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www.ridgedalepermaculture.com

Small-scale Diversified Regenerative Farming (SSDRF)

Business Plan - T3181

TH Köln

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Abbreviations

CSA	Community Supported Agriculture
e.g.	For example (<i>exempli gratia</i>)
E1 to E4	Enterprise 1-4
ESS	Ecosystem Services
EU	European Union
EWEP	European Work Experience Programme
FFA	Fair For All
GbR	Gesellschaft (des) bürgerlichen Rechts
GmbH	Gemeinschaft mit beschränkter Haftung
LS	Lump sum
OHG	Offene Handels Gesellschaft
Pcs.	pieces
SSDRF	Small-scale Diversified Regenerative Farming
T.B.D.	To be determined
WOOF(ing)	Willing Workers on Organic Farms (process of participating)

NOTE:

Within the business plan, references are indicated with small superscript numbers (¹⁻⁹⁹).

A full reference list is provided at the end of the document.

Footnotes for further considerations are indicated with small superscript letters (^{a-z}) for explanations on the same page.

Company: Fair For All Farming GbR [FFA Farming GbR]
Location: [Details T.B.D. – near Cologne - North Rhine Westphalia, Germany]
Hartweg 1, 51429, Bensberg, Bergisches Land, Germany
Field of business: Regenerative, diversified and regional agriculture
Business mission: Providing high quality, beyond-organic produce for regional markets, while regenerating soils, promoting ecosystem awareness & enhancing local business relations.

Main business components: *Enterprise 1:* Pastured Poultry

Enterprise 2: Free range egg production - Layer Hens

Enterprise 3: Bio-intensive, no-dig Market Gardening

Enterprise 4: Mushroom Production



Initial Investment Volume: ≈105.000 €

Projected annual costs: ≈240.000 €
(Fix-cost per business year: 14.080 €)

Projected annual revenue: ≈336.500 €
(Profitability reached after 29 weeks of operation)

Amortisation for initial investment: 2 years
(Remaining depreciation in 3rd year: 69.425 €)

Background: Ethical farming business concept aiming for triple-bottom line profitability. Embedded within a larger project frame of the Fair For All Project (www.ffa.web) Holding to enhance regional development and promote social justice.

“Consulting, Farming, Share & Care – Let’s make it Fair For All!”

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Executive Summary

Small-scale Diversified Regenerative Farming (SSDRF) is an entrepreneurial agricultural business model, which will be realised by the Fair For All (FFA) Farming GbR. The FFA Farming GbR will be embedded within a wider project framework of the FFA Project Holding (including consultancy work for regenerative land-use practices, permaculture^a and social-inclusive working as well as living programmes). Within this business plan an assessment of the SSDRF business model is presented, evaluating economic viability for four selected enterprises within a holistic regenerative context.

The whole system design of a SSDRF venture is not limited to the mentioned enterprises, but the Enterprises 1 to 4 (E1 to E4) have been chosen for business assessment according to required labour input and their potential to provide positive financial contribution to the whole-farm economy, essentially allowing financial viability. Next to financial viability, ecological benefits are highly valued in the regenerative context, so that each selected enterprise contributes to an overall goal of regenerative farming. These goals include, among others: Building soil, generating habitat and increasing biodiversity on the FFA property. The FFA Farming GbR will operate on rented land, which is purchased within the FFA Project and will contribute with annual rental payments to cover running property costs and provide revenue for the FFA Project investors. In addition to the mentioned enterprises, the regenerative context necessitates the implementation of various perennial cropping systems. This includes the envisaged long-term goals of agroforestry and moving the farm towards truly pastured livestock, alongside the presented enterprises. However, as these perennial systems need time to mature and the local, regional market for truly pastured livestock (e.g. geese or rabbit) is still very small, the focus in this business plan is on the ventures, providing a steady cashflow and fast returns of investment. As presented here steady cashflow, low cost start-up and fast cost recovery, are essential for successful farming operations.

The assessment shows good feasibility for the establishment of the proposed venture, which would allow for further reinvestments into perennial systems and regenerative land use intensification.

^a For more information on permaculture refer to references: Holmgren (2002)¹ or Mollison (1992)²

1 Business Mission

The following introduces the reader to the topic and points out the benefits SSDRF operations. Further this chapter introduces the general business principles and elaborates on the holistic context model of the GbR partners.

1.1 Why SSDRF?

In industrialised countries most of today's agricultural production is heavily dependent on external inputs and a high degree of heavy machinery utilization. While it is postulated that these production methods are the only feasible way to achieve the required yields, feeding a rapidly growing world population, industrial production takes a heavy toll on ecosystems and requires high fossil energy inputs. Additionally, a globalised food market is creating complex and competitive market situations for farmers all over the world, leading to decreasing numbers of agricultural producers, while significantly increasing the hectares of land farmed per individual. With growing property sizes the need for mechanisation increases, leading to high investment costs and a growing pressure to meet external financing costs for those locked-up mechanic assets.

Further, the large farming areas in combination with less and less agricultural practitioners involved, result in an increasing use of monocultural production approaches. These monocultural production methods often require intensive application of pesticides, herbicides and fungicides to maintain plant health, while damaging soil ecology, natural wildlife and accelerating the loss of topsoil.^b In addition to the required industrial fertilizers, which must compensate for monocultural activity, a growing number of farmers is dependent on large external seed suppliers, steadily losing seed sovereignty.

Taking the above into account there is growing evidence that a paradigm-shift in agricultural production methods is needed to address the challenges of the 21st century; this includes, but is not limited to, farming in a changing climate, reducing external energy dependency and

^b Additionally, health implications for humans are still being discussed for various plant protection products. For a latest discussion on Glyphosate (one of the most common herbicides) refer to WHO/UN debate (e.g. at: <https://www.theguardian.com/environment/2016/may/17/unwho-panel-in-conflict-of-interest-row-over-glyphosates-cancer-risk>).

enhancing biodiversity in farming, therefore increasing farming-system resilience, while including ecosystem services (ESS) and externalities to the farming approach.

The envisaged business aims to address these challenges of modern day agriculture. The project holders are convinced that SSDRF practices can be economical viable while having the potential of benefiting farming ecosystems and, within the larger FFA project scope, improve business opportunities in rural communities and enhance regional development.

Furthermore, regenerative practices aim to build top-soil and therefore increase carbon sequestration and improve nutrient cycling and water storage on site. The emphasis on ecosystem processes supports ESS, enhancing plant and animal health and improving system resilience on a small-scale.

The business mission is to provide economically viable, diverse production of various food products on local scale, addressing the growing trends of regional and green-consumption. The business intends to focus on a triple-bottom line, addressing social, economic and ecological profit within a holistic decision-making framework. To achieve this the farming business is embedded within the larger FFA Project frame, including social work and financial backbone enterprises.

While the overall objectives of the farming enterprise are embedded within this larger project scheme, the following business plan assesses solely the regenerative agricultural ventures, envisaged for the initial enterprise set-up.

Figure 1 indicates the core principles of the business and gives an overview of the enterprise set-up.

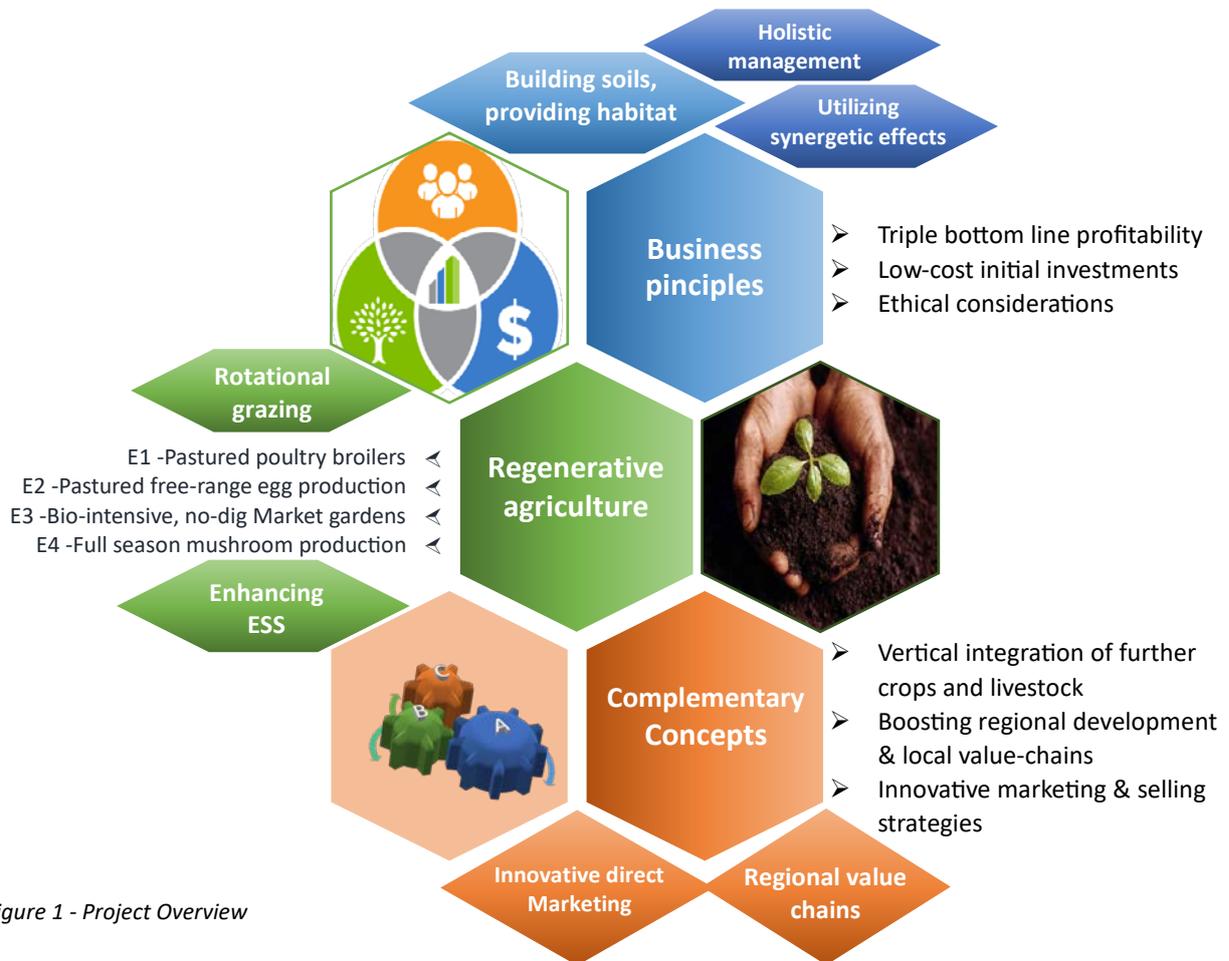


Figure 1 - Project Overview

1.2 The products & services

While organic production can be found in many agricultural production schemes and even hydroponic growing systems are being eligible for organic certification in the USA, there are certain enterprises which suit the regenerative farming approach best due to various reasons. As indicated in Figure 1 synergetic relations can develop by increasing the interaction between all life kingdoms, essentially mimicking ecosystem processes. Active soil building and therefore the sequestration of carbon, should be further goals in each enterprise. Additionally, Perkins (2016) extends the tenants of regenerative enterprises can by the following principles:³

- local inputs and outputs
- low fossil energy and fiscal inputs
- mobile & scalable infrastructure
- certification by customers

Therefore, it is important to underline, that each enterprise aims for economic viability, while maintaining the benefit of product diversification and improving ecosystem services. Figure 2

presents a first classification of the SSDRF context and indicates the envisaged main enterprises which are being addressed in the following chapters:



Figure 2 - SSDRF Context

As mentioned in the introduction, the regenerative context leads to further inclusion of complementary enterprises, which will not be addressed in detail within this business plan, but should be considered for future diversification. This includes, but is not limited to:

- The integration of woody crops, fruit-/ nut-trees and berry fruits within the rotational pasture lanes
- Other pastured small-scale live-stock ventures. E.g. geese, rabbits, turkeys or ducks (according to market place development)
- Inclusion of perennial herb production within the garden area
- Beekeeping for honey production while enhancing pollination services
- Integration of water systems and suitable aquaculture cultivation

An introduction to the for main cashflow enterprises (E1 to E4) is given in the following Chapters 1.2.1 tot Chapter 1.2.4. A summarizing overview of the contribution to regenerative agriculture concepts is given in Chapter 1.3.

For detailed information, inputs and outputs and monetary assessment refer to the regarding Chapter 8.

An introduction video to the farm can be found in the digital [ANNEX VI](#).

1.2.1 Bio-intensive, No-Dig Market Gardens (E3)



Picture 1 - Bio-intensive, no-dig garden, United Kingdom; Source www.charlesdowding.co.uk

In recent years bio-intensive, no-dig market gardening has been successfully implemented by various practitioners in various scales and climate zones, yielding excellent produce and proving highly profitable. The aim is to allow for a healthy soil life, while minimizing soil disturbance during seedbed preparation. Surface composting in combination with intense bioturbation by the soils micro-, meso- and macro-fauna and elaborated crop rotations on small-scale replace the need for industrial fertilizers and ploughing, while the integration of synergetic life stock and conscious habitat integration allows for biologic pest control. A high variety of cash crops can be grown on very small area, while requiring minimal investment costs. The main challenges for this enterprise are the high labour requirements, marketing and produce distribution. With recent technological development and drawing from the experience of successful practitioners, the labour requirements can be reduced by utilizing innovative low-budget tools, while marketing and produce distribution is eased by cross-synergizing with the following enterprises.

1.2.2 Free-range organic egg production: Layer hens (E2)



Picture 2 - Free range laying hens with egg mobile in background, Sweden; Source: www.ridgedalepermaculture.com

Mobile egg production units, sheltering small numbers of laying hens have been reintroduced lately by many entrepreneurial farmers. The moveable units capture between 100 and 450 birds and are often hosted on trailers. The mobility brings the advantage of easy transport and enables good spreading of chicken manure on grassland for intense fertilisation. Additionally, the regular movement ensures fresh forage for the birds. While ideally 15-25% of the fodder is provided by forage, this number varies with the quality of available grassland and can increase dramatically when movements are in line with a managed lead follow grazing scheme, where the chicken follow rotational movements of cows and sheep, allowing for the forage of insect larvae breeding in the manure paddies. The forage on fly larvae reduces in turn the pest-pressure of dung-flies for the cows and the forage activity helps spreading the dung for more even fertilisation of the grassland. Additional fodder inputs, a good water supply and daily work input for moves and egg collection are the main input factors, while low-budget egg mobiles and the on-site processing of spent layer hens can provide medium to high profitability with a constant cash-flow due to the minor investment costs. Pressure from ground or areal predators can be a major risk for free range enterprises and need to be addressed appropriately (e.g. fencing, guard species like geese, or sufficient training & hiding spots for areal predators).

1.2.3 Pastures poultry: Rotational grazed broilers (E1)



Picture 3 - Pastured broilers, USA; Model after Polyface Inc.; Source: www.sailorssmallfarm.wordpress.com

While rotational grazing under a lead follow principle for laying hens reduces the required feed input, pastured broiler profit massively from the high-quality food provided by insect larvae, high in omega-3 fats.^{4,5} Broilers are kept in higher density in smaller broiler pans rotating on a smaller more intensely grazed area, ideally in between established perennial agroforestry lanes to allow for improved nutrient cycling between pasture, scrubs and woody tree plantings. Broilers are best raised in deep litter systems under close monitoring and provision of high quality feed and water. The birds are raised in batches and processed on farm to allow full utilization of the value chain, avoiding excessive off-farm costs for slaughter. To allow this, a low-budget slaughter facility meeting EU and regional legislative requirements as well as training costs for farm managers need to be factored into the business plan. Good planning and assigning of skilled labour to process birds in combination with cold storage facilities and combined direct marketing are essential for viable profitability.

1.2.4 Complementary all-year enterprise: Mushroom breeding (E4)



Picture 4 - Mushroom breeding on saw-dust substrate; Source: www.swampyappleseed.com

To provide steady cash-flow during the off-season, when market gardening and broiler business is dropping down, complementary enterprises should be established on the farm. Due to the low-cost inputs and the opportunity to allow multiple infrastructure use, mushroom breeding presents a valuable addition to the off-season cash-flow. Due to the synergetic effects to woody crops and nutrient cycling, fungi have various benefits in the natural processes while establishing forestry and agroforestry systems. Though the addition of beneficial mycelium should be considered for tree plantings and outdoor growing logs can be planted for long-term profitability, the short term entrepreneurial and economical viable mushroom breeding is best achieved in controlled conditions. For this oyster mushrooms can be grown on saw dust or straw within greenhouses or polytunnels. Initiation costs, like the purchase of growing media and inoculation mycelium present the major costs, while the growing process itself is relatively effortless, mostly comprised by the monitoring and control of temperature and humidity.

1.3 Addressing tenants of regenerative agriculture

Table 1 summarises the contribution towards the tenants of regenerative agriculture for the different enterprises. Further details on the enterprises can be obtained in Chapter 7.

Table 1 - Tenants of regenerative agriculture within the business set-up; adopted from R. Perkins (2016)

Aspect covered	E1 & E2 Pastured Broilers & eggs	E3 Market Garden	E4 Mushromms
synergetic relations	High value food source in larvae and maggots from grazing predecessors; in addition Laying hens can be kept over the season, which allows utilisation in gardens to reduce next seasons pest pressure.	Diverse garden provides diverse source for pollen, garden scraps can be composted or fed to animals	Spent substrate can be used for mulching of tree lanes or composted to reduce compost acquisition for garden. Mycelia important component for biogenic nutrient cycling
active soil building	High nutrient input → increasing root mass & topsoil building; daily moves ensure that grasses do not leave vegetative state; foraging of chicken loosens upper layer of topsoil for better aeration and avoids compaction.	Surface composting & no-dig approach to actively build topsoil sequester carbon, support of soil flora & fauna by applying mulch & no-till	Mulching material turns into soil overtime. Beneficial impact of Mycelia for soil-biology
local inputs and outputs	Required building materials to be sourced locally, feed inputs to be sourced from regional producers, produce distributed locally (within 50-70km max.)		
low fossil energy and fiscal inputs	Mainly manual labour (for all enterprises), low initial investment cost, shared energy inputs for transport & distribution, shared fiscal resources for marketing & administration, utilizing high value local waste streams wherever possible.		
mobile & scalable infrastructure	Broilers: Scalable for every batch (6 batches for year) by increasing chick number; Egg mobiles could be added each season on low cost, based on fast investment recovery For both enterprises: all infrastructure designed to be moved off-site	Garden beds can be extended, and production adjusted to certain preferences of varieties, scaling to customer's demand	Mushroom enterprises could be extended utilizing infrastructure of the gardens during winter (trade off with keeping layer hens inside the tunnels during winter); Multiuse infrastructure allows easy scaling and production shifts
certification by customers	Open farm policy allows customers to visit the farm and familiarise with production methods, regular events (e.g. cooking events with local chefs, nose-to-tail eating) to continuously build relation with customers. Initial marketing campaign to address target group		

2 Envisaged market & customers

SSDRF is limited with regards to the production quantity, due to the available production area and reduced machinery input. Accordingly, the envisaged market is regional and therefore relatively small. A quantitative market analysis is to be conducted before business start, when a property has been chosen. For this business assessment a market is assumed within a larger city of the Cologne-Bonn area, which allows access to main consumptive hubs. Though, the market will be highly dependent on the region, there are general trends in the food market, indicating growing market shares for organic production. Figure 4 presents the organic market share in Germany from 2006 to March 2017, which has been steadily growing in recent years. It comprised a total market revenue of 9,48 billion Euro in 2016, projected to increase further.



Figure 4 - Market share of organic food in Germany
Source: www.statista.com (ID: 360581)



Figure 3 - Importance of regional produce for German customers
Source: www.statista.com (ID: 13465)

Figure 3 presents findings from a survey conducted in March 2017, indicating that 81% of the asked consumers assign high or medium importance to regional produce.

The following target group identification describes the envisaged customers, which will be primarily targeted for all marketing approaches. It is emphasised that the customer base will grow over time, but an established initial customer base and direct contact between customer and producer is essential for good feedback loops. According effort should be directed to initial marketing, building an initial customer base and emphasizing on continuous good customer relations, before intending to grow the customer base. Due to the challenge of marketing produce on a regular basis in line with the seasonal changing production, customers

need to be actively approached in the first years of enterprise establishment to raise awareness for the diverse product range.

2.1 Customers, intended target groups

The envisaged customers can be divided into two major customer groups: Commercial customers, reselling or further grafting produce and private customers purchasing privately most likely for direct consumption.

The first group of **commercial customers** requires a proactive effort before the enterprises commence. It is foreseen to directly approach local restaurants before the first growing season, to determine the demand and possibly adjust envisaged production figures. Among the commercial customers are local restaurants, and high-value restaurants of the region and grafting business, focusing on high quality products. For this the business location is crucial, as market access and transportation are limiting factors for marketing produce. Ideally the business is situated not further than 50km from a major consumptive hub or city, with a variety of restaurants and sufficient financial capital to acquire high quality produce. (For location description refer to Chapter 6.3)

A direct contact to local chefs is valuable to place products and inquire on further produce needs or supply gaps. Gardening plans and production scale of chicken meet can be scaled accordingly, which allows for a variable service provision to commercial customers.

The core **private customers** are mostly looking for high quality and regional produce and can include people with high eco-system awareness and ethical production standards. This applies to a growing number of young families, young people with academic background and/or with sufficient purchasing power as well as regional oriented consumers, wanting to support local business.

2.2 Customer Needs

The needs of envisaged customer are centred around the following points and apply to both major customer groups to various extends:

- High quality produce, exceeding conventional production quality
- Diverse production providing multiple products
- The ability to choose from delivery to delivery
- Good availability of regular products

- Timely & reliable delivery
- Good communication & customer care
- Possibility to inquire for certain products, absent in the current local market place

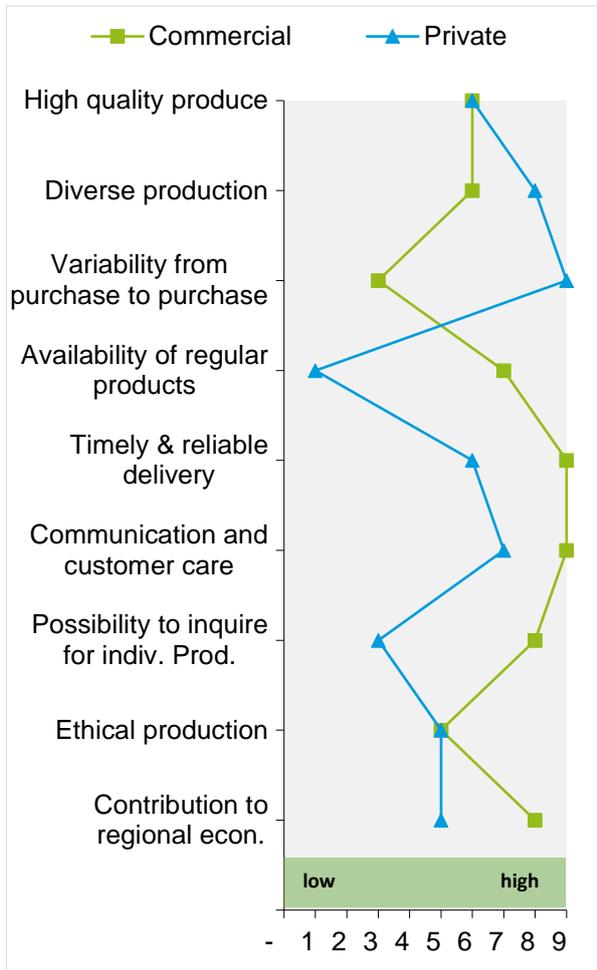


Figure 5 - Needs of envisaged customers

Further needs include ethical production & contribution to regional economy and development. As those further needs are not easy to quantify and address more general concerns of customers, they are not considered in the assessment graphic below.

Figure 5 indicates in a first assessment of how important the various customer needs are for the two major customer groups. The scale from 1 (low importance) to 9 (high importance) shows the variations for the two customer markets. Marketing strategies should be adjusted accordingly, while the core data for this preliminary evaluation needs to be maintained and updated during the business process to refine further market knowledge.

2.3 Advantages for customers

While conventional agriculture supplies high quantity outputs under a constant, high input of production utilities and capital, the quality of products often lacks behind smaller, selected organic production methods. Though certain effects of industrial production have caused increases in general produce quality (esp. with the intensified hygienic rules and regulations) and economies of scale bring certain advantages, diversification and skull-full management of small-scale farming can provide higher quality or at least very competitive produce. There is

first scientific evidence⁶ that the nutritional value and food quality of healthy organic production exceeds industrial food.^c

Additionally, the high dependency on fossil fuel and monocultural production approaches of large scale agriculture lead to unintended negative externalities and a reduction in ecosystem services. There is growing demand for organic production, with an accelerating trend to regional production. Traditionally, organic production focuses on methods, reducing the use of pesticides, herbicides and fungicides in crop production or following improved animal-welfare standards in livestock handling. In comparison, regenerative agriculture emphasises on beneficial synergies within life kingdoms and aims to create productive food-eco systems, while building topsoil and regenerating degenerated production ground, increasing ecosystem services on mismanaged land. It can be postulated that healthy soils are the basis for healthy plants, which in turn are the prerequisite for healthy animals and high-quality produce. There is a growing number of people, looking for high quality regional produce, whom are often willing to pay a considerable price premium for organic products.

Additionally, SSDRF offers the benefit that many products can be supplied by one regional producer, allowing value streams to strengthen the overall economic situation of the region.

The direct contact of customer and producer aims for better feedback loops and adjustment of the production according to local needs.

^c Though published research has been contradictory in the past, a growing number of scientific papers acknowledges higher concentrations in antioxidants, vitamins and carotenoids for organic food.

3 Competition & market access

3.1 Competition: Relative produce rating & competitor analysis

As SSDRF will produce a diverse range of products, most comparable to products in the organic food market, a detailed market analysis for each product would be necessary to scale production needs in the long term. A detailed assessment of the marketplace is envisaged as soon as a precise business location is chosen. For this assessment, a preliminary market evaluation will analyse the regional food market in general, as the complete production is within the consumable/food range. Figure 6 presents a first relative comparison of the unified SSDRF product range qualities in comparison to the average competition.

Competition can be expected on a regional scale and is very specific to the chosen location, though conventional producers should be considered as well. Currently the project is foreseen within in the Cologne-Bonn area to allow potential cooperation with the Agricultural Institute in Bonn and the Technical University of Cologne, where contacts are already established. A detailed competition analysis needs to be conducted once a specific site has been chosen.

As a preliminary assessment main competition can be categorized into three major fields:

- Conventional agricultural producers
- Small regional agricultural producers
- Organic producers

Though the regional, organic food market is mainly served by the latter two, conventional agricultural production should be compared and included in the assessment, as an increasing market share of organic food, will likely lead to engagement of the dominant market participants within this market.

The following graphs present a preliminary assessment of the competition for the three major products.

A detailed analysis should be conducted for chosen competitors (based on effectively shared markets) as soon as the detailed business location is chosen.

Various essential aspects according market development were rated comparing SSDRF, small regional producers (conventional), organic producers (large-scale) and conventional large-scale production. The results are presented in the graphs below comparing SSDRF to the average competition results. Detailed rating tables are attached in [ANNEX 1](#))

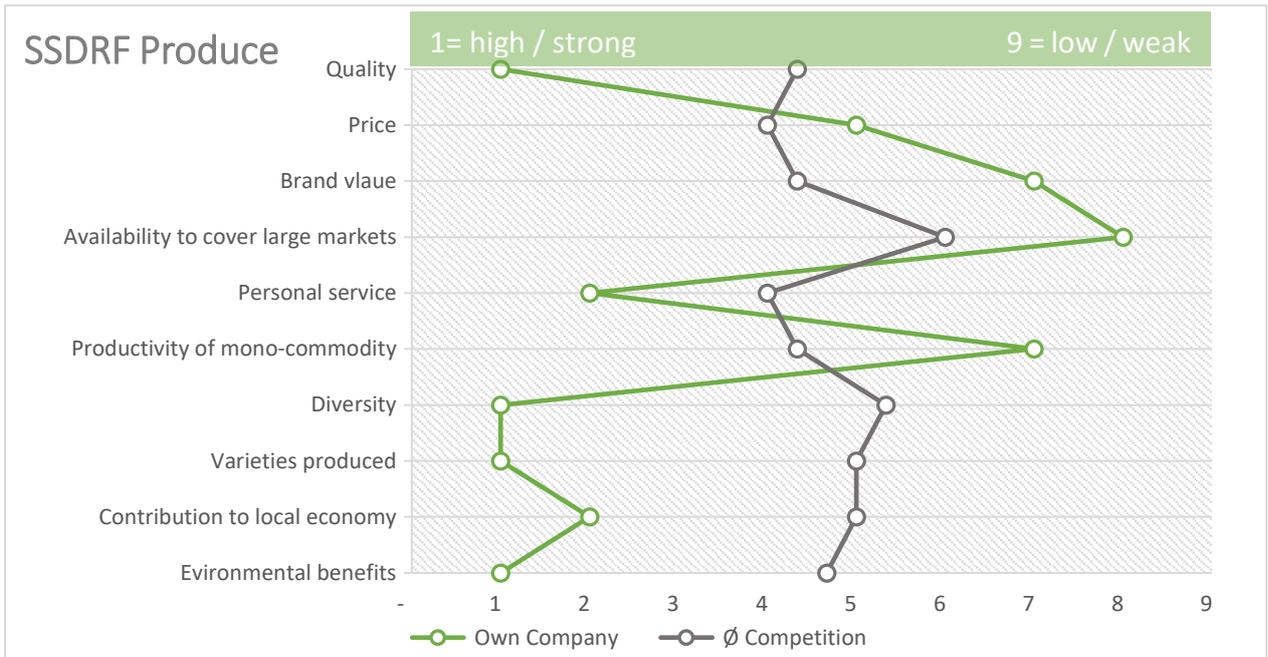


Figure 6 - General produce rating

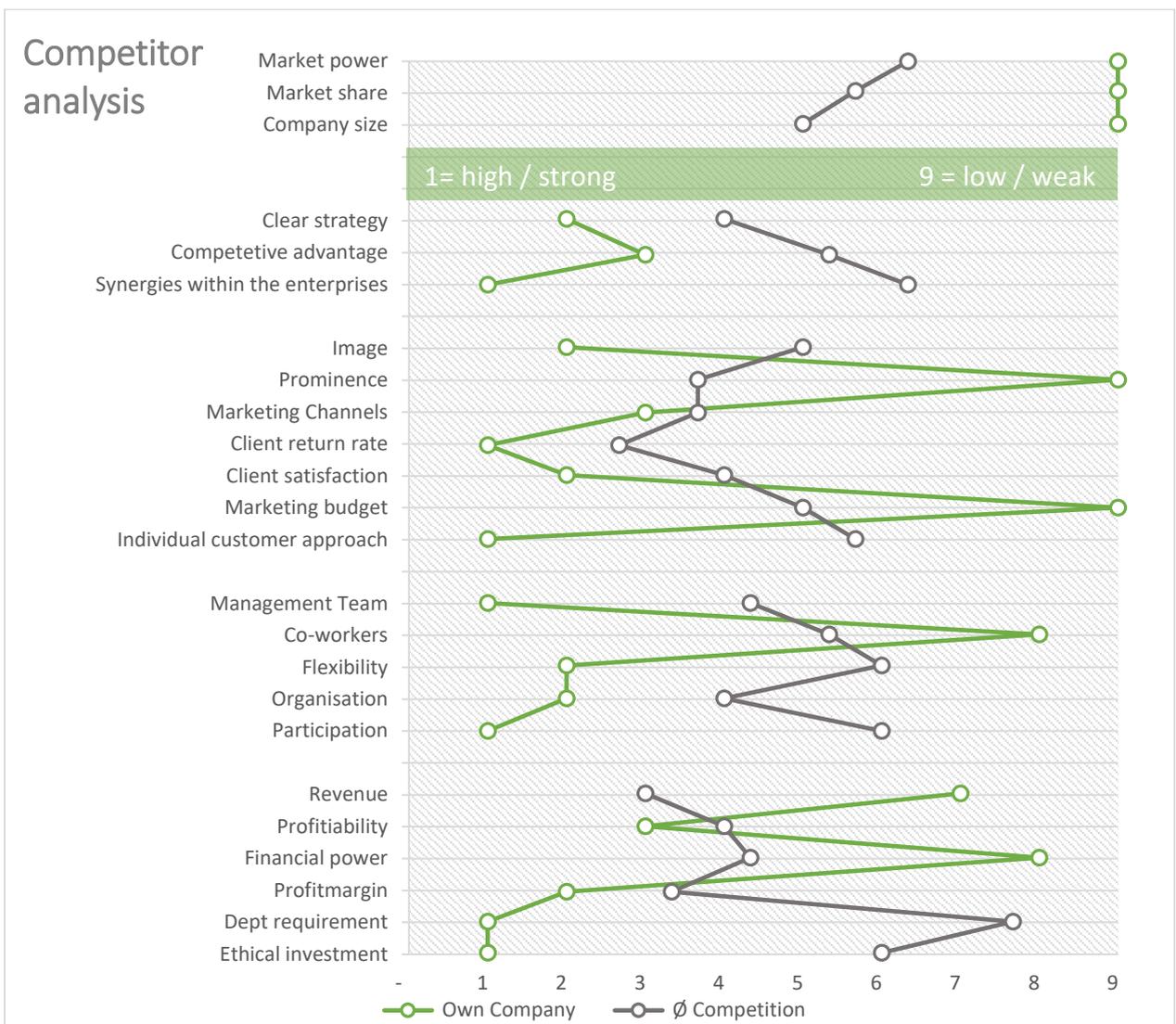


Figure 7 - Competitor analysis

3.2 Market access

Market access will be ensured by intensive marketing (see Chapter 4) and subsequent direct sales of produce, utilizing innovative distribution channels. This includes regular online pre-sales and direct online orders with delivery to previously agreed drop off points. Similar programs are starting to become more prominent and in Cologne, there are various selling associations for regional producers.

Small quantities (e.g. 20%) of produce can be directed to whole-sale distribution and cooperation with local shops must be considered to utilize local distribution infrastructure. Weekly deliveries to commercial customers must be made in a timely manner and delivery capacity and routes need careful detailed assessment.

For delivery, a 3-seat mini-transporter without cooling unit is foreseen, which can also be utilised for material transport during the start-up phase.

4 Marketing Concept

This chapter presents first approaches for a marketing concept. As a detailed marketing concept is best adjusted to suit the specific region, further amendments will be required as soon as the specific business location is determined.

4.1 Increasing profitability: On-Farm processing and Direct Marketing

To operate successfully and maintain high profitability of the business, the two principles of on-farm processing and direct marketing are essential.

As value of most agricultural produce increases along the production chain, processing on-farm allows obtaining a higher share of the full produce value. An easy example can be set with a broiler chicken which could be obtained from a hatchery from as low as 0,30 € (though FFA Farming GbR plans to obtain high value birds from organically fed mother birds at 1,50€ per chick). Under the input of labour, feed and time the chick matures, and value increases significantly. However, the highest value increase is often found in the last processing and selling steps: A bird might leave a conventional farm operation for 3-5€ while slaughter and selling increase the value to over 9-12€ a bird. Another example shall be given with vegetables: Seeds can be acquired for a fraction of the final products price, and further processing (e.g. pickling) can once again significantly increase produce value.

Conventional or industrialised agriculture often loses significant amounts of produce values, as the high production quantities and degree of specialisation do not allow for further on farm processing. SSDRF is planning for a whole-value concept for most of the envisaged product, following the full value-chain from initial production, over on-farm processing up to direct marketing to the consumer.

Direct marketing is potentially a step to obtain higher shares of the produce value chain, as sales offer an excellent good effort/value ratio. While it requires initial effort to approach potential customers and build a client-base, there are many examples where efforts pay off quickly and profitability increases. Though, gaining initial market access may be challenging & cost intensive, modern approaches and communication means allow for easy customer contact and can provide valuable instruments for direct marketing.

4.2 Marketing channels

A customary model for direct marketing in agriculture are on-farm sales via a farm shop. Though on-farm sales offer a good opportunity to market produce, meeting required regulations and establishing selling facilities add major costs to the business. Today a growing number of alternative marketing channels offer alternatives to conventional farm-shops and can efficiently extend the reach to various customer groups.

As the business will be near a major urban centre, marketing campaigns with flyers, posters & information stands will be started during business establishment. Additionally, private contact will be made with restaurants & local food grafters, potentially providing produce samples & building regional business relations.

Social media, like Facebook, Twitter and Instagram should also be considered for marketing purposes. A detailed social-media marketing campaign must be designed in line with business locations and intended target groups. Additionally, to the benefits of increasing market shares and extending the customer base digital marketing provides free user statistics and access data which can be used to model customer behaviour and estimate accessible market volume.

Producer-selling-circles like Marktschwärmer e.V. or LokaleWare.de are also deemed to be beneficial for customer outreach and cooperation with those private initiatives for regional produce marketing is foreseen. Further Community Supported Agriculture (CSA) can provide a valuable opportunity for pre-selling produce, or market garden shares.

4.3 Communication & public relations (PR)

As the market of interest is rather regional, good communication and public relations (PR) are essential to bind customers long-term and enable closed feedback-loops on produce quality and demand development.

Communication and feedback from customers during produce drop-off is crucial and can be used to optimize production towards the regional needs.

In addition to the marketing campaigns and regular customer communication, occasional events on the farm can assist in familiarizing customers (and potential customers) with the production methods and provide a beneficial opportunity to strengthen the consumer-producer relationship. This can include, but is not limited to cooking events, involving local chefs (nose-to-tail eating), educational events and celebration of local traditions or the organisation of small festivals.

In addition to the customer relations which can be fostered in events or via direct contact during orders & sales, public authorities and local competitors should be considered within the communication structures. Close work with authorities is necessary for various approvals and fulfilling legal obligations. Personal contact should be established with the municipalities' administration and local agricultural chambers to allow easy inspections and ease fulfilment of all legal requirements obligated by public entities.

5 Strategy

5.1 The triple bottom-line

The triple bottom line of SSDRF is addressing economic profitability while supporting ecosystems and building community. The term was coined by J. Elkington in the 1990s and has since been applied in a different framework. Triple bottom profit aims to establish a full cost accounting and considers ecological footprint and corporate social responsibility within the private sector.

Successful farm businesses that will last and thrive are revolving around the creation of win-win situations. Win-win situation evolve from a holistic consideration of needs for the customers & region, the own business and ultimately the natural world presenting essential production factors. These needs can be summarised by the PPP principles of benefitting People, Planet and Profitability.

Considerations for those three P's are presented in Table 2 and are part of the holistic decision-making framework for the FFA Farming GbR.

Table 2 - Triple bottom line considerations at FFA Farming GbR

People	Planet	Profitability
Creating a productive co-working environment, sharing profits and decision making equally, allowing personal development and striving for excellence, embedding business and partners within regional context, valuing customers and maintain closed feedback-loops, valuing local competition and developing regional synergies.	Regenerating ecosystems by improving ecosystem processes, working towards healthy water cycles, mineral cycles, synergetic community dynamics of various life kingdoms, optimizing energy flows, creating habitat, increasing biodiversity, allowing for biological synergies between enterprises	Economic viability for each individual enterprise, fast recovery of cost allowing for further investments within the holistic context, equal profit share between partners

5.2 Holistic decision making

As the FFA Farming GbR is run by four equally involved partners, a joint decision-making framework is essential. A suitable tool for this can be found with the holistic management framework as created by Allan Savory (www.savory.global).⁷ Though holistic management after savoury comprises a set of tools also useful for SSDRF (including planned grazing, land planning and financial planning), the decision making in a holistic context is a major aspect which shall be briefly addressed here: A joint holistic context between the partners defines

long-term goals and key-values which shall be jointly covered by the created business. To establish this joint holistic context, all partners should address the following aspects and formulate core values.³

- Definition of management power: Identifying decision makers and internal responsibilities (addressed in partnership contract)
- Definition of resource base: All available forms of capital (compare 8 capital forms by E. Roland⁸)
- Definition of income sources: On-farm and off farm means of financing
- Definition of “Statement of Purpose”: Overall objective of venture to be clearly defined.
- Definition of Quality of Life Statements: Assessing own wishes and values.
- Definition of Production forms: Ethical considerations, Knock-Out criteria (e.g. industrial fertilizers)
- Definition of the future resource base & Landscape: Towards what shall the farm develop? 5–10-year goals
- Definition of behavior to achieve the above defined targets: Rule set to be established jointly

Once the joint holistic context is formulated, decisions can be tested and subsequently monitored towards this context. This includes considerations for cause & effect, identification of weak links (may they be social, financial or biological), the consciousness of marginal reactions and gross profits as well as resources use, sustainability and social impact. According tables should jointly be generated for all major decisions made, and provide a base for monitoring and improving decision making processes.

5.3 Means to SSDRF profitability

For SSDRF profitability there some general principles, which have allowed successful business establishment and profitable operation for some practitioners.

5.3.1 Strength through diversification

While industrial farming is often produced only one commodity, SSDRF aims for an increasing variety of produce. Though only four enterprises are presented here, the long-term perennial systems and other FFA Project services (e.g. consulting, design-services and the integration of social caring services) will provide further income diversification.

Diversification is especially important when farming in a rapidly changing context. This includes changes in the natural world, due climatic shifts and the increase of extreme weather event, as well as changes in market requirements. While the SSDRF approach increases farm resilience on the one hand by following poly-cultural production approaches, it additionally

provides strength within the economic diversification. Losses of harvest or misadventures of one enterprise, can be - fully or partly – compensated by successes in other enterprises. Further, the on-farm diversification provides the benefit of sharing administrative infrastructure, marketing and distribution channels, while allowing a wide variety of produce for customers to choose from.

However, it must be emphasised that diversification comes at a cost: While initial investments increase with diversification, it is also important to underline the required knowledge of diverse production method and the synergies developing within these systems. Permaculture principles and whole system design provide great insights on the latter, while the economic experiences made by other SSDRF operations world-wide, have given great insights on how to minimize initial investment costs and allow economic viability of diverse production systems.

5.3.2 Low capital, fast returns, steady cashflow

Following production theory, each venture requires inputs of some capital forms. While different economic scholars differentiate capital in various ways, a common classification of five capital forms has been widely applied. These include: Financial, Natural, Social, Instructional (or Intellectual) and Human Capital. Production requires inputs of those capitals, while certain replacements can be made (e.g. replace financial capital with human labour). The production cannot be successful if capital is not available. However, it is possible to reduce capital inputs. This is essential for small farms, as financial capital and human capital (labour) are often short. Accordingly, means must be found to minimize shortages of production capital. This includes the use of innovative tools (e.g. direct seeders & egg mobiles) to minimize time inputs, as well as utilizing local waste streams (compare Chapter 5.3.3) to minimize costs.

Scholar from the permaculture movement change the definitions slightly and add cultural, spiritual and experiential capital to the classification (compare Figure 8), however, the essential production inputs remain the same.

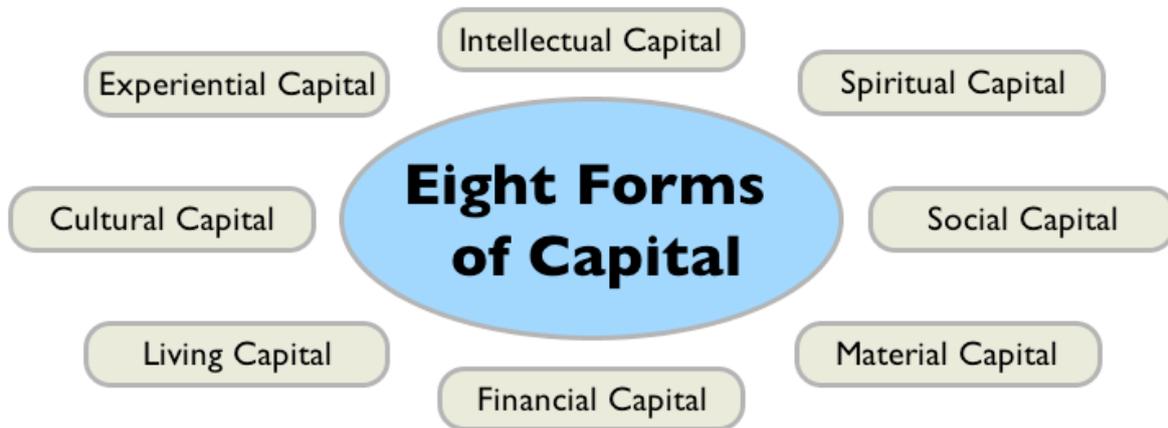


Figure 8 - 8 forms of capital; Source: www.appleseedpermaculture.com

Low financial investments allow a fast return of initial investments, allowing for intensification of production methods or for investments of further perennial cropping systems. Essentially building up system resilience while reducing external liabilities.

Cashflow presents an ongoing challenge for each farming operation, as most revenues are generated seasonal under peaking labour input. Accordingly, effort needs to be directed towards generating steady cashflows. Inclusion of laying hens, pre-selling produce via CSA schemes and grafting produce for longer shelf-life (e.g. drying mushrooms, pickling vegetables) to distribute long-living products later in the season, are elements considered here.

5.3.3 Low cost infrastructure & utilizing local waste streams

In general, the utilisation of local waste streams can significantly decrease enterprise costs. This could include the acquisition of rotten straw or hay for mulching or manure (e.g. from horses or cows) for initial garden preparation. Further, scrap wood, old windows, metal sheeting or pallets can provide valuable building material for egg-mobiles, broiler-pens or greenhouse extensions. However, as local waste streams are highly dependent on the region and cannot not be reliable nor deemed fully secured, this business assessment factors in conventional costs for infrastructure establishment.

5.4 Price and margin

Correct pricing is determined by the self-costs of products, which derive from the detailed enterprise calculations (see Chapter 8) and the chosen profit margin. Under the Fair For All

Project the margin contributes to the coverage of initial investments and might be used for compensation within the financial-resilience approach of diversification (See Chapter 5.3.1).

For this business assessment, there are four major on-farm commodities considered. Though additional products will be added to the production as to the complementary enterprise concept (see Chapter 1), the price assessment is only done for the major enterprises.

The self-costs derive from careful consideration of input requirements. The following summarizes the considerations for each enterprise:

Broilers: Chick-purchase, starter feed, organic grains, electricity, advertisement and inspection cost, packaging and fuel for delivery as well as human hours as to detailed time-input calculations (see Table 7).

Pastured eggs: Feed & water, packaging and fuel for delivery as well as human hours as to detailed time calculations (see Table 9) The purchase of layer hens is envisaged to be cost neutral, as spent laying hens can be sold for a slightly higher price as soup chicken.

Market Gardens: Seed purchase as well as human hours as to detailed time-input calculations (see Table 10)

Mushrooms: Mushroom spawn, substrate, growing bags, water as well as human hours as to detailed time input calculations (see Table 13)

Detailed cost calculations are presented in Chapter 8. As enterprise investment costs will be depreciated over 10 years (see Chapter 8.1.3), those costs will not be considered for determined unit self-cost. Based on the self-cost and price determination the profit margins for the various products are presented in Table 3.

Table 3 - Self cost assessment & price

	Produce	Production cost	Envisaged production	Determined Self-Cost		Price		Profit Margin
E1	Pastured Broilers*	64.500,00 €	10.800 kg	5,97	€/kg	11,50	€/kg	48%
E2	Pastured Eggs**	54.047,50 €	226.800 eggs	0,24	€/egg	0,30	€/egg	21%
	Spent layer**	7.000,00 €	900 birds	7,78	€/layer	8,00	€/layer	3%
E3	Garden shares	70.465,90 €	4.620 shares	15,25	€/share	19,99	€/share	24%
E4	Mushrooms	40.610,00 €	2240	18,13	€/kg	20,00	€/kg	9%

* Price for broilers is average price determined from 20% wholesale at 9,50 €/kg and 80% private sales at 12,00 €/kg

** Spent layers are sold nearly cost neutral, which would decrease the unit costs per to to 0,21€/egg and increases profit margin to 31%

6 Business Concept

6.1 Legal form

The chosen business entity is a “Gemeinschaft des bürgerlichen Rechts”^d (GbR), in which a group of partners combines their financial and human capital for a joint economic venture (§ 705 BGB). This form of partnership under civil law is possible in Germany, if the annual total revenue from trade business does not exceed 260.000 €, which is the case for all predicted 10 years of SSDRF business. When the total trade revenue exceeds 260.000 €, the GbR transforms to a “Offene Handelsgesellschaft” (OHG, §§ 105 ff. HGB). Details on the chosen business form are elaborated in this chapter.

Another potential business form could be the “Gemeinschaft mit beschränkter Haftung” (GmbH), with limited personal liability. However, tax benefits and a special suitability for agriculture and forestry led to the decision to establish a GbR. Table 4 presents a brief comparison of the two potential business forms (GbR and GmbH) with special focus on agricultural business.⁹

Table 4 - Comparison of GbR and GmbH; adopted from DBV (2016)

Aspect considered	GbR	GmbH
Business Taxation	“Trennungsprinzip” is applicable, not the company but each partner’s profit share is taxable individually	“Körperschaft” Business taxation applicable (“Körperschaftssteuer”)
Tax-level on business level	-	15% plus 5,5% SolZ
Trade taxation (“Gewerbsteuer”)	No, if according requirements do not classify business as trade	Yes, no reduction value for agriculture & forestry applicable
Bookkeeping obligation	When exceeding: 25.000€Economic land value >60.000€Profit >600.000€Revenue	In all cases; “Bilanzierungspflichten des Handelsgesetzbuches“
Profit generalization	yes	Yes (for revenues from “LuF”)
Liability	Full liability, including all private funds	Liability with business capital, no private liability

^d Due to the business location the following chapter will use German terms for the legal aspects covered in the section. Please refer to according legal literature for further information.

6.2 Legal aspects, Employment & Liability

In a GbR each partner bears full private liability for the business. Due to the initial low capital investment and relatively fast return rates in the business of FFA Farming GbR, the shared financial risk of all partners is predictable.

As partners within a GbR, each partner is required to put full commitment towards the joint business, while being self-employed as agricultural producer. As an option, an employment of additional staff could be foreseen, especially during the work intensive peak season. Proper contractual consideration of employment is essential. An exemplary employment contract is presented in [ANNEX III](#)

The taxation of a GbR depends on its size and orientation of business.¹⁰

In the envisaged business case the following requirements are met, which allows taxation of profits via private tax declaration of each partner within the tax attachment for profits from agricultural activity and forestry (“Anlage L” of private tax declaration).

The GbR is required to commence orderly bookkeeping (following §4 Abs.1 EStG), if the turnover exceeds 600.000€ a year; the economic value (“Wirtschaftswert”) of land (rented & owned) exceeds 25.000€, or the profit per partner from agriculture & forestry exceeds 60.000€^{9,10} Though, neither of these conditions are met in the business case, internal bookkeeping is foreseen.

The business needs to be registered with the German tax office within the first week of operation (following §138 Abgabenordnung), which results in the assignment of a business tax number (“Steuernummer”).¹⁰

6.2.1 Workforce of partners; Employee situation

Labour costs are a significant consideration for labour intensive small-scale farming. Accordingly, a business model is chosen where a majority of the monetary compensation for the partners is retrieved from the gross profits under a GbR model.

Close monitoring of working hours and detailed time and motion studies are essential to monitor and evaluate the profitability of the business. While the actual operation of the business is intended to be managed by four shareholders, the first implementation requires initial inputs of human and financial capital. Parts of the initial business set-up will be done

under educative workshops, in cooperation with regenerative land use institution (e.g. Permaculture academies & universities), which will be facilitated in cooperation with certified permaculture designers. Further, voluntary work-force plays an important part, which will be facilitate with institutions like Work Away, WOOFING or the European “EWEP” program. For those programmes food and accommodation need to be factored in for the participants, whereby a majority of the food will derive from the endogenous diverse production of the farm.

For the four profit sharers of the GbR it is intended to obtain an annual cost recovery of 60.000 €per year, deducted from the gross profit of the combined business.

A business contract regulates shares and income distribution between the different enterprise agents, which will work in the form of a GbR if annual turnover does not exceed 260.000 €per year. For revenues over 260.000 €the business registration as an OHG will allow for legislative compliant business administration (compare Chapter 6.1).

The responsibilities for the co-management are defined in written form within the cooperative GbR contract and the business statues framed by the joint holistic context (compare Chapter 5.2).

6.2.2 Taxation

As profits from the enterprises will be taxed privately within the private tax declaration (“Einkommenssteuererklärung” (EKS)) by each individual partner under “Anlage L” for profits from agriculture & forestry the private taxation law applies. It is important to emphasise that the private tax declaration has to be assessed with the calendar year (01.01.-31.12), while agricultural ventures are assessed over the economic year (01.07 to 30.06). Profits from the economic year are standardly distributed to 50% to each calendar year touched by the economic year.

Following the “Welteinkommens-Prinzip” private taxation varies from individual to individual but can be summarised in its structure as followed:

- + Profit from agriculture & forestry (Einkünfte aus Land- und Forstwirtschaft)
- + Profit from trade business (Einkünfte aus Gewerbebetrieb)
- + Profit from self-employed labour (Einkünfte aus selbständiger Arbeit)
- + Profit from employed labour (Einkünfte aus nichtselbständiger Arbeit)
- + Profit from capital investments (Einkünfte aus Kapitalvermögen)
- + Profit from rent (Einkünfte aus Vermietung und Verpachtung)
- + Profit from various sources; e.g. retirement (sonstige Einkünfte r.B. Renteneinkünfte)
- = Sum of revenue (Summe der Einkünfte)
- Reduction factor age (Altersentlastungsbetrag)
- Reduction factor for single parents (Entlastungsbetrag Alleinerziehende)
- Reduction factor for agriculture & forestry (Freibetrag für Land- und Forstwirte)
- = Total value of revenue (Gesamtbetrag der Einkünfte)
- Special expenses (Sonderausgaben)
- unexpected charges (außergewöhnliche Belastungen)
- = Income
- Reduction factor children (Kinderfreibetrag)
- = Taxable income

Table 5 compares taxation of a GbR with 2 partners (assuming equal share of profits) and a GmbH with two owners.

Table 5 - Tax assessment of business form

Business level	GbR	GmbH
Profit	200.000,00 €	200.000,00 €
1 - Business tax (GweSt: Gewerbesteuer)	n.A.	- 28.000,00 €
2 - 15% Company tax (Körperschaftssteuer)	n.A.	- 30.000,00 €
3 - 5,5% Soli	n.A.	- 1.650,00 €
A Tax burden of business		- 59.650,00 €
in %	-0,00%	-29,83%
Potential profit cash out		
	200.000,00 €	140.350,00 €
Partner level (for total: x2 for two partners)		
Profit from LuF per partner	100.000,00 €	- €
Company payment per partner	- €	70.175,00 €
- 25% Abgeltungssteuer (only GmbH)		- 17.543,75 €
- 5,5 Soli for Abgeltungssteuer		- 964,91 €
Total payment	100.000,00 €	51.666,34 €
1 Allowance for LuF	7.000,00 €	n.A.
2 Taxable income	93.000,00 €	n.A.
3 - Einkommensteuer (33,5%)	- 31.146,00 €	n.A.
4 -5,5% Soli	- 1.713,03 €	n.A.
B Total private tax burden per partner:	-32.859,03 €	-18.508,66 €
Combined tax for whole profit (A+2xB)		
Total tax burden:	- 65.718,06 €	- 96.667,31 €
In % of total profit:	33%	48%

6.2.3 Insurance, Backup

As no conventional employment is foreseen in the GbR insurance needs to be addressed accordingly. There are different possibilities to have retirement insurance when someone is self-employed. The idea is to pay a monthly contribution until the retirement age which is paid through the company you own and not personally by the insured person, in return the retirement pension pays back to the (for example; 1000 Euro/Month till the end of the insured person's life) company which forward this money to the insured employee.

One system of the German pension systems which is made up of the private pension sector, which incorporate a varying range of individual pension investment plans. These can be set up through banks and insurance providers to increase your total German pension entitlement when you reach pension age.

The main private German pension plans include, but aren't limited to, the Riester and Rürup plans.

Rürup Pension Plan is a more flexible life annuity plan better suited to self-employed and freelance workers. It comes with three investing varieties and during the contribution period the contributions are tax deductible. A certain percentage of pension benefits are taxable, however, at around 74 percent (2016) which will rise 2 percentage points annually until 2040.

A risk insurance, especially weather-related risks which covers also flooding and drought are a common tool in Germany and should be considered and can be payed from the contingencies. The contingencies are stated in Table 15.

6.3 Business location & access to land

Currently the business location is not indefinitely determined. Accordingly, certain assumptions are made for markets and regional circumstances. The assumptions are taken for a German business location in North Rhine Westphalia. Ideally, the business is in the Cologne-Bonn area, close to major consumptive hubs. Chapter 6.3.1 describes features of the ideal property, while Chapter 6.4 elaborates on potential project partners, based on business location in the Cologne-Bonn area.

Initial property purchase prices are not included in this business plan calculation as the land will be provided within the framework of the FFA Project and compensation will take place on annual basis, as indicated in Chapter 8.1.6.

6.3.1 Property description

The business idea is based on small-scale enterprises which are highly scalable and partly based on mobile low-cost infrastructure. This bears the benefit that all enterprises can be run on rented land.

The introduced business concept considers annual rental fees for the land managed, nevertheless the land will be in private possession of an engaged stakeholder (FFA Project Holding), who supports the long-term development of the property and allows for further integration of perennial cropping systems and long term eco-system improvement.

With this intention to purchase a property separately through the FFA Project holding, renting out the production area to the business entity (GbR), the enterprise investment costs are reduced significantly.

For this, it is intended that approximately 10 ha of land with existing infrastructure on site is purchased by a small group of investors, allowing the enterprise-team to stay on the farm and conduct business under profit-sharing principles. The introduced enterprises can run on smaller area (5ha under enterprise production), but the access to land allows for future development and inclusion of other project components.

Currently the property assessment phase is ongoing. Table 6 presents site specifics which can be considered ideal for the envisaged enterprise set-up.

Table 6 - Ideal property description

Category	Ideal property configuration
Climate & Landform	<ul style="list-style-type: none"> • Temperate to moderate climate zone in Germany • High percentage of south facing land • Majority of sight with slight to moderate slopes (<10%)
Water	<ul style="list-style-type: none"> • Even distribution of precipitation throughout the year • Min. 600 mm of annual precipitation • Well present or possibility to establish off-grit water source with public drinking water quality supply • Ideally stream or catchment for ponds present • Piped water supply to barns • Existing & approved sewage
Access	<ul style="list-style-type: none"> • Public road within 100m of house • Public transport within 5km • Train station within 10km
Infrastructure	<ul style="list-style-type: none"> • Family home not requiring major work before moving in • Sensible size of home • Barns for animal, storage and workshop establishment • Out-houses for accommodation and seminar space • Ideally root cellar or basement for cool storage • Option for 25/32 ampere power supply
Trees & Forestry	<ul style="list-style-type: none"> • Minimum of 2ha designated forestry • Endogenous timber and firewood supplies
Soils	<ul style="list-style-type: none"> • Agricultural designated land (“Ackerstatus”) for vegetable production • Well drained • Preferably loamy soils (>30 “Bodenpunkte”) • No major contamination of soils (e.g. “Altlasten”)
Markets	<ul style="list-style-type: none"> • Urban center within 50km (>50.000 population) • Must be within 2hrs train/bus ride from international airports
Socio-Economic	<ul style="list-style-type: none"> • Based in open-minded municipality/ local governance or close to a transition town • Access to a variety of local businesses to enhance interrelation (e.g. saw-mill, cheese-maker, bakery, ecological staple food production)

6.4 Partners & cooperation

Cooperation with various partners is important for the initial set-up of the business and contributes to the aim of enhancing social profitability. Many planning works can be done, utilizing the site establishment phase for teaching regenerative land use methods. With workshops on holistic grazing management, market garden establishment and low-cost infrastructure construction it is envisaged to cover major work requirements during initial set-up, while potentially generating small revenues (from workshop fees). Detailed partners within the establishment phase will be the educational permaculture associations, like the German Permaculture Academy, Permaculture Campus Hamburg and the Down-to-Earth Academy in Switzerland. By providing workshops and trainings during the establishment phase the farm can act as a multiplier for regenerative land use practitioners. Further public attention generated by group events and workshops can serve in promoting the farm's produce and increasing attention for the envisaged production methods.

Further the cooperation with universities, technical institutes and other educational facilities could be foreseen: This could lead to scientific cooperation for measuring impacts of the business on various levels. This includes carbon sequestration through soil building, biodiversity assessments to measure beneficial impacts on site as well as social & economic impact assessments for the region.

Details on cooperation & partners must be formulated in separate agreements after a specific business site is determined.

7 Prerequisites for business plan calculations – Enterprise description

After a first introduction to the enterprises the following describes each venture in more detail with regards to the **production method** and **time & labour input** (Tables for labour input estimates are marked yellow).

Marketing and distribution strategy will be done in line with the whole-farm marketing plan (see Chapter 4). Selling includes the handling orders, delivery & final hand-over to the customer.

An assessment of **expected cost**, **cost classification** and **expected revenue**, is presented in Chapter 8. The combined findings and a detailed profit and loss account is presented in the overall business assessment Chapter 8.4

A major cost factor for each agriculture venture is the land purchase or lease of arable land. As the FFA Farming GbR will operate within the wider context of the FFA Project, land will be rented from the FFA project holding and annual compensation will ensure land access (compare Chapter 8.1.6.).

7.1 Pastured Broilers

Pastured broilers, following a rotational grazing scheme are a highly profitable element to the business plan, while providing immense nutritional input to the pasture. This is especially interesting, when starting up on degraded green lands, which has not been under the impact of animals for a long time. The following elaborates on the production method & estimated time inputs.

7.1.1 E1 - Production method

The broilers are raised on farm from purchased 1-day-old chicks and are kept in a heated, well controlled indoor environment on a deep-litter system for the first 18-24 days (depending on weight gain & weather conditions). During this time close temperature control (including preheating bedding before chicks arrive), observation of chick's behaviour and daily provision of fresh water are vital (minimum 4,5l per 100 chicks/day), as the chicks are highly vulnerable during their first days. Starting from the first day on the farm, a closely monitored feeding schedule is applied during the full 70-75 days on the farm. Feeding will start of with locally purchased grains and pellets and will follow feed ratios as successfully applied by other

practitioners according to the breed of bird. After three weeks in the indoor brooder, the chicks are moved out on the pasture lines, being kept in low-weight bolted brooder pens (pens are ideally constructed from scrap wood & low-cost input materials). 14 pens shall be in operation (though cost provision was made for construction of 20 mobiles to allow for an up-scaling or replacement of broken pens), each pen taking 50-75 birds. The pens provide a floor space of 12m² (Measuring 4m x 3m x 0,75m), which allows for higher stocking densities, as the maximum stocking density for broilers in Germany & the European Union (EU) is set at 36 kg/m² or 25 fully grown birds/m². With 75 birds (assuming a homogenous peak weight of 3,3 kg, 10% higher than expected average) the envisaged production model will peak with 20,6 kg/m² which is way below industrial maximum stocking density, but proves to be more beneficial for the bird's movement, scavenging behaviour and fertilisation dispersed to the ground per day.

The use of broiler pens presents some major advantages within the SSDRF context:

- ✓ Good areal control over the bird's movements, enabling controlled grazing approach for Greenland regeneration.
- ✓ Protection from areal and ground predators
- ✓ Additional protection against wind and heavy precipitation
- ✓ Easy daily moves of field pens as no fencing needs moving
- ✓ Easy access for feed and water supply

As soon as the birds are out on the pasture the forage decreases feed ratios, though close observation of the birds scavenging behaviour and frequent weight-controls, might require adjusting of feed input. The cost calculations are done for a full feeding-schedule and it is likely to use less grain within the rotational grazing scheme. Ideally the birds are moved once a day, following a small herd of cows and sheep.^e After 70-75 days the birds should have reached an average dressing weight of 2,5 kg (for calculation this a rather conservative low-weight figure is used), which allows processing on farm.

^e Cows and sheep are kept only on homestead scale and for endogenous production. They will not be major economic drivers, as small quantity livestock-handling of cows and sheep does not prove profitable or competitive in the German market with large scale producers covering nearly the entire market.

For the on-farm processing it is envisaged to build a small on-farm slaughter facility, registered and approved for fowl only. The costs for the slaughter facility have been factored in the business calculations, though additional consulting fees will be required to ensure full and comprehensive coverage of all legal obligations involved. Processing the birds on-farm allows to gain full value along the production chain and further grafting businesses could be foreseen to add value in the future. However, the initial calculations are done on selling whole birds, as further processing (e.g. cutting chicken fillets) does imply additional legislative requirements. The tasks, which are estimated in time-inputs below, vary within the life cycle of the broilers. They include...

- a) ... for the indoor-brooder: Pen preparation, preheating, chick inspection on arrival, daily freshwater provision, feeding 3x a day, close observation of chicks & acting upon first signs of danger or discomfort.
- b) ... for the time in the field: Daily moves of field pens, feeding 3x a day, full water provision every morning.
- c) ... for the processing of birds: Herding of birds, slaughter process, evisceration, weighing, chilling, monitoring & record keeping, packaging,
- d) ... for the sales process: Managing orders & pre-sales, delivery, customer care & product handover

The slaughter [c)] for one batch will be done over 3 weeks, allowing for detailed selection of birds according to required slaughter weight. Leading to processing of 240 birds per slaughter (720 birds/batch over 3 weekly slaughters). During this process, the full team will be required in the slaughter facility, once a week. According planning needs to be arranged to facilitate required man-power: 1 person hauling the chicken moving to weighing and chilling after hauling is complete, 1 person stunning & bleeding, 1 person on the scolder & plucker, 1 person for evisceration. A full slaughter session for an average of 240 birds is estimated to take 3-4 hours depending on the level of training and experience.

7.1.2 E1 - Time & labour input

The human hours involved are highly depended on the farm layout, feed and water locations, as well as training of personnel (both in daily maintenance and processing the birds). The figures presented in Table 7 are mostly deriving from experience based figures (as communicated by R. Perkins) and are partly based on educated guess.

Table 7 - E1 – Labour input estimate pastured broilers

No. of birds purchased	No. of birds processed		No. of batches	Birds per batch
4800	4320		6	≈720
Activity	hrs/process	No of processes	Hrs spent on activity	
Initial care in brooder	50	6	300	
Daily moves of pens	1,5	160	240	
Time provision for feeding	0,5	160	80	
Monitoring & control	15	6	90	
Slaughter	4	18	72	
Chilling & packing of chicken	2	18	36	
Marketing, & selling*	4	18	72	
			Total	890 hrs

*It must be emphasised, that time estimates are estimated in conservative manner & that detailed time and motion studies during the first operational years are critical for more precise time input figures. It is also important to underline that part of the work load will be distributed to all partners, as harvesting and planting workloads are occurring in bulk. Further marketing & selling hours can be shared between all produce lines.

The estimated total labour input for E1 – Pastured Broiler compiles to 890 hrs per season, which would represent 2,5 hrs work per day for 7 days a week over 52 weeks a year for one of the partners. But as the work is not equally distributed over the year detailed seasonal planning needs to be ensured.

To visualise the timely distribution of batches and the associated work, a first planning on the timing of batches is presented in Table 8. Hereby it is emphasised that orders for chicks should be placed at least 10 days ahead. According to the seasonal circumstances in the business area, it is assumed that climatic conditions for the chicks are suitable for outdoors from the third week of April until the second week of December.

Table 8 - E1 – Time schedule for pastured broilers (assessed for 2019)

Start of outside broilers: 20. Apr		Last day in the field: 14. Sep									
				<table border="1"> <tr><td style="background-color: #f4a460;">Brooder</td></tr> <tr><td style="background-color: #c8e6c9;">Field</td></tr> <tr><td style="background-color: #bbdefb;"># of birds</td></tr> <tr><td style="background-color: #bbdefb;">Slaughter</td></tr> </table>				Brooder	Field	# of birds	Slaughter
Brooder											
Field											
# of birds											
Slaughter											
Month	Calendar week	Batch No.									
		1	2	3	4	5	6				
April	14										
	15										
	16										
	17										
May	18										
	19										
	20										
	21	≈240									
June	22	≈240									
	23	≈240									
	24		≈240								
	25		≈240								
July	26		≈240								
	27			≈240							
	28			≈240							
	29			≈240							
August	30				≈240						
	31				≈240						
	32				≈240						
	33					≈240					
September	34					≈240					
	35					≈240					
	36						≈240				
	37						≈240				
October	38						≈240				

Details of time planning could change with weather conditions, but in general E1 is envisaged to run for 28 weeks (7 months) a year only.

Distributing the above labour input over the weekly seasonal work plan, a weekly input of 37 hrs is required per week.

7.2 Free range pastured eggs

Laying hens are kept for daily egg supply and ensuring a small, constant cash-flow. Additionally, the same beneficial ecosystem services can to grassland can be provided by broilers and layers (compare positive Broiler impacts on pasture – Chapter 7.1). Keeping laying hens in moveable stables provides the major advantage of moving the birds on regular basis to new pasture, making new forage available and allowing for healthy movement.

7.2.1 E2 - Production method

Within the FFA Farming business the construction of four egg mobiles, is foreseen; each housing approx. 250 birds. The egg mobiles can be purchased by an innovative Australian company at high cost, but following the business principles, it is foreseen to construct them locally at low-cost on-farm. Detailed building plans are available, and an according cost calculation has been done (though cost will decrease, if local waste-streams can be successfully utilised).

In peak-season a total of 1,000 birds will be on the farm. With an expected laying capacity of 315 egg/hen per year, a loss rate of 10% and only 80% suitable for class A selling, this leads to an expected egg production of 226,000 eggs within one season. During off season, hens could either be kept within one of the green houses, or the birds could be sold as spent-layer hens (soup chicken) at a lower price than the broilers. It is notable that the laying capacity decreases with advancing age of the birds, but keeping layers over winter provides some advantages & should be considered, depending on the market situation. Some of the major advantages for keeping the birds over winter include the provision of mulching material (from the deep litter bedding applied during winter), constant egg production and utilising experienced birds for training of new batches of broilers or young layers (this includes for example their scavenging behaviour and hiding behaviour against areal predators)

Eggs are collected daily and are being packed and labelled within the on-farm egg-packing facility (according to EU standards & German law).

7.2.2 E2 - Time & labour input

As in E1, the human hours involved are highly depended on the farm layout, feed and water locations, as well as training of personnel (both in daily maintenance and collection & packing

speed of eggs). The figures presented in Table 9 are mostly deriving from experience based figures (as communicated by R. Perkins) and are partly based on educated guess.

Table 9 - E2 – Labour input estimate pastured laying hens

No. of layers	No. of eggs expected per year		No. eggs/day	Packs/day
1000	≈226,800		≈620	≈52
Activity	hrs/process	No of processes	Hrs spent on activity	
Regular moves of mobiles	2	160	320	
Time provision for feeding	0,5	360	180	
Monitoring & control	0,5	130	65	
Daily egg collection	1	360	360	
Daily egg packing	1	360	360	
Marketing, & selling*	2,5	18	45	
Provision for inspection	2	1	2	
			Total	1332 hrs

*It must be emphasised, that time estimates are estimated in conservative manner & that detailed time and motion studies during the first operational years are critical for more precise time input figures. It is also important to underline that part of the work load will be distributed to all partners, as harvesting and planting workloads are occurring in bulk. Further marketing & selling hours can be shared between all produce lines.

The estimated total labour input for E2 – Pastured Layers compiles to 1332 hrs per year, which would represent roughly represent 4 hrs work per day for 7 days a week over 52 weeks a year for one of the partners. But as the work is not equally distributed over the year detailed seasonal planning needs to be ensured.

7.3 Bio-intensive no-dig Market Gardening

7.3.1 E3 - Production method:

Biointensive, no-dig market gardening is a horticulture approach with little to no earthworks involved after initial bed preparation. A diverse range of 28 different vegetable cultivars with further variations in the species range is envisaged. Seeds are initially purchased off-farm with the intention to build a endogenous seedbank over the first 10 years of production.

Production takes place on 10 plots (24m x 40m), each taking 16 beds (35m x 0,75m), assembling to a total growing area of 4200 m². Bed width and length are chosen in accordance to standard length of row-covers and insect netting, as well as standard tool size and consideration of operational working requirements (e.g. stepping over the bed should be feasible). Initial bed preparation will eventually require some groundwork (depending on site),

Careful planning (considering micro-climates, sun-angles throughout the year & water movements on site after heavy rain events) and addition of organic material (ideally waste products from the region; e.g. dung & rotten hay) and considerable amounts compost to start beds. It is advisable to start surface composting in autumn before the first growing season is envisaged. Initial bed preparation can be done within a workshop set on market gardening set-ups and while material costs are foreseen, labour costs for initial bed set-up are not factored in with this calculation (under the assumption that garden planning workshop will provide ample men power for bed establishment).

In addition to the outdoor gardening area, 1 greenhouse will provide space for seed preparation and 2 hoop houses will allow for season extension & early start of tomatoes. Pathways in between beds and garden infrastructure could be paved with wood shavings or woodchips if the resource can be sourced locally for small costs.

The daily tasks, which are estimated in time-inputs below, include:

Bed-maintenance (e.g. weeding), bed-preparation, crop inspection, record keeping, seed preparation and garden-schedule updates.

Additional time needs to be factored in during planting and harvest of crops. This includes processes from garden planning, seed orders, seed-tray preparation, planting & transplanting and regular watering to harvesting, washing and packing produce to delivery & distribution.

7.3.2 E3 - Time & labour input

Table 10 - E3 – Labour input estimate Market Garden

No of beds (35m x 0,75m)	Cycles per bed/season		Cycles per season	Harvest Cycles
160	3,5		560	17
Activity	hrs/bed/cycle	No of Beds	total d or cycles	input hrs
Bed-maintenance	0,08	-	260,00 d	21,67
Bed-preparation	1,00	160,00	560,00	560,00
Crop inspection	0,04	-	260,00 d	10,83
Record Keeping	0,08	-	260,00 d	21,67
Seed preparation	0,75	160,00	560,00	420,00
Planting of crops*	1,00	160,00	560,00	560,00
Watering of beds	0,08	-	260,00 d	21,67
Harvest of crops*	1,50	160,00	560,00	840,00
Washing & Packing of crops	3,50	-	17,00	59,50
Marketing, & selling*	3,00	-	17,00	51,00
			Total	2566,33 hrs

*It must be emphasised, that time estimates are estimated in conservative manner & that detailed time and motion studies during the first operational years are critical for more precise time input figures. It is also important to underline that part of the work load will be distributed to all partners, as harvesting and planting workloads are occurring in bulk. Further marketing & selling hours can be shared between all produce lines.

The estimated total labour input for E3 – Market garden compiles to 2566,33 hrs per season, which would represent a 7 hrs workday for 7 days a week over 52 weeks a year for one of the partners.

7.3.3 Bed plans, harvest estimate & share distribution

The produced vegetables are sold in shares, distributing the harvest in weekly deliveries. Shares are ideally pre-sold in advance to harvest and sales packaging (or best even before garden planning). However, as a customer base will need time for establishment, it must be considered that during first years of business shares might be sold in bunches via various marketing channels instead of presold shares. The overall revenue of bed harvest, as presented in the bed-plan (Table 11) does exceed the combined value of all boxes over the season (Table 12), slight variations are to be expected due to changes in harvest quantities.

A detailed seeding table is presented in [ANNEX IV](#).

Table 11 - E3 – Garden plan & expected revenue

Vegetables (1/2)	No. of beds	Garden space	days in garden	Expected production		German market price [€]		Expected Revenue
Greenhouse tomato	4	3%	180	6000	kg	4,99	€/kg	29.940,00 €
Mescaline mix	35	18%	45	1600	kg	5,99	€/kg	9.584,00 €
Lettuce	18	9%	50	2000	pcs	1,49	each	2.980,00 €
Greenhouse cucumber	6	2%	90	2000	pcs	1,19	each	2.380,00 €
Garlic	8	4%	90	3500	bunch	1,49	each	5.215,00 €
Carrots	14	7%	85	1400	bunch	1,99	each	2.786,00 €
Onion	9	4%	110	2000	kg	1,99	€/kg	3.980,00 €
Pepper	8	4%	120	600	kg	2,99	€/kg	1.794,00 €
Broccoli	13	7%	65	1300	pcs	1,99	each	2.587,00 €
Snow/snap peas	8	4%	85	330	kg	5,99	€/kg	1.976,70 €
Summer squash	6	3%	70	1500	kg	1,49	€/kg	2.235,00 €

Vegetables (2/2)	No. of beds	Garden space	days in garden	Expected production		German price [€]	market	Expected Revenue
Green onion	4	2%	50	1800	bunch	1,99	each	3.582,00 €
Beans	8	4%	70	800	kg	2,99	€/kg	2.392,00 €
Spinach	5	3%	50	500	kg	5,99	€/kg	2.995,00 €
Beets	7	4%	70	700	bunch	3,99	each	2.793,00 €
Turnip	4	2%	50	400	bunch	3,99	each	1.596,00 €
Radish	5	3%	45	800	bunch	1,79	each	1.432,00 €
Cherry tomato	2	1%	120	200	kg	5,99	€/kg	1.198,00 €
Ground cherry	2	1%	120	250	kg	5,99	€/kg	1.497,50 €
Swiss chard	2	1%	90	400	bunch	2,99	each	1.196,00 €
Kale	2	1%	90	400	bunch	2,99	each	1.196,00 €
Cauliflower	4	2%	80	300	pcs	2,99	each	897,00 €
Basil	2	1%	120	70	kg	9,99	€/kg	699,30 €
Eggplant	3	2%	120	330	kg	3,49	€/kg	1.151,70 €
Melon	5	3%	85	250	kg	3,99	€/kg	997,50 €
Leek	3	2%	150	450	bunch	2,99	each	1.345,50 €
Kohlrabi	2	1%	55	400	pcs	1,99	each	796,00 €
Wild leek	2	1%	135	500	bunch	1,49	each	745,00 €
Arugula (bunch)	2	1%	45	600	bunch	1,49	each	894,00 €
Total								92.861,20 €

These shares are defined by making a list of assorted vegetables along with their values. The weekly objective is to produce at least 220 units of shares, each priced at 19,99 € over 21 weeks within a full season. Share distribution could start in May with young season crops and greenhouse produce, but for conservative business calculations the distribution shall be calculated for main-season from June to November. The vegetables are chosen based on seasonal availability, and will be adjusted over time towards subjective preferences such as “customer-favourites”, requests from local restaurants or personal choice of crops depending on crop performance. In the process of share distribution, the exact contents for only the first three and last four shares of the season are pinned down. As those first and last shares are most critical given the limited availability of crops during season start and end. For shares 4 to

17, detailed contents will be determined two weeks before harvest, the presented share plan is a rough estimate based on all the vegetables that will be grown in succession. When the season is in full swing and many vegetables are ripening at once, shares are built with some vegetables that will store (either on the plant, in the ground, or in the cold room) and some that must be harvested and sold quickly (e.g., peas, beans, tomatoes). Needs are calculated differently according to the type of vegetable.

Table 12 - E3 – Market Garden shares & monthly distribution

Month	Share description	Expected revenue
June	SHARE 1 (June 13): spinach, radishes, cucumbers, summer squash, kohlrabi, garlic scapes, kale, arugula, cilantro. Total value: 23.22€ SHARE 2 (June 20): lettuce, turnips, beets, cucumbers, summer squash, green onions, broccoli, mustard, greens, pak choy, dill. Total value: 23.22€ SHARE 3 (June 27): lettuce, spinach, radishes, cucumbers, summer squash, kale, garlic scapes, kohlrabi, basil, snow/snap peas. Total value: 23.22€	13.193,40 €
July	SHARES 4 to 17 (July 4 to 3 October): lettuce and, subject to availability, carrots, turnips, beets, cucumbers, tomatoes, summer squash, snow/ snap peas, beans, broccoli, cauliflower, garlic, onions, Swiss chard, basil, eggplants, peppers, cherry tomatoes, leeks, melons, tomatillos, celery root, hot peppers and herbs.	21.989,00 €
August		17.591,20 €
September		17.591,20 €
October	SHARE 18 (October 10): lettuce, carrots, turnips, cucumbers, tomatoes, garlic, leeks, arugula, bell peppers, cilantro. SHARE 19 (October 17): spinach, beets, winter radishes, cucumbers, kale, cauliflower, celery root, onions, broccoli, parsley. SHARE 20 (October 24): spinach, carrots, turnips, garlic, Chinese cabbage, kohlrabi, leeks, arugula, potatoes, thyme.	17.591,20 €
November	SHARE 21 (November 1): spinach, carrots, kale, onions, winter radishes, celery root, winter squash, parsley, potatoes.	4.397,80 €
Grand total over season:		92.353,80 €

7.4 Mushrooms

Mushroom cultivation is a profitable horticulture approach with little land and labour use. There are all sorts of exotic mushrooms that can easily be grown and have a significant market demand in Germany. As one of the most profitable species, Oyster mushroom can grow in a short time, normally taking about 6 weeks to mature. Though initial purchase of spawning material (mycelia) is a considerable cost, profitability increases significantly once the mycelia can be reproduced on-farm. Therefore, the enterprise can offer stable income to the farm and provides vast quantities of mulching and compost material.

7.4.1 E4 - Production method

The first critical step is preparing substrate for mushrooms. Usually straw is used as a growing medium which is easily accessible and provides high economic viability. Though depending on local waste stream, other materials could be considered as well (e.g. saw dust). The straw is immersed in limewater for half an hour to sterilize and moisturizing straw. After that, the wet straw is fermented on cement or concrete flooring for a week to increase the accessibility of its organic components, providing a suitable growing environment for mushroom spawn.

After fermentation, a handful of straw is added inside a plastic bag and press tightly pressed down. The mushroom spawn is spread around the edges of straw layer. This process is repeated 3 to 4 times until the bag is nearly full. The bags are stored on shelves. Within the business assessment 2 greenhouses are dedicated for mushroom cultivation, comprising a with total floor area of 600 m² (300 m² for each). This provides ample space for 82 shelves per greenhouse, with ever shelves storing 18 bags, a total of 1548 bags are stored per green house. The mushroom spreads within the plastic bag for about 3 weeks. Then 4-6 slits are cut at different sides of the bags so that the mycelium can grow through the openings. From now the mushrooms are watered 2 to 3 times a day (depending on temperature and humidity). After another 7-10 days, the Oyster mushrooms can be harvested for the first time. Subsequently, 3 to 4 more harvest cycles are possible, as long as air moisture and temperature are appropriate. Production figures from experienced mushroom breeder indicate that, 100kg straw can produce totally 50-80kg fresh oyster.

Accordingly, the expected harvest for 2 greenhouses will be approximately 2.240 kg oyster mushroom per year.

7.4.2 E4 - Time & labour input

The time and labour input for mushroom cultivation has seasonal fluctuation, because the work effort for each growing phase is different. Additionally, winter temperatures would require heating the greenhouses which is not deemed economical (due to little insulation). This leads to main operations from spring to autumn.

For phases, the work involves: Straw preparation, Ingredient filling bags, bag storage on shelves, watering mushrooms, monitoring & record keeping, cutting harvest slits in bags, harvesting and packaging.

Table 13 gives an overview of the expected overall time distribution and human hours required.

Table 13 - E4 – Labour input estimate Mushroom breeding

No of shelves (2 Greenhouses):	No. begs/shelf:		Total No. of bags:
164	18		2952
Activity	hrs/cycle	Cycles	total input
Straw preparation	2	3	6
Filling bags	70	3	210
Bags and shelves allocation	8	3	24
Cutting slits	45	3	135
first round Harvesting	67	3	201
second round Harvesting	67	3	201
third round Harvesting	67	3	201
Packaging & Selling	60	3	180
Record keeping & monitoring	24	3	72
		Total	1230 hrs

Table 14 presents a first seasonal plan for the mushroom cultivation with a preliminary distribution of expected revenues. Further details on cost, revenue and profit calculation are provided in Chapter 8.

Table 14 - Mushroom time schedule & expected revenue

Start of mushroom cultivation: 10 Mar
Last harvest: 28 Oct

Preparation (orange)
 Maturing (green)
 Harvest (blue with 'H')

Month	Calendar week	Batch No.			Expected Revenue	
		1	2	3	in kg	in €
March	10					
	11	Preparation				
	12	Preparation				
	13	Maturing				
	14	Maturing				
April	15	Maturing				
	16	Maturing				
	17	Maturing				
	18	Harvest			248,89 kg	4.977,78 €
May	19	Maturing				
	20	Harvest			248,89 kg	4.977,78 €
	21	Maturing				
	22	Maturing	Preparation			
June	23	Harvest	Preparation		248,89 kg	4.977,78 €
	24		Maturing			
	25		Maturing			
	26		Maturing			
July	27		Maturing			
	28		Maturing			
	29		Harvest		248,89 kg	4.977,78 €
	30		Maturing			
August	31		Harvest		248,89 kg	4.977,78 €
	32		Maturing			
	33		Maturing	Preparation		
	34		Harvest	Preparation	248,89 kg	4.977,78 €
September	35		Maturing			
	36		Maturing			
	37		Maturing			
	38		Maturing			
	39		Maturing			
October	40			Harvest	248,89 kg	4.977,78 €
	41			Maturing		
	42			Harvest	248,89 kg	4.977,78 €
	43			Maturing		
	44			Maturing		
	45			Harvest	248,89 kg	4.977,78 €
Total expected revenue:					2.240 kg	44.800 €

8 Detailed enterprise calculations

The following presents the detailed cost calculations (costs=orange; Chapter 8.1) and expected revenues (revenue=green; Chapter 8.2) for all enterprises.

A summary of costs & revenues, 10-year profit and loss account and the 1st year cashflow prediction follow in the subsequent chapters.

A combined Enterprise calculation sheet can also be found in the digital [ANNEX VI](#).

8.1 Cost calculations

Chapter 8.1.1 and 8.1.2 assess the *investment cost* for business establishment, whereby most of those investments are considered under *depreciation costs in Chapter 8.1.3*.

Chapter 8.1.5 provides details on the *operational enterprise costs*, occurring regularly on yearly basis, while **Chapter 8.1.6 elaborates on financing & investment costs**.

8.1.1 Total investment for business establishment

Table 15 - Overview of cost for business establishment

Description	Cost	Comment
Start-Up Cost (1st year)		
Administrative Costs		
	3.500 €	
Lawyer, Notary Cost & Consulting	2.500 €	
Administration for detailed market analysis	500 €	
Business registration	500 €	
Business planning		
	3.500 €	
Consulting Costs	3.000 €	
Various	500 €	
Start-Up Investments		
Production means		
	86.782 €	
Investment cost E1 (Broilers)	15.507 €	See Table 18
Investment cost E2 (Eggs)	6.045 €	See Table 19
Investment cost E3 (Gardens)	32.750 €	See Table 20
Investment cost E4 (Mushrooms)	7.480 €	See Table 21
Vehicle	15.000 €	
Contingencies	10.000 €	
Storage		
	2.000 €	
Storage establishment	500 €	
Storage rent down-payment	1.500 €	
Marketing		
	1.900 €	
Commercial material	500 €	
Homepage	400 €	
Various marketing cost	1.000 €	
General business equipment		
	6.600 €	
Furniture	2.000 €	
Telephone/Fax	100 €	
Computer/Digital Storage	2.000 €	
Printer	2.000 €	
Payment facilities	500 €	
Costs for business establishment	104.282 €	

8.1.2 Detailed costs for enterprise set-up

The total investment cost accumulates to 61,781.00 €. The summary and proportions of investment for each enterprise are given in Table 16.

Table 16 - Compiled investment cost E1 to E4

Compiled Investment Cost E1-E4								
E1 (see Table 18)		E2 (see Table 19)		E3 (see Table 20)		E4 (see Table 21)		Grand Total:
Indoor brooder establishment	1.550,00 €	Egg mobiles	3.644,80 €	Infrastructure investment	27.520,00 €	Greenhouse for mushrooms	4.200,00 €	
Outdoor broiler pens	3.255,00 €	Egg packing facility	1.290,00 €	Tool investment	4.730,00 €	Shelves for cultivation	3.280,00 €	
On-site slaughter facility	10.702,00 €	Various other enterprise cost	1.110,00 €	Rent for initial establishment	500,00 €			
Total	15.507,00 €		6.044,80 €		32.750,00 €		7.480,00 €	
% of total	25%		10%		53%		12%	100%

Production costs are elaborated in Chapter 8.1.5, though a summary is provided in Table 17, for a year under 100% production.

Table 17 - Compiled production cost E1 to E4

Compiled Production Cost E1-E4								
E1 (see Table 24)		E2 (see Table 25)		E3 (see Table 26)		E4 (see Table 27Table 21)		Grand Total:
Production means	41.360,00 €	Production means	19.415,50 €	Production means	3.749,90 €	Production means	8.630,00 €	
Labour	23.140,00 €	Labour	34.632,00 €	Labour cost	66.716,00 €	Labour cost	31.980,00 €	
Total	64.500,00 €		54.047,50 €		70.465,90 €		40.610,00 €	
	28%		24%		30%		18%	

Table 18 - E1 – Pastured Broilers: Detailed investment cost

1/2	Item	Qty.	Unit	Specification	Price/Unit	Total
Indoor brooder	Refurbishment of brooder (barn on rented site)	1	LS	Painting, cleaning, site clearance	600,00 €	600,00 €
	Heat lamps	20	pcs	4* 150-Watt Heat lamps per pen; on 5 pens	10,00 €	200,00 €
	Watering cans & feeding pen	25	pcs	food grade PVC feeding & water utilities (5 per pen)	10,00 €	250,00 €
	Wooden pan separation boards	5	LS	Price for one pan: 4mx4mx0,7m	100,00 €	500,00 €
	Indoor brooder establishment	TOT				1.550,00 €
Outdoor broiler pens	Broiler bolted pens wood construction	20	pcs	Light weight wood frame, utilizing scrap wood:	120,00 €	2.400,00 €
	Plastic sheeting for weather protection	300	m ²	Price per square meter	1,50 €	450,00 €
	Plastic side cover	270	m ²	Price per square meter	1,50 €	405,00 €
	Outdoor broiler pens	TOT				3.255,00 €
On-site slaughter facility	Knives	8	pcs	High quality industrial stainless-steel knives	40,00 €	320,00 €
	Protective clothing	6	set	Set of Gumboots, hygiene wear, gloves	15,00 €	90,00 €
	Cooling Unit	1	pcs		1.500,00 €	1.500,00 €
	Freezer	1	pcs		600,00 €	600,00 €
	UV Sanitizer	1	pcs		800,00 €	800,00 €
	Crates & Boxes	16	pcs		12,00 €	192,00 €
	Scolder & Plucker	1	pcs	For removing feathers (industrial range, stainless steel)	1.600,00 €	1.600,00 €
<i>Continues next page</i>						

2/2	Item	Qty.	Unit	Specification	Price/Unit	Total
	Container/Working Cabin	1	pcs		2.000,00 €	2.000,00 €
	Renovation	1	LS		800,00 €	800,00 €
	Painting	100	m ²	For area of: 8,7mx2,6mx2m: Floor & ceiling & walls	2,30 €	230,00 €
	Stainless steel working boards	4	pcs	Two eviscerating tables + weighing and sorting table	100,00 €	400,00 €
	Stunner	2	pcs		90,00 €	180,00 €
	Approval & Documentation	1	LS		400,00 €	400,00 €
	PVC Blends for red and white separation	1	set		60,00 €	60,00 €
	Power & Lighting	1	LS		300,00 €	300,00 €
	Stainless steel hooks & racks	1	LS		280,00 €	280,00 €
	Water & Plumbing	1	LS		200,00 €	200,00 €
	Washing hoses	6	pcs		15,00 €	90,00 €
	Allowance for annual inspection	1	LS		500,00 €	500,00 €
	Kill troughs	2	pcs	Each kill trough with 16 slots	80,00 €	160,00 €
	On-site slaughter facility	TOT				10.702,00 €
					Total	15.507,00 €

Table 19 - E2 – Free range pastured eggs: Detailed investment cost

1/2	Item	Qty.	Unit	Specification	Price/Unit	Total
4 x egg mobile	Caravan chassis	4	pcs	8 feet by 10 feet, with provision for extension at the length	280,00 €	1.120,00 €
	Nest Boxes	36	pcs	0.010 m ² for each bird for 500 birds (5m ² /box)	17,00 €	612,00 €
	Wood rafters	152	pcs	Various sizes; From 5cmx4cm -2,5m to 5cmx15cm -3,6m	5,00 €	760,00 €
	Staple gun	1	pcs	For construction work of egg mobiles	40,00 €	40,00 €
	Screw Nails	2	kg	7,6cm; Price per kg	78,00 €	156,00 €
	Nails	2	kg	3cm; Price per kg	38,00 €	76,00 €
	Mash floor	4	pcs	Mash:40mmx45mm; Area 3mx9m	200,00 €	800,00 €
	Plastic grass mat	4	pcs	2mx1m; food grade PVC	10,00 €	40,00 €
	Bitumen	8	l	for corrosion protection of chassis & mesh wire	5,10 €	40,80 €
	Egg Mobiles		TOT	4 Egg mobiles, housing 1000-layer hens		
1 x egg packing	Workers caravan/cabin	1	pcs		900,00 €	900,00 €
	Paint for refurbishment	1	LS		80,00 €	80,00 €
	Stamps & administration	1	LS		50,00 €	50,00 €
	Water heater	1	pcs		90,00 €	90,00 €
	Furniture	1	LS		170,00 €	170,00 €
	Egg packing facility		TOT	1.290,00 €		
<i>Continues next page</i>						

2/2	Item	Qty.	Unit	Specification	Price/Unit	Total
	Fencing	480	m	Fencing type to be determined in consideration of predator pressure	1,86 €	892,80 €
	Watering devices	4	pcs	15 l containers, to be refilled daily	19,90 €	79,60 €
	Feeders	4	pcs	27 l / 18 kg container, to be refilled daily	22,40 €	89,60 €
	Egg collection baskets	3	pcs	Easy strap-on baskets	16,00 €	48,00 €
	Various other enterprise cost	TOT				1.110,00 €
					Total	6.044,80 €

Table 20 - E3 – Market Garden: Detailed investment cost

1/2	Item	Qty.	Unit	Specification	Price/Unit	Total
	Greenhouse	1	Nos	7,5*30m (225m ²)	9.460,00 €	9.460,00 €
	Hoop house	2	Nos	3,5*30m (105m ²)	6.020,00 €	12.040,00 €
	Cold room	1	Nos		3.440,00 €	3.440,00 €
	Irrigation System	1	Nos		2.580,00 €	2.580,00 €
	Infrastructure Investment	TOT				27.520,00 €
	Furnace	1	Nos		989,00 €	989,00 €
	Flame Weeder	1	Nos		516,00 €	516,00 €
	Indoor Seeding Equipment	1	Nos		516,00 €	516,00 €
	Hoses and Wheel hoe	1	Nos		516,00 €	516,00 €
<i>Continues next page</i>						

2/2	Item	Qty.	Unit	Specification	Price/Unit	Total
	Broadfork	2	Nos		86,00 €	172,00 €
	Seeders	1	Nos		258,00 €	258,00 €
	Misc. Tools	1	Nos	Rakes, Shovels, Spade, Wheelbarrow	172,00 €	172,00 €
	Harvest Cart	1	Nos		301,00 €	301,00 €
	Floating Row cover, insect-netting, hoops	1	Nos		516,00 €	516,00 €
	Sprayer	1	Nos		86,00 €	86,00 €
	Harvest baskets, scales and other equipment	1	Nos		258,00 €	258,00 €
	Electric fencing	1	Nos		430,00 €	430,00 €
	Tool Investment	TOT				4.730,00 €
	Rent of two-wheel tractor & accessories	1	Nos	Rent on daily basis for bed establishment	500,00 €	500,00 €
					Total	32.750,00 €

Table 21 - E4 – Mushroom breeding: Detailed investment cost

1/1	Item	Qty.	Unit	Specification	Price/Unit	Total
	Greenhouse for Mushrooms	2	pcs		2.100,00 €	4.200,00 €
	Shelves for cultivation	164	pcs		20,00 €	3.280,00 €
					Total	7.480,00 €

8.1.3 Depreciation cost

It is in the interest of the business holders to retrieve investment costs as soon as possible. Dedicating first year's profits to recovery of investment costs should be contractually agreed in a separate rental contract (see Chapter 8.1.6).

However, for this business calculation a depreciation of 10 years is considered for above elaborated investments. Depreciation is linear and detailed depreciation calculations are presented in Table 22.

Table 22 - Depreciation cost over 10 years

Start-Up Investments		Depreciation	Cost
Initial investment for production equipment			86.782 €
Investment cost E1 (Chicken)		10 yrs.	15.507 €
Investment cost E2 (Eggs)		10 yrs.	6.045 €
Investment cost E3 (Garden)		10 yrs.	32.750 €
Investment cost E4 (Mushrooms)		10 yrs.	7.480 €
Company vehicle		10 yrs.	15.000 €
Additional equipment		10 yrs.	10.000 €
Depreciation	Annual depreciation	Cumulated	Remaining
Depreciation 1 st year	8.678 €	8.678 €	78.104 €
Depreciation 2 nd year	8.678 €	17.356 €	69.426 €
Depreciation 3 rd year	8.678 €	26.035 €	60.747 €
Depreciation 4 th year	8.678 €	34.713 €	52.069 €
Depreciation 5 th year	8.678 €	43.391 €	43.391 €
Depreciation 6 th year	8.678 €	52.069 €	34.713 €
Depreciation 7 th year	8.678 €	60.747 €	26.035 €
Depreciation 8 th year	8.678 €	69.426 €	17.356 €
Depreciation 9 th year	8.678 €	78.104 €	8.678 €
Depreciation 10 th year	8.678 €	86.782 €	0 €

The depreciation costs are considered in the compiled 10-year business forecast and profit-loss account in Chapter 8.4. In agriculture the depreciation time depends highly on the sector of agriculture and for a diverse small farm more detailed depreciation calculation could be applied as to the requirements of the German Federal Ministry of Finance (“Bundesfinanzministerium”).⁶

⁶ More information available under:

http://www.bundesfinanzministerium.de/Content/DE/Standardartikel/Themen/Steuern/Weitere_Steuerthemen/Betriebspruefung/AfA-Tabellen/1996-11-19-afa-88.html

8.1.4 Land access & rental cost

As stated in Chapter 6.3 the operations are envisaged to commence on rented land of the FFA Project Holding. It is foreseen to compensate for land use on annual basis. This compensation is measured on comparative access fees for land (which vary between 175-350€/per ha for agricultural land (“Acker”) and 80-200€ per ha for pasture (“Grünland”). Accordingly, a combined rental rate is chosen, and annual land access and infrastructure costs are presented in Table 23.

Table 23 - Cost for land access and utilisation of farm buildings

Item	Cost
Office running & coordination	4.080 €
Land rent	3.000 €
Rent for farm buildings	7.000 €
TOTAL RENT:	14.080 €

The annual rental costs are considered within the whole-farm economy and are used in the annual cash flow-prediction as well as the 10-year profit loss account.

8.1.5 Production cost

In addition to the investment cost which are depreciated over time, regular operational costs occur during the season. These costs are based on purchasing cost for various operational production means and labour cost. Labour cost are factored in to provide a monetary assessment for human labour invested.

The following Tables (Table 24 to Table 27) provide a detailed assessment of production cost for each enterprise individually. A compiled overview of running costs is presented in Chapter 8.1.1 (Page 57) and complies to 228.342,25 €/per year, assuming 100% productivity.

Table 24 - E1 – Detailed production cost & labour

Item	Qty.	Unit	Specification	Price/Unit	Total
Chick purchase	4800	hens	Breeding mast chicks (10% mortality anticipated)	1,50 €	7.200,00 €
Feed	40	t	40 tons as to feeding schedule	800,00 €	32.000,00 €
Water	200	m ³	for field provision of hens 200ml per bird/day (=73m ³)	2,00 €	400,00 €
Electricity	3000	kWh	@ 26 cent/kWh	0,26 €	780,00 €
Fuel	200	l	for transportation & purchasing (1,4€/l fuel)	1,40 €	280,00 €
Wood shavings for bedding	25	m ³		10,00 €	250,00 €
Cleaning supplies for on-site processing facility	18	Nos.	18 Slaughters, clean-up costs 15€/slaughter	15,00 €	270,00 €
Waste Water for slaughter facility	18	Nos.		10,00 €	180,00 €
Production means				TOT	41.360,00 €
Labour	890	hrs	for brooding, mast and slaughter human hours @ 26€/hour	26,00 €	23.140,00 €
				Total	64.500,00 €

Table 25 - E2 – Detailed production cost & labour

Item	Qty.	Unit	Specification	Price/Unit	Total
Bird purchase	1000	hens	New Hampshire Laying hen chick	7,00 €	7.000,00 €
Feed	1	LS	Grain & pellets as to feeding schedule	17.100,00 €	17.100,00 €
Oyster shells	25	pcs	2,5kg @ 8€	8,00 €	200,00 €
Water	73	m ³	for field provision of hens 4,5l per 100 chicks; 200ml per bird/day (=73m ³)	2,00 €	146,00 €
Electricity	575	kWh	@ 26 cent/kWh	0,26 €	149,50 €
Fuel	535	l	for transportation & purchasing (1,4€/l fuel)	1,40 €	750,00 €
Winter bedding	1	LS	Straw purchased from neighbours	360,00 €	360,00 €
Egg packing	2500	pcs	12 eggs per carrying crate for approx. 30.000 eggs	0,20 €	500,00 €
Allowance for inspection	1	LS	Annual inspection for egg packery	210,00 €	210,00 €
Production means				TOT	19.415,50 €
Labour	1332	hrs	human hours @ 26€/hour	26,00 €	34.632,00 €
				Total	54.047,50 €

Table 26 - E3 – Detailed production cost & labour

Item	Qty.	Unit	Specification	Price/Unit	Total
Seedlings as to planting schedule	1	LS	as per detailed planting schedule***	3.384,90 €	3.384,90 €
Water	150	m ³	for additional irrigation provision	2,00 €	300,00 €
Electricity	250	kWh	@ 26 cent/kWh	0,26 €	65,00 €
Production means				TOT	3.749,90 €
Labour cost	2566	hrs	estimated hour input as to detailed calculation	26,00 €	66.716,00 €
				Total	70.465,90 €

*** the detailed seeding schedule is attached in [ANNEX IV](#)

Table 27 - E4 – Detailed production cost & labour

Item	Qty.	Unit	Specification	Price/Unit	Total
Oyster Spawn	28,0	kg		210,00 €	5.880,00 €
Growing substrate	2,8	t	Straw bales	100,00 €	280,00 €
Saked lime	1,4	t		150,00 €	210,00 €
Plastic bag	8.000,0	pcs		0,08 €	640,00 €
Water	810	m ³		2,00 €	1.620,00 €
Production means				TOT	8.630,00 €
Labour cost	1230	hrs		26,00 €	31.980,00 €
				Total	40.610,00 €

8.1.6 Financing & investment cost

Due to the relative low start-up investment costs for the enterprise set-up, it is envisaging to cover all initial investments and required funds for the first year with private capital.

The total business-establishment cost accumulates to 104.282,00 €(compare Chapter 8.1.1, Table 15). Further, the first business year requires additional funds for business operation (compare Chapter 8.1.1 ,Table 17). As some of these operational means are acquired at the beginning of the season, but revenues are generated later in the year, the company must allow for additional cash provisions. As indicated in the detailed 1st year cash flow assessment, profitability is only reached in the 29th week of business (compare Chapter 8.3). From the calculations and cashflow distribution the maximum deficit, assembles to 80.500€deficit in April (when all major seasonal investments have been made for layer purchase, bulk feed purchase for broilers, garden seeds and mushroom spawn), but no major income where generated, yet.

Table 28 summarizes the required funds, necessary for the first year of successful business operation.

Table 28 - Fund requirements for successful 1st year operation

Activity	Required funds
Initial business establishment (compare Table 16)	104.282,00 €
Accumulated expenses till seasonal profitability is reached (compare Table 31)	81.772 €
Required funds for 1 st successful business year:	Σ 186.054,22 €

Accordingly, fund requirements the first year accumulate to 186.054,22 €

To do so, each partner will be required to contribute funds in an amount of 47.000€for the business initiation. It is foreseen that these investment cost are quickly recovered from the annual profit. Financing costs on company level are not assessed within this business assessment due to the small investment volume. If funds are not privately available, partners can consider private loans. Expected return of investment can be foreseen after approx. 2 years: Refer to Chapter 8.4 for a detailed profit-loss account for the first years of business operation and further information on return of investment.

8.2 Revenue calculations

The revenue is calculated by assessing production quantity and multiplying those quantities with the chosen prices derived from a self-cost assessment and applied profit margins (see Chapter 5.4). Table 29 provides an overview of the expected revenue.

Table 29 - Revenue calculation: Overview E1 to E4

Item	Qty	Unit	Specification	Price/Unit	Total
Chicken (mortality/loss rate of 10%; average dressing weight 2,5 kg)	8640	kg	Private sales; approx. 80% of production	12,00 €/kg	103.680,00 €
4320 hens equal 10.800 kg of meat → 80% private sales; 20% wholesale	2160	kg	Whole Sale; approx. 20% of production	9,5 €/kg	20.520,00 €
			E1	Total	124.200,00 €
Calculate a mortality/loss rate of 10%; only 80% A class selling	226800	eggs	approx. 315 eggs/hen/a	0,3 €/egg	68.040,00 €
Selling of spent layer hens	900	hens	(not considered for unit costs of eggs)	8 €/hen	7.200,00 €
			E2	Total	75.240,00 €
Garden harvest as per Table 12	22	Shares	220 shares over 21 weeks; see Table 12	19,99 €/share	92.353,80 €
			E3	Total	92.353,80 €
Mushroom harvest as per Table 14	2240	kg	3 cycles in 2 green-houses; see Table 14	20,00 €/kg	44.800,00 €
			E4	Total	44.800,00 €
			Grand Total		337.101,20 €

While Table 30 provides an overview on harvest related revenues, further details can be obtained from the detailed enterprise descriptions in Chapter 7. It is important to emphasise that these figures will be constantly monitored and further data collection over the first seasons will ease business planning for following years.

Table 30 - E3 & E4 – Simplified overview of expected revenue for harvest enterprises

E3	Deliveries	Shares/Delivery	Total [shares]	Price [€/share]	Cumulated revenue
Revenue calculation:	21	220	4620	19,99 €	92.353,80 €
E4	Cycles	Harvest [kg] / Cycle	Total [kg]	Price [€/kg]	Cumulated revenue
Revenue calculation:	3	746,67	2240	20	44.800,00 €

8.3 Cashflow prediction 1st year (under 100% production)

Based on the elaborated production process, the cost structure and the predicted revenue, a cashflow prediction for the 1st year is presented in Table 31 (preliminary detailed calculations for the first year are attached in [ANNEX V](#)).

Based on the distribution of revenue streams Figure 9 presents a graphical overview of the weekly revenue for the FFA Farming GbR, while Figure 10 indicates the weekly cost structure for the first business year (over 52 weeks, assuming 100% production).

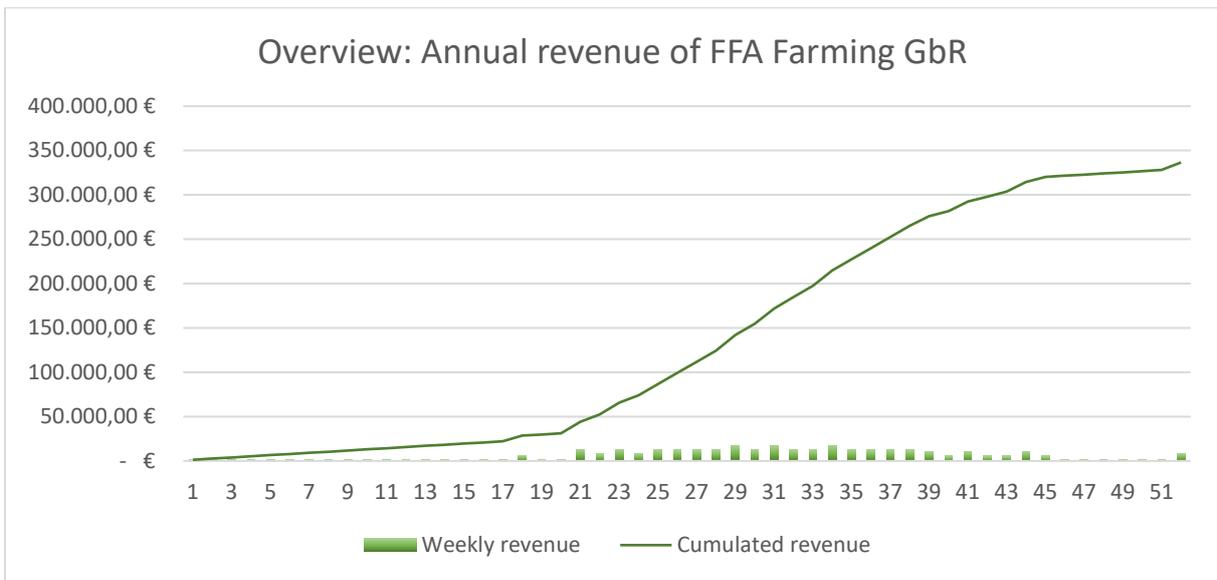


Figure 9 - Overview of weekly revenues during the 1st business year (100% production)

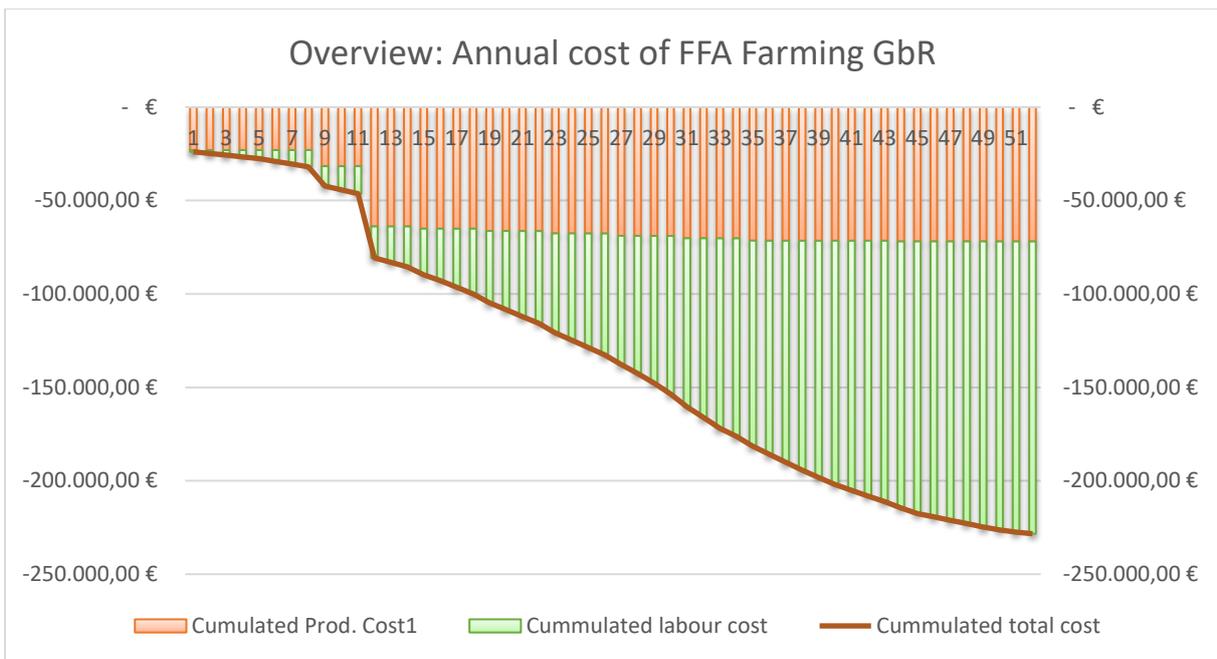


Figure 10 - Overview of weekly costs during the 1st business year (100% production)

Figure 11 combines cumulated revenue and cumulated costs presenting the overall profitability. Figure 12 show the profit curve within the first business year.

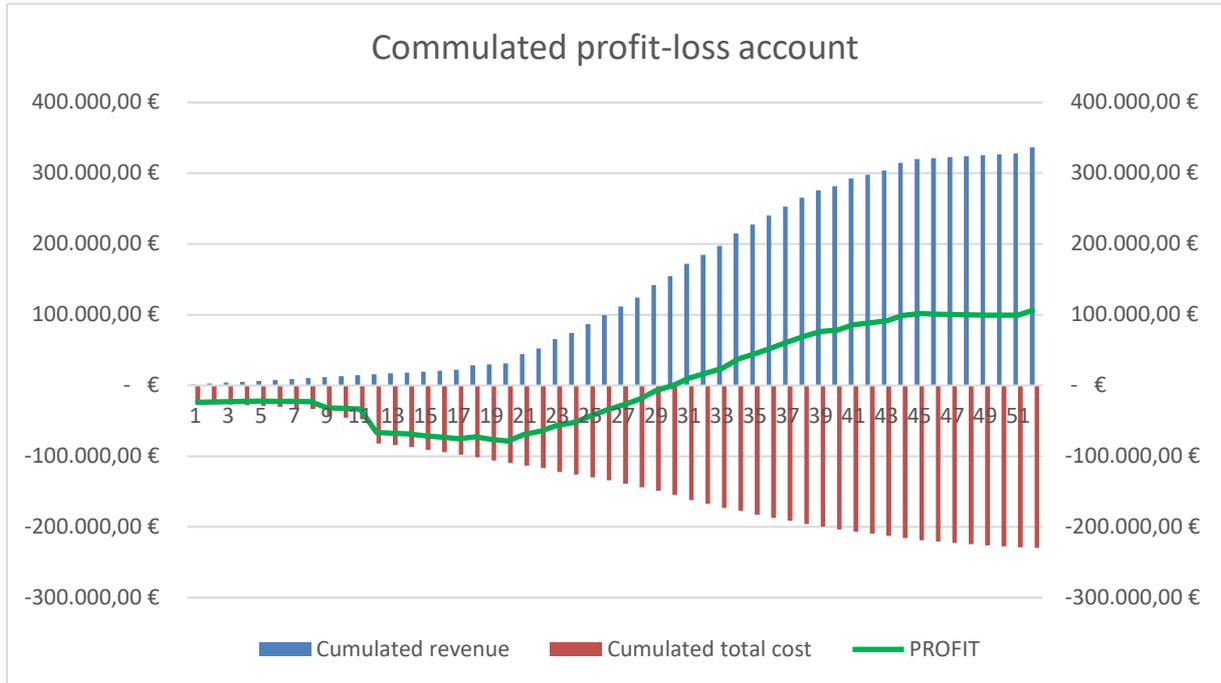


Figure 11 - Combined cost & revenue; indicating profitability

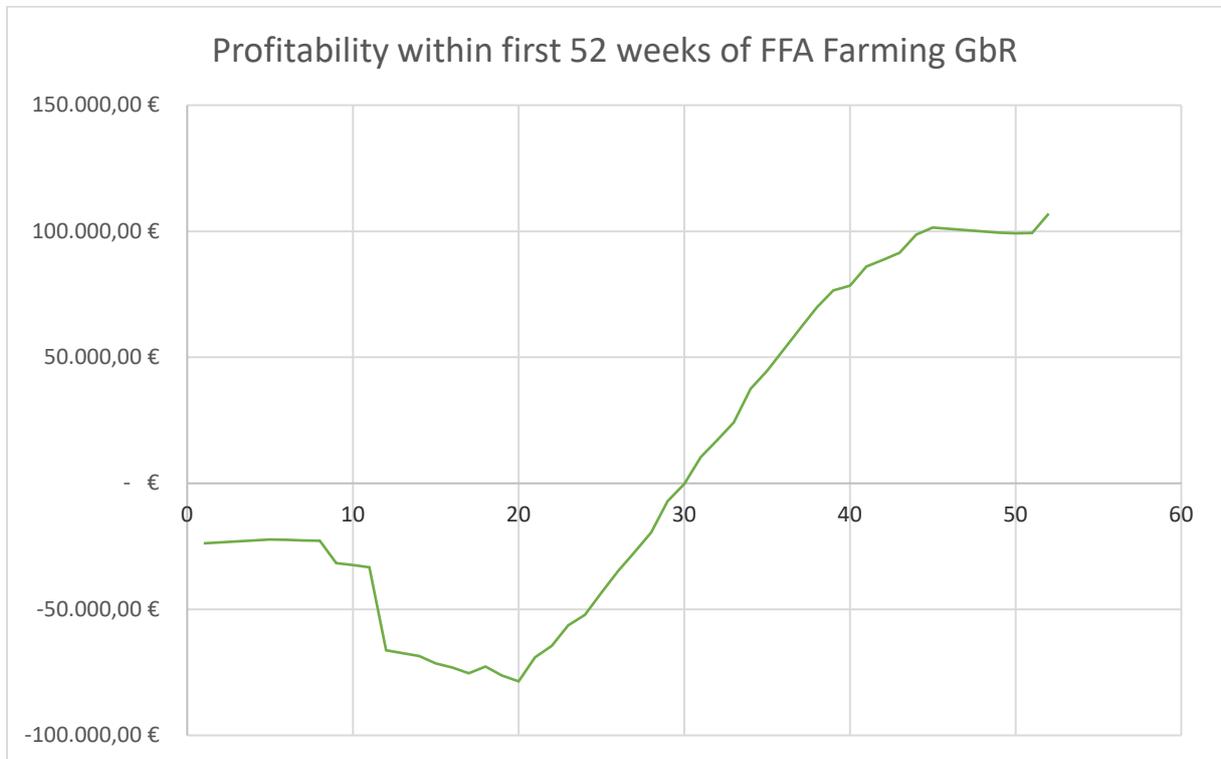


Figure 12 - Profitability within the first 52 weeks (100% production)

Table 31 - Overall Cashflow projection 1st year

Start Date	Jan. 2019	Feb. 2019	Mar. 2019	Apr. 2019	May. 2019	Jun. 2019	Jul. 2019	Aug. 2019	Sep. 2019	Oct. 2019	Nov. 2019	Dec. 2019
	1	2	3	4	5	6	7	8	9	10	11	12
Expected income												
S) Enterprise sales												
E1	- €	- €	- €	- €	13.800,00 €	27.600,00 €	34.500,00 €	27.600,00 €	20.700,00 €	- €	- €	- €
E2	6.540,00 €	5.232,00 €	5.232,00 €	6.540,00 €	5.232,00 €	5.232,00 €	6.540,00 €	5.232,00 €	5.232,00 €	6.540,00 €	5.232,00 €	12.466,00 €
E3	- €	- €	- €	- €	- €	8.795,60 €	21.989,00 €	17.591,20 €	17.591,20 €	21.989,00 €	4.397,80 €	- €
E4	- €	- €	- €	4.977,78 €	4.977,78 €	4.977,78 €	9.955,56 €	4.977,78 €	4.977,78 €	9.955,56 €	- €	- €
Revenue per month	6.540 €	5.232 €	5.232 €	11.518 €	24.010 €	46.605 €	72.985 €	55.401 €	48.501 €	38.485 €	9.630 €	12.466 €
Enterprise cost												
C-1) Operational cost *(excl. Labour)												
E1	-1.460,00 €	- €	-32.250,00 €	-1.200,00 €	-1.275,00 €	-1.300,00 €	-2.525,00 €	-1.300,00 €	-50,00 €	- €	- €	- €
E2	-19.055,50 €	- €	- €	- €	- €	- €	- €	- €	- €	-360,00 €	- €	- €
E3	-3.749,90 €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
E4	- €	-8.630,00 €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
	-24.265 €	-8.630 €	-32.250 €	-1.200 €	-1.275 €	-1.300 €	-2.525 €	-1.300 €	-50 €	-360 €	- €	- €
C-2) Required labour @ 26€/hr												
Combined labour, as required	-4.514 €	-6.018 €	-8.726 €	-15.647 €	-14.443 €	-15.647 €	-25.276 €	-19.859 €	-16.550 €	-15.948 €	-8.425 €	-5.416 €
Enterprise variable cost (C-1 + C-2)	-28.779 €	-14.648 €	-40.976 €	-16.847 €	-15.718 €	-16.947 €	-27.801 €	-21.159 €	-16.600 €	-16.308 €	-8.425 €	-5.416 €
C-3) Rent of land & Infrastructure												
Office running & coordination	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €	-340 €
Land rent	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €	-250 €
Rent for farm buildings	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €	-583 €
C-3) Sum fix costs	-1.173 €	-1.173 €	-1.173 €									
C-4) Depreciation cost (annual depreciation broken down to monthly)												
	-723 €	-723 €	-723 €									
C-5) Recovery of various start-up cost (cost recovery within 24 months)												
	-365 €	-365 €	-365 €									
Cost/Benefit per year [S-C]	-24.500 €	-11.677 €	-38.005 €	-7.590 €	6.030 €	27.397 €	42.923 €	31.980 €	29.640 €	19.916 €	-1.056 €	4.789 €
Cost/Benefit accumulated	-24.500 €	-36.177 €	-74.182 €	-81.772 €	-75.742 €	-48.344 €	-5.422 €	26.559 €	56.199 €	76.115 €	75.059 €	79.847 €

***As indicated in the figures above, profitability is only reached after 30 weeks of operations. The highest accumulated deficit is found in April with 81.772€ invested.

8.4 Profit-loss account over 10 years

This chapters assesses the profitability within a detailed profit-loss account over 10 years.

To provide an additional level security for the assessment, the productivity calculations are subject to a productivity factor for the variable production quantity. This includes variable production cost and enterprise revenues. The production factor is set to 70% for the first year, 80% for the second year, 90% for the third year and 100% for the remaining year.

It must be emphasised that profitability is likely to increase after the 5th year as perennial systems (e.g. berry bushes) will start contributing to the whole farm economy. Nevertheless, this business assessment is only taking the core enterprises E1 to E4 into account. Further variations in production might occur, as production figures will be adopted to meet regional market needs and optimization of enterprise set-ups is envisaged, based on detailed time and motion studies, through record keeping and adoptions within the holistic context.

Based the detailed calculation provided in Table 32, the return on investment can be calculated. Taking the initial investment for business start-up as sole expenditure during the first business year into account (therefore neglecting depreciation costs), return on investment is established after 2 years.

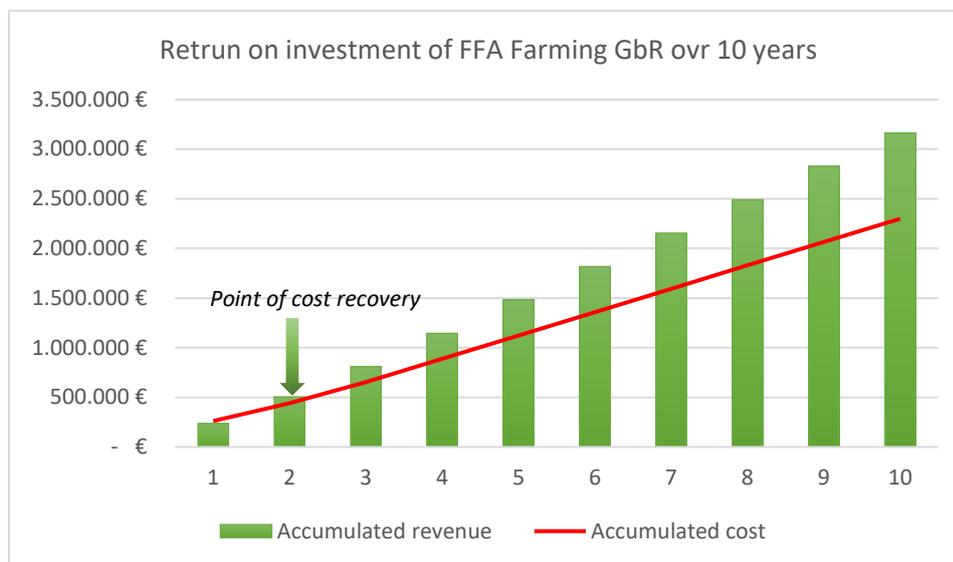


Figure 13 - Return on investment over 10 years

Table 32 - Cashflow projection; 10 years

Start Date	Jan. 2019										
Assumed productivity factor:	0,7	0,8	0,9	1	1	1	1	1	1	1	1
	2019	2020	2021	2022	2023	2024	2025	2026	2027	20278	
	1	2	3	4	5	6	7	8	9	10	
Expected income											
S) Enterprise sales											
E1	86.940,00 €	99.360,00 €	111.780,00 €	124.200,00 €	124.200,00 €	124.200,00 €	124.200,00 €	124.200,00 €	124.200,00 €	124.200,00 €	124.200,00 €
E2	52.668,00 €	60.192,00 €	67.716,00 €	75.240,00 €	75.240,00 €	75.240,00 €	75.240,00 €	75.240,00 €	75.240,00 €	75.240,00 €	75.240,00 €
E3	64.647,66 €	73.883,04 €	83.118,42 €	92.353,80 €	92.353,80 €	92.353,80 €	92.353,80 €	92.353,80 €	92.353,80 €	92.353,80 €	92.353,80 €
E4	31.360,00 €	35.840,00 €	40.320,00 €	44.800,00 €	44.800,00 €	44.800,00 €	44.800,00 €	44.800,00 €	44.800,00 €	44.800,00 €	44.800,00 €
Revenue per year	235.616 €	269.275 €	302.934 €	336.594 €							
Enterprise cost											
C-1) Operational cost (excl. Labour)											
E1	28.952 €	33.088 €	37.224 €	41.360 €	41.360 €	41.360 €	41.360 €	41.360 €	41.360 €	41.360 €	41.360 €
E2	13.591 €	15.532 €	17.474 €	19.416 €	19.416 €	19.416 €	19.416 €	19.416 €	19.416 €	19.416 €	19.416 €
E3	1.728 €	1.975 €	2.222 €	2.469 €	2.469 €	2.469 €	2.469 €	2.469 €	2.469 €	2.469 €	2.469 €
E4	6.041 €	6.904 €	7.767 €	8.630 €	8.630 €	8.630 €	8.630 €	8.630 €	8.630 €	8.630 €	8.630 €
	50.312 €	57.499 €	64.687 €	71.874 €							
C-2) Required labour @ 26€/hr											
E1	16.198 €	18.512 €	20.826 €	23.140 €	23.140 €	23.140 €	23.140 €	23.140 €	23.140 €	23.140 €	23.140 €
E2	24.242 €	27.706 €	31.169 €	34.632 €	34.632 €	34.632 €	34.632 €	34.632 €	34.632 €	34.632 €	34.632 €
E3	46.701 €	53.373 €	60.044 €	66.716 €	66.716 €	66.716 €	66.716 €	66.716 €	66.716 €	66.716 €	66.716 €
E4	22.386 €	25.584 €	28.782 €	31.980 €	31.980 €	31.980 €	31.980 €	31.980 €	31.980 €	31.980 €	31.980 €
	109.528 €	125.174 €	140.821 €	156.468 €							
C-3) Rent of land & Infrastructure											
Office running & coordination	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €	4.080 €
Land rent	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €	3.000 €
Rent for farm buildings	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €	7.000 €
	14.080 €										
Enterprise running cost (C-1 to C-3)	173.920 €	196.754 €	219.588 €	242.422 €							
Depreciation cost (Recovery of Investment cost)	8.678 €										
Recovery of various start up cost (2 years)	8.750 €	8.750 €									
Cost/Benefit per year	44.268 €	55.093 €	74.668 €	85.493 €							
Cost/Benefit accumulated	44.268 €	99.361 €	174.029 €	259.523 €	345.016 €	430.509 €	516.003 €	601.496 €	686.989 €	772.483 €	

9 Conclusion

This business assessment shows that SSDRF can be a profitable business, if the business follows the elaborated principles for small-scale profitability. Further, it is essential that enterprises are carefully planned, assessed for autonomous, economic viability and are thoroughly implemented.

As the business location is not yet exactly determined, this business plan required some assumptions with regards to the regional market situation & competition. Though these assumptions limit the assessment of market size and potential competition, it is assumed that marketing and selling of produce can be realised successfully. Nevertheless, detailed market assessment and competitor analysis are foreseen as soon as a detailed location is determined.

Given full distribution of various products, the FFA Farming GbR can provide a valuable contribution to local business development, while being profitable for the GbR partners.

Major challenges to the business can be summarized in the following points:

- a) High seasonal work efforts: Changing work-input requirements with peaks in main season and little work during start and end of the season.
- b) High dependency on manual labor: Partners are required to be physically fit and able to work long hours during peak season.
- c) Vulnerability of land-dependent production: Risks of natural hazards and changes in legislation can harm productivity (e.g. droughts, floods or large pests requiring the confinement of poultry).

These risk factors should be considered during the first years of business implementation and close monitoring of production and constant evaluation of the various production factors is essential for long term business success.

Overall, the presented SSDRF enterprises offer a valuable approach to profitable small-scale farming, while improving the overall health of the farm-scape. This small-scale profitability is essential, while building up top-soil, increasing ground fertility and moving towards high yielding perennial cropping systems. Further business planning for perennial cropping systems needs to be elaborated during the first years of operations.

Acknowledgement

I would like to express my sincere gratitude and appreciation for the pioneering works of Bill Mollison and David Holmgren, who stood up for whole system design and consideration of ecosystem processes in farming, while the agricultural world around them changed significantly since the 1960s. Their collection and recombination of knowledge on land-use practices from all over the globe, while embedding their findings within the deep study of ecology, as well as of patterns and relationships in the natural world, has been a constant stream of inspiration within the last years.

Further, the experience and knowledge of practicing regenerative agriculturist all around the world, silent or outspoken, is highly valued and cannot be understated:

Major gratitude goes out to Richard Perkins, for his book “Making Small Farms Work” and the constant effort of openly sharing his progress and experience up in Sweden: Truly living up to his motto: “Farming, Innovation and Education - for the benefit of all”!

In addition, Ben Falks’ work¹¹ and his findings from the Whole Systems Design Research Farm in Vermont have been enormously valuable for my understanding of ecosystem farming models.

For the market gardening section, the pioneering work of micro farming in Quebec based around Jean-Martin Fortier has provided valuable insights and very comprehensive datasets.

Further, the economic insights from well-established farms like Neversink, Rdigedale and Polyface Farm Inc., have been incredibly valuable for this project and are gladly recommended in the references.

It is to those scholars and practitioners of permaculture, micro and regenerative farming that there might be a viable model evolving from their pioneering work, while Eliot Coleman provided the insight, that remembering some of the old might go half the way in creating something new.

Finally, utmost respect goes out to all the small-farm holders all over the world, still feeding a majority of the world’s population and all family farms who stood up against harmful industrialisation, still working with high ecosystem awareness and supplying their communities with high quality produce.

H. Höhne, Cologne 2017

References

1. Holmgren D. *Permaculture: Principles and pathways beyond sustainability*. Hepburn, Victoria: Holmgren Design Services, 2002.
2. Mollison BC. *Permaculture: A designers' manual*. Repr. Tyalgum: Tagari Publ, 1992.
3. Perkins R. *Making Small Farms Work: A pragmatic whole systems approach to profitable regenerative agriculture*. An Experience-based Handbook for the holistic Design, Installation & Management of Farm Scale Permaculture, 2016.
4. Aranya. *Permaculture design: A step-by-step guide*. East Meon: Permanent Publications, 2012.
5. Salatin J. *You can farm: The entrepreneur's guide to start and succeed in a farm enterprise*. [1st ed.]. Swoope, Virginia: Polyface, 1998.
6. Barański M, Srednicka-Tober D, Volakakis N, et al. Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: A systematic literature review and meta-analyses, pp. 794–811.
7. Savory A and Butterfield J. *Holistic management: A new framework for decision making*. 2nd ed. Washington, D.C: Island Press, 2010.
8. Roland EC and Landua G. *Regenerative Enterprise: Optimizing for Multi-capital Abundance*, 2015.
9. Simon Jäckel DB. Steuern und Abgaben in der Landwirtschaft: Hofnachfolge und Existenzgründung,
https://www.google.de/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwiyiOKAsYzYAhWkbFAKHcwSAiYQFggoMAA&url=http%3A%2F%2Fwww.junglandwirte.de%2Fwerkzeuge%2Fmaterialkoffer%2Ffachinformationen%2Fdoc_download%2F18-steuervortragdbv2008&usg=AOvVaw2zIB12gwGUQQmM2RYCSRgi (2016, accessed 15 December 2017).
10. Bundesministerium für Ernährung und Landwirtschaft. Wichtige steuerliche Regelungen für die Land- und Forstwirtschaft: Ausgabe 2015; 2015,
<https://www.bmel.de/SharedDocs/Downloads/Broschueren/SteuerlicheRegelungen2015.html> (accessed 15 December 2017).
11. Falk B. *The resilient farm and homestead: An innovative permaculture and whole systems design approach*. 1. print. White River Junction Vt.: Chelsea Green Publ, 2013.

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ANNEX I Competition Assessment – Detailed, relative rating table.

1 = Best rating	Own Company	Industrial Farm	Regional Produ	Organic Farmer	Ø Competition
9 = Worst rating					
SSDRF Offer					
Produkt					
Quality	1	6	5	2	4,3
Price	5	2	4	6	4,0
Brand vlaue	7	7	4	2	4,3
Availability to cover large markets	8	3	8	7	6,0
Personal service	2	5	3	4	4,0
Productivity of mono-commodity	7	2	5	6	4,3
Diversity	1	9	4	3	5,3
Varieties produced	1	9	4	2	5,0
Contribution to local economy	2	8	5	2	5,0
Evironmental benefits	1	9	2	3	4,7
Competition Rating					
Market					
Market power	9	2	9	8	6,3
Market share	9	2	7	8	5,7
Company size	9	2	7	6	5,0
Strategy					
Clear strategy	2	6	3	3	4,0
Competitive advantage	3	7	5	4	5,3
Synergies within the enterprises	1	9	7	3	6,3
Marketing					
Image	2	7	5	3	5,0
Prominence	9	2	5	4	3,7
Marketing Channels	3	2	5	4	3,7
Client return rate	1	3	2	3	2,7
Client satisfaction	2	5	4	3	4,0
Marketing budget	9	1	7	7	5,0
Individual customer approach	1	9	3	5	5,7
Organisation					
Management Team	1	8	3	2	4,3
Co-workers	8	3	7	6	5,3
Flexibility	2	9	4	5	6,0
Organisation	2	5	4	3	4,0
Participation	1	8	6	4	6,0
Finance					
Revenue	7	1	4	4	3,0
Profitability	3	2	4	6	4,0
Financial power	8	1	4	8	4,3
Profitmarge	2	4	3	3	3,3
Dept requirement	1	9	8	6	7,7
Ethical investment	1	9	4	5	6,0

ANNEX II – GbR Contract

Articles of Association – FFA Farming G.b.R.

Between:

Person A

Person B

Person C

Person D

following articles of association are contracted:

§ 1 Name, Registered Office and Financial Year

The company's name is Fair For All Farming (FFA Farming) G.b.R.

The company is located in Eifelstr. 126, in 01234 Eifel.

The financial year shall be the calendar year.

§ 2 Object of Business

The object of the company's business is the management of a Small-scaled Diversified Regenerative Farm.

§ 3 Share Capital

The share capital is 200,000.00 Euro.

The associates Person A, Person B, Person C and Person D have a share of 25 %

The share shall be paid immediately on the bank account of FFA Farming G.b.R..

§ 4 Managing Directors and Representation

The managing director of FFA Farming G.b.R. is Person A.

The managing director can represent the whole association.

The managing director can be represented with a written consent by Person B, Person C and Person D.

§ 5 Announcements

Announcements of the company shall be published on the official FFA Farming G.b.R. homepage.

§ 6 Formation costs

All four associates shall bear the costs of incorporation.

§ 7 Final provisions

This contract can only be changed in a written form.

These articles of association shall be governed by the laws of the Federal Republic of Germany.

In case of any discrepancies between the German and the English version the German version of these articles of association shall prevail.

[Place, Date]

[Place, Date]

Signature [Associate A]

Signature [Associate B]

[Place, Date]

[Place, Date]

Signature [Associate C]

Signature [Associate D]

ANNEX III – Employee Contract

Employment Agreement

THIS AGREEMENT made as of the _____ day of _____, 2017, between

FFA Farming GbR

Address:

Contacts:

(named employer within the following)

a corporation incorporated under the civil of the State of Nordrhein-Westfalen, and

Address:

Contact:

(named employee within the following) of the City of Köln in the Nordrhein-Westfalen.

WHEREAS the Employer desires to obtain the benefit of the services of the Employee, and the Employee desires to render such services on the terms and conditions set forth.

IN CONSIDERATION of the promises and other good and valuable consideration (the sufficiency and receipt of which are hereby acknowledged) the parties agree as follows:

§ 1. Employment

The Employee agrees that he will at all times faithfully, industriously, and to the best of his skill, ability, experience and talents, perform all of the duties required of his position.

In carrying out these duties and responsibilities, the Employee shall comply with all Employer policies, procedures, rules and regulations, both written and oral, as they are announced by the Employer.

It is also understood and agreed to by the Employee that his assignment, duties and responsibilities and reporting arrangements may be changed by the Employer in its sole discretion without causing termination of this agreement.

§ 2. Position Title

As a _____ (Farm Manager/ Farm Assistant), the Employee is required to perform the following duties for in a professional manner.

(a) full duty on (Enterprise 1/ Enterprise 2/ Enterprise 3/ Enterprise 4) – Detailed work description as to attached work schedule.

(b) seasonal assistance in broiler processing and garden works (esp. harvesting & planting) – Detailed work description as to the attached seasonal schedule.

(c) Other duties as may arise from time to time and as may be assigned to the employee.

§ 3. Compensation

- (a) As full compensation for all services provided by the employee shall be paid at the rate of 13€ per labour-hour. The payments shall be subject to normal statutory deductions by the Employer.
- (b) The salary mentioned in paragraph §3 (a) shall be reviewed on a seasonal basis.
- (c) All reasonable expenses arising out of the employment shall be reimbursed assuming same have been authorized prior to being incurred and with the provision of appropriate receipts.

§ 4. Vacation

The Employee shall be entitled to vacations in the amount of 28 days per annum.

§ 5. Benefits

The Employer shall at its expense provide the Employee with the Health Plan that is currently in place or facilitate national insurance as to the legislation of the federal republic of Germany.

§ 6. Termination

- (a) The Employee may at any time terminate this agreement and his employment by giving not less than two weeks written notice to the Employer.
- (b) The Employer may terminate this Agreement and the Employee's employment at any time, without notice or payment in lieu of notice, for sufficient cause.
- (c) The Employer may terminate the employment of the Employee at any time without the requirement to show sufficient cause pursuant to (b) above, provided the Employer pays to the Employee an amount as required by the legislation as may be in effect at the time of termination. This payment shall constitute the employee's entire entitlement arising from said termination.

§ 7. Laws

This agreement shall be governed by the laws of the Nordrhein-Westfalen and the federal republic of Germany.

§ 8. Independent Legal Advice

The Employee acknowledges that the Employer has provided the Employee with a reasonable opportunity to obtain independent legal advice with respect to this agreement, and that either:

- (a) The Employee has had such independent legal advice prior to executing this agreement, or;
- (b) The Employee has willingly chosen not to obtain such advice and to execute this agreement without having obtained such advice.

§ 9. Entire Agreement

This agreement contains the entire agreement between the parties, superseding in all respects any and all prior oral or written agreements or understandings pertaining to the employment of the Employee by the Employer and shall be amended or modified only by written instrument signed by both of the parties hereto.

§ 10. Severability

The parties hereto agree that in the event any article or part thereof of this agreement is held to be unenforceable or invalid then said article or part shall be struck and all remaining provision shall remain in full force and effect.

IN WITNESS WHEREOF the Employer has caused this agreement to be executed by its duly authorized officers and the Employee has set his hand as of the date first above written.

SIGNED, SEALED AND DELIVERED in the presence of:

[Name of employee]

[Signature of Employee]

[Name of Employer Rep]

[Signature of Employer Rep]

[Title]

ANNEX IV – Detailed seeding table

Cells per flat	Variable Cost # of flats	Item	[1] Number of seeds per pack	[2] Price/Seed pack	[3]=[2]/[1] Cost per seed	[4]=[3]*#ofPlants purchase total	Comment
72	4	Asian greens	30	2,20 €	0,07 €	21,12 €	
128	3	Basil	10	0,05 €	0,01 €	1,92 €	
128	11	Beet	500	1,55 €	0,00 €	4,36 €	
72	3	Broccoli	50	2,35 €	0,05 €	10,15 €	
72	3	Brussels sprout	10	0,09 €	0,01 €	1,94 €	
72	3	Cauliflower	40	2,45 €	0,06 €	13,23 €	
72	10	Celery	100	0,19 €	0,00 €	1,37 €	
72	5	Celery root	100	0,18 €	0,00 €	0,65 €	
72	5	Chard and kale	50	2,76 €	0,06 €	19,87 €	
72	3	Chinese cabbage	40	2,45 €	0,06 €	13,23 €	
128	4	Corn	20	2,76 €	0,14 €	70,66 €	
72	1,5	Cucumber	5	3,69 €	0,74 €	79,70 €	
16	85	Eggplant	50	2,01 €	0,04 €	54,67 €	
72	7	Fennel	100	0,16 €	0,00 €	0,81 €	
500	13	Green onion	250	1,45 €	0,01 €	37,70 €	
72	1	Ground cherry	100	2,38 €	0,02 €	1,71 €	
72	9	Kohlrabi	100	2,94 €	0,03 €	19,05 €	
300	2	Leek	350	2,35 €	0,01 €	4,03 €	
128	3	Lettuce	200	1,95 €	0,01 €	3,74 €	
72	2	Melon	10	3,08 €	0,31 €	44,35 €	
500	3	Onion	300	1,35 €	0,00 €	6,75 €	
128	8	Parsley	10	0,02 €	0,00 €	2,05 €	
16	170	Pepper	8	2,45 €	0,31 €	833,00 €	
72	7	Rutabaga	100	1,83 €	0,02 €	9,22 €	
128	11	Spinach	300	1,75 €	0,01 €	8,21 €	
72	3	Summer cabbage	40	2,45 €	0,06 €	13,23 €	
72	1	Summer squash	40	2,45 €	0,06 €	4,41 €	
36	170	Tomato	8	2,75 €	0,34 €	2.103,75 €	
Total						3.384,90 €	

ANNEX V – Detailed calculation 1st year

DATE	REVENUE										COST										PROFIT	
	E1		E2		E3		E4		ENTERPRISE COST				PRODUCTION		LABOUR COST		Average € per week	Total hrs:	Cumulated total cost			
	Units	2,5 kg/bird	Units	@ 11,5€/kg	Units	@ 0,3€/egg	as to harvesting schedule	Value	Value	Costs E1	Costs E2	Costs E3	Costs E4	Combined costs	Cumulated Prod. Cos	Labour cost	Cummulated labour	Productivity		6018		
Date	Month	Week	Birds	kg	Value	Eggs/week	Value	Value	Weekly revenue	Cumulated revenue	Costs E1	Costs E2	Costs E3	Costs E4	Combined costs	Cumulated Prod. Cos	Labour cost	Cummulated labour	Productivity	6018	Cumulated total cost	PROFIT
01.01.2019	1	1				4360	1.308,00 €		1.308,00 €	1.308,00 €	- 1.460,00 €	- 19.055,50 €	- 3.749,90 €		- 24.265,40 €	- 24.265,40 €	- 902,70 €	- 902,70 €	0,3	-	25.168,10 €	- 23.860,10 €
08.01.2019	1	2				4360	1.308,00 €		1.308,00 €	2.616,00 €					- €	- 24.265,40 €	- 902,70 €	- 1.805,40 €	0,3	-	26.070,80 €	- 23.454,80 €
15.01.2019	1	3				4360	1.308,00 €		1.308,00 €	3.924,00 €					- €	- 24.265,40 €	- 902,70 €	- 2.708,10 €	0,3	-	26.973,50 €	- 23.049,50 €
22.01.2019	1	4				4360	1.308,00 €		1.308,00 €	5.232,00 €					- €	- 24.265,40 €	- 902,70 €	- 3.610,80 €	0,3	-	27.876,20 €	- 22.644,20 €
29.01.2019	1	5				4360	1.308,00 €		1.308,00 €	6.540,00 €					- €	- 24.265,40 €	- 902,70 €	- 4.513,50 €	0,3	-	28.778,90 €	- 22.238,90 €
05.02.2019	2	6				4360	1.308,00 €		1.308,00 €	7.848,00 €					- €	- 24.265,40 €	- 1.504,50 €	- 6.018,00 €	0,5	-	30.283,40 €	- 22.435,40 €
12.02.2019	2	7				4360	1.308,00 €		1.308,00 €	9.156,00 €					- €	- 24.265,40 €	- 1.504,50 €	- 7.522,50 €	0,5	-	31.787,90 €	- 22.631,90 €
19.02.2019	2	8				4360	1.308,00 €		1.308,00 €	10.464,00 €					- €	- 24.265,40 €	- 1.504,50 €	- 9.027,00 €	0,5	-	33.292,40 €	- 22.828,40 €
26.02.2019	2	9				4360	1.308,00 €		1.308,00 €	11.772,00 €			- 8.630,00 €		- 8.630,00 €	- 32.895,40 €	- 1.504,50 €	- 10.531,50 €	0,5	-	43.426,90 €	- 31.634,90 €
05.03.2019	3	10				4360	1.308,00 €		1.308,00 €	13.080,00 €					- €	- 32.895,40 €	- 2.106,30 €	- 12.637,80 €	0,7	-	45.533,20 €	- 32.453,20 €
12.03.2019	3	11				4360	1.308,00 €		1.308,00 €	14.388,00 €					- €	- 32.895,40 €	- 2.106,30 €	- 14.744,10 €	0,7	-	47.639,50 €	- 33.251,50 €
19.03.2019	3	12				4360	1.308,00 €		1.308,00 €	15.696,00 €	- 32.250,00 €				- 32.250,00 €	- 65.145,40 €	- 2.106,30 €	- 16.850,40 €	0,7	-	81.995,80 €	- 66.299,80 €
26.03.2019	3	13				4360	1.308,00 €		1.308,00 €	17.004,00 €					- €	- 65.145,40 €	- 2.407,20 €	- 19.257,60 €	0,8	-	84.403,00 €	- 67.399,00 €
02.04.2019	4	14				4360	1.308,00 €		1.308,00 €	18.312,00 €					- €	- 65.145,40 €	- 2.407,20 €	- 21.664,80 €	0,8	-	86.810,20 €	- 68.498,20 €
09.04.2019	4	15				4360	1.308,00 €		1.308,00 €	19.620,00 €	- 1.200,00 €				- 1.200,00 €	- 66.345,40 €	- 3.009,00 €	- 24.673,80 €	1,0	-	91.019,20 €	- 71.399,20 €
16.04.2019	4	16				4360	1.308,00 €		1.308,00 €	20.928,00 €					- €	- 66.345,40 €	- 3.009,00 €	- 27.682,80 €	1,0	-	94.028,20 €	- 73.100,20 €
23.04.2019	4	17				4360	1.308,00 €		1.308,00 €	22.236,00 €					- €	- 66.345,40 €	- 3.610,80 €	- 31.293,60 €	1,2	-	97.639,00 €	- 75.403,00 €
30.04.2019	4	18				4360	1.308,00 €	4.977,78 €	6.285,78 €	28.521,78 €					- €	- 66.345,40 €	- 3.610,80 €	- 34.904,40 €	1,2	-	101.249,80 €	- 72.728,02 €
07.05.2019	5	19				4360	1.308,00 €		1.308,00 €	29.829,78 €	- 1.200,00 €				- 1.200,00 €	- 67.545,40 €	- 3.610,80 €	- 38.515,20 €	1,2	-	106.060,60 €	- 76.230,82 €
14.05.2019	5	20				4360	1.308,00 €		1.308,00 €	31.137,78 €	- 25,00 €				- 25,00 €	- 67.570,40 €	- 3.610,80 €	- 42.126,00 €	1,2	-	109.696,40 €	- 78.558,62 €
21.05.2019	5	21	240	600	6.900,00 €	4360	1.308,00 €	4.977,78 €	13.185,78 €	44.323,56 €	- 25,00 €				- 25,00 €	- 67.595,40 €	- 3.610,80 €	- 45.736,80 €	1,2	-	113.332,20 €	- 69.008,65 €
28.05.2019	5	22	240	600	6.900,00 €	4360	1.308,00 €		8.208,00 €	52.531,56 €	- 25,00 €				- 25,00 €	- 67.620,40 €	- 3.610,80 €	- 49.347,60 €	1,2	-	116.968,00 €	- 64.436,45 €
04.06.2019	6	23	240	600	6.900,00 €	4360	1.308,00 €	4.977,78 €	13.185,78 €	65.717,33 €	- 1.225,00 €				- 1.225,00 €	- 68.845,40 €	- 3.911,70 €	- 53.259,30 €	1,3	-	122.104,70 €	- 56.387,37 €
11.06.2019	6	24	240	600	6.900,00 €	4360	1.308,00 €		8.208,00 €	73.925,33 €	- 25,00 €				- 25,00 €	- 68.870,40 €	- 3.911,70 €	- 57.171,00 €	1,3	-	126.041,40 €	- 52.116,07 €
18.06.2019	6	25	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	86.531,13 €	- 25,00 €				- 25,00 €	- 68.895,40 €	- 3.911,70 €	- 61.082,70 €	1,3	-	129.978,10 €	- 43.446,97 €
25.06.2019	6	26	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	99.136,93 €	- 25,00 €				- 25,00 €	- 68.920,40 €	- 3.911,70 €	- 64.994,40 €	1,3	-	133.914,80 €	- 34.777,87 €
02.07.2019	7	27	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	111.742,73 €	- 1.225,00 €				- 1.225,00 €	- 70.145,40 €	- 3.911,70 €	- 68.906,10 €	1,3	-	139.051,50 €	- 27.308,77 €
09.07.2019	7	28	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	124.348,53 €	- 25,00 €				- 25,00 €	- 70.170,40 €	- 4.814,40 €	- 73.720,50 €	1,6	-	143.890,90 €	- 19.542,37 €
16.07.2019	7	29	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	17.583,58 €	141.932,11 €	- 25,00 €				- 25,00 €	- 70.195,40 €	- 5.115,30 €	- 78.835,80 €	1,7	-	149.031,20 €	- 7.099,09 €
23.07.2019	7	30	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	154.537,91 €	- 25,00 €				- 25,00 €	- 70.220,40 €	- 5.717,10 €	- 84.552,90 €	1,9	-	154.773,30 €	- 235,39 €
30.07.2019	7	31	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	17.583,58 €	172.121,49 €	- 1.225,00 €				- 1.225,00 €	- 71.445,40 €	- 5.717,10 €	- 90.270,00 €	1,9	-	161.715,40 €	- 10.406,09 €
06.08.2019	8	32	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	184.727,29 €	- 25,00 €				- 25,00 €	- 71.470,40 €	- 5.717,10 €	- 95.987,10 €	1,9	-	167.457,50 €	- 17.269,79 €
13.08.2019	8	33	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	197.333,09 €	- 25,00 €				- 25,00 €	- 71.495,40 €	- 5.717,10 €	- 101.704,20 €	1,9	-	173.199,60 €	- 24.133,49 €
20.08.2019	8	34	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	17.583,58 €	214.916,67 €	- 25,00 €				- 25,00 €	- 71.520,40 €	- 4.212,60 €	- 105.916,80 €	1,4	-	177.437,20 €	- 37.479,47 €
27.08.2019	8	35	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	227.522,47 €	- 1.225,00 €				- 1.225,00 €	- 72.745,40 €	- 4.212,60 €	- 110.129,40 €	1,4	-	182.874,80 €	- 44.647,67 €
03.09.2019	9	36	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	240.128,27 €	- 25,00 €				- 25,00 €	- 72.770,40 €	- 4.212,60 €	- 114.342,00 €	1,4	-	187.112,40 €	- 53.015,87 €
10.09.2019	9	37	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	252.734,07 €	- 25,00 €				- 25,00 €	- 72.795,40 €	- 4.212,60 €	- 118.554,60 €	1,4	-	191.350,00 €	- 61.384,07 €
17.09.2019	9	38	240	600	6.900,00 €	4360	1.308,00 €	4.397,80 €	12.605,80 €	265.339,87 €					- €	- 72.795,40 €	- 4.212,60 €	- 122.767,20 €	1,4	-	195.562,60 €	- 69.777,27 €
24.09.2019	9	39				4360	1.308,00 €	4.397,80 €	10.683,58 €	276.023,44 €					- €	- 72.795,40 €	- 3.911,70 €	- 126.678,90 €	1,3	-	199.474,30 €	- 76.549,14 €
01.10.2019	10	40				4360	1.308,00 €	4.397,80 €	5.705,80 €	281.729,24 €					- €	- 72.795,40 €	- 3.911,70 €	- 130.590,60 €	1,3	-	203.386,00 €	- 78.343,24 €
08.10.2019	10	41				4360	1.308,00 €	4.397,80 €	10.683,58 €	292.412,82 €					- €	- 72.795,40 €	- 3.009,00 €	- 133.599,60 €	1,0	-	206.395,00 €	- 86.017,82 €
15.10.2019	10	42				4360	1.308,00 €	4.397,80 €	5.705,80 €	298.118,62 €					- €	- 72.795,40 €	- 3.009,00 €	- 136.608,60 €	1,0	-	209.404,00 €	- 88.714,62 €
22.10.2019	10	43				4360	1.308,00 €	4.397,80 €	5.705,80 €	303.824,42 €					- €	- 72.795,40 €	- 3.009,00 €	- 139.617,60 €	1,0	-	212.413,00 €	- 91.411,42 €
29.10.2019	10	44				4360	1.308,00 €	4.397,80 €	10.683,58 €	314.508,00 €		- 360,00 €			- 360,00 €	- 73.155,40 €	- 3.009,00 €	- 142.626,60 €	1,0	-	215.782,00 €	- 98.726,00 €
05.11.2019	11	45				4360	1.308,00 €	4.397,80 €	5.705,80 €	320.213,80 €					- €	- 73.155,40 €	- 3.009,00 €	- 145.635,60 €	1,0	-	218.791,00 €	- 101.422,80 €
12.11.2019	11	46				4360	1.308,00 €		1.308,00 €	321.521,80 €					- €	- 73.155,40 €	- 1.805,40 €	- 147.441,00 €	0,6	-	220.596,40 €	- 100.925,40 €
19.11.2019	11	47				4360	1.308,00 €		1.308,00 €	322.829,80 €					- €	- 73.155,40 €	- 1.805,40 €	- 149.246,40 €	0,6	-	222.401,80 €	- 100.428,00 €
26.11.2019	11	48				4360	1.308,00 €		1.308,00 €	324.137,80 €					- €	- 73.155,40 €	- 1.805,40 €	- 151.051,80 €	0,6	-	224.207,20 €	- 99.930,60 €
03.12.2019	12	49				4360	1.308,00 €		1.308,00 €	325.445,80 €					- €	- 73.155,40 €	- 1.805,40 €	- 152.857,20 €	0,6	-	226.012,60 €	- 99.433,20 €
10.12.2019	12	50				4360	1.308,00 €		1.308,00 €	326.753,80 €					- €	- 73.155,40 €						

ANNEX VI – Access to Digital Annex

A detailed digital Annex is provided on online cloud storage.

The storage file contains detailed information on calculations, source information, minutes of meetings and drafting files towards this report.

Additionally, an introduction/overview video was produced by the group, which can be found within the Annex as well.

To access all stored files, please visit:

<https://www.dropbox.com/sh/5gbtshfw0ns8kvd/AAArjnbtAl0jso0p6KuRnoHWa?dl=0>