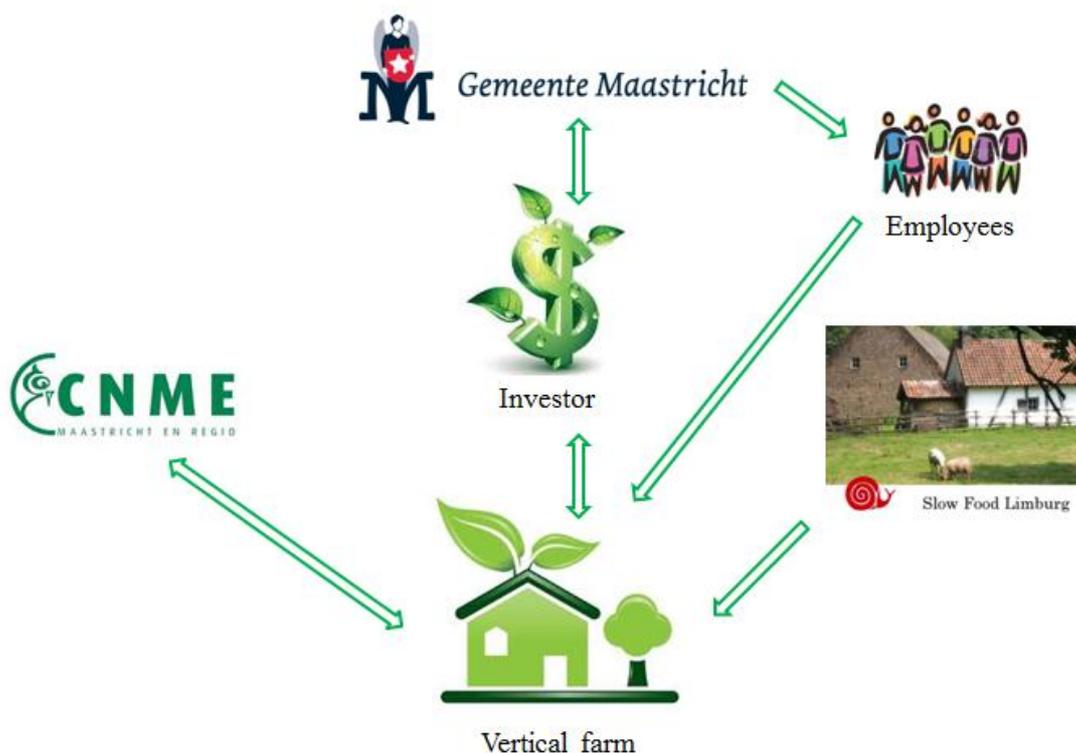
Beyond a sheer agricultural production system (re-) using urban resources, UPA “to a large extent [also] complements rural agriculture” (van Veenhuizen, 2006, p.2). Therefore, urban and rural agriculture should not be contemplated as two competing systems but rather as two complementing systems with different potential in terms of sustainability, and different objectives and organisational forms. Speaking of which, the FAO (2007) provides additional insight, pointing out that UPA is characterised by the diversity of its objectives and organisational forms. First, UPA encompasses a wide range of urban farming system (UFS) with either subsistence-oriented, or market-oriented objectives, or a combination of both. Second, UFS can take on multiple organisational forms, including community gardens, rooftop gardens, homes gardens, institutional gardens (managed by institutions like schools or hospitals). Moreover, Vagneron et al. (2003) emphasise that UFS can take different orientations in terms of production: specialised (one activity), mixed (two activities) or hybrid (more than two activities). Each activity can be performed in a variety of ways. In particular, hydroponics system is a soilless production method consisting in growing plants using mineral solutions. Alternatively, the concept of aquaponics combines

hydroponics with aquaculture and hinges on a circular use of water; plants are grown with water full of minerals that are absorbed by the plants and then re-used for animals.

“Urban Agriculture (UA) is a dynamic concept that comprises a variety of livelihood systems ranging from subsistence production and processing at the household level to more commercialised agriculture. It takes place in different locations and under varying socio-economic conditions and political regimes. The diversity of UA is one of its main attributes, as it can be adapted to a wide range of urban situations and to the needs of diverse stakeholders. UA or urban and peri-urban agriculture [...] can make important contributions to social, economic and ecological objectives of sustainable urban development (SUD).”

FAO; 2007, p. v.

Exhibit 3. Business Model of the Green Food Movement Maastricht



Section 3. Business Model and explanation

Exhibit 3 depicts the proposed Business Model of GFMM. It consists of five parties, namely the Municipality of Maastricht, possible investors, CNME, Slow Food Limburg, and the vertical farm. The arrows show the multiple relationships between the different parties that add value through exchange of knowledge, support, financial aid and profits. The heart of the model consists of a vertical farm that could be implemented in future with an entrepreneurial approach consisting of a market, restaurant and the urban farm itself. Start-ups have the potential to implement small-scale business experiments, e.g. in food production, by means of clean technologies which do not sacrifice the environmental well-being. This concept is named the “Green Sprout” approach. Since the farm provides new jobs, the Municipality of Maastricht has the chance to create employment for people involved in the Social Return program. Those people will be trained and educated by mentors. Furthermore, the farm is not only used as a new employer but responsible for educational learning effects in the Maastricht region. Workshops that will be provided by the new employees can educate school children as well as members of the community. The CNME, the Centrum voor Natuur en Milieu Educatie, will take a leading part in supporting this vision and in fostering the relationships between the various stakeholders. Slow Food Limburg takes over a key role in providing expert knowledge how to grow sustainably which increases the quality of the offered workshops as well as insurance of offering high quality food. Interchanging ideas, techniques, and output guarantees that the business improves and will be challenged over time. In the following section, the diverse stakeholders will be introduced in detail.

Section 4. Key Success Factors

4.1. Municipality of Maastricht as the principal partner

The first and most important key partner in the GFMM is the Municipality of Maastricht. Without substantial support of the Municipality the project will lose its feasibility. The city of Maastricht is a candidate for the 2018 European Cultural Capital, yet it still suffers from a vacant building in the Belvédère area which is located near the city center. Developing the Belvédère area can positively contribute to the growth and reinforce the cultural infrastructure of the city Maastricht (Aquarius,

2008). The business model has three fundamental building blocks; (1) the urban farm, (2) the market, and (3) the restaurant. The desired locations for these pillars are owned by the Municipality of Maastricht and will be discussed in depth in the following paragraphs.

4.1.1. The urban farm

This report proposes the old Sphinx building as the location for the urban farm. It is a large, vacant building close to the city center and additionally particularly well connected to the nearby highway. There are plans to change the Belvédère area into a living and shopping complex, which fits reasonably well with our business model. Considering the size of the building, only a relatively small amount of space is required for the urban farm. As described in the literature review on urban agriculture, aquaponics shall be used as a method of growing products without additional pressure on existing ecosystems. Therefore it is a clean food production technology and a mini-ecosystem on itself. The urban farm should be accessible for the general public through activities or workshops (CNME / Slow Food). Furthermore, typically local and organic food should be grown at the urban farm as the underlying theme is local for local (e.g. local producers for local consumers).

4.1.2. Market & restaurant

A crucial part of the business model is how the cash flows are generated. First, an organic food market can be established with the aim that consumers taste and buy locally grown food. Specifically, food produced at the urban farm. Second, a restaurant should be developed where local consumers can taste and enjoy products which are prepared by professionals. This design follows a similar project that was adopted in Torino, Italy (www.eataly.it). In their first year, the market/restaurant attracted over 2.5 million visitors, and is still a huge success. Following their success, they expanded their activities overseas towards New York City and Tokyo in 2010. Their success factors do not involve low pricing, yet through quality standards and the experience of tasting, rationally choosing and finally buying local products.

The location for the market and restaurant lies within walking range of the urban farm as described above. The desired vacant building is an old factory that has enormous amounts of space. In the

satellite picture on the following page, one can see the locations for the urban farm and for the market and restaurant.

Exhibit 4. Picture Sphinx Maastricht



To sum up, the three pillars of the business plan are not ready to use and need to be restored for use. In this process, the municipality of Maastricht is crucial hence they own the building and additionally desire to ‘re-use’ the Belvédère area. Moreover, due to their prominent role in the business model, it is crucial that the municipality of Maastricht gains decision-making power and acts as a local player who connects fringe stakeholders (e.g. poor and under-educated) with the Green Movement Maastricht community (Bansal & Roth, 2000). Therefore, the following parts will describe these educational and societal purposes.

4.2. Centrum voor Natuur en Milieu Educatie as the educational player

The Centrum voor Natuur en Milieu Educatie (CNME), Center for Nature and Environment Education, is the second major partner in the GFMM. While the municipality’s focus lies on support, sponsoring and offering of a location, the CNME will help to raise awareness, as it has the aim to educate people in the region, especially school children, on local sustainability and

ecological development issues. As Hart (2010) suggested, the CNME can bring new stakeholders into the project and therefore enhance the shared value (Porter & Kramer, 2011). The CNME is involved in several projects, such as school gardens, forest education, but also in the botanical garden of Maastricht. The CNME also owns a city farm in Daalhoeve. Even though the farm is primarily an animal farm, sustainability and the lifecycle approach also play a major role, as various animals, are fed sustainably harvested corn, grown on the city farm (CNME, 2012). The CNME sees itself as a messenger between sustainable organizations and initiatives and the people of the Maastricht region. Currently it is going through changes, as its responsibilities are broadened and its focus will not only be on education, but also on the management of projects. (CNME, 2012).

As the role of the CNME is changing, the best way to fit it into the urban farming project would be to use the CNME as a project management organization, and due to its tremendous contacts could facilitate the communication between various stakeholders. Similar projects are already implemented providing educational benefits workshops, demonstrations and fairs (CNME, 2012). The director of the CNME stated: "I always had the vision to do something similar to the project in Vaeshartelt in our Botanical garden. It would be great if we could get people to experience a vertical farm and then they can also learn how to build one at their homes" (CNME, 2012). In that case, the CNME could act as a messenger and communicator and could bring the urban farming project and the people who are eager to learn about it together. In the future, downscaling as well as up-scaling would be possible. This is mainly due to the fact that not only private individuals can get an inspiration to create an urban farm themselves, but also big companies can learn how to use their empty roof tops in order to help create a greener Maastricht. If such efforts are successful, then it would be possible to create urban farming cooperatives, like the initiatives by Mergelwind, an organization that tries to promote agricultural cooperation within the Netherlands as well as in France and Germany (Mergelwind, 2012).

A cooperation with the CNME would not only benefit the urban farm itself, but also the CNME and all other stakeholders involved (CNME, 2012).. The urban farm and some involved business students can help the stakeholders that are not used to being in contact with other business partners to get publicity and receive an active voice, a contribution that could be initiated by the School of Business and Economics of Maastricht University through organizations such as SIFE (See Appendix 3). Since the CNME already has projects that involve school kids, it would be the most

desirable partner in addressing this specific target group for workshops, cooking classes and general cooperation with the schools in Maastricht. However, the potential customers for the sustainable food product should not be neglected. Therefore the CNME can help to organise activities for them as well. As the goals of the project and of the CNME are similar, namely educating the people how to make Maastricht more sustainable and greener through urban farming, the partners fit well together. Ideally, the urban farm can act as a prototype for future urban farming within the region (CNME, 2012). In the future, it might also be considered to bring another partner on board, the Gebiedsontwikkeling Maastricht\Meerssen\Valkenburg (GOMV), as this organization is focused on the combined greening efforts of the three cities and can be another valuable asset to the urban farming project (GOMV, 2012). Another organization, which can be helpful in implementing the business model is Slow Food Limburg. Its role will be addressed in the next section.

4.3. Slow Food Limburg as a regional promoter of sustainability

The third key partner in this business model is Slow Food Limburg. Slow Food Limburg is part of the international association Slow Food which was founded 20 years ago in response to fast-food, and the globalization of the food industry. The association's core value is the production of pure pesticide free food which is produced in a sustainable way. Moreover, the food should be produced by local farmers for local consumers (local for local). The business model of GFMM is in line with their core values as it supports sustainability, and local for local pure and honest food.

Their support in the business model is essential due to Slow Food's ability and willingness to create consumer awareness concerning sustainable and locally grown food. First, Slow Food Limburg has the available resources to educate potential consumers through workshops and community activities. This complements the activities of the CNME as these workshops are aimed at both the younger and older generation. These educational activities are essential in creating added value for consumers as they are able to experience their food consumption from seed to end product. Second, Slow Food Limburg can act as a commission that monitors the quality of the products. This can be accomplished through the implementation of a product label that ensures that the product is locally grown in a sustainable way. The SL-label (Sustainable & Local) is in line with the above-described educational goals. Moreover, it adds value and experience as to why consumers should purchase these products at the market in comparison with products of large retailers.

Empirical evidence is exemplified in Slow Food Weimar in Germany. They have successfully established an educational food project for students from kindergarten, elementary schools as well as high schools. The jury of the National Committee of the UN Decade "Education for Sustainable Development" even nominated and rewarded the project as an official excellent Decade Project for the period 2009/2010 (Slow Food Thüringen, 2012). The focus has been the sensual experience of food as well as the sensory and action-oriented experience and enjoyment of each manufactured product.

In sum, Slow Food Limburg's main purpose is to educate people through workshops and various community activities, and to monitor and control the quality of products through a product label. Both can enhance the experience and willingness of consumers to purchase these locally grown sustainable products at the market and/or restaurant. Continues involvement of Slow Food Limburg is desirable due to the association's ability to educate and maintain a long-term relationship with the local community.

4.4. Social Return as a party responsible for the coordination of employment

In order to realize and improve the social quality of life in terms of employment, participation, self-development and self-sufficiency for the citizens of today and tomorrow, the municipality of Maastricht is involved in several projects. One of them – Social Return was initiated in 2005. The main goal of the Social Return initiative is to provide a proactive, stimulating, cooperative and entrepreneurial environment for people who face difficulties finding and maintaining their job.

There are certain steps to be taken before the project is implemented and the unemployed are offered a position. At first, the municipality of Maastricht makes development plans and organises an auction for potential investors. The winning company is then obliged to dedicate at least 5% of the invested amount to the Social Return. Moreover, the company has to provide suitable jobs within the scope of their activities for people who are willing to work. Those job seekers are supported by an external institute that takes responsibility for coordination, trainings, coaching. The cooperation between the investor and the institute is monitored by the Project Leader from the Social Return department of the municipality in Maastricht. In case of any complications and

disobedience, the Project Leader intervenes and claims certain actions from the investor. Until now, many successful placements were offered to the unemployed (including greenery maintenance, catering, road construction, home care, cleaning and administration) and the municipality is willing to support other initiatives by means of the Social Return.

GFMM has a high potential to become the right workplace for currently unemployed, as confirmed by the Social Return representative. The tasks that would be assigned to workers are not complex and therefore, learning how to work on a vertical farm will not require the long training process. Since no specific pre-knowledge or skills are needed, many people will be available for work. Thus, people who lack education will get a chance to earn money and develop themselves. Employment in this project is focused on creating human capital and lifting the socioeconomic status of the poor (Karnani, 2007) by giving them the chance to work. Therefore, it is intended to reach to those at the bottom of the Maastricht's pyramid (as indicated by Hart (2010)), understand their needs and increase their earning power by providing jobs for them. Those who will gain enough knowledge and work experience will feel empowered to enter the job market and in this way the base of the pyramid will start shifting to the top. Moreover, skilful employees will be assigned to organise thematic workshops (cooking, gardening, farming, nutrition) for the public and to pass their expertise by training their colleagues. In that sense, the value of the sustainable vertical farming will be spread to as many stakeholders as possible.

Social Return plays a crucial role in the GFMM for many reasons. First, the necessary workforce is provided since the external institute is responsible for the selection of right people. Second, employees receive the necessary training before they start working. In other words, knowledgeable and skilful people are provided to the GFMM to ensure the quality and standard of the work they deliver. Third, the institute takes care of the administration and formalities. Additionally, Social Return has a lot of experience in assisting various projects. It was suggested that the MTB Maastricht (labor market integration company) could become a potential partner for the GFMM.

Taking into account the Social Return, not only the unemployed will benefit from the GFMM. Providing jobs to people who were not able to work before is favourable for the municipality of Maastricht hence less social security money has to be spent on the unemployed. Furthermore the more workers involved in projects that tackle the aspect of sustainability, the more likely the city

will reach its goals of becoming green, vital and strong in the long-run. Should the Social Return project not be implemented, the SIFE (see Appendix 3) might serve as an alternative stakeholder that will assist in the employment and training of workers for the GFMM.

Recommendations

After a thorough situational analysis of the GFMM there are several challenges and recommendations that have to be discussed. The fundamental first step is to identify an investor that is willing to finance the GFMM. to increase potential customer awareness of the project and its implication to the community of Maastricht as a whole. It comes as no surprise that an informed community is more willing to support the project and contribute to a more sustainable development of Maastricht. It is therefore of quintessential importance that the local government actively supports the project. An independent implementation of the project would most likely result in failure, and temporarily deter the local community from attempting further sustainable projects.

On a more specific note, several recommendations have to be made for the factors mentioned in the text. The Sphinx building needs to be renovated for the urban farm. This requires minimal investment and is surely already a planned process. Slow food Limburg has to make sure that the combination of a qualitatively superior food experience and education is recognized by the local community. The implementation of workshops and SL-labels as quality identification sources might be the right step forward. As far as CNME is concerned it is empirical that the organization receives subsidies and funds from the Province of Limburg. This ensures future support for projects such as the GFMM. It becomes evident that the success of the project can be seen as the initiator for several other projects, and therefore in its role as a prototype can result in further sustainability movements. However, further technical research is required to substantiate the feasibility of the concept of aquaponics in the urban area of Maastricht.

Conclusion

As a result of a continuously growing world population and all of the difficulties and hazards that come along with it, the need for sustainability becomes increasingly apparent. It is the duty of every individual, group, government and organization to realize the dangers for future generations, and to vigorously work towards a future for generations to come. It comes as no surprise that the current ecological footprints of the western world by far surpass the rest of the world. The realization of this phenomenon puts an unique responsibility into the hands of the western world. The only solution to this problem is to start living and consuming in a truly sustainable way as suggested in the cradle-to-cradle approach. As a result of this realization it has become this papers purpose to provide a specific answer to a possible scenario within Maastricht. As such this paper introduces a business model with the intention of integrating urban agriculture into Maastricht's socio-economic environment in a sustainable and innovative way. After a careful analysis of existing literature of both sustainability and methods of implementing urban agriculture, this paper has methodologically outlined the most efficient manner of applying such a concept to Maastricht's urban area. Vital players such as the Municipality of Maastricht, CNME, Social Return, and Slow Food Limburg were introduced and carefully applied to their prospective roles. It becomes apparent that a firm cooperation between these various players remains the ultimate key to success. Maastricht as a proactive green city provides tremendous potential for a truly sustainable environment. It is this potential that can act as a catalyst for future projects to come.

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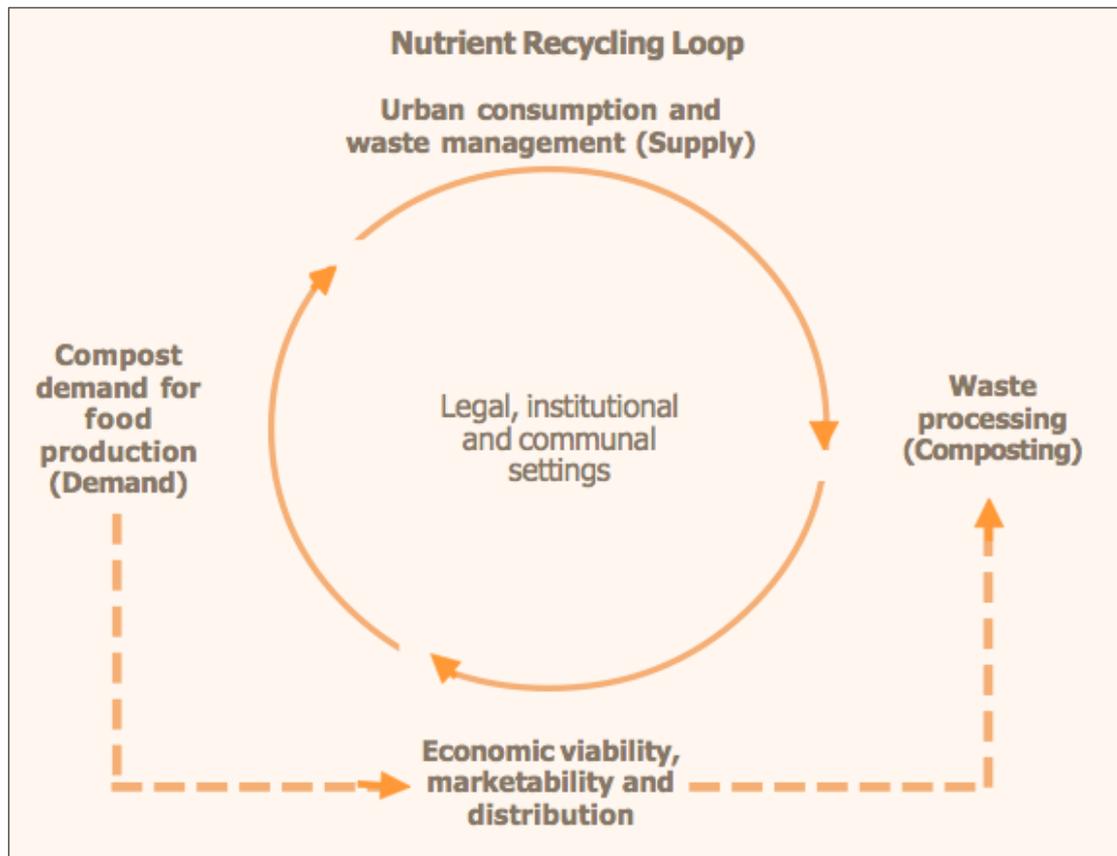
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Appendices

Appendix 1. The nutrient recycling loop



Appendix 2. The Millennium Development Goals

 1	Eradicate extreme poverty and hunger	 5	Improve maternal health
 2	Achieve universal primary education	 6	Combat HIV/AIDS, malaria and other diseases
 3	Promote gender equality and empower women	 7	Ensure environmental sustainability
 4	Reduce child mortality	 8	Develop a global partnership for development

Source: [United Nations Development Programme \(UNDP\) website](#).

Appendix 3. SIFE

Another building block of the proposed model involves the active support of non-profit organizations as SIFE, which stands for Students In Free Enterprise. SIFE Maastricht was founded in October 2008 and is part of a global network of 57.000 students in 39 countries and currently consists of 47 active students from various faculties (UCM, FASoS, LF, FPN, SBE) and nationalities (Polish, Dutch, American, German, Canadian, Austrian, Turkish, South African (SIFE Maastricht, 2012).

Taking the concept of the “Triple Bottom Line” from Hart (2010) into consideration, SIFE is heavily involved in improving the social, environmental and economical impact of the Maastricht region through an entrepreneurial approach. The goal of SIFE is to empower people in need with the knowledge, skills and motivation to improve their standard of living and quality of life (SIFE Maastricht, 2012). The non-profit organization aims to create a better, more sustainable world through the positive power of business by mobilizing university students to make a difference in their communities while developing the skills to become socially responsible business leaders.

SIFE is always looking for new projects and ways to actively be a part of the Maastricht community (SIFE, 2012). The added value to incorporate students from SIFE into the proposed business model is substantial. Young professional people with creative and innovative ideas from various backgrounds committed to a common goal can considerably influence the results of the project. Extremely significant is the fact that those students work on a non-for profit basis, which reduces financial pressure of GFMM. The added value for SIFE students is the learning effects of participating in the implementation of an entrepreneurial business model in the Maastricht region. Through their work they are able to apply theoretical ideas into practice. Further, SIFE promotes their current projects and shares them through their international network of universities, companies and politicians. This can be a source of new ideas, knowledge and international experience that can be very valuable in case problems occur in the implementation of the business model.

Currently, one team of SIFE members aims to establish and develop a local project that involves diverse areas of the local community Maastricht. “We intend to co-create a project with a community in need of social, economic, and environmental impact, and to empower these people with our help, and increase their overall quality of life” (SIFE, 2012). Students are now researching the needs of local people and analyse whether those are in line with the municipality. Due to the fact that the Hotelschool Maastricht is located in this region, SIFE sees the need to connect students from the Hotel School and unemployed in the area. One of their visions would be the provision of educational workshops that are rewarded by school credits for students. During those workshops students are able to teach unemployed soft skills, restaurant servings or knowledge of how to prepare food. The workshops connect Hotel School students with locals, creating social cohesion and teaching them basic skills of the hospitality sector. However, a clear concept of such a project is still missing (SIFE, 2012). Ms. Vervloet from SIFE acknowledges that the unemployed in the region show high interest in participating in such a project given that clear participation benefits are disclosed. Including the SIFE organization and Hotel school students provide valuable inputs ranging from implementations of business practices to proper standards in the service and food sector.