FarmIn

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1. PROBLEM

The ability to feed a growing population without compromising global efforts to reverse climate change is one of the most prominent debates of our time. By 2050 the global population is expected to reach the 10 billion mark and along with it food production is expected to grow dramatically. In fact, recent studies indicate that by then global demand for food will increase by 70 to 100%[1].

Current agricultural practices are largely 'conventional' – input intensive and degrading. Estimates indicate that the Agriculture, Food and Land Use (AFOLU) sector accounts for 24% of global greenhouse gas emissions today and that is not considering the severe biodiversity losses associated with intensive monocultures[2]. Technological advances in precision agriculture are clearly not a sufficient solution to address this challenge. But increased food production need not translate into a significant increase in GHG emissions. A recently launched report by the Ellen MacArthur Foundation revealed that the widespread adoption of regenerative agricultural practices could help reduce global GHG emissions by as much as 3.9%, in addition to associated human and ecosystem health benefits associated with this transition[3].

In fact, a number of drivers for change are emerging in this space. On the consumption side, demand for organic food is showing double-digit growth in various geographies and represented a USD 90 billion market in 2016[4]. At the same time, a number of policies are emerging at country and city-level with specific targets and incentives for different forms of regenerative food production, such as in India and Brazil, which aim to become 100% organic by 2025 and promote the adoption of agroecology practices through school feeding programmes, respectively[5].

Still, smallholder farmers, who are believed to account for 80% of the world's cropland and 60% of global agricultural output[6], still face significant challenges that affect their ability or willingness to move away from damaging agricultural practices. Pressured by competition for land, low wages, marginalisation from modern food value chains, and limited mechanisation, they often seek input-intensive production as the easiest way to improve yields[7]. This creates long-term disadvantages, however - soil degradation and desertification reduces yields significantly over time and that is not considering the health cost of long-term pesticide exposure.

A 2015 report by the United Nations Food and Agriculture Organisation (FAO) on the economics of smallholder family farming suggested that a farmer's knowledge and skills have a positive correlation with productivity and even shapes the way in which they use inputs and respond to changes in the environment[8]. With that in mind - and considering that agricultural systems are essentially living systems and therefore varying in composition and dynamics between regions - it seems likely that a high-impact solution to the global challenge described above could arise from answering the following question: **how to enable more smallholder farmers to adopt regenerative practices knowing that there are resource constraints and no one-size-fits-all solution?**

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[1] Godfray, C. et al. (2010). Food Security: The Challenge of Feeding 9 billions people. Science, 327(5967): 812-18

[2] Ellen MacArthur Foundation, Completing the Picture: How the Circular Economy Tackles Climate Change (2019). Available from: https://www.ellenmacarthurfoundation.org/our-work/activities/climate-change (accessed 2019-11-14)

[3] ibid.

[4] Ellen MacArthur Foundation, Cities and Circular Economy for Food (2019). Available from: https://www.ellenmacarthurfoundation.org/our-work/activities/food (accessed 2019-11-14)

[5] Ibid.

[6] FAO. The future of food and agriculture – Trends and challenges (2017). Available from: http://www.fao.org/3/a-i6583e.pdf (accessed 2019-12-7)

[7] FAO. The economic lives of smallholder farmers (2015), p. 8-20. Available from: http://www.fao.org/3/a-i5251e.pdf (accessed 2019-12-04)

[8] Ibid.

2. PROPOSED CONCEPT

As a contribution to addressing this key challenge we propose **FarmIn**: a peer-to-peer knowledge and asset exchange platform for farmers.

FarmIn at a glance. FarmIn is a web-based and mobile application with a primary goal to facilitate connections between farmers that are interested in transitioning from conventional to regenerative practices, and others in the same region that have either begun or even completed this process. By using FarmIn, smallholder farmers will have an easy and affordable way to find peers with a common interest in various regenerative practices (ie agroforestry, crop rotation) and actual experience in dealing with their implementation in a similar environment - which might significantly reduce the cost, time and risk of implementation. They will also find in FarmIn a useful means for sharing equipment and other inputs such as organic compost.

How it works. Each FarmIn user will have an individual profile, accessible by others, where they will be able to share the following information: personal and contact details, region, production details, practices currently employed and those of particular interest, challenges faced, equipment and inputs needed or offered, and others. These filters will allow farmers in a particular region to match their needs and offers. Additional community and knowledge-building features include peer-to-peer rating as a social monitoring tool for regenerative food production (overcoming the challenge of organic certification costs), topic-specific discussion threads and the possibility to schedule face-to-face meetings. A hotline will be set up, additionally, to support users. and facilitate the integration of those without internet access.

A feasible business model based on three audiences. The FarmIn business model depends on three key audiences consisting of smallholder farmers, food retailers and advertisers. No membership fee will be charged to the farmers, in line with the purpose to facilitate and scale the transition to regenerative agriculture practices. However, quarterly insight reports georeferencing regenerative food production will be produced based on aggregated data from the application and sold to major retailers, thus supporting them to reach increasingly ambitious responsible sourcing goals while helping smallholder farmers avoid being marginalised by modern food value chains by providing them with visibility and connections to the market. As an additional revenue stream, in-app advertising spots will be offered to local suppliers of farming equipment and organic agricultural inputs. Hence FarmIn is an effective solution that addresses the challenge proposed with benefits to all audience groups:

- **Farmers** gain access to qualified advice for implementing changes to their production at no cost, can easily share and exchange resources with peers, strengthen ties with the local farming community with potential to positively impact their professional self worth, and gain access to local markets;
- **Retailers** can locate and access local supply of regeneratively grown food from family farming, reaching their CSR goals more easily; and
- **Advertisers** gain access to a channel with the ability to reach their target audiences with unparalleled precision

Scope. FarmIn focuses on smallholder farmers as a key audience for transforming the global agricultural landscape, aiming to facilitate their non-commercial information exchange as a means to boost the uptake of regenerative agricultural practices. It is not open to industry-scale producers. It does not intend to position itself as an expert information provider either, or to act as a paid intermediary in commercial transactions between farmers and retailers.

Other existing solutions. Market research revealed the existence of a number of initiatives with complementary approaches to addressing the same challenge, as is to be expected given its relevance. There are specialised consultancies targeting large producers (such as Brazil-based Agros Fortis[9]) and top-down government-led initiatives to support farmers making the transition to agroecology practices by means of technical assistance (São Paulo's Connect the Dots initiative was awarded a Bloomberg Mayor's Award in 2016[10]). There are also project-based ecosystem restoration

[9] Agros Fortis - Consultoria de Culturas Biológicas, http://blog.agrosfortis.com.br/ (accessed on 2019-12-04)

[10] City of São Paulo. Ligue os Pontos, https://ligueospontos.prefeitura.sp.gov.br (accessed on 2019-12-04)

initiatives with corporate sponsorship and provision of technical guidance not focusing specifically on smallholder farming or peer-to-peer learning (B-Corp PUR Projet[11] is amongst these), as well as others that conversely seek to promote integration and support of smallholder farmers without a focus on promoting regenerative practices.

While these offer valuable contributions to addressing this important challenge, a crucial gap has been identified as to enabling the continuous and autonomous sharing of experiences and knowledge between smallholder farmers. This is essential because (i) agriculture relates to natural ecosystems which are complex metabolisms rather than machines that can be treated with standardised solutions or a single intervention (so learning from experience and continuous dedication are key) and (ii) issues are very much localised, as in that different regions have different climate and ecosystem specificities to be dealt with. FarmIn address smallholder farmers' information, resource and market access needs through a comprehensive approach that ultimately helps redesign food production for a climate-resilient future. Further to this, which serves as an initial proof of concept, in-depth interviews with a sample of the three target audience groups should be carried out to validate the format.

3. EXPECTED POSITIVE IMPACTS

Through this particular application: FarmIn - LinkedIn for farmers, we are hoping to address various issues prevalent in the world. As a generation that has grown up with the evolvement of digitisation, we feel we understand more than anything the difference it can bring to our lives. Taking the example of various lifestyle habits that have been made ten times easier due to the readily available information at our hands (writing this paper is one of them), made us question the true power of information in the form of guidance, data and knowledge. Farmers are the true "Autotrophs" in this world; that is to say, the wonderfully fresh fruits and vegetables in the market are a direct result of their hard work and toil.

The problems faced by farmers of today are numerous in number: feeding an over-expanding global population that is expected to increase to 9 billion by 2050 (World Population Prospects: United Nations, 2019); degrading quality of land due to large scale industrialisation; issues arising from pests and insects; floods and other natural disasters. Thus, keeping in tandem with the Sustainable Development Goals, it is important to realise a way to bring the regenerative practices back, meet new strict emission requirements and maximise food production while minimizing environmental harm. With FarmIn, we plan to address the above mentioned issues, and a few others. The positive impacts are mentioned below:

Primarily, we would be creating a common platform for local knowledge and information exchange between farmers, that is a PeerToPeer (P2P) consultancy. Most of the farmers in the world lack the resources to afford consultancy services, and through this platform, we want to facilitate global connections.

We hope that this would not only provide insightful information to a farmer in trouble, but also foster harmonious relations. For example, a farmer from a particular geographic region might be facing issues with a type of insect attacking his crops, he can go up on the platform and look for one someone who has already faced, and successfully engineered a solution for the problem, or just post about his problem in general to see if anyone possesses the knowledge to guide him. Through this application, we also want the farmers to not feel alone. Through this, they might find other groups of people going through a similar problem, and this might be a small, but significant, step towards reducing farmer suicide.

Certain indigenous practices of each country should be preserved, and with the emergence of large-scale capitalised and industrialised way of farming, they are slowly dying. Through this application, small-holder farmers can reach out to others and make the methods more popular, as usually they are more environment friendly.

Just like the features of Linkedin, we would like the page to provide accreditation/ratings to users who have, for example, advised more than 50 people. Small notable achievements like this, might push the farmers to use the application more.

Further, we want the application to also have an equipment sharing platform for free, between the farmers.

[11] PUR Projet, https://www.purprojet.com/ (accessed on 2019-12-04)

Nowadays people are more sensitive towards their purchasing choices and the environmental and social consequences of those choices due to which organically sourced foods are increasingly gaining importance. We want to eliminate the middleman through this application, and bring the farmers directly in contact with the retailers.

We would also like to monetise the application through advertisements (For example, local equipment stores, local grocery shops and others) and by selling the data insights received through the application to different industrial suppliers and retailers.

4. MAJOR RISKS AND ACTIONS TAKEN TO REDUCE THEM

The major risks and hurdles that we will be facing in order to implement this application would be the following:

Language barriers: One of the difficult issue that we need to tackle is the apparent language barriers that exist. We can expect, some of the said farmers to be illiterate, and thus using an application which favours any particular language, may not be the safest option. To tackle this particular issue, we plan to include as many keyboard variations as possible in the application. Further, we would also like to include voice assistance (something similar to Siri, Alexa), but we are aware of the costing and it is not in our immediate list of agenda.

Breaking into the market: A major obstacle that would need immediate attention would be the successful launch of the app and to get it to the people. The target market, in this case, is difficult to reach since there is an obvious gap between rural and urban setting and the marketing schemes are different for each. For example, to make an application more popular a person would advertise it in the already existing social media platforms like Facebook, Instagram so as to increase its reach. However, for rural areas, we cannot depend on such social media sites as the engagement rate might be different and not as impactful. Thus, to tackle this issue we will be approaching Food and Agricultural Organisation of the United Nations, who are known to organise annual Regional Conferences where ministers of agriculture and high officials of the state meet to discuss relevant political and global issues related to agriculture and the food industry. We could use these platforms to popularise our application, and also gain the partnership of the government in the process. We would also like to approach NGOs and other organisations that work exclusively with farmers, and thus could be a part for the initial testing of the application.

Absence of Internet: One of the main difficulties we have anticipated is the lack of internet in certain rural areas. The probability of that happening is more in certain developing countries than developed countries. To make it available to everyone, specially people in the rural areas, we plan to operate a hotline which would be available at the farmer's disposal for 5 days a week. However, the plans for that are in the pipeline and we plan to address the issue later when we decide to go global. For now, we will be concentrating on France, as 82% of the population receives internet access[12].

5. DEPLOYMENT STRATEGY AND MAJOR MILESTONES

We plan to approach various organisations so as to popularise the application within the target market. The following are integral to the success of FarmIn:

NGOs and Governmental organisations: We believe that in order to infiltrate the market we will need help in the form of organisations that deal with the rural mass on a daily basis. In order for the application to be accepted, the information and know-how needs to come from a trusted source. We will also be relying mostly on word-of-mouth advertisements.

Training Stalls: With the intent of making the application more user-friendly and easy to use, we plan to put up training stalls after the first month of the launch of the app. There will be volunteers (either from the NGOs or ourselves) to answer any immediate questions the users might have.

Retailers: Since we plan to monetise the app by selling data insights to the local retailers, mainstream retailers and eventually large scale industries, it is important to set up connections and form tie-ups early in the process.

[12] Internet Penetration in France, www.statista.com/statistics/460693/internet-penetration-in-france/ (Accessed on 2019-12-14)

Advertisers: Another way of revenue generation will be through the advertisements of equipment sharing and local agricultural input. Thus, to get them to advertise on the application will be one of the major strategies that we will need to adopt. Only through proper facilities and assurance of a successful and symbiotic alliance between local people will this idea be successful in popularising regenerative practices.

Accreditation: We also plan to provide certification and accreditation like LinkedIn, so as to boost the morale and engage user activity.

6. RETURN ON INVESTMENT ANALYSIS

Cost structure	
Application development	$50000
Marketing	$1000
Hotline	$2000
Analyst	$2500

Return on investment	
Retailers pay for data	$40000
Advertisement for farming equipment	$20000

As for the cost structure, the cost of making a mobile application represents the main unitary cost of our activity. The typical cost average stated by application development companies is $100 000 to $500 000. Yet, as our app will be using basic features it could cost around $50 000.

To make people know the service we offer, the aim is to target the right farmers at the places through an efficient marketing campaign. The campaign will not use traditional advertising but will be done through discussions in villages where the app will be used. Those discussions require renting a place for 2h to welcome everyone but also materials such as microphones, chairs, tables, etc.

The second operating cost is hotline which will depend on the level of need. In the beginning we will hire two persons in charge of that. Our goal is to employ people who are disabled or migrants.

Finally, an analyst will be working on app management and conducting data analysis.

Our return on investment will be mainly from selling data to retailers, NGOs, companies, and governments. Besides, as the application highly target farmers, it represents a good platform for an advertisement for each activity related to it.

7. ORGANISATION

We would be approaching the country governments for their aid in implementing and popularising the application amongst the rural target market. We also plan to approach corporate houses, presenting this application as a part of their CSR (Corporate Social Responsibility) activity.

Although, initially we would bring this forward with our own investment to test the waters so that we can bring positive results to the table and garner sponsors. Through this, we can partner with NGOs working towards better employment opportunities for disabled, LGBTQ people (through hotlines and training stalls).