

## 01 COVER PAGE WELCOME TO OUR FIELDS



# plotfarm

rooting local food supplies

Due to the centralization of food systems in Europe, small-scale farmers lack financial security which inhibits them to transition to climate-smart farming practices.

plotfarm enables small-scale farmers to access a reliable source of income, by providing a digital platform that serves as a link to local canteens. Simultaneously, plotfarm facilitates knowledge transfer on climate-smart farming practices within its community.

*Highlights:* Small-scale partner farmers (cultivating less than 10 ha) can use the platform free of charge to market their respective produce. At the same time, an integrated planning tool facilitates farmland and crop planning while providing relevant success stories and best-practices on climate-smart farming techniques.

Canteens pay a monthly fee to receive access to the platform where they can conveniently place bulk orders. plotfarm processes those orders to its pool of farms while keeping 15% of the sales price. According to the order, additional information on production, nutritional values and recipes. Employees, frequenting these canteens, can subscribe to a weekly delivery of pre-packed food boxes, which are delivered directly to their workplace canteen.

The harvested data from production- and consumption-side is used to refine the algorithms powering the planning tool to diversify production to match predicted demand and reduce potential loss of yield as well as overproduction.

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## 02 CHALLENGE & SOLUTION (1/2)

### SEEDING THE POTENTIAL

*Team:* The plotfarm team shares a love for the natural environment and living with it while preserving it for future generations. With a diverse skill set, including agricultural-, social- and business-knowledge - both in a domestic and international context - plotfarm addresses each of the three pillars in sustainability. Furthermore, the team is inspired to tackle local issues in relation to the agriculture industry and is confident that they can overcome any challenge in relation to sustainable farming while co-creating a more sustainable future for our planet.

*Framed Challenge:* In the current economic structure, food systems are organised into centralised supply chains that foster nonconscious consumption. Price and quantities are key drivers that determine the access to the market. Smaller farms struggle to secure consistent prices for their produce. Furthermore, farmers are vulnerable to climate change and are susceptible to extreme weather conditions. Simultaneously, there is little transparency in regards to food supply chains as the food is transported over long distances and involving many steps.

*Challenge Relations:* Under sustainable land use goals identified by Climate-KIC, plotfarm has the potential to tackle impact goal 4: make agriculture climate-smart and impact goal 5: reform food systems. Technical solutions under goal 4 are to increase resilience and may be a good approach to create momentum and motivation to deal with climate change. Furthermore, there is a need for training and education to raise awareness among farmers and value chain actors. Increasing farmers resilience is also a key leverage point and is an important entry point for gaining

their trust. The development of tools can bring stakeholders along the entire value chain together allowing for fair development of pricing mechanisms.

Under goal 5, the world's food production has increased substantially within the past century. Furthermore, modern agriculture practices have led to intensive cultivation with an increased dependency in pesticides and fertilizers. This has led to a significant decrease in biodiversity. The future for reformed food systems can be done through the transformation of climate-damaging food chains and the development of resource efficient agri-food chains. A change in customer behavior such as switching to local production and alternative diets is another mean of transformation. The global consumption of meat will increase on average by 30 percent by 2030, from 37 to 48 kilograms of meat per capita.

The agricultural sector is facing economic challenges which creates a gap between large and small-scale farms, hindering the latter's ability to secure financial security and often forcing them to close. The current food supply chain requires the shipment of large quantity orders in aims of achieving high financial efficiency. This hinders their ability to compete on the wholesale market. Due to the demand for high produce diversity and quantity, small-scale farmers are unable to fulfill high volume contracts.

There are social drivers which influence people's mentality such as a higher demand for information on conscious consumption and local sourcing of food (LOHAS). Rural exodus is mainly caused by lack of or unattractive jobs, of which many are linked to the agricultural sector

and its adjacent industries. In addition, farms can also serve as catalysts for improvements in local livelihoods while rejuvenating rural communities. Our challenge tackles major issues regarding sustainability and consumption transitions from business to business (B2B) and business to consumer (B2C) while fostering knowledge exchange in the production community.

Most of the EU subsidies for the agricultural sector are paid out directly and are distributed unfairly. Small farmers are at a significant disadvantage. In Germany, 0.5% of all farms each receive more than 300.000€ in subsidies per year - 20% of the total subsidies. In contrast, 70% of farmers receive subsidies of a maximum of 10.000€ per year. This system further promotes the centralization of the sector.

AFOLU industry accounts for 24% (11.76 Gt of CO<sub>2</sub>e) of direct emissions. Furthermore, the agricultural sector indirectly contributes an additional 1.06 Gt of CO<sub>2</sub>e through energy and heat production. Reducing energy use and increasing efficiency is the future direction for impact potential within the agricultural industry. The changing climate and unpredictability of extreme weather events threaten the viability of small-scale farms. By the end of 2050, the worldwide population is expected to surpass 9 billion people. There will be an increase in demand for food, further impacting the already high CO<sub>2</sub>e impact from the agricultural sector.

## 02 CHALLENGE & SOLUTION (2/2) SEEDING THE POTENTIAL

*Solution:* Small-scale farmers lack financial security due to cost-efficiency driven, centralised food supply chains. Extreme climatic events further threaten the yield and create higher risks in the agriculture sector and planning. Conscious consumption and a need for more transparency in food production are generally increasing in society. Intensive work times make it harder for consumers to reach out for more sustainable food options. Workplace canteens with inhouse catering services struggle in finding alternatives to wholesale suppliers and find it difficult to satisfy their food demand from individual local farmers.

Plotfarm is the link between canteens and local small-scale farmers within a reach of 100km. Its digital platform enables canteen operators to conveniently pre-order their vegetable produce on a monthly basis from a single point-of-sale. plotfarm then pools the available farms on the platform to reach the required amount of produce and delivers daily package-free, fresh goods with the help of an external logistics provider. This reduces the risk and lowers supply chain complexity. Through the sustainability package that canteens receive by becoming a paying member, canteens are provided with additional marketing material on the respective farms, the farms production methods, nutritional values, and new recipes for vegetarian and vegan meals according to the ordered vegetables. In addition to these service, plotfarm provide weekly food boxes for the employees, that are conveniently delivered directly to the employees workplace together with the canteen's order. plotfarm provides its service to farmers free of charge and offers them a convenient way to market their produce and handle their sales.

Gathering data on canteens' demand and available farmland, as well as crops within plotfarm's network, allows the team to create an immediate link of supply and demand on a small-scale local level. The algorithm-based platform is therefore able to calculate predictable figures for upcoming years according to seasons and local climatic conditions. An integrated farmland planning tool enables farmers to plan their land and crop in order to eliminate the mismatch between supply and demand, thereby increasing security of sales for the farmers. Together with this, plotfarm integrates best-practices in designing this farmland in a climate-smart way while promoting crop diversification. This diversification creates supply redundancy to lower the impact of possible yield-loss by spreading the resources on multiple farms within the pool. In addition, diversified fields consisting of yield and non-yield crops mitigate potential extreme weather events. Simultaneously, the platform framework showcases success stories and best-practices in sustainable farming techniques while facilitating knowledge-transfer between the farmers. The additional food boxes allow us to compensate possible overproduction by facilitating a secondary sales channel directly to the consumers.

## 03 CLIMATE IMPACT WEATHERING ALL

plotfarm enables reductions in CO2e emissions through two channels: the reduction of transport distances in the supply chain and incentivisation of vegetarian diets on the canteen side. At a conversion of eight canteens in the first year of operation, plotfarm calculated a reduction of 180.000kg in CO2e emissions. Based on an average of 50.000 served meals per canteen per year, we substitute 50% of the 150g of meat per meal with fresh vegetables in a ratio of 1:1.5. Demand based production and shorter supply chains reduce food waste from 15% to 5%. Excluding exotic produce, we estimated a saving in transport of 500km per delivery resulting in saving 7.500tkm per canteen per year.

Fostering transition to climate-smart agriculture has high potential for improved carbon sequestration through cultivation of non-yield crops and less tillage for healthier soil conditions. Less tillage also leads to less machine use and less energy consumption. Based on academic research, we estimate a sequestration of 0.7t per ha per year while we defined our average farmland size as 10 ha per farm. Healthier soil stores more water and nutrients, thus reducing necessary inputs of water, artificial fertilizers, pesticides. Farming with adjacent ecosystems also increases biodiversity and helps restoring degraded farmland while improving resilience against extreme climatic events. Besides the sequestration rate, those reduction means are not quantified in our calculation.

In total, plotfarm estimated a saving of 0.5kg of CO2e per served meal, which means an accumulated 4.600.000kg CO2e after five years.

## 04 TEAM & NETWORK PUTTING DOWN OUR ROOTS

The plotfarm team shares a love for the natural environment and living with it while preserving it for future generations to come.

SEEDCO- Rebecca has recognized a need for change in sustainable farming having grown up in the cabbage capital of Germany. She is particularly interested in cabbage farming practices and is eager to apply her communication and marketing experience in farmer outreach.

SEEDFO - Julia is passionate about climate change and protecting the environment. As food is the foundation of human existence, she sees a need to transform the agricultural industry. She uses her background in business administration to provide the knowledge needed to make sure we're not just having a positive social impact but also become a successful business.

SEEDAO- Noémie is a graduate from a masters in agronomy and sustainability and is eager to apply her skills within the start-up community. Having volunteered with sustainable farms in her home country of France, she has grown an even deeper appreciation for the effort needed for the agriculture industry.

SEEDTO - Mirko has a background in design and is interested in permaculture and sustainability transitions. He believes that farming with eco-system services is not only the future for the agriculture industry, but also holds a high potential for regenerating our environment. His development experience helps us kick-start the platform and its algorithms.

SEEDEO - Anna has a long-time love for food and has recently become more curious on where her food comes from. She believes that supporting the local industry is an important practice for building a radiant community. With her background in international business, Anna can envision plotfarm's growth potential on the global market.

The plotfarm team will grow the future of small scale climate-smart farming through their experience in the field of sustainability and affiliation with the startup community. The plotfarm team has identified a lack regarding legal competencies as these skills will be critical in contract agreement between plotfarm, canteens, and farmers. Contract fees have been accounted for in plotfarms financial planning tool to meet these needs.

plotfarm's business model combines a diverse set of stakeholders. We don't just need a network among farmers, but also need to be connected with canteens in Germany due to the large market size, market structure of inhouse business canteens as well as our rooted connections in this country. We have identified multiple stakeholders to support our start-up, such as small-scale farmer lobbies (Bauernverband e.V.) and canteen associations (Verband der Köche e.V.), many of whom we have already been in touch with during our research.

Through discussions with agriculture experts and advocates on sustainable farming practice such as Gerhild Liehmann-Kress, Manager of Direct Marketing for the Chamber of Agriculture Schleswig-Holstein and Ursula Emmert, a committee member of the Association of the Regional

Movement conveyed the need for a platform such as plotfarm. Both are convinced of the benefits that plotfarm can bring to the local economy. The University of Kiel will also contribute to the network which plotfarm creates. Prof. Dr. Friedhelm Taube from Versuchsgut Lindhof, a farm that facilitates pilot projects in ecological agriculture, is willing to contribute to plotfarms knowledge pool of good agricultural practices. Additional input on Permaculture is provided by Joshua Finch from Lillklobb Permaculture, an urban farm in Helsinki and through teaching material by Ridgedale Permaculture in Sweden.

Dieter Pansegrau from Wurzelhof and Tim Bährs from Dithmarschen are two small scale farms that have voiced their concern regarding their financial security. They have both agreed to come onboard with plotfarm as they see the benefits which plotfarm can provide. On the canteen side, Kantine der KVG and Coffeebar Wissenschaftszentrum have both shown interest in plotfarm's business model and are eager to be connected to local farmers. They not only see the benefit that healthy food options will bring to their employees, but also the benefits of supporting the local economy.

To distribute the locally sourced vegetables, plotfarm will be working with Meyer Logistik with a dispatch location in Kiel. plotfarm has selected this logistics company in particular due to their commitment to sustainability (hybrid and fully electric delivery vehicles). Furthermore, plotfarm will be in cooperation with MANGOPAY as they will be the online platform which facilitates plotfarm's financial transactions.

## 05 MARKET DRIVERS

### THE SUN AND THE RAIN

*Proposed business model:* plotfarm is a digital platform targeting the niche market of inhouse business canteens and the employees working for that company for two reasons: Canteens provide a better selling point for large volumes compared to the end-consumer market while at the same time enabling us to access the employees for further products such as the food boxes. Canteens know their demand in advance which allows the farmer to harvest the exact amount of food resulting in better exploitation of yields and less food waste.

plotfarm creates a low-cost, time efficient, “one stop shop” platform to connect producer and consumers and enable interactions between the participants, which is needed in the time-pressured environment of canteens. Canteens subscribe to our platform for a minimum of one year paying a membership fee of 99€ per month to use our service (match-making and sustainability package). The farmers sell directly to the canteens at fair market price which will be negotiated between the two parties, with no binding input from plotfarm. Thus, there is no middleman: canteens pay the farmer directly, allowing them to earn 85% for their work (in comparison to around 30% through wholesalers), while plotfarm receives 15% of the sales price with payments facilitated by MANGOPAY, a third-party payment specialist which takes financial responsibility of all plotfarm transactions. plotfarm offers food boxes: Employees can subscribe to weekly vegetable boxes for a minimum of three months paying 40€ per month. Farmers can access and use the platform without charge after plotfarm audited their farms and gathered information for the communication material which helps us to secure the integrity of our offer.

*Drivers and effects:* Despite the success of platform economy in other sectors (e.g. ebay, Airbnb) the potential of digital technology has not been exploited at a large scale in the food market. It is a growing market with multiple policy initiatives promoting it. Digital direct marketing has been focused on the end consumer so far (e.g. Etepetete) and the use of small and big data in agriculture is still in the early stages of development.

Nearly 50% of German consumers want to eat healthily but lack time and around three-quarters of them value regional food. At the same time 70% of them say that the food industry should contribute more strongly to sustainably produced foods. plotfarm can tap into these unused technology and socio-economic potentials.

Food wholesalers with a wide range of products and established personal networks between canteens and farmers may be the main competitors of plotfarm. However, both lack the comprehensive service we offer to farmers and canteens. Trade barriers may be the unwillingness of canteens to change, long-term contracts with canteen suppliers and the smaller product selection of plotfarm. Potential market risks are crop shortfalls and therefore supply shortages as a result of unpredictable extreme weather events as well as increasing price pressures that canteens may face during difficult economic times. Although consumers value local and healthy food, a seasonal orientation of the menu may raise dissatisfaction. plotfarm tackles this issue by providing canteens with the comprehensive communication material to educate the employees.

Due to climate change, food market prices are unlikely to decrease in the future while food demand is expected to rise by an estimated 35% until the year 2030. Thus, we don't expect the market price for vegetables, which is the base for our revenues, to decrease, therefore making it a stable base for our financial calculations.

Road transport by small trucks is likely to be the main mean of transport while plotfarm's logistics partner have already moved towards clean mobility. With proven success in online platform business models, social media channels and the acceleration of digitalization and availability of data, plotfarm is confident that they will face few difficulties in reaching their customer base. Still, the initial contact acquisition of canteens and farmers has to be made at a personal level - especially in the first year, since plotfarm still has to build up its popularity and reputation.

*Final market:* In Germany, 17 million employees have access to 14.000 business canteens. 13 million of them use the canteen service daily. Our final market comprises the 9.350 business canteens in Germany which are run in-house since plotfarm does not meet the needs of cost-driven, large external canteen catering services. As stated above, the customer segment of business canteens serves as an entrance to our second customer segment: employees of the companies running an in-house canteen.

## 06 REALISATION SCHEDULE OUR SEASONS OF GROWTH

To achieve our vision, we will start up lean. We will use Kiel as our proof of concept market, where canteen prices are on average the highest in Germany and many small-scale farmers exist, making up around 15% of the agricultural sector in Schleswig Holstein.

Once our initial investments are secured, we will grow our business organically. In our first quarter, we will build up our network both on the canteen side as well as the farmer's side, hoping to already enable the first connection, thus starting our revenue stream. The launch of our online platform will occur towards the end of our second quarter, giving us enough time to develop it properly and take the first experiences we make when approaching potential clients into account. Our goal is to reach eight canteens by the end of year one. During the third quarter, we will start rolling out the food boxes to the canteens that we have established trusting relationships with.

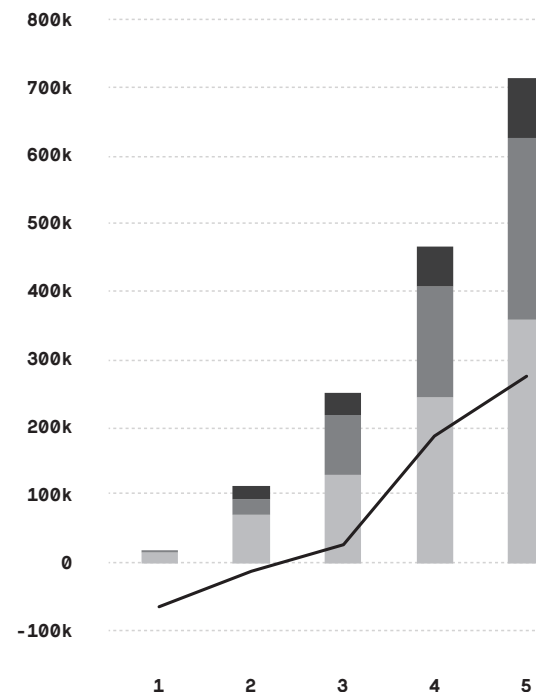
By the beginning of year two, we will have grown our network on the farmer's side enough to justify the 99€ monthly membership fee for the canteens. This will be accompanied by an extension of the sustainability package, which now includes personalized information on the farmer that the canteen receives their food from. We will then expand into other German cities.

During year three, we will expand our product range to fruit through the expansion of our farmer's network. Having proved our business model, we will open up the platform to reduce our workload through automatization, helping to scale up the platform much quicker, with the opportunity to enter further European markets in the following two years. This also allows us to develop other value adding services further, such as the food boxes and the planning algorithm.

The largest costs within our business are our personnel cost, as well as the logistics cost. In our personnel cost, we calculate with three full-time employees (with four of us working in part time) in the first two years, and then adding another full-time employee in year three. In the beginning, we assume a net salary of 400€ per month, which is justified since we are all just students and/or have other sources of income. We increase this monthly salary over the next five years up to 2500€ net per month.

plotfarm will hire a local logistics provider to execute the daily deliveries to the canteens, estimated at 150€ per day based on our research. Especially in the beginning, this cost is significant, since we cannot make use of any economies of scale. Basically, adding more canteens as clients will only slightly increase transport cost, since the truck is already going and just needs to do more stops while all food – even for several canteens – can fit into one truck. Over the years, we can realize significant economies of scale regarding our logistics cost.

Due to the missing economies of scale in our logistics, we have a cumulative operating loss of 83.450€ until reaching our breakeven point in August of year two. This will be covered by our initial capital input into our GmbH of 25.000€, which will come through support from our families, as well as an initial investment. plotfarm will seek additional funding of 60.000€ through public funding schemes, e.g. from the Zukunftsprogramm Ländlicher Raum (ELER) which has a funding of 420.000.000€. plotfarm will also approach seed funders which have a special interest in social and environmental challenges. The payback period for these investments is three years and four months.



- 1) plotfarm assumes an average price perkg of vegetables of 1,65€ (based on our research on wholesale cost on the most important vegetables, plus logistics cost). plotfarm will get a service fee of 15% of the revenues. We assume an average of 200 canteen customers per day, and 400 g of vegetables per customer and day.
- 2) food boxes will be offered to the employees at 10€ per week, containing 2-3kg of vegetables. Out of this, 70% go to the farmer and 5% go to the canteens, who will distribute the boxes. We assume 0,50€ additional logistics cost per box due to the additional effort of assembling the boxes. In year one, we assume that 5% of all canteen customers will order a food box (with a delay of 6 months after delivering food to a canteen), increasing to 15% in year 5.
- 3) In year 1, the canteens will not yet have to pay the membership fee. From year 2 onward, we assume a fee of 75€ per canteen, with a variable cost of 5€ per canteen due to the sustainability package.