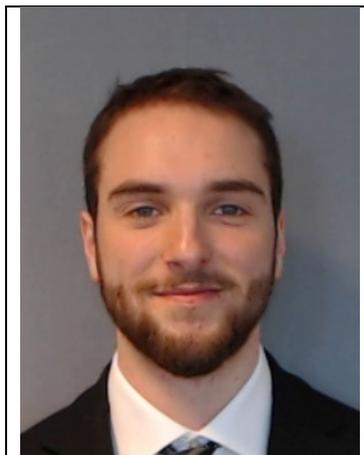


LYcar Research Proposal

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Vertical farming and Educational
Experiences, a marriage bound to happen

Executive Summary

Launching your career is the last step of the bachelor course at Hotelschool The Hague, aimed at kickstarting the career of the individual students. This step takes form in a company project that solves a problem or find an opportunity withing the hospitality sector. This project follows the five steps of the Designed Based Research cycle: Problem Definition, Analysis & Diagnosis, Solution Design, Implementation and Evaluation.

The problem definition focuses on the economic structure of Vertical Farming. It was discovered that Vertical Farming offers great opportunities to foster economic development as the sector generates one of the highest economic returns. However, this opportunity could be limited due consumer's low willingness-to-pay and their resistance to innovation. Consumers express their scepticism towards a technology that they believe to be unnatural and unsafe. This is a non-representative view of reality, and little has been done to change this belief due to the complexity of the system.

An initial situational scan provided useful information on how companies from the same or similar sectors have been able to overcome this resistance. These include education on the benefits that their product can offer, the use of co-creating experiences, and the multiplier effect of partnership with trusted parties. A careful review pointed out that the combination of education and the experience economy could be the preferred solution to tackle the issue. In fact, the experience economy is divided into four pillars, entertainment, educational, escapist, and aesthetic. This leads to the main research question:

"How can Education and the Experience Economy raise customers' willingness-to-pay for Vertical Farming products?"

The literature review investigated what willingness to pay is to better understand what factors can influence it. The aims were to find specific actions that can be applied to destroy the Consumers' resistance barriers to buy VF products with the aid of the experience economy. It was found that five major factors compose and influence it, "Taste and preference", "Belief about future", "Income and wealth", "Availability and price of related goods", and "Number and scale of buyers". When the results have been cross-checked with the pillars of the experience economy, it was discovered that the educational pillar of the experience economy can have a direct impact on the first two factors of willingness to pay. Additionally, the Covid-19 crisis caused a shift in customer behaviour towards sustainable product, with majority of consumers willing to pay a premium for them. Ultimately, the findings have been linked to the educative pillar of vertical farming. The research believes that the combination of education and the experience economy would be the key to vertical farm success.

The researcher developed a research design to statistically test the scientific evidence findings and test for relevant correlations. Initially, quantitative data was gathered with an experimental survey to test the hypothesis of a positive correlation between education on vertical farming benefits and willingness to pay. This was conducted with the use of a contingent valuation model, the application of theory of planned behaviour and analysis through statistical software. The results confirmed the Hypothesis, with a 15.3% increase in willingness-to-pay before and after education. However, they also confirmed that education alone is not sufficient. The results of the survey have been summarised and

were present to three vertical farming expert practitioners as first disseminating act. Feasible educational experiences have been analysed and additional insights on vertical farm problems were gathered. These were included in “implications for future research”. At this stage a discussion for possible intervention was carried with the industry expert as an initial solution co-creation.

the initial solution took the form of an educative campaign to consumers about VF benefits and training to VF companies to teach them how to incorporate the experience economy to their business model. The *University of Gastronomic Sciences of Pollenzo* was individuated as the natural candidate to implement the solution due to its interest in sustainable food production and connection with *Slow Food*. The solution was disseminated with the University and adapted to better suit their needs, resources, and capabilities as a second act of co-creation. The reviewed solution took the form of a *Vertical Farming Consortium*, currently missing in the market, that will provide education and training as its services.

Key players to be part of the consortium have been identified along with an implementation plan to execute a consortium agreement. The implementation phase is expected to last 3 years and considering the newness of the decision, it includes a study phase, a development phase with a pilot test, and full execution.

The framework to evaluate the solution is provided and take the form of a combination between a quasi-experiment and before-after assessment. The solution is deemed effective if the consumers’ willingness-to-pay increases by 15% as per research findings and a further 12.1% a year to align itself with the sustainable food industry.

Furthermore, an academic reflection is provided. This includes reflection over the models and framework used, the value-adding elements, the structure and point of improvements of the research. Additionally, possible limitations and biases of the studies have been identified and explained throughout the paper.

Acknowledgements

The completion of this research paper would have not been possible without the help of my coach Ms Gikas. Her commitment to continuously strive for improvement is exemplary and made me feel proud to be her coachee.

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Lastly, I would like to thank all the stakeholders that took part in the completion of the company project.

Yours sincerely,
Francesco Filipetti

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List of abbreviation

Abbreviation	Meaning
CAGR	Compound annual growth rate
EU	European Union
EXP	Experience economy
LYCar	Launching Your Career
MRQ	Main Research Question
RQ	Research Question
UNISG	Università di Scienze Gastronomiche
VF	Vertical Farming
WTP	Willingness to pay

PROBLEM DEFINITION

Introduction

This paper aims to research the economics of *Vertical Farming (VF)*, and its struggles, with a focus on the low customers' willingness-to-pay (WTP). This concept involves the cultivation of crops in high-rise buildings on vertical surfaces or on a multitude of vertical layers (Beacham et al., 2019). The method was first hypothesized by William Gericke in 1929 and later popularized by Dickson Despommier in 1999. This concept rises on three major aspects: Food security, Sustainability, and educational purpose.

However, VF gives an opposite and unnatural image to the idyllic idea of a local farmer organically growing plants; therefore, VF is suffering customer resistance. This research aims to discover what directly influences WTP and formulate actionable solutions to increase customers' WTP for VF products to permit its immediate application.

Furthermore, it investigates possible combination of the Experience Economy with Vertical Farming that educates people on its benefits and creates engagement. This would make individuals more familiar with the technology and consequently rise their willingness-to-pay. This improvement will be tested both statistically by means of a survey and qualitatively through interviews with expert practitioners.

The Economics of Vertical Farming

Agroforestry and urban greening have one of the highest economic and employment yields, outperforming renewable energies and traditional investment. Research conducted by Vivid, shows that agroforestry yields an average of 54 new jobs for each million invested, 11 more than electric vehicles sector and 25 more than infrastructure development. When looking at economic returns, Urban greening generates \$3 of gross-valued added for each \$1 invested, compared to \$1.8 for electric vehicles and \$1.2 for infrastructures upgrades. With this data in hand, the President of the European Commission Ursula von der Leyen defined the Eu recovery plan to shift towards greener economy as "the opportunity of the century" (Dixson-Declève and Zadek, 2021).

Although VF seems like the perfect solution, many studies and real-life case have questioned its feasibility in terms of costs. The industry is abounding with bankruptcies because of high initial investment for the technology and high running costs (Dahlberg and Lindén, 2019). Moreover, leafy vegetables and micro greens are the only types of crops that have been profitable (Beacham et al., 2019). VF relies on funding rounds to survive, in the range of \$100 million, hoping to find a cheaper way to grow crops through Research Development (Brown-Paul, 2016).

The acceptance to pay a premium for VF products is low as customers are sceptical about the high-tech and perceive it as unnatural (Jürkenbeck et al., 2019; Specht et al., 2019).

Willingness-to-pay

According to previous literature on the WTP for lettuce grown in different methods (Coyle and Ellison, 2017; Gilmour, 2018; Jürkenbeck et al., 2019), VF scored the lowest (3 out of 5), with traditional farming coming on top (4.3), followed by urban greenhouses (3.6). Additionally, VF had the lowest WTP, \$2.23, then greenhouses with \$2.28 and \$2.36 for traditional farming. When people were asked to justify their score, a lack of knowledge was the number one answer, followed by scepticism on the naturality and the safety of

the system. Individuals generally prefer the status quo; therefore, a new product needs certain attributes to win customers' trust.

These are *compatibility* (with existing values), *observability* (of the benefits), *complexity* (it needs to be understood) and *trialability* (it can be adaptable) (Rodríguez Sánchez et al., 2020; Kleijnen et al., 2009). When one or more of these attributes are missing, innovation will fail, as it already happens for 40% of new launched products. Referring back to the survey by Coyle & Ellison (2017) and Jürkenbeck (2019), we can deduct that VF, with its high-tech and futuristic design, is misunderstood and consumers are unaware of its characteristics. Consequentially, they have a low WTP for its products, making it harder for companies to be profitable.

Situational scan

VF is not the first industry to face customer's resistance; many sectors before fought and overcame some misconceptions about their products by showing the added benefits for the consumer. Some VF pioneers are already doing so, with positive examples from the Middle East, Asia, and parts of North America. *Skygreen* and *Citiponics* in Singapore, *FarmOne* in the US and *Badia Farms* in Dubai created partnerships with high-end restaurant that allow the companies to charge for the experience of fresh fruits and vegetables in high density urban setting (Mai, 2019). That is due to a more progressive culture towards technological advancements (complexity), they highly value fresh food and vegetables (compatibility) and the government support these initiatives (observability) (Douglass, 2016). Therefore, they have a higher WTP than most of Northern Europe, where the population seeks cost-effective solutions with lower importance on the taste of the products.

Upon review of successful and best in class, the solutions that have been adopted in the past or in other industry to address customer resistance are presented below.

Integrating experiences

It emerged that co-creation and education are key factors in overcoming customer resistance. These methods have been successful in presenting customers the added-value and benefits of VF products. This was the case for *The Plant* in Chicago, and the *Peri Urban Farms* in New Delhi (Chance et al., 2018; Gill, 2019) (see app.1). We can notice a successful pattern when education and engagement of the individual are combined into a unique experience, which is what the EXP aims to offers. In fact, research shows that although customers still prefer the traditional utilitarian view of a product, they are shifting to a consumerism of experiences, co-creating opportunities and hedonic dimensions (Hunt, 2017; Lee, 2018).

Third-party cooperation

Partnership with third parties, such as governmental and educational institution, can act as a multiplier to widen consumers' knowledge. This has been the case for *SkyGreens*: through Partnerships with Agri-food association, the government and Polytechnic college they sensitize people about VF. This design is more relatable for customers and more suitable for visits and workshop. Additionally, the *Rangsit GreenRoof* started a project to reduce customer resistance to Urban Farming with the support of the Thai government and the inclusion of individuals in the production process (Rangsit, 2021) (see app.1).

Educating the mass

In the early 80s, a now mainstream innovation suffered an initial customer resistance like the one of modern VF, the Screw Cap for wine bottles.

Although the screw cap was a cheaper and more reliable method to conserve wine bottles, it encountered large discontent among customer and retailer, just as VF.

However, Australia and New Zealand were able to overcome this resistance and low WTP by showcasing the power of education people through the cooperation with third-parties (Choi et al., 2010). This proves that if both aspects are well combined together, it is possible to overcome any customer resistance to buy (Pretorius, 2018) (see app.1).

The Experience Economy

Upon review of the situational scan, it has been shown that best practices have used the combination of educative purpose where the consumer is co-creating their products to overcome customer resistance to buy their products. This service where the guest is playing a part in the process, thus co-creating, is called an experience (Chang, 2018). Experiences are the last product stage in the evolution of the economy. They are adding value element that do not focus on a product or service but on the consumer itself. This permits consumer to benefit a more unique experience and for the producer to differentiate themselves and achieve higher profits (Oh et al., 2007). In fact, producers can charge for premiums for their product, especially when combined with green products. The benefits of the EXP would match what VF is missing in terms of economic structure (Swinnen et al., 2012).

There are four domains of co-creation in the EXP:
Entertainment – Passive role as listeners with full caption of their attention. Represented by a documentary on VF.

Educational – active participation and concentration on the experience. Workshops aims at educating people on the VF growing method of the crop life where guests can touch with first-hand VF.

Escapist – active participation that influences the performance and they are part of it, virtually of physically. Here guests are incorporated in the growing or harvesting process and they impact the outcome.

Aesthetic – passive participation as observer with a visual or physical connection. This refers to artistic designs that some park or lands adopted, such as the botanical garden of Keukenhof (Chang, 2018)

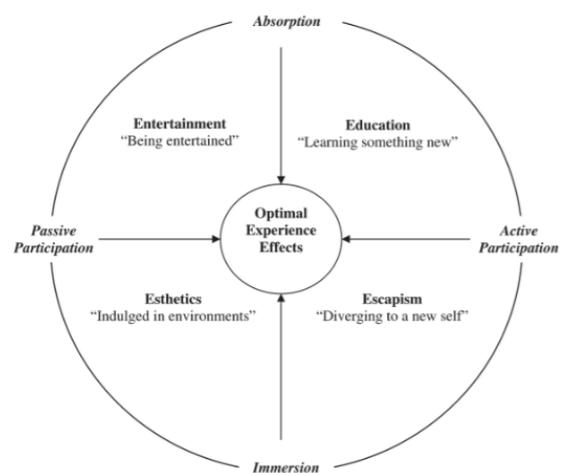


Figure 1 EXP domains (Chang, 2018)

Reason for research

The rise of vertical farming is very actual; climate change and the Paris agreement boosted the interest in the technology. Sustainability ambassadors and SDG community are fast growing movements and immediate action is required to invert the negative trends of mass production, CO2 emissions and rising temperature. Vertical Farm propose itself to be part of a greener future in the era of smart cities. As highlighted by United Nations, embracing this innovation could address Zero Hunger (SDG2), Good Health & Well-being (SDG3), Decent Work & Economic Growth (SDG8) and Sustainable Cities (SDG 11). Additionally, Urban greening account for one the largest economic multipliers with USD3 of gross-added value for each USD1 invested. Consequentially, vertical farming is experiencing its golden rush. However, as all new innovations, it is not yet a consolidated industry and it is facing many problems, which ultimately results in a low consumer's willingness-to-pay and bankruptcies. The problem analysis suggested that these are linked to a poor education on the topic and lack of engagement with consumers. These problems could create large opportunity cost in environmental, societal, and economic growth. This would harness the USD3.7 trillion EU plan to foster green activities to launch the economy post-COVID (Chen et al., 2020).

As found with the situational scan, Education and the Experience Economy could play a central role to overcome consumer resistance and launch VF product into the mass market. However, we stumble upon an important discussion on how combine these two factors, their real effectiveness, feasibility, and possible moderators; therefore, research that investigates these factors is needed.

Main research question

"How can Education and the Experience Economy raise customers' willingness-to-pay for Vertical Farming products?"

For research goals see app.2

ANALYSIS AND DIAGNOSIS

Willingness-to-pay

Factors influencing Willingness-to-pay

WTP can be defined as the maximum amount an individual is willing-to-pay for an extra unit of a good. At that specific price, the individual is neutral in making the purchase as the cost-benefits analysis is in equilibrium. The more an individual consumes a good, the more its WTP decreases. This concept is called diminishing marginal benefits. Once we acquire all the individuals demand curve we can create an aggregated demand curve (see app.3) (Shogren et al., 1994). This is the process of adding all the quantity demanded for all the individuals at a set price. However, this demand curve is not fixed in time, it can shift depending on 5 factors:

1. Tastes and preferences

This takes into consideration what people personally enjoy or value. This factor is directly related to education about a product, the more a consumer is aware of the benefits of a good, the more he will be willing-to-pay for it. When referring to VF this considers how much a person value certain characteristics of a product, such as its quality, freshness or method of growth (Acemoglu et al., 2015).

2. Income and wealth

A change in income and wealth affects the WTP of an individual for a good or service. This means that you can buy more quantity of the same good or switch to a higher quality product, for example going from canned goods to fresh and organic food (Acemoglu et al., 2015).

3. Availability and price of related goods

Most of goods are related and can be said to be either substitutes or complementary. A substitute is the case of traditionally farmed vegetables and VF products. If a storm would damage crops of traditional farming, it would reduce its availability, therefore people are more likely to switch to VF products. Complementary is the case between LED lights and VF. If the price of LED lights drop, so does the price of VF (Acemoglu et al., 2015).

4. Number and scale of buyers

The more people demand a good, the more they will be willing-to-pay to secure its acquisition (Acemoglu et al., 2015).

5. Belief about the future

These takes into consideration what people believe will affect their daily lifestyle in the future. As an example, many people are worried about the climate change even though they are not directly affected by it in the short term. If consumer believe that the current world carbon intensive use is not sustainable for the planet, part of consumers will switch to eco-friendly products, such as VF (Acemoglu et al., 2015).

Paying a premium – the Covid-19 effect

According to the Eurobarometer Public opinion survey of spring 2021, consumers are placing a growing importance on sustainability and health especially on the food sector (Eurobarometer, 2020). These behavioural changes are connected to the current Covid-19 pandemic; people have realized the importance of Sustainable Consumption (SDG 12) and decided to act upon it (Perkins et al., 2021). Consumers' purchase has shifted towards plant-based diets and organic products, and they are increasingly willing-to-pay premiums for it. According to a survey conducted by McKinsey, 51% of respondents said that they are willing-to-pay a premium for sustainable groceries since the beginning of the pandemic (Gatzer and Roos, 2021). But sustainability is not the only factor, health and taste became the two top consideration when making a purchase, for a trend called "healthy hedonism" (Gehin and Talanova, 2021). There are some characteristics for which they are willing-to-pay more, and the findings are presented below:

For which criteria would you be willing to pay more for products?, %

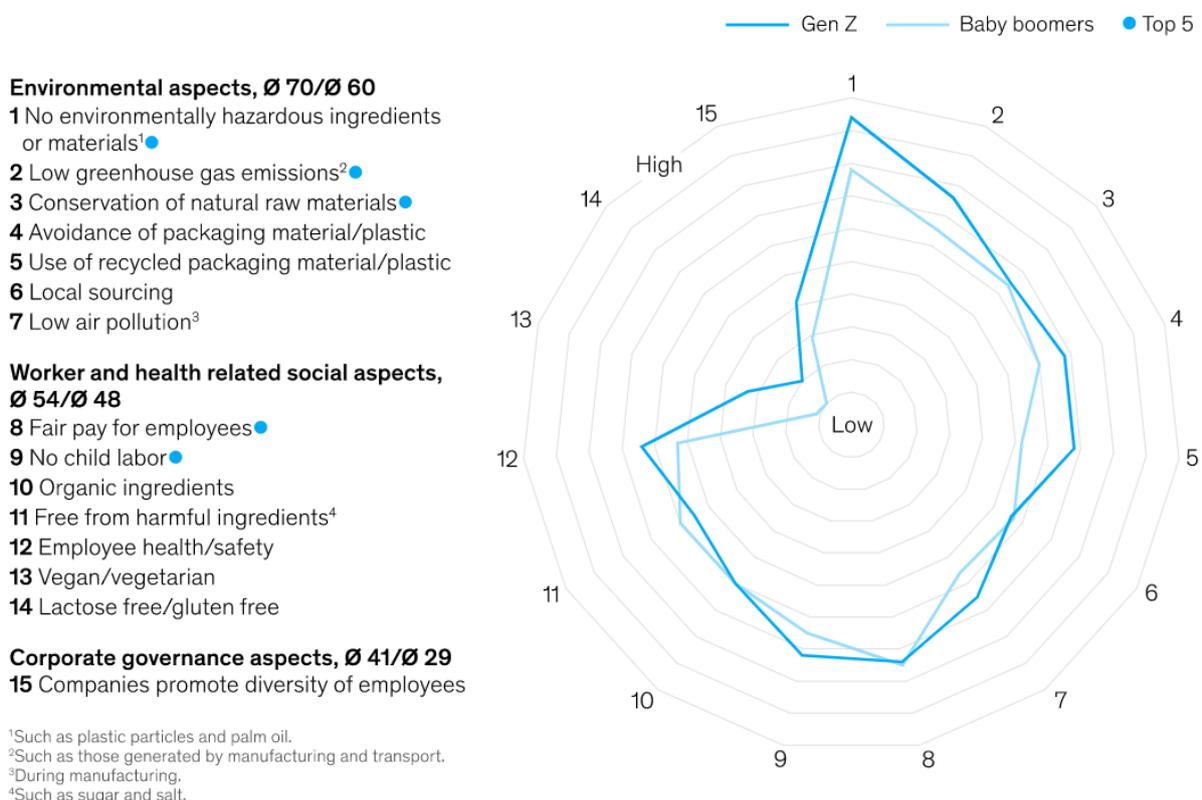


Figure 2 Paying a premium (Gatzer and Roos, 2021)

According to their findings, the top five criteria for which consumer would pay a premium are: no environmentally hazardous ingredients or material; fair pay for employees; low greenhouse gas emission; no child labour; conservation of natural raw materials. Finally, they researched the most valued categories for which consumer would pay more if they were sustainable. Fresh Fruit & Vegetable and Meat & Fish were the top categories (Gatzer and Roos, 2021). Additionally, customer are very influenced by the packaging and labels; they are more willing-to-buy products that are traceable and transparent about the ingredients and value chain (Morone et al., 2021).



Figure 3 Preferred categories (Gatzer and Roos, 2021)

This pressure to switch towards sustainable practice does not solely come from a customer demand. There is a growing interest from financial markets to invest in green sectors as “The growth rate for consumer goods marketed for sustainability is nearly four times higher than the market average. As a result, sustainability is increasingly a strategic differentiating factor for retailers and a source of value and growth in often challenging, stagnating market environments” (Gatzer and Roos, 2021). According to Statista (2018), sustainable food industry is expected to achieve a compound annual growth rate of 12.1% until 2026. Correspondingly, many reports have found a correlation between improved companies’ financial performance and application of ESG (Environmental, Social, and Governance) practices in fields where sustainability matters (Alsayegh et al., 2020; Cornell and Damodaran, 2020; Signori et al., 2021).

However, putting a label that state the product as organic or sustainable it is not sufficient; a certification is needed. Many consumers are wary of generic labels and place their trust, and money, in certified brand or logos (Morone et al., 2021). According to literature, clear certification schemes and labels for sustainable products can boost market penetration and brand awareness (Morone and D’Amato, 2019; Ladu and Blind, 2017).

Using the Experience economy to influence WTP

We can define experience a service or a product that connects with its users and it is able to deliver a multisensory dimension which goes beyond utility (Chang, 2018).

It differs from product and service economy as "it is an event that engages individuals in a memorable and personal way" (Oh et al., 2007), rather than a customized service or tangible items.

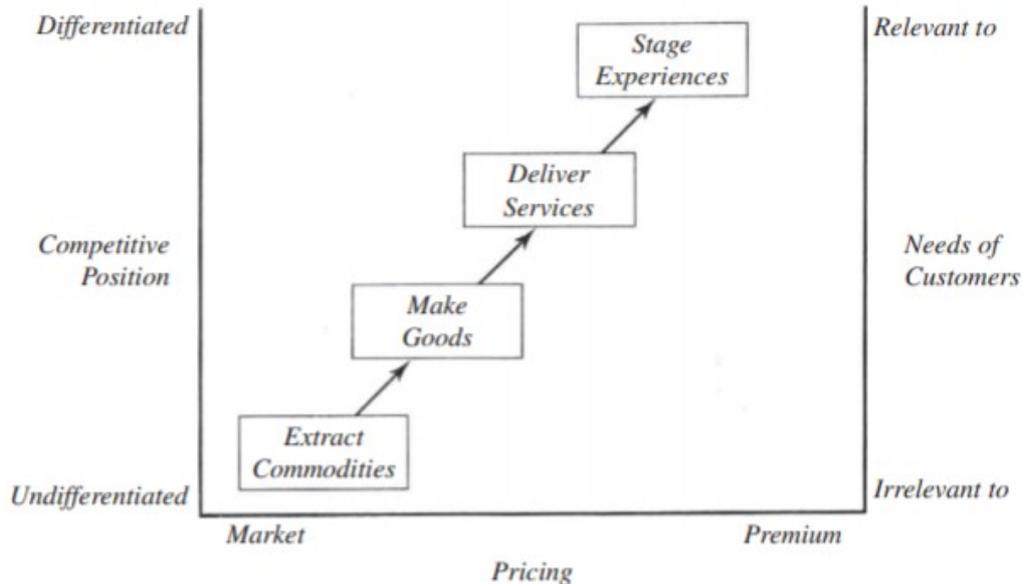


Figure 4 EXP stages (Adhikari, 2015)

Studies have investigated the financial value of the EXP, if it generates greater revenues than the service economy. It was found that experiences actively influence emotional attachment and loyalty to a brand (Ibid) and if they successfully capture the consumer interest, they can be charged with a premium. This is especially true for green initiatives which is still relatively small compared to the product market, but it is experiencing the highest CAGR. Multiple studies conducted in East Asia showed that most respondents purchased food and beverage related experiences and that nature-related experiences would be the preferred choice for future purchase (Ibid).

Green practices may satisfy guests' psychological emotional need and this satisfaction, in turn, influence guests' WTP premiums for environmentally sound practices.

If then consumers are educated on the green benefits of VF, it may then lead to a higher WTP for its products.

The Consumer Buying Behaviour

From the situational scan, it was found that education and the EXP can potentially impact WTP. The next stage is to understand the customer buying process to know in which step to apply these two factors. The consumer buying behaviour is an economic model that depicts the decision-making process of customers when they make a purchase. It was first believed that decisions were purely based on economic values, called a process of perfect rationality. However, as first understood by Simon and Peterson (1947), there would be too many variables in play and people's processing ability is limited. This ideology was the base for the models of Engel, Blackwell and Miniard (1995), Nicosia (1966) and Howard and Sheth (1969) (see app.4). These models have a similar 5-step backbone, that marketers use for their work, and it is explained in the figure 5 below:

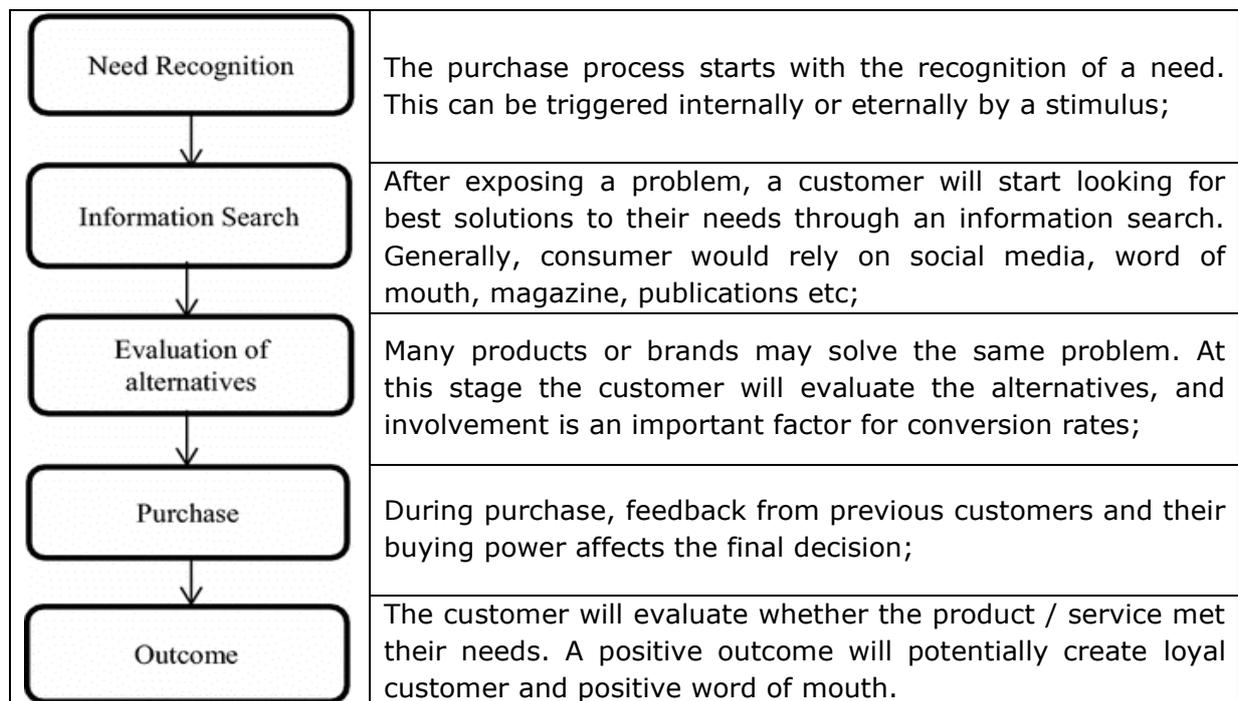


Figure 5 Consumer Buying Behaviour (Casas et al., 2004)

Linkage with the foundation of Vertical Farming

VF surges on three pillars: food security, sustainability, and education (see app.5). For the relevance of the study, Education and Sustainability were examined.

Education

VF can be engineered in many forms and sizes. It provides educational opportunities to make people aware on how their food is grown and what impact climate change has on the process. Princeton University was one of the first academic bodies to understand this versatility and they launched a VF-project with elementary school in 2018 (Haynes, 2018).

Additionally, its high-entry jobs opportunities, require highly skilled jobs. To make up for this demand, government are stimulating agricultural education, with the Netherlands being a clear example. They offer many level of education on VF, going from vocational training, Bachelors and University levels, such as the renowned Wageningen University (den Besten, 2019).

Education is a fundamental of VF and it aims to reconnect people with nature by making them familiar with agricultural processes.

This educative aspect makes VF particularly suitable to adopt the EXP to raise its WTP, in fact, education is one its pillars. Moreover, both make use of third-party collaboration to foster their messages, therefore, if united, they would result more effective (Anderson and Freebody, 2013).

Sustainability

Indoor vertical farming is a controlled environment where variables such as storms, diseases, insects are taken out, therefore there is no need for any chemicals or fertilizer. Its products are fresher, they reduce pollution and they are full of nutrients without any use of pesticides (Möller Voss, 2013). CO₂ emissions are cut down because there is no use of transportation, refrigeration or harvesting emissions. However, it has been questioned whether VF is sustainable due to the high use of LED lights. However, R&D managed to make LED more energy efficient with a longer durability. If we now look at the ratio energy consumption relative to quantity produced, VF is the most efficient growing method (Beacham et al., 2019).

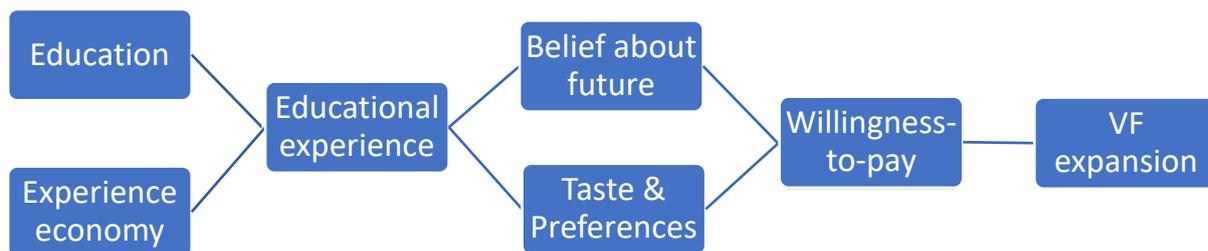
Conclusion

VF presents all the top-5 sustainability features that directly lead customers to be willing-to-pay a premium (Eurobarometer, 2020; Gatzert and Roos, 2021).

However, people are not aware of these benefits and the complexity of the method led to misunderstanding of the products. Nonetheless, the educational aspect of VF makes it possible to use the educational pillar of the EXP to educate the mass about its benefits. As the literature review assessed, this would directly influence specific WTP factors. If we then overlap the two domains, we can understand what factors of WTP can be influenced by the EXP. As the engagement and hedonic sensation can generate emotional changes, the EXP is suitable to positively change "*Tastes and preferences*" and the educational side can change "*Belief about the future*" (Acemoglu et al., 2015). Consequentially, it would lead to improved economics of the VF sector and ultimately to VF expansion.

EXP can generate more "*income and wealth*", as the green sector is one of the highest economic multipliers. However, this would be an indirect effect once the customer resistance problem has been solved. This also mean that the EXP would be ineffective with regards to "*availability and price of related good*" and "*number and scale of buyers*" (Acemoglu et al., 2015).

Conceptual framework



(Abbasi and Aamir, 2021; Acemoglu et al., 2015; Nandi et al., 2017; Swinnen et al., 2012)

Methodology

Research design

Contingent valuation method

A contingent valuation is a standardized and widely used method to estimate that consumers have for a good. It uses a questionnaire to directly ask people how much they would be willing-to-pay for a specific product or service, in this case VF products. Contingent means that it creates a realistic hypothetical market situation, to assess WTP (Blomquist and Whitehead, 1998). The underlying theoretical structure of this framework is the demand curve, as explained in the literature review. This would show the price distribution and it can be used to represent the estimation of price elasticities.

The preferred approach is to ask an open-ended question where respondents can directly state their WTP. This gives times for respondents to keep in mind all external influences factors (Venkatachalam, 2004) (location, education, age, knowledge of product, taste & preference, belief about the future).

Survey design

The questionnaire gathered quantitative primary data and it was an experimental survey, as the researcher aims to test a positive correlation between education about VF benefits and WTP.

First, it was tested to what extent people value the characteristics of VF that falls under the category of "Taste and Preferences" and "Belief about the future". These include for the first freshness of products, origin, quality, pesticide-free, organic and fair-trade; the latter consist of green practices and climate change awareness when making a purchase (Acemoglu et al., 2019).

It was then asked the maximum price they were willing-to-pay for a bio product, that include most of the above-mentioned characteristics.

The researcher aimed to test a positive correlation between a person that highly takes into consideration "Taste and preference", "Belief about future" and their WTP; the more a person values quality the more they would be willing-to-pay for a high-quality product. The second research question aimed to establish the WTP for VF product. Different questions related to WTP were asked according to the theory of planned behaviour, where multiple questions measure an underlying variable in the same direction (Ajzen, 2020). The first set of question was asked without providing any information on VF. This assessed the current level of perceived knowledge that people have for VF. Then, respondents were educated on the topic of VF. In section 3, an explanatory video described the technology, qualities, and benefits of VF. The same set of questions, to ensure reliability and consistency, was repeated to assess a change in their WTP. The researcher expected to find a positive correlation between the two factors, meaning that people would have a higher WTP after they have been educated about its benefits.

The last research questions served to define what characteristics of VF are the most appealing. It was an open question after the explanatory video to check what the most valued features for potential customers were.

This question served to understand on what aspect the solution design should focus on. All the questions were based on a 7-point Likert scale (for survey design see app.6).

Interviews

The researcher interviewed Paolo Pezzola, an undergraduate at the Wageningen university that worked in a VF start-up in Milan, David Turina, the sales representative at a company that supplies VF technology called Freight Farm, Chris James, a certified horticulturist, and crop adviser for VF.

The researcher summarised the findings from the survey and shared with the practitioners. This information was the base to construct the solution design (Breen, 2006).

RQ1: What are the components and sub-components that influence willingness-to-pay for VF?

1.1: *Taste & Preferences* - Freshness of products, quality, origin, production method, organic, pesticide-free, fair trade.

H0: There is a correlation between Taste & Preferences (how much consumer value specific product characteristics) and willingness-to-pay; (the higher they value the characteristics of the product, the higher the willingness-to-pay)

H1: There is no correlation between Taste & Preferences and willingness-to-pay.

1.2: *Belief about the future* - Concern about green, environmental and climate change issues.

H0: There is a correlation between Belief about the future (how much a consumer is concerned about societal issues) and willingness-to-pay; (the more a customer is concerned about societal issues, the higher the willingness-to-pay)

H1: There is no correlation between Belief about the future and willingness-to-pay.

RQ2: What is the willingness-to-pay for VF products by the consumer of fresh fruits and vegetables?

2.1: Initial WTP for VF products

H0: There is a difference between WTP for VF products before education and BIO products from traditional agriculture; (BIO from traditional agriculture > VF before education)

H1: There is no difference between WTP for VF products before education and BIO products from traditional agriculture.

2.2: WTP for VF products after educational video

H0: There is a correlation between Education (Knowledge of the product) and willingness-to-pay; (the higher the awareness of the product benefits, the higher the willingness-to-pay)

H1; There is no correlation between Education (Knowledge of the product) and willingness-to-pay.

H0: There is a difference between WTP for VF products before education and WTP for VF products after education; (VF after education > VF before education)

H1: There is no difference between WTP for VF products before education and WTP for VF products after education.

RQ3: What characteristics of VF are the most appealing to individuals?

RQ4: What are suitable experiences from the EXP that can be combined with the concept of VF?

Sampling

The population size was chosen from three different customer profile: the early adopters of VF, potential customer (green consumer and people with an interest in sustainability) and adverse customers. This is done to understand what is most valued by current customer, how green consumer react to VF products and identify what VF is missing to win those potential customers. The aim was not to win the adverse customer but gather important feedback and information on why they are against this innovation and prevent potential consumer to become adverse because of false misconceptions. The survey was shared through LinkedIn groups that included at least one of the chosen profiles. Additionally, the survey was shared through direct mailing. The survey was based on voluntary participation, anyone from the group could answer. Considering the project constraints and willingness-to-answer experienced in previous surveys, the research expected at least 150 answers. For an overview of the groups, see app.7.

For the interview the researcher relied on their network to identify industry expert. Three industry experts were contacted through direct invitation. These include Paolo Pezzolla, a postgraduate from Wageningen University Working in VF start-up in Milan; David Turina, Account Executive in the Business Development department at Freight Farms, a company building VF containers; Chris James, Head Grower at Indoor Farming Cooperative.

Ethical data Governance considerations

The gather and use of Data as ethical implications that needs to be acquainted for. The research follows the four-core goal of data governance, quality, privacy, security, and compliance. The research paper complies with the General Data Protection Regulations to process personal Data (Voigt and von dem Bussche, 2017). A consent form was created to ask permission for the processing of their Data. This form informed customers on their right to view, edit and delete data, or withdraw any permission previously given (Tikkanen-Piri et al., 2018).

Research findings

Survey

The survey gathered 155 responses from the various groups. The researcher run the statistical tests using the SPSS statistical software to answer the research questions. To assess the successfulness of the educational video, the researcher conducted a Repeated Measure and sample T-Test to check the difference in willingness-to-pay and knowledge after education. Before all the data were analysed, reliability tests were run to ensure the validity of each data and the creation of new variables through aggregation. All the tests generated a Cronbach alpha value, a statistical measure for consistency and reliabilities, higher than 0.75 meaning that it was safe and reliable to compare two or more variables together (for the research findings see app.8).

RQ1: What are the components and sub-components that influence willingness-to-pay for VF?

Regarding RQ1, the researcher initially hypothesized that there would be a correlation between people with a higher score in Tastepref and BeliefFuture with regards to the WTP in Vertaafter. A regression was run with Taste & Preference and Belief about the future as independent variable with regards to the willingness-to-pay for vertical farming products as the dependent variable.

Both variables Tastepref and BeliefFuture had statistical significance when tasted alone with a positive weak correlation (0,302 and 0,303). If tested together, only BeliefFuture had statistical significance (0,262). Out of the three components that create the variable BeliefFuture, Green certification had the strongest impact (0,292) followed by Food scarcity (0,197) while Climate change had no statistical significance (p. value 0,074).

With regards to the sub-components of Tastepref, it was recorded a statistical correlation for Organic (0,305), then Pesticide-free (0,292) and fair-trade (0,175).

Conclusion

Two possible causes were identified: 1 the sustainability aspect is the primary driver to make the targeted consumer pay for a premium; 2 VF is perceived to better fit their sustainability criteria rather than taste and preferences.

The underlying cause was identified after reviewing the question "Why would you buy Vertical Farming products over other Farming methods?".

Most of the answers led to believe that the sustainability factor is generally more influential to make the targeted consumers pay a premium. Nonetheless, some aspect of Taste & Preference have a significance correlation with WTP; these are Organic, Pesticide-free, and Fair trade. These survey findings are in line with the literature review (1.1 paying a premium – the Covid-19 effect). Therefore, when creating a marketing campaign, the researcher suggests VF companies to focus more in general on the ecological aspect of their products as well as directly include the fact that their products are Organic, Pesticide-free and Fair-trade (Gatzer and Roos, 2021).

RQ2: What is the willingness-to-pay for VF products by the consumer of fresh fruits and vegetables?

To answer this research question two tests were run: one-sample T-test to express willingness-to-pay in a descriptive way, and then a Repeated Measure test to define the influence of the knowledge video (Education) on the WTP.

- **One-sample T-test:** it was found a statistical difference between WTP for Biological and Vertical farming products. The mean for VF was €3,56/kg, 9,2% lower than for Bio products €3,92/kg.
- **Repeated Measures:** successively to the explanatory video, therefore the variable education, the WTP for VF products increased to a mean of €4,12/kg, for an increase of +15,73% (+€0,56/kg). Compared to the Bio products, the new mean was 5% higher (+€0,20/kg).

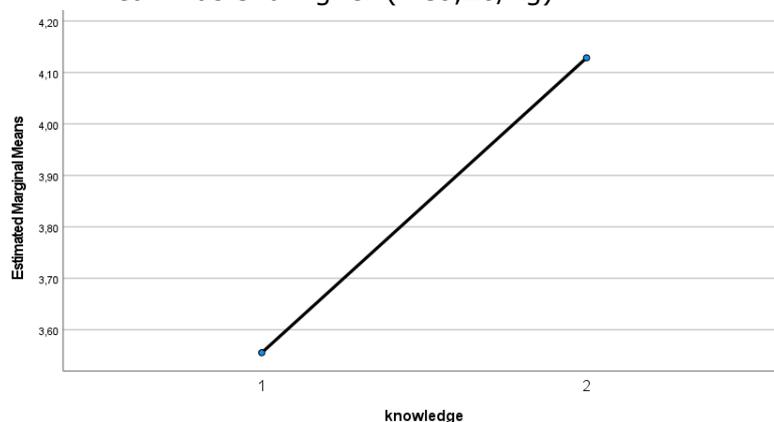


Figure 6 Repeated measure

Although there was no statistical significance between the variables Age, Location and Study with regards to a higher increase in WTP, it is important to point out that the millennial generation (age group 25-34) had the highest WTP for VF products after watching the video.

Conclusion

In the initial hypothesis, the researcher believed to find a significant difference between the WTP for VF products and for Bio products. This was confirmed by the one-sample T-test; the targeted consumers have a 9,2% (€0,36/kg) higher WTP for Bio products from traditional agriculture than from vertical farming before access to knowledge.

The second formulated hypothesis stated that although education would prove to be effective in increasing WTP, the increase would not be sufficient. Therefore, the EXP would provide the extra step in making VF companies more profitable. As we can see from the repeated measure test, the knowledge video was effective, delivering a +15,73% (+€0,56/kg) increase in WTP compared to the first measurement and +5% (€0,20/kg) higher than Bio Products. This could mislead people in believing that the educational video was sufficient, and no other action should be taken. However, as it was mentioned in the literature review, VF has a production cost ca. 23% higher than Bio products, therefore, although education significantly increase WTP among the targeted consumers, it is not sufficient to make VF competitive on the market.

RQ3: What characteristics of VF are the most appealing to individuals?

To answer RQ3, survey respondents were asked why they would be vertical farming products and given the freedom to add any additional comment on the research and the topic. As mentioned in RQ1, the ecological factor was the most frequent, with 65 mentions (42%). They mentioned the low CO2 footprint and the reduced use of land and water resources. The second most frequent answer was the health aspect with 16 mentions, especially the elimination of any chemicals and the additional nutritional values compared to traditional farming. The third most frequent comment was about quality with 13 answers. However, respondents showed scepticism over the actual quality of VF, saying that they would first have to try it before making a purchase. The last relevant comment was regarding the novelty and curiosity generated after the video with 10 mentions. Then there were a series of isolated mentions that differed from the rest and that have been considered of importance to be mentioned during the interviews. Those have been summarized in the appendices.

Conclusion

Here, there are some similarities with the conclusion of RQ1. It is safe to assume that the components that are most valued by the targeted consumers are also the one that affected the most their WTP. In fact, hypothesis was reflected and confirmed in the data analysis connected to RQ3. The additional comments that have been summarize are the basis on which the researcher created the qualitative question for the interview with industry expert to gather data and analyse RQ4.

Interview with expert practitioners

The interview followed a semi structure, with the intent to first gather background knowledge about the VF experts, then ask for opinions about why most VF fail today and what they believe the future of VF will be. Lastly, the researcher presented a summary of the research, with a focus on the research findings, and asked the interviewee to provide feedback on the process and discuss about feasible experiences to apply to VF. The interviews have been carried out to answer RQ4 and be the start point for the solution design of the next chapter (for interview summary see app.9).

RQ4: What are suitable experiences from the EXP that can be combined with the concept of VF?

Education: Educational experiences are the most feasible activities in VF. This is because they do not require additional expenses. This include on-site and off-site activities. For on-site activities it was suggested to transform part of the building into a touristic centre. It is important to make people see the methods of production to eliminate any misconception about the non-naturality or chemical use in VF. Although one of the experts considers entering the VF as value-adding, it is considered too risky by the other experts as it creates a breach in the closed environment (James, 2021; Pezzolla, 2021). This type of experience can only be carried out in a specific portion of the VF, like a showroom that is not used for production. The expert who suggested this works for a company that produced hydroponic shipping container farm therefore for him it would be beneficial to have one container just for educational purposed without interfering with the real production. The most feasible experiences include site trips to visit the farm, touristic centre with workshop about VF (Turina, 2021).

Personalization: a big trend in many sectors is the possibility to provide personal experiences. Thanks to the general fast turnover of VF (crops can be grown in just 15 days) you can offer a high degree of personalization to both restaurant owner, local community and supermarkets (Turina, 2021).

Esthetic experiences: according to the expert design is a key component in the success of the farm, especially for marketing reasons. The design impact both the farm itself and the packaging chosen for the products. It is possible to shock the customer by creating a futuristic design that breaks with the past of agriculture or follow an “instagrammable” approach where the aesthetics of the farm and packaging make it exclusive or transport your mind from the city centre to a green landscape.

Lifestyle: two experts pointed out that VF could work great as the heart of a commercial or residential complex. The idea is to create add-ons where you do not just experience tasty fresh food, but it becomes a lifestyle. You create a brand that includes gym, smoothie & salad bar, restaurant, CSA centre, boutique shop with branded merchandise and so on. Although the perfect brand developed as ex novo, the experts suggested it is still possible to create a similar experience through exclusive partnerships.

Limitations and biases

The research method used to gather quantitative data is subjected to biases. First, the size of the sample does not represent the entire population, therefore it can affect the results when designing a solution (Delice, 2010). The population size of the targeted groups counts a total of 1,435,519 members, which would require a total of 385 answers with 95% confidence level and 5% margin of error. The current situation satisfies the criteria only at a 7.9% margin of error.

The complexity of the topic could have thrown off some participants that would feel obliged to give an answer before they created an opinion on the subject. This is particularly the case for the survey section before the knowledge video. Participants might have put random answers that did not reflect their real opinion on VF or WTP. However, this action was necessary to ensure a closed environment during the experiment and test the impact of education on WTP.

Reachability to expert practitioners was limited due to COVID-19 regulations and time differences with other continents. 2 of the 3 interviews were conducted through online platforms, therefore qualitative data could be tempered by distractions, such as the chosen environment bad connections (Williams et al., 2020).

SOLUTION DESIGN

A solution was designed to solve one of the current VF problems, the customers' low WTP for its products. The solution is based on the outcomes of the survey and from the input of the expert practitioners during the interviews. As it was discovered through the situational scan, potential customers are not aware of the benefits of VF, therefore, they are not willing-to-pay a higher price compared to other farming methods (Coyle and Ellison, 2017). The solution aims at educating the mass on these benefits to raise their WTP and boost the expansion of VF. The survey results confirmed the hypothesis that education can influence "Taste & Preference", "Belief about future" and directly raise WTP (Acemoglu et al., 2015). However, as hypothesized, education alone does not have a sufficient. Therefore, the EXP comes in hand to create emotional attachment to the brand and WTP to pay a premium for the experience (Adhikari, 2015; Nandi et al., 2017). Expert practitioners from the VF field offered valuable insight to understand which educational experiences are the most adapt and feasible. The solution was ideated based on the above consideration to be carried out by an international player with the right set of resources and capabilities.

Pollenzo University of Gastronomic Sciences

The researcher individuated University of Gastronomic Sciences (*UNISG*) of Pollenzo as a perfect fit. The university was established in 2004 by the *Slow Food* association in collaboration with Piedmont and Emilia-Romagna Italian region. Its goal is to "create an international research and education centre for those working on renewing farming methods, protecting biodiversity, and building an organic relationship between gastronomy and agricultural science".

The university possesses high quality educative resources and many partnerships with governmental and private associations to foster their message of educative food (Pietrykowski, 2004). Moreover, the stakeholders involved include a network filled high ranked individuals, academic figures, and local communities. Its alumni network is composed of the future professional figure in the fields of food science, environmental politics, economics, and ecology. *UNISG* research benefits from a 50 different product sector network with companies that cover production to distribution and commercial as well as institution, public bodies, and banking foundations. These supporting members aim to cooperate with the university to "spread a multidisciplinary attention to sustainability and an in-depth gastronomic culture". The intricated network of *UNISG* creates a situation in line with the findings of the situational scan that partnerships act as a multiplier effect, (for further elaboration see app.10). Therefore, when creating a solution design, resources, and capabilities of the *UNISDG* have be taken into consideration along the values of *UNISG* and the *Slow Food* association that founded the university. These include "commitment to bring back the essence of food and respect its producers while working in harmony with the environment and the ecosystem" (*UNISG*, 2021). They strongly believe in the importance of food education for the younger generations, and both already host events and conduct research on VF.

Co-creation

The solution was co-created with the industry experts interviewed for the research findings and Silvio Barbero, vice-headmaster at Pollenzo and co-founder of Slow Food. The first were asked for insight on the future of VF, which trends to keep in consideration, what are the current struggles of VF companies and solutions to win customers (see appendix for interview summary). It was found that vertical farming is experiencing its “golden rush” with many businessmen seeking opportunities without the proper agricultural knowledge and business acumen. They believe that growing vertical follows the same step as traditional farming; therefore, there is a need to train them (James, 2021; Pezzolla, 2021). The first draft was then reviewed with *UNISG* to better tailor the solution to their needs. *UNISG* is currently doing research on Vertical Farming, and it is interested in promoting it because of its benefits. However, Slow Food is the promoter of traditions and local food, something that could clash with vertical farming. However, after careful review it was found that these perspectives could co-exist (Barbero, 2021).

Based on the research findings, the insights from industry experts, review of *UNISG* & the *Slow Food* organization, the solution takes the shape of a Vertical Farming Consortium, missing in the market. It includes universities, research centres, organizations, grocery chain and VF companies to form a multidisciplinary consortium whose mission is to eliminate barriers and empower VF companies to foster the expansion of VF. The major services offered are education to consumers about VF benefits to eradicate stereotypes and training to VF companies to provide them with the right set of skills and knowledge to incorporate the experience economy with their business model. Furthermore, Slow Food mission is to bring back ancient crop varieties to maintain traditions. However, these crops are difficult to grow because they require climate conditions of the past. Vertical farm would be the ideal solution to re-create this environment and be a bank of sedimentation. The research centre will be a datacentre for research on ancient variety. Although the coexistence of traditional and Vertical farming is viable, it is further elaborated in implications for future research.

Consortium

Although *UNISG* possesses great resources and capabilities, the VF problems are too complex to be addressed by a single entity. A consortium is an agreement made by two or more individuals, companies, governments, or university to collaborate towards a common objective. Each entity under the consortium’s agreement remains independent but it agrees on specific obligations (ICC, 2021).. It is a collaborative approach where resources of different organizations are pulled together, thus keeping costs down and creating a streamlined organization (Mestre et al., 2007). “A consortium can provide a structure that can support smaller frontline organisations (VF companies) to win contracts (grocery store) and deliver services (experience economy) that they otherwise would not have access to” (Theodoridis et al., 2021; ICC, 2021). A university-private industry type of consortium has been individuated as the most effective to educate consumers, provide training to VF companies and create a research centre for the development of VF. The main players in the research centre are Hotelschool The Hague, the Wageningen University and *UNISG*. HTH possesses vast knowledge in the field of experience economy and business hospitality and knows how to disseminate this knowledge to its stakeholders; the Wageningen university is the leading research institution in the environmental sciences; *UNISG* is the promoter thanks to its connection with the Slow Food organization.

Educative campaign

The educative campaign for customers will influence the consumer buying behaviour at multiple stages. In the literature review the consumer buying process was analysed. Although still relevant, the models created by Engel, Blackwell and Miniard (1995), Nicosia (1966) and Howard and Sheth (1969) are now less reflective of modern practices. They are still predominantly economic models, now outdated, since consumer behaviour is shifting towards emotions, experience, and belief. This shift is mostly due to the various crisis that have happened since the first ideation of these models; these are the 2008 crisis, climate change and Covid-19 Pandemic. Therefore, a new model for the solution design has been created (figure below). The solution will act as a stimulus. This will create exposure in the mind of consumers; they will research the current problems in the fresh food supply chain and the educative campaign will market vertical farming as the solution (N. and Ali, 2016). It is important that the message arrives in a clear way, easy to understand. The campaign needs to focus on the organic, pesticides-free & fair-trade aspect of VF (Taste & Preferences) as it was found that these characteristics have the highest correlation in increasing WTP for VF products. Additionally, the campaign needs to create a green certification especially for VF products to distinguish it from competitors during the Product evaluation stage and stress how the innovation is a possible solution to Food scarcity (Belief about the future). As suggested by the industry experts, a partnership with a well-known grocery chain is essential as a multiplier effect (Butenko and Kot, 2019).

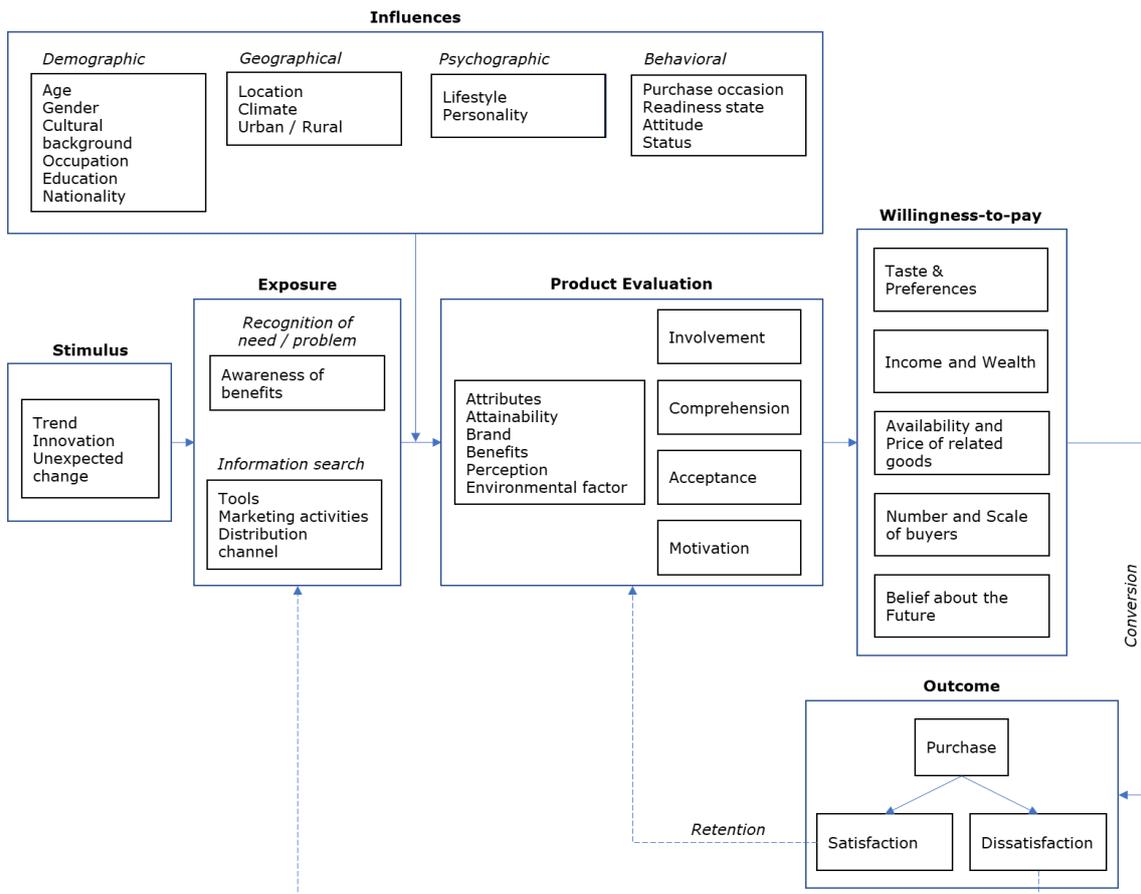


Figure 7 Ideated Model (Nandi et al., 2017; Chinie et al., 2021; Turrell and Kavanagh, 2006; Garcia et al., 2007; Milner and Rosenstreich, 2013; Nicosia et al., 1966; Engel et al., 1995)

Training programme

The consortium will empower VF companies to stand out in the product evaluation by adopting the experience economy. This will create involvement with the products, help customer to comprehend the technology and more easily accept it (Solankey et al., 2020). This entire momentum created ultimately serve to make customer pay a premium for VF products and have a high purchase rate (Adhikari, 2015).

The “*Association for Vertical Farming*” is the leading non-profit organization for the development of the Vertical Farming industry. It collaborates with government to review policies to favour the expansion of VF. Although this is an important aspect, many VF companies lack economic and market knowledge to gain from these policies. Therefore, the training programme aims at empowering them with valuable business knowledge.

A partnership between the *AVF*, *UNISG* and *Slow Food* is deemed necessary to create a global centre for research and support for existing and future VF companies. This partnership creates a centralized research centre for VF that the AVF already partially possess, and it enlarge it with the industry knowledge of *UNISG* and the *Slow Food* association. As a matter of fact, the AVF focuses mostly on the sustainability aspect of VF, while the research findings suggest that consumers are also attracted by other characteristic (See *educative campaign* paragraph).

IMPLEMENTATION

The solution designed is a novel and hypercomplex decision. VF is a new sector facing different problems and not enough evidence is present to effectively inform decision-makers. Therefore, creating a centralized research centre for VF scientific literature can better inform future decision-makers on how to expand the industry. Moreover, a pilot test and systematically assess the solution are critical component of the implementation.

Between each step, implementation fidelity will be assessed. This describes the degree to which the solution was executed as planned. Any deviation from the plan would prevent the solution to reach its desired outcomes and set KPIs. The three elements of implementation fidelity, content, dose, and moderators were taken into consideration.

Phase 1: Study phase

Create a sense of awareness and need of the consortium.

UNISG and *Slow Food* need to involve their network in this process to stress the importance of this solution. They contact VF companies, association, and grocery store to present the plan aimed at expanding the VF industry. The presentation includes the research findings of the survey and interview with industry expert, with the latter invited at the presentation. The initial bodies contacted should be limited to *UNISG* and *Slow Food* existing network to give the possibility to explain the problem, solution, and benefits of the consortium on a one-to-one basis.

Stakeholders' analysis

The early partners meet to define the scope of the consortium. A stakeholder analysis is carried out to understand political context, the resources and capabilities that each player can bring to the consortium.

Key partners have been identified to be part of the consortium. They have been selected based on the strategic resources they own and that would contribute to the success of the consortium. They are: *Eurostampa*, a leading manufacturer in marketing and quality labels and *Novamont*, a sustainable biodegradable packaging manufacturer. Both will be key players in the creation of a diversifying packaging for VF products and a VF brand.

COOP, an Italian consumers' cooperative which operates the largest supermarket chain in Italy. Along with *Eataly*, a chain of high-quality Italian marketplaces (food halls) comprising a variety of restaurants, food and beverage counters, bakery, retail items, and cooking schools, they will be the ideal partner for the pilot project (see next paragraph).

Hotelschool The Hague, one of the leading hospitality business schools, whose mission is "to create a hub where industry partners could gain and share new insights, skills and knowledge". Its knowledge in experience economy, alumni network and research unit could create an ad hoc research centre for the consortium and drive innovation with hospitality concepts.

Vertical Farm Italia, a consulting group for design, development and coordination of VF project and the *Association for Vertical farming*, the leading non-profit organization for the development of the Vertical Farming industry. They possess important knowledge for the development and innovation of VF.

Local Green, a VF start-up that already benefits a partnership with *COOP*, and *Planet Farm*, the largest European VF based in Milan that has a partnership with *Esselunga* grocery store. They would bring important insight on how to overcome VF challenges.

Develop a shared vision

Criswell and Cartwright (2010) state a clear vision consists of five building blocks: ideas, values, a story, the growth factor, and the change factor. The main goals of a vision are to inspire, clarify, and create focus (Cartwright and Baldwin, 2007), and identify early potential clashes among members.

To create the consortium's vision, the external and internal environment need to be analysed which then results in critical success factors. After gathering enough data, a statement is created, focused on the goals and mindset to be achieved, which leads to a minimized lack of communication (Lavikka et al., 2020).

Phase 2: Agreement proposal and development

Draft consortium agreement

Gather the key players that have showed interest to draft a consortium agreement which includes a framework for a successful project implementation. Considering its complexity, professional legal advice is needed to oversee the negotiation phase and assure legal compliance (Horizon, 2019). This agreement sets the benefits, rights and obligations of its members (ICC, 2021). Each party will evaluate the option to join the consortia based on key information shared upon execution of confidentiality agreement. At this stage the name of the consortium is chosen and it needs to be deposited as a trademark along with area of operation (AMPG international, 2020). It is a co-creating phase that sets the base for the long-term sustainability and resilience of the consortium.

Define and gather resources

For its success, it is important to define and gather the business resources needed to run itself and provide the services of educational campaign and training programme. These include 4 types of resources:

Human: form a management board that will foresee the entire plan with at least one member from the key stakeholders involved in the process. It also includes the people that will actuate the interventions, strategic partners, and network.

Physical: all the inventory, equipment and distribution network needed to run both educational campaign and training programme and these can be either offline or online resources.

Intellectual: all the intangible products related to the solution. It includes academic articles, past research, current KPIs, surveys and intellectual property that will drive the decision-making process; a centralized knowledge pole must be established to avoid dispersion.

Financial: how the solution will be funded. Two paths are suggested, EU Horizon 2027 grants for consortium agreements and private investors.

Many of these resources are already owned by the key stakeholder previously identified.

Pilot testing

The solution designed falls under the category of novel and hypercomplex decision. A consortium is not a novel solution but the application to VF is. VF is a new sector where WTP is just one of the problems of the industry and not enough evidence is present to effectively inform decision-makers. A pilot project is carried out to review the work of the consortium based on the drafted agreement. This pilot project is run in the Italian market, the main countries of operation of *UNISG* and *Slow Food*. They will provide educational

and training services and analyse the results of the project through a before-after measurement and to keep track of progress. The board needs to define the KPIs that will be tracked, measured and analysed, and these include customer engagement, market penetration, consumer satisfaction, number of profitable VF, client retention rate, campaign response rate, sales per customer and profit per customer. This project test the achievability of the set metrics and it is an important stage to include interaction with consumers and VF companies. After the pilot project, the operating structure, and necessary resources to run the consortium efficiently and effectively will be re-evaluated.

The results will be disseminated and considered as intellectual property rights.

Phase 3: Full implementation and expansion.

Execute the agreement

Based on the outcomes of the pilot project, the drafted consortium agreement will be either accepted or rejected. It will be revised with the new members who were not involved in the proposal phase. Once all the documents have been executed, the final contract agreement need to be executed; a drafted agreement is provided is appendix.

Celebrating success

The consortium needs to set short-term goals and celebrate each achievement (Haas et al., 2020). This serves to create a sense of accomplishment among members to keep them engaged and create momentum to the movement (Radwan, 2020). At the beginning of the full implementation, monthly meeting should be held to gather feedback and review the operations of the consortium. A monthly magazine should be published to keep members updated on the latest news and the work of the consortium.

The implementation is considered successful if the parties find an agreement on the consortium contract if they secure the participation of the key player and can provide the services of education to consumer and training to VF companies daily.

Services

The next paragraph includes a short implementation of the educating and training services that the consortium will offer. These are considered the moderators in successfully raise willingness-to-pay for VF products, therefore it is essential that the consortium knows how to deliver these services in the correct manner.

Education

It is suggested to use a mix of online and offline channels as suggested by the industry experts for the educative campaign. Social media are the main influence for younger generations in food purchase, while for older generations you need to break the knowledge gap. This means that the partnered supermarkets will be the contact channel for the educative campaign. *UNISG* has grocery store in its network, Coop, Slow Food and Eataly, which will be the first group included and used during the pilot test. As found in the literature review, labels and packaging are influencing factors during purchase. Currently, no exclusive label exists to for vertical farming products. Therefore, *UNISG* needs to co-create with the adhering VF companies a sustainable packaging to distinguish VF products to competitors. Additionally, it is highly suggested to create a VF certification to differentiate product grown through vertical farming systems under the category of green product. This is because sustainable certifications trigger a willingness-to-pay for premiums (see literature review). As suggested by experts, the grocery stores possess extensive customer profiling, and they are included in the co-creating process. The packaging includes the characteristics of VF that are most valued by consumers and focuses on the health, sustainability, and taste of the product.

Training

Online platforms are the preferred channels due to the impracticability of gathering all the vertical farms in one location and COVID-19 restrictions. Trainings will be delivered with online workshops and live Q&A sessions. Hotelschool The Hague would be the ideal member to deliver this service and help vertical farming owners to create engagement with their brand. The curriculum of Hotelschool The Hague includes real life case study assessment. Companies would have the privilege to receive an ad hoc report on their company and expand their network with the future hospitality leaders (de Jong, 2021). The members in charge of training services need to ensure that all parties are kept up-to-date regarding the latest breakthrough research; dissemination is a fundamental training service. A dedicated platform should be developed to centralize communication. Through the platform, the Vertical Farms can access shared documents, (surveys, research, recording of training sessions, etc), monthly magazine with latest news and suggest new policy to further develop the consortium.

Moderators

The creation of a consortium includes many stakeholders and factors that could influence its implementation fidelity. The member of the consortium and level of cooperation are two main moderators. Regarding the first, key players have been identified; however, should *UNISG* not be able to recruit them, similar player with the same level of importance should be contacted. For the latter, the shared vision aims at providing a sense of unity and therefore it must not be overlooked. Knowing the interest of Pollenzo Slow Food and Hotelschool The Hague, the level of skills and expertise does not constitute a worrying factors. Insufficient financial resources might pose a threat since the process should not be rushed and capital is needed to fund operations before the implementation.

EVALUATION

The process is evaluated by assessing the intervention plan and the results achieved with a mix of a before-after assessment and quasi-experiment (Schwarz et al., 2020).

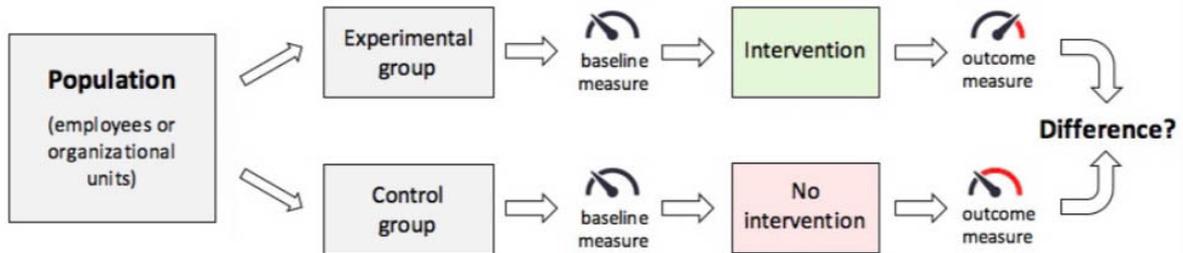


Figure 8 quasi-experiment (Carroll et al., 2007)

This type of review includes two essential factors: a baseline and control group. A baseline is necessary to understand if the solution caused the desired outcome and rule out the factor of reverse causality. The KPIs suggested are number of sales, return on investment, retention, market share, company value growth, brand awareness, customer satisfaction and cost/benefit ratio. These are valid and reliable measures that reduce the risk biases and confounders (OLI, 2021).

To evaluate the successfulness of the solution, two groups should be compared: the experimental group that was exposed to the solution, and the control group that was not exposed to the solution. Some limitations apply to this factor: the consortium solution operates in real life environment, with too many variables to control. This is the reason why a complete quasi-experiment evaluation cannot be performed (Petticrew and Roberts, 2008). However, it is suggested to compare the difference in consumer knowledge about VF in a geographical area where the consortium operates with one where it is not present. Then test if there is a significant difference in performance between the vertical farms that are members of the consortium and the ones who are not in the same geographical area.

The solution will be considered successful if it reaches a minimum target of 15.73% increase in customers' willingness-to-pay, thus registering the same increase in revenue, by the end of the first year of its implementation. Then the increase should align itself with the 12.1% predicted by Statista (2018).

Limitations

This type of evaluation lacks randomization, a method to assigning subjects to group at random so that the groups are similar before the baseline measure, therefore it does not achieve the golden standard. Additionally, it is difficult to achieve a perfectly identical control group to the intervention groups for novel and hypercomplex decisions and for large-scale interventions, such as an international VF consortium. However, it is still possible to find a control group similar to the intervention group if we perform the test in the same geographical area as suggested (Petticrew and Roberts, 2008). Although prone to biases, the before-after measurement is a simple and practical method to evaluate the outcome of the solution. Additionally, these biases can be eliminated if valid and reliable KPIs are used, as the one suggested (OLI, 2021).

Solution timeline

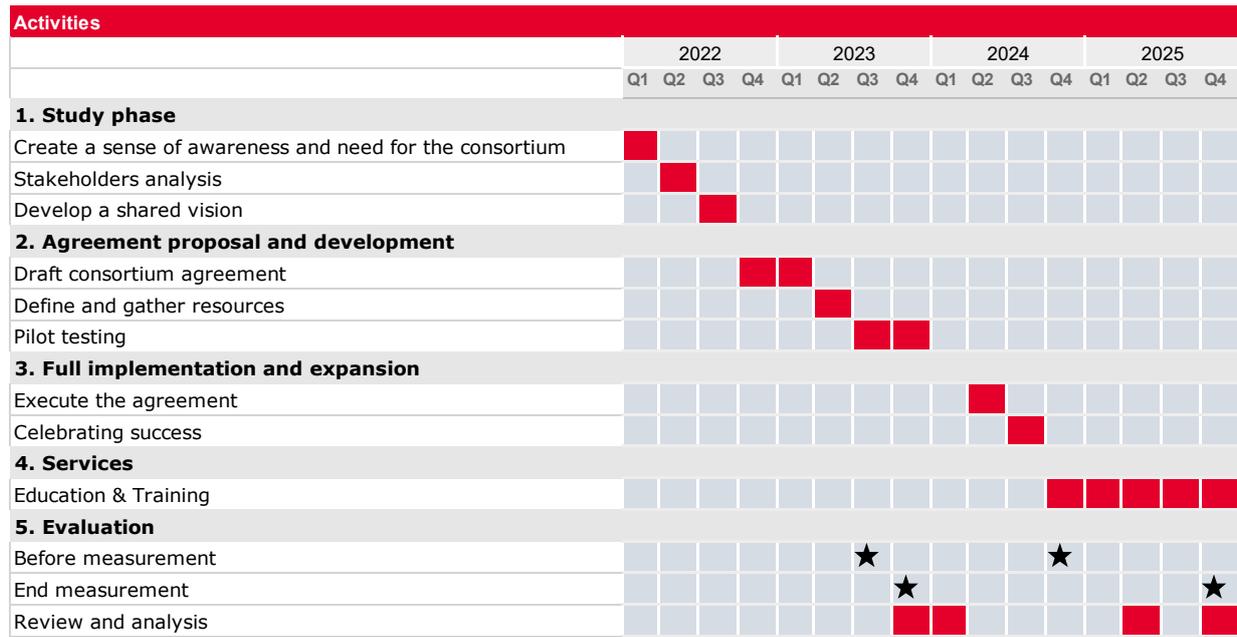


Figure 9 timeline

DISSEMINATION

Active dissemination

The research was disseminated to two main stakeholders' group: the VF experts that helped co-creating the solution and Silvio Barbero, vice-headmaster at UNISG.

Regarding the first, the research findings from the survey (see appendix) were summarized and shared with them during the interview. They highlighted that many VF would struggle to deliver experiences as they might lack the proper set of skills and organization. This was considered when creating the solution and it was decided to include training services in the consortium operations. Another important aspect regards to customer profiling. Although an exact profile for vertical farming customer is missing, supermarket have an extensive market knowledge, therefore VF would highly benefit from a partnership. This has been included in the key steps of the solution design. Additionally, Paolo Pezzolla, one of the expert practitioners, provided feedback on the implementation of the consortium and contributed to suggesting key players for a pilot project in the Italian market, including his current company.

Silvio Barbero was also an important stakeholder for the research dissemination. The research topic, including the summary of situational scan, the literature review and survey findings were discussed in a meeting. The key takeaway was to inspect the customer buying behaviour, which was reviewed with past literature. He also agreed with some comments of the research findings and advised to study the possible integration of traditional farmer in the process as it is a current research topic at UNISG. Although a very valuable insight and partially integrated in the solutions design, this topic has been identified as a starting point for future research. Additionally, the UNISG has agreed to a presentation of the research to the Ms. Migliorini, the lecturer in Agrarian sciences. Unfortunately, due to time and personal constraint the presentation will done at a later stage and the feedback has not been included in this research.

Future Dissemination

This research aims to spread knowledge to any party interested in VF and its economics, the impact of education and applications of the EXP to overcome customer resistance. For this research to be useful, the topic needs to be understood and clearly communicate the knowledge gathered throughout the process (Dobbins et al., 2002). A dissemination plan was developed with the commissioner (de Jong, 2021). The research found many different perspectives of the VF challenges and not all have been investigated in the process. All the other implications for future research will be presented in a report for the student attending the Minor Future of Food at the Hotelschool The Hague. The report will include a summary of the research paper, a presentation of research findings and all the external insights that have not been investigated and that are worth researching. It will be delivered in February 2022. Two other important dissemination events will be performed in January. The first during the online urban farming event organized by Hotelschool The Hague. The research findings will be shared with a presentation and feedback will be gathered among participant through a live Q&A. The second during the LYcar event on January 18th in front of lecturers of HTH and invited stakeholders.

The research was published on LinkedIn (see app.11) and Hotelschool The Hague Media centre to reach a wider audience that has the capabilities to prove this research useful for future applications. These websites permit practitioners to review papers and leave comments on how to improve or move forward for future research (Ovadia, 2014).

Implications on future research

As it emerged from the research findings, the combination of education and the experience economy have a positive effect on the consumers' WTP for VF products. However, they are not the only factors that could make VF expand. There are some implications and side-effect that needs to be acquainted for before VF technology can properly be accepted.

Coexistence of Traditional and Vertical Farming

VF requires high-skilled labour, and its mission is to grow any kind of crop anywhere, regardless of climate conditions. This means that in the future VF could grow exotic crops such as cocoa beans and avocados. Consequentially, many farmers could be replaced and lose their job, especially from developing countries. These uncertainties could pose a threat to the development of the industry; many countries whose economy is sustained by agriculture could start a campaign against VF. Additionally, Vertical Farming could pose a threat to traditions, an important cultural heritage. As suggested by UNISG, there is a need to research what implication will VF have on these countries and how could VF integrate traditional farming in this transformation process.

The net green of VF

Over the centuries there have been many inventions that have branded themselves as green and eco-friendly products, but they are not. In fact, many products labelled as green generate enormous amount of pollution to be produced. These concerns have been raised for electric cars batteries and recycled clothing produced in sweatshops. This phenomenon is known as greenwashing, "the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound". Many people have raised this question about VF as it utilizes large amount of energy. Although it has been shown that this high amount is lower in relation to the production output, a study to assess the actual net green of the technology should be carried out.

Business knowledge & management

As explained in this research, the VF sector is abounding with bankruptcies due to its high initial and running costs and a moderate customer resistance that prevent companies from reaching profitability. However, a lack of skills and business knowledge of these start-ups emerged from the interviews with industry experts and survey respondents. As VF is an emerging sector, many people seek an opportunity to enter the market without the right set of skills needed to run a business effectively and efficiently or without performing a market analysis. Future research to assess the profile of VF companies should be performed to assess if level of skills, logistic and business knowledge matches the market requirements and how to provide for them.

Customer Profiling

VF aims to be the next mean of food production for the mass population, but it will not be able to do so for a long time. Currently VF is associated with green consumers and the ecotourist, but they are vague descriptions without a specific customer profile. Further research on identifying and profiling customer should be carried so that organization can understand their needs and wants and better adapt the products and services offered.

ACADEMIC REFLECTION

The research was structured as follow: the first step consisted of a problem analysis where preliminary research was conducted. Then different sources of evidence have been acquired, including scientific literature, expert practitioners and multiple stakeholders have been included in the research (potential & adverse customer, commissioner, LYcar peers and UNISG). All the evidence has been put together to design a solution. The research followed a logical structure based on the theory of evidenced based management. Each step was reviewed, and it was the logical continuation of the previous chapter.

A contingent valuation model was used to assess willingness-to-pay. Although a very efficient tool, additional economic estimating methods could have been used to give a more accurate result. The method used consisted of a theoretical method and stated willingness-to-pay could differ in a real environment. In any case the CV is the most consisted method and due to a limited experience with complex economical model and time constraints, the CV was considered the best fit for the purpose of this research. Additionally, the scarcity of scientific literature on vertical farming created some challenges during the appraisal phase as comparison with other relevant studies was limited. Therefore, the appraisal of scientific literature could have been biased by personal influence.

The research topic arose interest amongst major stakeholders in today's sustainable food movement, which are UNISG and Slow Food. They would be a beneficial partner for the future of vertical farming and their participation in the research provided great value-adding insights on the topic. Direct access to academic resources and data stored at the UNISG and Slow Food research centre would have provided even more value to the topic.

References

Abbasi, A.S. and Aamir, S.M., 2021 Sustainable Development: Factors Influencing Public Intention towards Vertical Farming in China and Moderating Role of Awareness, Rochester, NY, Social Science Research Network.

Acemoglu, D., Laibson, D. and List, J., 2015 Economics PDF eBook, Global Edition, Pearson Education.

Acemoglu, D., Laibson, D.I. and List, J.A., 2019 Economics,

Adhikari, A., 2015 Differentiating Subjective and Objective Attributes of Experience Products to Estimate Willingness to Pay Price Premium. *Journal of Travel Research*, 54(5), pp.634–644.

Ajzen, I., 2020 The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, 2(4), pp.314–324.

Al-Kodmany, K., 2018 The Vertical Farm: A Review of Developments and Implications for the Vertical City. *Buildings*, 8(2), p.24.

Allen, C., Metternicht, G. and Wiedmann, T., 2018 Initial progress in implementing the Sustainable Development Goals (SDGs): a review of evidence from countries. *Sustainability Science*, 13(5), pp.1453–1467.

Alsayegh, M.F., Abdul Rahman, R. and Homayoun, S., 2020 Corporate Economic, Environmental, and Social Sustainability Performance Transformation through ESG Disclosure. *Sustainability*, 12(9), p.3910.

AMPG international, 2020, 6.4 Putting a Consortium Together | The APMG Public-Private Partnerships Certification Program Available at: <https://ppp-certification.com/ppp-certification-guide/64-putting-consortium-together> (Accessed 14 December 2021).

Anderson, M. and Freebody, K., 2013 *Partnerships in Education Research: Creating Knowledge that Matters*, A&C Black.

Barbero, S., 2021 *Dissemination & Solution co-creation*.

Barrera-Osorio, F., Guaqueta, J. and Patrinos, H.A., 2012 *The Role and Impact of Public Private Partnerships in Education*. Public Private Partnerships in Education. Available at: <https://www.elgaronline.com/view/edcoll/9780857930682/9780857930682.00019.xml> (Accessed 20 June 2021).

Beacham, A.M., Vickers, L.H. and Monaghan, J.M., 2019 Vertical farming: a summary of approaches to growing skywards. *The Journal of Horticultural Science and Biotechnology*, 94(3), pp.277–283.

den Besten, J., 2019 Chapter 8.2 - Vertical Farming Development; the Dutch Approach. In: Anpo, M., Fukuda, H. and Wada, T., (eds.) *Plant Factory Using Artificial Light*. Elsevier., pp. 307–317.

- Blomquist, G.C. and Whitehead, J.C., 1998 Resource quality information and validity of willingness to pay in contingent valuation. *Resource and Energy Economics*, 20(2), pp.179–196.
- Breen, R.L., 2006 A Practical Guide to Focus-Group Research. *Journal of Geography in Higher Education*, 30(3), pp.463–475.
- Brown-Paul, C., 2016 Scaling new heights. *Practical Hydroponics and Greenhouses*. Available at: <https://search.informit.org/doi/abs/10.3316/informit.374949724854355> (Accessed 7 May 2021).
- Butenko, N. and Kot, L., 2019 METHODOLOGICAL APPROACHES TO THE EVALUATION OF THE EFFECTIVENESS OF PARTNERSHIP RELATIONS. *Baltic Journal of Economic Studies*, 5(4), pp.42–49.
- Carroll, C. et al., 2007 A conceptual framework for implementation fidelity. *Implementation Science*, 2(1), p.40.
- Cartwright, T. and Baldwin, D., 2007 Seeing your way: Why leaders must communicate their visions. *Leadership in Action*, 27(3), pp.15–24.
- Casas, P. et al., 2004 Models of consumer behaviour.
- Chance, E. et al., 2018 The Plant—An experiment in urban food sustainability. *Environmental Progress & Sustainable Energy*, 37(1), pp.82–90.
- Chang, S., 2018 Experience economy in hospitality and tourism: Gain and loss values for service and experience. *Tourism Management*, 64, pp.55–63.
- Chen, Z., Marin, G., Popp, D. and Vona, F., 2020 Green Stimulus in a Post-pandemic Recovery: the Role of Skills for a Resilient Recovery. *Environmental and Resource Economics*, 76(4), pp.901–911.
- Chinie, C., Biclesanu, I. and Bellini, F., 2021 The Impact of Awareness Campaigns on Combating the Food Wasting Behavior of Consumers. *Sustainability*, 13(20), p.11423.
- Choi, P., Garcia, R. and Friedrich, C., 2010 The drivers for collective horizontal coopetition: a case study of screwcap initiatives in the international wine industry. *International Journal of Strategic Business Alliances*, 1(3), pp.271–290.
- Cornell, B. and Damodaran, A., 2020 Valuing ESG: Doing Good or Sounding Good?, Rochester, NY, Social Science Research Network.
- Coyle, B.D. and Ellison, B., 2017 Will Consumers Find Vertically Farmed Produce “Out of Reach”? *Choices*, 32(1), pp.1–8.
- Criswell, C. and Cartwright, T., 2010 *Creating a Vision*, Center for Creative Leadership.

Dahlberg, A. and Lindén, A., 2019 Can vertical farms outgrow their cost? - An analysis of the competitive strength of vertical. Available at: <https://odr.chalmers.se/handle/20.500.12380/256972> (Accessed 6 May 2021).

Delice, A., 2010 The Sampling Issues in Quantitative Research. *Educational Sciences: Theory and Practice*, 10(4), pp.2001–2018.

Despommier, D., 2011 The vertical farm: Controlled environment agriculture carried out in tall buildings would create greater food safety and security for large urban populations. *Journal für Verbraucherschutz und Lebensmittelsicherheit*, 6, pp.233–236.

Dixson-Declève, S. and Zadek, S., 2021 Nature is the missed opportunity of the EU's recovery plans. www.euractiv.com. Available at: <https://www.euractiv.com/section/energy-environment/opinion/nature-is-the-missed-opportunity-of-the-eus-recovery-plans/> (Accessed 7 July 2021).

Dobbins, M. et al., 2002 A Framework for the Dissemination and Utilization of Research for Health-Care Policy and Practice. *Worldviews on Evidence-based Nursing presents the archives of Online Journal of Knowledge Synthesis for Nursing*, E9(1), pp.149–160.

Douglass, M., 2016 *The Rise of Progressive Cities in Asia: Toward Human Flourishing in Asia's Urban Transition*,

Engel, J.F., Blackwell, R.D. and Miniard, P.W., 1995 *Consumer behavior*, Fort Worth, Dryden Press.

Eurobarometer, 2020, Sustainability, rural areas, food security: Commission publishes public opinion survey on EU food and farming Available at: https://ec.europa.eu/info/news/sustainability-rural-areas-food-security-commission-publishes-public-opinion-survey-eu-food-and-farming-2020-oct-13_en (Accessed 14 December 2021).

Garcia, R., Bardhi, F. and Friedrich, C., 2007 Overcoming consumer resistance to innovation. *MIT Sloan management review*, 48(4), p.82.

Gatzer, S. and Roos, D., 2021 The path forward for sustainability in European grocery retail | McKinsey. 1 Disruption and Uncertainty – The State of Grocery Retail 2021: Europe, p.6.

Gehin, S. and Talanova, O., 2021 How health and sustainability trends are driving changes in customer behaviour. *Roland Berger*, p.16.

Gill, K., 2019 Innovations in Experiential Services: A Case of Peri Urban Farm Tourism in New Delhi, India. *Journal of Emerging Technologies and Innovative Research*, 6(6), pp.1–15.

Gilmour, D., 2018 Consumers' Willingness to Pay for Hydroponic Lettuce. *Theses and Dissertations*. Available at: <https://scholarworks.uark.edu/etd/2722>.

Haas, M.R.C. et al., 2020 #DidacticsRevolution: Applying Kotter's 8-Step Change Management Model to Residency Didactics. *Western Journal of Emergency Medicine*, 21(1), pp.65–70.

Haynes, J., 2018 Assessing the Energy and Water Use of Vertical Farming at Princeton University. Available at: <https://dataspace.princeton.edu/handle/88435/dsp015425kd40n> (Accessed 7 July 2021).

Horizon, 2019 [Guide] Horizon 2020 Consortium Agreement. Enspire Science Ltd. Available at: <https://enspire.science/horizon-europe-consortium-agreement-why-when-and-how/> (Accessed 14 December 2021).

Howard, J.A. and Sheth, J.N., 1969 *The theory of buyer behavior*, New York, Wiley.

Hunt, M., 2017 Innovating for the Greater Good. *Leader to Leader*, 2017(86), pp.6–11.

ICC, 2021 Consortium Agreement. ICC - International Chamber of Commerce. Available at: <https://iccwbo.org/resources-for-business/model-contracts-clauses/consortium-agreement/> (Accessed 14 December 2021).

James, C., 2021 *Expert Practitioner*.

de Jong, M., 2021 *Dissemination plan*.

Jürkenbeck, K., Heumann, A. and Spiller, A., 2019 Sustainability Matters: Consumer Acceptance of Different Vertical Farming Systems. *Sustainability*, 11(15), p.4052.

Kleijnen, M., Lee, N. and Wetzels, M., 2009 An exploration of consumer resistance to innovation and its antecedents. *Journal of Economic Psychology*, 30(3), pp.344–357.

Ladu, L. and Blind, K., 2017 Overview of policies, standards and certifications supporting the European bio-based economy. *Current Opinion in Green and Sustainable Chemistry*, 8, pp.30–35.

Lavikka, R., Seppänen, O., Peltokorpi, A. and Lehtovaara, J., 2020 Fostering process innovations in construction through industry–university consortium. *Construction Innovation*, 20(4), pp.569–586.

Lee, S.M., 2018 Innovation: from small “i” to large “I.” *International Journal of Quality Innovation*, 4(1), p.2.

Mai, T., 2019, Top 25 vertical farming companies Available at: <https://roboticsandautomationnews.com/2019/05/03/top-25-vertical-farming-companies/22181/> (Accessed 7 May 2021).

Mestre, L.S., Turner, C., Lang, B. and Morgan, B., 2007 Do We Step Together, in the Same Direction, at the Same Time? How a Consortium Approached a Federated Search Implementation. *Internet Reference Services Quarterly*, 12(1–2), pp.111–132.

Milner, T. and Rosenstreich, D., 2013 A review of consumer decision-making models and development of a new model for financial services. *Journal of Financial Services Marketing*, 18(2), pp.106–120.

Möller Voss, P., 2013 Vertical Farming : An agricultural revolution on the rise,

Morone, P. et al., 2021 Consumer willingness to pay for bio-based products: Do certifications matter? *International Journal of Production Economics*, 240, p.108248.

Morone, P. and D'Amato, D., 2019 The role of sustainability standards in the uptake of bio-based chemicals. *Current Opinion in Green and Sustainable Chemistry*, 19, pp.45–49.

N., R. and Ali, D., 2016 Factors affecting consumer buying behavior.

Nandi, R., Bokelmann, W., Gowdru, N.V. and Dias, G., 2017 Factors Influencing Consumers' Willingness to Pay for Organic Fruits and Vegetables: Empirical Evidence from a Consumer Survey in India. *Journal of Food Products Marketing*, 23(4), pp.430–451.

Nicosia, F.M. et al., 1966 *Consumer decision processes; marketing and advertising implications*, Englewood Cliffs, N.J., Prentice-Hall.

Oh, H., Fiore, A.M. and Jeoung, M., 2007 Measuring Experience Economy Concepts: Tourism Applications. *Journal of Travel Research*, 46(2), pp.119–132.

OLI, 2021, *Assessing the Outcome: Two Preliminary Questions Available at:* <https://oli.cmu.edu/jcourse/workbook/activity/page?context=16fa3b910a0001dc00cc37490ead072a> (Accessed 19 December 2021).

Ovadia, S., 2014 *ResearchGate and Academia.edu: Academic Social Networks*. *Behavioral & Social Sciences Librarian*, 33(3), pp.165–169.

Perkins, K.M., Velazquez, L. and Munguia, N., 2021 Reflections on Sustainable Consumption in the Context of COVID-19. *Frontiers in Sustainability*, 2, p.26.

Peterson, M.W., 1947 Decision Type, Structure, and Process Evaluation: A Contingency Model. *Higher Education Quarterly*, 1(2), pp.207–219.

Petticrew, M. and Roberts, H., 2008 *Systematic Reviews in the Social Sciences: A Practical Guide*, John Wiley & Sons.

Pezzolla, P., 2021 *Expert Practitioner*.

Pietrykowski, B., 2004 You Are What You Eat: The Social Economy of the Slow Food Movement. *Review of Social Economy*, 62(3), pp.307–321.

Pretorius, I., 2018 *Beyond competition*,

Radwan, A., 2020 Lead transformational change, minimize resistance with 8-step model. *Dean and Provost*, 21(7), pp.1–5.

Rangsit, 2021, *See Asia's largest organic rooftop farm — located in busy Bangkok Available at:* <https://ideas.ted.com/see-asias-largest-organic-rooftop-farm-located-in-the-middle-of-bangkok/> (Accessed 25 May 2021).

Rodríguez Sánchez, I., Williams, A.M. and García Andreu, H., 2020 Customer Resistance to Tourism Innovations: Entrepreneurs' Understanding and Management Strategies. *Journal of Travel Research*, 59(3), pp.450–464.

Schneider, U.A. et al., 2011 Impacts of population growth, economic development, and technical change on global food production and consumption. *Agricultural Systems*, 104(2), pp.204–215.

Schwarz, G.M., Bouckenooghe, D. and Vakola, M., 2020 Organizational change failure: Framing the process of failing. *Human Relations*, p.0018726720942297.

Shogren, J.F., Shin, S.Y., Hayes, D.J. and Kliebenstein, J.B., 1994 Resolving Differences in Willingness to Pay and Willingness to Accept. *The American Economic Review*, 84(1), pp.255–270.

Signori, S., San-Jose, L., Retolaza, J.L. and Rusconi, G., 2021 Stakeholder Value Creation: Comparing ESG and Value Added in European Companies. *Sustainability*, 13(3), p.1392.

SkyGreens, 2021 Home. Sky Greens. Available at: <https://www.skygreens.com/> (Accessed 7 July 2021).

Solankey, S.S. et al., 2020 Urban Horticulture: Necessity of the Future, BoD – Books on Demand.

Specht, K. et al., 2019 How Will We Eat and Produce in the Cities of the Future? From Edible Insects to Vertical Farming—A Study on the Perception and Acceptability of New Approaches. *Sustainability*, 11(16), p.4315.

Statista, 2018, • Sustainable food industry | Statista Available at: <https://www-statista-com.eu1.proxy.openathens.net/study/23912/sustainable-food-industry-statista-dossier/> (Accessed 14 December 2021).

Swinnen, J.F.M., Van Herck, K. and Vandemoortele, T., 2012 The Experience Economy as the Future for European Agriculture and Food? *SSRN Electronic Journal*. Available at: <http://www.ssrn.com/abstract=2084633> (Accessed 13 June 2021).

Theodoridis, G. et al., 2021 FoodOmicGR_RI: A Consortium for Comprehensive Molecular Characterisation of Food Products. *Metabolites*, 11(2), p.74.

Tikkinen-Piri, C., Rohunen, A. and Markkula, J., 2018 EU General Data Protection Regulation: Changes and implications for personal data collecting companies. *Computer Law & Security Review*, 34(1), pp.134–153.

Turina, D., 2021 Expert Practitioner.

Turrell, G. and Kavanagh, A.M., 2006 Socio-economic pathways to diet: modelling the association between socio-economic position and food purchasing behaviour. *Public Health Nutrition*, 9(3), pp.375–383.

UNISG, 2021 Slow Food and the University of Gastronomic Sciences. UNISG - University of Gastronomic Sciences. Available at: <https://www.unisg.it/en/student-life/slow-food-university-gastronomic-sciences-pollenzo/> (Accessed 7 July 2021).

United Nations, 2015, Sustainable Development Goals .:. Sustainable Development Knowledge Platform Available at: <https://sustainabledevelopment.un.org/?menu=1300> (Accessed 24 September 2019).

United Nations, 2019, World Population Prospects 2019: Highlights | Multimedia Library - United Nations Department of Economic and Social Affairs Available at: <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html> (Accessed 20 March 2021).

Venkatachalam, L., 2004 The contingent valuation method: a review. *Environmental Impact Assessment Review*, 24(1), pp.89–124.

Voigt, P. and von dem Bussche, A., 2017 Scope of Application of the GDPR. In: Voigt, P. and von dem Bussche, A., (eds.) *The EU General Data Protection Regulation (GDPR): A Practical Guide*. Cham, Springer International Publishing., pp. 9–30.

Williams, V., Boylan, A.-M. and Nunan, D., 2020 Critical appraisal of qualitative research: necessity, partialities and the issue of bias. *BMJ Evidence-Based Medicine*, 25(1), pp.9–11.

Yu, H. and Li, J., 2021 Short- and long-term challenges in crop breeding. *National Science Review*, 8(2). Available at: <https://academic.oup.com/nsr/article/8/2/nwab002/6104464> (Accessed 28 April 2021).

APPENDICES

App.1: Situational scan

Company	Sector & Products	Innovative take
SkyGreens, Singapore	VF Tropical leafy vegetables	First low carbon and hydraulic driven vertical farm. Partnerships with Agri-food association, the government and Polytechnic college to sensitize people on the subject of Vertical farming (SkyGreens, 2021). They are now one of the most profitable and successful VF also thanks to the use automated A-frame rotary system that adjusts the amount of sun per crop, makes it easy to harvest and does not require LED lights (SkyGreens, 2021).
The Plant, Chicago	Warehouse VF Greens, mushrooms, bread and Kombucha tea	A zero-energy facility that converts food waste into biogas to power its operations. It incorporates an educational and training facility to get the inhabitants of Chicago aware of VF economics and sustainable benefits (Chance et al., 2018).
Rangsit Green Roof, Bangkok	Rooftop Farm 50 varieties of vegetables, herbs and rice	The project aims to incorporate individuals in the food production process. Students and local community are invited to participate in the seeding and harvesting process as an experience and are offered workshops and trainings on sustainable agriculture to shape the future of organic farming. It offers workshops and trainings on sustainable agriculture to shape the future of organic farming (Rangsit, 2021).
Screw cap case study, Australia and New Zealand		The Screw cap suffered an initial resistance from customers like the one of modern VF. Although the screw cap was a cheaper and more reliable method to conserve wine bottles, it encountered large discontent among customer and retailer. Customers did not understand the motives of this change and had a low willingness-to-pay, associating bottles with a screw cap to cheap and low-quality wine. Distributors themselves were resistant to stocking the products and slowed down the product take-off. However, Australia and New Zealand were able to overcome this resistance and low willingness-to-pay through horizontal and vertical cooperation. The first, refers to a the technique to involve multiple competitors in developing a joint marketing strategy; the latter focuses on involving the supply and distribution chain (Choi et al., 2010).
New Delhi, India	Peri Urban farm	The Indian state of Haryana launched an initiative to implement tourism initiatives within their farming region. They design tours of the various farms in a way that it would engage all the five senses of visitors; they participate in agricultural, gardening and dairy activities, and receive workshops about the local culture. The 6 farms analysed were able to create a hybrid between a rural and agricultural business model (Gill, 2019).

App.2: Research Goals

Goals for the client

Primary: Acquire actionable advises on how to enhance willingness-to-pay for vertical farming products through education and the experience within the hospitality industry

Secondary: Gain insight on the possible applications and opportunities of the experience economy in other sectors

Goals for the researcher

Primary: Identify the most effective pillar of the experience economy to raise willingness-to-pay and deliver professional and actionable advice on how apply it to vertical farm

Secondary: Gain insight on the economics of vertical farming and the possible application of the experience economy to create a successful company

App.3: Demand curves

Buyers behave differently in different markets but generally they follow the optimization rule to choose the best feasible option given the available information. If we assume that a buyer will try to choose the best option for themselves, we can establish a relationship between the price of a product and the quantity demanded. The quantity demanded is the amount of good an individual is willing-to-pay at a set price. Since every buyer can differ in behaviour, a demand curve is used to plot this relationship between prices and the quantity demanded across markets. For normal goods, these two characteristics are negatively related. This means that if one goes up, price rises, the other goes down, quantity demanded drops; this is called the law of demand (Acemoglu et al., 2015).

App.4: Consumer Buying Behaviour model

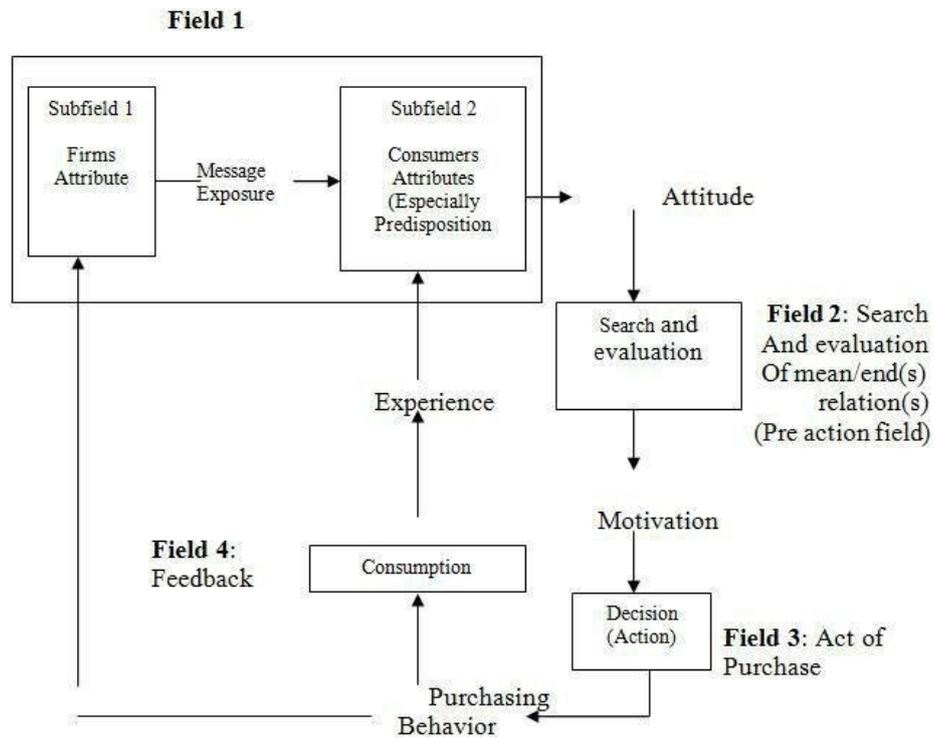


Figure 10 Nicosia model (Nicosia et al., 1966)

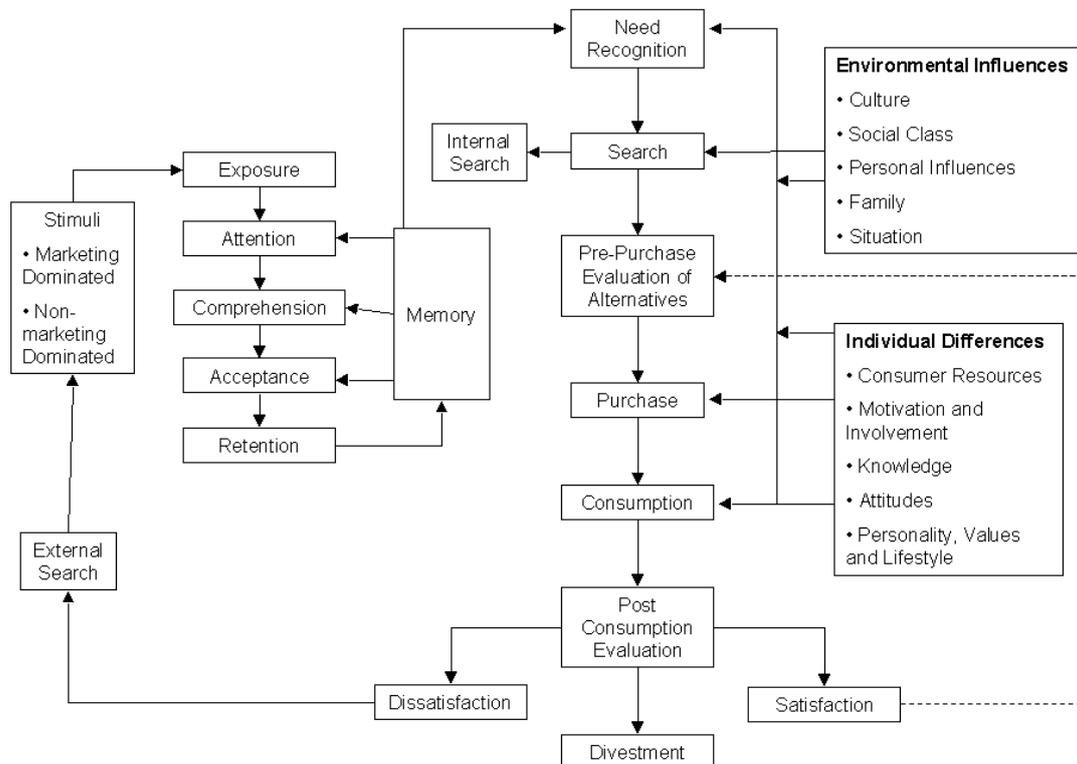


Figure 11 Engel model (Engel et al., 1995)

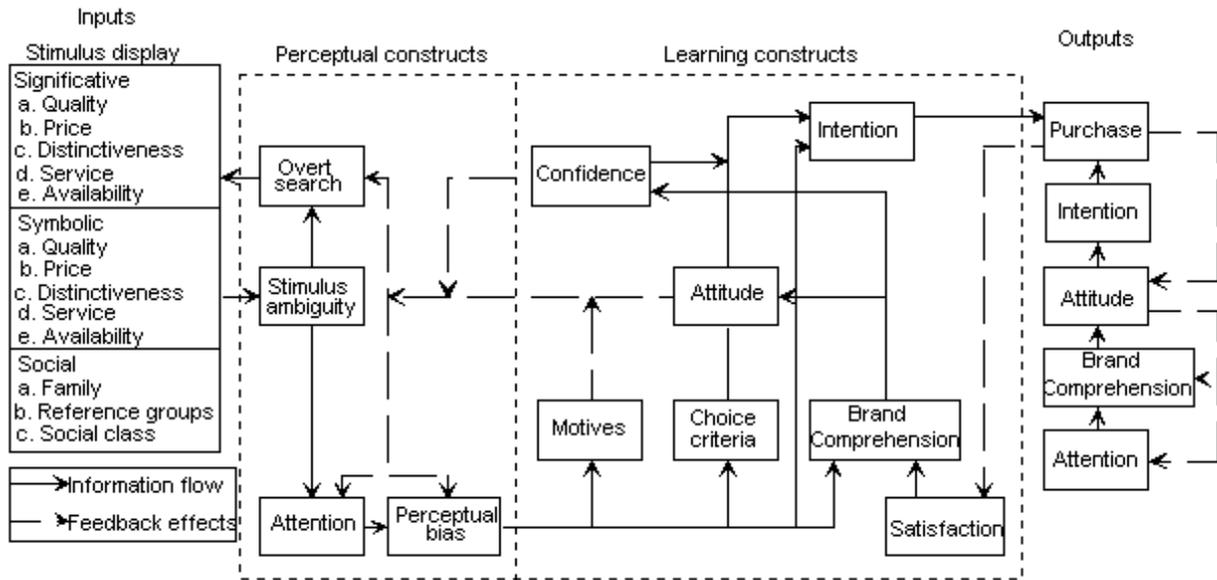


Figure 12 Howard model (Howard and Sheth, 1969)

App.5: Vertical farming pillars

Background

According to the United Nations, the world population is prospected to grow to around 8.5 billion in 2030 and reach almost 10 billion by 2050. The growth in population offers some opportunities for economic development (United Nations, 2019). It generates new business opportunities, new jobs, tax revenue for its countries and raises property values (Schneider et al., 2011). This is mostly the case for developed countries that have a well-established infrastructure system and security. These developed areas, such as Eastern Asia, Europe and America are not expected to grow much; They will reach a peak in size and then slightly decline due to emigration and low level of fertility (United Nations, 2019). However, with Sub-Saharan African leading this growth with a projected addition of 1 billion people by 2050, it is clear how this growth entails substantial challenges. Food production and water resources are on top of the list (Allen et al., 2018). It is forecasted the food production will have to increase by 70% to make up for the additional demand, with the primary source coming from innovation in the agricultural sector (Ibid). Arable land is already at 80% utilization, so innovation will be essential as stricter regulations on climate change, deforestations and water usage (United Nations, 2015) will see tomorrow's farmer will need to produce more food with fewer resources (Yu and Li, 2021). Here is where vertical farming could be vital to grow food in a sustainable way. This concept involves the cultivation of crops in high-rise buildings on vertical surfaces or on a multitude of vertical layers (Beacham et al., 2019). The method was first hypothesized by William Gericke in 1929 and later popularized by Dickson Despommier in 1929. This concept rises on three major aspects: Food security, Sustainability and educational purpose.

Food security

Many nations depend on other countries for the distribution of fresh food, which might take weeks of month before it arrives at destination. The Netherlands, one of the smallest countries in Europe, counts as the largest food exporter after the USA, with almost €100 billion worth of agricultural products, including machinery, bulbs, and fresh food.

However, most of the fresh food is just re-export of goods produced outside The Netherlands. It is estimated that more than one third of the global food production is being lost or wasted because of the current centralized infrastructure system.

This happens because most countries suffer from scarcity of resources, such as water, land or climatic challenges to independently produce their required food levels. As plants are grown in a mist solution with their roots in direct contact with nutrients, VF requires very little water compared to traditional farming and it can be applied in various urban context, thus creating a decentralized system (Specht et al., 2019). It makes use of a controlled environment to grow non-stop and, therefore, it produces exponentially higher yields than any other cultivation method (Al-Kodmany, 2018). The plants are not subjects to seasons and they can be harvested all-year round with no crop lost due to weather events (Despommier, 2011).

App.6: Survey design

What is your age?

- 18-24 years old
- 25-34 years old
- 35-49 years old
- 50-64 years old
- 65-74 years old
- 75 years or older

What is the highest degree or level of school you have completed? If currently enrolled, highest degree attending.

- No school completed
- Middle school or equivalent
- High school or equivalent
- Trade/technical/vocational training
- Associate degree
- Bachelor's degree
- Master's degree
- Professional degree
- Doctorate degree

To what extent do you value the following characteristic when purchasing fresh fruit and vegetables? (low to high)

- Freshness of product
- Quality
- Origin
- Production method
- Organic
- Pesticide-free
- Fair trade

To what extent do you take into consideration the following characteristic before making a purchase? (low to high)

- Climate change
- Green labels
- Food scarcity

How much would you be willing to pay in €/kg for a product that includes the above-mentioned characteristics? Open answer

How much would you be willing to pay in euros for the same product grown with Vertical farming technology? Open answer

How would you rate the following characteristics of VF products? Before educative video

- Natural
- Local
- Environmentally friendly
- Quality

How would you rate the following characteristics of VF products? After educative video

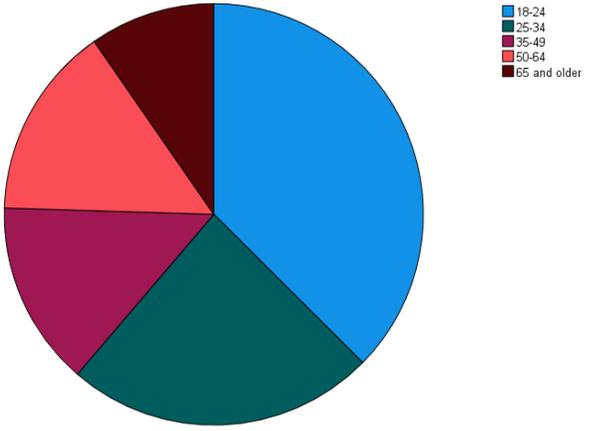
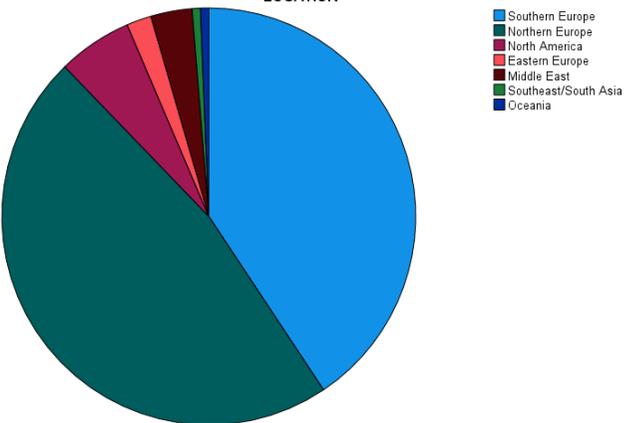
- Natural
- Local
- Environmentally friendly
- Quality

Why would you buy vertical farming products over other farming methods? Open answer

App.7: Sampling

Group name	people	Group description
Experience Designers, "Experience Economy" Experts, and "Joe Pine & Jim Gilmore" Fan Club Network	1.6K	
The Vertical Farming Business	5K	This group is for change pioneers. A group for industry professionals, entrepreneurs, suppliers and enthusiasts to network and discuss vertical farming and urban agriculture. This group aims to facilitate the furthering of the vertical farming movement.
Association for Vertical Farming	2.5k	The Association for Vertical Farming is an internationally active non-profit organization of individuals, companies, research institutions and universities focusing on advancing Vertical Farming technologies, designs and businesses.
Agricultural Education	3k	Knowledge Sharing & Information On Agricultural Education (Universities, Colleges, Courses and Admissions etc)
Fresh Fruits, Vegetables and Herbs	10k	The Fresh Fruits and Vegetables group includes Info for Buyer & Seller of Fresh Fruits & Fresh Vegetable. You can share your Selling and Buying Leads here
The New Green Economy: Aligning Science, Education, and Markets	841	The National Council for Science and the Environment's (NCSE) 10th National Conference offers a forum to explore the transformation to a green economy in both a short-term and long-term context. NCSE will engage leading thinkers and practitioners from a diversity of disciplines, sectors, and perspectives in a structured conversation about the meaning of the green economy and how investment in green education, research and jobs can help solve both the economic and environmental crises.

App.8: Research Findings

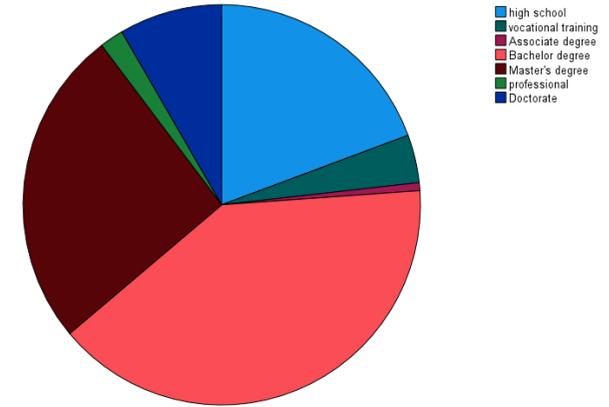
<p>What is your age group?</p>	<p style="text-align: center;">AGE</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th>Frequenza</th> <th>Percentuale</th> <th>Percentuale valida</th> <th>Percentuale cumulativa</th> </tr> </thead> <tbody> <tr> <td rowspan="6">Valido</td> <td>18-24</td> <td>58</td> <td>37,4</td> <td>37,4</td> <td>37,4</td> </tr> <tr> <td>25-34</td> <td>37</td> <td>23,9</td> <td>23,9</td> <td>61,3</td> </tr> <tr> <td>35-49</td> <td>22</td> <td>14,2</td> <td>14,2</td> <td>75,5</td> </tr> <tr> <td>50-64</td> <td>23</td> <td>14,8</td> <td>14,8</td> <td>90,3</td> </tr> <tr> <td>65 and older</td> <td>15</td> <td>9,7</td> <td>9,7</td> <td>100,0</td> </tr> <tr> <td>Totale</td> <td>155</td> <td>100,0</td> <td>100,0</td> <td></td> </tr> </tbody> </table>			Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa	Valido	18-24	58	37,4	37,4	37,4	25-34	37	23,9	23,9	61,3	35-49	22	14,2	14,2	75,5	50-64	23	14,8	14,8	90,3	65 and older	15	9,7	9,7	100,0	Totale	155	100,0	100,0		<p style="text-align: center;">AGE</p> 										
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Valido	18-24	58	37,4	37,4	37,4																																												
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<p>Where are you located?</p>	<p style="text-align: center;">LOCATION</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th>Frequenza</th> <th>Percentuale</th> <th>Percentuale valida</th> <th>Percentuale cumulativa</th> </tr> </thead> <tbody> <tr> <td rowspan="8">Valido</td> <td>Southern Europe</td> <td>63</td> <td>40,6</td> <td>40,6</td> <td>40,6</td> </tr> <tr> <td>Northern Europe</td> <td>73</td> <td>47,1</td> <td>47,1</td> <td>87,7</td> </tr> <tr> <td>North America</td> <td>9</td> <td>5,8</td> <td>5,8</td> <td>93,5</td> </tr> <tr> <td>Eastern Europe</td> <td>3</td> <td>1,9</td> <td>1,9</td> <td>95,5</td> </tr> <tr> <td>Middle East</td> <td>5</td> <td>3,2</td> <td>3,2</td> <td>98,7</td> </tr> <tr> <td>Southeast/South Asia</td> <td>1</td> <td>,6</td> <td>,6</td> <td>99,4</td> </tr> <tr> <td>Oceania</td> <td>1</td> <td>,6</td> <td>,6</td> <td>100,0</td> </tr> <tr> <td>Totale</td> <td>155</td> <td>100,0</td> <td>100,0</td> <td></td> </tr> </tbody> </table>			Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa	Valido	Southern Europe	63	40,6	40,6	40,6	Northern Europe	73	47,1	47,1	87,7	North America	9	5,8	5,8	93,5	Eastern Europe	3	1,9	1,9	95,5	Middle East	5	3,2	3,2	98,7	Southeast/South Asia	1	,6	,6	99,4	Oceania	1	,6	,6	100,0	Totale	155	100,0	100,0		<p style="text-align: center;">LOCATION</p> 
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	Middle East	5	3,2	3,2	98,7																																												
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	Totale	155	100,0	100,0																																													

What is the highest degree or level of school you have completed? If currently enrolled, highest degree attending.

STUDY

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	high school	30	19,4	19,4	19,4
	vocational training	6	3,9	3,9	23,2
	Associate degree	1	,6	,6	23,9
	Bachelor degree	62	40,0	40,0	63,9
	Master's degree	40	25,8	25,8	89,7
	professional	3	1,9	1,9	91,6
	Doctorate	13	8,4	8,4	100,0
	Totale	155	100,0	100,0	

STUDY



To what extent do you value the following characteristic when purchasing fresh fruit and vegetables?

Statistiche

		Freshness of product	Quality	Origin	Production method	Organic	Pesticide-free	Fair trade
N	Valido	155	155	155	155	155	155	155
	Mancante	0	0	0	0	0	0	0
Media		6,24	6,21	5,35	4,42	4,97	5,34	4,72
Deviazione std.		,748	,718	1,380	1,667	1,395	1,439	1,619

Freshness of product

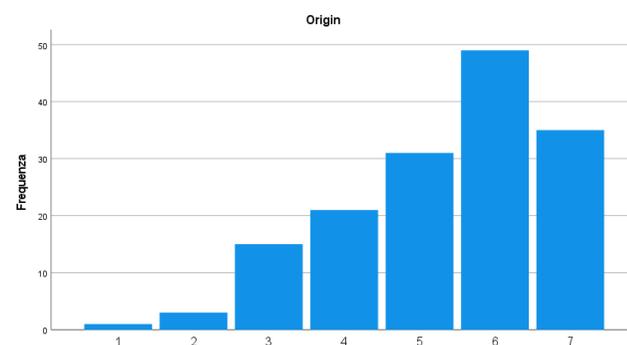
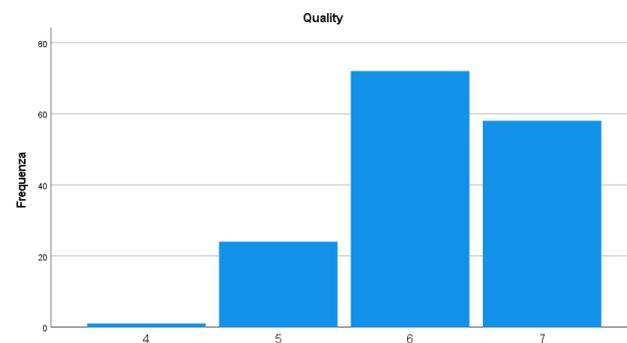
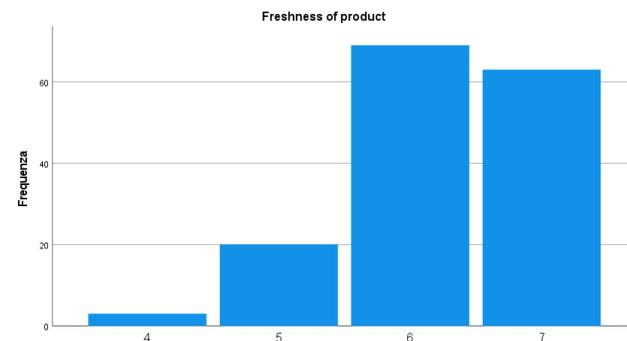
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	4	3	1,9	1,9	1,9
	5	20	12,9	12,9	14,8
	6	69	44,5	44,5	59,4
	7	63	40,6	40,6	100,0
Totale		155	100,0	100,0	

Quality

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	4	1	,6	,6	,6
	5	24	15,5	15,5	16,1
	6	72	46,5	46,5	62,6
	7	58	37,4	37,4	100,0
Totale		155	100,0	100,0	

Origin

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	1	,6	,6	,6
	2	3	1,9	1,9	2,6
	3	15	9,7	9,7	12,3
	4	21	13,5	13,5	25,8
	5	31	20,0	20,0	45,8
	6	49	31,6	31,6	77,4
	7	35	22,6	22,6	100,0
Totale		155	100,0	100,0	



Production method

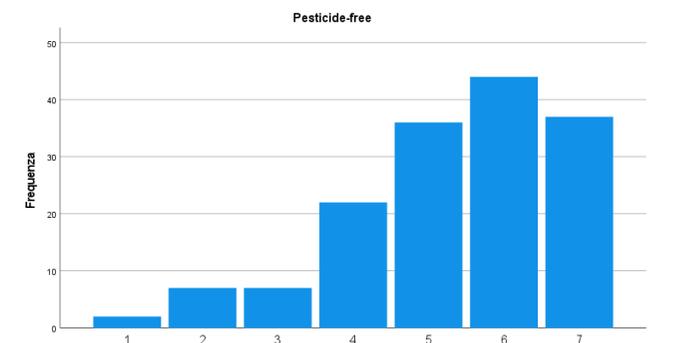
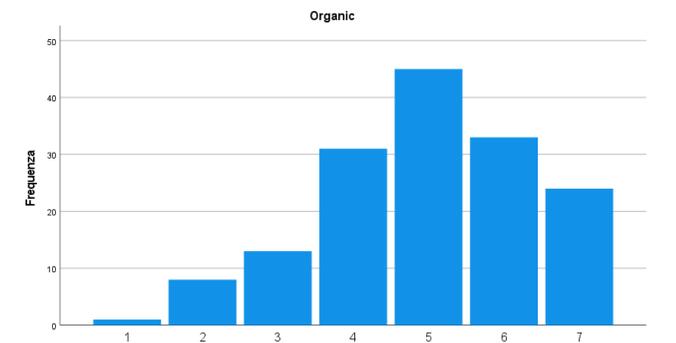
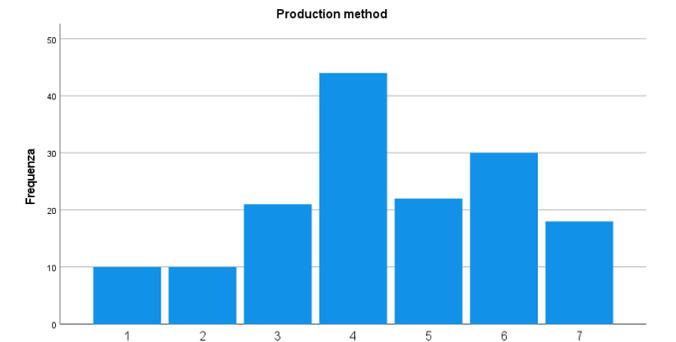
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	10	6,5	6,5	6,5
	2	10	6,5	6,5	12,9
	3	21	13,5	13,5	26,5
	4	44	28,4	28,4	54,8
	5	22	14,2	14,2	69,0
	6	30	19,4	19,4	88,4
	7	18	11,6	11,6	100,0
Totale		155	100,0	100,0	

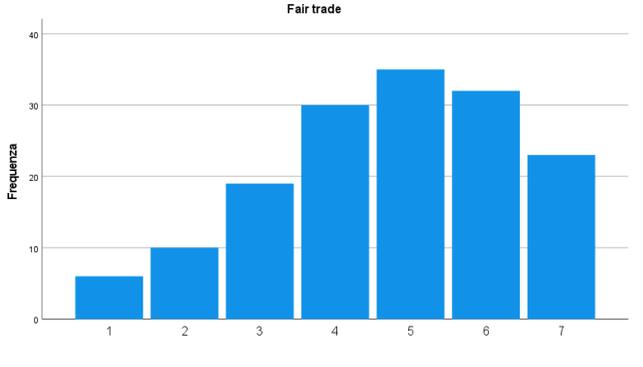
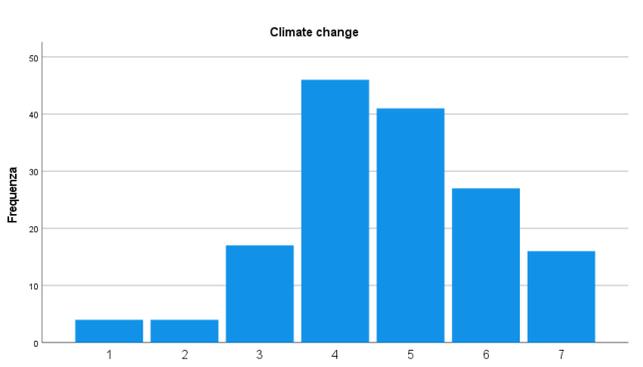
Organic

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	1	,6	,6	,6
	2	8	5,2	5,2	5,8
	3	13	8,4	8,4	14,2
	4	31	20,0	20,0	34,2
	5	45	29,0	29,0	63,2
	6	33	21,3	21,3	84,5
	7	24	15,5	15,5	100,0
Totale		155	100,0	100,0	

Pesticide-free

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	2	1,3	1,3	1,3
	2	7	4,5	4,5	5,8
	3	7	4,5	4,5	10,3
	4	22	14,2	14,2	24,5
	5	36	23,2	23,2	47,7
	6	44	28,4	28,4	76,1
	7	37	23,9	23,9	100,0
Totale		155	100,0	100,0	



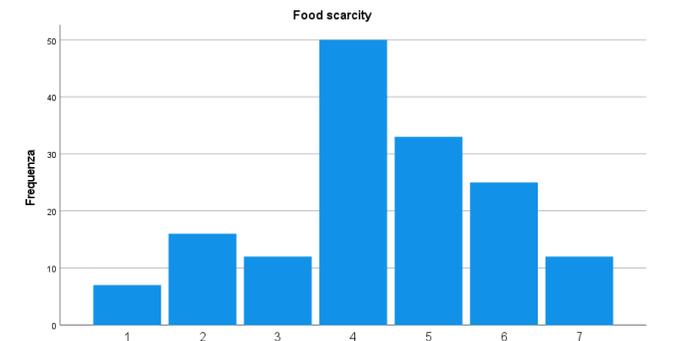
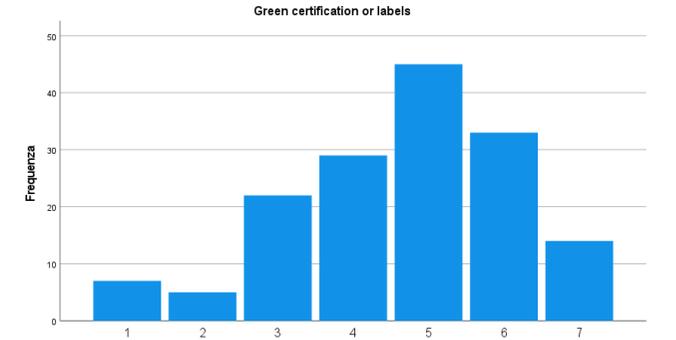
		Fair trade					Fair trade	
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa			
Valido	1	6	3,9	3,9	3,9			
	2	10	6,5	6,5	10,3			
	3	19	12,3	12,3	22,6			
	4	30	19,4	19,4	41,9			
	5	35	22,6	22,6	64,5			
	6	32	20,6	20,6	85,2			
	7	23	14,8	14,8	100,0			
	Totale	155	100,0	100,0				
To what extent do you take into consideration the following characteristics before making a purchase?		Statistiche						
		Climate change	Green certification or labels	Food scarcity				
N	Valido	155	155	155				
	Mancante	0	0	0				
Media		4,68	4,65	4,35				
Deviazione std.		1,371	1,493	1,531				
		Climate change					Climate change	
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa			
Valido	1	4	2,6	2,6	2,6			
	2	4	2,6	2,6	5,2			
	3	17	11,0	11,0	16,1			
	4	46	29,7	29,7	45,8			
	5	41	26,5	26,5	72,3			
	6	27	17,4	17,4	89,7			
	7	16	10,3	10,3	100,0			
	Totale	155	100,0	100,0				

Green certification or labels

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	7	4,5	4,5	4,5
	2	5	3,2	3,2	7,7
	3	22	14,2	14,2	21,9
	4	29	18,7	18,7	40,6
	5	45	29,0	29,0	69,7
	6	33	21,3	21,3	91,0
	7	14	9,0	9,0	100,0
Totale		155	100,0	100,0	

Food scarcity

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	7	4,5	4,5	4,5
	2	16	10,3	10,3	14,8
	3	12	7,7	7,7	22,6
	4	50	32,3	32,3	54,8
	5	33	21,3	21,3	76,1
	6	25	16,1	16,1	92,3
	7	12	7,7	7,7	100,0
Totale		155	100,0	100,0	



Willingness-to-pay (€/kg)
for Bio products from
traditional agriculture.

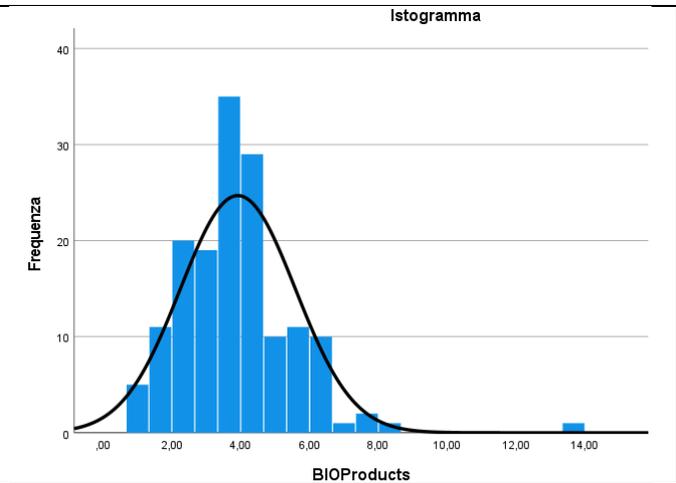
Mean value of:

- Lettuce;
- Vine tomatoes;
- Strawberry.

Statistiche

BIOProducts

N	Valido	155
	Mancante	0
Media		3,9184
Errore standard della media		,13408
Deviazione std.		1,66928



Willingness-to-pay (€/kg)
for Vertical Farming
Products Before
knowledge.

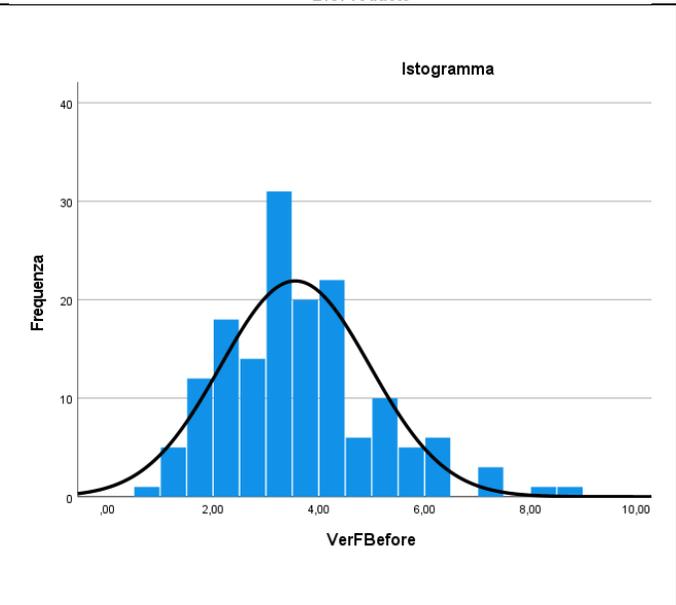
Mean value of:

- Lettuce;
- Vine tomatoes;
- Strawberry.

Statistiche

VerFBefore

N	Valido	155
	Mancante	0
Media		3,5554
Errore standard della media		,11333
Deviazione std.		1,41094



Based on your current knowledge, how would you rate the following characteristics of Vertical Farming?

Naturality before

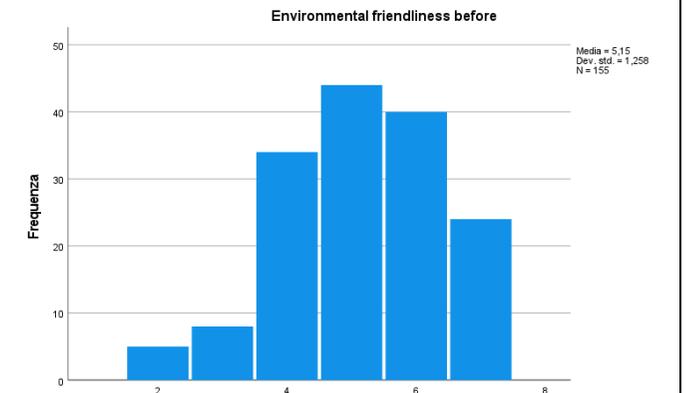
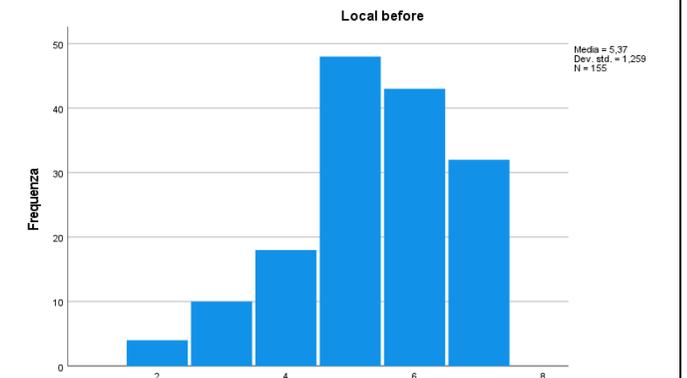
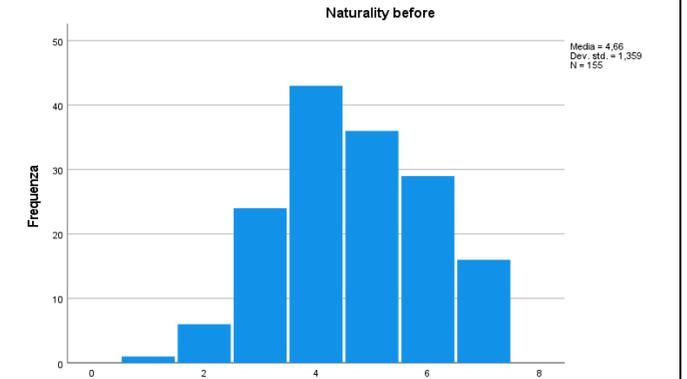
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	1	,6	,6	,6
	2	6	3,9	3,9	4,5
	3	24	15,5	15,5	20,0
	4	43	27,7	27,7	47,7
	5	36	23,2	23,2	71,0
	6	29	18,7	18,7	89,7
	7	16	10,3	10,3	100,0
Totale		155	100,0	100,0	

Local before

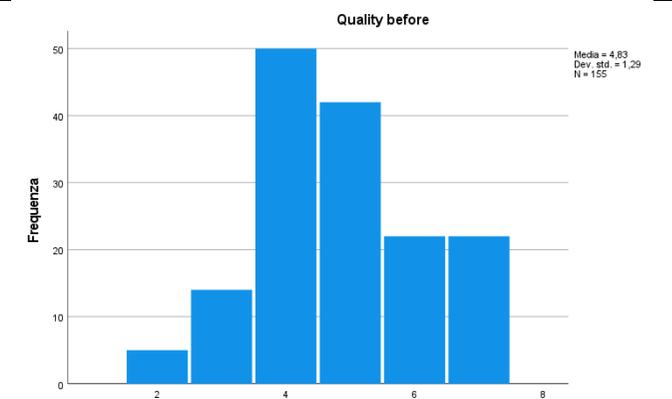
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	2	4	2,6	2,6	2,6
	3	10	6,5	6,5	9,0
	4	18	11,6	11,6	20,6
	5	48	31,0	31,0	51,6
	6	43	27,7	27,7	79,4
	7	32	20,6	20,6	100,0
	Totale		155	100,0	100,0

Environmental friendliness before

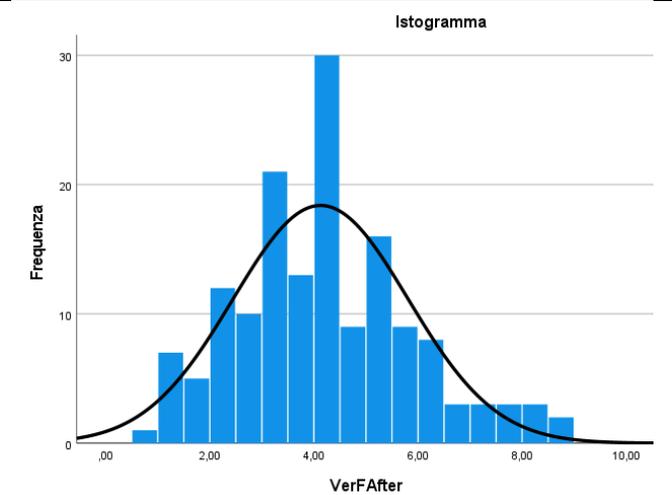
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	2	5	3,2	3,2	3,2
	3	8	5,2	5,2	8,4
	4	34	21,9	21,9	30,3
	5	44	28,4	28,4	58,7
	6	40	25,8	25,8	84,5
	7	24	15,5	15,5	100,0
	Totale		155	100,0	100,0



		Quality before			
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	2	5	3,2	3,2	3,2
	3	14	9,0	9,0	12,3
	4	50	32,3	32,3	44,5
	5	42	27,1	27,1	71,6
	6	22	14,2	14,2	85,8
	7	22	14,2	14,2	100,0
Totale		155	100,0	100,0	



		Statistiche	
VerFAfter		Valido	Mancante
N		155	0
Media		4,1286	
Errore standard della media		,13505	
Deviazione std.		1,68141	



Willingness-to-pay (€/kg)
for Vertical Farming
Products After
knowledge.

Mean value of:

- Lettuce;
- Vine tomatoes;
- Strawberry.

Now that you have watched the explanatory video on how Vertical Farming works, how would you rate the following characteristics of this growing method?

Naturality post video

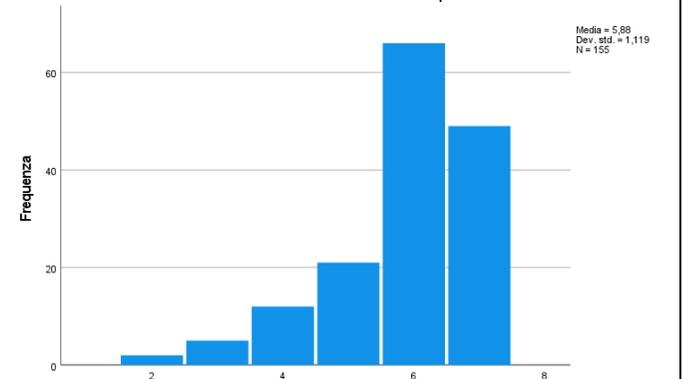
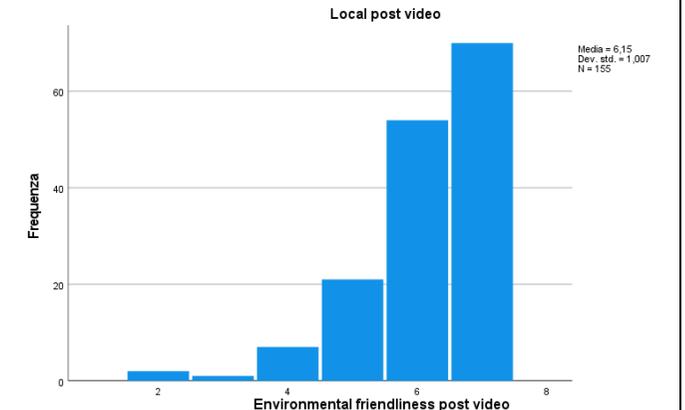
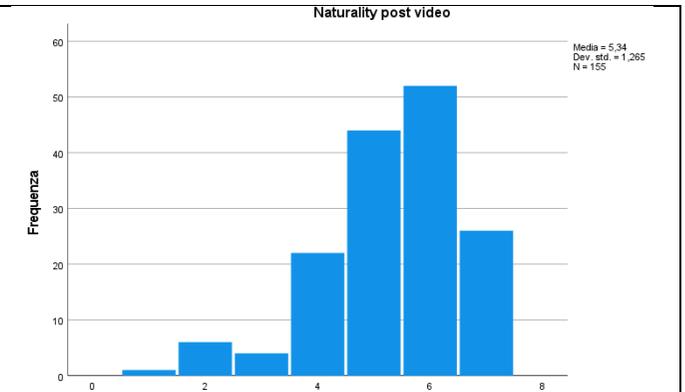
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	1	1	,6	,6	,6
	2	6	3,9	3,9	4,5
	3	4	2,6	2,6	7,1
	4	22	14,2	14,2	21,3
	5	44	28,4	28,4	49,7
	6	52	33,5	33,5	83,2
	7	26	16,8	16,8	100,0
Totale		155	100,0	100,0	

Local post video

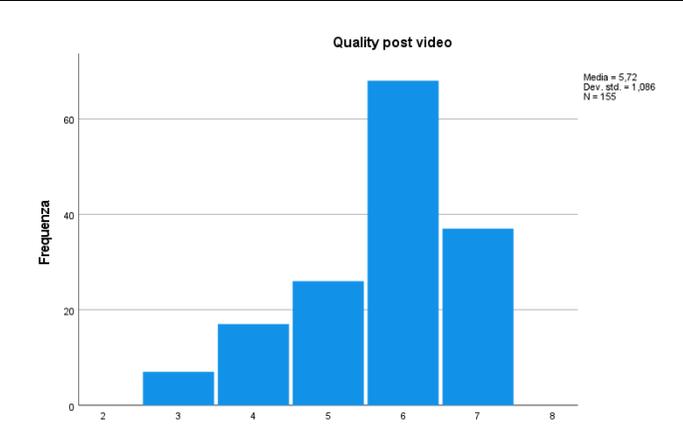
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	2	2	1,3	1,3	1,3
	3	1	,6	,6	1,9
	4	7	4,5	4,5	6,5
	5	21	13,5	13,5	20,0
	6	54	34,8	34,8	54,8
	7	70	45,2	45,2	100,0
	Totale		155	100,0	100,0

Environmental friendliness post video

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	2	2	1,3	1,3	1,3
	3	5	3,2	3,2	4,5
	4	12	7,7	7,7	12,3
	5	21	13,5	13,5	25,8
	6	66	42,6	42,6	68,4
	7	49	31,6	31,6	100,0
	Totale		155	100,0	100,0



		Quality post video					
		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa		
Valido	3	7	4,5	4,5	4,5		
	4	17	11,0	11,0	15,5		
	5	26	16,8	16,8	32,3		
	6	68	43,9	43,9	76,1		
	7	37	23,9	23,9	100,0		
Totale		155	100,0	100,0			



Additional comments	<p>"it would be a nice gift basket of fresh products";</p> <p>"To differentiate in my restaurant"; "to help the industry grow and create even more innovative solutions";</p> <p>"I would not expect that it is explicitly advertised being grown via Vertical Farming. It would raise unnecessary questions. Better advertise the benefits".</p> <p>"More than buy I would invest in it for African countries";</p> <p>"I would need to visit one to decide";</p> <p>"I would still prefer the local farmer that passionately grows products, could you work or look into similar ideas for your research";</p> <p>"Intrigued in the human sustainability aspect as well, potentially a lot of farmers could lose their jobs because of too tough competition, and they are already struggling. How can they be part of the transformation as well?";</p> <p>"You should check and address the entire supply chain itself because I believe suppliers more than customers are not aware of its benefits";</p> <p>"I didn't know much about vertical farming but i knew aerofarm as company. what is the percentage of companies that are as good as aerofarm compared to the total market?";</p> <p>"I would suggest in looking into the possible application of the concept not just as a food production (Very little profit as noticed from the greenhouses) but as a touristic centre. Many halls would be the ideal place to attract people with VF and then create shops that are closely related. I actually did some research on this topic for a uni project. Create many add-ons like gym, restaurants bar visits that are suitable";</p> <p>"new companies make it more attractive, so design is very important (of your farm and layout of the crops)";</p> <p>"Need more development for the crop";</p> <p>"How sustainable is technology to build it?";</p> <p>"look into subsidy and government partnership"</p>
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<p>RELIABILITY</p> <p>/VARIABLES=Freshnessofproduct Quality Origin Productionmethod Organic Pesticidefree Fairtrade</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=MEANS.</p>	<p style="text-align: center;">Statistiche di affidabilità</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Alpha di Cronbach</th> <th style="text-align: center;">Alpha di Cronbach basata su elementi standardizzati</th> <th style="text-align: center;">N. di elementi</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">,845</td> <td style="text-align: center;">,849</td> <td style="text-align: center;">7</td> </tr> </tbody> </table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,845	,849	7
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,845	,849	7					
<p>RELIABILITY</p> <p>/VARIABLES=Climatechange Greencertificationorlabels Foodscarcity</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p style="text-align: center;">Statistiche di affidabilità</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Alpha di Cronbach</th> <th style="text-align: center;">Alpha di Cronbach basata su elementi standardizzati</th> <th style="text-align: center;">N. di elementi</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">,823</td> <td style="text-align: center;">,826</td> <td style="text-align: center;">3</td> </tr> </tbody> </table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,823	,826	3
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,823	,826	3					
<p>RELIABILITY</p> <p>/VARIABLES=BioTomatoestradiationalagricult ure BioLettucetraditional BioStrawberrytraditionalagriculture</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p style="text-align: center;">Statistiche di affidabilità</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Alpha di Cronbach</th> <th style="text-align: center;">Alpha di Cronbach basata su elementi standardizzati</th> <th style="text-align: center;">N. di elementi</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">,774</td> <td style="text-align: center;">,846</td> <td style="text-align: center;">3</td> </tr> </tbody> </table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,774	,846	3
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,774	,846	3					
<p>RELIABILITY</p> <p>/VARIABLES=TomatoesVFbeforevideo LettuceVFbeforevideo StrawberryVFBbeforevideo</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p style="text-align: center;">Statistiche di affidabilità</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Alpha di Cronbach</th> <th style="text-align: center;">Alpha di Cronbach basata su elementi standardizzati</th> <th style="text-align: center;">N. di elementi</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">,794</td> <td style="text-align: center;">,836</td> <td style="text-align: center;">3</td> </tr> </tbody> </table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,794	,836	3
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,794	,836	3					



<p>RELIABILITY</p> <p>/VARIABLES=Naturalitybefore Localbefore Environmentalfriendlinessbefore Qualitybefore</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p>Statistiche di affidabilità</p> <table border="1"><thead><tr><th>Alpha di Cronbach</th><th>Alpha di Cronbach basata su elementi standardizzati</th><th>N. di elementi</th></tr></thead><tbody><tr><td>,853</td><td>,852</td><td>4</td></tr></tbody></table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,853	,852	4
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,853	,852	4					
<p>RELIABILITY</p> <p>/VARIABLES=TomatoesVFPostvideo LettuceVFPostvideo StrawberryVFPostvideo</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p>Statistiche di affidabilità</p> <table border="1"><thead><tr><th>Alpha di Cronbach</th><th>Alpha di Cronbach basata su elementi standardizzati</th><th>N. di elementi</th></tr></thead><tbody><tr><td>,818</td><td>,871</td><td>3</td></tr></tbody></table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,818	,871	3
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,818	,871	3					
<p>RELIABILITY</p> <p>/VARIABLES=Naturalitypostvideo Localpostvideo Environmentalfriendlinesspostvideo Qualitypostvideo</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p>Statistiche di affidabilità</p> <table border="1"><thead><tr><th>Alpha di Cronbach</th><th>Alpha di Cronbach basata su elementi standardizzati</th><th>N. di elementi</th></tr></thead><tbody><tr><td>,831</td><td>,833</td><td>4</td></tr></tbody></table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,831	,833	4
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,831	,833	4					
<p>RELIABILITY</p> <p>/VARIABLES=Tastepref BeliefFuture</p> <p>/SCALE('ALL VARIABLES') ALL</p> <p>/MODEL=ALPHA</p> <p>/STATISTICS=DESCRIPTIVE</p> <p>/SUMMARY=TOTAL MEANS.</p>	<p>Statistiche di affidabilità</p> <table border="1"><thead><tr><th>Alpha di Cronbach</th><th>Alpha di Cronbach basata su elementi standardizzati</th><th>N. di elementi</th></tr></thead><tbody><tr><td>,755</td><td>,772</td><td>2</td></tr></tbody></table>	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	,755	,772	2
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi					
,755	,772	2					

Green certification or label

Coefficienti^a

Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	2,771	,429		6,463	,000		
	Green certification or labels	,292	,088	,260	3,325	,001	1,000	1,000

a. Variabile dipendente: VerFAfter

Climate change

Coefficienti^a

Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	3,301	,479		6,897	,000		
	Climate change	,177	,098	,144	1,800	,074	1,000	1,000

a. Variabile dipendente: VerFAfter

Food Scarcity

Coefficienti^a

Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	3,273	,402		8,132	,000		
	Food scarcity	,197	,087	,179	2,254	,026	1,000	1,000

a. Variabile dipendente: VerFAfter

Freshness of Product

Coefficienti^a

Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	4,451	1,141		3,900	,000		
	Freshness of product	-,052	,182	-,023	-,285	,776	1,000	1,000

a. Variabile dipendente: VerFAfter

Quality

Coefficienti^a

Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	4,612	1,182		3,901	,000		
	Quality	-,078	,189	-,033	-,412	,681	1,000	1,000

a. Variabile dipendente: VerFAfter

Origin								
Coefficients ^a								
Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	3,323	,540		6,152	,000		
	Origin	,150	,098	,123	1,539	,126	1,000	1,000
a. Variabile dipendente: VerFAfter								
Production method								
Coefficients ^a								
Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	4,022	,385		10,446	,000		
	Production method	,024	,082	,024	,297	,767	1,000	1,000
a. Variabile dipendente: VerFAfter								
Organic								
Coefficients ^a								
Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	2,610	,487		5,362	,000		
	Organic	,305	,094	,253	3,240	,001	1,000	1,000
a. Variabile dipendente: VerFAfter								
Pesticide-free								
Coefficients ^a								
Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	2,567	,506		5,074	,000		
	Pesticide-free	,292	,091	,250	3,196	,002	1,000	1,000
a. Variabile dipendente: VerFAfter								
Fair trade								
Coefficients ^a								
Modello		Coefficients non standardizzati		Coefficients standardizzati			Statistiche di collinearità	
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	3,302	,413		8,004	,000		
	Fair trade	,175	,083	,169	2,117	,036	1,000	1,000
a. Variabile dipendente: VerFAfter								

Taste & preference, Belief about the future

Coefficienti^a

Modello		Coefficienti non standardizzati		Coefficienti standardizzati		Statistiche di collinearità		
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	2,520	,755		3,337	,001		
	Tastepref	,302	,140	,172	2,163	,032	1,000	1,000
2	(Costante)	2,479	,749		3,311	,001		
	Tastepref	,085	,178	,049	,478	,633	,604	1,655
	BeliefFuture	,262	,135	,197	1,938	,055	,604	1,655

a. Variabile dipendente: VerFAfter

Coefficienti^a

Modello		Coefficienti non standardizzati		Coefficienti standardizzati		Statistiche di collinearità		
		B	Errore standard	Beta	t	Sign.	Tolleranza	VIF
1	(Costante)	2,747	,496		5,533	,000		
	BeliefFuture	,303	,105	,227	2,887	,004	1,000	1,000
2	(Costante)	2,479	,749		3,311	,001		
	BeliefFuture	,262	,135	,197	1,938	,055	,604	1,655
	Tastepref	,085	,178	,049	,478	,633	,604	1,655

a. Variabile dipendente: VerFAfter

App.9 Interview summary

Interview 1

Postgraduate from Wageningen University.

Account Executive, Business Development, at Freight Farm.

What services does your company offer?

Freight farms build user-friendly hydroponic farms inside shipping container, and we provide training along that. The company was launched in 2010.

What application does your product provide?

It really depends on the customer. We work a lot with existing farm (Traditional) in adding a steady source of production that doesn't depend on weather and to differentiate their products. Our product is suitable to entrepreneur that want to start a small farming business because the technology is user-friendly, and we provide training along the journey. This releases a lot of stress and we saw that people got creative. We have a Customer XX that put her container at the service of a boys and girls club in NY to give the kids access to healthy food as a non-profit company. It can be used as an education centre; we even do that at our headquarters.

According to you, how will VF evolve in the future?

Vertical farm started as a complex technology, but it needs to become more user friendly to actually break the market and that is what we strive to do at freight farms. We now see a centralization of production plant to supply a large population, and this goes against some principal of VF. It seems like VF producer want to replicate and compete the mass production of large field with a product that is simply too expensive. At freight farms we believe that VF will be decentralized, and many communities will own small VF where the availability of fresh product is limited.

(Explain EXP and present a summary of my survey findings) How feasible is the application in a VF?

Here at freight farms, we test to what extend we can stress the plants by having tour visits inside the container. We are not a production company, so our goal is not the product, but the technology and services related to it. There are a number of experiences that we recommend as they have already been tested and they are:

- Educational experiences: by having people visiting your farm you can explain the growing process and people then understand that it is not lab food but actually a very pure and fresh produce. This works really well with schools; we observed a growing interest from elementary and middle schools to connect kids to sustainable agriculture from an early age.
- Personalized crop: most of our farmers are local supplier, so involving the local community is essential. A great experience they have been able to deliver is growing on demand. One week from the other they would publish a list of crops they can grow, and restaurant and individual could ask for specific goods. That is very advantageous for restaurant as well as they can enormously differentiate their menu, especially with exotic or rare herbs and spices. This level of personalization creates high conversion rates, retention and good word of mouth.

- Francesco Filipetti and David Turina
Turina
Mercoledì, 20 ottobre · 18:30 – 18:45



Figure 12 Meeting

Interview 2

Head Grower at Indoor Farming Cooperative

What services do you offer?

I am a certified adviser at an Urban Farmer cooperative in the Metropolitan area of Las Vegas. We work with two clients, urban farm owners and the local community. We advise local owner to realize their business plan, therefore, enable them to consistently achieve high yields of top-quality produce. As a cooperative we manage the planning, growing and distribution on behalf of the local community.

As a freelancer I specifically assist businesses at the operational level and its technicalities (crop choice, temperature, nutrients, lights). My job is to make businesses more effective and efficient and educate them on how to operate VF technologies

How profitable are the company you advise?

Most, if not all, the companies I assisted had serious cashflow problems. They were not able to put in practise their business plan in terms of production and labour costs. This is because most farmers were not aware of the difference in skills needed between traditional and vertical farming. VF uses a greater degree of technology to achieve its promise yields. While you can procrastinate some activities in traditional farming, such as irrigating, seeding, soil tests etc, without creating much opportunity cost, it is not the same for VF. If an aeroponic irrigating systems malfunction for more than two hours, the plants' root will die out, making you lose your entire crop. This caused lots of companies to substantially differ from their original business plan and, on the long run, to go bankrupt.

According to you, how will VF evolve in the future?

Aerofarms (from the video) is really a best practices case of the sector, and it is not even sure they are profitable. They were supposed to go public through a merger, but the deal did not go through, so that was a big hit for us as well since we could have learned a lot from them, they would have become the market reference. So, I really think that a lot of the VF future will depend on them, as they might have the power to draw the path for all the other start-ups.



As I said before, most companies do not have idea about the market practice in VF, since as of today there is no public company to “copy”, so they just go through an extensive trial & error phase. If my business plan tells me that to be profitable, I need to harvest 50,000 heads of lettuce a year, but I only produce 20,000 because of my inadequacies, I am destined to fail. I believe it is also very important to keep this in mind for your research.

Please, explain more about it.

I will make you an example. According to my business plan I need to produce 50,000 heads of lettuce a year and sell them at a €3.00/piece to be profitable. However, consumer is only willing to pay €2-2,50/piece. In this scenario, your solution of education and experience economy (the research thesis outcome) could cover or even exceed the gap. However, if I only produce 20,000 heads a year, I will have to sell each head of lettuce at €7,50 to be profitable and nobody would pay that price.

(Explain EXP and present a summary of my survey findings)

How feasible is the application in a VF?

On-site trip	Education is one of the pillars of vertical farming, so it does fit very well. Lots of traditional farm have done so in the initial phase of Biological cultivation. It is more challenging for a VF as you need to maintain a closed environment but very feasible.
Gift basket	We occasionally do some gift basket for our community at our coop and guests that received it always came back to buy more products. In our case it is a great marketing tool.
Handpick your own basket	Theoretically is a great idea, practically a logistical nightmare. For the same reason that it is a fragile environment, some people might associate it to a fake food lab. Most VF do not project their building to carry out these activities in a smooth way. However, if kept in mind during construction, it would be a great opportunity to engage customers and showcase your farm (cut down harvesting and packaging costs) and make them pay a premium. However, it is a great opportunity to engage customers and showcase your farm (cut down harvesting and packaging costs) and make them pay a premium.
Touristic centre (with gym, bars, restaurant)	It is the ultimate business plan. For this case it is essential to have great management of production, logistic and business acumen. The vertical farm would become the heart of the centre and differentiate it from competition. You can even extend that to an entire neighbourhood if you have the right facility, technology and labour.
Restaurant supplier	This was one of the most successful market moves from Singapore. It is a win-win situation for the restaurants in terms of marketing and for the VF that partners with reliable consumers.

Educational centre /event You hear a lot of new partnership in the sector between government and schools with VF. It is very beneficial for VF as they can get a steady income and rely on partnership with big institutions. In some cases, you can even use students from specialized university to work on R&D and project for your company, and although the work is not as professional as from industry expert, it come at little or no price. Additionally, those young students will be VF customer of the future. As you mentioned education is one of the pillars of VF, therefore, this would probably be my most suggested experience. A great example of a successful educational events is the Dubai expo on sustainability, you should look into that.

Other EXP Design A possible application of VF is to blend it with any type of commercial activities, imagine going to a café and the walls are the production area. In would transport people outside the city.

Transform it into a brand with appropriate interior design, make it instagrammable. People might come to you because it looks futuristic and cool.

Merchandise is a great way to generate side revenue, you can make plant key chains, sustainable clothing, grow your own farm kit.

Make a live cam of how your products are grown, allow customer to browse through the VF.

Pop-up events such as tasting, cocktail workshop, partnership with famous food brands for limited products next to the VF, but not inside (ice-cream).

Interview 3

Bachelor's in environmental sciences in Rome, master's degree in plant sciences at the Wageningen University with specialization in crop science. Working in the R&D department of LocalGreen, a VF start-up in Milan.

What is the history of the company?

Local green is a VF start-up launched in 2019 after his founder patented an innovative water system for aeroponics. They were new to the market (there were only 2 companies at the time). LocalGreen grows with aeroponics in a vertical way, which is rare among the sector as it is the most technical and delicate production method.

What struggles did you overcome to achieve profitability?

We could not precisely predict our production output, we struggled to understand what the ideal growing conditions for the crop were. This was because there was yet little documentation about VF and Aeroponics as those who discover the best setting want to keep it to themselves to be successful. The owner the hired an Aeroponics expert from a successful competitor. When he entered the company started growing fast because of his

knowledge and we were able to match our business plan. We can now reliably forecast how much we are going to produce, and the cost associated with it. After that we started growing through partnerships and we will launch a new production plant in March 2022.

(Present the most common struggles of VF companies discovered through literature review and interviews with previous experts)

Why do start up in VF struggle so much?

There are many problems:

- Agronomic knowledge: plants can grow differently in VF depending on many factors, such as light, temperature, type of crops etc. People that come from traditional agriculture do not understand that; they believe that it is almost the same method and that if you just buy the technology, you will be successful. This is not the case because before going on production, companies need to run extensive R&D to understand the perfect condition for each crop. This is not something you can know unless you studied it or ran lots of experiments. The information on the internet or academic articles are not accurate, as they are only theoretical and successful companies do not share their "recipe".
- Economic Knowledge: most businessmen are not willing to invest the right amount of capital but expect immediate results. VF is the sector of the future, not the present, therefore successful companies know they need to be patient and continue with expensive R/D before becoming profitable. And people usually do not pay attention to hidden or side costs, that add up all together create large expenses. These are the seeds, the plant medium, maintenance of the equipment, packaging cost, substrates etc.
- Business knowledge: you need to know your customers. Although you might grow perfectly grow 20 crop varieties you need to understand what the market wants. Most VF check what they can grow best and then put their product on the market without checking if the customer want them or not. They should do the opposite: understand what crop the customer want and then do R&D on how to grow them.

According to you, how will VF evolve in the future?

VF is currently experiencing its golden rush. People understand there are many opportunities in the sector. Now there is a lot of knowhows for green products and leafy greens. Now, the next step is R&D on medicinal plants with a branch called molecular farming, which is a mix between vertical farming and biotechnology. Then there is a need for research in soft fruits and staple crops. Another direction is making VF more sustainable by using renewable green energy and sustainable materials. Now most of the equipment, like the substrate, gloves, packaging, and racks are made of plastic. However, there is a lack of expertise to achieve this. I believe that universities will have to evolve with new master and specialization to provide for this lack of knowledge.

I also forecast a boom of VF in those countries that have limited water resources and adverse climate. And I do not mean just developing countries, like Africa, but especially developed regions such as Sicily and Puglia.



(Present a summary of research and survey findings)

What experiences will or do you provide to customers?

We have a partnership with an elementary school where one of our employees explains what VF is. We are planning to provide tours inside the facility so that it may be easier to understand the added benefits of VF if people see it in person. We want to expand our partnership range with universities as well.

What are feasible experiences to apply to VF?

It depends on your customer segment, for young people I believe that the educational experiences are enough. Partnerships with local companies are essential and vital to the success of the farm. Normally when you go to a restaurant and take a salad, you do so to be healthy and in most cases, it will not be as satisfying as taking something tasty which is unhealthy. If you can combine both I believe you provide the biggest experience to customers. So, restaurants are key in spreading this message. The other experiences you mentioned are feasible only if they are external to VF. You can have a building with vertical farm inside but not vice versa. You cannot do pop-up events inside the VF itself as you need to keep a closed environment; the risk of pests would be too high. However, if this is all part of an interactive building it would be the ultimate project to showcase the circular economy.

What solutions do you suggest winning customers?

Younger generations are keener to understand the added benefits and come visit VF. You need to work harder with older generations; you need to break the knowledge gap. I believe you need to provide a sort of experience in the supermarkets. When you go to the supermarket you do not see a problem with your fresh food and vegetables. Big chains do a meticulous selection before displaying their products, so you cannot understand that a product is old and lost his nutrients at naked eye. So, to make the ball rolling you need to start talking about the problems and create interest about it. And supermarkets can play a role in this. When at the supermarket, a consumer will generally read labels of wines to understand the differences among them, while with lettuce they just take the cheapest or first package they find. I would like to be able to tell people everything behind that package of green leaves, that it is not just a seed put into the ground. They always talk about the problems during conferences and congress but rarely where the actual purchase is made, the best place to educate people on the topic. Although customers might not see this difference, supermarkets do. As I mentioned before, grocery stores are very selective with what they display, they have criteria like shelf life, packaging, type of greens, lengths, shape, they take everything into consideration because they know what the customer wants. So, you need to act at the supply chain level because they are already the one selecting everything, and the customer mostly see a price difference. On one hand the supermarket need play the role of educators in this process and VF companies need to stand out from traditional agriculture and present their products as something different. If a customer sees the same overall packaging, labels and mix in a supermarket they will likely choose the cheaper option and we need to stop trying to copy traditional or Bio products. I do not mean that you should say that your product is better, but that it is different and explain in what it is so that people will stop having misconceptions or get confused about VF.

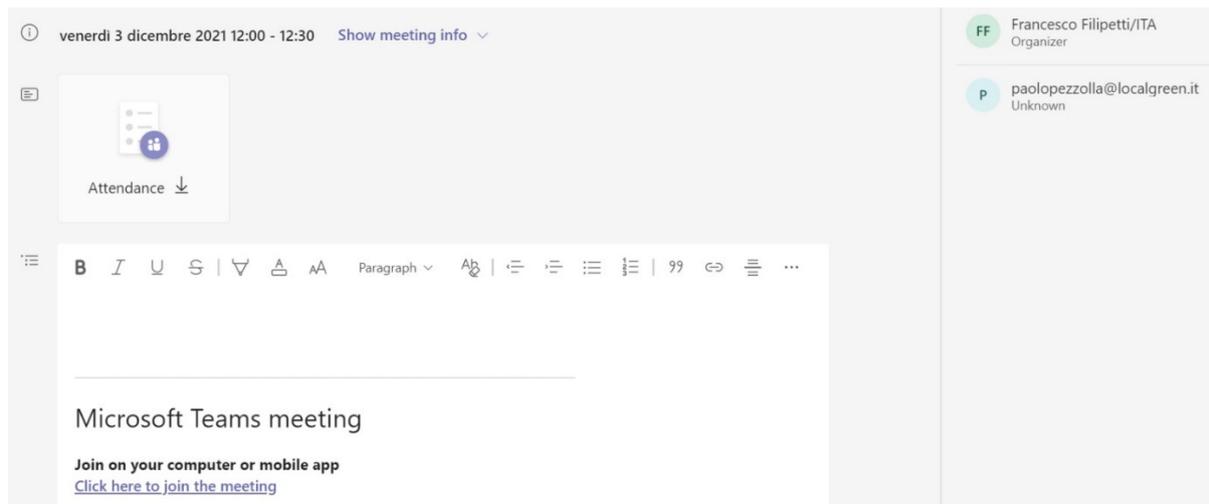


Figure 13 Meeting

App.10: Solution design

Multiplier effect of partnerships.

Upon problem analysis, the researcher looked how other companies and industries have been able to overcome customer resistance to buy new products; it was found that partnerships with trusted parties help spreading knowledge about innovation. This is particularly the case for Private public partnerships (PPP). On one hand, the private sector increases efficiency due to specialized skills of the organization and it can overcome operating restrictions that the public sector faces (Anderson and Freebody, 2013). On the other hand, the public sector gives access to a larger infrastructure to connect with the mass (Barrera-Osorio et al., 2012). For this types of partnerships to be effective for a long period, “you need mutual confidence, trust, and loyalty of partners, and the absence of negative externalities for the members of the partner network” (Butenko and Kot, 2019). The end goal should be favourable to both organizations. Another type of partnership is the co-operation of private entities. This refers to a coalition of the VF companies to create a joint marketing strategy aimed to spread the VF benefits. This type was successful for the screw cap innovation. Some features influence the value outcome of the alliance: companies marketing infrastructure, capabilities and interconnection among firms (Barrera-Osorio et al., 2012).

App.11: Dissemination tools

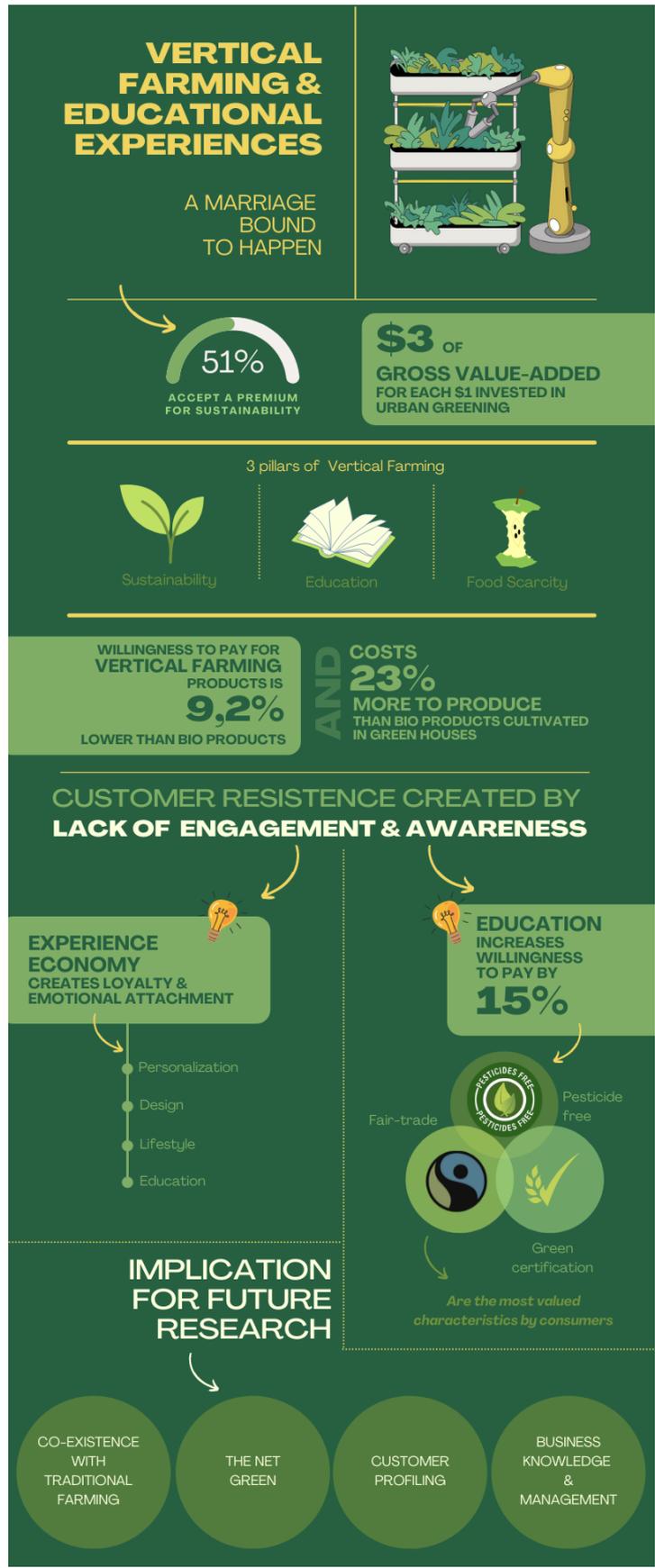


Figure 14 LinkedIn infographic

App.12 Evaluation Research

(EVALUATION FORM OF ALL CLIENTS AND ON ALL DELIVERABLES IS COMPULSORY, FORMAT IS NOT)

Name of student:	Francesco Filipetti	Student number:	672073
Name of company/organisation:	SDG community of HTH	Department:	Research
Name of company tutor/research commissioner:	Ms. Marjan de Jong	Position of company tutor/commissioner (if applicable):	Lecturer
Project and/or Deliverable: (please specify)	Company Project		

During the first (unofficial) evaluation the set-up for the project and end deliverable(s) is discussed. For this final evaluation the project has been delivered by the student and is thus evaluated. This is taken into consideration for the final assessment of the student.

CATEGORY 1: EXPERTISE/KNOWLEDGE OF THE FIELD

Rating	Excellent	Good	Room for improvement	Comments
	In-depth use of relevant literature and knowledge of the field. The deliverable shows excellent thinking capacity of the student (taking into account all significant factors and looking from all different perspectives).	Use of relevant literature and knowledge of the field. The deliverable shows mostly intellectual depth (taking into account significant factors and looking from different perspectives).	No or incorrect use of literature and knowledge of the field. The deliverable lacks intellectual depth.	Multiple perspectives are well chosen and analysed.

CATEGORY 2: KNOWLEDGE APPLICATION/SOLVING PROBLEMS

Rating	Excellent	Good	Room for improvement	Comments
	The theories and models are skilfully applied and the student can translate this in a unique solution and implementation. The student can relate situations to concepts that results into a solution that adds great value to the company's overall strategy. The creative solution is/can be implemented and evaluated and is solving the	The student uses theory and models and shows understanding of the issues at hand. The solution is realistic and implementable for the company. The solution is/can be implemented and evaluated.	Mentioning theory and models, but not using them in the correct way. The student cannot convince of the possibilities to implement and evaluate. It is not solving the problem.	Literature is very well applied. It is not clear who the beneficiary of your research is, therefore the solution design feels dropped in. Solution does however seem to add a lot of value, but not all stakeholders seem to be involved (feedback in communication). Should have been covered in the problem analysis.

CATEGORY 3: INFORMED JUDGEMENTS				
Rating	Excellent	Good	Room for improvement	Comments
	The research process is done and explained in an excellent way. All statements, conclusions and recommendations are underpinned with the data collected by the students and/or referencing. The analysis is very substantial.	The research process is done and explained well. Most statements, conclusions and recommendations are underpinned with the data collected by the student and/or referencing. The analysis is substantial.	Weak problem analysis, research question not clear enough. Data collection and/or methodology is insufficient. Weak analysis, use of data from one dimension and not backed up.	In dept research. Again using multiple perspectives and in dept underpinning.
CATEGORY 4: COMMUNICATION AND SHARING KNOWLEDGE				
Rating	Excellent	Good	Room for improvement	Comments
	Excellent ability to communicate information, ideas, problems and solutions to all stakeholders involved. The deliverable adds great value to the main stakeholders. Initial and creative channels have been actively used to share outputs and knowledge.	Good ability to communicate information, ideas, problems and solutions to stakeholders. The deliverable adds value to the company. Existing channels have been used to share knowledge	The deliverable could have been better delivered to the stakeholders. The deliverable could have added more value, if better delivered. No active communication of outputs and knowledge.	Who will benefit from your research? Hospitality Industry? How do they benefit from your research? Commissioner seems to be missing. How does the research benefit HTH?
CATEGORY 5: INTERCULTURAL HOSPITALITY LEADERSHIP				
Rating	Excellent	Good	Room for improvement	Comments
	Student is able to lead the project by themselves. Student is self-critical towards improvement and takes feedback to heart. Student deals with a diversity of stakeholders in an intercultural competent way. Hospitality mindset is seen in project or work in a very distinct way.	Student is able to lead the project with little help. Student is critical towards improvement and listens to feedback. Student deals with different stakeholders. Hospitality mindset can be seen.	Tasks performed are described and not critically analysed. Student is not too critical towards own learning and can listen better to feedback. Student does not know how to deal with differences in stakeholders. Hospitality can be improved.	Very independent, thorough, and enthusiastic. Is was a pleasure to work with you!

OVERALL COMMENTS:

STUDENTS' COMMENTS:

Comments on evaluation:

Comments have been partially applied and will be further developed during dissemination event of the Vertical farming event

DATE & STUDENT'S SIGNATURE:

COMPANY SUPERVISOR'S/RESEARCH COMMISSIONER'S SIGNATURE:





App.13 ICC Consortium Agreement

ICC Model Consortium Agreement

for supplies and services provided through an open Consortium (including bidding phase)

by and between:

.....

and

.....

and

.....

This Agreement contains an arbitration clause and clauses limiting and/or excluding the liability of the Consortium Members in certain circumstances.



Main Agreement Form

This agreement is made on [_____, _____, _____]

Between:

[_____] (a [_____] company with registered number [_____] whose registered office is at [_____] and represented by _____ acting through a duly authorized power of attorney (the [_____], which expression shall include successors and permitted assigns), and;

[_____] (a [_____] company with registered number [_____] whose registered office is at [_____] and represented by _____ acting through a duly authorized power of attorney (the [_____], which expression shall include successors and permitted assigns),

[_____] (a [_____] company with registered number [_____] whose registered office is at [_____] and represented by _____ acting through a duly authorized power of attorney (the [_____], which expression shall include successors and permitted assigns),

[_____], [_____] and [_____] hereinafter referred to individually as "Consortium Member" or collectively as "Consortium Members".

Whereas:

a. the Employer has invited interested companies to submit offers for the Project;

a. the Consortium Members wish to submit a joint Offer for the Project, and, if the Offer is successful, to jointly implement the Project;

a. the Consortium Members anticipate that submission by them of individual offers would not lead to any of them being the successful bidder;

a. the Consortium wishes to be selected and appointed by the Employer to execute and carry out the Work under the terms of the Contract, including any addition or variation thereto, which may be ordered by the Employer under the Contract. To enable the proper performance of the Work to be so carried out the Consortium Members have agreed to enter into this Consortium Agreement on terms and conditions herein agreed or referred to.

It is agreed as follows:

1. In this Main Agreement Form, all capitalised words and expressions shall have the same meanings as are assigned to them in this Main Agreement Form or the General Conditions.

2. The Consortium Members agree to co-operate based on the terms and subject to the conditions of this Agreement, as more particularly described in the Special Conditions, General Conditions and Annexures as attached hereto.

3. The following Sections shall be read as one document and form the Agreement and, in the event of ambiguity or contradiction between the Sections, the ambiguity or contradiction shall be resolved by giving precedence to the Sections in the order listed:

- Main Agreement Form
- Section I – Special Conditions
- Section II – General Conditions
- Annex 1 – Scope of Work
- Annex 2 – Project Schedule
- Annex 3 – Contract Price
- [...]

Whereas the Consortium Members have executed this Agreement by duly authorized representatives on the day and year first above written.

[_____]

[_____]

[_____]

Name

Name

Name

Witness

Witness

Witness

Section II - Special Conditions

Schedule of Reference Details:

Article 1 "Employer" means [...].

"Project" means [...].

The Proportionate Value of each Consortium member is:

(i)

(ii)

(iii)

Article 2.2 The administrative office of the Consortium shall be at [...].

Article 4.2 The Consortium Leader shall be [...].

Article 9.1.2 Minimum Transportation Insurance coverage shall be [...].

Article 9.2.1 (c) Minimum Comprehensive third-party liability Insurance coverage shall be [...] per occurrence and [...] in the aggregate.

Article 13.3.4 The liability of each Consortium Member shall per event be limited to [...] percent of the value of the Scope of Work of the liable Consortium Member.

Article 13.3.5 The delayed payment rate shall be [...] percent per annum.

Article 15.1 This Agreement shall become effective on [...] regardless of the date of signature of the parties.

Article 16.5.3 The seat of arbitration shall be [...].

Article 17 The applicable legal system shall be the law of [...].

Article 18.6 The addresses for the service of notices are:

(i)

(ii)

(iii)

[end of Special Conditions]

Section I - General Conditions

Article 1 Definitions

"Agreement" means this Consortium Agreement consisting of the Main Agreement Form, the Special Conditions of Contract, the General Conditions of Contract and the Annexes listed in the contents section.

"Consortium" means the temporary association of the Consortium Members established under this Agreement pursuing the objectives described in Article 2.1.

"Consortium Leader" is the Consortium Member nominated in the Special Conditions when acting in the functions described in Article 4.3.3.

"Consortium Member" means any party to this Agreement as described hereinabove.

"Contract" means the contract for the Project to be entered into by the Employer and all Consortium Members or awarded by the Employer to all Consortium Members as the case may be.

"Employer" shall have the meaning given to it in the Special Conditions.

"DRB" means Dispute Review Board.

"DB Rules" mean the ICC Dispute Board Rules 2015.

"Design Freeze Date" means the date set forth in the Time Schedule prior to which a Consortium Member may change the design within or related to its Scope of Work without becoming liable hereunder due to the change.

"Dispute" means differences, conflicts or disputes arising out of or in connection with this Agreement, including any question regarding its existence, validity, termination or its performance, or in connection with arrangements regarding the performance of this Agreement or amendments thereto.

"Good Practice" means the exercise of that degree of skill, diligence, prudence, foresight and that engineering and construction practice which would reasonably and ordinarily be expected from a skilled contractor under circumstances same or similar to the Project.

"Gross Negligence" shall mean the conscious and reckless disregard for the need to use Good Practice.

"HSE" means Health, Safety and Environment.

"ICC" means the International Chamber of Commerce.

"Negligence" means any act or omission which is not in line with Good Practice.

"Offer" means the offer to be submitted by the Consortium Members to the Employer for the Project pursuant to Article 6.1.

"Project" shall have the meaning given to it in the Special Conditions.

"Proportionate Value" is the percentage ratio of the value of the Scope of Work of a Consortium Member in proportion to the Total Value of the Work as specified in the Special Conditions.

"Rules of Arbitration" has the meaning described in Article 16.4.

"Scope of Work" is the part of the Work a Consortium Member has to perform pursuant to Annex 1.

"**Supervisory Board**" is...[TO COME]

"**Site**" is the piece of land where Work supplied under the Contract is to be erected and commissioned.

"**Time Schedule**" is the time schedule attached as Annex 2 and referred to in Article 7.4.

"**Total Value of the Work**" is the Contract price as amended during the implementation of the Project and as is specified in Annex 3.

"**Work**" means the supplies and services to be provided by the Consortium Members to the Employer pursuant to the Contract.

Article 2 Formation of the Consortium

2.1 Objectives

The Consortium Members hereby agree to form a Consortium having the following objectives:

- (i) to prepare and submit the Offer,
- (ii) to conduct any necessary negotiations with the aim to agree on the Contract, and
- (iii) to execute and perform the Contract.

Optional

2.2 *Administrative Office*

The administrative office of the Consortium shall be at as specified in the Special Conditions.

Article 3 Participation / Allocation

3.1 Allocation of Work

The Work shall be allocated among the Consortium Members according to Annex 1, as amended, as the case may, according to Article 7.3.

3.2 Bearing of Risks

To the extent not otherwise provided herein and particularly Article 13 each Consortium Member shall, *inter partes*, bear the technical, economic, quantity and time related, financial and other risks connected with or affecting its Scope of Work.

3.3 Profits and Losses

The Consortium Members do not intend to share the profits or losses of their joint performance of the Contract.

Article 4 Organisation and Decision making

4.1 General Organisation

4.1.1 Each Consortium Member shall perform and be responsible for carrying out its portion of the Scope of Work in accordance with the Contract and this Agreement.

4.1.2 The executive bodies of the Consortium, when constituted, shall be:

(1) The Supervisory Board

(2) The project management of the Work

4.1.3 Establishment of the Consortium Organisation:

4.1.3.1 Overall control shall be vested in a Supervisory Board, comprising two senior management representatives of each Consortium Member, to be nominated in writing. The representatives shall be fully authorised to act and bind the Consortium Member which they represent in all matters within the scope of the Consortium and the Contract.

4.1.3.2 Each of the Consortium Members may change its representatives at any time by written notice to the other Consortium Member(s).

4.1.3.3 By written notice to the Supervisory Board, each representative may appoint an alternate to attend, speak and (subject to Article 4.2.2.6 below) vote on his behalf at any meeting of the Supervisory Board at which he is not present.

4.1.3.4 A representative of the Consortium Leader shall act as chairman of the Supervisory Board.

4.1.3.5 In addition to any specific matters which are reserved for the jurisdiction of the Supervisory Board under this Agreement, its primary duty shall be to decide all matters of policy, including major changes to - or termination of - the Contract.

4.1.3.6 Subject to the provisions of the Agreement to the contrary, each of the Consortium Members shall have two votes at the meetings of the Supervisory Board, irrespective of the number of its representatives present.

4.1.3.7 The individual costs and expenses of attendance of Supervisory Board Representatives and alternates, and other Consortium Member representatives on Consortium business shall be borne by each relevant Consortium Member individually. Unless otherwise agreed, Supervisory Board representatives, their alternates and other Consortium Member representatives shall not receive any remuneration from the Consortium.

4.1.3.8 Subject to the overriding authority and control of the Supervisory Board, the execution and carrying out of the Work shall be supervised, co-ordinated, managed and directed by full-time project managers.

4.1.3.9 A first meeting of the project managers shall take place no later than days from the date of the award of the Contract. At that first meeting at the latest, the Consortium Members shall finalize the overall project organization and appoint the appropriate management level representatives of each Consortium Member who will be the Supervisory Board representatives.

4.1.3.10 The Consortium Members shall use best efforts to avoid any change of appointed representatives during the performance of the Contract.

4.2 Decision Making and Supervisory Board Meetings

4.2.1 Decision Making

Decisions will be made by the Supervisory Board and decision making shall require the unanimous consent of the Supervisory Board representatives, if not otherwise explicitly provided herein. Supervisory Board representatives shall not unreasonably withhold their consent. In the event of a deadlock in the Supervisory Board, the meeting shall be adjourned and shall reconvene not more than three days later. In the event of a continued deadlock, the matter shall forthwith be referred, in writing, by the Chairman of the Supervisory Board to the chief executive officers of each of the Consortium Members (or other person of suitable standing and authority chosen by the respective Consortium Members who shall meet within [three (3)] days of the matter being referred to them. They shall work together in order to reach a unanimous decision which shall be binding on all Consortium Members.

4.2.2 Form

Resolutions or decisions to be taken by the Supervisory Board shall be passed or taken at a meeting or – without a meeting – in writing or by telephone or e-mail without electronic signature if – in the case of resolution or decision by telephone or e-mail without electronic signature – confirmed in writing within five (5) calendar days after the resolution was passed.

4.2.3 Convening of Meetings

Supervisory Board meetings shall be held regularly and shall be convened by the Consortium Leader at the agreed intervals or whenever necessary for furtherance of the contractual objectives or upon written request of a Supervisory Board representative. If possible, the Consortium Leader shall give the Supervisory Board representatives seven (7) calendar days' prior written notice of Supervisory Board meetings and provide a written agenda. Proposals of a Supervisory Board representative for the agenda for Supervisory Board meetings shall be taken into account if they are submitted by the Supervisory Board representative to the Consortium Leader at least four (4) calendar days prior to the scheduled Consortium meeting. If agreed by the Supervisory Board representatives, the Supervisory Board meeting may be held by telephone or video conference.

4.2.4 Obligation to Attend Meetings

The Supervisory Board representatives shall attend the properly convened meetings of the Supervisory Board. If a Supervisory Board representative fails to attend a Supervisory Board meeting without justification despite a correct and timely invitation, the Consortium Leader shall immediately reconvene such a meeting pursuant to Article 4.2.3. If the Supervisory Board representative that did not attend the first Consortium meeting fails to attend the reconvened meeting without justification, resolutions which have a direct impact on the continuation of the Work may be passed by the attending Supervisory Board representatives alone even if the non-attending Consortium Member is affected by such resolutions.

4.2.5 Records of Meetings

The Consortium Leader shall keep minutes of the Supervisory Board meetings and shall record decisions passed by the Supervisory Board, and shall send a copy of any such record to the other Supervisory Board representatives without delay, but in no event later than ten (10) calendar days after the resolution was passed. Unless the Consortium Leader receives a written objection to any such record within ten (10) calendar days from the date of receipt by the Supervisory Board representative concerned, such record shall be deemed to be correct and complete.

4.3 Consortium Leader

4.3.1 Leader

The Consortium Leader shall be the Consortium Member as specified in the Special Conditions.

4.3.2 Authority

The Consortium Leader shall be instructed to undertake those actions and activities as set out in this Agreement but shall, subject to the provisions of this Agreement, in no case be authorised to make commitments for or legally bind the Consortium or any Consortium Member, without the written approval of the Supervisory Board representative(s) affected.

4.3.3 Duties

The duties of the Consortium Leader shall solely be of an administrative and coordinative character, including:

- to provide technical, commercial and organizational coordination of the Consortium Members in the bidding phase and during the performance of the Contract;
- to act as the spokesman in negotiations with the Employer, authorities or any third parties which are of joint interest, including preparing the necessary correspondence;
- to the extent applicable and subject to to keep the necessary books, and, to prepare and submit tax returns for the Consortium;
- to convene Supervisory Board meetings;
- to make proposals for joint insurance coverage of all the Consortium Members pursuant to Article 9.1.4;
- to coordinate the establishment of a joint construction site;
- to coordinate the preparation of progress reports and other documentation to be submitted to the Employer;
- to collect payments from the Employer to the extent and in the way foreseen in Article 10.4; and
- to perform any other duties assigned to the Consortium Leader through this Agreement or through a respective resolution or decision of the Consortium Members.

4.3.4 Duty to Inform

The Consortium Leader shall advise the other Consortium Members without delay of all matters, of which it becomes aware in its function as Consortium Leader and which may materially affect the preparation of the Offer, the performance of the Contract or any other Consortium Member's Scope of Work and provide the other Consortium Members with copies of all important correspondence in its possession relating to the Project, particularly those relating to each Consortium Member's Scope of Work.

4.3.5 Compensation of the Consortium Leader

Option 1:

Consortium Leader's Fee

For performing its duties, the Consortium Leader shall be entitled to receive a fee provided the Contract is awarded to the Consortium. This fee shall settle all expenses of the Consortium Leader in the bidding phase and in performing the Contract, unless the Consortium Members decide otherwise in accordance with Article 4.2.

The fee shall be [...]. % of the Total Value of the Work and increased by any applicable value-added tax.

Option 2:

Consortium Leader's Compensation

For performing its duties, the Consortium Leader shall be entitled to calculate and include a certain amount in the price of its Scope of Work. This amount shall cover all expenses of the Consortium Leader in the bidding phase and in performing the Contract, unless the Consortium Members decide otherwise in accordance with the next paragraph.

The Consortium Members may decide to assign specific tasks to the Consortium Leader during the bidding phase or during the performance of the Contract, on behalf of one or more of the Consortium Members. Each Consortium Member affected shall reimburse the Consortium Leader for any expenses the Consortium Leader incurs in performing such tasks and which have been approved by the respective Consortium Members. This reimbursement shall be according to the Proportionate Values, and shall be made by the Consortium Member(s) without undue delay after receipt of a respective invoice including an itemized bill of expenses.

4.3.6 Reimbursement of Expenditures

Each Consortium Member shall reimburse the Consortium Leader for any expenses the Consortium Leader incurs during the bidding or implementation phase on behalf of all the Consortium Members, which are not intended to be paid out of its fee and which have been approved by all Consortium Members. This reimbursement shall be according to the Proportionate Values, and shall take place without undue delay. The Consortium Leader shall draw up an itemized bill of expenses to be submitted to the Consortium Members.

If the Contract is not awarded to the Consortium/Consortium Members, expenses reasonably incurred by the Consortium Leader during the bidding phase shall be borne by each Consortium Member according to the Proportionate Values and the Consortium Leader shall be reimbursed accordingly. Such payments shall become due with the date the Consortium Members are notified of the non-award of the Contract and be payable within fourteen (14) days.

4.4 Execution of the Project

4.4.1 Project and Site Management

Each Consortium Member shall appoint a project manager who shall represent the Consortium Member and be its primary point of contact. Each Consortium Member shall appoint a senior Site manager who shall be its onsite representative and primary point of contact on matters related to the Site.

The project and site managers shall sufficiently and promptly provide each other with all information that might concern the performance of the other Consortium Member's Scope of Work and coordinate any eventual communication with representatives of the Employer and/or third parties in order to present a common position and to act in the overall interest of the Consortium in a spirit of mutual trust and co-operation.

4.4.2 Meetings with the Employer or Third Parties

Each Consortium Member may take part in meetings with the Employer or third parties in relation to the Project provided that the subject of such meetings affects the interests of all or the respective Consortium Member(s) and further provided that the Employer or the third party does not object to such participation; upon request of the Consortium Leader each of the other Consortium Members shall attend. The Consortium Leader shall use reasonable efforts to ensure that a Consortium Member

may attend such meeting whose subject is such Consortium Member's Scope of Work. If, despite such reasonable efforts, the affected Consortium Member does not attend such meeting without good reason, it will be liable for any and all costs and expenses incurred by the other Consortium Member(s) due to its non-attendance.

4.4.3 Correspondence with Employer

All correspondence of the Consortium Members with the Employer shall be sent via the Consortium Leader. In matters affecting only one Consortium Member the affected Consortium Member shall prepare drafts of the correspondence to be sent to the Employer. In matters affecting more than one but not all of the Consortium Members one of the Consortium Members affected shall prepare drafts of the correspondence to be sent to the Employer. In matters affecting the whole of the Consortium the Consortium Leader shall prepare drafts of the correspondence to be sent to the Employer.

No correspondence shall be sent by the Consortium Leader before it has received the approval of all the Consortium Members affected. In case the Consortium Leader does not receive another Consortium Member's approval or disapproval latest within three (3) working days after submission of a respective notification of the requirement of its approval, the Consortium Leader shall be entitled to send such correspondence without approval and no Consortium Member can be held liable for any information contained therein.

Article 5 Principles of Cooperation

5.1 Good Faith and Fair Dealing

In carrying out their obligations under this Subcontract the Consortium Members will act in accordance with the principles of good faith and fair dealing. The provisions of the Contract, as well as any statements made by the Consortium Members in connection with it, shall be interpreted in accordance with the principles of good faith and fair dealing.

5.2 Duty to Inform

Each Consortium Member shall inform the other Consortium Members without undue delay of any matters of which it becomes aware and which may materially affect the preparation of the Offer, the performance of the Contract or any other Consortium Member's Scope of Work.

Each Consortium Member shall provide the Consortium Leader with such technical data and drawings and other information to the extent necessary and appropriate for the preparation and submission of the Offer and performance of the Contract so that they can be forwarded to the Employer in a timely and complete manner and in the required form and language.

Each Consortium Member shall in a timely manner provide the other Consortium Members with accurate and - to the extent possible - complete technical data and drawings, which are related to its Scope of Work and which the other Consortium Members require for engineering and performing their own Scope of Work.

Each Consortium Member shall be responsible for checking the technical data and drawings received from the Employer or other Consortium Members, insofar as they affect its Scope of Work. The Consortium Leader shall not bear any responsibility in this respect.

5.3 Exclusivity

The Consortium Members shall cooperate on an exclusive basis to achieve the objectives set forth in Article 2.1 hereof. In particular, no Consortium Member shall by itself or with third parties, either make offers or enter into agreements concerning the Project or any part thereof.

The foregoing exclusivity obligation only applies to products and services which belong to the Scope

of Work of the respective Consortium Member. This exclusivity obligation shall apply until the Consortium is wound up pursuant to Article 15.2 hereof. If a Consortium Member voluntarily leaves or is expelled from the Consortium for any reason for which it is responsible this obligation shall bind it until the Consortium is wound up pursuant to Article 15.2 hereof.

5.4 Title to Assets

Unless otherwise explicitly set out in this Agreement, the Consortium Members shall not establish joint assets when pursuing the objectives of this Agreement. If it is not possible to avoid undivided joint ownership of any rights and/or assets, such undivided joint ownership shall only refer to each respective right and/or asset separately and not to the aggregate of the rights and/or assets.

5.5 Justification of Non-Performance

Non-performance of the Contract by a Consortium Member shall only be justified or excused under this Agreement if it is justified or excused under the Contract or – to the extent relevant – the applicable law of the Contract.

5.6 No Authority to represent

Unless otherwise agreed in writing for a specific case, no Consortium Member is authorized to or shall enter into commitments on behalf or in the name of the Consortium or the Consortium Members and no Consortium Member or any of its respective agents, employees, contractors, or representatives shall:

- (i) be considered an agent, employee or representative of any other Consortium Member for any purpose whatsoever, or
- (ii) have any authority to make any agreement or commitment for any other Consortium Member, nor to incur any liability or obligation in the other Consortium Member's name or on its behalf, or
- (iii) represent to third parties that they have any right so to bind any other Consortium Member, or
- (iv) have the authority to recognize, without prior written approval of the affected Consortium Member, claims of the Employer or third parties for which the Consortium or other Consortium Members are wholly or partly responsible.

5.7 Prohibition of Corruption

5.7.1 Each Consortium Member hereby undertakes that, at the date of the entering into force of the Agreement, itself, its directors, officers or employees have not offered, promised, given, authorized, solicited or accepted any undue pecuniary or other advantage of any kind (or implied that they will or might do any such thing at any time in the future) in any way connected with the Agreement and that it has taken reasonable measures to prevent subcontractors, agents or any other third parties, subject to its control or determining influence, from doing so.

5.7.2 The Consortium Members agree that, at all times in connection with and throughout the course of the Agreement and thereafter, they will comply with and that they will take reasonable measures to ensure that their subcontractors, agents or other third parties, subject to their control or determining influence, will comply with Part I of the ICC Rules on Combating Corruption 2011, which is hereby incorporated by reference into the Agreement, as if written out in the Agreement in full.

5.7.3 If a Consortium Member, as a result of the exercise of a contractually-provided audit right, if any, of another Consortium Member's accounting books and financial records, or otherwise, brings evidence that the latter Consortium Member has been engaging in material or several repeated breaches of the provisions of Part I of the ICC Rules on Combating Corruption 2011, it will notify the latter Consortium Member accordingly and require such Consortium Member to take the necessary remedial action in a reasonable time and to inform it about such action. If the latter Consortium Member fails to take the necessary remedial action, or if such remedial action is not possible, it may invoke a defense by proving that by the time the evidence of breach(es) had arisen, it had put into place adequate anti-corruption preventive measures, as described in Article 10 of the ICC Rules on Combating Corruption 2011, adapted to its particular circumstances and capable of detecting



corruption and of promoting a culture of integrity in its organization. If no remedial action is taken or, as the case may be, the defense is not effectively invoked, the first Consortium Member may, at its discretion, either suspend the Agreement or terminate it, it being understood that all amounts contractually due at the time of suspension or termination of the Agreement will remain payable, as far as permitted by applicable law.

5.7.4 Any entity, whether an arbitral tribunal or other dispute resolution body, rendering a decision in accordance with the dispute resolution provisions of the Agreement, shall have the authority to determine the contractual consequences of any alleged non-compliance with this ICC Anti-corruption Article.

Article 6 Preparation, Submission and Acceptance of the Offer

6.1 Preparation of the Offer

The Consortium Leader shall establish the format of the Offer having due regard to the requirements established by the Employer. Each Consortium Member shall timely prepare the technical part of the Offer related to its Scope of Work. The Consortium Leader shall draw up a list of comments on the commercial conditions of the Employer's bidding documents or a proposal for the commercial conditions of the Offer as the case may be. The final list of comments on the commercial conditions and/or the commercial and technical conditions of the Offer shall require a unanimous resolution by all the Consortium Members. The Offer shall be compiled by the Consortium Leader and submitted to the Employer after being approved by all Consortium Members by the due date for the bid.

6.2 Costs

Each Consortium Member shall bear the costs incurred by it in the preparation and submission of the Offer for its Scope of Work (including the costs for obtaining documents and for technical data and drawings to be provided to another Consortium Member).

6.3 Non-award of Contract

No Consortium Member shall be responsible to the other Consortium Members in case of non-award of the Contract except for Gross Negligence and wilful misconduct.

Article 7 Project Implementation

7.1 Completeness

Each Consortium Member shall provide its respective Scope of Work as if it had entered into a separate contract with the Employer covering the Scope of Work of the Consortium Member. Each Consortium Member shall provide all supplies and services required for the proper fulfilment of its Scope of Work, irrespective of whether or not such supplies and services are completely specified in Annex [1], and even if the incompleteness is attributable to insufficient information received from another Consortium Member.

Any supplies and/or services which are not allocated to any Consortium Member's Scope of Work in Annex 1, but which are required for the performance of the Contract, shall be performed by the Consortium Member whose Scope of Work is primarily affected thereby or has the closest relationship thereto, irrespective of whether such supplies and/or services give an entitlement to an adjustment of the Contract Price.

7.2 Employer Required Changes

Changes with respect to the Work that are required by the Employer in accordance with the Contract shall be performed by the Consortium Member(s) whose Scope(s) of Work is/are affected by such changes. If more than one Consortium Member is affected by such changes required by the Employer

the changes in the Scope of Work of the respective Consortium Members shall be carried out pursuant to Article 7.3 hereof.

7.3 Changes in the Work Allocation

Any changes in the allocation of the Work and any resulting consequences (for example relating to the Proportionate Values) shall be agreed upon by the Supervisory Board. Such agreement shall take the form of an amendment to Annex 1 to this Agreement and shall be signed by the Consortium Members.

7.4 Time Schedule

The Work shall be carried out in accordance with the Time Schedule attached as Annex 2 hereto. The Consortium Members shall regularly update this Time Schedule, as necessary.

7.5 Subcontracting

Each Consortium Member may subcontract in its own name and on its own behalf part - but not the whole - of its Scope of Work unless the Contract provides otherwise; however, a Consortium Member subcontracting part of its Scope of Work shall remain fully liable for the performance of its Scope of Work and for all the acts and omissions of the subcontractor or sub-supplier.

7.6 Applicable laws, public permits and authorizations

Each Consortium Member shall be responsible for observing the laws applicable to it and/or its Scope of Work. Each Consortium Member shall be responsible for obtaining and maintaining all administrative permits, licences and other authorisations required for the performance of its Scope of Work, except those which are to be obtained by another Consortium Member pursuant to an explicit provision of this Agreement or by the Employer pursuant to the Contract. The Consortium Members which are not responsible for obtaining the respective authorizations shall reasonably assist the responsible Consortium Member in the process of obtaining such authorizations.

7.7 HSE Requirements

Each Consortium Member shall observe the HSE requirements established by the Contract, the applicable laws and Good Practice. The Consortium Leader shall draw up a draft for a project specific HSE plan which shall be observed by all Consortium Members after being approved by them. Each Consortium Member shall nominate a HSE representative who shall be the direct contact for the general HSE representative appointed by the Consortium Leader.

7.8 Enforcement of Claims against Employer

To the extent permitted by the Contract each Consortium Member is entitled to pursue claims relating exclusively to the Scope of Work of such Consortium Member against the Employer after written notification to the other Consortium Members. If according to the Contract claims can only be asserted by the Consortium Leader or by all Consortium Members jointly the Consortium Leader or the non-claiming Consortium Members respectively shall reasonably cooperate with the claiming Consortium Member(s). The claiming Consortium Member(s) shall reimburse the Consortium Leader or the non-claiming Consortium Members for the expenditure incurred by them in connection with the pursuit of the claim.

7.9 Division of Additional Payments and/or Extension of Time

If the Consortium Members have successfully claimed additional remuneration or compensation (Additional Payment) and/or an extension of time from the Employer, such Additional Payment or extension of time shall be divided internally based on the extent a neutral third party in a dispute settlement proceeding pursuant to the Contract has indicated that the Additional Payment or extension of time refers to or is attributable to the Scope of Work of the respective Consortium Member or, in the

absence of such indication, to the extent any Consortium Member has contributed to the Additional Payment and/or extension of time through submission of a justified and documented claim.

Article 8 Securities

8.1 Where the Consortium Members are required to provide security (e.g. bid bonds, advance payment bonds, performance bonds, warranty bonds) in connection with the Offer or the performance of their obligations under the Contract, each Consortium Member shall provide such security separately corresponding to its Proportionate Value.

8.2 If the Employer does not accept such an arrangement, the Consortium Leader shall procure the issue of such security on behalf of all Consortium Members. Each Consortium Member shall commit itself towards the issuer of such security to indemnify him according to its Proportionate Value in the event the security is drawn upon by the Employer. To the extent required by the issuer each Consortium Member shall provide an additional security, including in the form of a counter-guarantee, acceptable to the issuer securing the indemnification obligation of the Consortium Member to the issuer.

8.3 If the issuer of the security requires an indemnity obligation from the Consortium Leader for the full amount of the security, the other Consortium Members shall promptly provide the Consortium Leader with counter guarantees equivalent to their Proportionate Values payable on demand issued by an institution and on terms acceptable to the Consortium Leader. In all cases of joint security pursuant to this Article the Consortium Members shall bear the costs of it according to the Proportionate Values.

8.4 In the event the Employer avails himself of any security, the Consortium Members shall internally be liable as provided in Articles 13 hereof.

Article 9 Insurance

9.1 Work Insurance

9.1.1 General principles

The Parties recognize and accept the need for insurance cover for all of the Work as specified in Article 9.1. The insurance cover shall be on terms and conditions as are reasonably available in the insurance market and that are customarily purchased by contractors on similar projects with regard to size, technology and location. Any insurance proceeds under the Work Insurance under Article 9.1 shall be paid from the insurers to the joint account created for the Consortium and shall be applied for the repair or rectification of any damage that has occurred. Deductibles, if any, shall be borne by the Consortium Member responsible for the damage.

9.1.2 Marine Cargo/Transportation Insurance

Marine Cargo/Transportation Insurance, where applicable, shall be maintained for not less than 110 % of the Incoterms® (latest edition) CIF value to cover loss or damage to the Work during transportation with conveyances of whatsoever kind from any warehouse worldwide until and including unloading at the Site. This cover shall not be less than the internationally known Institute Cargo Clauses (A) of the Institute of London Underwriters, provided war risks are available at base rate and the deductible shall not be higher than the amount per occurrence specified (if any) in the Special Conditions.

9.1.3 Construction/Erection All Risk Insurance

Construction/Erection All Risk Insurance shall cover loss or damage to the Work on all risks basis for not less than the full reinstatement cost, subject to sub-limits as are reasonably commercially available and with exclusions customarily required by the insurance market, such as the exclusion of the terrorism risk. This insurance shall cover any Site activity after unloading of the Work at the Site,

including storage on or near the Site, construction, erection, assembly, cold and hot commissioning and testing until the Taking-Over Certificate is issued or deemed to be issued.

9.1.4 If not taken out by the Employer, then unless otherwise agreed, the Consortium Leader shall effect and maintain the insurance cover as set out in Articles 9.1 in the joint names of the Consortium Members and shall provide for a waiver of recourse from the insurers against all insured parties, in which case the cost of the cover shall be treated as common cost to be shared by the Consortium Members according to their Proportionate Value.

9.2 Other Insurance

9.2.1 Each Consortium Member shall effect and maintain at its own expense, or shall cause its Sub-contractors to effect and maintain at their own expense, the following insurance cover with reputable insurance carriers authorised to do business in the country of the Site:

(a) Employer's liability and workman's compensation insurance in accordance with any applicable law(s). If the law does not provide for any obligations in this respect or requires only some minimum limits, then the Consortium Member shall arrange this insurance in a manner and with limits as a prudent and reasonable contractor in the same circumstances and environment would so do. This insurance shall be maintained in full force and effect during the whole time that Consortium Member's Personnel are assisting in the execution of the Work on Site.

(b) Automobile liability insurance in the country of the Site in accordance with any applicable law(s). If the law does not provide for any obligations in this respect or requires only some minimum limits, then the Consortium Member shall arrange this insurance in a manner and with limits as a prudent and reasonable contractor in the same circumstances and environment would so do.

(c) Comprehensive third-party liability insurance to cover the Consortium Member's legal liability with a limit, unless otherwise agreed, of indemnity of not less than specified in the Special Conditions.

(d) Consortium Member's equipment insurance to cover loss or damage to Consortium Member's equipment on an all risks basis for not less than the full replacement value, during any activity on the Site and including delivery to Site.

9.2.2 On request of another Consortium Member, a Consortium Member shall provide evidence to the other Consortium Members that the Consortium Member's Other Insurance is in place at the latest within thirty (30) days after such request.

Article 10 Financials

10.1 Bank account

On behalf of the Consortium Members, the Consortium Leader is authorized and obliged to open and - together with one other Consortium Member - to operate a joint account. The Consortium Leader shall use best efforts to ensure that payments by the Employer under the Contract are effected through the joint account. The authority to operate the account shall be revocable at any time by the other Consortium Members through written notice.

10.2 Bank Charges

Each Consortium Member shall bear the bank charges for handling the payments for its Scope of Work.

10.3 Invoicing

Each Consortium Member shall invoice the Employer directly to the extent permitted by the Contract and by applicable tax regulations and shall send copies of the invoices to the Consortium Leader. To the extent it is not permitted to send invoices directly to the Employer, each Consortium Member shall send invoices concerning its Scope of Work to the Consortium Leader, who shall invoice the Employer in accordance with the Contract.

10.4 Payment Claims

Payments shall be received on the joint account and the Consortium Leader shall promptly forward them to the Consortium Members in proportion to the Work invoiced and performed. A claim against the Consortium Leader for payment may only be made after the Consortium Leader has received the relevant payment from the Employer. Withholding of payment, non-payment or partial non-payment by the Employer attributable to a Consortium Member shall be taken into account with respect to the payment claim by the respective Consortium Member.

10.5 Misdirected Payments

If a Consortium Member receives payments to which it is not entitled, it shall immediately forward them to the Consortium Member entitled; if this Consortium Member cannot be determined within seven (7) calendar days from receipt of such payments, they shall be forwarded to the Consortium Leader.

10.6 Non-payment by Employer

The failure of the Employer to effect payments does not entitle any Consortium Member to suspend or reduce the performance of its Scope of Work unless such suspension or reduction is justified under the Contract or accepted by the Supervisory Board.

10.7 Financing

Each Consortium Member shall be responsible for any financing arrangements required for its Scope of Work and shall bear all costs connected therewith.

Article 11 Taxes

11.1 Tax Obligations

Each Consortium Member shall comply with all tax regulations concerning its Scope of Work at its own risk and expense and for its own account. In particular, each Consortium Member shall be responsible for preparing and submitting all necessary tax returns and tax payments, as legally required.

11.2 Value-Added Tax

If the Consortium is subject to sales or value-added tax, the relevant tax obligations shall be satisfied by the Consortium Leader on behalf of the Consortium.

Details of necessary procedures (with regard to invoicing procedure, tax declarations, documents and respective tax payments) will be agreed upon separately.

11.3 Taxation of the Consortium

It is the Consortium Members' common understanding that the implementation of the Project based on the principles of cooperation in this Agreement will not cause the Consortium to register for corporate income tax purposes, whether as taxable entity or in another form. No Consortium Member shall take any action that may contradict such common understanding of the Consortium Members.

If the tax authorities nevertheless should tax the Consortium on the basis of income from the entire Contract, the Consortium Members shall closely cooperate and agree on a joint approach in responding to the tax authorities' position. If the Consortium should be taxable, the Consortium Leader will coordinate the tax filling and tax payment process. Details will be agreed upon separately.

In principle, each Consortium Member shall bear the corporate income tax to the extent it relates to its

Scope of Work. The calculation of each Consortium Member's proportional amount of tax will be subject to the local tax law, each Consortium Member's pro-rata share of the taxable income and the relevant tax rate.

If such calculation is not possible, the Consortium Members shall agree on another way of allocation of the respective tax.

Taxes other than corporate income tax assessed on the Consortium shall be borne by the Consortium Members pursuant to their Proportionate Values.

Article 12 Confidential Information and Publicity

12.1 Confidentiality

12.1.1 Definitions

"Purpose" means the purpose of the Agreement.

"Disclosing Consortium Member" means the Consortium Member disclosing Confidential Information to the Receiving Consortium Member.

"Permitted Recipients" means any director, officer, employee, adviser or auditor of the Receiving Party or any of its Related Companies who reasonably needs to know Confidential Information for the Purpose.

"Receiving Consortium Member" means the Consortium Member receiving Confidential Information from the Disclosing Consortium Member.

"Related Company" means any corporation, company or other entity that controls, or is controlled by, one Consortium Member or by another Related Company of that Consortium Member, where control means ownership or control, direct or indirect, of more than fifty (50) per cent of that corporation's, company's or other entity's voting capital.

"Confidential Information" means any information or data, or both, communicated by or on behalf of the Disclosing Consortium Member to the Receiving Consortium Member, including, but not limited to, any kind of business, commercial or technical information and data in connection with the Purpose, except for such information that is demonstrably non-confidential in nature. The information shall be Confidential Information, irrespective of the medium in which that information or data is embedded, and whether the Confidential Information is disclosed orally, visually or otherwise. Confidential Information shall include any copies or abstracts made of it as well as any products, apparatus, modules, samples, prototypes or parts that may contain or reveal the Confidential Information. Confidential Information is limited to information disclosed on or after the date of signature of this Agreement.

12.1.2 Obligations of Receiving Consortium Member

The Receiving Consortium Member shall:

- a. not disclose any Confidential Information to anyone except to the Permitted Recipients, who are bound to the same level of confidentiality obligations as set forth by this Article 12;
- a. use any Confidential Information exclusively for the Purpose; and
- a. keep confidential and hold all Confidential Information with no less a degree of care as is used

for the Receiving Consortium Member's own confidential information and at least with reasonable care.

12.1.3 Exceptions

Any obligation to keep confidential all Confidential Information shall not apply to the extent that the Receiving Consortium Member can prove that any of that information:

a. was in the Receiving Consortium Member's possession without an obligation of confidentiality prior to receipt from the Disclosing Consortium Member;

a. is at the time of disclosure, or subsequently becomes, generally available to the public through no breach of this Agreement by the Receiving Consortium Member or any Permitted Recipient;

a. is lawfully obtained by the Receiving Consortium Member from a third party without an obligation of confidentiality, provided that third party is not, to the Receiving Consortium Member's best knowledge, in breach of any obligation of confidentiality to the Disclosing Consortium Member relating to that information; or

a. is developed by the Receiving Party or its Related Companies independent of any Confidential Information.

12.1.4 Copies of the information

Unless otherwise specified by the Disclosing Consortium Member at the time of disclosure, the Receiving Consortium Member may make copies of the Confidential Information to the extent necessary for the Purpose.

12.1.5 Nothing in this Contract shall obligate any Consortium Member to disclose any information.

Each Consortium Member has the right to refuse to accept any information under this Agreement prior to any disclosure. Confidential Information disclosed despite an express prior refusal is not covered by the obligations under this Article 12.

12.1.6 Property

Nothing in this Agreement shall affect any rights the Disclosing Consortium Member may have in relation to the Confidential Information, neither shall this Agreement provide the Receiving Consortium Member with any right or license under any patents, copyrights, trade secrets, or the like in relation to the Confidential Information, except for the use of Confidential Information in connection with the Purpose and in accordance with this Article 12.

12.1.7 Status of the information

The Disclosing Consortium Member makes available the Confidential Information as is and does not warrant that any of this information that it discloses is complete, accurate, free from defects or third-party rights, or useful for the Purpose or other purposes of the Receiving Consortium Member.

12.1.8 Limits

This article 12 does not:

a. create any other relationship among the Consortium Members;

- a. oblige a Consortium Member to enter into any other contract; or
- a. require consideration for any information received.

12.1.9 Breach or violation of any provision of this clause

In addition to any remedies under the applicable law, the Consortium Members recognize that any breach or violation of any provision of this Article 12 may cause irreparable harm to other Consortium Members, which money damages may not necessarily remedy. Therefore, upon any actual or impending violation of any provision of this Article 12, any Consortium Member may obtain from any court of competent jurisdiction a preliminary, temporary or permanent injunction, restraining or enjoining such violation by another Consortium Member or any entity or person acting in concert with that Consortium Member.

12.1.10 Disposal procedure

Within ninety (90) days of termination of this Agreement, the Disclosing Consortium Member may request the disposal of the Confidential Information. Disposal means execution of reasonable measures to return or destroy all copies including electronic data. Destruction shall be confirmed in writing. Disposal shall be effected within thirty (30) days of the request being made.

The provisions for disposal shall not apply to copies of electronically communicated Confidential Information made as a matter of routine information technology back-up and to Confidential Information or copies of it that must be stored by the Receiving Consortium Member or its advisers according to provisions of mandatory law, provided that this Confidential Information or copies of it shall be subject to continuing obligations of confidentiality under this Agreement; but no further use shall be permitted as from the date of the request.

12.1.11 No Consortium Member shall be in breach of this Article 12 to the extent that it can show that any disclosure of Confidential Information was made solely and to the extent necessary to comply with a statutory, judicial or other obligation of a mandatory nature, afterwards referred to as "Mandatory Obligation". Where a disclosure is made for these reasons, the Consortium Member making the disclosure shall ensure that the recipient of the Confidential Information is made aware of and asked to respect its confidentiality. This disclosure shall in no way diminish the obligations of the parties under this Clause except to the extent that a Consortium Member is compelled by any Mandatory Obligation to disclose Confidential Information without restriction.

To the extent permitted by any Mandatory Obligation, the Receiving Party shall notify any other Consortium Member without delay in writing as soon as it becomes aware of an enquiry or any process of any description that is likely to require disclosure of the other Consortium Member's Confidential Information in order to comply with any Mandatory Obligation.

12.1.12 Termination of the consortium

Upon termination, the Receiving Consortium Member shall stop making use of the Confidential Information. The obligations of the Consortium Members under this Agreement shall survive indefinitely or to the extent permitted by the applicable mandatory law.

Article 13 Liability

13.1 Liability towards the Employer

To the extent provided for in the Contract or in the law governing the Contract the Consortium Members shall be jointly and severally liable to the Employer for performance of the Contract. As among themselves, each Consortium Member shall be liable for its Scope of Work.

13.1.1 Liability for Delay

If the Employer claims penalty or damages (including liquidated damages) for delay, the Consortium Member responsible for the delay shall be solely liable up to the amount that is equal to the respective limitation for liability in the Contract expressed in percent applied to the Consortium Member's Proportionate Value. The excess liability (if any) shall be borne by all Consortium Members pursuant to their respective Proportionate Value, unless the delay has been caused by Gross Negligence of the responsible Consortium Member, in which case it shall be solely liable.

13.1.2 Liability for Defects

The Consortium Member having caused a defect will be liable for this defect and any resulting claims of the Employer. However any remedial work shall be executed subject to the terms of the Contract and subject to Article 13.3.1, by the Consortium Member in whose Scope of Work it is located or occurs.

13.1.3 Technical Guarantees

If technical guarantees specified in the Contract are not met, liability shall rest solely with the Consortium Member or Members responsible.

13.1.4 Mitigation by Consortium Members

If the Employer has or can reasonably be expected to become entitled to a claim for non-compliance with the Contract and the Consortium Member(s) responsible for this claim (hereinafter referred to as "Responsible Consortium Member(s)") is/are unable or unwilling to avoid, mitigate or resolve it and if the claim can be avoided, mitigated or resolved by measures initiated by any of the other Consortium Members not responsible for the claim (hereinafter referred to as "Non-Responsible Consortium Members"), the Non-Responsible Consortium Members may make every reasonable effort to avoid, mitigate or resolve the claim, to the extent that the claim is likely to adversely and materially affect the Consortium or Non-Responsible Consortium Members.

If the measures consist of carrying out works on the Responsible Consortium Member(s)' Scope of Work on behalf of the Responsible Consortium Member(s) a decision of all Consortium Members, the Responsible Consortium Member(s) not being allowed to vote, is required. If the Responsible Consortium Member(s) without justification do not attend the Supervisory Board meeting where the decision on such action is to be taken, the other Consortium Member's representatives can make a decision without need for reconvening the meeting pursuant to Article 4.2.4. Such decision shall become final if the Responsible Consortium Member(s) has not, within thirty (30) calendar days of receipt of notice of the decision, initiated DRB proceedings in accordance with Article 16.3. If the Non-Responsible Consortium Members have to carry out works on the Responsible Consortium Member(s)' Scope of Work the Responsible Consortium Member remains liable for defects and deficiencies in its Scope of Work (including the work carried out by the Non-Responsible Consortium Members except in case of their Gross Negligence or wilful misconduct).

The Non-Responsible Consortium Members may exercise the right under Article 13.1.4 to avoid, mitigate or resolve the claim only after appropriately notifying the Responsible Consortium Member(s), where reasonably possible.

13.1.6 Other Liability

Any other claims of the Employer shall be borne by the Consortium Member responsible for the event giving rise to the claim.

13.2 Liability towards Third Parties

In the case of third-party claims, the Consortium Member(s) responsible for the event causing the claim shall be solely liable.

13.3 Liability of the Consortium Members with respect to each other.

13.3.1 Allocation of Cost for remedying Defects

If a Consortium Member must execute remedial work pursuant to Article 13.1.2 without being liable for the respective defect, the costs shall be borne by that Consortium Member who caused the defect subject to any right to seek reimbursement under any insurance policy. Such costs shall also include expenses for establishing the cause of and the responsibility for the defect, for additional measures necessitated as a result of the defect, for changes in the Scope of Work of another Consortium Member necessitated by correction of such defect, and for repeat inspections or acceptance or other tests.

13.3.2 Design Changes and Design Freeze

A Consortium Member may change the design within or related to its Scope of Work at any time provided such design change does not violate the Contract and this Agreement. If such design change occurs prior to or on the Design Freeze Date the Consortium Member effecting it shall not be liable to the other Consortium Members for any impacts. If such design change occurs after the respective Design Freeze Date the Consortium Member making such change shall be liable to the other Consortium Members affected by such change for the reasonable additional direct cost plus overheads and reasonable profit resulting therefrom unless the design change was necessitated by another Consortium Member or the Employer or could not have been avoided by the responsible Consortium Member by applying Good Practice.

13.3.3 Reimbursement of expenditure

The Responsible Consortium Member(s) shall reimburse Non-Responsible Consortium Members for necessary costs incurred by the other Non-Responsible Consortium Members in avoiding, mitigating or resolving any claim in accordance with Article 13.1.4 (including e.g. additional personnel, overtime and the like).

13.3.4 Damage caused to other Consortium Members

If not otherwise provided herein each Consortium Member shall be liable to the other Consortium Members for the damage(s) which it causes to the other Consortium Members through Gross Negligence or wilful misconduct.

13.3.5 Limitation of Liability

Liability of the Consortium Members pursuant to this Article 13.3.3 shall be limited to a percentage of the value of the Scope of Work of the liable Consortium Member as specified in the Special Conditions per event and (ii) to the value of the Scope of Work of the liable Consortium Member in the aggregate. In the event of a liability pursuant to Articles 13.1.4 and 13.3.3 or Article 14.6 or Article 14.7 hereof or in the case of responsibility for termination by the Employer for cause, only the latter limitation shall apply.

Unless explicitly provided otherwise, no Consortium Member shall be liable to another Consortium

Member for loss of profit, loss of use, loss of data or information, loss of contracts or business opportunities or any punitive damages.

The foregoing limitations and exclusions of liability shall apply to the extent consistent with mandatory law and regardless of the basis of the liability is contractual or non-contractual, or is based on breach of contract, breach of warranty, negligence, strict liability, tort or any other legal theory and shall also apply for the benefit of employees, agents, subcontractors and sub-suppliers of the responsible Consortium Member.

13.3.6 Delayed Payments

If the Employer's payments to the Consortium Leader or any Consortium Member, as the case may be, are delayed, the Consortium Member responsible for causing the Employer's delayed payment shall compensate the Consortium Member affected by the delay in payment at a rate per annum as specified in the Special Conditions for the resulting loss of interest with respect to the amount of that Consortium Member's delayed payment and for the duration of the delay. The Consortium Leader shall be liable for loss of interest in the same way if it does not promptly pass on payments to the other Consortium Member(s) pursuant to Article 10.4.

13.3.7 Claim Period

If a Consortium Member intends to bring a claim against another Consortium Member pursuant to this Article 13.3, it has to notify the other Consortium Member in writing within a time period of thirty (30) calendar days after it knew or - if it had applied Good Practice - should have known of the facts constituting the basis of the claim and shall describe the facts in reasonable detail in its notification. If the Consortium Member fails to do so it shall not be entitled to the claim anymore.

13.3.8 Exclusion of further Claims

Claims against any other Consortium Member pursuant to this Article 13.3 which have arisen prior to provisional acceptance of the last unit of the Project are excluded after expiry of six months thereafter except for claims for which dispute settlement procedures have been commenced pursuant to Article 16 within the time period mentioned before.

13.4 Responsibility and Liability of Multiple Consortium Members

13.4.1 General

If more than one Consortium Member is responsible for a claim, each responsible Consortium Member shall be liable to the extent of its responsibility.

13.4.2 Concurrent Delay

If a Consortium Member causes a predominant delay under the Contract for which the Employer is entitled to compensation, any other Consortium Member being concurrently in delay which – without the predominant delay – would have also caused a delay under the Contract entitling the Employer to compensation shall as amongst the Consortium Members also be liable pursuant to Article 13.4.1 For determining the shares of responsibility of the Consortium Members Article 13.4.4 shall apply.

13.4.3 Claims against non-responsible Consortium Members

If the Employer or third parties make a claim against a Consortium Member who is not responsible, such Consortium Member shall without undue delay inform the responsible Consortium Member, who shall indemnify the Consortium Member against whom the claim was made.

13.4.3 Settlement of Claims

If the Employer or third parties submit a claim against the Consortium the Supervisory Board shall convene as soon as practicable and decide the immediate step to be taken to avoid an negative impacts on the progress of the project such as not limited to the financial needs of the Project; and such other measures to be taken to insure the schedule progress on project.

Thereafter the supervisory board shall endeavour to establish the responsibility and the liability with regard to the event leading to the Employer's claim.

13.4.4 Preliminary Allocation

If the Consortium Members are unable to reach agreement with respect to responsibility for all or any proportion of an Employer's claim in sufficient time to avoid negative impact on the Project, all Consortium Members shall provisionally assume responsibility for the claim according to their respective Proportionate Values. If an agreement is reached as to which Consortium Member(s) is/are liable and at what amount, or if the matter has been decided by arbitration, the Consortium Members shall reimburse each other accordingly.

13.4.5 Liability in case of Insolvency of the responsible Consortium Member

If a Consortium Member is held liable by the Employer or a third party due to the joint and several liability of the Consortium Members and such Consortium Member is internally not or not fully liable but is not indemnified by the internally liable Consortium Member due to the insolvency of the latter Consortium Member or by insurance, the liability share of the insolvent Consortium Member or remainder thereof shall be borne by the other Consortium Members pursuant to their Proportionate Values and they shall indemnify the Consortium Member held liable by the Employer or the third party accordingly.

13.4.5 Liability of the Consortium Leader

13.4.5.1 Liability and Limitation of Liability

The Consortium Leader shall be liable for damage caused to the other Consortium Members through Negligence with respect to performance of its duties. Such liability shall in aggregate be limited to the amount of the Consortium Leader's fee. Where no Consortium Leader's fee has been agreed, such liability shall in aggregate be limited to [...] EUR. In no event shall the Consortium Leader be liable for loss of profit, loss of use, loss of data or information, loss of contracts or business opportunities or any punitive damages. This limitation and exclusion of liability shall apply to the extent consistent with mandatory law and regardless of whether the liability claim is based on breach of contract, breach of warranty, negligence, strict liability, tort or any other legal theory and shall also apply for the benefit of the employees of the Consortium Leader.

13.4.5.2 Insufficient Compensation

If compensation under Article 13.4.5.1 hereof is not sufficient to cover the amount of damages caused to more than one Consortium Member, the compensation shall be divided among the affected Consortium Members in proportion to the damage suffered by each.

13.4.6 Exclusion of further Claims

Among each other, the Consortium Members shall have no claims for damages and cost reimbursement other than those set forth in this Agreement to the extent consistent with mandatory law.

Article 14 Insolvency and Expulsion

14.1 Grounds for Expulsion

Unless the Contract excludes it, a Consortium Member may be expelled from the Consortium in the following circumstances:

a. a material breach or persistent breaches of the Agreement, the Contract or applicable laws and regulations by a Consortium Member which is irremediable or (if such breach is remediable) where it fails to remedy that breach within [fourteen (14)] days of the other Consortium Members serving written notice on it requiring such remedy (including but not limited to non-provision of the security stipulated in Article 8 are deemed a material breach of this Agreement) or so much earlier as required in the Contract, if applicable; or

a. a Consortium Member ceases to hold any qualification, certification or registration required for the performance of its duties as a Consortium Member, or becomes unfit to carry on his duties and obligations as a Consortium Member; or

a. Consortium Member has bankruptcy, composition or reorganization proceedings or any other insolvency proceedings opened against it by court or other public authority; or has an order entered against it either appointing a receiver or trustee for, or issuing a levy attachment against a substantial portion of its assets, without this order being vacated, set aside or stayed within sixty (60) calendar days from the date of entry; voluntarily files a petition under the bankruptcy or equivalent insolvency law; becomes insolvent or faces a substantial deterioration (actual or imminent) in its assets; or has payment claims (existing under the terms of the Contract) or its membership interest in this Consortium seized by a creditor; consents to or applies for reorganization under the bankruptcy or equivalent insolvency law; makes an assignment for the benefit of its creditors; or has involuntarily filed against it, a petition under the bankruptcy or equivalent insolvency law, which is not dismissed within ninety (90) calendar days after filing.

14.2 Procedure of Expulsion

Expulsion shall be effected by a resolution adopted by the Supervisory Board, except the Consortium Member to be expelled and any affiliate of this Consortium Member (in case an affiliate is also a Consortium Member). If the Consortium Member which is to be expelled does not – without justification – attend the Supervisory Board meeting where the decision on the expulsion is to be taken, the other Supervisory Board representatives can decide without need for reconvening the meeting. Expulsion shall become incontestable if the Consortium Member to be expelled has not, within thirty (30) calendar days of receipt of notice of the resolution, initiated DRB proceedings in accordance with Article 16.3. Expulsion shall not affect any other existing rights or obligations of the Consortium Member to be expelled or any claims against it.

14.3 Continuation of the Consortium

If a Consortium Member voluntarily leaves the Consortium with the consent of the other Consortium Members or is expelled from it, the Consortium shall continue with the remaining Consortium Members. Upon a Consortium Member's exercise of its right under mandatory law to terminate the Consortium, it shall leave the Consortium, and the remaining Consortium Members shall continue the Consortium.

14.4 Use of Property

The Consortium Members remaining in the Consortium may use the expelled Consortium Member's physical property (such as equipment, materials, system components) and intellectual property (such as drawings and know-how), for which no substitute can be obtained at a reasonable cost and in due time. The departing Consortium Member shall make every effort to facilitate such utilization. The departing Consortium Member shall be entitled to a reasonable

compensation for such use by the other Consortium Members. The compensation shall only become payable once all accounts have been settled between the remaining Consortium Members and the Employer.

14.5 Liability for Work Provided

If a Consortium Member voluntarily leaving with the consent of the other Consortium Members or being expelled from the Consortium has provided supplies and services which remain in the Work, it shall retain liability for them as described in Article 13 above even after being expelled from or leaving the Consortium. The remuneration of the departing Consortium Member for such supplies and services shall be paid in accordance with Article 10. The other Consortium Members shall be entitled to condition such payments to the departing Consortium Member on its provision of securities covering possible claims in accordance with the first sentence of this Article 14.5 and/or Article 14.6.

14.6 Liability for Damages

To the extent the expulsion is due to causes within the control of the expelled Consortium Member it shall be liable to the other Consortium Members for damages (for example for the increase in cost to finalize the Project and for compensation payable to the Employer for delay to the extent they result from the expulsion).

14.7 Execution by Substitution, Suspension of Rights and Obligations of Outgoing Member

Any Consortium Member who ceases to be a member of the Consortium either by voluntary withdrawal with the consent of the other Consortium Members or expulsion ("Outgoing Member") is not entitled to any share or interest in the property or profits arising out of or in connection with the Consortium arising after the date on which such Outgoing Member ceases or is deemed to cease to be a Consortium Member ("Leaving Date") and shall have no right to vote or to participate in the management or affairs of the Consortium from its Leaving Date. With effect from the Outgoing Member's Leaving Date, the remaining Consortium Members shall succeed to all the interest of the Outgoing Member in the Consortium in accordance with [percentage or other arrangement, advisable to be set out in a schedule to the contract].

On or within a reasonable time of its Leaving Date, the Outgoing Member (or its duly authorised representative) shall:

- sign and execute all documents and perform all acts that the Consortium requires for the purpose of enabling the Consortium to recover any outstanding interest or right, or the property of or in connection with the Consortium or the remaining Members; and
- return to the Consortium or Consortium Members all documents, records, papers, or other property (in whatever form held) which are not owned by itself but may be in its possession or under its control, which relate in any way to the Scope of Work or the Consortium's business affairs, and it shall not retain any copies thereof.

Articles 14.2, 14.4, 14.5 and 14.6 shall apply accordingly in this case. The Outgoing Member whose Scope of Work is completed by the other Consortium Members remains liable for defects and deficiencies in its Scope of Work (including the part taken over by the other Consortium Members except in case of their Gross Negligence or wilful misconduct). In case of such liability of the Outgoing Member for defects or deficiencies the first sentence of Article 13.1.2 shall not apply; the Outgoing Member shall instead reimburse the costs for the correction of the defects or deficiencies to the remaining Consortium Members.

14.8 Dismissal of the Consortium Leader

The Consortium Leader may be dismissed from its tasks by resolution of the other Consortium Members if circumstances arise in accordance with Article 14.1 which make it unreasonable for the other Consortium Members to allow the Leader to maintain its position as Consortium Leader. Articles 14.2 shall apply to the dismissal of the Consortium Leader from its tasks as far as appropriate.

Article 15 Duration and Termination

15.1 Effective Date

This Agreement shall become effective on the date as specified in the Special Conditions regardless of the date of signature of the parties.

15.2 Winding-up

The Consortium shall be automatically wound up in the following events:

- i.withdrawal of the Bid by the Employer or announcement by the Employer that it will not award the Contract to any of the bidding parties; provided, that if the Employer announces within one hundred and eighty (180) days of such withdrawal or announcement of non-award that it will re-bid the Project, then this Agreement shall remain in effect for the re-bid unless otherwise agreed by the Consortium Members; or
- ii.the expiry of the period of validity of the Bid unless the Consortium Members have agreed in writing to prolong the validity of this Agreement beyond such period; or
- iii.if the final offer of the Consortium Members is not accepted and no further negotiations are carried out by between the Employer and the Consortium; or
- iv.the cancellation or abandonment of the Project by the Employer; or
- v.when the Consortium Members have unanimously so decided and recorded such decision in writing; or
- vi.in the event that the Contract is awarded to the Consortium, once the Contract has been performed or terminated and the Consortium Members have fulfilled all their obligations and received their rights in accordance with the Contract and this Agreement.

Prior to that, a Consortium Member is only entitled to exit the Consortium due to reasons explicitly stated in this Agreement.

The winding-up of this Agreement shall not affect the rights and obligations of the Consortium Members accrued up to the date of the event causing the wind-up of the Agreement.

15.3 Termination of [Agreement: NOTE: Article to be discussed by Task Force]

15.3.1 Pre-award

The Consortium shall be terminated pre-award of the Contract in the following events:

- i.with respect to a Consortium Member, in the events listed under Article 14.1 above.
- ii.failure of the Consortium Members to agree on an offer after negotiating in good faith for a reasonable time, provided that jointly two Consortium Members or the Consortium Leader give the other Members five (5) days written notice of the intention to terminate the Agreement;
- iii.with respect to a Consortium Member, said Member being acquired by or merged with an entity having a conflict of interest with the pursuit of the Project or with the other Consortium Members.
- iv.with respect to a Consortium Member, if said Member is disqualified by the Employer.

15.3.2 Post-award

The Consortium shall be terminated post-award of the Contract in the following events:

- i. in the event of termination by the Employer of the Contract.
- ii. with respect to a Consortium Member, in the events listed under Article 14.1 above.
- iii. with respect to a Consortium Member, if said Consortium Member fails to contribute its share of common expenses or fails to provide its share of the Securities as and when required
- iv. with respect to a Consortium Member, said Member being acquired by or merged with an entity having a conflict of interest with the pursuit of the Project or with the other Consortium Members.
- v. with respect to a Consortium Member, if said Member is excluded from the Contract by the Employer.

The continuing Consortium Members shall nevertheless have the right to retain for the completion of the Project all assets of the Consortium and all materials provided by the defaulting Consortium Members against the agreed rates or hired or leased by this Consortium Member until the completion of the Project and the final acceptance thereof by the Employer.

The termination of this Agreement shall not affect the rights and obligations of the Consortium Members accrued up to the time of termination. Any payment due to a Consortium Member pursuant to termination of the Agreement shall be subject to receipt of payment from the Employer for the services provided prior to termination.

Article 16 Dispute Resolution

16.1. The intention of this article is to provide a system for the avoidance and resolution of all and any claims, differences or disputes (“Disputes”) that might arise under the Agreement. The DB Rules provide for the appointment and administration of an amicable dispute prevention and resolution mechanism and the Parties are encouraged to consider their use.

It is also the intention of the Consortium Members, that in the event of a Dispute amongst themselves, they shall nonetheless give precedence to the performance of the Work in accordance with the terms and provisions of the Contract.

16.2 Disputes arising before the signature of the Contract

If a Dispute arises in connection with this Agreement during the time period described in Article 6, the responsible representatives of the respective Consortium Members shall attempt, in fair dealing and good faith, to settle such dispute amicably. Such responsible representatives shall be free to organize the procedure of their settlement negotiations and to include senior management representatives as the case may be. Any of the Consortium Member involved in the negotiation process may terminate the settlement negotiations at all times by written notification to the other Consortium Member(s).

In that case, any of the Consortium Members shall be entitled to refer the Dispute to arbitration according to Article 16.4 below.

16.3 Avoidance and resolution of Disputes among Consortium Members arising on or after the signature of the Contract

16.3.1 The Consortium Members hereby agree to establish a Dispute Review Board (“DRB”) in accordance with the DB Rules, which are incorporated herein by reference. The DRB shall have three (3) members.

16.3.2 The Consortium Members shall jointly appoint the first two DRB Members no later than within thirty (30) days after the commencement of the Project. If the Consortium Members fail to appoint one or both DRB Members within the said time period, both DRB Members shall be appointed by the Centre upon the request of any Consortium Member.

16.3.3 The third DRB Member shall be proposed to the Consortium Members by the two DRB Members appointed in accordance with article 16.3.2 above within thirty (30) days following the appointment of the second DRB Member. If the Consortium Members do not appoint the proposed third DRB Member within fifteen (15) days from their receipt of the proposal, or if the two DRB Members fail to propose the third DRB Member, the third DRB Member shall be appointed by the Centre upon the request of any Consortium Member. The third DRB Member shall act as president of the DRB unless all DRB Members agree upon another president with the consent of the Consortium Members.

16.3.4 If at any time, in particular during meetings or site visits, the DRB considers that there may be a potential Dispute between the parties, the DRB may raise this with the Parties with a view to encouraging them to avoid it on their own without any further involvement of the DRB. In so doing, the DRB may assist the Parties in defining the potential Dispute. The DRB may suggest a specific process that the Parties could follow to avoid the Dispute, while making it clear to the Parties that it stands ready to provide informal assistance or to render an Opinion in the event that the Parties are unable to avoid the Dispute on their own.

16.3.5 On its own initiative or upon the request of any Consortium Member and in either case with the agreement of all of the Consortium Members, the DRB may informally assist the Consortium Members in resolving any Dispute that may arise during the performance of the Contract. Such informal assistance may occur during any meeting or site visit. A Consortium Member proposing the informal assistance of the DRB shall endeavour to inform the DRB and the other Consortium Member(s) thereof well in advance of the meeting or site visit during which such informal assistance would occur.

The informal assistance of the DRB may take the form of a conversation among the DRB and the Consortium Members; separate meetings between the DRB and any Consortium Member with the prior agreement of the Consortium Members; informal views given by the DRB to the Consortium Members; a written note from the DRB to the Consortium Members; or any other form of assistance which may help the Consortium Members resolve the Dispute.

The DRB, if called upon to render an Opinion in connection with a Dispute on which it has provided informal assistance, shall not be bound by any views, either oral or in writing, which it may have given in the course of its informal assistance, nor shall it take into account any information that has not been available to all Consortium Members.

16.3.6 Any Consortium Member may at any time formally refer a Dispute to the DRB for an Opinion pursuant to article 19 of the DB Rules.

16.3.7 If any Consortium Member expresses its dissatisfaction with an Opinion, the Dispute shall be resolved pursuant to Article 16.4.

16.3.8. Notwithstanding the existence of the DRB, the Consortium Members may at all times, through their representatives, conduct negotiations aimed at preventing and resolving Disputes.

16.4 Arbitration

16.4.1 Any Dispute arising out of or in connection with this Agreement shall be submitted to the International Court of Arbitration of the International Chamber of Commerce and shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by three arbitrators appointed in accordance with the said Rules (the "Arbitration Rules").

16.4.2 Where there are more than two Consortium Members involved in a Dispute, Article [12 para. 6 and 8] of the Arbitration Rules shall apply.

16.4.3 The seat of arbitration shall be as specified in the special Conditions. The procedural law of such seat of arbitration as applicable to international arbitration proceedings shall apply where the ICC Rules of Arbitration are silent.

16.4.4 Consolidation of arbitrations pending under the Rules into a single arbitration shall only be possible if the Consortium Members have agreed to consolidation.

16.4.5 Indemnification

Each Consortium Member hereby indemnifies the other Consortium Member(s) for any and all costs or losses caused by breach of Articles 16.3 and 16.4.

16.5 Language

The language of the DRB proceeding and the arbitral proceeding shall be the ruling language of the Agreement unless otherwise provided for.

16.6 Supplemental Provisions Relating To Arbitration

16.6.1 The arbitral tribunal may use the opinion of the DRB.

16.6.2 Any Consortium Member may contest the Opinion before the arbitral Tribunal.

16.7 Disputes with the Employer

16.7.1 In the event a dispute occurs between the Consortium Members and the Employer which results in arbitration or Court proceedings under the Contract, the Consortium Members concerned shall fully cooperate in the proceedings by preparing all the necessary documentation and justification. Consortium Members not concerned by the dispute shall give any and all reasonable assistance required for the pursuit of the claim or dispute. That assistance may include, with the consent of the DRB or arbitral tribunal, participation as a witness to the DRB claim or arbitration

16.7.2 If a Consortium Member is not concerned it shall not oppose to the proceedings in arbitration by other Consortium Members.

16.7.3 In case of disagreement between the Consortium Members as to the choice of the arbitrator to be appointed by the Consortium in any dispute with the Employer such arbitrator shall be appointed by the President of the International Chamber of Commerce at the request of either of the Consortium Members.

16.7.4 In the event that arbitration proceedings hereunder occur concurrently with and are related to any arbitration proceedings under the Contract, it is agreed that such arbitration proceedings under the Agreement shall be stayed pending the conclusion, either by settlement or by award, of the arbitration proceedings under the Contract. Any settlement or award under the Contract will be binding under the Agreement and the Consortium Members agree to submit only the question of allocation and contribution for such settlement or award, if any, to the arbitrators in the proceedings under the Agreement.

Article 17 Choice of Law

17.1 This Agreement shall be governed by, and all disputes in connection with it shall be resolved in accordance with the substantive law of the country as specified in the Special Conditions without regard to this jurisdiction's conflicts of law provisions.

Article 18 Miscellaneous

18.1 No Joint Venture, Agency or Partnership

Nothing contained in this Agreement shall be construed as creating an agency, partnership or joint venture relationship among the Consortium Members.

18.2 Set-off

Except in the context of insolvency proceedings concerning the assets of a Consortium Member, no Consortium Member shall be entitled to set off any payment owed to it against payments due to another Consortium Member for claims which the creditor party believes it has against the debtor party under this Agreement, or to withhold such payments, as long as no agreement with respect to such claims has been reached or such claims have not been settled pursuant to Article 16.

18.3 Assignment

No Consortium Member shall assign its rights under this Agreement to any third party, without the prior written consent of all Consortium Members, and any attempted assignment without this consent shall be void. Should the Contract additionally require Employer's authorization for such an assignment, the latter will only be effective upon prior approval of all Consortium Members and Employer.

18.4 Amendments

No modification to this Agreement will be binding, unless made in writing by authorized representatives of all Consortium Members. Any waiver of this requirement for the written form shall likewise be issued in writing thereby.

18.5 Communications in writing

All correspondence, notices and other communications to be given to any of the Consortium Members pursuant to this Agreement in writing or written form, shall be sent, delivered or transmitted by courier, in person (against receipt), or by facsimile or e-mail with confirmation of receipt, at the respective addresses set forth below. However, if Consortium Members designate other addresses by notice given in accordance herewith, all correspondence, notices and other communications to be given to the respective Consortium Members shall thereafter be delivered accordingly.

Any correspondence, notice or other communication served as provided in this section shall be deemed to have been received:

- i. in the case of delivery by hand or by courier, when delivered against an acknowledgement of receipt; or
- ii. in the case of fax or e-mail (with confirmation of receipt requested) sent to the correct delivery address, the next local business day in the Country of the intended recipient (day on which banks are open for general business), following the day of successful transmission;

Approvals, certificates, consents, decisions, requests, notices and/or notifications shall not be unreasonably withheld or delayed by Consortium Members.

18.6 Written form

Written form or in writing shall mean that the respective notification, statement, agreement, decision,

resolution is signed by one or more representative(s) of the Consortium Member. An e-mail message shall only be considered in writing if it results in a [record with a confirmation of receipt].

All correspondence, notices and other written communications shall be delivered by authorized individuals of the Consortium Member, as follows: legal representatives of each Consortium Members, project managers and site managers thereof and all other individuals which authorization is previously informed to all Consortium Members.

18.7 Partial Invalidity, Omissions

Any individual provision of this Agreement which is or becomes invalid, or any omission to provide for any subject matter, shall not affect the validity of the remaining provisions of this Agreement. In such cases, the Consortium Members shall seek effective solutions as closely as possible approximating (in economic effect) to the invalid provisions.

18.8 Language of the Agreement, Correspondence, Documentation

The language of this Agreement shall be English. Correspondence, technical and commercial documents as well as any other information exchanged between the Consortium Members relating to this Agreement shall be in English. If another language is agreed with the Employer in respect of the Contract, correspondence, technical and commercial documents and other information – including any drafts thereof – to be exchanged between the Consortium Members and which are intended to be passed on to or to be used towards the Employer may be in the language that is agreed with the Employer.

18.9 Waivers

Any waiver on the part of any Consortium Member of any right or interest shall be in writing and shall not imply the waiver of any other right or interest or any subsequent waiver.

18.10 Entire Agreement

This Agreement is the Consortium Members' entire agreement relating to the subject matter hereof. It supersedes all prior or contemporaneous agreements, oral or written communications, proposals, drafts and representations with respect to its subject matter. Such prior or contemporaneous agreements, oral or written communications, proposals, drafts and representations may however be used for the interpretation of the Agreement where the Agreement is unclear or ambiguous.

18.11 Counterparts

This Agreement may be executed in any number of counterparts, all of which, taken together shall constitute one and the same Agreement.

18.12 Announcements

No Consortium Member shall make any public announcement or communicate any information to third parties concerning the subject matter of this Agreement without the prior approval of the other Consortium Members.

18.13 Alleging Lack of Capacity

Each Consortium Member warrants that, once this Agreement is executed, it will not allege that the person or persons who signed the Agreement on behalf of that Consortium Member lacked the capacity or authority to execute the Agreement, or that there was some other formal invalidity or incapacity that affected the validity or enforceability of the Agreement against that Consortium Member. In particular, actual or alleged lack of governmental or managing board authorisations or

permits shall not excuse non-performance or non-observance of the Agreement by a Consortium Member.

18.14. Waiver of Sovereign Immunity and Similar Privileges

Any sovereign immunity or immunity from execution or attachment is hereby waived by Consortium Members. It is agreed that this Agreement is a commercial transaction under international law and that governmental or state bodies entering into this Agreement do so with the intention of making the Agreement effective in accordance with its terms and so hereby waive any and all sovereign immunity, immunity from attachment or administrative law requirements that otherwise might have applied to them.

18.15. Wording of the Agreement

In the Agreement, except where the context requires otherwise:

- i. the Agreement and language are neutral in relation to gender;
- ii. words indicating the singular also include the plural and words indicating the plural also include the singular;
- iii. provisions including the word “agree”, “agreed” or “agreement” require the agreement to be either in writing or recorded in writing (before or after the agreement);
- iv. in understanding this Agreement, the Sections, Chapters, Articles and other headings are intended to be included in the Agreement and its interpretation; and
- v. all Notices, notifications, certificates, consents, approvals, decisions and requests under this Agreement shall indicate the sections(s) of this Agreement under which they are given or made.

18.16 Provisions to Continue

The expiration or termination of this Agreement shall not affect such provisions of this Agreement as expressly provide that they will operate after any such expiration or termination, or which of necessity must continue to have effect after such expiration or termination, notwithstanding that the clauses themselves do not expressly provide for this.

[end of General Conditions]

Proof of Research Data Upload

[noreply <noreply@hotelschool.nl>](#)



Mon 20/12/2021 00:02

To: Francesco Filipetti

Dear Francesco Filipetti,

This is an automatic delivery message to notify you that a new file has been uploaded.

Name : Francesco Filipetti
Student Number : 672073
Email : 672073@hotelschool.nl
LYCar Coach : Ms. Gikas
Research Number : 2021-332

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Thank You.

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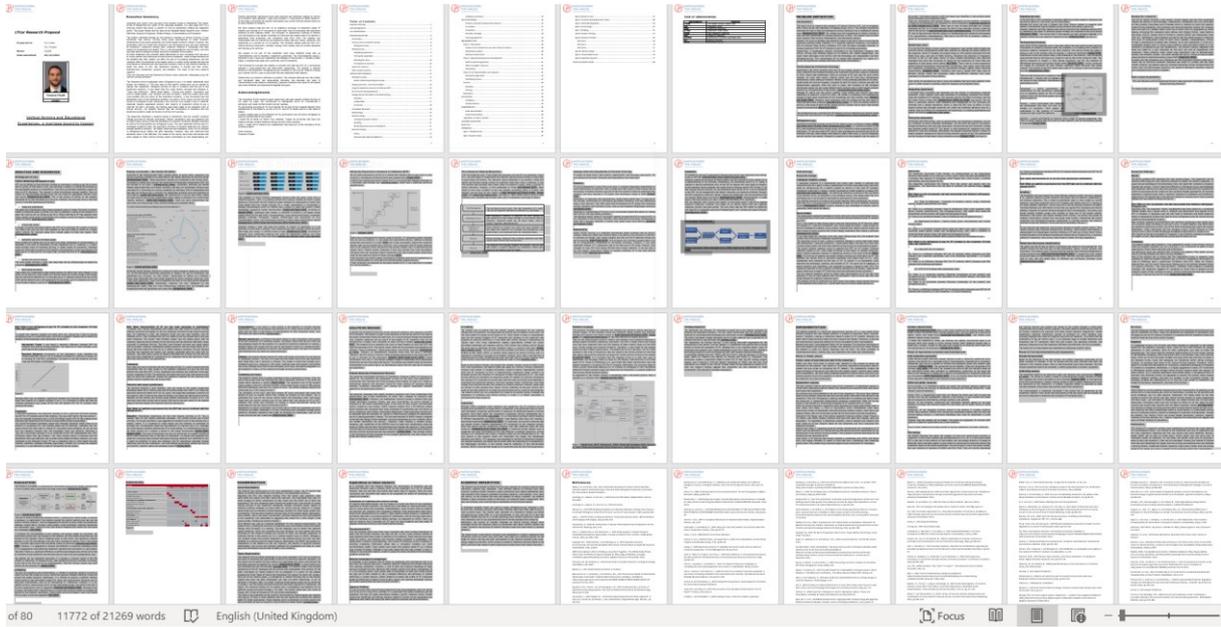
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