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CASE STUDY

# CCUS and Local Social Perspectives

[version 1; peer review: 1 approved with reservations]

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## Abstract

Climate change is a wicked problem that requires an interdisciplinary approach to address it. Technological advancements are considered as a viable solution in addressing climate change, ans innovation programs such as the Horizon2020 is one of the European Union's tools to mitigate climate change and address societal issues. Our project funded by Horizon 2020, is exploring the societal perceptions and awareness of Carbon Capture Utilization and Storage technologies in two European clusters. In this paper we present the findings from a single case study interview that we conducted as part of the bigger project. This interview is the culmination of a three-year collaboration we had with a local community in Greece. Our findings enhance current literature suggesting the importance of early engagement of local communities in a project, the role that the sociopolitical environment can have on peoples' engagement, while also highlighting the importance of social capital and access to resources that communities should have.

## Plain language summary

This paper reports on the work we have done with a local community in Greece in regard to their views on Carbon Capture Utilisation and Storage technologies. This case study reports findings from a three year collaboration and enhances current literature suggesting the importance of early engagement of local communities in a project, the role that the sociopolitical environment can have on peoples' engagement, while also highlighting the importance of social capital and access to resources that communities should have.

## Keywords

Climate change, carbon dioxide, Carbon capture utilization and Storage, Community Engagement, Impacts, Greece

**Open Peer Review**

**Approval Status** ?

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1. **Jing-Li Fan**, (China University of Mining and Technology), Beijing, China

Any reports and responses or comments on the article can be found at the end of the article.

H2020 This article is included in the Horizon 2020 gateway.

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## Introduction

The majority of scientists and society members agree that climate change is a wicked problem that has been exacerbated by human activity and needs to be addressed immediately. Despite that agreement, there are differing opinions on the strategies that need to be followed to address climate change, and who holds the responsibility for instigating and applying those strategies (Kenis & Mathijs, 2012). The main contestation is whether climate change can be addressed through changing personal behaviours; the use of green technology-ecomodernism; political and social changes, or some combination of the above.

**Change on human behaviours**, is one of the strategies suggested to address climate change. For the behavioural changes to be effective in addressing climate change, the focus should be on "*high impact behaviours and high emitting groups*" (Whitmarsh *et al.*, 2021) p.79, rather than small scale behavioural changes. Examples of behavioural changes include but not limited to our dietary preferences (Li *et al.*, 2024; Tilman & Clark, 2015), and transportation choices (Gössling & Dolnicar, 2023; Moriarty & Honnery, 2021).

**Ecomodernism,** refers to the school of thought that promotes technological advancements and economic growth to address climate change, without the economic growth jeopardizing nature's conservation (Javed *et al.*, 2025). Big scale technological advancements that aim to address climate change such as solar farms, wind farms, nuclear power and carbon capture utilisation and storage (CCUS), are all part of the technological advancements that ecomodernists seek solutions from.

Our study is exploring the societal acceptance of CCUS technologies, thus CCUS is going to be the technology we focus on.

**Social acceptance** of technological advancements is an important element that can influence the implementation of technology-based solutions to address climate change towards a Net Zero future (Tanveer *et al.*, 2021; Upham *et al.*, 2015). In this paper we focus on the community aspect of social acceptance, rather than that of market or political acceptance (Wüstenhagen *et al.*, 2007). Meaningful public participation in climate change projects, can lead in positive results by strengthening adaptation initiatives and promoting mitigation ambitions (Cattino & Reckien, 2021). In addition, several scholars have pinpointed the importance of engaging with local communities from very early on, and even before a decarbonisation project has started (Beddies, 2015; Mabon *et al.*, 2015), which was not the case for our project. In their paper Armstrong *et al.* (2025), discuss how public participation in scientific research can have multiple benefits to the local communities by bolstering community, political and economic empowerment.

We believe that local communities, should have at least the same access to resources as companies have, to be able to address wicked issues such as climate change and the reduction of $CO_2$ from the atmosphere. Through our research, we want to learn from local communities about the work they do to address climate change, while also being able to contribute to their efforts by sharing resources and information they might not have access to. We hope we can act as a pedestal to bring their voices forward and disrupt the current socio-technological paradigm that sees local communities as a hurdle to a Net Zero future, rather than embrace their knowledge and capacities to support a Net Zero future.

## Methodology

The study area of this paper is a small island in Greece that is active in both the tourism and agriculture industry throughout the year. In addition, it has an operational oil field that has recently been licensed for carbon dioxide storage. Despite community members' knowledge and experiences with the oil field, they had very little knowledge of carbon storage and the area's potential.

The data used in this paper is based on a one-hour long interview conducted with one of the project's participants. This one-hour long interview is the culmination of a three-year collaboration we had with community members as part of the ConsenCUS project. During the three years we had five separate meetings and discussions, with one being face to face and the rest being online meetings. The face-to-face meeting included a short presentation of the ConsenCUS project by the researchers and a generic informative session on Carbon Capture Utilisation and Storage technologies. It was a very informative session that developed lots of questions for both the local residents and the researchers. A more detailed account of the area and our collaboration can be seen in this paper (Stavrianakis *et al.*, 2024). The person interviewed was present at all the discussions and is very active in local matters. He has a lot of professional experience as a manager in different industrial settings, while also having led multiple international projects. The participant gave us his informed consent verbally to audio-record the conversation and use it for research purposes. The participant was offered both options for verbal and written informed consent, and he chose the verbal consent.

The focus of the interview was to get an account of the perceived societal impact our project had as understood by a community member. The interview was recorded through Teams and transcribed in the Greek language as that was the language used throughout the interview.

An abductive thematic analysis was used, informed by questions asked in the interview and themes emerging from the text (Thompson, 2022). The analysis was done in the Greek language, and relevant excerpts were then translated in the English language.

The final draft was shared with the interviewee for member checking and giving the interviewee the opportunity to remove or add anything they see fit (Pinto *et al.*, 2022; Varpio *et al.*, 2017).

This study has received ethical approval from the Research and Ethics Committee at Robert Gordon University, Aberdeen Business School (approval code: 10052022PS/EL/ZM, approval date: 10 May 2022.

## Results

There are three main themes we identified from the interview as being crucial to the societal impacts of this project. Below we discuss each theme individually using direct quotes from the interview.

### Social capital and community awareness

Local communities have the capacity and wish to actively participate in such projects, but they often lack the resources and are not informed about such initiatives. The interviewee highlighted the importance that our initial communication had for him and in extension to the local community, as until that point, him and most of the residents did not know a lot about carbon storage.

> "*Basically, for me, our acquaintance played a pivotal role, because although I have been in business for many years and I knew about the European Trade Scheme, and I knew we had to reduce the $CO_2$ from the atmosphere, that's all I knew. I then started reading more about the carbon stock exchange and how political decisions, [talking about Donal Trump] can influence different trading schemes*".

The discussion later shifted to social capital and the EU's role in supporting local communities. They emphasised the lack of support from the EU, in contrast to the funding private companies receive for research and development. As a local community, they would benefit from having access to an independent EU team made of social scientists, geologists etc, that they could get advice from.

> "*If we have a project, let's put it in simple terms, that is funded by the EU, let's say a consortium that includes BP, and then we have another team part of the same project keeping an eye on them…you can't do that because you then have a vertical approach, where you should have a horizontal approach, i.e. a matrix organisation that is an independent entity and they can advise on different projects* ".

### Governance

Political governance can influence peoples' participation in such initiatives, while also impacting their notion of trust. The interviewee discussed how in other countries, such as Norway, $CO_2$ storage was only allowed in great distances from the shore, e.g. more than 60 miles out, compared to their location that is just 3 miles from inhabited areas. He expanded by saying that although there are reassurances about the safety of $CO_2$ storage, he does not trust the Greek government to monitor and having the know how in such operations, and he is also very sceptical towards scientists that say that they guarantee that no leaks would occur within the next 1000 years.

> "Look *here, my personal view is that it is very difficult to trust them [Greek government]. The state is pushed by the companies, for example to follow the London Protocol*[4] *. And what does the London Protocol say? It says that for the marine transportation of $C0_2$ certain specifications and standards should be followed…. Now, because 2/3 of the member states did not vote for it, the London Protocol has no validity, and you need to have agreements between two parties. The company is pressuring the society to pass laws "in the night" and "under the table" and the government does not know what to do. The prime minister does not know what to do and there is continuity in the public services and being independent from the government*".

The impact of local governments and parties in a united front was also discussed by the participant. He described his experience, where representatives from different political parties that are part of the local government on the island, has asked him for advice on carbon storage, as well as requested PowerPoints or reports to be written about the topic. He mentioned that he happily helped them with any information they needed, but he was not going to take a political stance with any of them as according to him that would jeopardise any of their efforts. They described themselves as the "Information Centre" because many people were asking for his input.

In addition, he also mentioned how important it was that the mayor of the island that belongs to the national government, was against the storage of $CO_2$ in contrast to the prime minister of Greece that supports it, and that carbon storage is a big political game.

> "*Yes, it is a big political game, and I am in the middle. They argue with each other, and I have told them, that if we want to go forward, then we need to establish a committee on the island*".

### Place based concerns

As mentioned above, the participant had a very generic understanding towards carbon dioxide and its impacts prior to our introduction to the project. Our acquaintance gave them the spark to read a lot on the topic while also asking other people with expertise in geological storage, as that aspect was of their main concern. Their primary concern was on human health, and secondary about the natural environment and marine ecosystems and discussed about not wanting the storage in their backyard.

> "*When you have a house that is 3 kilometres away from the storage site, and because I have that house and I am looking at my personal interest, and that is a problem for me. Now if you take that to other places, like Norway or somewhere 150 kilometres away, my problem would be smaller. I know that you might destroy somehow the marine environment, I do not know the exact disasters that can take place if suddenly the concentration of $CO_2$ increases by 30–20 percent…you will have and ecological disaster, but human lives are not threatened as much*".

At that point he brought up as an example a disaster that happened at Lake Nyos in Cameroun in 1986, where an eruption released hundreds of thousands of tons of $CO_2$, resulting in the death of thousands of people and animals. He made the distinction that the eruption was due to natural causes, volcanic explosion, but he also made the point that $CO_2$ is $CO_2$ and can be hazardous, no matter if the source is natural or manmade.

### Implications

From the above we can see that the participant was eager to get involved with the project, as he saw both personal and communities benefit in his involvement. Despite his initial lack of knowledge on the topic, he succeeded on his own time to develop an overall understanding of carbon storage and share his knowledge with others in the community.

Although we have only provided a snippet of our research in this paper, we are confident that our findings can inform future projects seeking to address issues related to climate change and environmental concerns.

Our recommendations for future community engagement to further bolster the social impacts of a project include

1) Early involvement of the public in the project.
2) Promote public participation in scientific research.
3) Spherical understanding of the socio-political situation of the region prior to engaging with the communities.
4) Develop easy to access resources that communities can refer to when needed to enhance their capacity in decision making and further involvement in the project.

## Ethics and consent statement

This study received ethical approval from the Research and Ethics Committee at Robert Gordon University, Aberdeen Business School (approval code: 10052022PS/EL/ZM, approval date: 10 May 2022). The participant provided verbal informed consent to be audio-recorded and for the data to be used for research purposes. Both verbal and written consent options were offered, and the participant chose to give consent verbally.

## Data availability statement

Due to the small locality of the study area, the availability of the qualitative dataset could expose the identity of the participant. For access to the non-public dataset, you can email the corresponding author at k.stavrianakis@rgu.ac.uk with a request to access the qualitative transcript.

### Acknowledgements

We would like to thank the participants for giving us their valuable time and sharing their knowledge and experiences with us.

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# Open Peer Review

## Current Peer Review Status: ?

**Version 1**

Reviewer Report 11 December 2025

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**Jing-Li Fan**
(China University of Mining and Technology), Beijing, China

This paper, based on a case study interview with a local island community in Greece, highlights the critical roles of early public engagement, social capital, and political trust in the social acceptance of CCUS. The overall writing is clear and logically structured; however, several points should be addressed before indexing:

1. The study relies on a single interview as the primary data source—can this adequately support conclusions about “local social perspectives”? The authors should justify the choice of a single case and interview rather than multiple participants or focus groups.
2. The paper employs an “abductive thematic analysis,” but the analytical steps are described briefly. The authors could enhance methodological explanation and transparency.
3. Concepts such as “ecomodernism,” “social acceptance,” and “community engagement” are mentioned—could the literature review be expanded and better organized to clarify their relationships and compare this case with Northern European or UK experiences, thereby emphasizing the paper’s unique contribution?
4. It is suggested to strengthen the logical linkage in the “Implications” section, elevating discussion from the perspective of a single interviewee to a broader theoretical level and integrating practical recommendations with academic analysis more effectively.This paper, based on a case study interview with a local island community in Greece, highlights the critical roles of early public engagement, social capital, and political trust in the social acceptance of CCUS. The overall writing is clear and logically structured; however, several points should be addressed before acceptance:
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8. It is suggested to strengthen the logical linkage in the “Implications” section, elevating discussion from the perspective of a single interviewee to a broader theoretical level and integrating practical recommendations with academic analysis more effectively.

**Is the background of the case’s history and progression described in sufficient detail?**
Partly

**Is the work clearly and accurately presented and does it cite the current literature?**
Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**
Not applicable

**Are all the source data underlying the results available to ensure full reproducibility?**
Yes

**Are the conclusions drawn adequately supported by the results?**
Yes

**Is the case presented with sufficient detail to be useful for teaching or other practitioners?**
Yes

***Competing Interests:*** No competing interests were disclosed.

***Reviewer Expertise:*** CCUS

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**