



The People's Transition - Ardara

**Implementation of Community-Led
Development for Climate Justice**

Acknowledgements

This paper is one of two focused on the findings of The People's Transition pilot projects which have been conducted over the course of 2021. These pilot projects have been led by the Think-Tank for Action on Social Change (TASC) and supported by AIB.

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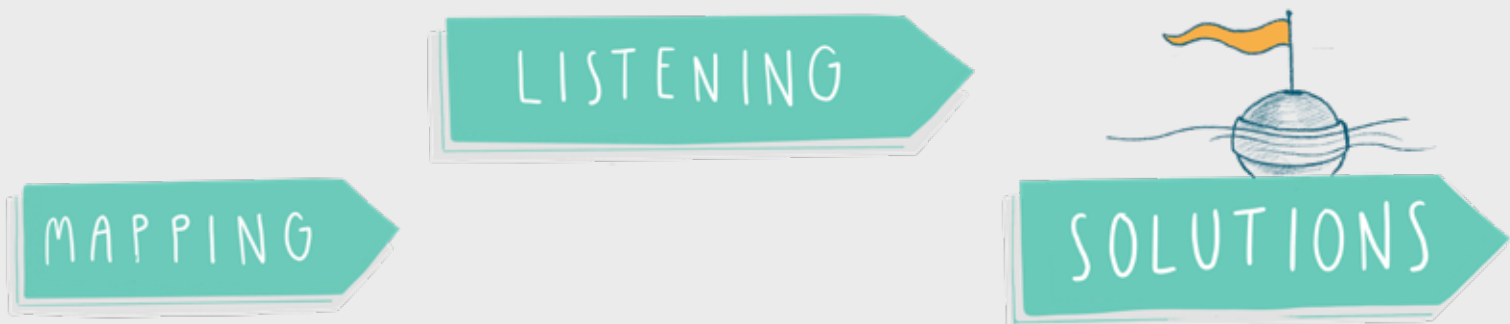
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Executive Summary

The People's Transition describes a model for participative decision making that is intended to enable a community to benefit from the transition to a zero-carbon society. It aims to design climate solutions that give local people and communities ownership of assets of transition and thus enhance public support for climate action by tackling inequality and raising standards of living.

The Ardara People's Transition began in March 2021. The intention of the project was to listen to, and learn from, the community's needs and abilities in Ardara and then attempt to design a number of climate solutions that would benefit the community and address a number of the main development priorities of the community.



The project had three phases. The first phase was the Mapping Phase. The mapping phase aimed to build a picture of the Ardara community, outlining a geographical scope for the project that represents the people who live there. The key was understanding how people within the community could be included by assessing who was at greatest risk of being excluded. In addition to demographics and circumstances, the area was studied to understand the distribution of institutions and organisations, such as schools, churches and community groups, that play a significant role in the locality.

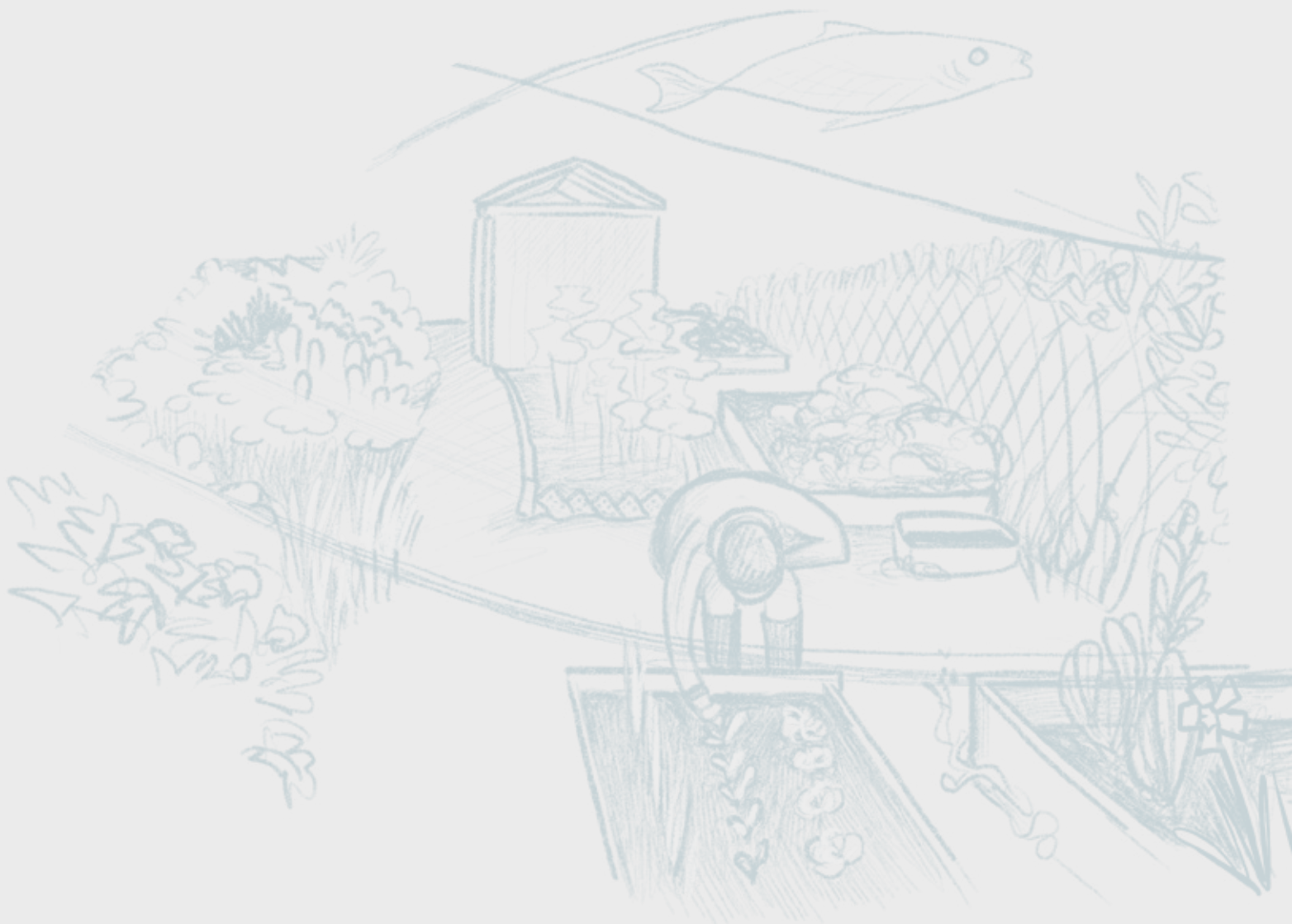
The mapping phase informed the roll out of the second phase – the Listening Phase. Because of complications caused by the COVID-19 pandemic, this phase had to be designed without significant public gatherings. This ruled options such as deliberative mini-publics or other representative gatherings. Instead, community rapporteurs were deployed to engage with various cohorts across the community and gather inputs on community needs, priorities and strengths. Young people were engaged too, through an art competition on the theme of inclusivity, and smaller focus groups were convened. As the Listening Phase came to an end, a survey was sent around the community to ground truth the findings and ensure that the emerging picture of the community was correct.

The community highlighted the need for good jobs, with a need for a greater focus on sustained employment within the community as well as more local apprenticeships and traineeships. Participants also spoke about the need for enhanced local democracy, and the need for the community

to have a greater say in decisions that impact upon their lives. The importance of the traditional industries to the area was highlighted, with many in the community hoping to see a revival in local enterprise. The community also spoke about the need for better connectivity, both physical and digital, the lack of sufficient housing provision, the importance of inclusion of women, young people and the older members of the community and addressing issues of isolation.

Based on the listening phase, the TASC team worked with experts in an array of fields to identify and substantiate viable climate solutions that would address local needs and build on the community's strengths. After deliberation the two proposed solutions were a cooperative biochar facility and a large-scale indigenous seaweed farm with the community benefitting from a 30% profit share. The rationale behind these proposals were the opportunities for community wealth building, the potential for enhanced local employment opportunities and the links to existing local industries and livelihoods.

When the community came back together to discuss the solutions there was significant enthusiasm for the biochar cooperative and a tepid reception for the seaweed farm. The community saw the biochar cooperative as a manageable scale and something that could be advanced quickly but were concerned about the scale of the seaweed farm and uncertain regarding the long-term viability of their engagement with the enterprise.





1. Introduction

Tackling climate change requires urged and unprecedented action in communities all around the world. Given the interdependent nature of the crisis, if climate action is to be enduring, then it must be inclusive and equitable, ensuring that its burdens and benefits are shared throughout society. While the importance of inclusive climate policy seems to be widely understood, there are few tried and tested frameworks for the co-creation of climate policy in European communities.

The People's Transition (McCabe, 2020) attempts to address this. It is a participative decision-making model for climate action. It views climate action as an enabler of local development, giving people and communities ownership of the transition to zero carbon societies. The model, which was developed through extensive consultation with communities and organisations around Ireland, seeks to deliver a bottom-up approach to transition that builds local wealth, enables local ownership of climate action and empowers local people. It aims to tackle inequality and raise standards of living through the delivery of climate solutions, thus proactively building social approval, and demand, for climate action.

To transfer the People's Transition model into practice, a set of pilot projects were run in two

communities in Ireland. This report deals with the project undertaken in Ardara, a rural community on the west coast of County Donegal. Ardara reflects many of the issues of western seaboard communities in Ireland including the challenges faced by the fishers and farmers and the outmigration of its young population. As an active community with a strong social fabric and engaged local representatives. The People's Transition began in the community in March 2021 and ran until October 2021.

The project had three phases, leading to the co-creation of solutions that address the needs of the community. First, a mapping phase made use of existing geographical and census data to outline the groups of people that live in the community, giving particular attention to vulnerable groups and identifying challenges and opportunities for climate action. This information was used to design a listening phase, through which the TASC team engaged directly with the community to understand the needs and priorities of different groups and individuals.

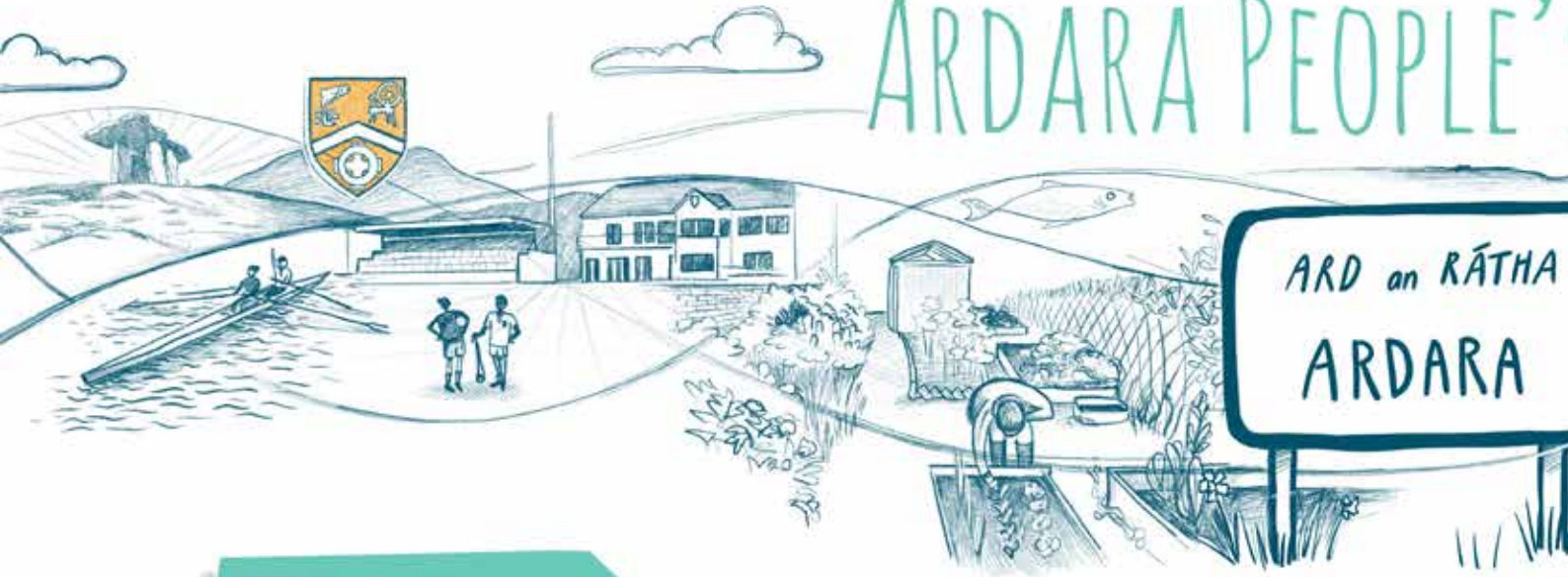
The solutions outlined in the report are the result of thorough analysis of community needs and priorities identified in the mapping and listening phases. In response to the call for community led climate action laid out by the People's Transition, the solutions have been co-designed with experts and the Ardara community. The solutions developed are a biochar cooperative and a seaweed farm with a community profit share. Both solutions provide opportunities for employment, while the biochar cooperative links additionally with local agriculture, and both projects have ties to cultural heritage.

These specific solutions are designed to meet the need for climate action whilst also being realistic and beneficial for the Ardara community. They provide a blueprint for how the People's Transition Model might be applied in a specific context.

This report presents the findings of all three phases in a narrative which aims to take the reader through the People's Transition process to illustrate why it is important to consider climate action from a people or community centred approach. By listening first, and ensuring that all voices are heard, it is hoped that climate action will benefit from greater social approval and thus will be in higher demand.



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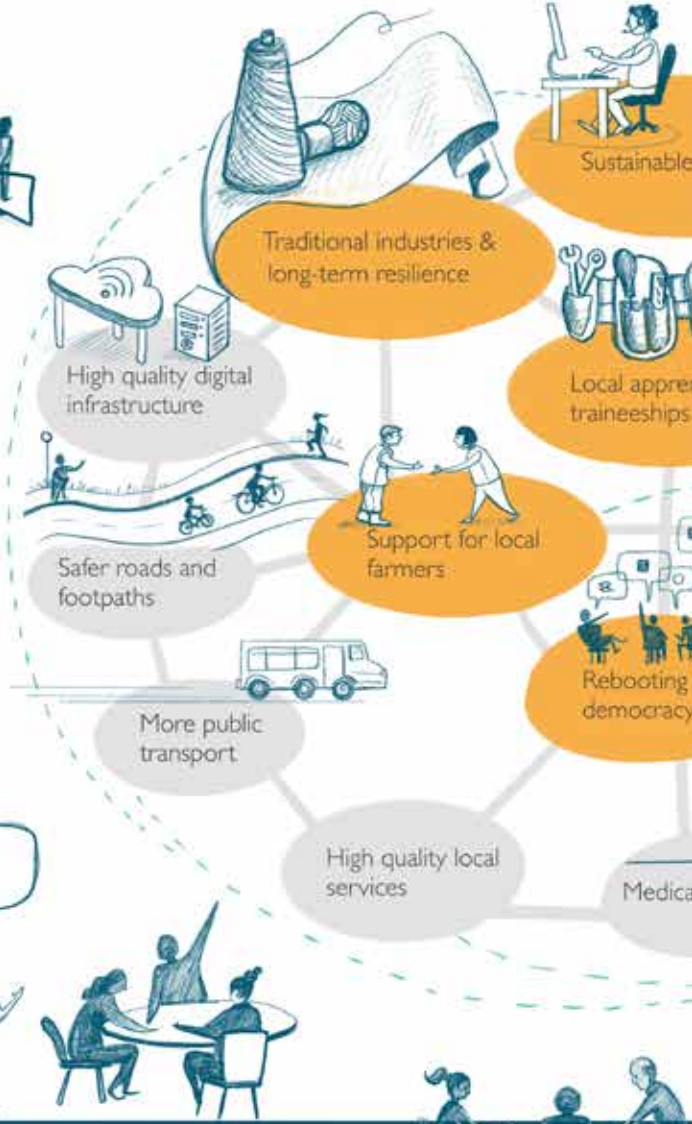


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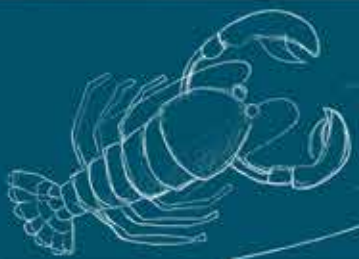
MAPPING



LISTENING



BUILDING WEALTH IN OUR



S TRANSITION



SOLUTIONS

quality jobs

apprenticeships &

local

facilities

More recreational amenities

More community spaces

COMMUNITY WEALTH-BUILDING creates RESOURCES for LONG-TERM USE



15km² 30% PROFIT SHARE SEAWEED FARM

Income
Up to €5m annually when fully operational.

CO2 Sequestration
22,500 tonnes per year

Local Economy
New business opportunities

Environmental Benefits
Improving soil
Converting waste into a resource
Sequestering CO2

Energy
Potential heat and energy generation

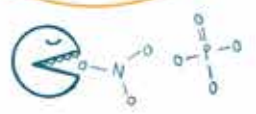
Community owned and led

Job creation
Up to 100 direct jobs
100- 150 jobs downstream.
Mix of skills across engineering, marine biology, operations and maritime.

Marine Ecosystem
Seaweed farms act as a shelter for juvenile species of fish.

Absorbing excess nitrates and phosphates and supporting biodiversity

Local Economy
Indirect benefits e.g. to service sector



COMMUNITY



Key Terms

Climate action

Political, collective and individual action on climate change can take many forms. Climate action means stepped-up efforts to reduce greenhouse gas emissions and strengthen resilience and adaptive capacity to climate-induced impacts, including climate-related hazards in all countries; integrating climate change measures into national policies, strategies and planning; and improving education, awareness-raising and human and institutional capacity with respect to climate change mitigation, adaptation, impact reduction and early warning. There are other challenges that intersect climate action and environmental protection such as enhancing biodiversity and improving water quality.

Community Wealth Building

Community wealth building or local wealth building is a new people-centred approach to local economic development, which redirects wealth back into the local economy, and places control and benefits into the hands of local people. Community wealth building is a response to the contemporary challenges of austerity, financialisation and automation. It seeks to provide resilience where there is risk and local economic security where there is precarity.

Anchor Institution

An anchor institution is one that, alongside its main function, plays a significant and recognised role in a locality by making a strategic contribution to the local economy. Anchor institutions generally have strong ties to the geographic area in which they are based through invested capital, mission and relationship to customers and employees. These institutions tend to operate not-for-profit. It is much simpler for private businesses to move, so there is no guarantee they will continue serving the local community in the long-term. However, there are examples of for-profit organisations playing the role of an anchor institution.

Local Development

Local development is the identification and use of the resources and endogenous potentialities of a community, neighbourhood, city or equivalent. The local development approach considers the endogenous potentialities of territories. Economic and non-economic factors influence local development processes. Among the non-economic factors, social, cultural, historical, institutional, and geographical aspects can be decisive in the process of local economic development.

Sustainable Development

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development calls for concerted efforts towards building an inclusive, sustainable, and resilient future for people and planet. For sustainable development to be achieved, it is crucial to harmonise three core elements: economic growth, social inclusion, and environmental protection. These elements are interconnected, and all are crucial for the well-being of individuals and societies.



MAPPING

2. Phase I: Mapping phase

The mapping phase aimed to build a picture of the Ardara community, outlining a geographical scope for the project that represents the people who live there. An area was mapped to include the anchor institutions, such as schools, churches and community groups, that play a significant role in the locality. These institutions are important since they make a strategic contribution to the local economy and society on a long-term basis (McCabe 2020). Identifying key actors and community leaders in various fields allowed for the inclusion of the groups associated with them in the project, helping the TASC team to connect with the community and identify their needs and priorities.

Ardara, as with many rural towns and villages, does not have a significant density of anchor institutions. However, there are a high number of active organisation and community focal points that were identified, including Iniskeet Hall, the Dolmen Centre, Sandfield pitch and putt, Ardara GAA, Loughros Point rowing club, the national schools, churches, pubs, Garda stations, the post office and health centre. This information gave an idea of some of the places where the community is already meeting, and institutions that might be involved in a plan for community-led climate action.

More detailed information was gathered from the area using census data. This allowed for an assessment of potentially underrepresented groups so that inequalities in participation could be better addressed during the listening phase. The mapping phase also helped to identify potential barriers that people might face to participate in climate action. On the flip side, opportunities for

engaging in climate action were identified, with information collected on resources available to the community that might strengthen the project.

2.1 Community data

Data from the most recent census was utilised in the mapping phase. It should be noted that this data was gathered in 2016 and there may have been changes since, especially in light of the Covid 19 pandemic. The census showed a notable decrease of the population aged 19-39, indicating a high level of out-migration among young people. The highest proportion of people are in the 50-69 age range, so the population is clearly ageing. Both the elderly and disabled populations of Ardara were taken into consideration when planning the listening phase, since it is crucial that vulnerable groups are engaged in community-led action. 15% of the population of Ardara have a disability and 5% are carers, with both groups having specific needs to participate in the project.

Most of the population work in manual skilled and non-manual labour, while 11% work in agriculture and around 20% are self-employed. A high proportion of the population have a secondary education, but one in five left formal education after primary level. It was also found that female members of the community held higher level educational qualifications than their male counterparts.

Connectivity was the final parameter taken into consideration in the mapping phase. Ardara fell slightly below the national average in terms of internet access, with one in four people having no internet connection, and over one in three having no access to a PC. While these figures have probably decreased since 2016, a lack of connectivity is likely to have been a barrier to participation in the project, in addition to other aspects of community life, during the Covid-19 pandemic.

The mapping phase highlighted information that was the foundation of the listening phase. An understanding of the community dynamics, vulnerable groups and demographic data, allowed TASC to design a listening phase that was inclusive and built on existing community relations and social fabric. This listening phase set out to understand the needs and priorities of the community, thereby taking steps towards identifying suitable community-led climate solutions to meet societal needs.



LISTENING

3. Phase II: Listening Phase

The Listening Phase was designed to foster trust, gather knowledge and build capacity whilst identifying community needs and priorities. A communications plan was developed to bring attention to the People's Transition project, increasing engagement in the listening phase, and informing the community of the outcomes of the project. A Young Voices Challenge art competition was organised to ensure that the young people were heard first. They were asked to create drawings representing how they would like to see the community improved.

The announcement of the Young Voices Challenge awards served as one of the first moments to bring attention to the project, and a press release was published to inform the community of the listening phase. Radio stations were invited to interview the TASC team and the local community guides about the potential of the project for Ardar.



Because of complications caused by the COVID-19 pandemic, this phase had to be designed without significant public gatherings. This ruled options such as deliberative mini-publics or other representative gatherings. Instead, based on the information gathered in the mapping phase, the TASC team laid out three key steps to establish community dialogues in the listening phase that would not require large gatherings. Through each of these processes the scale of participation widened, and the representation of local people deepened so that a true reflection of the community could be garnered.

First, the team worked with local rapporteurs in Ardara to ensure the involvement of groups of people that might not typically have their voices heard. In particular, two rapporteurs worked closely with elderly people living alone or in sheltered accommodation. This was especially important since Ardara has an ageing population and many carers.

At the outset of the listening phase, the TASC team were able to host virtual coffee mornings and after dinner discussions with community guides to check their findings and ensure that planning for the remainder of the project was well-grounded.

As well as community guides, the TASC team was able to establish relationships with community stakeholders including the local development company, the family resource centre, primary schools, the community garden, the GAP (Glenties, Ardara, Portnoo) heritage group, and other local actors. Furthermore, there was a high level of participation in the previously mentioned Young Voices Challenge, where children submitted artwork to represent ways that their community could be more welcoming and inclusive. Art was a creative means of engaging with young people that allowed them to express their views, ensuring that as many voices as possible were heard.

The second stage of the listening phase involved interviews and group discussions with community members. These were initially remote to adapt to Covid 19 restrictions. A visit to Ardara was eventually possible in June and, with the support of the staff of DLDC, individual interviews were conducted with people who were at a distance from the labour market and availing of social employment schemes such as Tús, CE and RSS. Informal chats were also conducted with people who had been made aware of the project through social media and other project communications. These discussions also allowed the TASC team to engage with stakeholders like businesses and sports clubs.

The first two stages of the listening phase then led into the third, which was a survey. The purpose of the survey was to check the findings from listening to community members about the key issues identified. The survey was digital but distributed as widely as possible with support from community guides and worked to bridge any digital divide by supporting individuals who might not otherwise be able to participate.

Political support is essential to ensure that a final community-developed climate action plan can be implemented. A political engagement plan was ongoing throughout the project, with TASC staff hosting regular meetings with decision makers to ensure they were aware of and engaged with the opportunities presented by the People's Transition project. An outdoor event held in June was aimed at discussing the challenges, needs and opportunities related to the capacity for the community to engage in climate action. Later, when the solutions had been co-created, an event was held in Ardara to present and respond to the solutions.

3.1 Challenges experienced

The COVID-19 pandemic severely altered the proposed plan for the People's Transition. The listening phase of the project would typically be centred around local citizens assemblies where a representative sample of the community would be brought together to deliberate over both the community needs and the proposed climate action. However, this was not possible.

A lack of engagement throughout the community was always a risk, given the pressures of the pandemic, Zoom fatigue and potential distrust of TASC, an organisation previously unknown to the community. However, this was not the case and the TASC team made it a priority to ensure that community members who did engage had a meaningful experience. Truly valuing the opinions of local people is a central tenant to the project, so it was crucial that the needs of the community were heard and reflected in the outcomes. This is especially important since there is a wider trend in Donegal of people feeling that their voices are marginalised in national decision making.



3.2 Who we heard from?

A total of 205 community members were engaged throughout the project. 147 responded to the survey, with smaller groups involved in direct conversations or as a group. A focus group of eight decision makers and community leaders was held face to face, and 20 elderly residents were engaged through the rapporteurs. Ten other community members were interviewed on an individual basis, including young people, a fisherman, returnees and out-migrants, women struggling with housing, long-term second homeowners, and tourism operators. Online conversations were held with business owners and farmers, as well as key interviews with members of the Social Inclusion and Community Activation Programme (SICAP).

3.3 What we heard?

3.3.1 Importance of place and a sense of community

The community of Ardara is the most valued aspect of the area for residents, with 54% of people citing it directly in the surveys. This extends to responses referring to 'home', 'friendliness', and

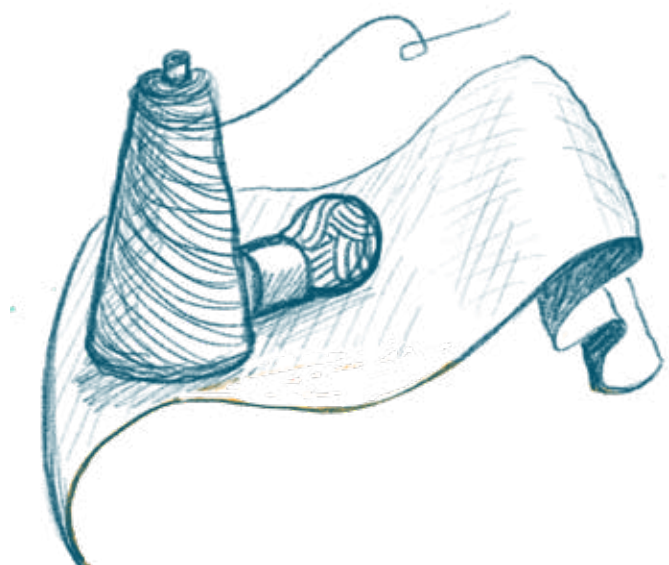
'people', as elements of the local area that are important to them. At the same time there is a significant diaspora that spreads to nearby counties and abroad. Several survey respondents noted that they had moved away for work or education, but still felt a strong connection to the community, heritage and the local area. This makes emigration a challenging decision that must weigh up community values against needs for education and employment. Several pandemic returnees pointed out their desire to stay and make Ardara home again and also expressed interest in assisting where possible with the success of the People's Transition projects.

"The town holds a very strong sense of welcomeness and warmth, but I feel Covid has strained that not only as families in the area but businesses, workers and town as a whole."



A sense of connectedness to the locality extends to the history and heritage of the area. Ardara was once linked closely to Killybegs through the fishing industry, with men and women working at all stages of fishing from preparation to selling. Tweed and knitwear were also important industries in the past.

"I think there is a great opportunity to look at industries from the past, and how to make them profitable, sustainable and create employment opportunities in the now."



Although there is a strong connection between community and place, there is motivation for change. The prioritisation of needs differed across groups and individuals but drove in the same overall direction. Ardara even has a history of early adoption of new technology – one resident shared the story of how the village didn't wait for rural electrification but rather bought a micro-hydro electricity generator. Such motivation is a great asset for meaningful participation in the project.



3.3.2 The importance of inclusion

Inclusion of all members of the community is essential to achieve societal benefits through equitable participation in the project. Residents of Ardara made it clear that isolation and inclusion were major issues, with 85% of participants in the survey addressing them as a high or pretty high priority. Inclusivity spans access to healthcare, disability access, support and inclusion for women, and local political participation. It also involves bringing marginalised groups in the community into decision-making processes.



Access to healthcare was an issue raised several times in terms of proximity to health facilities and the support available for carers, who feel isolated. Concerns were also highlighted around the accessibility of Ardara for wheelchair users, with 36% responding that they would feel more included in the community if they could access more community buildings and public toilets. The sense of scarcity in terms of services and amenities also extends to community spaces, with 84% of respondents strongly agreeing that Ardara needs more, especially those that serve marginalised community members.

Respondents identified the need for a youth hub for teenagers and young adults, with ideas gathered for a running track, library, gym and other facilities. There were discussions of amenities for children and parents such as parks and play areas, and for facilities to offer classes in activities and crafts like knitting, painting, and pottery. An idea was presented for pairing up young and elderly people in the community, giving both groups' opportunities for building relations and keeping cultural heritage alive.

There was a prominent discourse of isolation for stay-at-home mothers, women with young children and carers. This leads to exclusion from local society and significant barriers to attaining leadership positions in the community, despite women having a generally higher level of education.



The need for a space where mothers could meet to socialise with their children was put forward as a possibility, as well as an initiative to empower women through educational classes and courses led by women from various backgrounds and age groups.

“There is a need for more support for women in the house, in the home who feel isolated and forgotten.”

Barriers to participating in local politics were not limited to women, with many respondents raising the need for a community council that would localise decision making. Of the people who took the survey, 39% said that they wanted to have a voice in local democratic community forums. There was also an emphasis on young people being a part of this process, which should be built around transparency and accountability in decision making, according to respondents.

3.3.3 Building local opportunities

The importance of including young people in community life has been highlighted already, but it is rooted in a need for better opportunities that make Ar dara desirable in terms of employment and housing. In the surveys, 57% of people said that access to a good job was a high priority. People want these opportunities to be locally focused with 60% agreeing that locally sustained community employment is needed and 61% strongly agreeing that there was a need for more local apprenticeships and traineeships. Furthermore, there was an interest in revisiting traditional industries that had once thrived in the area, inviting opportunities for resilient forms of employment rooted in cultural heritage.

“I think there is a great opportunity to look at industries from the past, and how to make them profitable, sustainable and create employment opportunities in the now.”

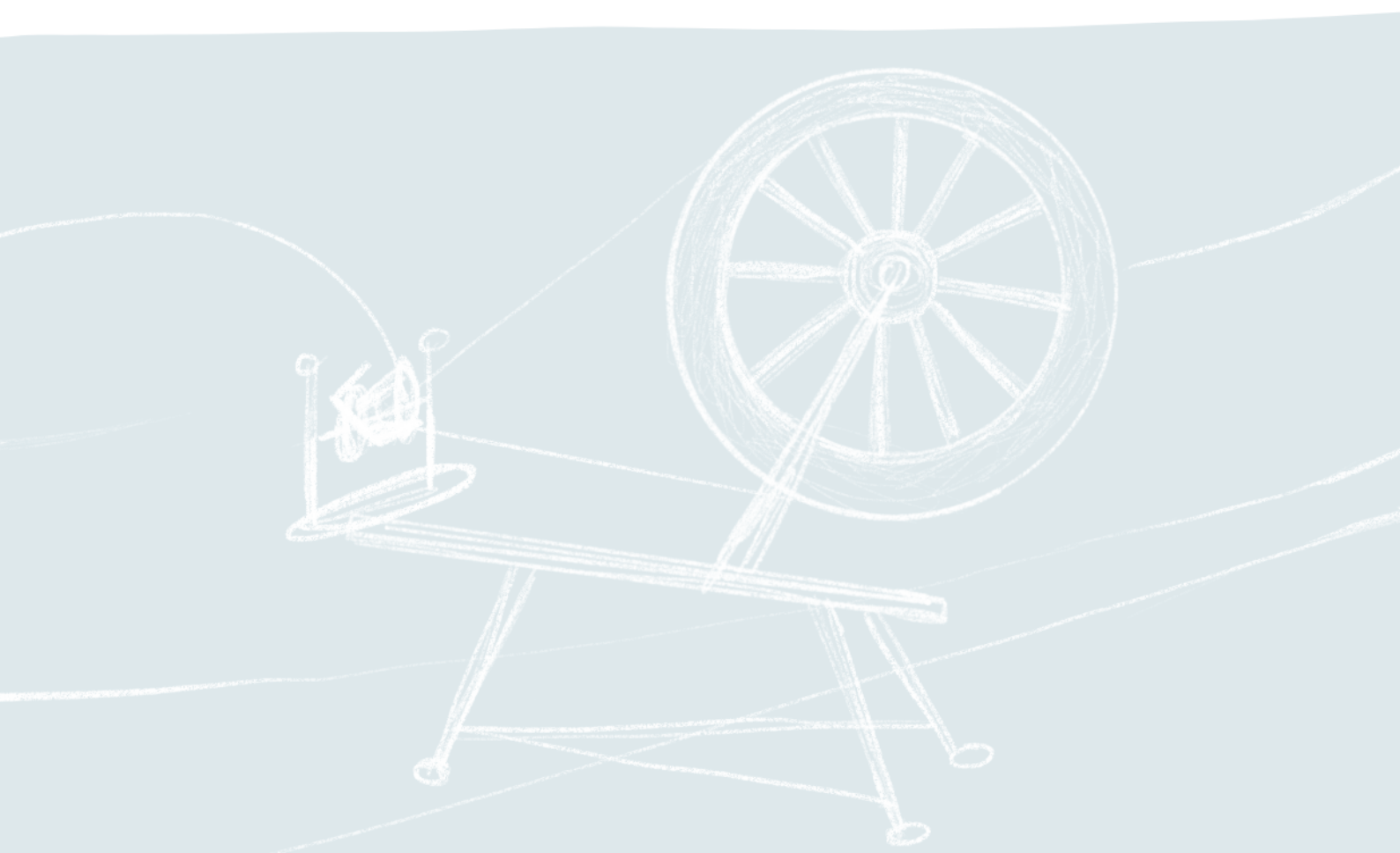
Throughout the listening phase, housing was raised as a community issue. Access to good housing was a high priority for 36% of people and a high priority for 32%. The high proportion of holiday home rentals in the area was a concern raised by many residents, with 24% strongly agreeing that they have difficulty finding long-term rentals in the area.

“Local people that contribute to the local economy cannot compete with urban holiday home purchasers.”

As well as attaining housing, many residents find it difficult to keep up with the costs of maintaining a home. Electricity and heating bills are unaffordable for 27% of people, with 33% saying that their home is difficult to keep warm. Furthermore, 52% of respondents stated that they want to make home improvements but cannot afford to.

“I have recently taken on a mortgage. It is terrifying and I have had to work very hard. I am just grateful I am able to work.”

Housing for the elderly was also highlighted as an issue, with 36% agreeing that access to sheltered housing is a challenge that they face. Respondents also said that sheltered housing is important so that people can stay in the area as they age, rather than having to move away to seek care.



3.3.4 Improving connectivity

The quality and safety of transport infrastructure was a concern for residents, with 69% strongly agreeing that safer road facilities were necessary in the area. The need for safer footpaths, green walkways and cycleways was brought up frequently. Respondents noted the need for better public transport infrastructure, with 38% strongly agreeing that this was a priority. In addition, there are issues around digital infrastructure, with 76% strongly agreeing that there needs to be better access to reliable internet. This emphasises the finding in the mapping phase that one in four people has no internet access.



3.4 Participation informed the development of solutions

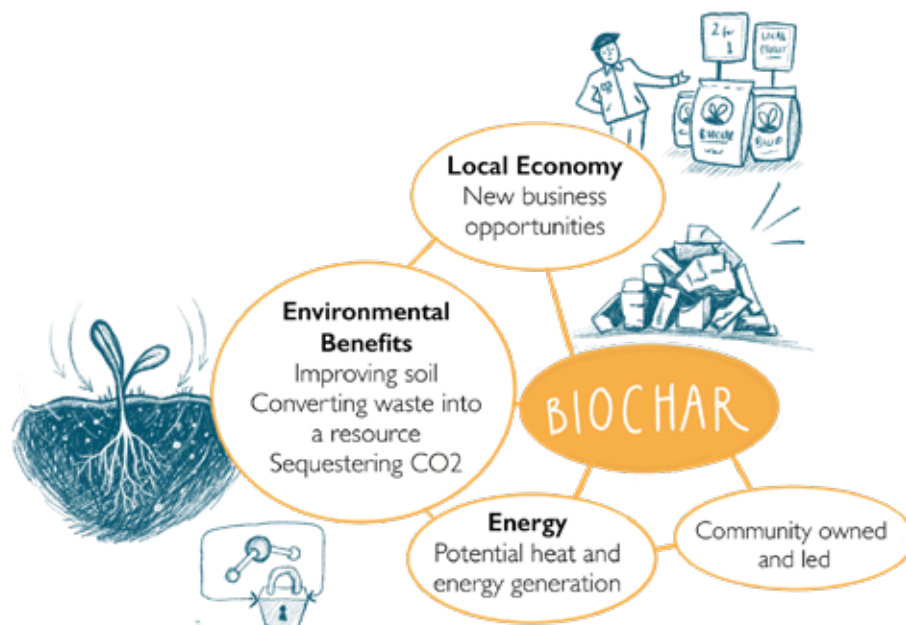
A strong sense of community is what residents value most of all in Ardara. This depends upon people feeling comfortable in their locality and being actively engaged in the local economy and society. The results of the listening phase present a desire among people to be engaged in building a community that can support its marginalised groups and cultivate a democratic society where the voices of everyone are creating the change that they need.



4. Phase III: Solutions Phase

Drawing from information gathered during the mapping and listening phases, TASC was able to formulate a set of solutions for climate action that meets community needs and priorities. The need for more employment opportunities was addressed through two proposals: a biochar cooperative; and a seaweed farming business with a community profit share. Both of these solutions also have the potential to reinvigorate the cultural heritage of Ardara, with links to the fishing, seaweed harvesting, and textiles industries. They provide opportunities for climate action, with biochar offering a means of storing carbon, and seaweed farming acting as a carbon sink.





4.1 Solution 1: A Local Biochar Cooperative

Carbon is an essential element for all forms of life on earth. It is in a constant state of movement between plants and animals, the soil, water and sky by a variety of processes including photosynthesis, respiration and the burning of fossil fuels. Plants absorb carbon from the atmosphere, in the form of gases like carbon dioxide, using it to build leaves and stems. It is transferred to animals when they eat plants and into the soil when plants and animals die and decompose. The balance of the carbon cycle is naturally maintained to support life on earth, but the burning of fossil fuels has disrupted this balance. Combined with other human activity like intensive farming and deforestation, the burning of fossil fuels has led to climate change and ocean acidification.

Biochar offers an opportunity to store carbon in the soil in the long-term whilst having benefits for agriculture and community enterprise. Biomass which is not used in animal feeding occupies a large area of agricultural land in Ireland, and this can be converted along with other sources of biomass to create biochar.

4.1.1 What is biochar?

Biochar is a solid carbon-rich material produced by pyrolysis, which is the burning of solid biomass in conditions where oxygen is not present. It is similar to the process by which charcoal is produced. The biomass that is burned could be from any number of sources, including crop and forestry residue and organic waste from industry. In agriculture, considerable expenditure is made in the control of plants such as rushes, bracken, hazel and heather (Government of Ireland 2019). This is a potential source of biomass in Ireland. In addition to solid biochar, liquids and gases are produced during pyrolysis that can be used to produce energy that feeds back into the pyrolysis machine. This makes it largely independent from external energy sources.

Biochar has the potential to store large quantities of carbon that have been removed from the atmosphere by plants, thereby contributing to climate change mitigation as well as environmental management. It also has applications in agriculture with benefits for crop yields and animal health.

4.1.2 Uses of biochar

The majority of biochar applications are in agriculture or forestry, especially as a soil additive. Whilst not a direct substitute for fertilizer, it can improve the efficiency of fertilizer by preventing runoff. It has a liming effect that changes soil pH, as well as stabilising soil structure so that it retains water better. Biochar also affects soil microbes and emissions of greenhouse gases from the soil.

In horticulture, biochar can be used a growing medium to replace peat. It can also be produced from old growing mediums, thereby closing the cycle of growing material production and use. In forestry, biochar can be used in re-planting, meaning that the residue from felling can be repurposed to help the growth of new trees. Biochar has also been shown in some cases to act as a preventative against ash dieback, a disease that has been leading to the loss of native ash trees throughout Ireland.

Biochar can be used as bedding for animals, as well as in the management of slurry and to improve nutrient cycling and reduce emissions. It can even be used as a food additive for cattle to reduce emissions of methane, thereby providing additional benefits for climate change mitigation.

Due to its chemical stability, biochar has been shown to have wider environmental benefits, such as in contaminated land management, agricultural runoff management to prevent contamination of water courses, wastewater and drinking water treatment. Each of these applications requires a specific biochar type dependent on the target application or contaminant to be managed. In addition, biochar can be used in building materials, including concrete and tarmac, thereby reducing the need for other more extractive materials to be used whilst creating long-term carbon storage in roads and buildings.

4.1.3 Community biochar facility

Biochar can be produced using a wide range of technologies, from the simple setups used in traditional charcoal burning, all the way through to fully automated processing plants that produce biochar, fuels and chemicals as well as heat and electricity. The scale of a biochar project can therefore be adapted to meet the needs of the local community and match the capacity for finance and labour that the community is able to invest.

Traditional biochar processes use lump wood as a biomass feedstock and heat it by burning some of the wood before sealing the whole batch in a container, like a drum or even a shipping container, or in an earth or brick kiln. The biomass is then left to char for a number of days. This method



can be set up quickly and moved from site to site since the installation is not permanent. It also requires very little financial investment or skilled labour.

The traditional charring process does have limitations, since the biomass feedstock is usually restricted to larger pieces of wood. Use of non-woody biomass is uncommon, reducing the breadth of materials that can be used from agriculture and industry. Due to the lack of control mechanisms, the quality of biochar produced can vary. While this is not usually an issue for charcoal that is going to be used for burning, it is an important aspect to avoid contamination of biochar for soil and environmental applications. Traditional processes also lack mechanisms for dealing with emissions and effluent from charring, leading to the release of noxious gases to the atmosphere and the leaching of contaminants into the soil.

Alternatively, industrial pyrolysis units allow a continuous flow of materials where biomass is fed in at one end and biochar extracted from the other end. Since they are more complex, pyrolysis units require skilled labour but with less manual work involved since the system is automated. This automation also allows the process to be controlled, resulting in better and more consistent production of biochar. Continuous pyrolysis units are also flexible in terms of biomass feedstock that can be processed, ranging from woody biomass such as woodchips and sawdust to straw, husks, sludges and pellets. These systems also have a better environmental performance due to emission management systems that treat gases and liquid effluents, often using these to produce energy that powers the system.

4.1.4 How does it work?

The first component of a biochar facility is biomass handling, which includes delivery, on-site storage, handling, pre-processing and feeding into the pyrolysis reactor. This is an easy component to underestimate leading to operational issues in biomass feeding. The process needs to be

designed for the specific types of biomass to be used according to their requirements.

Once inside the reactor, the biomass is heated by hot steel walls as it is moved along the length of the reactor by an auger – a rotating metal shaft with a spiral that moves the biomass along. The biochar that exits the reactor is then cooled by either a water jacket or by spraying it directly with water, all within the enclosed system and in the absence of air. Once cooled, the biochar can be stored in closed containers or bags. Since biochar is a flammable material, precautions must be taken in the storage process.

Pyrolysis vapours and gases are separated and can either be directly combusted in a combustion chamber to produce energy for the reactor or be condensed into liquid form and further processed to produce chemicals and fuels.

4.1.5 Potential Market and Primary Product

The biochar industry is in the first phase of a product lifecycle – the market introduction stage. During this phase, costs are very high and sale volumes slow to start. While competition is generally low, so is demand. In essence, demand must be created, which will require educating the potential consumer base to try the product and then working to retain them as a customer.

For the community in Ardara, scaling a smaller production model to a larger one is likely required if a biochar business is to be profitable, although at that point, the cooperative would risk attracting competition. This would be considered the growth stage in a product life cycle. Production costs will decrease, but due to potentially increased competition, so would prices.

There are two basic ways to market a biochar soil amendment product: 100% pure biochar that needs to be measured and mixed with other fertilizers by the consumer and biochar compost/fertilizer mixes, which are formulated to meet specific soil amendment needs. These approaches have pros and cons associated with them. There is a potential extra climate co-benefit to the latter as an effective alternative to peat-based compost which is to be phased out if peat bog restoration is to be successful.

Model A: 100% pure biochar

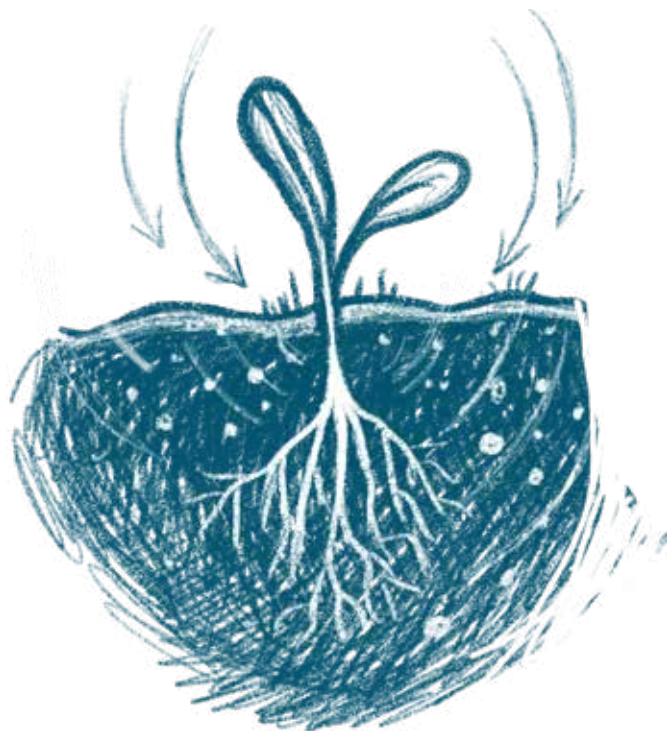
- Less costly to produce, but sold at a lower price point
- Geared towards the “educated” consumer
- Can be sold in bulk
- Delivery from Ardara to other parts of the country could be costly

Model B: Biochar Compost/Fertilizer Mixes

- More expensive to produce, but can be sold at a higher price point
- More convenient for the “less educated” (home gardeners)
- Offers more options for expansion of product lines
- Delivery from Ardara to other parts of the country could be costly

Biochar and Ash Dieback

Ash dieback (*Hymenoscyphus fraxineus*) commonly known as Chalara is devastating Ash trees all over Europe and this has a major potential to disrupt so much in nature. This disease causes leaf loss, crown dieback and will eventually lead to the death of Ash trees. In Ireland, ash dieback has forced the importing of ash for the manufacture of hurleys. Efforts to become self-sufficient in ash for hurleys were scuppered by the disease and today over 75% of the required ash is imported (GAA, 2016). Biochar might offer a hope of fighting back against the fungal infection. Research being conducted into the genomes of Ash, to develop a breeding program of resistant trees and this includes investigations to substantiate anecdotal evidence that using biochar soil amendments to manage ash die back (Carroll, 2020).



4.1.6 Market and Business Model

The biochar market in Ireland, both north and south, is considered as being in a nascent state (IrBEA, 2018), with very little commercial activity having been undertaken therein to date. However, there has been a significant degree of activity carried out in terms of research, technology and stakeholder representation, such that the sector could be described as being on the cusp of expansion, albeit requiring certain activities and developments to stimulate the market.

Globally, biochar production is increasing year on year, as awareness of and demand for biochar grows, with the global market in 2015 being quantified at 85,000 tonnes. A market size of 8,000 tonnes in Europe is also estimated and, suggests a European biochar market value of €14 million (IrBEA, 2018). The activated carbon demand in Ireland is estimated at 1,275 tonnes per annum and a market value ranging from €2.8 million to €3.7 million (IrBEA, 2018).

It is proposed that a cooperative model would be best suited to developing a biochar business in Ardara. This is seen as advantageous because distributed community shareholding can help to mitigate initial pressures and distribute to enhance community wealth building. The structure would both encourage shared responsibility and address key concern identified during the listening phase such as rebooting local democracy and providing the community a collective climate action. Furthermore, the community has built up experience in similar ways of working through the Dolmen Centre.

There are two potential operational models which could be charted in order to better understand the growth of a biochar model in Donegal. The first is estimated off existing demand, which is low, and thus provides for a much smaller operation. This could be a potential starting point for the development of the cooperative. The second model assumes biochar products become a viable alternative to peat-based compost. This much larger cooperative offers some sense of the growth potential of the business.

Please note, with both solutions, the numbers provided in this report are estimates based off limited available data, both on local conditions and required resources. A complete feasibility study would be required before embarking on either solution.

4.1.6.1 Business Model A: Demand Model

As stated above, the annual sales volume for this scenario is based on current industry demand. If we assume an annual sales volume of 5,000 kg of an artisanal, high-value biochar organic fertilizer for potted plants, (0.5kg currently retailing at between €10 and €25), we could estimate a potential annual sales of approximately €75,000. It is estimated that this scenario would require approximately 70 working days per year and would provide positive net income in year 1.

Initial financing of approximately €20,000 would be required to offset the capital equipment cost. The operating equipment used in this scenario utilizes sets of steel drums as well as other machinery like a woodchipper, bagger/labeller, website development and vehicle and trailer. Input costs would vary depending on the availability of quality biomass and the other potential inputs into the fertilizer mix.

This scenario provides approximately 9 tons of carbon sequestration per year. Unfortunately, this scenario provides limited social benefits, as the low annual sales cannot support the justification for paid employees. Operated as a cooperative, however, it might provide supplementary income for members or provide the basis of a model that could be scaled over time to be a much more significant operation.

4.1.6.2 Business Model A: Peat Alternative

The Irish Horticultural industry employ's approximately 6,600 full time workers, a further 11,000 workers in value added and downstream businesses and produces €437m in farm gate value and a further €239m in exports. The industry is heavily reliant on peat as an input and now requires safe,

effective and low emissions alternatives. It is very possible that biochar, with other inputs, could provide this alternative (Tosca et al, 2021).

For a proposed cooperative in Ardara, this could offer a significant opportunity. However, a comprehensive feasibility study would be required in order to fully understand viability. Much would depend on the extent of the available feedstock, the access to necessary markets and the potential for tie in with carbon abatement efforts such as sequestration credits.

Industrial scale pyrolysis units typically involve continuous processes, where biomass is fed at one end and biochar is extracted at the other end of either a horizontal or vertical reactor, but batch or semi-continuous (several batches run in series) designs are also possible.

The cost of the pyrolysis process, based on currently available units) with auxiliary systems (without site and services) is likely to be in the range of € 400,000 to over € 1, 000,000, depending on scale and level of automation (cheaper alternatives may be available if buying secondhand plants). The OpEx for this type of biochar plant will depend on the specific configuration, level of automation as well as mode of operation, i.e., single shift or multiple shift operation.

In terms of efficiency and productivity, three shift (24/7) operation is ideal as it minimises unit downtime as well as potential issues related to thermal cycling of the equipment as it is frequently heated up and cooled down, but this may not be suitable for many settings, where single shift operation would be preferable.

There are multiple advantages of such advanced production processes, including:

- a) possibility of automation – this reduced demand on labour and creates skilled jobs opportunities, as well as enables better process control
- b) better product quality control – with improved process control comes also better quality of products and its consistency within and among batches
- c) better environmental performance – this type of process units is equipped with emission management systems to treat gaseous emissions as well as liquid effluents to prevent any environmental contamination and to comply with relevant regulations. Due to the self-contained nature of the processes, manual handling of materials by operators is minimised and therefore so is their potential exposure to dust, fumes or noxious gases.
- d) Higher feedstock flexibility –continuous pyrolysis units are quite flexible in terms of



biomass feedstock that can be processed, ranging from woody biomass, such as wood chips and sawdust, to straw, husks, sludges and pellets/briquettes.

Furthermore, a larger market share, or indeed just a larger horticulture market, would open the door to enhanced community benefit and greater community wealth building potential. This in turn would create opportunities to address other challenges identified by the Ardara community during the listening phase.

4.1.7 Community benefits

A biochar enterprise in Ardara has the potential to benefit existing agriculture as well as creating new enterprises that provide jobs in the area. This would be a response to the need for employment that was highlighted in the listening phase, with between three and ten people needed to run the facility depending on its scale. It is very feasible that the cycle of feedstock and product is kept local, thereby creating a local circular carbon economy. This would be a significant achievement in terms of the People's Transition model, building community wealth through local economic development that redirects both products and profits into the local economy.

“By working with our farming community, working with people locally, the benefits can be kept local – something that can be used by people we all know in the community.”

Thomas Pringle TD, at the People's Transition launch event in Ardara.

As well as a standalone biochar production facility, an integrated process linking the plant with other enterprises is possible, thereby sharing facilities and expanding job creation. Some options include sawmills, anaerobic digestion plants, wastewater treatment, or even electricity production.

4.1.8 Potential support

Establishing a biochar facility in Ardara will require a feasibility study that leads to the design of a viable business plan. Such a project could provide a strong fit for the Innovating Communities initiative currently being conducted under LEADER and Project Ireland 2040. The project is both a local development project and a viable climate action project and so should be a fit for funding under LEADER, the Rural Regeneration and Development Fund, or as a Community Development Programme. Alternatively, it could be supported by the Community Climate Action Programme or the Climate Action Fund.

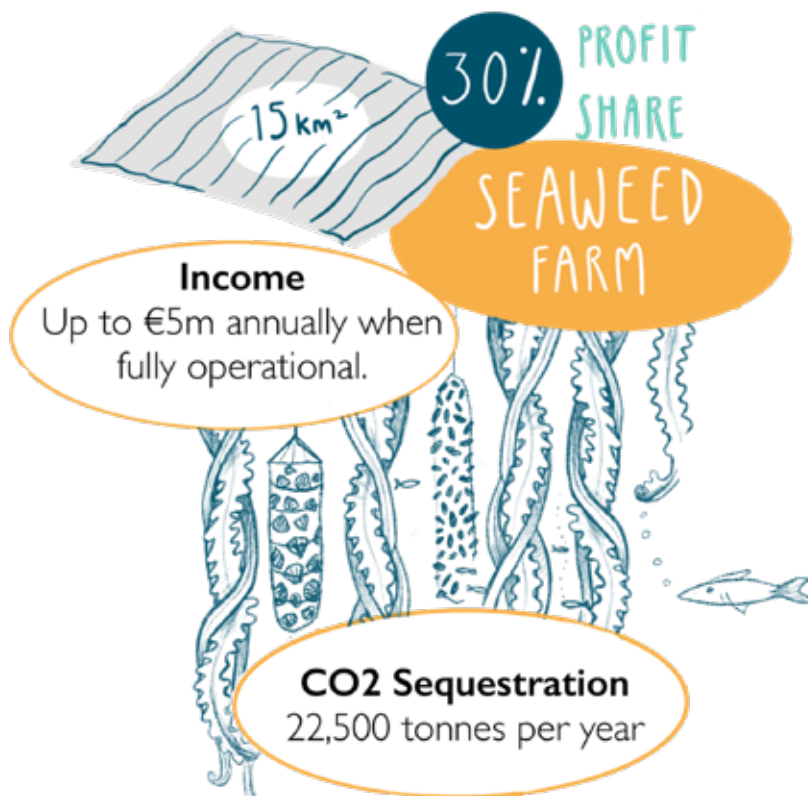
The Donegal Local Development Company can potentially assist with setting up a community enterprise, providing support with governance through writing strategic and financial plans. They can also facilitate training, assist with marketing where needed, and source sustainable funding for



the project. Innovating communities is another organisation that aims to support communities by creating a local approach to tackling climate change. They offer training courses for communities that cover topics from setting up social enterprise to providing youth services.

More specifically, the Irish Biochar Cooperative in Tipperary can assist with training and certification for biochar projects. They also provide a marketing and distribution service either under their brand or that of an independent producer. This could be useful if the Ardara biochar project were to look at selling its products outside the local area. The cooperative can also provide local processing services for feed and silage additive products from biochar, with a strong foundation of research to build upon.





4.2.1 Solution 2: Seaweed farming

As an island nation, Ireland has always had a close relationship with its seas. Bronze age middens mark the sites of coastal foraging for oysters, winkles and limpets, and by the mid-16th century, Irish ships were fishing in the North Atlantic. Irish livelihood and culture are inextricably linked with the sea, but through time our means of engaging with it have become increasingly extractive. Globally, over 30% of fish stocks are overexploited, while almost 60% are at their maximum levels of exploitation. Other kinds of marine exploitation, like drilling for oil and gas, are unsustainable due to limited reserves and their contribution to climate change. Pollution from oil spills, plastic waste, fish farming and runoff from agriculture, are all being recognised as growing concerns in the marine environment.

While 70% of the world's surface is covered by water, 98% of all food energy comes from land. Farming in the sea is becoming a growing trend worldwide as governments and businesses begin to prioritise growth in what is becoming known as the 'blue economy'. There is an opportunity for communities to take ownership of their coasts and develop sustainable enterprises that have benefits for tackling climate change in parallel with social priorities.

As part of the Ardara project, TASC worked with Sustainable Seaweed Ltd to draw up a blueprint for what a seaweed enterprise might look like in the case of the community partnering with a private business for a profit share aimed at community-led local development. Seaweed is easy to cultivate since there are suitable species for all manner of temperatures and depths. Farms often

us thick lines suspended in water, like shellfish farms, or mats that are suspended below the surface on mooring lines.

At the time of harvest, seaweed is either cut at the appropriate length to allow it to regrow, or the lines or mats can be fully removed from the water and new seaweed planted from scratch. Some species are so bountiful that they can be harvested several times a year.

4.2.1.1 Seaweed in Ireland

Some 25,000 to 40,000 tonnes of seaweed are harvested every year in Ireland, with 95% naturally grown and gathered by hand (Government of Ireland, 2021). Around 150-300 people are employed in seaweed harvesting, mostly along the western seaboard. Many of these jobs are ingrained in cultural practices that have been carried through generations, and these are enshrined in law. Rights to harvest seaweed are issued under the Foreshore Act (1933) by the Minister for Housing, Planning and Local Government, with around 6500 rights related to seaweed along the west coast, of which between 250-400 are being exercised. Anyone with existing rights can continue to harvest seaweed whilst respecting environmental legislation. These harvesters often sell their crop to processing plants, which develop them into a product for sale or further production.

While harvesting has traditionally been aimed at wild seaweed, there is a growing move towards seaweed aquaculture as larger companies get involved. While aquaculture is a practice that has been typically harmful on marine environments, it can be sustainably designed. Integrated multi-trophic aquaculture is a method that has been trialled in Connemara, involving the farming of complementary species from different levels of the food chain together. The waste from some species is used by others, fish are fed, shellfish filter out microscopic plants and organic matter, and seaweed absorbs minerals in the water. The natural ability of shellfish and seaweed to recycle nutrients around fish farms leads to a healthier system that also maximises space for economic benefit.

4.2.1.2 Proposal

The project outlined here is built on a five-year business plan to create an ambitious seaweed farm at a full scale of 15km² and with 100 full-time employees. The farm would use mats suspended beneath the water on which seaweed can grow, drawing these mats to the surface for harvesting. The mats would be secured on ropes to the seabed and tended to by boat, with the crop of seaweed transported to a processing facility where it can be dried and milled for further processing or sale. The steps laid out to achieve this include a feasibility study, site selection, equipment installation, harvesting and processing the crop, and sale of the crop. It also includes a discussion on finance and scale.

Appropriate licencing would need to be obtained from Bord Iascaigh Mhara, based on appropriate site selection as part of a feasibility study. Stakeholder engagement, including people involved in other marine activities like fishing, is an essential prerequisite to choosing a site, since marine infrastructure can be a contentious issue. Maintaining engagement with community members and local stakeholders will minimise potential conflicts with the seaweed farm. Other factors to take

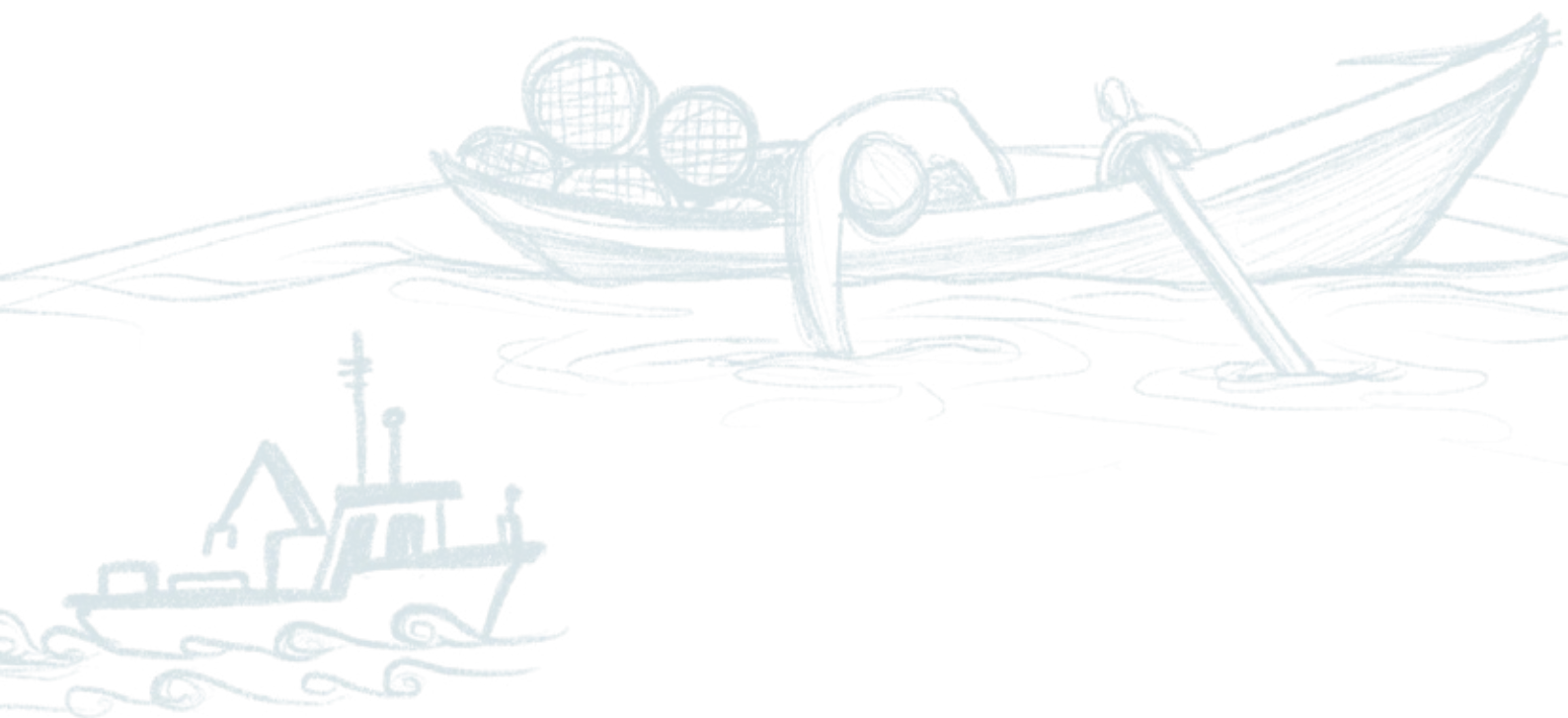
into consideration for site selection are depth, currents and tides, boat traffic and seabed type. Where a mooring system is being used, a depth of 10-20m is ideal in areas with a stable seabed. A formal marine engineering study would be needed to determine suitable sites for the seaweed farm. The bay east of Killybegs has been identified as a possibility for setting up a seaweed farm since there is little conflict with marine users as well as a suitable depth and bottom type. Killybegs harbour would be well suited as a base from which to manage the operation, with seaweed landed there for processing.

Operating expenditure at full-scale for this project is expected to be 18.5 million euro per year, with an income of 39 million euro per year with the production of 130,000 tonnes of seaweed at a price of 300 euro per tonne. The progression to this stage would take five years, beginning with a 3ha pilot site that produces 269 tonnes. The capital investment and operating cost for this site would be 1.3 million euro in the first year and would be gathered primarily through grants. There are a number of investment funds and social entrepreneurship programs offered through the government, and these can be navigated through supporting organisations such as the Donegal Local Development Company mentioned in the biochar section.

It is expected that the business would become profitable after four years, at which stage the community profit share is expected to exceed 5 million per year. This could be invested in community development initiatives that address the needs and priorities identified in the listening phase.

4.2.1.3 Species

By cultivating indigenous Irish species, the project can preserve local heritage whilst supporting marine biodiversity. The primary species identified for cultivation are sugar kelp (*Saccharine latis-sima*) and purple laver (*Porphyra umbilicalis*). Sugar kelp can be used as a sweetener, as well as



a thickening and gelling agent that can be added to food, textiles and cosmetics. It is a natural source of vitamins and minerals including zinc, magnesium, iodine, iron, potassium, copper and calcium. In the past it was known as the 'poor man's weather glass', since it goes limp in high humidity and dry and brittle when the humidity decreases. It was traditionally harvested in Ireland for fertilizer, and is eaten by sheep on the Orkney Island of North Ronaldsay, leading to a sweet tasting meat. Sugar kelp is very similar to kombu (*Saccharina japonica*), which is used in Japan to make soups, stews and stocks.

Purple laver is used in sushi and seaweed sheet snacks. It is currently used in restaurant chains and supermarkets throughout the UK and Ireland. Since it has a high protein content of 30-50%, it is an ideal supplement for vegan and vegetarian diets. Other species that might be considered are British winged kelp (*Alaria esculenta*) and dulse (*Palmaria palmata*). Dulse has been eaten in Ireland for centuries, traditionally harvested between May and September, and dried on harbour walls and beaches. It can be eaten whole or flaked in soups, bread, salads, or as a relish.

The most common seaweed harvested in Ireland is *Ascophyllum nodosum*, which is gathered from rocky surfaces near the seashore by hand at low tide. Beds are typically cut on a four-to-five-year cycle and used for high-quality animal meal as well as fertilizer.

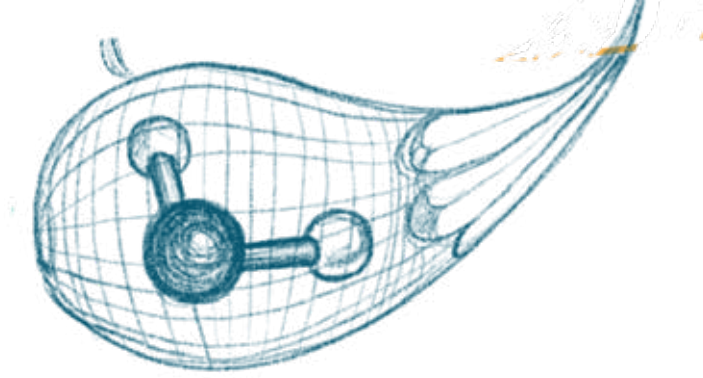
Other species, *Asparagopsis taxiformis* and *Asparagopsis armata*, have been shown to reduce methane emission in cattle up to 67% when they are incorporated in feed. There is an opportunity here to explore further means of increasing the climate impact of the project.

The wrack was dark an' shiny where it floated in the sea,
There was no-one in the brown boat but only him an' me:
Him to cut the sea wrack, me to mind the boat,
An' not a word between us the hours we were afloat.
- Moira O'Neill, mid-19th century.

4.2.1.4 Climate benefits

Compared with land-based agriculture, seaweed farming has a number of environmental and climate benefits since there is no need for freshwater, fertilizer or arable land. There is also a significant uptake by seaweed of dissolved nitrogen and phosphorus, which are leached into coastal waters from agricultural fertilizers and cause eutrophication – a process by which oxygen is depleted in the water by algal blooms. Seaweed also has a mitigating effect on climate change by absorbing carbon through photosynthesis. At full scale (15km²), the estimated potential mitigation capacity is 22,500 tonnes of CO₂ per year.

Seaweed forms the base of complex coastal food webs. Its cultivation therefore supports a greater abundance and diversity of life. This increase in biodiversity would have benefits for fisheries as well as increasing resilience against environmental change since the diversity of an ecosystem improves its ability to adapt.



4.2.1.5 Societal benefits

Alongside the physical environmental benefits of seaweed farming, the engagement of the local community in a sustainable marine enterprise will encourage people to value the sea in new ways that promote positive environmental practices. This might be supported through an advocacy program with local schools and community groups so that they can learn about the benefits of the enterprise, whilst also engaging them with community led climate action. Community views tend to shape the environment around them which in turn shapes their identity. This is a central component to the sense of community that was shown to be of such value during the listening phase.

The direct creation of up to 100 jobs is projected for a full-scale project covering 15km². These jobs are based on the cultivation and processing of seaweed, with a significant number requiring maritime skills. This would provide an opportunity for people currently engaged in fishing to transition to a growing sustainable industry. There would also be high-skill jobs across engineering, marine biology and operation. If more downstream processes are developed, such as retail food products or cosmetics, another 100-150 jobs could be created. The profit share gained by the community would also feed back into benefits that meet the needs and priorities identified in the listening phase. This is a means of community-wealth building, a people centred approach to economic development which redirects wealth back into the local economy and places control and benefits on the hands of local people.

4.2.1.6 Challenges and concerns

When presented to the community, the seaweed farm met with more questions and concern than the proposed biochar facility. Primary among them was the relationship with the private company, the reliance on the harbour at Killybegs and the size and scale of the operation.

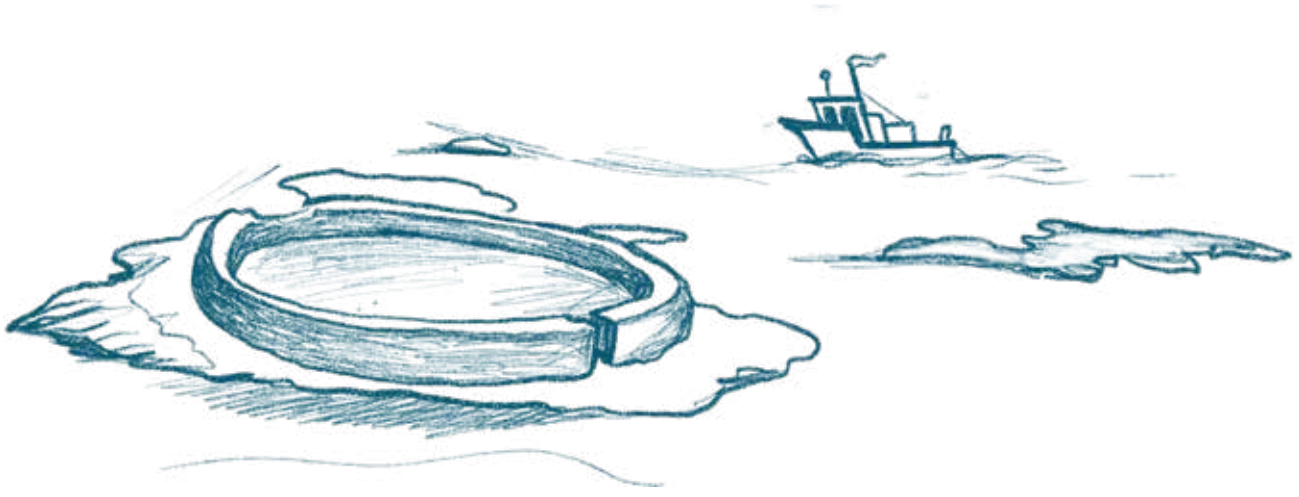
With regards the relationship with the private company, there were questions raised regarding how long it would take for the company to be profitable and thus for the community to receive their share. There were also questions about how this relationship would be formalised so that the stake would be realised.

The community also noted that there was not necessarily a direct benefit to Ardara, given the reliance on the harbour at Killybegs for the development of the enterprise. While there would be an opportunity for employment for the people in Ardara, the rest of the enterprise would be located in Killybegs. This then led to questions regarding the profit share and how it would be managed between the two communities.

It was suggested that the identification of seaweed as a community enterprise was valuable but that the community might look into taking on a smaller farm and own it collectively, rather than pursue such a large operation and benefit from a smaller slice. The scale of the proposal did offer food for thought, however, with one participant in the final community meeting remarking:

“This just goes to show the size of projects we can aspire to as a community. There’s no reason why we can’t dream big if we have the necessary resources available to us.”





5. Conclusion

The model described in *The People's Transition: Community-led Development for Climate Justice* aims to systematically include people and communities in the design, implementation and ownership of climate action such that communities would begin to see the benefits of sustainable development in their lives and thus would support a rapid deep decarbonisation push towards zero emission societies. It also recognises that the public investment in climate action, if directed towards community-led initiatives, could provide an enormous boost for local development across Ireland and could address issues of inequality that exist on the island.

But theory is one thing and practice is another. Thanks to the support of AIB, TASC has been able to work with the community of Ardara to see if the model could be applied effectively. In spite of the challenges of COVID-19 and the short timeline for operationalisation, the project in Ardara indicates that the People's Transition model can be successfully deployed in rural communities in Ireland.

There are some key enabling factors, particularly an active and dedicated group of local actors who were able to steer the development of the project and guide the TASC team. In addition, support from the staff at the Donegal Local Development Company CLG was invaluable in helping the TASC team understand the challenges faced by the community and meet with community members. Finally, the willingness of experts in a variety of fields to engage with TASC on the development of solutions was central to delivery.

The solutions themselves met with a mixed reaction, with the community being more positively disposed to the solution which presented them with full ownership – despite the potential return from the seaweed profit share being more substantial. This likely speaks to an underlying distrust of private sector actors and centralised decision-making processes which have often left Donegal behind.

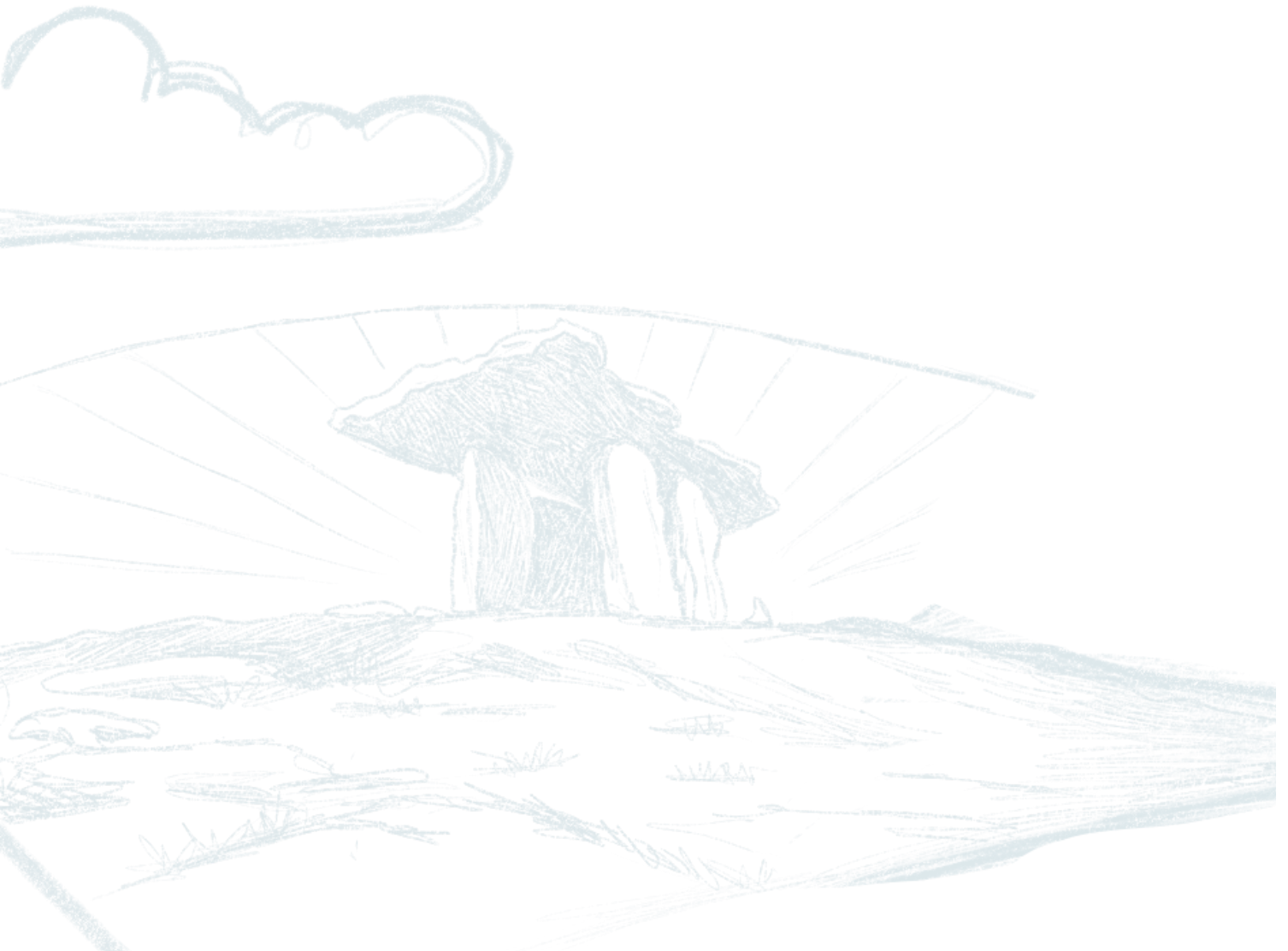
It is our hope that the community can now advance the solutions as they see fit and expected that

the resources for further exploration should be available as several new funding opportunities for climate action come online over the course of 2022.

It is also hoped that the experience of engaging with the project will have been a valuable one for participants. TASC was aware from the outset that asking a community to believe in a participative process is not necessarily an easy request. Communities are jaded from consultative process that led to little change. This has led to a lack to an understandable questioning of the merits of participative models. TASC has endeavoured to ensure that the process of participation was valuable in and of itself, and this seems to be reflected in the feedback from one project participant:

“The People’s Transition’s pilot brought the community of Ardara together to discover pain points in everyday rural living, to innovate and hear voices from all areas of the community. It was very valuable to have TASCs research team use what they learned to help find climate transition solutions which will benefit both local people and the planet. We are excited to receive the final report from TASC and get ready to move forward with next steps.”

We hope this report is what you imagined it could be!



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